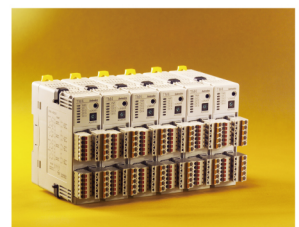


Autonics!

# SELECTION GUIDE

Ver. 14



# Global partner for Industrial Automation **Autonics**

Autonics is a leading company of Sensors & Controllers in Korea. 6,000 detailed items, high quality, reliability and affordable price make them the most cost effective and best selling products in Korea and widely marketed in more than 100 countries.

If you are looking for more cost effective sensors and controllers, Autonics is the answer.



Cost Effective IA Solutions?

# Autonics is the Answer



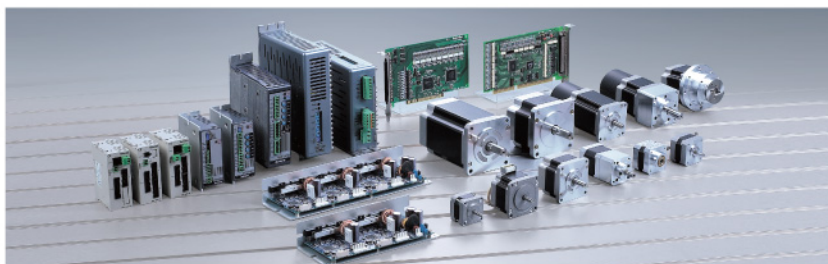
## Sensors

- Photoelectric Sensors
- Fiber Optic Sensors
- Door / Door Side Sensors
- Area Sensors
- Proximity Sensors
- Pressure Sensors
- Rotary Encoders



## Controllers

- Temperature Controllers
- Temp. /Humidity Transducers
- Power Controllers
- Counters
- Timers
- Panel Meters
- Pulse(Rate) Meters
- Display Units
- Switching Power Supplies
- Sensor Controllers
- Touch Screen/Logic Panels
- Field Network Devices



## Stepper Motors

- 2, 5-Phase Stepper Motors
- 2, 5-Phase Stepper Motor Drivers
- Motion Controllers



## Control Switches

- Push button Switches
- Selector Switches
- Emergency Switches
- Pilot Lamps
- Switch Accessories
- Buzzers
- Sockets
- Digital Switches
- Interface Terminals

\*Not included in this guide. Refer to the control switch catalogue.

## TK Series



NEW



## TK Series

## High Accuracy Type PID Temp. Controllers

- Easy to configure parameters (with DAQMaster) : Parameter mask, User parameter group
- 3 Alarm outputs & 2 Transmission outputs
- High sampling speed of 50ms & Display accuracy of  $\pm 0.3\%$
- Simultaneous control of heating/cooling & automatic/manual control
- Supports communication : RS485 (Modbus RTU)
- Configure parameters via PC (Use USB cable or RS485)
- SSR/current output options
- SSRP output (standard/phase/cycle control options)
- Heater burn-out alarm : CT input (Except TK4SP)
- Multi SV setting mode of up to 4
- Space saving design : 38% smaller in thickness than existing models (60mm)
- Multi input/Multi range

## TM Series



## TM Series

## Multi-channel Modular Temp. Controllers

- Multi channel (4-channel / 2-channel) I/O from one unit
- High sampling speed control (4-channel : 100ms; 2-channel : 50ms)
- Expansion via modular connectors : Communication or power connection not required between modules (Expand up to 31 units (124 channels / 62 channels)
- Insulation between input channels (Dielectric strength 1,000VAC)
- Simultaneous control of heating/cooling
- Parameter setting from PC (USB or RS485 Communication) : DAQMaster provided

## TCN Series



NEW



## TCN Series

## Economical Dual Display Type PID Temp. Controllers

- Improved convenience with dual display(SV/PV)
- Realizing 100ms high speed sampling
- SSRP output and relay output embodied together : SSRP output makes phase control and cycle control possible
- Dramatically increased visibility using wide display and high luminance LED
- Space saving mounting with compact design : downsized by 38% in depth(60mm)
- Various sensor input types and wide indication ranges

## TC Series



## TC Series

## Economy Type PID Temp. Controllers

- 100ms high speed sampling
- Relay output and SSRP output embodied together : SSRP output makes phase control and cycle control possible
- Dramatically increased visibility using wide display and high luminance LED
- Space saving mounting with compact design : downsized by 38% in depth(60mm)
- PV/SV deviation indicatable

## TC3YF/TC3YT Series



### TC3YF Series TC3YT Series

## Simple Operation Type Temp. Controllers

### Freezing/Defrosting TC3YF Series

- Available with up to 3 outputs  
: Compressor, Defrost, and Evaporation(fan)
- Auto/Manual defrost function
- Various delay functions for optimal cooling control  
: Compressor start-up delay, re-operation delay, Minimum ON time, defrost-end delay and evaporation-fan operation delay
- Operation cycle setting available for compressor protection in case of error

### TC3YT Series

- Simple and economical type
- ON/OFF and Proportional control
- Control output : Relay(250VAC 3A 1c or 250VAC 16A 1c)
- Input sensor : Thermocouple(J, K), RTD(Pt100Ω)
- Input correction function
- Finger safety type of terminal

## TA Series



### TA Series

## Analog Dial Setting Type PID Temp. Controllers

- Sensor burn-out display function
- Improved control performance with built-in microcomputer
- Adopting new Auto-tuning PID control algorithm
- Selectable ON/OFF, PID control (with the external slide S/W)
- PID control using self-tuning function
- Easy to check controlling status with deviation indicating lamp  
: Deviation LED(red, green), output LED(red) indication
- Dial setting output OFF function
- Sensor broken display function

## SSR



SR1 Series

SRH1 Series

SRC1 Series

SRPH1 Series

SRS1 Series

## Highly Reliable SSR Solid State Relay

### SR1 Series

- Detachable Heatsink Type – Easy maintenance with detachable heatsink

### SRH1 Series

- Heatsink Integrated Type – Superior heat protection efficiency and high reliability

### SRC1 Series

- Slim Detachable Heatsink Type – Slim & Compact

### SRPH1 Series

- Analog Input Type – Control cycle and phase with analog input of 4-20mA

### SRS1 Series

- Socket Type – Socket type SSR for easy maintenance

## SR1/SRH1/SRC1/SRPH1 /SRS1 Series



**LON Series**



Counter  
(LA8N Series)

Timer  
(LE8N Series)

Speed/RPM/Pulse Meter  
(LR5N Series)

## Compact LCD Type Counter/Timer/Pulse Meter

- Long life & replaceable internal lithium battery  
(Battery life cycle : LA8N – 7 yrs / LE8N – 10 yrs / LR5N – 3yrs)
- 7 segment LCD display (LA8N / LE8N : 8 digit, LR5N : 5 digit)
- Screw Terminal type (Terminal protection cover)
- Protection structure IP66 (Front panel only)
- Signal input type
  - No-voltage input : Use contacts reliable enough to flow 5 $\mu$ A of current.
  - Universal voltage input : "H" : 24-240VAC / 6-240VDC  
"L" : 0-2.4VAC / 0-2.4VDC  
(Universal voltage input not available in LR5N.)



**LON Series**

**CT Series**



## Programmable Counters/Timers

- Supports RS485 communication (Modbus RTU) function : Parameter setting and monitoring via PC
- PC loader program 'DAQMaster' provided free of charge
- Increased contact capacity of load to 5A(Previous model: 3A) (CTS, CTM)
- Sets one-shot output time from 0.01 to 99.99sec. per 10ms
- Diverse input/output modes available

**[Counter]**

- Available to set 6 digit prescale value (0.00001 to 999999) (4 digit: 0.001 to 9999)
- Added BATCH counter indication mode for CT6M-1P and CT6M-2P
- Available to set Count Start Point (Initial value)

**[Timer]**

- Memory backup function (For indicator)
- More diverse time range  
(6 Digit : 999.999s / 9999m59 / 99999.9h, 4 Digit : 9.999s)
- Available to set "0"



**CT Series**

**LP-S070/GP-S070 Series**



Logic Panels

**LP-S070 Series**



Touch Screen

**GP-S070 Series**

## PLC Function Incorporated Type Logic Panels/Touch Screen

**Logic Panels LP-S070 Series**

- PLC Function Incorporated Type
- Supports input 16 points/ output 16 point basically.
- Position control function(Max. 100KHz pulse 2 contact concurrent output)
- Various device support(including 10K word and data device 10K device)
- Large memory capacity  
(Program memory : 8,000 Step, Drawing memory : 16MB)

\* Other features are the same with GP-S070's.

**Touch Screen GP-S070 Series**

- 16,777,216(24bit) color with 7" wide TFT LCD screen
- Analog touch type monitor
- Data logger function: various data collect and back-up support for controllers
- Various image library support
- Synchronous monitoring for Multi address / channel
- Support multi font (providing various bitmap and widows vector font)
- Support multi communication interface  
(USB Host/Device, RS232/RS485, Ethernet)

7" True Color



## BTF Series

Ultra Slim Type  
Photoelectric Sensors

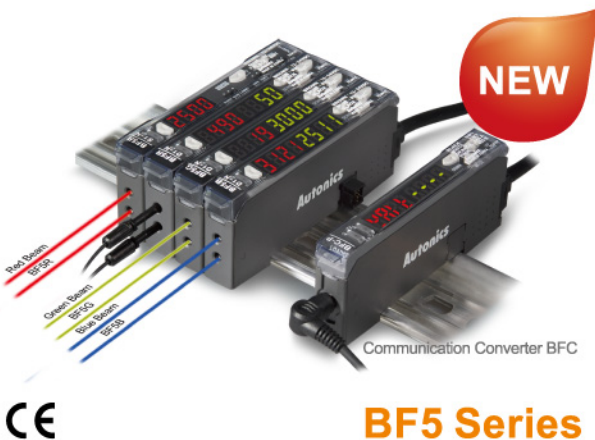
- Compact installation
- Lighting spot checking available with red LED beam
- BGS reflective type features
  - : Hardly affected by background
  - : Advanced sensing performance by minimizing the influences of object color and materials.
- Detecting up to  $\varnothing 0.2\text{mm}$  small object
- Improved visibility with safety indicator(green) and operation indicator(red)
- Reverse polarity protection, Output short-circuit protection circuit
- Protection structure IP67 (IEC standard)

## BJ Series

Compact Amplifier built-in  
Photoelectric Sensors

- High performance lens : Through-beam 15M, Polarized retro-reflective 3M, Diffuse reflective 1M
- Adjacent installations possible with auto mutual interference prevention function
- No effects of background object with Background Suppress(B.G.S) function(BGS reflective type)
- Stable sensing to minimize error range regardless of color and material of sensing objects(BGS reflective type)
- Stable detection for transparent objects(LCD, PDP, glass etc) by BJG30-DDT
- Micro-spot type(BJN)
- High accuracy sensing for minute object(BJN)
- Compact size : W20 x L10.6 x H32mm

## BF5 Series

Digital Indicating Type  
Fiber Optic Amplifiers

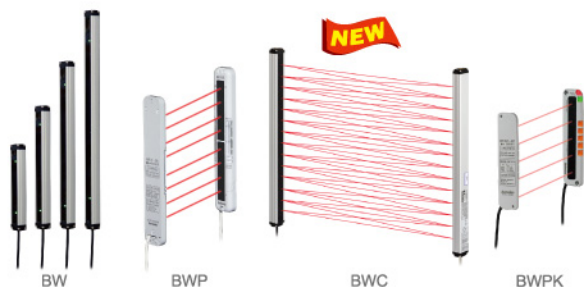
- New line-up of red/green/blue beam types and PNP output types
- Dual display for light incident level and configuration value (BF5R-D1-N)
- Micro-sized object detection with high resolving power of 1/10,000
- High speed detection of up to 20,000/s to sense rapid moving objects
- 4 response speed options :  $50\mu\text{s}$ ,  $150\mu\text{s}$ ,  $500\mu\text{s}$  and 4ms
- Long lasting amplifier regardless of element's life degradation or temperature change
- Diverse sensitivity setting modes : Auto tuning, 1-point (max. sensitivity), 2-point, Position setting
- Adjacent mounting of up to 8 units with mutual interference prevention from side connector
- Slim design (W10 x H30 x L70mm)
- Supports RS485 and serial communication when used with BFC (communication converter, sold separately)

## PR/PRD/PSN Series

Cylindrical/Rectangular  
Proximity Sensors

- World class noise resistance by adopting dedicated IC.
- Realizing 1.5 to 2 times long distance sensing performance (PRD Series)
- Long life cycle, High reliability and Easy operation
- Protection structure IP 67
- Reverse power polarity, surge, overcurrent protection
- Replacer for micro switches and limit switches

**BW/BWP/BWC/BWPK Series**



**BW/BWP/BWC/BWPK Series**

**Slim Type  
Area Sensors/Picking Sensors**

**Area Sensor BW Series**

- Increased sensing stability by minimizing non-sensing area
- Long sensing distance of up to 7m

**Area Sensor BWP Series**

- 13mm slim body with Fresnel lens
- Adoption of plastic (PC/ABS) injection case

**Area Sensor BWC Series** NEW

- 3-point cross beams minimize non-sensing area
- Long sensing distance of up to 7m
- 7 types with different no. of optical axes (4-20), optical axis pitch (40, 80mm) and sensing heights (120-1,040mm)
- Installation mode for discrete adjustment of sensing position

**Picking Sensor BWPK Series**

- Slim plastic injection body (W30 x H140 x L9.9mm)
- Wide range of sensing distance (0.1 to 3m, 0.05 to 1m)

**E58/EP58 Series**



**E58/EP58 Series**

**Shaft/Flange Type  
Rotary Encoders**

- Diverse appearance supported
  - Shaft/ flange type
    - : Shaft clamping type, Shaft sync type, Hollow shaft built-in type and Hollow shaft type (in case of hollow shaft type, incremental type only)
  - Wiring
    - : Axial/ radial connector type, Cable outgoing connector type and Cable outgoing type (in case of hollow shaft type, axial cable outgoing type only)
- Convenient screw mounting

**AK/AHK Series**



**AK/AHK Series**

**□24mm/□42mm/  
□60mm/□85mm**

**5-Phase Stepper Motors**

- High speed, accuracy and torque
- Pentagon & Standard connection type
- Various types
  - : Shaft, Hollow shaft, Brake, Geared, Geared-Brake, Rotary actuator, Rotary actuator-Brake
- Various frame size : 24, 42, 60, 85mm
- Rated current : 0.75, 1.4, 2.8A/phase

**MD5 Series**



**CE** **UL** **US**  
(Except for MD5-HD14, ND14)

**MD5 Series**

**1/250 High Resolution  
5-Phase Stepper  
Motor Drivers**

- Bipolar constant current pentagon drive type
- Max. 250 divisions(Except for MD5-ND14)  
(0.00288° per pulse controllable - 5 phase stepping motor)
- Available low-speed revolution and super-precision control with a micro-step drive.
- Auto current down, self test, user's run/stop current setting, zero point excitation output provided

## ARD Series



Digital Terminal block type



Analog Terminal block type



Digital Sensor connector type

NEW

## DeviceNet Protocol Type Digital/Analog Remote I/O

### Digital Types

- Sensor connector types
  - e-Con type sensor connectors save wiring work by half
  - Slim size of W26xL76xH54mm allows compact installation
  - Expansion up to 7 units per each basic unit (Controls up to 64 points of I/O)
- Terminal block types
  - Expansion up to 3 units per each basic unit (Controls up to 64 points of I/O)

### Analog Types

- Terminal block types
- Differential input offers stronger noise resistance and high accuracy measurement (0.3%)
- I/O ranges : 0-5VDC, 1-5VDC, 0-10VDC, -5-5VDC, -10-10VDC, DC 4-20mA, DC 0-20mA
- Scaling : Configure max/min values for analog I/O range (-28,000 to 28,000)



ARD Series

## ARM Series



Basic unit

1 Basic unit + 3 expansion units on DIN rail

## Modbus RTU Protocol Type Digital Remote I/O

- Features Modbus RTU standard protocol
- E-Con sensor connector : Save connection handling
- Slim size : W26xL76xH54 • Mount on DIN rail or with screws
- Real time monitoring with various functions
  - Auto recognition of communication speed, network power voltage monitoring, recognition of no. and spec of expansion units, and model types of expansion modules
  - Single byte I/O, multi byte I/O & status flag monitoring
- Easy expansion of units
  - Mount up to 63 modules per 1 master unit
  - Attach up to 7 expansion units per 1 unit (Control up to 64 points of I/O)
  - Customize combination of I/O specs by providing I/O units
  - Power supply from communication cable
- Highly reliable : Features protection circuits against surge, short, overheating, reverse polarity and static electricity



ARM Series

## I/O Terminal Blocks



AFS/AFL/AFR Series



ACS Series



AFE Series



ABS Series

NEW

## Highly Durable & Compatible Autonics I/O Terminal Blocks

### Interface Terminal Block AFS/AFL/AFR Series

- Ideal for connector type PLC and dedicated controllers

### Common Terminal Block ACS Series

- No Jumper bars required due to built-in PCB common

### Sensor Connector Terminal Block AFE Series

- Realizing simple wiring work and saving time using sensor connector

### Relay Terminal Block ABS Series

- Ideal solution to drive diverse loads using PLC output signals



AFS/AFL/AFR/  
ACS/AFE/ABS Series



# SELECTION GUIDE

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**Autonics**

## Photoelectric sensor

### ■ Ordering information

<b>BEN</b>	<b>10</b>	<b>M</b>	<b>-</b>	<b>T</b>	<b>F</b>	<b>R</b>					<b>-</b>					<b>-</b>		<b>P</b>
Item																		
※1: 'S' represents lateral sensing type. 'P' represents plastic case type.																		
NPN/PNP																		
Connection type																		
Timer																		
Reflective/Narrow beam type																		
Emitter/Receiver																		
Control output																		
Power supply																		
Sensing type																		
Sensing distance unit																		
Sensing distance																		
BX																		
BEN																		
BA																		
※1 BPS																		
※1 BM/BMS Photoelectric sensor Series																		
※1 BR/BRP																		
※1 BUP																		
※1 BY/BYS																		
BYD																		
P PNP open collector output																		
No mark NPN open collector output																		
No mark Cable type																		
C Connector type																		
1 Emitter																		
2 Receiver																		
L Light ON																		
D Dark ON																		
No mark Mode switching																		
T Solid-state output(Transistor)																		
D DC power																		
D Diffuse reflective type																		
P Retroreflective type(Built-in polarizing filter)																		
T Through-beam type																		
N Narrow beam reflective type																		
B BGS reflective type																		
M Sensing distance unit: m																		
No mark Sensing distance unit: mm																		
Number Sensing distance																		
BJ Small long sensing distance photoelectric sensor																		
BJN Micro-spot photoelectric sensor																		
BJG Transparent sensing photoelectric sensor																		
BTF Ultra-thin photoelectric sensor																		
BRE Cylindrical long sensing distance photoelectric sensor																		

<b>BJN</b>	<b>50</b>		<b>-</b>	<b>N</b>	<b>D</b>	<b>T</b>					<b>-</b>					<b>-</b>		<b>P</b>
Item																		
NPN/PNP																		
Connection type																		
Emitter/Receiver																		
Operation mode																		
Control output																		
Power supply																		
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BJG Transparent sensing photoelectric sensor																		
BTF Ultra-thin photoelectric sensor																		
BRE Cylindrical long sensing distance photoelectric sensor																		

※: This information is intended for product management of through-beam type models. It is not required when ordering a model.  
 ※ This ordering information is only for reference. For ordering a specific model, check the ordering information of the model.  
 ※ There is no micro photo sensor(BS5 Series) and liquid level sensor(BL Series) in this ordering information.

# Ultra-slim and amplifier built-in type [BTF Series]

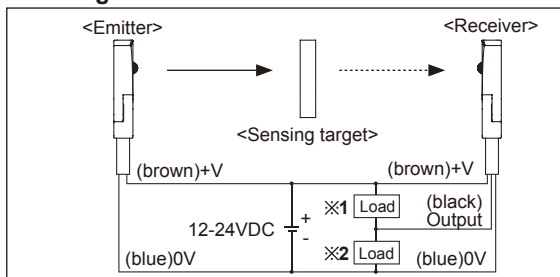
## Specifications

Model	NPN open collector output	BTF1M-TDTL	BTF1M-TDTD	BTF30-DDTL	BTF30-DDTD	BTF15-BDTL	BTF15-BDTD
	PNP open collector output	BTF1M-TDTL-P	BTF1M-TDTD-P	BTF30-DDTL-P	BTF30-DDTD-P	BTF15-BDTL-P	BTF15-BDTD-P
Appearances							
Sensing type	Through-beam		Diffuse reflective		BGS reflective		
Sensing distance	1m		5 to 30mm (Non-glossy white paper 50×50mm)		1 to 15mm (Non-glossy white paper 50×50mm)		
Sensing target	Opaque materials of max. $\phi$ 2mm		Opaque materials, Translucent materials				
Min.sensing target	Opaque materials of $\phi$ 2mm		$\phi$ 0.2mm (Sensing distance 10mm)		$\phi$ 0.2mm non-illuminated objects (Sensing distance 10mm)		
Hysteresis	—		Max. 20% at rated sensing distance		Max. 5% at rated sensing distance		
Reflectivity characteristics (black/white error)	—		—		Max. 15% of maximum sensing distance		
Response time	Max. 1ms						
Power supply	12-24VDC $\pm$ 10%(ripple P-P: Max. 10%)						
Current consumption	Max. 20mA(This is for each emitter and receiver of through-beam type)						
Light source	Red LED(650nm)						
Operation mode	Light ON	Dark ON	Light ON	Dark ON	Light ON	Dark ON	Dark ON
Control output	NPN or PNP open collector output •Load voltage: Max. 26.4VDC •Load current: Max. 50mA •Residual voltage - NPN:Max. 1V, PNP:Max. 2V						
Protection circuit	Reverse polarity protection, output short-circuit protection						
Indicator	Operation indicator: Red, Stability indicator: Green						
Insulation resistance	Min. 20M $\Omega$ (at 500VDC megger)						
Noise resistance	$\pm$ 240V the square wave noise(pulse width:1 $\mu$ s) by the noise simulator						
Dielectric strength	1,000VAC 50/60Hz for 1 minute						
Vibration	1.5mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 2 hours						
Shock	500m/s <sup>2</sup> (approx. 50G) in each of X, Y, Z directions for 3 times						
Environment	Ambient illumination	Sunlight: Max. 10,000lx Incandescent lamp: Max. 3,000lx (receiver illumination)					
	Ambient temperature	-25 to 55°C, storage: -40 to 70°C					
	Ambient humidity	35 to 85%RH, storage: 35 to 85%RH					
Protection	IP67(IEC standards)						
Material	Case: PBT, Sensing part: PMMA						
Cable	$\phi$ 2.5mm, 3-wire, Length: 2m (Emitter of through-beam type: $\phi$ 2.5mm, 2-wire, Length: 2m) (AWG28, Core diameter: 0.08mm, Number of cores: 19, Insulator out diameter: $\phi$ 0.9mm)						
Accessory	Fixing bracket(SUS304), Bolt(SWCH10A)						
Approval	CE						
Unit weight	Approx. 40g			Approx. 25g			

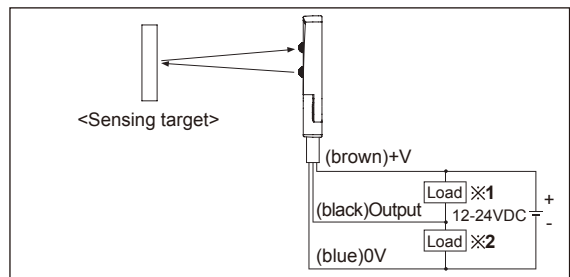
※The temperature or humidity mentioned in Environment indicates a non freezing or condensation environment.

## Connections

### Through-beam



### Diffuse reflective/BGS reflective



※1: Load connection for NPN output

※2: Load connection for PNP output

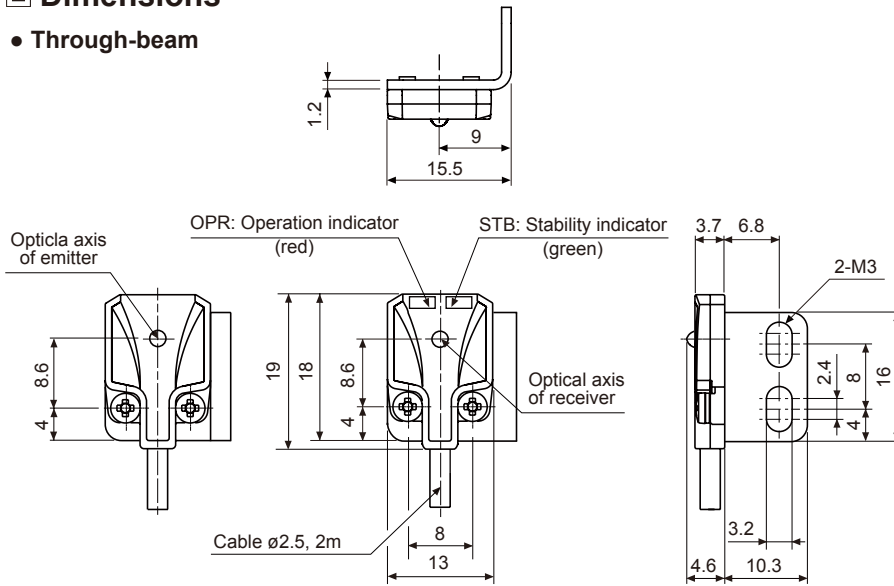
- Photo electric sensor
- Fiber optic sensor
- Door/Area sensor
- Proximity sensor
- Pressure sensor
- Rotary encoder
- Connector/Socket
- Temp. controller
- SSR/Power controller
- Counter
- Timer
- Panel meter
- Tacho/Speed/ Pulse meter
- Display unit
- Sensor controller
- Switching mode power supply
- Stepper motor& Driver&Controller
- Graphic/ Logic panel
- Field network device

# Selection Guide

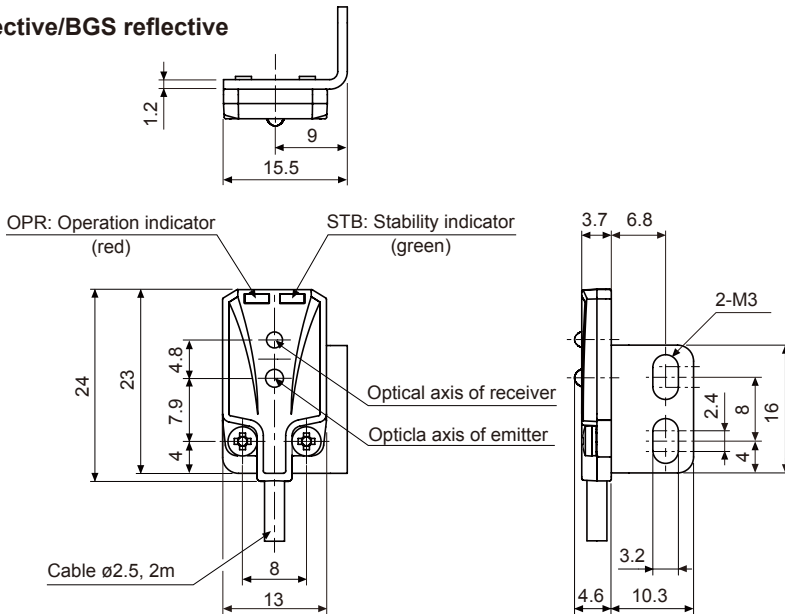
## Dimensions

(unit: mm)

### Through-beam



### Diffuse reflective/BGS reflective

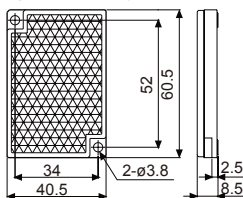


## Reflector

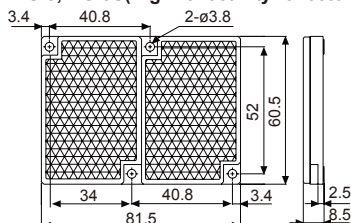
Retroreflective photo sensor is sold with a basic reflector. You can select other reflectors for the proper install environment.

- Select proper reflector size for the install space. - Basically the bigger reflector size has the longer sensing distance.
- High reflectivity reflectors (MS-2S, MS-3S) tend to have longer sensing distance than a basic reflector's sensing distance.

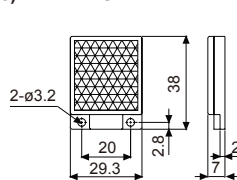
### MS-2, MS-2S (High reflectivity reflectors)



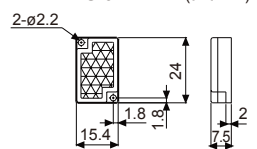
### MS-3, MS-3S (High reflectivity reflectors)



### MS-4



### MS-5



(unit: mm)

## Compact and Long sensing distance [BJ Series]

### Specifications

※The model name with '-C' is connector type.

Type	Long distance sensing type							
Model	NPN open collector output	BJ15M-TDT BJ15M-TDT-C	BJ10M-TDT BJ10M-TDT-C	BJ7M-TDT	BJ3M-PDT BJ3M-PDT-C	BJ1M-DDT BJ1M-DDT-C	BJ300-DDT BJ300-DDT-C	BJ100-DDT BJ100-DDT-C
	PNP open collector output	BJ15M-TDT-P BJ15M-TDT-C-P	BJ10M-TDT-P BJ10M-TDT-C-P	BJ7M-TDT-P	BJ3M-PDT-P BJ3M-PDT-C-P	BJ1M-DDT-P BJ1M-DDT-C-P	BJ300-DDT-P BJ300-DDT-C-P	BJ100-DDT-P BJ100-DDT-C-P
Appearances								
Sensing type	Through-beam			Polarized retroreflective	Diffuse reflective			
Sensing distance	15m	10m	7m	0.1 to 3m <sup>※1</sup> (MS-2A)	1m (Non-glossy white paper 300×300mm)	300mm (Non-glossy white paper 100×100mm)	100mm (Non-glossy white paper 100×100mm)	
Sensing target	Opaque material over ø12mm		Opaque material over ø8mm	Opaque material over ø75mm	Translucent, opaque materials			
Hysteresis	—							
Response time	Max. 1ms							
Power supply	12-24VDC±10%(ripple P-P: Max.10%)							
Current consumption	Emitter/Receiver: Max. 20mA			Max. 30mA				
Light source	Infrared LED (850nm)	Red LED (660nm)	Red LED (650nm)	Red LED (660nm)	Infrared LED (850nm)	Red LED (660nm)	Infrared LED (850nm)	
Sensitivity adjustment	Built-in the adjustment VR							
Operation mode	Light on/Dark on selectable by VR							
Control output	NPN or PNP open collector output • Load voltage: Max. 26.4VDC • Load current: Max. 100mA • Residual voltage - NPN: Max. 1V, PNP: Max. 2.5V							
Protection circuit	Reverse polarity protection, output short-circuit protection, interference prevention function(Except through-beam type)							
Indicator	Operation: Red, Stable: Green(Emitter's power indicator: Green)							
Insulation resistance	Max.20MΩ(at 500VDC megger)							
Noise resistance	±240V the square wave noise(pulse width:1μs) by the noise simulator							
Dielectric strength	1000VAC 50/60Hz for 1minute							
Vibration	1.5mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 2 hours							
Shock	500m/s <sup>2</sup> (approx. 50G) in each of X, Y, Z directions for 3 times							
Environment	Ambient illumination	Sunlight: Max. 11,000lx, Incandescent lamp: Max. 3,000lx(receiver illumination)						
	Ambient temperature	-25 to 55°C, storage: -40 to 70°C						
	Ambient humidity	35 to 85%RH, storage: 35 to 85%RH						
Protection	BJ - IP65(IEC standard), BJ-C - IP67(at non-dew status)							
Material	Case: PC+ABS, LED Cap: PC, Sensing part: PMMA							
Cable <sup>※2</sup>	BJ: ø3.5mm, 3-wire, Length: 2m(Emitter of through-beam type: ø3.5mm, 2-wire, Length: 2m) (AWG24, Core diameter: 0.08mm, Number of cores: 40, Insulator out diameter: ø1mm)							
Accessory	Common	Mounting bracket, Bolt, Nut, VR adjustment driver			Reflector(MS-2A)	—		
	Individual	—			—	—		
Approval	CE							
Unit weight	BJ: Approx. 90g, BJ-C: Approx. 20g			BJ: Approx 60g BJ-C: Approx 30g	BJ: Approx. 45g, BJ-C: Approx. 10g			

※1: The sensing distance is extended to 0.1 to 4m or 0.1 to 5m when using optional reflector MS-2S or MS-3S.

※2: M8 connector cable is sold separately. (Cable - AWG22, Core diameter: 0.08mm, Number of cores: 60, Insulator out diameter: ø1.25)

※The temperature or humidity mentioned in Environment indicates a non freezing or condensation environment.

Photo electric sensor

Fiber optic sensor

Door/Area sensor

Proximity sensor

Pressure sensor

Rotary encoder

Connector/Socket

Temp. controller

SSR/Power controller

Counter

Timer

Panel meter

Tacho/Speed/ Pulse meter

Display unit

Sensor controller

Switching mode power supply



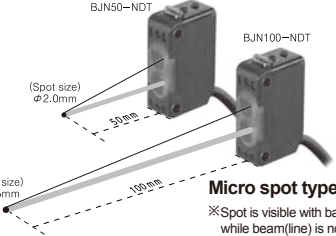
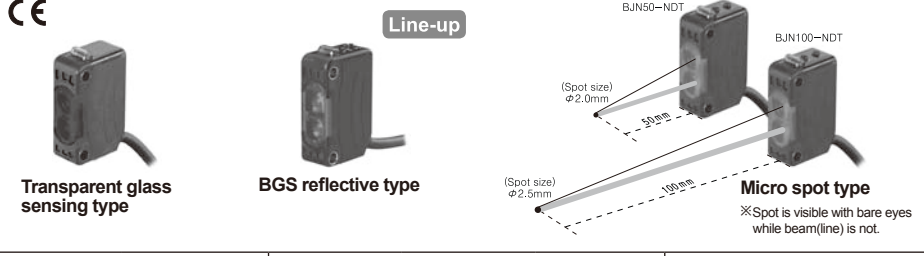
Stepper motor & Driver&Controller

Graphic/Logic panel

Field network device

## Transparent glass sensing/BGS reflective/Micro spot type [BJ Series]

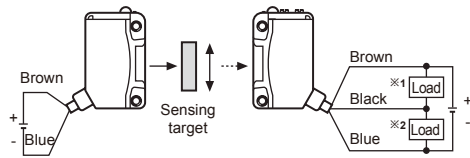
### Specifications

Type	Transparent glass sensing type		BGS reflective type			Micro spot type	
Model	NPN open collector output	<b>BJG30-DDT</b>	<b>BJ30-BDT</b>	<b>BJ50-BDT</b>	<b>BJ100-BDT</b>	<b>BJN50-NDT</b>	<b>BJN100-NDT</b>
Model	PNP open collector output	—	<b>BJ30-BDT-P</b>	<b>BJ50-BDT-P</b>	<b>BJ100-BDT-P</b>	<b>BJN50-NDT-P</b>	<b>BJN100-NDT-P</b>
Appearances	 <p><b>Transparent glass sensing type</b></p>		 <p><b>BGS reflective type</b></p>			 <p><b>Micro spot type</b></p> <p>※ Spot is visible with bare eyes while beam(line) is not.</p>	
							
Sensing type	Diffuse reflective		BGS reflective			Narrow beam reflective	
Sensing distance	30mm (Non-glossy white paper 100×100mm)	15mm (Transparent glass 50×50mm, t=3.0mm)	10 to 30mm (Non-glossy white paper 50×50mm)	10 to 50mm (Non-glossy white paper 50×50mm)	10 to 100mm (Non-glossy white paper 100×100mm)	30 to 70mm	70 to 130mm
Sensing target	Transparent glass, opaque materials, translucent		Translucent, opaque materials			Translucent, opaque materials	
Min. diameter of transmitting SPOT	—		Approx. ø5.0mm	Approx. ø4.5mm	Approx. ø6.5mm	Approx. ø2.0mm	Approx. ø2.5mm
Min. sensing target	—		—			Approx. min. ø0.2mm (Copper wire)	
Hysteresis	Max. 20% at sensing distance		Max. 10% at sensing distance			Max. 25% at sensing distance	
Response time	Max. 1ms		Max. 1.5ms			Max. 1ms	
Power supply	12-24VDC ±10% (ripple P-P: Max. 10%)						
Current consumption	Max. 30mA						
Light source/Wavelength	Infrared LED(850nm)		Red LED(660nm)			Red LED(650nm)	
Sensitivity adjustment	—		Built-in the adjustment VR				
Operation mode	Light ON fixed		Light ON / Dark ON selectable by VR				
Control output	NPN open collector output • Load voltage: Max. 26.4VDC • Load current: Max. 100mA • Residual voltage: Max. 1V		NPN or PNP open collector output • Load voltage: Max. 26.4VDC • Residual voltage - NPN: Max. 1V, PNP: Min. 2.5V				
Protection circuit	Reverse polarity protection, output short-circuit protection, interference prevention function(Exept BGS reflective type)						
Indicator	Operation indicator: red, Stability indicator: green						
Insulation resistance	Min. 20MΩ(at 500VDC megger)						
Noise resistance	±240V the square wave noise(pulse width:1μs) by the noise simulator						
Dielectric strength	1,000VAC 50/60Hz for 1minute						
Vibration	1.5mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 2 hours						
Shock	500m/s <sup>2</sup> (approx. 50G) in each of X, Y, Z directions for 3 times						
Environment	Ambient illumination	Sunlight: Max. 11,000lx, Incandescent lamp: Max. 3,000lx(receiver illumination)					
	Ambient temperature	-25 to 55°C, storage:-40 to 70°C					
	Ambient humidity	35 to 85%RH, storage: 35 to 85%RH					
Protection	IP65(IEC standard)						
Material	Case: PC+ABS, LED Cap: PC, Sensing part: PMMA						
Cable	ø3.5mm, 3-wire, Length: 2m(AWG24, Core diameter: 0.08mm, Number of cores: 40, Insulator out diameter: ø1mm)						
Accessory	Mounting bracket, Bolt		Mounting bracket, Bolt, Adjustment driver				
Approval	<b>CE</b>						
Unit weight	Approx. 45g		Approx. 50g			Approx. 45g	

※The temperature or humidity mentioned in Environment indicates a non freezing or condensation environment.

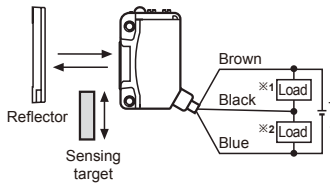
## ■ Connections

### ● Through-beam type

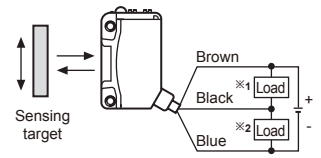


※1: The load connection of NPN open collector output  
 ※2: The load connection of PNP open collector output

### ● Retroreflective type



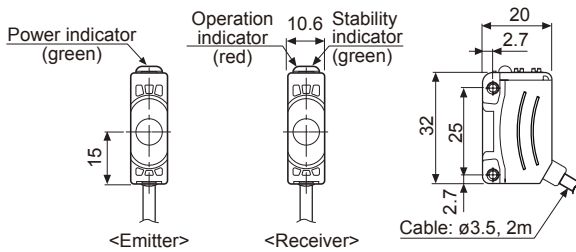
### ● Diffuse/Narrow beam/BGS reflective type



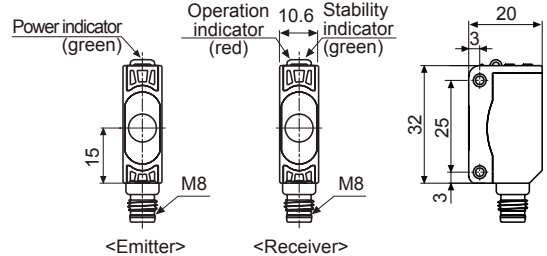
## ■ Dimensions

(unit: mm)

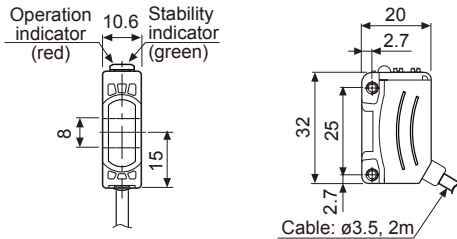
### ● Through-beam type



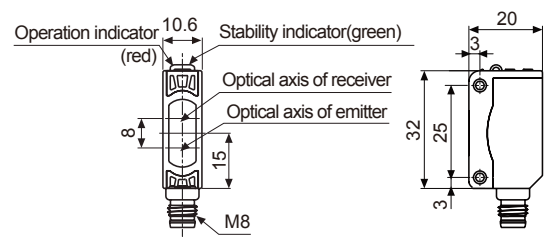
### ● Through-beam type(Connector type)



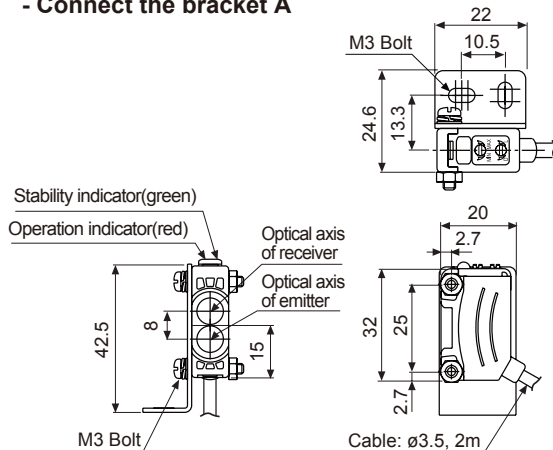
### ● Retroreflective type



### ● Retroreflective type(Connector type)



### ● Diffuse/Narrow beam/BGS reflective type - Connect the bracket A



### ● Diffuse reflective type(Connector type) - Connect the bracket B

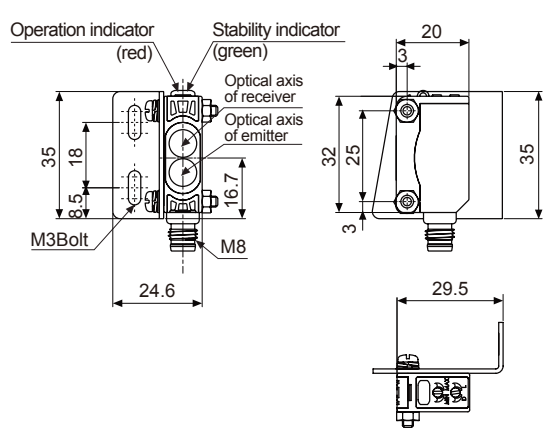


Photo electric sensor

Fiber optic sensor

Door/Area sensor

Proximity sensor

Pressure sensor

Rotary encoder

Connector/Socket

Temp. controller

SSR/ Power controller

Counter

Timer

Panel meter

Tacho/ Speed/ Pulse meter

Display unit

Sensor controller

Switching mode power supply




Stepper motor & Driver&Controller

Graphic/ Logic panel

Field network device

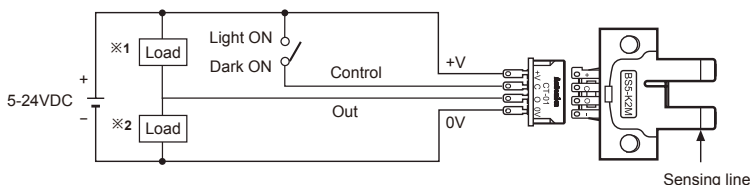
## Micro photo sensor [BS5 Series]

### Specifications

Model	NPN open collector output	BS5-K2M	BS5-T2M	BS5-L2M	BS5-Y2M	BS5-V2M
	PNP open collector output	BS5-K2M-P	BS5-T2M-P	BS5-L2M-P	BS5-Y2M-P	BS5-V2M-P
Appearances						
		CE Line-up	CE Line-up	CE Line-up	CE Line-up	CE Line-up
Sensing distance	5mm fixed					
Sensing type	Through-beam(Not modulated)					
Sensing target	ø0.8×1mm Opaque materials					
Hysteresis	0.05mm					
Response time	Light ON: Max. 20μs, Dark ON: Max. 100μs					
Response frequency	2kHz(refer to the measuring range of frequency response)					
Power supply	5-24VDC ±10%(ripple P-P: Max. 10%)					
Current consumption	Max. 30mA(at 26.4VDC )					
Light source	Infrared LED(950nm)					
Operation mode	Light ON / Dark ON selectable by control wire					
Control output	NPN or PNP open collector output •Load voltage: Max. 30VDC •Load current: Max. 100mA •Residual voltage: Max. 1.2V					
Protection circuit	Reverse power polarity protection, Overcurrent protection					
Indicator	Operation Indicator: red LED					
Connection	Connector type					
Insulation resistance	Min. 20MΩ(at 250VDC megger)					
Noise resistance	±240V the square wave noise(pulse width:1μs) by the noise simulator					
Dielectric strength	1,000VAC 50/60Hz for 1minute					
Vibration	1.5mm amplitude at frequency of 10 to 55Hz in each of X, Y, Z directions for 2 hours					
Shock	500m/s <sup>2</sup> (approx. 50G) in each of X, Y, Z directions for 3 times					
Environment	Ambient illumination	Fluorescent lamp: Max. 1000lx (receiver illumination)				
	Ambient temperature	-20 to 55°C, storage: -25 to 85°C				
	Ambient humidity	35 to 85%RH, storage: 35 to 85%RH				
Protection	IP50(IEC standard)					
Material	PBT					
Approval	CE					
Unit weight	Approx. 30g					

※The temperature or humidity mentioned in Environment indicates a non freezing or condensation environment.

### Connections



※1: The load connection of NPN open collector output

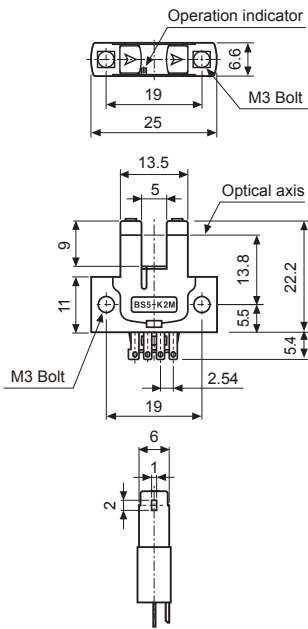
※2: The load connection of PNP open collector output

※Connect the unit using socket. If it is soldered on terminal pin directly without socket, it may cause product damage.

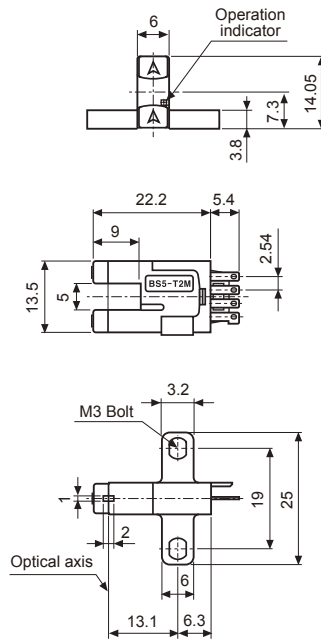


## ■ Dimensions

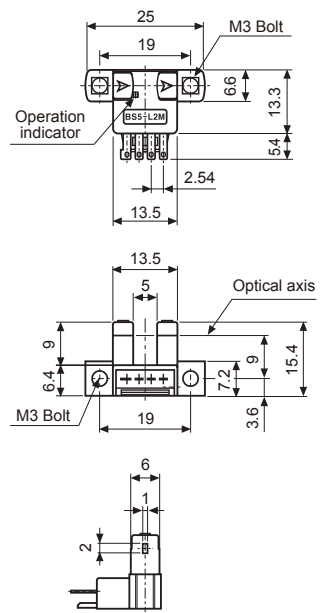
### ● BS5-K2M / BS5-K2M-P



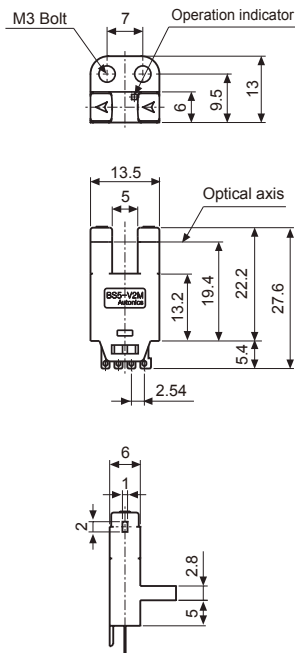
### ● BS5-T2M / BS5-T2M-P



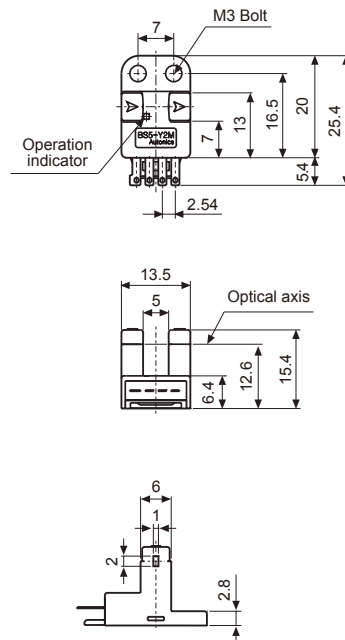
### ● BS5-L2M / BS5-L2M-P



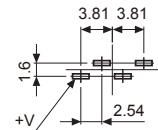
### ● BS5-V2M / BS5-V2M-P



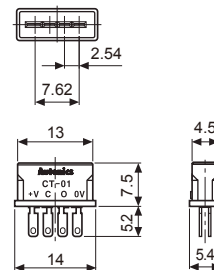
### ● BS5-Y2M / BS5-Y2M-P



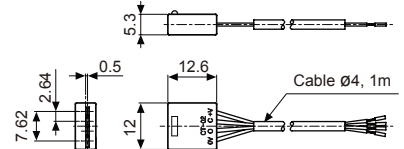
### ● PCB mounting hole



### ● Socket: CT-01(sold separately)



### ● Socket: CT-02(sold separately)



※ Cable:  $\phi 4$ , 4-wire, Length: 1m  
 (AWG22, Core wire diameter: 0.08mm,  
 No. of core wire: 60, Insulator out diameter:  
 $\phi 1.2$ )  
 ※ Cable length is available to option.

Photo  
electric  
sensor

Fiber  
optic  
sensor

Door/Area  
sensor

Proximity  
sensor

Pressure  
sensor

Rotary  
encoder

Connector/  
Socket

Temp.  
controller

SSR/  
Power  
controller

Counter

Timer

Panel  
meter

Tacho/  
Speed/  
Pulse  
meter

Display  
unit

Sensor  
controller

Switching  
mode power  
supply


Stepper  
motor &  
Driver&Controller

Graphic/  
Logic  
panel

Field  
network  
device

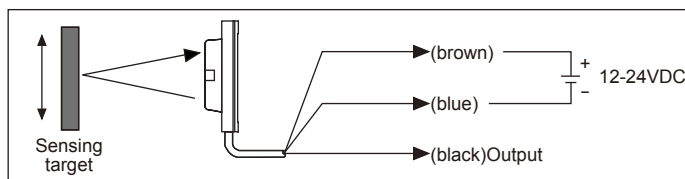
## Small, diffuse reflective type with long sensing distance [BA Series]

### Specifications

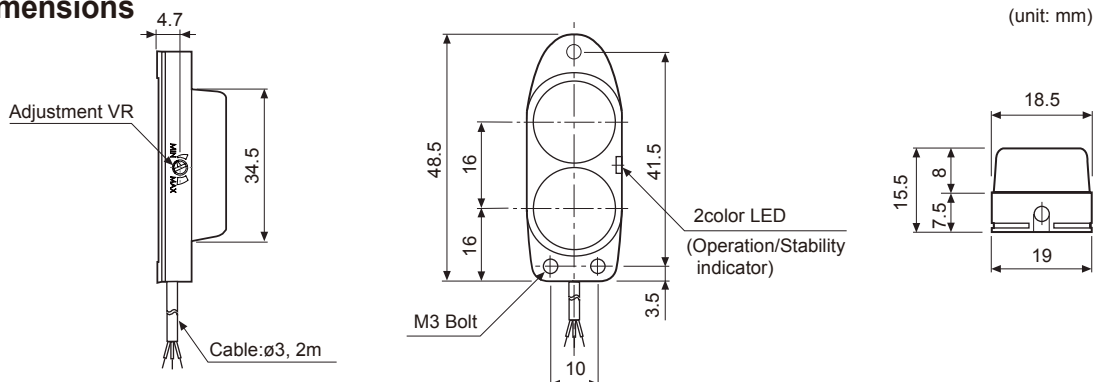
Model	NPN open collector PNP open collector	<b>BA2M-DDT</b> <b>BA2M-DDT-P</b>	<b>BA2M-DDTD</b> <b>BA2M-DDTD-P</b>
Appearances			
Sensing type	Diffuse reflective		
Sensing distance	2m(Non-glossy white paper 200×200mm)		
Sensing target	Translucent, opaque materials		
Hysteresis	Max. 20% at sensing distance		
Response time	Approx. 1ms		
Power supply	12-24VDC ±10%(ripple P-P: Max. 10%)		
Current consumption	Max. 15mA(Max. 30mA when the output is ON)		
Light source	Infrared LED(850nm)		
Sensitivity adjustment	Built-in the adjustment VR		
Operation mode	Light ON		Dark ON
Control output	NPN or PNP open collector output •Load voltage: Max. 26.4VDC •Load current: Max. 100mA •Residual voltage - NPN: Max. 1V, PNP: Min. 2.5V		
Protection circuit	Reverse polarity protection, output short-circuit protection		
Indicator	•Operation indicator: red •Stability indicator: orange(Light ON), green(Dark ON)		
Insulation resistance	Min. 20MΩ(at 500VDC megger)		
Noise resistance	±240V the square wave noise(pulse width: 1μs) by the noise simulator		
Dielectric strength	1000VAC 50/60Hz for 1minute		
Vibration	1.5mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 2 hours		
Shock	100m/s <sup>2</sup> (approx. 10G) in each of X, Y, Z directions for 3 times		
Environment	Ambient illumination	Sunlight: Max. 11,000lx, Incandescent lamp: Max. 3,000lx(Receiving illumination)	
	Ambient temperature	-25 to 55°C, storage: -25 to 70°C	
	Ambient humidity	35 to 85%RH, storage: 35 to 85%RH	
Protection	IP64(IEC standard)		
Material	Case: ABS, Sensing part: PC, Indicator: PC, VR: IXEF		
Cable	ø3mm, 3-wire, Length: 2m (AWG24, Core diameter: 0.08mm, Number of cores: 40, Insulator out diameter: ø1mm)		
Accessory	VR adjustment driver		
Approval	CE		
Unit weight	Approx. 50g		

※The temperature or humidity mentioned in Environment indicates a non freezing or condensation environment.

### Connections





### Dimensions



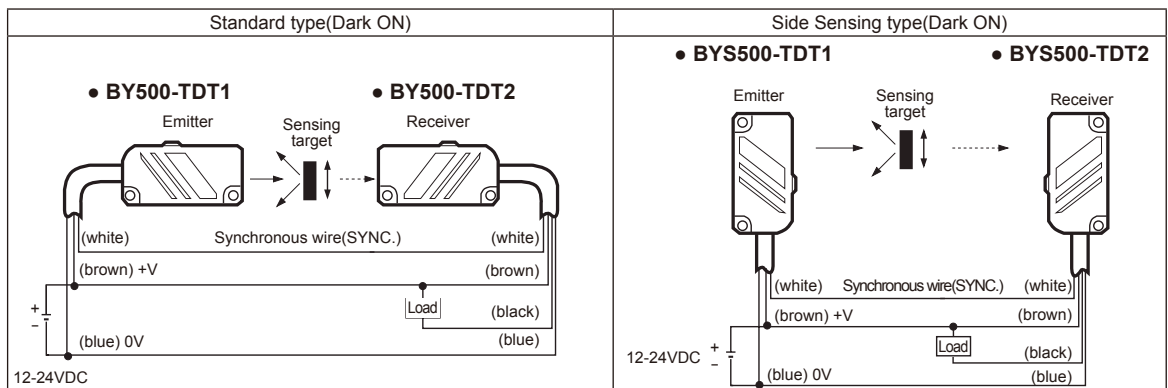
## Small emitter/receiver synchronizing type [BY Series]

### ■ Specifications

Model	Standard type <b>BY500-TDT</b>	Side sensing type <b>BYS500-TDT</b>
Appearances		
Sensing type	Through-beam	
Sensing distance	500mm	
Sensing target	Opaque materials of Min. ø5mm	
Response time	Max. 1ms	
Power supply	12-24VDC ±10%(ripple P-P: Max. 10%)	
Current consumption	Max. 30mA	
Light source	Infrared LED(940nm)	
Operation mode	Dark ON	
Control output	NPN open collector output • Load voltage: 30VDC • Load current: Max. 100mA • Residual voltage: Max. 1V	
Protection circuit	Reverse polarity protection, output short-circuit protection	
Indicator	Operation indicator: red LED	
Insulation resistance	Min. 20MΩ(at 500VDC megger)	
Noise resistance	±240V the square wave noise(pulse width: 1μs) by the noise simulator	
Dielectric strength	1,000VAC 50/60Hz for 1minute	
Vibration	1.5mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 2 hours	
Shock	500m/s <sup>2</sup> (approx. 50G) in each of X, Y, Z directions for 3 times	
Environment	Ambient illumination	Sunlight: Max. 11,000lx Incandescent lamp: Max. 3,000 lx (Receiving illumination)
	Ambient temperature	-10 to 60°C, storage: -25 to 70°C
	Ambient humidity	35 to 85%RH, storage: 35 to 85%RH
Protection	IP50(IEC standard)	
Material	Case: ABS, Sensing part: Acrylic	
Cable	ø4mm, 4-wire, Length: 2m (Emitter of through-beam type: ø4mm, 3-wire, Length: 2m) (AWG22, Core diameter: 0.08mm, Number of cores: 60, Insulator out diameter: ø1.25mm)	
Accessory	Mounting bracket, Bolts/Nuts	
Unit weight	Approx. 150g	

※The temperature or humidity mentioned in Environment indicates a non freezing or condensation environment.

### ■ Connections



※The power of the emitter and the receiver must be supplied from same power line.

※Synchronous wire(white) of the receiver must be connected with that of the emitter, or it may cause malfunction.

Photo electric sensor

Fiber optic sensor

Door/Area sensor

Proximity sensor

Pressure sensor

Rotary encoder

Connector/Socket

Temp. controller

SSR/Power controller

Counter

Timer

Panel meter

Tacho/Speed/ Pulse meter

Display unit

Sensor controller

Switching mode power supply

Stepper motor & Driver&Controller

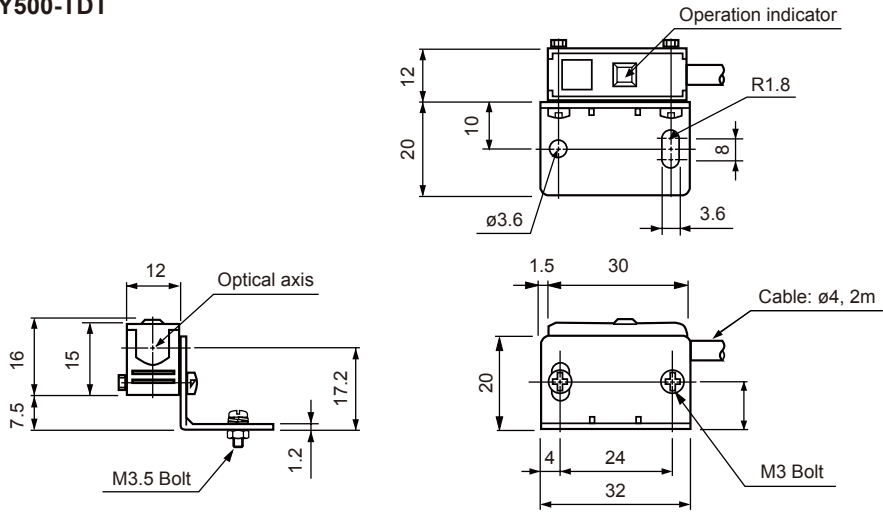
Graphic/ Logic panel

Field network device

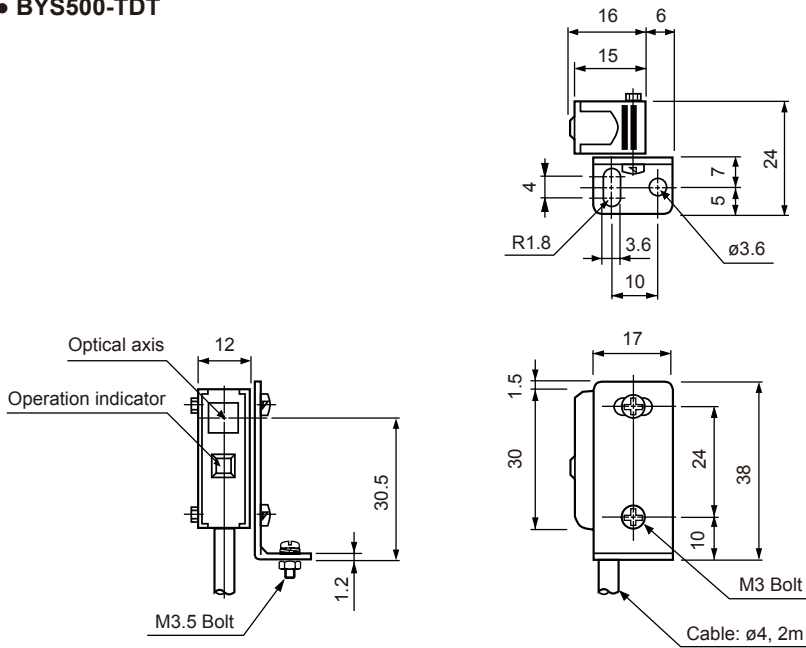
## ■ Dimensions

(unit: mm)

### ● BY500-TDT



### ● BY500-TDT



## Small diffuse reflective and convergent reflective type [BYD Series]

### ■ Specifications

Model	BYD30-DDT BYD30-DDT-U※1 BYD30-DDT-T※2	BYD50-DDT BYD50-DDT-U※1 BYD50-DDT-T※2	BYD100-DDT	BYD3M-TDT	BYD3M-TDT-P
Appearances	<p>CE</p> <p>Operation indicator</p> <p>BYD30-DDT-U BYD50-DDT-U</p>				
Sensing type	Convergent reflective		Diffuse reflective	Through-beam	
Sensing distance	10 to 30mm※3	10 to 50mm※3	100mm※3	3m	
Sensing target	Translucent, opaque materials			Opaque materials of Min. ø6mm	
Hysteresis	Max. 10% at sensing distance		Max. 25% at sensing distance	—	
Response time	Operation: Max. 3ms, Return: Max. 100ms (When the time adjustment VR is minimum)		Operation: Max. 3ms Return: Max. 100ms	Max. 1ms	
Power supply	12-24VDC ±10%(ripple P-P: Max. 10%)				
Current consumption	Max. 35mA			Max. 30mA	
Light source	Infrared LED				
Sensitivity adjustment	Fixed		Built-in the adjustment VR	Fixed	
Operation mode	Light ON			Dark ON(Light ON: Option)	
Control output	NPN open collector output • Load voltage: Max. 30VDC, • Load current: Max. 50mA, • Residual voltage: Max. 1V			NPN or PNP open collector output • Load voltage :Max. 30VDC, • Load current: Max. 100mA, • Residual voltage - NPN: Max. 1V, PNP: Max. 2.5V	
Protection circuit	Reverse polarity protection, output short-circuit protection				
Timer function	Built-in(OFF delay) delay Time : Max. 0.1 to 2 sec.(adjustment VR)		—		
Indication	Operation indicator: red LED				
Insulation resistance	Min. 20MΩ(at 500VDC megger)				
Noise resistance	±240V the square wave noise(pulse width: 1μs) by the noise simulator				
Dielectric strength	1,000VAC 50/60Hz for 1minute				
Vibration	1.5mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 2 hours				
Shock	500m/s²(approx. 50G) in each of X, Y, Z directions for 3 times				
Environment	Ambient illumination	Sunlight: Max. 11,000lx, Incandescent lamp: Max. 3,000lx(receiver illumination)			
	Ambient temperature	-20 to 65°C, storage: -25 to 70°C			
	Ambient humidity	35 to 85%RH, storage: 35 to 85%RH			
Protection	Standard type: IP64(IEC standards)/ ※1, ※2: IP50(IEC standards)		IP50(IEC standard)	IP64(IEC standard)	
Material	Case: ABS, Sensing part: Acrylic				
Cable	ø3.5mm, 3-wire, Length: 2m(Emitter of through-beam type: ø3.5mm, 2-wire, Length: 2m) (AWG24, Core diameter: 0.08mm, Number of cores: 40, Insulator out diameter: ø1mm)				
Accessory	VR adjustment driver, Mounting bracket A, M3 Screws, Nuts			Mounting bracket A, M3 Screws, Nuts	
Approval	CE				
Unit weight	Approx. 70g			Approx. 150g	

※1: Operation indicator is on the top.

※2: OFF delay timer is built-in. (Delay time: Max. 0.1 to 2sec.)

※3: Sensing distance for Non-glossy white paper(50×50mm)

※The temperature or humidity mentioned in Environment indicates a non freezing or condensation environment.

Photo electric sensor

Fiber optic sensor

Door/Area sensor

Proximity sensor

Pressure sensor

Rotary encoder

Connector/Socket

Temp. controller

SSR/Power controller

Counter

Timer

Panel meter

Tacho/Speed/Pulse meter

Display unit

Sensor controller

Switching mode power supply

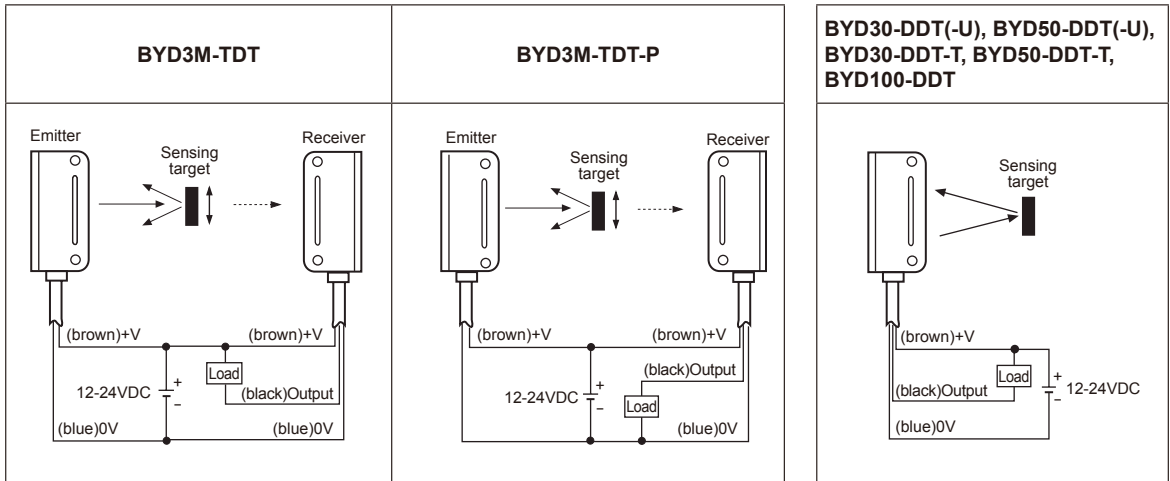
Stepper motor & Driver/Controller

Graphic/Logic panel

Field network device

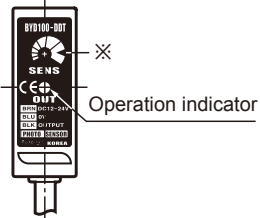
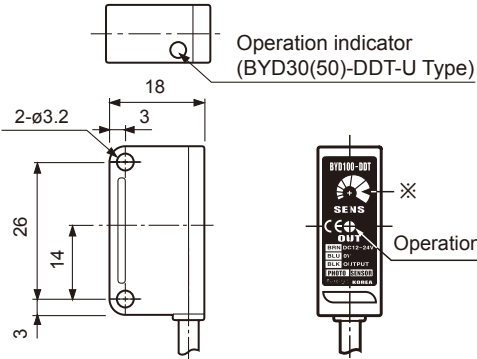
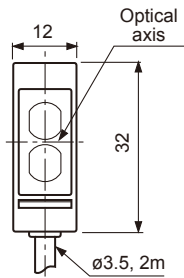
# Selection Guide

## ■ Connections



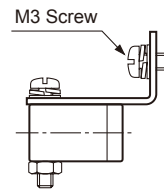
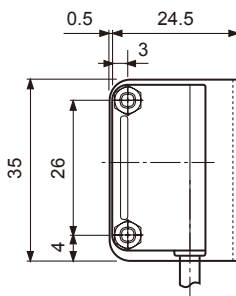
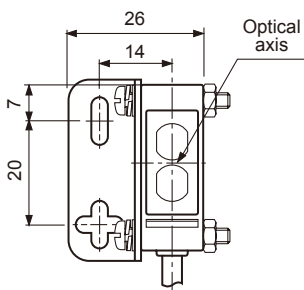
## ■ Dimensions

(unit: mm)

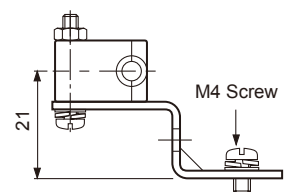
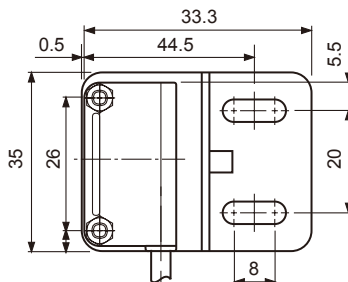
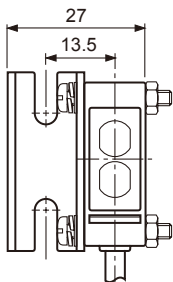


※Built-in timer type: Timer adjustment VR,  
Diffuse reflective type: Sensitivity adjustment VR

### ● Bracket A dimension when mounting




### ● Bracket B dimension when mounting



# Slim photoelectric sensor for long sensing distance [BPS Series]

## Specifications

Model	NPN open collector output	<b>BPS3M-TDT</b>	<b>BPS3M-TDTL</b>
	PNP open collector output	<b>BPS3M-TDT-P</b>	<b>BPS3M-TDTL-P</b>
Appearances			
Sensing type	Through-beam		
Sensing target	Opaque materials of Min. $\phi$ 5mm		
Operation mode	Dark ON		Light ON
Sensing distance	3m		
Response time	Max. 1ms		
Power supply	12-24VDC $\pm$ 10%(ripple P-P: Max. 10%)		
Current consumption	Max. 20mA		
Light source	Infrared LED(850nm)		
Control output	NPN or PNP open collector output • Load voltage: Max. 30VDC • Load current: Max. 100mA • Residual voltage - NPN: Max. 1V, PNP: Max. 2.5V		
Protection circuit	Reverse polarity protection, Output short-circuit protection		
Indicator	Emitter: Power indicator(red LED), Receiver: Operation indicator(red LED)		
Insulation resistance	Min. 20M $\Omega$ (at 500VDC megger)		
Noise resistance	$\pm$ 240V the square wave noise(pulse width:1 $\mu$ s) by the noise simulator		
Dielectric strength	1,000VAC 50/60Hz for 1minute		
Vibration	1.5mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 2 hours		
Shock	500m/s <sup>2</sup> (approx. 50G) in each of X, Y, Z directions for 3 times		
Environment	Ambient illumination	Sunlight: Max. 11,000lx , Incandescent lamp: Max. 3,000lx (receiver illumination)	
	Ambient temperature	-25 to 65°C, storage: -25 to 70°C	
	Ambient humidity	35 to 85%RH, storage: 35 to 90%RH	
Protection	IP67(IEC standard)		
Material	Case: PC		
Cable	$\phi$ 3mm, 3-wire, Length: 2m(Emitter of through-beam type: $\phi$ 3mm, 2-wire, Length: 2m) (AWG24, Core diameter: 0.08mm, Number of cores: 40, Insulator out diameter: $\phi$ 1mm)		
Approval	<b>CE</b>		
Unit weight	Approx. 66g		

※The temperature or humidity mentioned in Environment indicates a non freezing or condensation environment.

## Connections

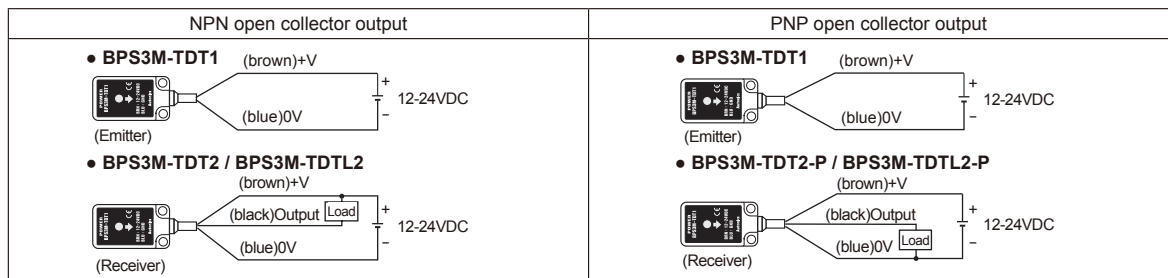


Photo electric sensor

Fiber optic sensor

Door/Area sensor

Proximity sensor

Pressure sensor

Rotary encoder

Connector/Socket

Temp. controller

SSR/ Power controller

Counter

Timer

Panel meter

Tacho/ Speed/ Pulse meter

Display unit

Sensor controller

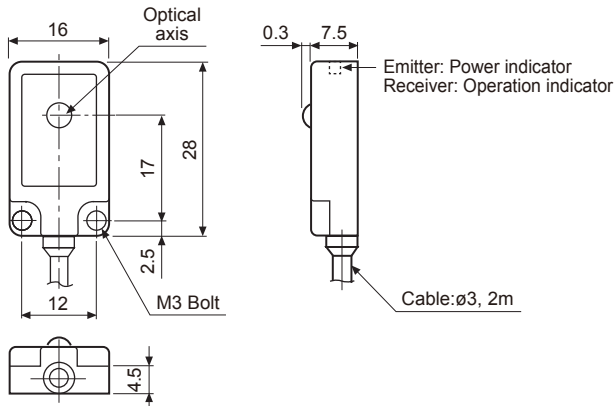
Switching mode power supply

Stepper motor & Driver&Controller

Graphic/ Logic panel

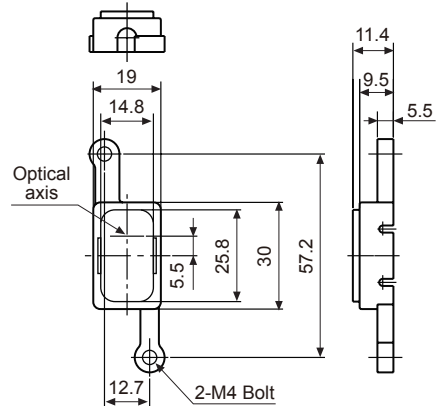
Field network device

## ■ Dimensions




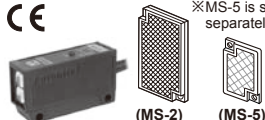


## ● Cover(sold separately)

(unit: mm)



## Small and light, common type [BM Series]

### ■ Specifications

Model	BM3M-TDT	BM1M-MDT	BM200-DDT
Appearances		 <small>※MS-5 is sold separately.</small>	
Sensing type	Through-beam	Retroreflective	Diffuse reflective
Sensing distance	3m	0.1 to 1m <sup>※1</sup>	200mm <sup>※2</sup>
Sensing target	Opaque materials of Min. ø8mm	Opaque materials of Min. ø60mm	Translucent, Opaque materials
Hysteresis	—		Max. 10% at rated setting distance
Response time	Max. 3ms		
Power supply	12-24VDC ±10%(ripple P-P: Max. 10%)		
Current consumption	Max. 45mA	Max. 40mA	
Light source	Infrared LED(940nm)		
Sensitivity adjustment	Fixed		Adjustable VR
Operation mode	Dark ON		Light ON(Dark ON: Option)
Control output	NPN open collector output •Load voltage: Max. 30VDC •Load current: Max. 100mA •Residual voltage: Max. 1V		
Protection circuit	Reverse polarity protection		
Indication	Operation indicator: red LED		
Insulation resistance	Min. 20MΩ(at 500VDC megger)		
Noise resistance	±240V the square wave noise(pulse width: 1μs) by the noise simulator		
Dielectric strength	1,000VAC 50/60Hz for 1minute		
Vibration	1.5mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 2 hours		
Shock	500m/s <sup>2</sup> (approx. 50G) in each of X, Y, Z directions for 3 times		
Environment	Ambient illumination	Sunlight: Max. 11,000lx Incandescent lamp: Max. 3,000lx(receiver illumination)	
	Ambient temperature	-10 to 60°C, storage: -25 to 70°C	
	Ambient humidity	35 to 85%RH, storage: 35 to 85%RH	
Material	Case: ABS, Sensing part: PC	Case: ABS, Sensing part: Acrylic(Retroreflective: PC)	
Cable	ø4mm, 3-wire, Length: 2m(Emitter of through-beam type: ø4mm, 2-wire, Length: 2m) (AWG22, Core diameter: 0.08mm, Number of cores: 60, Insulator out diameter: ø1.25mm)		
Accessories	Individual	—	Reflector(MS-2)
	Common	Mounting bracket, Bolts/nuts	
Approval			
Unit weight	Approx. 170g	Approx. 105g	Approx. 88g

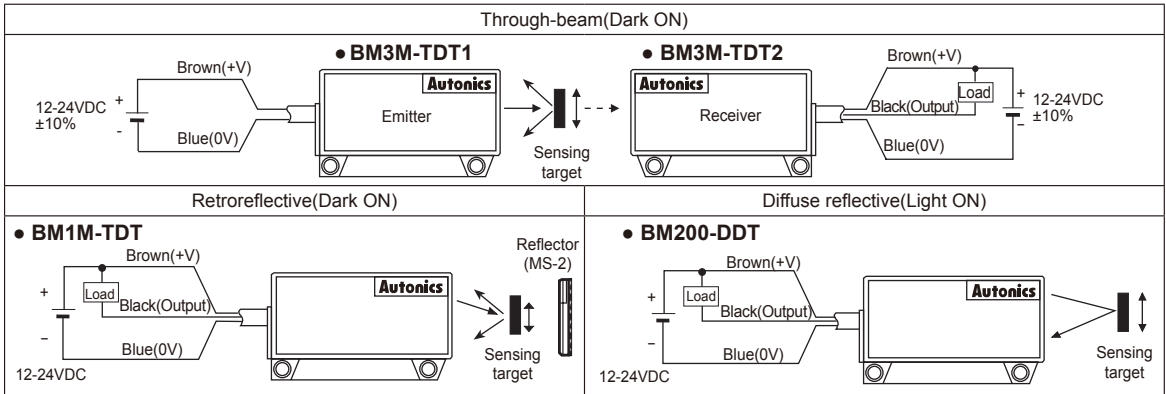
※1: It is mounting distance between sensor and reflector MS-2 and it is same when MS-5 is used. It is detectable under 0.1m.

※2: It is for Non-glossy white paper(200×200mm)

※The temperature or humidity mentioned in Environment indicates a non freezing or condensation environment.



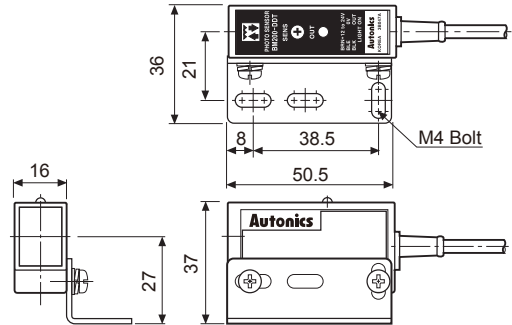
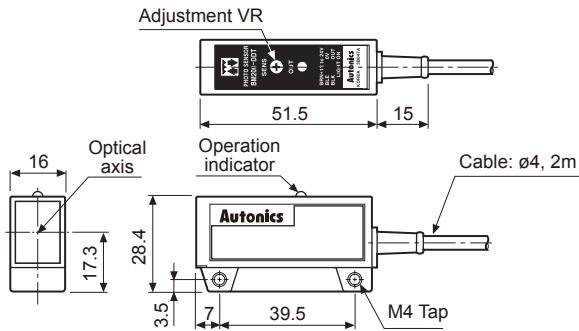
## ■ Connections



## ■ Dimensions

### • Connect the bracket

(unit: mm)



## High speed response type with built-in output protection circuit [BMS Series]

### ■ Specifications

Model	NPN open collector output	<b>BMS5M-TDT</b>	<b>BMS2M-MDT</b>	<b>BMS300-DDT</b>
	PNP open collector output	<b>BMS5M-TDT-P</b>	<b>BMS2M-MDT-P</b>	<b>BMS300-DDT-P</b>
Appearances			 ※MS-5 is sold separately.	
Sensing type		Through-beam	Retroreflective	Diffuse reflective
Sensing distance		5m	0.1 to 2m <sup>※1</sup>	300mm <sup>※2</sup>
Sensing target		Opaque materials of Min. ø10mm	Opaque materials of Min. ø60mm	Translucent, Opaque materials
Hysteresis		—	—	Max. 20% at rated setting distance
Response time		Max. 1ms	—	—
Power supply		12-24VDC ±10% (ripple P-P: Max. 10%)		
Current consumption		Max. 50mA	Max. 45mA	—
Light source		Infrared LED(940nm)		
Sensitivity adjustment		—		Adjustable VR
Operation mode		Selectable Light ON or Dark ON by control wire		
Control output		NPN or PNP open collector output • Load voltage: Max. 30VDC • Load current: Max. 200mA • Residual voltage - NPN: Max. 1V, PNP: Max. 2.5V		
Protection circuit		Reverse power polarity, Output short-circuit(Overcurrent) protection circuit		
Indicator		Operation indicator: red LED, Power indicator: red LED(BMS5M-TDT1)		

※1: It is mounting distance between sensor and reflector MS-2 and it is same when MS-5 is used. It is detectable under 0.1m.  
 ※2: It is for Non-glossy white paper(100×100mm)

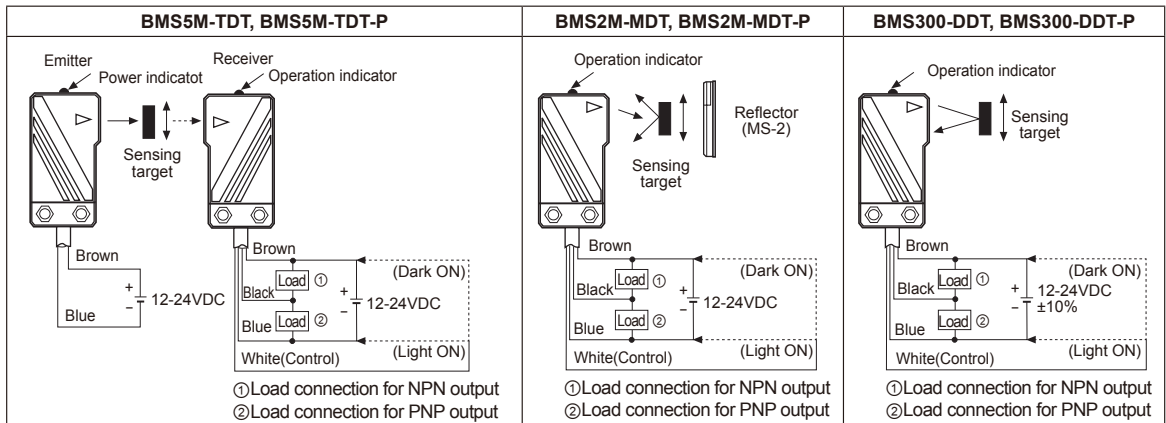
## High speed response type with built-in output protection circuit [BMS Series]

### Specifications

Model	NPN open collector output	<b>BMS5M-TDT</b>	<b>BMS2M-MDT</b>	<b>BMS300-DDT</b>
	PNP open collector output	<b>BMS5M-TDT-P</b>	<b>BMS2M-MDT-P</b>	<b>BMS300-DDT-P</b>
Insulation resistance		Min. 20MΩ(at 500VDC megger)		
Noise resistance		±240V the square wave noise(pulse width: 1μs) by the noise simulator		
Dielectric strength		1000VAC 50/60Hz for 1minute		
Vibration		1.5mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 2 hours		
Shock		500m/s <sup>2</sup> (approx. 50G) in each of X, Y, Z directions for 3 times		
Environment	Ambient illumination	Sunlight: Max. 11,000lx, Incandescent lamp: Max. 3,000lx		
	Ambient temperature	-10 to 60°C, storage: -25 to 70°C		
	Ambient humidity	35 to 85%RH, storage: 35 to 85%RH		
Material		Case: ABS, Sensing part: Acryl (Through-beam: PC)		
Cable		ø5mm, 4-wire, Length: 2m(Emitter of through-beam type: ø5mm, 2-wire, Length: 2m) (AWG22, Core diameter: 0.08mm, Number of cores: 60, Insulator out diameter: ø1.25mm)		
Accessories	Individual	—	Reflector(MS-2), VR adjustment driver	VR adjustment driver
	Common	Mounting bracket, Bolts/nuts		
Approval		CE		
Unit weight		Approx. 180g	Approx. 110g	Approx. 100g

※The temperature or humidity mentioned in Environment indicates a non freezing or condensation environment.

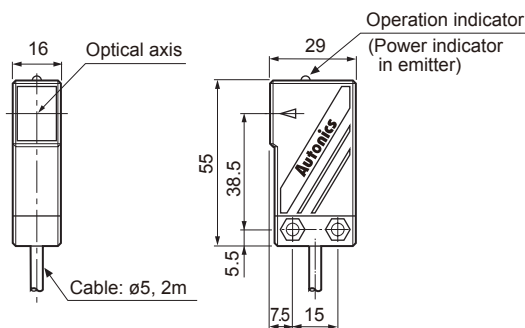
### Connections



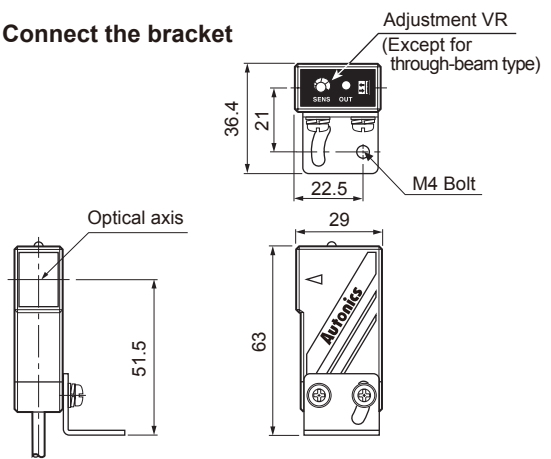
※Dark ON mode is on when control line is opened.

### Dimensions

(unit: mm)





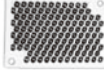



#### Connect the bracket



# Compact, amplifier built-in type with Universal voltage [BEN Series]

## ■ Specifications

### ◎ Free power, Relay contact output type

Model	BEN10M-TFR	BEN5M-MFR	BEN3M-PFR	BEN300-DFR
Appearances		  (MS-2)  (MS-4) ※MS-4 is sold separately.		
Sensing type	Through-beam	Retroreflective (Standard type)	Retroreflective (Built-in polarizing filter)	Diffuse reflective
Sensing distance	10m	0.1 to 5m <sup>※1</sup>	0.1 to 3m <sup>※1</sup>	300mm <sup>※2</sup>
Sensing target	Opaque materials of Min. ø16mm	Opaque materials of Min. ø60mm		Translucent, Opaque materials
Hysteresis	—			Max. 20% at rated setting distance
Response time	Max. 20ms			
Power supply	24-240VAC ±10% 50/60Hz, 24-240VDC ±10%(ripple P-P : Max. 10%)			
Power consumption	Max. 4VA			
Light source	Infrared LED(850nm)		Red LED(660nm)	Infrared LED(940nm)
Sensitivity adjustment	—		Adjustment VR	
Operation mode	Selectable Light ON or Dark ON by VR			
Control output	Relay contact output • Relay contact capacity: 30VDC 3A of resistive load, 250VAC 3A resistive load • Relay contact composition: 1c			
Relay lifetime	Mechanically: Min. 50,000,000 operation, Electrically: Min. 100,000 operation			
Light receiving element	Photo IC			
Indicator	Operation indicator : red, Stability indicator : green (The red lamp on Emitter of transmitted beam type is for power indication)			
Insulation resistance	Min. 20MΩ(at 500VDC megger)			
Insulation type	Double or strong insulation (Mark :  , Dielectric voltage between the measured input and the power: 1kV)			
Noise resistance	±1,000V the square wave noise(pulse width : 1μs) by the noise simulator			
Dielectric strength	1000VAC 50/60Hz for 1minute			
Vibration	Mechanical	1.5mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 2 hours		
	Malfunction	1.5mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 10 minutes		
Shock	Mechanical	500m/s <sup>2</sup> (approx. 50G) in each of X, Y, Z directions for 3 times		
	Malfunction	100m/s <sup>2</sup> (approx. 10G) in each of X, Y, Z directions for 3 times		
Environment	Ambient illumination	Sunlight : Max. 11,000lx, Incandescent lamp : Max. 3,000lx (Receiver illumination)		
	Ambient temperature	-20 to 65°C, storage : -25 to 70°C		
	Ambient humidity	35 to 85%RH, storage : 35 to 85%RH		
Protection	IP50(IEC standard)			
Material	• Case, Case cover: Heat resistant ABS • Sensing part: PC(with polarizing filter: PMMA)			
Cable	ø5mm, 5-wire, Length: 2m(Emitter of through-beam type: ø5mm, 2-wire, Length: 2m) (AWG22, Core diameter: 0.08mm, Number of cores: 60, Insulator out diameter: ø1.25mm)			
Accessory	Individual	—		Reflector(MS-2)
	Common	VR adjustment driver, Mounting bracket, Bolts/nuts		
Unit weight	Approx. 354g	Approx. 208g		Approx. 195g

※1: The sensing distance is specified with using the MS-2 reflector and same as the MS-4 reflector. Sensing distance is setting range of the reflector. The sensor can detect under 0.1m.

※2: It is for Non-glossy white paper(100×100mm).

※The temperature or humidity mentioned in Environment indicates a non freezing or condensation environment.

Photo electric sensor

Fiber optic sensor

Door/Area sensor

Proximity sensor

Pressure sensor

Rotary encoder

Connector/Socket

Temp. controller

SSR/Power controller

Counter

Timer

Panel meter

Tacho/Speed/Pulse meter

Display unit

Sensor controller

Switching mode power supply

Stepper motor & Driver&Controller


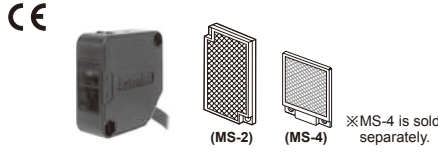


Graphic/Logic panel

Field network device

## Compact, amplifier built-in type with Universal voltage [BEN Series]

### ■ Specifications

#### ◎ DC power, Solid state output type

Model	BEN10M-TDT	BEN5M-MDT	BEN3M-PDT	BEN300-DDT
Appearances				
Sensing type	Through-beam	Retroreflective	Retroreflective (with polarizing filter)	Diffuse reflective
Sensing distance	10m	0.1 to 5m <sup>※1</sup>	0.1 to 3m <sup>※1</sup>	300mm <sup>※2</sup>
Sensing target	Opaque materials of Min. ø16mm	Opaque materials of Min. ø60mm		Translucent, Opaque materials
Hysteresis	—			Max. 20% at rated setting distance
Response time	Max. 1ms			
Power supply	12-24VDC ±10%(ripple P-P: Max. 10%)			
Current consumption	Max. 50mA			
Light source	Infrared LED(850nm)		Red LED(660nm)	Infrared LED(940nm)
Sensitivity adjustment	—		Adjustment VR	
Operation mode	Selectable Light ON or Dark ON by VR			
Control output	NPN open collector / PNP open collector simultaneous output •Load voltage: Max. 30VDC •Load current: Max. 200mA •Residual voltage - NPN: Max. 1V, PNP: Max. 2.5V			
Protection circuit	Reverse polarity protection, Short-circuit protection			
Light receiving element	Photo IC			
Indicator	Operation indicator : Red, Stability indicator : Green (The red lamp on Emitter of transmitted beam type is for power indication)			
Insulation resistance	Min. 20MΩ(at 500VDC megger)			
Noise resistance	±240V the square wave noise(pulse width: 1μs) by the noise simulator			
Dielectric strength	1000VAC 50/60Hz for 1minute			
Vibration	1.5mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 2 hours			
Shock	500m/s <sup>2</sup> (approx. 50G) in each of X, Y, Z directions for 3 times			
Environment	Ambient illumination	Sunlight : Max. 11,000lx Incandescent lamp : Max. 3,000lx (Receiver illumination)		
	Ambient temperature	-20 to 65°C, storage : -25 to 70°C		
	Ambient humidity	35 to 85%RH, storage : 35 to 85%RH		
Protection	IP50(IEC standard)			
Material	•Case, Case cover: Heat resistant ABS •Sensing part: PC(with polarizing filter: PMMA)			
Cable	ø5mm, 4-wire, Length: 2m(Emitter of through-beam type: ø5mm, 2-wire, Length: 2m) (AWG22, Core diameter: 0.08mm, Number of cores: 60, Insulator diameter: ø1.25mm)			
Accessory	Individual	—		Reflector(MS-2)
	Common	VR adjustment driver, Mounting bracket, Bolts/nuts		
Approval				
Unit weight	Approx. 342g	Approx. 200g		Approx. 187g

※1: The sensing distance is specified with using the MS-2 reflector and same as the MS-4 reflector.  
Sensing distance is setting range of the reflector. The sensor can detect under 0.1m.

※2: It is for Non-glossy white paper(100×100mm)

※The temperature or humidity mentioned in Environment indicates a non freezing or condensation environment.

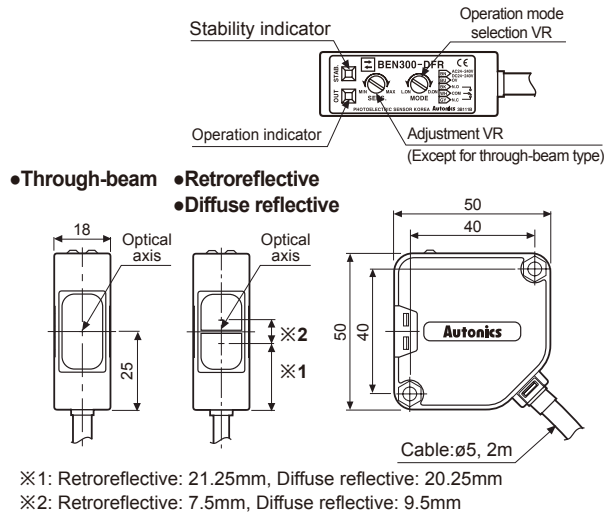
## ■ Connections

Through-beam		Retroreflective	Diffuse reflective
<ul style="list-style-type: none"> <li>● BEN10M-TFR1</li> <li>● BEN10M-TFR2</li> </ul>	<ul style="list-style-type: none"> <li>● BEN5M-MFR(Standard type)</li> <li>● BEN3M-PFR(Built-in polarizing filter)</li> </ul>	<ul style="list-style-type: none"> <li>● BEN300-DFR</li> </ul>	
<ul style="list-style-type: none"> <li>● BEN10M-TDT1</li> <li>● BEN10M-TDT2</li> </ul>	<ul style="list-style-type: none"> <li>● BEN5M-MDT(Standard type)</li> <li>● BEN3M-PDT(Built-in polarizing filter)</li> </ul>	<ul style="list-style-type: none"> <li>● BEN300-DDT</li> </ul>	

※ Unused line must be insulated.

## ■ Dimensions

(unit: mm)



### ● Connect the bracket

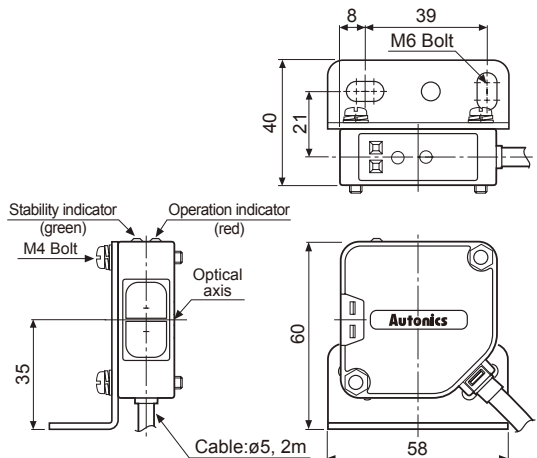


Photo electric sensor

Fiber optic sensor

Door/Area sensor

Proximity sensor

Pressure sensor

Rotary encoder

Connector/Socket

Temp. controller

SSR/Power controller

Counter

Timer

Panel meter

(unit: mm)

Tacho/Speed/ Pulse meter

Display unit

Sensor controller

Switching mode power supply

Stepper motor & Driver&Controller


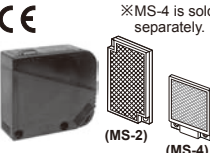
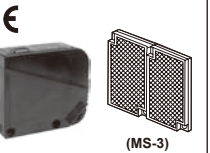



Graphic/ Logic panel

Field network device

## Terminal type and Long sensing distance type [BX Series]

### ■ Specifications

#### ◎ Free power type, Relay contact output type

Model	Standard type	BX15M-TFR	BX5M-MFR	BX3M-PFR	BX700-DFR
	With Timer	BX15M-TFR-T	BX5M-MFR-T	BX3M-PFR-T	BX700-DFR-T
Appearances					
Sensing type	Through-beam	Retroreflective (Standard type)	Retroreflective (Built-in polarizing filter)	Diffuse reflective	
Sensing distance	15m	0.1 to 5m(MS-2) <sup>※1</sup>	0.1 to 3m(MS-3) <sup>※2</sup>	700mm <sup>※3</sup>	
Sensing target	Opaque materials of Min. $\phi$ 15mm	Opaque materials of Min. $\phi$ 60mm		Translucent, opaque material	
Hysteresis	—			Max. 20% at rated setting distance	
Response time	Max. 20ms				
Power supply	24-240VAC $\pm$ 10% 50/60Hz, 24-240VDC $\pm$ 10%(ripple P-P:Max. 10%)				
Power consumption	Max. 3VA				
Light source	Infrared LED(850nm)		Red LED(660nm)	Infrared LED(940nm)	
Sensitivity adjustment	Built-in the adjustment VR				
Operation mode	Selectable Light ON or Dark ON by switch				
Control output	Relay contact output(Contact capacity: 30VDC 3A, 250VAC 3A at resistive load, Contact composition: 1c) <sup>※4</sup>				
Relay life cycle	Mechanically: Min. 50,000,000, Electrically: Min. 100,000				
Self-diagnosis output	Green LED turns on at stable operation				
Timer function	Selectable ON Delay, OFF Delay, One Shot Delay by slide switch [Delay Time: 0.1 to 5sec.(Adjustable VR)]				
Indicator	Operation indicator: yellow LED, Self-diagnosis indicator: green LED				
Insulation resistance	Min. 20M $\Omega$ (at 500VDC megger)				
Insulation type	Double or strong insulation(Mark:  , Dielectric voltage between the measured input and the power: 1.5kV)				
Noise resistance	$\pm$ 1,000V the square wave noise(pulse width: 1 $\mu$ s) by the noise simulator				
Dielectric strength	1500VAC 50/60Hz for 1minute				
Vibration	Mechanical	1.5mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 2 hours			
	Malfunction	1.5mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 10 minutes			
Shock	Mechanical	500m/s <sup>2</sup> (approx. 50G) in each of X, Y, Z directions for 3 times			
	Malfunction	100m/s <sup>2</sup> (approx. 10G) in each of X, Y, Z directions for 3 times			
Environment	Ambient illumination	• Sunlight: Max. 11,000lx • Incandescent lamp: Max. 3,000lx (receiver illumination)			
	Ambient temperature	-20 to 55°C, storage: -25 to 70°C			
	Ambient humidity	35 to 85%RH, storage: 35 to 85%RH			
Protection	IP66(IEC standard)				
Material	• Case, Lens cover: PC • Sensing part: Acrylic				
Accessory	Individual	—	Mirror(MS-2)	Mirror(MS-3)	—
	Common	VR adjustment driver, Mounting bracket, Bolts, Nuts			
Approval					
Unit weight	TFR: Approx. 225g TFR-T: Approx. 226g	MFR: Approx. 130g MFR-T: Approx. 131g	PFR: Approx. 148g PFR-T: Approx. 149g	DFR: Approx. 115g DFR-T: Approx. 116g	

※1: It is same when using the MS-4 reflector (sold separately). The sensor can detect under 0.1m.

※2: When using the MS-2 reflector, the sensing distance is 0.1 to 2m. The sensor can detect under 0.1m.


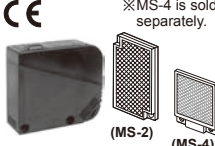
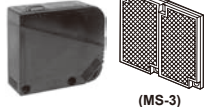


※3: It is for Non-glossy white paper(200×200mm)

※4: Relay contact output 1a type is option.

※Relay contact output 1a type is option.

※The temperature or humidity mentioned in Environment indicates a non freezing or condensation environment.

## ◎ DC power type, Solid state output type

Model	Standard type	BX15M-TDT	BX5M-MDT	BX3M-PDT	BX700-DDT
	With Timer	BX15M-TDT-T	BX5M-MDT-T	BX3M-PDT-T	BX700-DDT-T
Appearances					
Sensing type	Through-beam	Retroreflective (Standard type)	Retroreflective (Built-in polarizing filter)	Diffuse reflective	
Sensing distance	15m	0.1 to 5m(MS-2) <sup>※1</sup>	0.1 to 3m(MS-3) <sup>※2</sup>	700mm <sup>※3</sup>	
Sensing target	Opaque materials of Min. $\phi$ 15mm	Opaque materials of Min. $\phi$ 60mm		Translucent, opaque material	
Hysteresis	—			Max. 20% at rated setting distance	
Response time	Max. 1ms				
Power supply	12-24VDC $\pm$ 10%(ripple P-P:Max. 10%)				
Current consumption	Max. 50mA				
Light source	Infrared LED(850nm)			Red LED(660nm)	Infrared LED(940nm)
Sensitivity adjustment	Built-in VR				
Operation mode	Selectable Light ON or Dark ON by switch				
Control output	NPN or PNP open collector output •Load voltage: Max. 30VDC •Load current: Max. 200mA •Residual voltage - NPN:Max. 1V, PNP:Max. 2.5V				
Relay life cycle	Mechanically: Min. 50,000,000, Electrically: Min. 100,000				
Self-diagnosis output	Green LED turns on at unstable operation and output(transistor output) turns on				
Timer function	Selectable ON Delay, OFF Delay, One Shot Delay by slide switch [Delay Time: 0.1 to 5sec.(Adjustable VR)]				
Indicator	Operation indicator: yellow LED, Self-diagnosis indicator: green LED				
Insulation resistance	Min. 20M $\Omega$ (at 500VDC megger)				
Noise resistance	$\pm$ 240V the square wave noise(pulse width: 1 $\mu$ s) by the noise simulator				
Dielectric strength	1500VAC 50/60Hz for 1minute				
Vibration	Mechanical	1.5mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 2 hours			
	Malfunction	1.5mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 10 minutes			
Shock	Mechanical	500m/s <sup>2</sup> (approx. 50G) in each of X, Y, Z directions for 3 times			
	Malfunction	100m/s <sup>2</sup> (approx. 10G) in each of X, Y, Z directions for 3 times			
Environment	Ambient illumination	•Sunlight: Max. 11,000lx •Incandescent lamp: Max. 3,000lx(receiver illumination)			
	Ambient temperature	-20 to 55°C, storage: -25 to 70°C			
	Ambient humidity	35 to 85%RH, storage: 35 to 85%RH			
Protection	IP66(IEC standard)				
Material	•Case, Lens cover: PC •Sensing part: Acrylic				
Accessory	Individual	—	Mirror(MS-2)	Mirror(MS-3)	—
	Common	VR adjustment driver, Mounting bracket, Bolts, Nuts			
Approval					
Unit weight	TDT: Approx. 211g TDT-T: Approx. 212g	MDT: Approx. 123g MDT-T: Approx. 124g	PDT: Approx. 141g PDT-T: Approx. 142g	DDT: Approx. 116g DDT-T: Approx. 117g	

※1: It is same when using the MS-4 reflector (sold separately). The sensor can detect under 0.1m.

※2: When using the MS-2 reflector, the sensing distance is 0.1 to 2m. The sensor can detect under 0.1m.

※3: It is for Non-glossy white paper(200×200mm)

※The temperature or humidity mentioned in Environment indicates a non freezing or condensation environment.

Photo electric sensor

Fiber optic sensor

Door/Area sensor

Proximity sensor

Pressure sensor

Rotary encoder

Connector/Socket

Temp. controller

SSR/Power controller

Counter

Timer

Panel meter

Tacho/Speed/ Pulse meter

Display unit

Sensor controller

Switching mode power supply

Stepper motor& Driver&Controller

Graphic/Logic panel

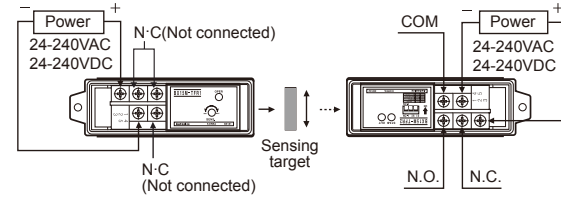
Field network device

# Selection Guide

## ■ Connections

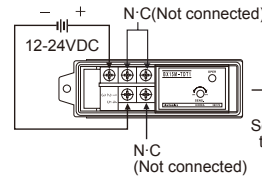
### ◎ Through-beam type

#### ● BX15M-TFR1

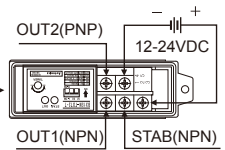


#### ● BX15M-TFR2 BX15M-TFR2-T

#### ● BX15M-TDT1



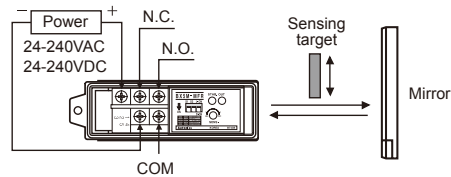
#### ● BX15M-TDT2 BX15M-TDT2-T



### ◎ Retroreflective type / Retroreflective type with polarizing filter

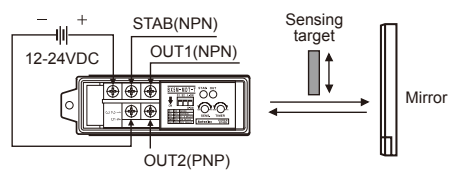
#### ● BX5M-MFR, BX5M-MFR-T(Standard type)

#### ● BX3M-PFR, BX3M-PFR-T(Built-in polarizing filter)



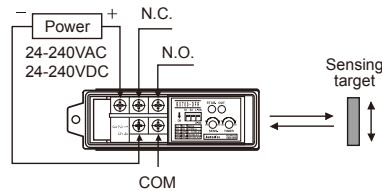
#### ● BX5M-MDT, BX5M-MDT-T(Standard type)

#### ● BX3M-PDT, BX3M-PDT-T(Built-in polarizing filter)

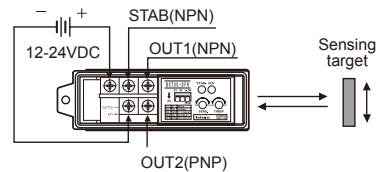


### ◎ Diffuse reflective type

#### ● BX700-DFR, BX700-DFR-T

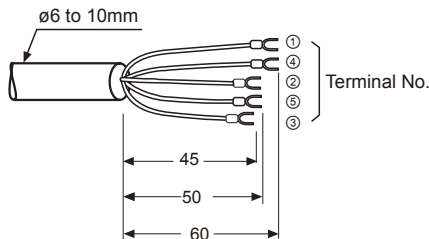


#### ● BX700-DDT, BX700-DDT-T

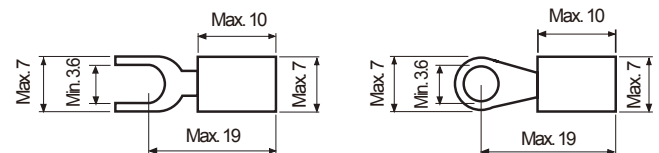


### ◎ Cable

(unit: mm)



#### ● Crimp terminal size

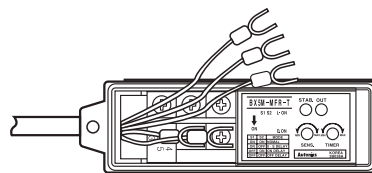


Wire holder

Washer

Cover

Waterproof rubber



※ To connect the wires on the terminal, follow as above figures.

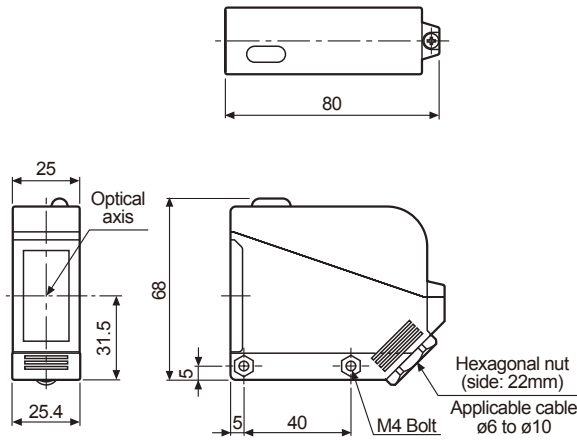
※ Select the round wire with the size of ø6 to 10mm for the waterproof and tighten the cable holder by torque of 1.0 to 1.5N·m.

※ To connect the wires on the terminal, tighten screws by torque of 0.8N·m.

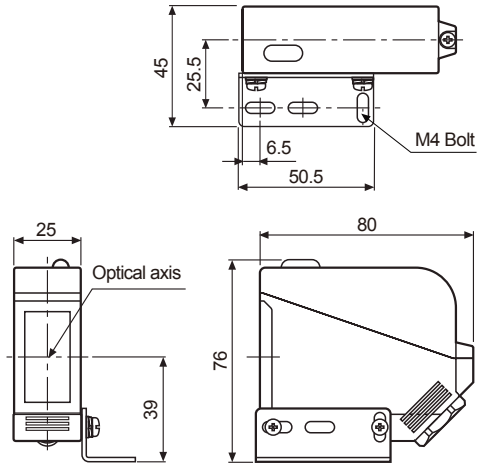


## ■ Dimensions

(unit: mm)



### ● Connect the bracket



## Upgraded cylindrical(Ø18mm) type [BR Series]

### ■ Specifications

※ The model name with '-C' is connector type.

Model	Model Name											
	NPN open collector output	BRP100-DDT	BR100-DDT	BRP400-DDT	BR400-DDT	BRP200-DDTN	BR200-DDTN	BRP3M-MDT	BR3M-MDT	BR4M-TDTD	BR20M-TDTD	BR4M-TDTL
PNP open collector output	BRP100-DDT-C	BR100-DDT-C	BRP400-DDT-C	BR400-DDT-C	BRP200-DDTN-C	BR200-DDTN-C	BRP3M-MDT-C	BR3M-MDT-C	BR4M-TDTD-C	BR20M-TDTD-C	BR4M-TDTL-C	BR20M-TDTL-C
	BRP100-DDT-P	BR100-DDT-P	BRP400-DDT-P	BR400-DDT-P	BRP200-DDTN-P	BR200-DDTN-P	BRP3M-MDT-P	BR3M-MDT-P	BR4M-TDTD-P	BR20M-TDTD-P	BR4M-TDTL-P	BR20M-TDTL-P
	BRP100-DDT-C-P	BR100-DDT-C-P	BRP400-DDT-C-P	BR400-DDT-C-P	BRP200-DDTN-C-P	BR200-DDTN-C-P	BRP3M-MDT-C-P	BR3M-MDT-C-P	BR4M-TDTD-C-P	BR20M-TDTD-C-P	BR4M-TDTL-C-P	BR20M-TDTL-C-P

Appearances			
	 (MS-2)	 (MS-5)	 Connector type

Sensing type	Diffuse reflective	Narrow beam reflective	Retroreflective	Through-beam
Sensing distance	100mm <sup>※1</sup>	400mm <sup>※2</sup>	200mm <sup>※2</sup>	0.1 to 3m <sup>※3</sup>
Sensing target	Translucent, Opaque materials		Opaque materials of min. ø60mm	Opaque materials of min. ø15mm
Hysteresis	Max. 20% at rated setting distance			
Response time	Max. 1ms.			
Power supply	12-24VDC ±10%(ripple P-P: Max. 10%)			
Current consumption	Max. 45mA			
Light source	Infrared LED(940nm)	Infrared LED(850nm)	Red LED(660nm)	Infrared LED(850nm)
Sensitivity adjustment	Adjustable(built-in the adjustment VR)			Fixed
Operation mode	Selectable Light ON or Dark ON by control cable(white)			Dark ON   Light ON
Control output	NPN or PNP open collector output • Load voltage: Max. 30VDC • Load current: Max. 200mA • Residual voltage - NPN: Max. 1V, PNP: Max. 2.5V			
Protection circuit	Reverse polarity protection circuit, Output short-circuit protection circuit			
Indicator	Operation indicator: red LED, Power indicator: red LED(only for emitter of through-beam type)			
Insulation resistance	Min. 20MΩ(at 500VDC megger)			
Noise resistance	±240V the square wave noise(pulse width: 1μs) by the noise simulator			
Dielectric strength	1000VAC 50/60Hz for 1 minute			

※1: Non-glossy white paper 50×50mm

※2: Non-glossy white paper 100×100mm

※3: The sensing distance is specified with using the MS-2 reflector. Sensing distance is setting range of the reflector. The sensor can detect under 0.1m.

Photo electric sensor
Fiber optic sensor
Door/Area sensor
Proximity sensor
Pressure sensor
Rotary encoder
Connector/ Socket
Temp. controller
SSR/ Power controller
Counter
Timer
Panel meter
Tacho/ Speed/ Pulse meter
Display unit
Sensor controller
Switching mode power supply
Stepper motor& Driver&Controller
Graphic/ Logic panel
Field network device

## Upgraded cylindrical(Ø18mm) type [BR Series]

### Specifications

※The model name with '-C' is connector type.

Model	BRP100-DDT	BR100-DDT	BRP400-DDT	BR400-DDT	BRP200-DDTN	BR200-DDTN	BRP3M-MDT	BR3M-MDT	BR4M-TDTD BR20M-TDTD	BR4M-TDTL BR20M-TDTL	
NPN open collector output	BRP100-DDT-C	BR100-DDT-C	BRP400-DDT-C	BR400-DDT-C	BRP200-DDTN-C	BR200-DDTN-C	BRP3M-MDT-C	BR3M-MDT-C	BR4M-TDTD-C BR20M-TDTD-C	BR4M-TDTL-C BR20M-TDTL-C	
PNP open collector output	BRP100-DDT-P	BR100-DDT-P	BRP400-DDT-P	BR400-DDT-P	BRP200-DDTN-P	BR200-DDTN-P	BRP3M-MDT-P	BR3M-MDT-P	BR4M-TDTD-P BR20M-TDTD-P	BR4M-TDTL-P BR20M-TDTL-P	
	BRP100-DDT-C-P	BR100-DDT-C-P	BRP400-DDT-C-P	BR400-DDT-C-P	BRP200-DDTN-C-P	BR200-DDTN-C-P	BRP3M-MDT-C-P	BR3M-MDT-C-P	BR4M-TDTD-C-P BR20M-TDTD-C-P	BR4M-TDTL-C-P BR20M-TDTL-C-P	
Vibration	1.5mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 2 hours										
Shock	500m/s <sup>2</sup> (approx. 50G) in each of X, Y, Z directions for 3 times										
Environment	Ambient illumination Sunlight: Max. 11,000lx, Incandescent lamp: Max. 3,000lx (receiver illumination)										
	Ambient temperature -10 to 60°C, storage: -25 to 75°C										
	Ambient humidity 35 to 85%RH, storage: 35 to 85%RH										
Protection	IP66(IEC standard)										
Material	• Case - BRP: PA(black) BR: Brass, Ni-plate • Sensing part - PC						• Case - BRP3M: PA(black) BR3M: Brass, Ni-plate • Sensing part - Acrylic		• Case - Brass, Ni-plate • Sensing part - BR4M: Glass BR20M: PC		
Cable	• BR(P): ø5mm, 4-wire, Length:2m(Emitter of through-beam type: ø5mm, 2-wire, Length: 2m / Receiver: ø5mm, 3-wire, Length: 2m) (AWG 22, Core diameter: 0.08mm, Number of cores: 60, Insulator out diameter: ø1.25mm) • BR(P)-C: M12 connector										
Accessory	Individual	VR adjustment driver					VR adjustment driver, Reflector(MS-2)		—		
	Common	BR: Fixing nuts, Washer / BRP: Fixing nuts									
Approval	CE										
Unit weight	• BRP Series: Approx. 100g, BR Series: Approx. 120g • BRP-C Series: Approx. 30g, BR-C Series: Approx. 50g							• BR Series: Approx. 300g • BR-C Series: Approx. 110g			

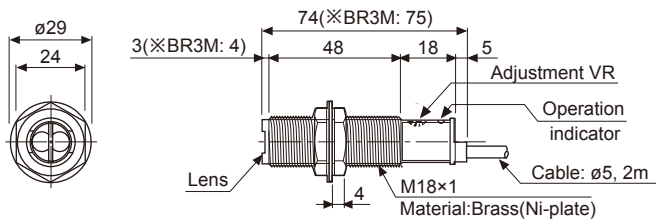
※Tightening torque for connector is 0.39 to 0.49N.m.

※The temperature or humidity mentioned in Environment indicates a non freezing or condensation environment.

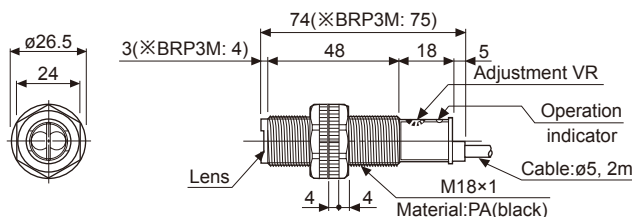
### Dimensions

(unit: mm)

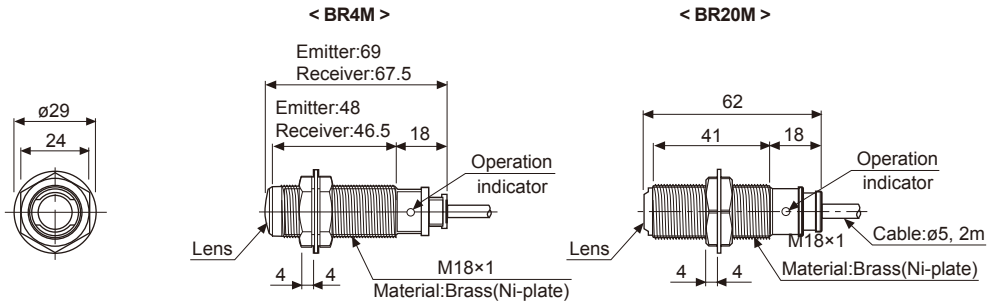
- BR100-DDT / BR100-DDT-P
- BR400-DDT / BR400-DDT-P
- BR200-DDTN / BR200-DDTN-P
- BR3M-MDT / BR3M-MDT-P (※)



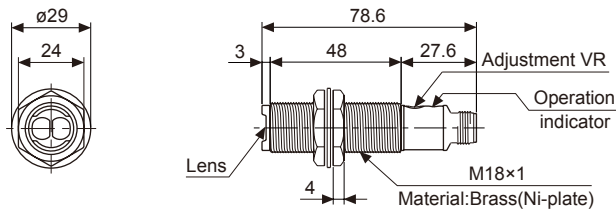
- BRP100-DDT / BRP100-DDT-P
- BRP400-DDT / BRP400-DDT-P
- BRP200-DDTN / BRP200-DDTN-P
- BRP3M-MDT / BRP3M-MDT-P (※)



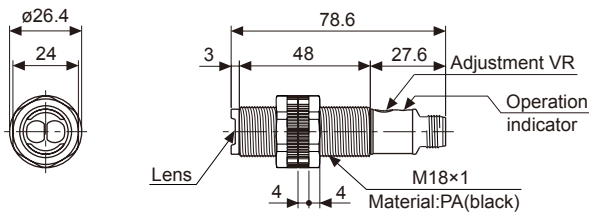
- BR4M-TDTD / BR4M-TDTD-P / BR4M-TDTL / BR4M-TDTL-P  
BR20M-TDTD / BR20M-TDTD-P / BR20M-TDTL / BR20M-TDTL-P



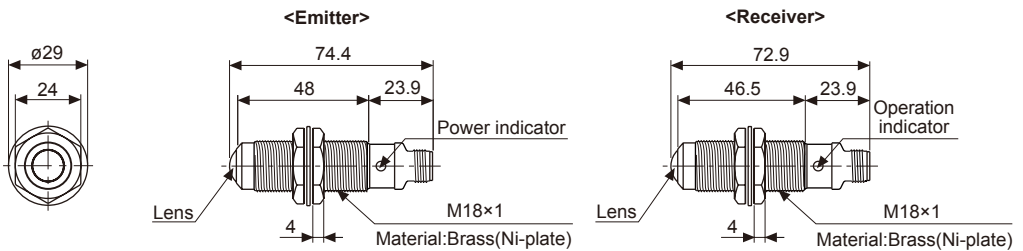
- BR100/200/400/3M-DDT(N)-C(-P)



- BRP100/200/400/3M-DDT(N)-C(-P)



- BR4M-TDTD(L)-C(-P)



- BR20M-TDTD(L)-C(-P)

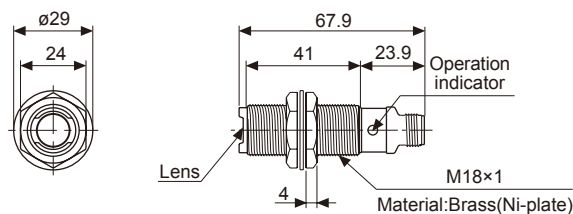


Photo electric sensor

Fiber optic sensor

Door/Area sensor

Proximity sensor

Pressure sensor

Rotary encoder

Connector/Socket

Temp. controller

SSR/ Power controller

Counter

Timer

Panel meter

Tacho/ Speed/ Pulse meter

Display unit

Sensor controller

Switching mode power supply

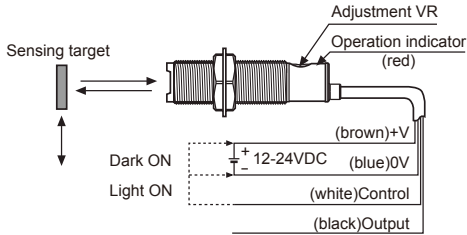
Stepper motor & Driver&Controller

Graphic/ Logic panel

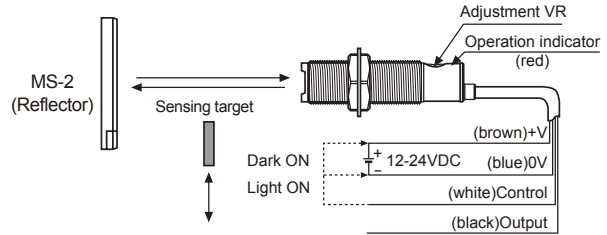
Field network device

## ■ Connections

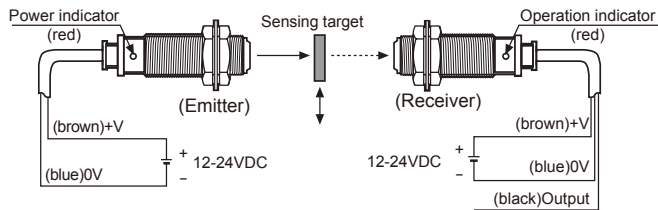
### ● Diffuse reflective type / Narrow beam reflective type



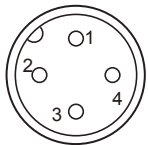
### ● Retroreflective type



### ● Through-beam type



## ■ Connections for connector part



M12 Connector pin



Connector pin No.	Cable colors	Application		
		Diffuse/Narrow beam reflective type	Retroreflective type	Through-beam type
1	Brown	24VDC	24VDC	24VDC
2	White	CONTROL	N.C	GND
3	Blue	GND	GND	GND
4	Black	OUTPUT	N.C	OUTPUT

● Connector cable(sold separately)

※Please refer to the 148 page for connector cable.

## Easy mounting(one push), small sized and long sensing distance through beam type [BRE Series]

### ■ Specifications

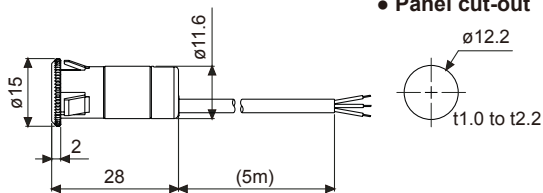
Model	BRE5M-TDTL	BRE5M-TDTD	BRE10M-TDTL	BRE10M-TDTD
Appearances	 			
Sensing type	Through-beam			
Sensing distance	5m		10m	
Sensing target	Opaque materials of min. $\phi$ 10mm			
Response time	Max. 1ms			
Power supply	12-24VDC $\pm$ 10%(ripple P-P: Max. 10%)			
Current consumption	Emitter: Max. 20mA, Receiver: Max. 16mA			
Light source	Infrared LED(850nm)			
Sensitivity adjustment	Sensitivity adjustment by connecting external resistance on control cable(3k $\Omega$ to 10k $\Omega$ variable)			
TEST function	Connecting output pin of control output cable to GND to enter into TEST mode.[Power indicator(green) of emitter flashes]			
Operation mode	Light ON	Dark ON	Light ON	Dark ON
Control output	NPN open collector output • Load voltage: Max. 24VDC • Load current: Max. 100mA • Residual voltage: Max. 1.6V			
Protection circuit	Reverse polarity protection circuit, Output short-circuit protection circuit			
Indicator	Operation indicator: red LED, Power indicator: green LED			
Insulation resistance	Min. 20M $\Omega$ (at 500VDC megger)			

Model	<b>BRE5M-TDTL</b>	<b>BRE5M-TDTD</b>	<b>BRE10M-TDTL</b>	<b>BRE10M-TDTD</b>
Noise resistance	±240V the square wave noise(pulse width: 1μs) by the noise simulator			
Dielectric strength	1000VAC 50/60Hz for 1 minute			
Shock	500m/s <sup>2</sup> (approx. 50G) in each of X, Y, Z directions for 3 times			
Environment	Ambient illumination	Sunlight: Max. 50,000lx (receiver illumination)		
	Ambient temperature	-25 to 55°C, storage: -40 to 70°C		
	Ambient humidity	35 to 85%RH, storage: 35 to 85%RH		
Protection	IP66(IEC standard)			
Material	• Case: PC(black) • Sensing part: Acrylic			
Cable	ø3mm, 3-wire, Length: 5m(AWG 22, Core diameter: 0.08mm, Number of cores: 40, Insulator out diameter: ø1.0mm)			
Approval	<b>CE</b>			
Unit weight	Approx. 130g			

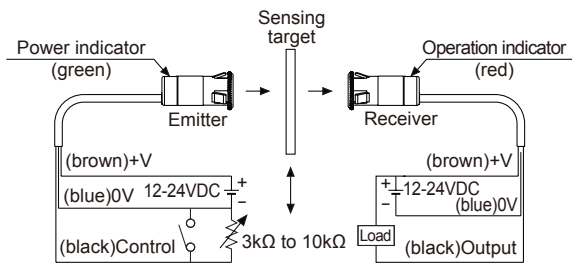
※The temperature or humidity mentioned in Environment indicates a non freezing or condensation environment.

## ■ Dimensions

(unit: mm)




## ■ Connections



## Reinforced plastic case U-Shaped type [BUP Series]

### ■ Specifications

Model	NPN open collector output	<b>BUP-30</b>	<b>BUP-30S</b>	<b>BUP-50</b>	<b>BUP-50S</b>
	PNP open collector output	<b>BUP-30-P</b>	<b>BUP-30S-P</b>	<b>BUP-50-P</b>	<b>BUP-50S-P</b>
Appearances	<b>CE</b> 				
Sensing type	Through-beam				
Sensing target	Opaque materialsof min. ø4mm	Opaque materialsof min. ø1.5mm	Opaque materialsof min. ø4mm	Opaque materialsof min. ø1.5mm	
Operation mode	Selectable Light ON or Dark ON by control wire				
Sensing distance	30mm			50mm	
Response speed	Max. 1ms				
Power supply	12-24VDC ±10%(ripple P-P: Max. 10%)				
Current consumption	Max. 30mA				
Light source	Infrared LED(940nm)				
Sensitivity adjustment	Fixed	Adjustment VR	Fixed	Adjustment VR	
Control output	NPN or PNP open collector output • Load voltage: Max. 30VDC • Load current: Max. 200mA • Residual voltage - NPN: Max. 1V, PNP: Max. 2.5V				
Protection circuit	Reverse polarity protection, Output short-circuit protection				
Indication	Power indicator: green LED, Operation indicator: red LED				
Insulation resistance	Min. 20MΩ(at 500VDC megger)				
Noise strength	±240V the square wave noise(pulse width: 1μs) by the noise simulator				
Dielectric strength	1,000VAC 50/60Hz for 1 minute				

## Reinforced plastic case U-Shaped type [BUP Series]

### Specifications

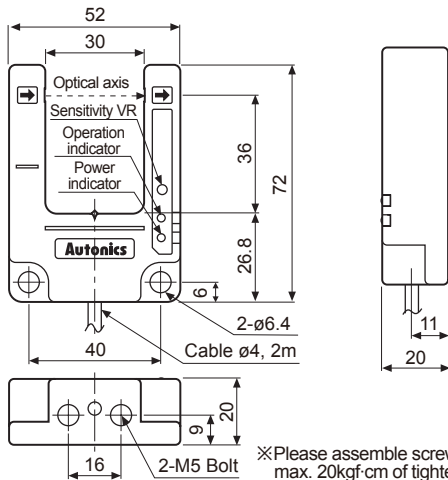
Model	NPN open collector output	BUP-30	BUP-30S	BUP-50	BUP-50S
	PNP open collector output	BUP-30-P	BUP-30S-P	BUP-50-P	BUP-50S-P
Vibration	1.5mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 2 hours				
Shock	500m/s <sup>2</sup> (approx. 50G) in each of X, Y, Z directions for 3 times				
Environment	Ambient illumination	Sunlight: Max. 11,000lx Incandescent lamp: Max. 3,000lx (Receiving illumination)			
	Ambient temperature	-25 to 65°C[BUP-30S(-P) & BUP-50S(-P): -10 to 60°C], storage: -25 to 70°C			
	Ambient humidity	35 to 85%RH, storage: 35 to 85%RH			
Protection	IP66(IEC standard)	IP50(IEC standard)	IP66(IEC standard)	IP50(IEC standard)	
Material	Case: ABS, Cap: PC				
Cable	ø4mm, 4-wire, Length: 2m (AWG22, Core diameter: 0.08mm, Number of cores: 60, Insulation out diameter: ø1.25mm)				
Accessory	—	VR adjustment driver	—	VR adjustment driver	
Approval	CE				
Unit weight	Approx. 90g			Approx. 140g	

※The temperature or humidity mentioned in Environment indicates a non freezing or condensation environment.

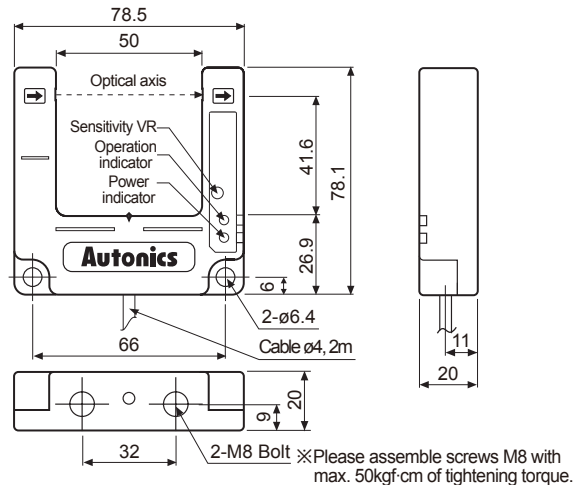
### Dimensions

(unit: mm)

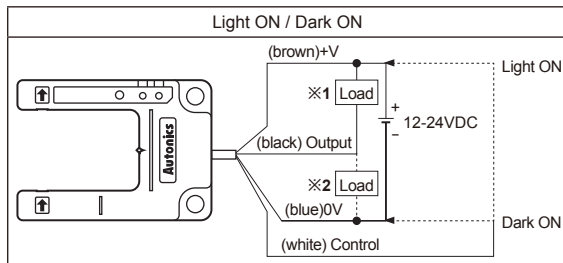
#### • BUP-30, BUP-30-P, BUP-30S, BUP-30S-P



#### • BUP-50, BUP-50-P, BUP-50S, BUP-50S-P



### Connections




※1: Load connection for NPN open collector output

※2: Load connection for PNP open collector output

# Liquid level sensor for mounting pipe (through-beam) [BL Series]

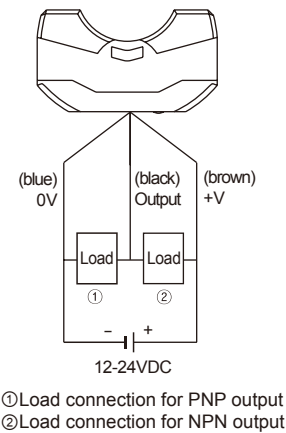
## Specifications

Model	NPN open collector output	<b>BL13-TDT</b>
	PNP open collector output	<b>BL13-TDT-P</b>
Appearances		
Sensing type	Through-beam	
Applicable pipe	ø6 to 13mm(thickness: 1mm) transparent pipe (FEP(fluoroplastic) or with equivalent transparency)	
Standard sensing target	Liquid in a pipe <sup>※1</sup>	
Response time	Max. 2ms	
Power supply	12-24VDC ±10%(ripple P-P: Max. 10%)	
Current consumption	Max. 30mA	
Light source	Infrared LED(950nm)	
Operation mode	Light ON/Dark ON switching by operation mode switching button	
Control output	NPN or PNP open collector output •Load voltage: Max. 30VDC •Load current: Max. 100mA •Residual voltage: Max. 1V	
Protection circuit	Reverse polarity protection circuit, output short-circuit protection circuit	
Indicator	Operation indicator: Red LED, Operation mode indicator: Green LED	
Insulation resistance	Min. 20MΩ(at 500VDC megger)	
Noise resistance	±240V the square wave noise(pulse width: 1μs) by the noise simulator	
Dielectric strength	1,000VAC 50/60Hz for 1 minute(between all terminals and case)	
Vibration	1.5mm amplitude at frequency of 10 to 55Hz in each of X, Y, Z directions for 2 hours	
Shock	500m/s <sup>2</sup> (approx. 50G) in each of X, Y, Z directions for 3 times	
Environment	Ambient illumination	Sunlight/Incandescent lamp: Max. 3,000lx for each(receiver illumination)
	Ambient temperature	10 to 55°C, storage: -25 to 65°C
	Ambient humidity	35 to 85%RH, storage: 35 to 85%RH
Protection	IP64(IEC standards)	
Material	Case: PC	
Cable	ø2.5mm, 3-wire, Length: 1m (AWG28, Core diameter: 0.08mm, Number of cores: 19, Insulator diameter: ø0.9mm)	
Accessory	Binding band 2EA, Anti-slip tube 2EA	
Approval	CE	
Unit weight	Approx. 30g	

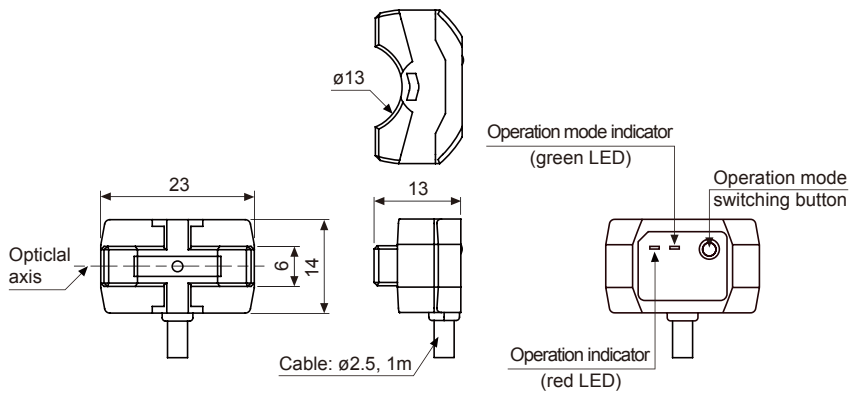
※1: This may not detect the liquid with low transparent, with high viscosity, or with floating matters.

※The temperature or humidity mentioned in Environment indicates a non freezing or condensation environment.

## Connection



## Dimensions



- Photo electric sensor
- Fiber optic sensor
- Door/Area sensor
- Proximity sensor
- Pressure sensor
- Rotary encoder
- Connector/Socket
- Temp. controller
- SSR/Power controller
- Counter
- Timer
- Panel meter
- Tacho/Speed/ Pulse meter
- Display unit
- Sensor controller
- Switching mode power supply
- Stepper motor & Driver&Controller
- Graphic/Logic panel
- Field network device

## Fiber optic sensor

### ■ Ordering information(Fiber optic amplifier)

**BF 5 R - D 1 - N**

N	NPN open collector output
P	PNP open collector output
1	Standard type
D	Dual display type
S	Single display type
R	Red LED
G	Green LED
B	Blue LED
5	Series
BF	Fiber Sensor

**BF 4 R P - E**

No mark	Standard type
E	External synchronization input type
R	Remote sensitivity setting type
No mark	NPN open collector output
P	PNP open collector output
R	Red LED
G	Green LED
4	Series
BF	Fiber Sensor

**BF 3 RX - P**

No mark	NPN open collector output
P	PNP open collector output
RX	Red LED
3	Series
BF	Fiber Sensor



## Ordering information(Fiber optic cable)

<b>F</b>	<b>T</b>		-	<b>4</b>	<b>20</b>	-	<b>10</b>		<b>S</b>																																																																																												
<div style="display: flex; justify-content: space-between; align-items: flex-start;"> <div style="width: 45%;"> <p style="margin-left: 20px;">Option</p> <p style="margin-left: 20px;">Cable type</p> <p style="margin-left: 20px;">Fiber diameter</p> <p style="margin-left: 20px;">Cable length</p> <p style="margin-left: 20px;">Hood diameter (nut)</p> <p style="margin-left: 20px;">Head form</p> <p style="margin-left: 20px;">Sensing type</p> <p style="margin-left: 20px;">Fiber material</p> </div> <div style="width: 55%;"> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 15%;">S</td> <td>Small hood</td> </tr> <tr> <td>No mark</td> <td>Standard type(-40 to 70°C)</td> </tr> <tr> <td>H</td> <td>Heat-resistance(-40 to 105°C)</td> </tr> <tr> <td>H1</td> <td>Heat-resistance(-40 to 150°C)</td> </tr> <tr> <td>H2</td> <td>Heat-resistance(-40 to 250°C)</td> </tr> <tr> <td>R</td> <td>Flexible type(R1)</td> </tr> <tr> <td>B</td> <td>Break-resistant type(R5)</td> </tr> <tr> <td>05</td> <td>ø0.5mm</td> </tr> <tr> <td>06</td> <td>ø0.6mm</td> </tr> <tr> <td>10</td> <td>ø1.0mm</td> </tr> <tr> <td>13</td> <td>ø1.3mm</td> </tr> <tr> <td>14</td> <td>ø1.4mm</td> </tr> <tr> <td>15</td> <td>ø1.5mm</td> </tr> <tr> <td>20</td> <td>ø2.0mm</td> </tr> <tr> <td>F</td> <td>ø0.5mm, ø0.25mm×4(coaxial type)</td> </tr> <tr> <td>F1</td> <td>ø0.5mm, ø0.25mm×9(coaxial type)</td> </tr> <tr> <td>F2</td> <td>ø1.0mm, ø0.265mm× 16(coaxial type)</td> </tr> <tr> <td>05</td> <td>0.5m</td> </tr> <tr> <td>10</td> <td>1m</td> </tr> <tr> <td>20</td> <td>2m</td> </tr> <tr> <td>10M</td> <td>10m</td> </tr> <tr> <td>15</td> <td>ø1.5mm</td> </tr> <tr> <td>2</td> <td>ø2mm(M2)</td> </tr> <tr> <td>3</td> <td>ø3mm(M3)</td> </tr> <tr> <td>4</td> <td>ø4mm(M4)</td> </tr> <tr> <td>6</td> <td>ø6mm(M6)</td> </tr> <tr> <td>No mark</td> <td>Standard type(bolt type)</td> </tr> <tr> <td>P</td> <td>Plastic type</td> </tr> <tr> <td>S</td> <td>SUS type(SUS length 90mm)</td> </tr> <tr> <td>S1</td> <td>SUS type(SUS length 35mm)</td> </tr> <tr> <td>S2</td> <td>SUS type(SUS length 45mm)</td> </tr> <tr> <td>C</td> <td>Cylinder type</td> </tr> <tr> <td>CS</td> <td>Cylinder+SUS type(SUS length 15mm)</td> </tr> <tr> <td>H</td> <td>Fire cable protection tube</td> </tr> <tr> <td>LU</td> <td>L type/Top view(Height 12.2mm)</td> </tr> <tr> <td>LU1</td> <td>L type/Top view(Height 17.2mm)</td> </tr> <tr> <td>LU2</td> <td>L type/Top view(Height 22.2mm)</td> </tr> <tr> <td>F</td> <td>Flat type/Flat view</td> </tr> <tr> <td>FN</td> <td>Flat type/Side view</td> </tr> <tr> <td>FU</td> <td>Flat type/Top view(Up)</td> </tr> <tr> <td>FB</td> <td>Flat type/Side view+Top view(Bending)</td> </tr> <tr> <td>T</td> <td>Through-beam type</td> </tr> <tr> <td>D</td> <td>Diffuse reflective type</td> </tr> <tr> <td>L</td> <td>Convergent reflective type</td> </tr> <tr> <td>F</td> <td>Plastic Fiber cable</td> </tr> <tr> <td>G</td> <td>Glass Fiber cable</td> </tr> </table> </div> </div>										S	Small hood	No mark	Standard type(-40 to 70°C)	H	Heat-resistance(-40 to 105°C)	H1	Heat-resistance(-40 to 150°C)	H2	Heat-resistance(-40 to 250°C)	R	Flexible type(R1)	B	Break-resistant type(R5)	05	ø0.5mm	06	ø0.6mm	10	ø1.0mm	13	ø1.3mm	14	ø1.4mm	15	ø1.5mm	20	ø2.0mm	F	ø0.5mm, ø0.25mm×4(coaxial type)	F1	ø0.5mm, ø0.25mm×9(coaxial type)	F2	ø1.0mm, ø0.265mm× 16(coaxial type)	05	0.5m	10	1m	20	2m	10M	10m	15	ø1.5mm	2	ø2mm(M2)	3	ø3mm(M3)	4	ø4mm(M4)	6	ø6mm(M6)	No mark	Standard type(bolt type)	P	Plastic type	S	SUS type(SUS length 90mm)	S1	SUS type(SUS length 35mm)	S2	SUS type(SUS length 45mm)	C	Cylinder type	CS	Cylinder+SUS type(SUS length 15mm)	H	Fire cable protection tube	LU	L type/Top view(Height 12.2mm)	LU1	L type/Top view(Height 17.2mm)	LU2	L type/Top view(Height 22.2mm)	F	Flat type/Flat view	FN	Flat type/Side view	FU	Flat type/Top view(Up)	FB	Flat type/Side view+Top view(Bending)	T	Through-beam type	D	Diffuse reflective type	L	Convergent reflective type	F	Plastic Fiber cable	G	Glass Fiber cable
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※Please refer to the 39 to 47 page(Fiber optic cable specification) for exact model name of fiber optic cable, or it might cause wrong model selection not existing in the above ordering information.

Photo electric sensor

Fiber optic sensor

Door/Area sensor

Proximity sensor

Pressure sensor

Rotary encoder

Connector/Socket

Temp. controller

SSR/ Power controller

Counter

Timer

Panel meter

Tacho/ Speed/ Pulse meter

Display unit

Sensor controller

Switching mode power supply


Stepper motor& Driver&Controller

Graphic/ Logic panel

Field network device

## Dual digital display type fiber optic amplifiers [BF5 Series]

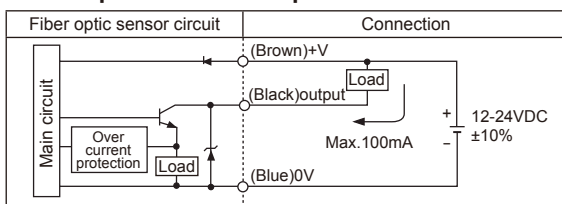
### Specifications

Display type	Dual Display type			Single Display type
Model	NPN open collector output PNP open collector output	<b>BF5R-D1-N</b> <b>BF5R-D1-P</b>	<b>BF5G-D1-N</b> <b>BF5G-D1-P</b>	<b>BF5B-D1-N</b> <b>BF5B-D1-P</b>
Appearances	<div style="display: flex; align-items: center;"> <div style="margin-right: 20px;"> <p><b>Line-up</b> PNP output model</p> <p>CE</p> </div>  </div>			
Light source	Red LED (660nm, modulated)	Green LED (530nm, modulated)	Blue LED (470nm, modulated)	Red LED (660nm, modulated)
Power supply	12-24VDC±10%			
Current consumption	Max. 50mA			
Operation mode	Light ON / Dark ON Selectable			
Control output	NPN or PNP open collector • Load voltage: Max. 24VDC • Load current: Max. 100mA • Residual voltage - NPN:Max. 1V, PNP:Max. 3V			
Protection circuit	Reverse polarity protection, overcurrent protection, surge absorption			
Response time	Ultra Fast: 50µs(only for dual display type), Fast: 150µs, STD: 500µs, Long: 4ms			
Display method	<ul style="list-style-type: none"> <li>Incident light level: Red, 4digit, 7Segment</li> <li>SV: Green, 4digit, 7Segment</li> <li>Main output indicator: Red LED</li> </ul>			<ul style="list-style-type: none"> <li>Incident light level / SV: Red, 4digit, 7Segment</li> <li>Main output indicator: Red LED</li> </ul>
Display function	Incident light level / SV display [4,000/10,000 resolution], Percentage display, High/Low peak value display, Normal / Reversed display (only for dual display type)			
Sensitivity setting	Manual sensitivity setting, teaching sensitivity setting (Auto tuning, 1 point, 2 point teaching, positioning teaching)			Manual sensitivity setting, teaching sensitivity setting (auto tuning)
Mutual interference prevention	Max. 8 unit sets (Automatically set regardless of response time)			
Initializing	Initializing to factory mode			—
Energy saving	Normal / Energy saving 1 / Energy saving 2			—
Timer	OFF, OFF Delay, ON Delay, One-shot			OFF, 10ms OFF Delay timer, 40ms OFF Delay timer
Insulation resistance	Min. 20MΩ(at 500VDC megger)			
Dielectric strength	1,000VAC 50/60Hz for 1 min.			
Vibration	1.5mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each X, Y, Z directions for 2 hours			
Shock	500m/s <sup>2</sup> (approx. 50G) in each X, Y, Z directions for 3 times			
Environment	Ambient illumination	Incandescent lamp: Max. 3000lx Sunlight: Max. 11000lx (received illumination)		
	Ambient temperature	-10 to 50°C, storage: -20 to 70°C		
	Ambient humidity	35 to 85%RH, storage: 35 to 85%RH		
Protection	IP40(IEC standards)			
Material	Case: PBT, Cover: PC			
Fiber cable tightening torque	Min. 2kgf			
Accessory	Connector type wire(Ø4mm, 3-wire, length: 2m) (AWG22, Core diameter: 0.08mm, Number of cores: 60, Insulator out diameter: Ø1.25mm), Side connector			
Approval	CE			
Unit weight	Approx. 20g			

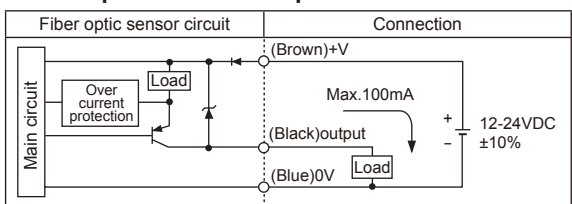
※The temperature or humidity mentioned in Environment indicates a non freezing or condensation environment.

### Control output diagram

#### • NPN open collector output



#### • PNP open collector output

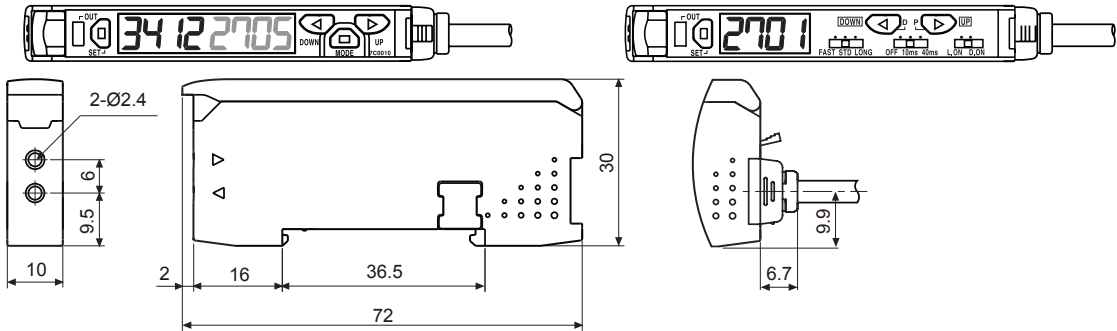


## ■ Dimensions

● BF5□-D1-□

● BF5R-S1-□

(unit: mm)



## Digital fiber optic amplifier communication converter [BFC Series]

### ■ Specifications

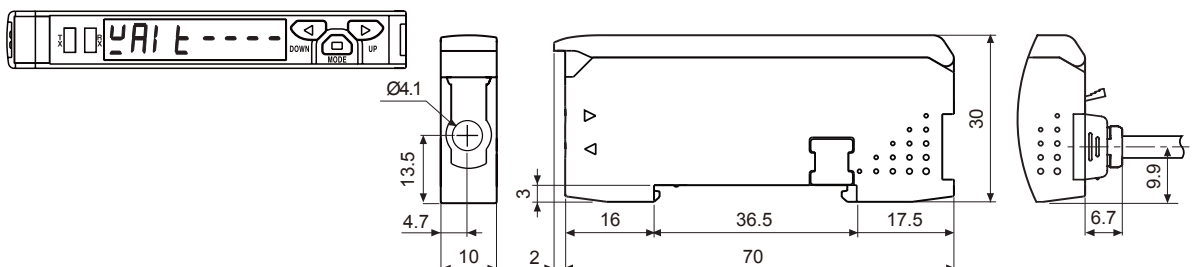
Model	NPN Solid-state input BFC-N	PNP Solid-state input BFC-P
Appearances		
Power supply <sup>※1</sup>	12-24VDC ±10%	
Current consumption	Max. 40mA	
SW input (SW1, SW2)	LOW: 0-1V, HIGH: 5-24V SW1/SW2 - HH: Standby, HL: BANK0, LH: BANK1, LL: BANK2	SW1/SW2 - LL: Standby, LH: BANK0, HL: BANK1, HH: BANK2
Communication function	RS485 communication, serial communication, SW input	
Communication speed	1200, 2400, 4800, 9600, 19200, 38400bps	
Indication	<ul style="list-style-type: none"> <li>Parameter: Red 4digit 7 Segment</li> <li>Set value: Green 4digit 7 Segment</li> <li>Indicator: TX indicator(red), RX indicator(green)</li> </ul>	
Function	<ul style="list-style-type: none"> <li>Real-time monitoring (incident light level, on/off state)</li> <li>Executes every BF5 feature and sets parameter by external device(PC, PLC)</li> </ul>	
Environment	Ambient temperature: -10 to 50°C, storage: -20 to 60°C Ambient humidity: 35 to 85%RH, storage: 35 to 85%RH	
Vibration	1.5 mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 2 hours	
Shock	500m/s <sup>2</sup> (approx. 50G) in each of X, Y, Z directions for 3 times	
Protection	IP40(IEC standard)	
Material	Case: PBT, Cover: PC	
Accessory	Connector type wire(ø4mm, 3-wire, length: 2m) (AWG 22, Core diameter: 0.08mm, Number of cores: 60, Insulator out diameter: ø1.25mm), Side connector	
Approval		
Unit weight	Approx. 15g	

※1: Powered by supply voltage of the amplifier unit connected by a side connector.

※Environment resistance is rated at no freezing or condensation.

## ■ Dimensions


(unit: mm)



- Photo electric sensor
- Fiber optic sensor
- Door/Area sensor
- Proximity sensor
- Pressure sensor
- Rotary encoder
- Connector/Socket
- Temp. controller
- SSR/ Power controller
- Counter
- Timer
- Panel meter
- Tacho/ Speed/ Pulse meter
- Display unit
- Sensor controller
- Switching mode power supply
- Stepper motor& Driver&Controller
- Graphic/ Logic panel
- Field network device

## High reliability of fiber optic amplifier for convenient mounting [BF4 Series]

### ■ Specifications

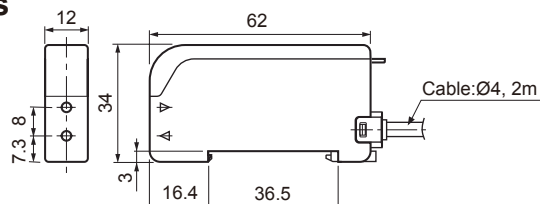
Model	Standard type				External synchronization input type		Remote sensitivity setting type	
	BF4RP	BF4GP	BF4R	BF4G	BF4R-E	BF4G-E	BF4R-R	BF4G-R
Appearances								
Response frequency	Max. 0.5ms(Frequency 1), Max. 0.7ms(Frequency 2)							
Power supply	12-24VDC ±10%(Ripple P-P: Max.10%)							
Current consumption	Max. 45mA							
Light source (modulated light)	Red	Green	Red	Green	Red	Green	Red	Green
Sensitivity adjustment	Sensitivity adjustment button(ON/OFF)							
Operation mode	Automatic selection of Light ON/Dark ON accordance with button setting							
Control output	NPN or PNP open collector output • Load voltage: Max. 30VDC • Load current: Max. 100mA • Residual voltage - NPN: Max. 1V(load current: 100mA), Max. 0.4V(load current:16mA) / PNP: Max. 2.5V							
Self-diagnosis output	ON state under unstable sensing(When the target stays for 300ms in unstable area), ON state when control output short-circuited • Load voltage: Max. 30VDC • Load current: Max. 50mA • Residual voltage - NPN: Max. 1V(load current: 50mA), Max. 0.4V(load current:16mA) / PNP: Max. 2.5V							
Protection circuit	Reverse power polarity, short-circuit(overcurrent) protection circuit							
Indication	Operation indicator: Red LED, Stability indicator: Green LED ON when the target stays in stable sensing level							
Input of stop transmission function	—				Built-in		—	
External synchronization function	—				Built-in(Gate/Trigger)		—	
Remote sensitivity setting function	—				—		Built-in	
Interference prevention function <sup>※1</sup>	Built-in differential frequency mode (set by frequency 1 or 2 by ON/OFF button)							
Timer function (selectable)	Built-in OFF delay timer, Approx. 40ms fixed				—		Built-in OFF delay timer, Approx. 40ms fixed	
Ambient illumination	Sunlight: Max. 11,000lx, Incandescent lamp: Max. 3,000lx (Receiver illumination)							
Noise resistance	±240V the square wave noise(pulse width: 1μs) by the noise simulator							
Dielectric strength	1,000VAC 50/60Hz for 1 minute							
Insulation resistance	Min. 20MΩ(at 500VDC megger)							
Vibration	1.5mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 2 hours							
Shock	500m/s <sup>2</sup> (approx. 50G) in each of X, Y, Z directions for 3 times							
Environment	Ambient illumination	Sunlight: Max. 11000lx, Incandescent lamp: Max. 3000lx (received illumination)						
	Ambient temperature	-10 to 50°C, storage: -20 to 70°C						
	Ambient humidity	35 to 85% RH, storage :35 to 85% RH						
Material	Case: Heat-resistance ABS, Cover: PC							
Cable	Ø4mm, 4-wire, Length: 2m (AWG22, Core diameter: 0.08mm, Number of cores: 60, Insulator out diameter: Ø1.25mm)				Ø4mm, 6-wire, Length: 2m (AWG24, Core diameter: 0.08mm, Number of cores: 40, Insulator out diameter: Ø1mm)			
Accessory	Mounting bracket, Bolts/nuts							
Approval	CE							
Unit weight	Approx. 65g							

※1: Frequency 1(Normal mode): Max. 0.5ms, Frequency 2: Max. 0.7ms

※The temperature or humidity mentioned in Environment indicates a non freezing or condensation environment.

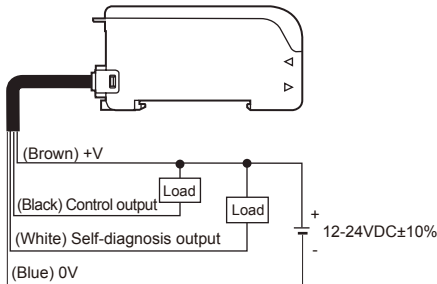
### ■ Dimensions

(unit: mm)

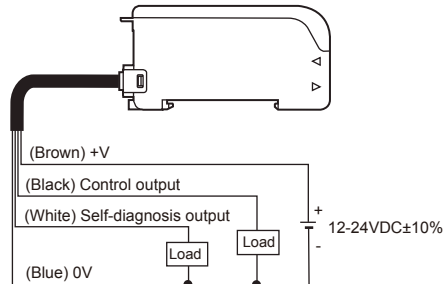


■ Connections

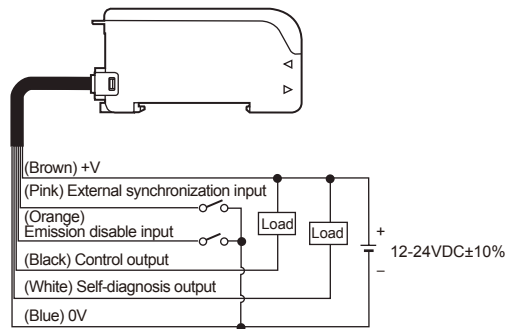
● BF4R / BF4G



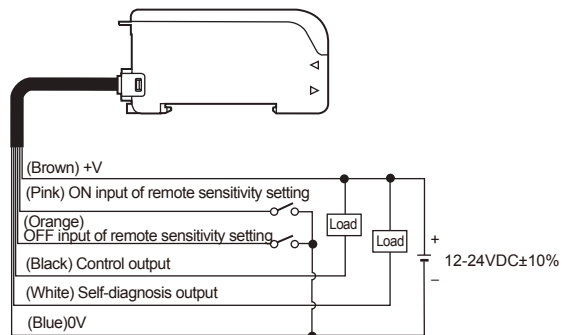
● BF4RP / BF4GP



● BF4R-E / BF4G-E



● BF4R-R / BF4G-R



High accuracy fiber optic amplifier with twin adjuster [BF3 Series]

■ Specifications

Model	BF3RX	BF3RX-P
Appearances		
Response time	Max. 1ms	
Power supply	12-24VDC ±10%(Ripple P-P: Max. 10%)	
Current consumption	Max. 40mA	
Light source	Red LED(Modulated)	
Sensitivity adjustment	Adjustable VR(Dual adjustment: Coarse adjustment, Fine adjustment)	
Operation mode	Selectable Light ON or Dark ON by control cable	
Control output	NPN or PNP open collector output • Load voltage: Max. 30VDC    • Load current: Max. 200mA, • Residual voltage - NPN: Max. 1V, PNP: Max. 2.5V	
Protection circuit	Reverse power polarity, output short-circuit protection circuit	
Indication	Operation indicator: Red LED	
Insulation resistance	Min. 20MΩ(at 500VDC megger)	
Noise resistance	±240V the square wave noise(pulse width: 1μs)by the noise simulator	
Dielectric strength	1,000VAC 50/60Hz for 1minute	
Vibration	1.5mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 2 hours	

- Photo electric sensor
- Fiber optic sensor
- Door/Area sensor
- Proximity sensor
- Pressure sensor
- Rotary encoder
- Connector/ Socket
- Temp. controller
- SSR/ Power controller
- Counter
- Timer
- Panel meter
- Tacho/ Speed/ Pulse meter
- Display unit
- Sensor controller
- Switching mode power supply
- Stepper motor& Driver&Controller
- Graphic/ Logic panel
- Field network device

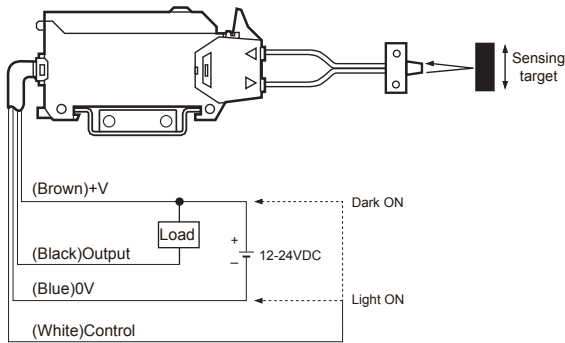
# Selection Guide

Model	<b>BF3RX</b>	<b>BF3RX-P</b>
Shock	500m/s <sup>2</sup> (approx. 50G) in each of X, Y, Z directions for 3 times	
Environment	Ambient illumination	Sunlight: Max. 11,000lx, Incandescent lamp: Max. 3,000lx (Receiver illumination)
	Ambient temperature	-10 to 50°C, storage: -25 to 70°C
	Ambient humidity	35 to 85%RH, storage: 35 to 85%RH
Material	Case: ABS, Cover: PC	
Cable	Ø5mm, 4-wire, Length: 2m (AWG24, Core diameter: 0.08mm, Number of cores: 40, Insulator out diameter: Ø1mm)	
Accessory	VR adjustment driver, Mounting bracket, Bolts/nuts	
Unit weight	Approx. 90g	

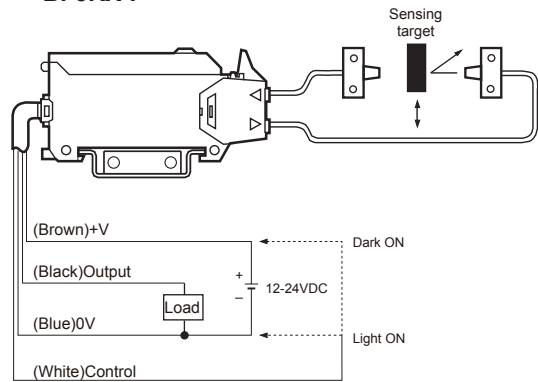
※The temperature or humidity mentioned in Environment indicates a non freezing or condensation environment.

## ■ Connections

### ● BF3RX



### ● BF3RX-P



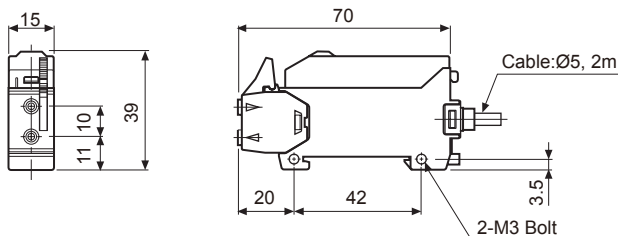
※Enables to use as diffuse reflective type or through-beam type according to the fiber optic cable.

※**Adapter** marked fiber optic cable should be used with adapter ( ).

※GT-420-13H2 cannot be used because the length inserted into amp is too short.

## ■ Dimensions

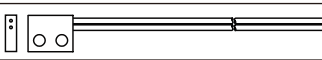
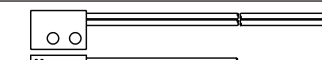
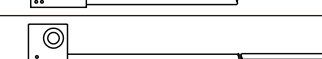
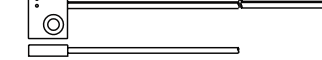
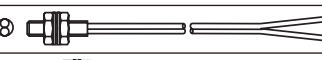
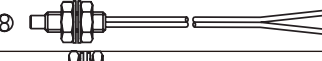
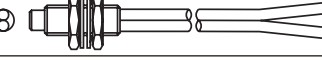

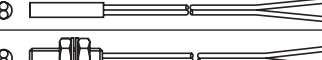
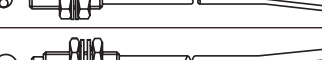



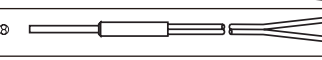






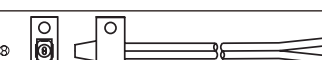
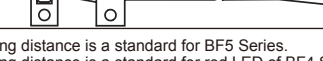
(unit: mm)



# Fiber Optic Cable

## Specifications (diffuse reflective type)

(based on Non-glossy white paper)

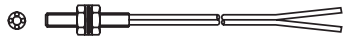
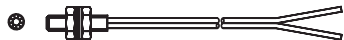
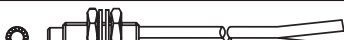
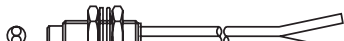
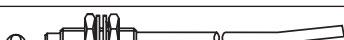

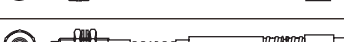
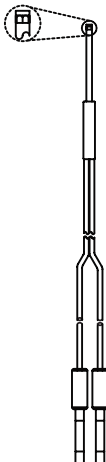
Type	Appearance	Feature	Model	Sensing distance (mm)	Min. sensing target <sup>※3</sup>	Allowable bend radius	Cable length(L) <sup>※4</sup>	Temp.	
Flexible type <sup>※5</sup>		Flat type /Top view	DFDU-210-05R	35 <sup>※1</sup>	Ø0.0125	R1	1m <b>Free cut</b>	-40 to 60°C	
		Flat type /Side view	DFDN-210-05R	30 <sup>※1</sup>					
		Flat type /Flat view	FDF-210-05R						
		M3 Bolt	FD-320-05R	35 <sup>※1</sup>	Ø0.0125				
		M4 Bolt	FD-420-05R	130 <sup>※1</sup>					
		M6 Bolt	FD-620-10R						
Break-resistant type <sup>※5</sup>		M3 Bolt	FD-320-06B	35 <sup>※2</sup>	Ø0.0125	R5			
		Ø3 Cylinder type	FDC-320-06B						
		M4 Bolt	FD-420-06B						
		M6 Bolt	FD-620-13B	100 <sup>※2</sup>					
Standard type		M3 Bolt	FD-320-05	40 <sup>※2</sup>	Ø0.03	R15	2m <b>Free cut</b>		-40 to 70°C
		M4 Bolt	FD-420-05						
		Ø3 Cylinder type	FDC-320-05						
		Ø3 Cylinder type SUS type (90mm)	FDCS-320-05						
		M3 Bolt SUS type (90mm)	FDS-320-05						
		M3 Bolt SUS type (45mm)	FDS2-320-05						
		M4 Bolt SUS type (90mm)	FDS-420-05						
		M4 Bolt SUS type (45mm)	FDS2-420-05						
		M6 Bolt	FD-620-10	120 <sup>※2</sup>		R30			
		M6 Bolt SUS type (90mm)	FDS-620-10						
	M6 Bolt SUS type (45mm)	FDS2-620-10							
	Plastic	FDP-320-10	R30						

※1: The sensing distance is a standard for BF5 Series.  
 ※2: The sensing distance is a standard for red LED of BF4 Series and 10% of red LED is applied when it is green LED. It is applied to 40% of sensing distance for BF3RX.  
 ※3: Min. sensing target is a value measured opaque material in accurate output status and the sensing distance is different with the rated sensing distance ※2.  
 ※4: Fiber optic cable out of the rated length can be customizable.  
 ※5: • **Flexible optical fiber (Multi core):** A large number of ultra-fine cores are all surrounded by cladding. Easy to install the many places where are bending areas because the change of the intensity of radiation by bending is small.  
 • **Break-resistant optical fiber:** The fiber units contain a large number of independent fine fibers, ensuring a high degree of flexibility. It can be used for moving parts(robot hand) and it is not easily broken.  
 ※ **Free cut** The sensing distance can be shortened about max. 20% than the normal according to condition of the cable. [(FC-2) should be used for cutting fiber cable.]

Photo electric sensor
Fiber optic sensor
Door/Area sensor
Proximity sensor
Pressure sensor
Rotary encoder
Connector/ Socket
Temp. controller
SSR/ Power controller
Counter
Timer
Panel meter
Tacho/ Speed/ Pulse meter
Display unit
Sensor controller
Switching mode power supply
Stepper motor& Driver&Controller
Graphic/ Logic panel
Field network device

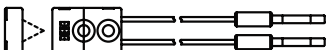
## ■ Specifications (diffuse reflective type)

(based on Non-glossy white paper)

Type	Appearance	Feature	Model	Sensing distance (mm)	Min. sensing target <sup>※3</sup>	Allowable bend radius	Cable length(L) <sup>※4</sup>	Temp.
Coaxial type		M3 Bolt	<b>FD-320-F</b>	40 <sup>※2</sup>	Ø0.03	R15	2m <b>Free cut</b>	-40 to 70°C
		M3 Bolt	<b>FD-320-F1</b>	60 <sup>※2</sup>				
		M6 Bolt	<b>FD-620-F2</b>	120 <sup>※2</sup>		R30		
Heat-resistant type		M6 Bolt	<b>FD-620-10H</b>			160 <sup>※2</sup>		R30
		M6 Bolt	<b>FD-620-15H1</b>	R50				-40 to 150°C
		M4 Bolt <b>Glass type</b>	<b>GD-420-20H2</b>	100 <sup>※2</sup>		R50		2m
		M4 Bolt <b>Glass type</b>	<b>GD-620-20H2</b>					
Side view	<b>Line-up</b> 	Ø3 Cylinder type	<b>FDCSN-320-05</b>	30 <sup>※1</sup>	Ø0.0125	R15	2m	-40 to 60°C

## ■ Specifications (convergent reflective type)

(based on Non-glossy white paper)

Type	Appearance	Feature	Model	Sensing distance (mm)	Min. sensing target <sup>※3</sup>	Allowable bend radius	Cable length(L) <sup>※4</sup>	Temp.
Convergent reflective type	<b>Line-up</b> 	Convergent reflective type	<b>FLF-320-10</b>	8 <sup>※1</sup>	Ø0.0125	R25	2m	-40 to 60°C

※1: The sensing distance is a standard for BF5 Series.

※2: The sensing distance is a standard for red LED of BF4 Series and 10% of red LED is applied when it is green LED. It is applied to 40% of sensing distance for BF3RX.

※3: Min. sensing target is a value measured opaque material in accurate output status and the sensing distance is different with the rated sensing distance ※2.

※4: Fiber optic cable out of the rated length can be customizable.

※ **Free cut** The sensing distance can be shortened about max. 20% than the normal according to condition of the cable. [(FC-2) should be used for cutting fiber cable.]

※ **Glass type** is for BF5R, BF4R Series.



## ■ Specifications (through-beam type)

(based on Non-glossy white paper)

Type	Appearance	Feature	Model	Sensing distance (mm)	Min. sensing target <sup>※3</sup>	Allowable bend radius	Cable length(L) <sup>※4</sup>	Temp.	
Flexible type <sup>※5</sup>	Line-up	Flat type /Top view	FTFU-210-05R	110 <sup>※1</sup>	Ø0.04	R1	1m <b>Free cut</b>	-40 to 60°C	
	Line-up	Flat type /Side view	FTFN-210-05R						
	Line-up	Flat type /Flat view	FTF-210-05R	100 <sup>※1</sup>					
	Line-up	Flat type /Top+Side view	FTFB-210-05R	110 <sup>※1</sup>					
	Line-up	Integrated bracket(L type) /Top view	FTLU-310-10R FTLU1-310-10R FTLU2-310-10R	500 <sup>※1</sup>					Ø0.06
	Line-up	M3 Bolt	FT-320-05R	110 <sup>※1</sup>					Ø0.3
	Line-up	Ø2 Cylinder type	FTC-220-05R						
	Line-up	M4 Bolt	FT-420-10R	500 <sup>※1</sup>					Ø0.5
	Break-resistant type <sup>※5</sup>	Line-up	M3 Bolt	FT-320-06B					110 <sup>※2</sup>
Line-up		Ø1.5 Cylinder type	FTC-1520-06B						
Line-up		M4 Bolt	FT-420-13B	400 <sup>※2</sup>	Ø0.6				

※1: The sensing distance is a standard for BF5 Series.

※2: The sensing distance is a standard for red LED of BF4 Series and 10% of red LED is applied when it is green LED. It is applied to 40% of sensing distance for BF3RX.

※3: Min. sensing target is a value measured opaque material in accurate output status and the sensing distance is different with the rated sensing distance ※2.

※4: Fiber optic cable out of the rated length can be customizable.

※5: ● **Flexible optical fiber (Multi core):** A large number of ultra-fine cores are all surrounded by cladding. Easy to install the many places where are bending areas because the change of the intensity of radiation by bending is small.

● **Break-resistant optical fiber:** The fiber units contain a large number of independent fine fibers, ensuring a high degree of flexibility. It can be used for moving parts(robot hand) and it is not easily broken.

※ **Free cut:** The sensing distance can be shortened about max. 20% than the normal according to condition of the cable. [(FC-2) should be used for cutting fiber cable.]

※FT-420-13 was discontinued. FT-420-13B is replacement.

Photo electric sensor

Fiber optic sensor

Door/Area sensor

Proximity sensor

Pressure sensor

Rotary encoder

Connector/Socket

Temp. controller

SSR/ Power controller

Counter

Timer

Panel meter

Tacho/ Speed/ Pulse meter

Display unit

Sensor controller

Switching mode power supply

Stepper motor & Driver&Controller

Graphic/ Logic panel

Field network device

## ■ Specifications (through-beam type)

(based on Non-glossy white paper)

Type	Appearance	Feature	Model	Sensing distance (mm)	Min. sensing target <sup>※3</sup>	Allowable bend radius	Cable length(L) <sup>※4</sup>	Temp.				
Standard type		M3 Bolt	<b>FT-320-05</b>	150 <sup>※2</sup>	Ø0.5	R15	2m	-40 to 70°C				
	<b>Line-up</b> 	Ø1.5 Cylinder type	<b>FTC-1520-05</b>									
		Ø2 Cylinder type	<b>FTC-220-05</b>									
		Ø2 Cylinder type SUS type(90mm)	<b>FTCS-220-05</b>									
		M3 Bolt SUS type(90mm)	<b>FTS-320-05</b>									
		M3 Bolt SUS type(35mm)	<b>FTS1-320-05</b>									
		M3 Bolt SUS type(45mm)	<b>FTS2-320-05</b>									
		M4 Bolt	<b>FT-420-10</b>						500 <sup>※2</sup>	Ø1	R30	<b>Free cut</b>
		Ø3 Cylinder type	<b>FTC-320-10</b>									
		Plastic	<b>FTP-320-10</b>									
	M4 Bolt SUS type(90mm)	<b>FTS-420-10</b>										
	M4 Bolt SUS type(45mm)	<b>FTS2-420-10</b>										
Heat-resistant type		M4 Bolt	<b>FT-420-10H</b>	300 <sup>※2</sup>	R30	2m	-40 to 105°C					
		M4 Bolt	<b>FT-420-15H1</b>	500 <sup>※2</sup>			R50	-40 to 150°C				
		M4 Bolt Glass type	<b>GT-420-13H2</b>	400 <sup>※2</sup>			R25	-40 to 250°C				
Side view	<b>Line-up</b> 	Ø2.47 Cylinder type	<b>FTCSN-2520-05</b>	120 <sup>※1</sup>	Ø0.0125	R15	2m	-40 to 60°C				

※1: The sensing distance is a standard for BF5 Series.

※2: The sensing distance is a standard for red LED of BF4 Series and 10% of red LED is applied when it is green LED. It is applied to 40% of sensing distance for BF3RX.

※3: Min. sensing target is a value measured opaque material in accurate output status and the sensing distance is different with the rated sensing distance ※2.

※4: Fiber optic cable out of the rated length can be customizable.

※ **Free cut**: The sensing distance can be shortened about max. 20% than the normal according to condition of the cable. [(FC-2) should be used for cutting fiber cable.]

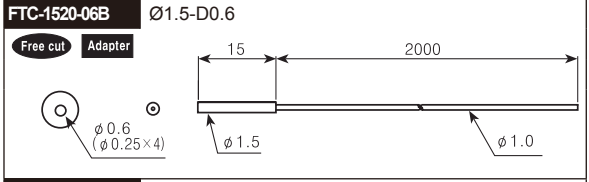
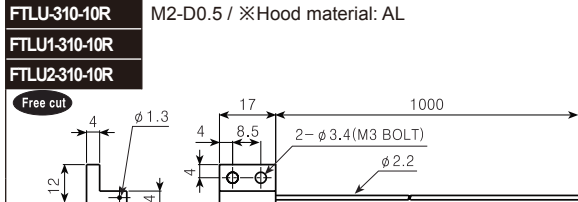
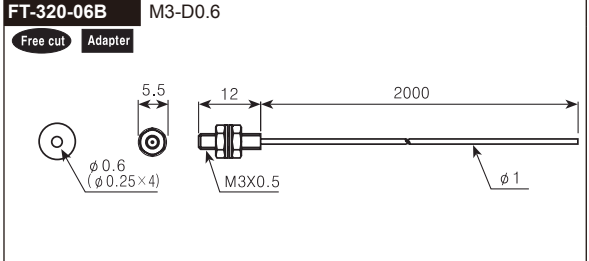
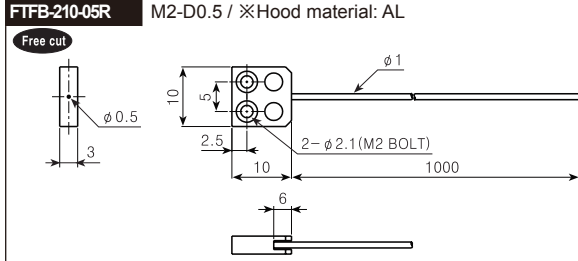
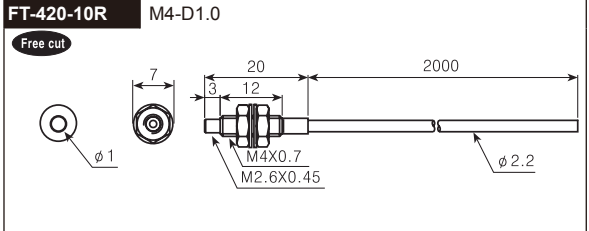
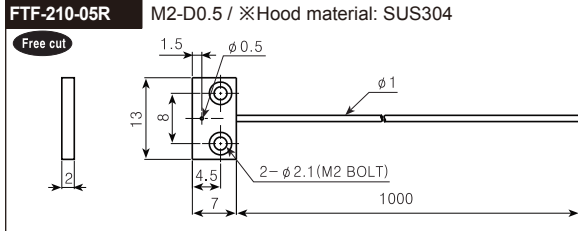
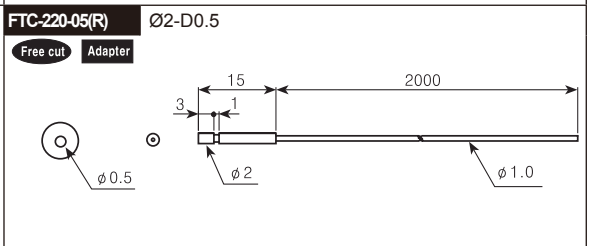
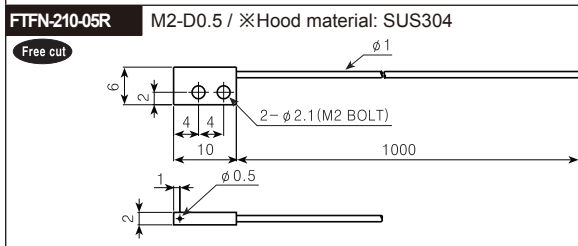
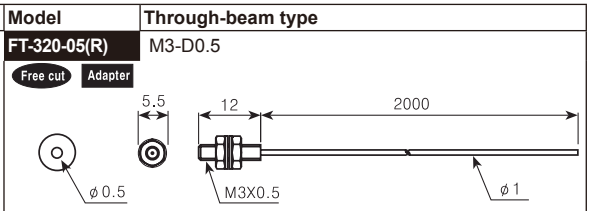
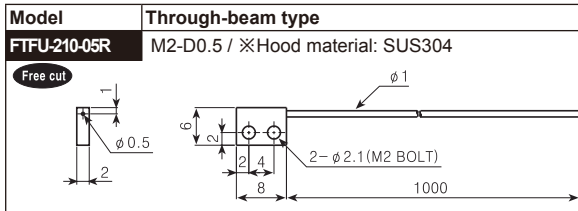
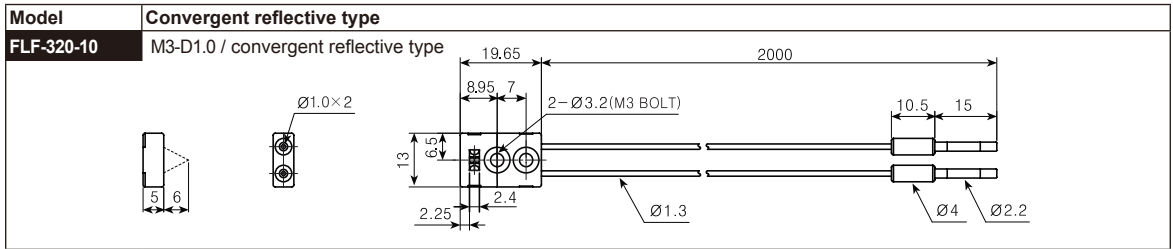
※ **Glass type** is for BF5R, BF4R Series.



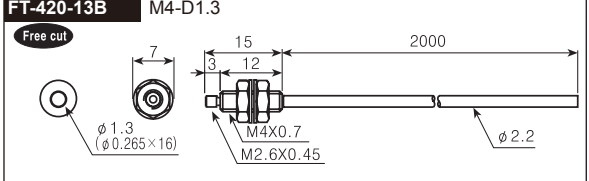
## ■ Dimensions

Model	Diffuse reflective type	Model	Diffuse reflective type
<b>FDS-420-05</b> Free cut Adapter	M4-D0.5 / SUS Ø1.5×90mm 	<b>FD-320-F1</b> Free cut Adapter	Co-axial M3 / Ø0.5, Ø0.25×9 
<b>FDS2-420-05</b> Free cut Adapter	M4-D0.5 / SUS Ø1.5×45mm 	<b>FD-620-F2</b> Free cut	Co-axial M6 / Ø1.0, Ø0.265×16 
<b>FDS-620-10</b> Free cut	M6-D1.0 / SUS Ø2.5×90mm 	<b>FD-620-10H</b> Free cut	M6-D1.0 / Heat-resistant 105°C 
<b>FDS2-620-10</b> Free cut	M6-D1.0 / SUS Ø2.5×45mm 	<b>FD-620-15H1</b> Free cut	M6-D1.5 / Heat-resistant 150°C 
<b>FDP-320-10</b> Free cut	D1.0×2 / Plastic 	<b>GD-420-20H2</b>	M4-D0.05×1000 / Heat-resistant 250°C 
<b>FD-320-F</b> Free cut Adapter	Co-axial M3 / Ø0.5, Ø0.25×4 	<b>GD-620-20H2</b>	M6-D0.05×1000 / Heat-resistant 250°C 
<b>FDCSN-320-05</b>	Ø3 / SUS Ø1.47×20 / Side view 		

## ■ Dimensions



Model	L1	L2
FTLU-310-10R	12.2	10
FTLU1-310-10R	17.2	15
FTLU2-310-10R	22.2	20



- Photo electric sensor
- Fiber optic sensor
- Door/Area sensor
- Proximity sensor
- Pressure sensor
- Rotary encoder
- Connector/Socket
- Temp. controller
- SSR/ Power controller
- Counter
- Timer
- Panel meter
- Tacho/ Speed/ Pulse meter
- Display unit
- Sensor controller
- Switching mode power supply
- Stepper motor & Driver&Controller
- Graphic/ Logic panel
- Field network device

## ■ Dimensions

Model	Through-beam type	Model	Through-beam type
<b>FTC-1520-05</b> Free cut Adapter	Ø1.5-D0.5 	<b>FTP-320-10</b> Free cut	D1.0 / Plastic 
<b>FTCS-220-05</b> Free cut Adapter	Ø2-D0.5 / SUS Ø1.0×15mm 	<b>FTS-420-10</b> Free cut	M4-D1.0 / SUS Ø1.5×90m 
<b>FTS-320-05</b> Free cut Adapter	M3-D0.5 / SUS Ø1.0×90mm 	<b>FTS2-420-10</b> Free cut	M4-D1.0 / SUS Ø1.5×45m 
<b>FTS1-320-05</b> Free cut Adapter	M3-D0.5 / SUS Ø1.0×35mm 	<b>FT-420-10H</b> Free cut	M4-D1.0 / Heat-resistant 105°C 
<b>FTS2-320-05</b> Free cut Adapter	M3-D0.5 / SUS Ø1.0×45mm 	<b>FT-420-15H1</b> Free cut	M4-D1.0 / Heat-resistant 150°C 
<b>FT-420-10</b> Free cut	M4-D1.0 	<b>GT-420-13H2</b>	M4-D1.3 / Heat-resistant Max. 250°C / Glass 
<b>FTC-320-10</b> Free cut	Ø3-D1.0 	<b>FTCSN-2520-05</b>	Ø2.47-D0.5 / SUS Ø0.8×15mm / Side view 

■ Lens unit for long distance detection(sold separately)

◎ Model: FTL-M26



◎ Mounting of lens

Mount the lens unit on the 3mm projecting point of the front hood.

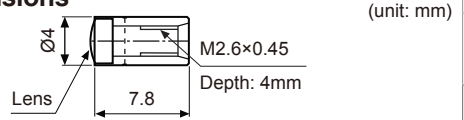
◎ Ambient temperature range of lens unit

It should be used within -40 to 100°C.(not over 100°C.)

◎ Applicable fiber optic cable and max. mounting distance

- FT-420-10: 2500mm
- FT-420-10H: 1500mm

◎ Dimensions

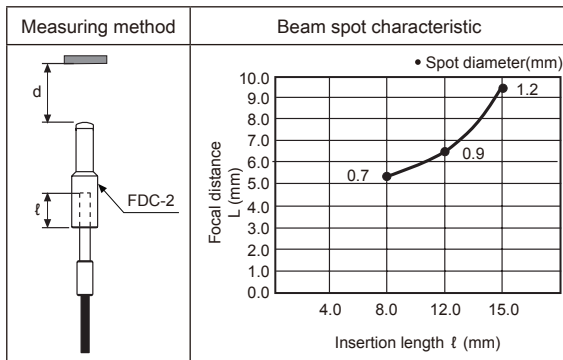


■ Micro spot fiber optic cable and lens unit(sold separately)

◎ Model

- Fiber optic cable: FDC-320-F
- Micro spot lens: FDC-2

◎ Feature data

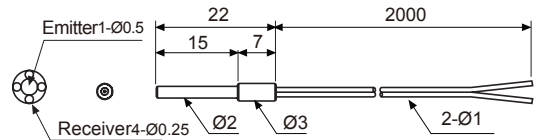


◎ Ambient temperature range of lens unit

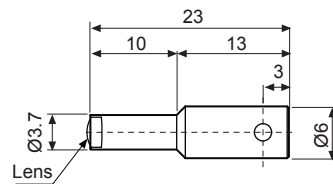
It should be used within -40 to 100°C. (not over 100°C.)

◎ Dimensions

• FDC-320-F



• FDC-2



■ Protection tube for fiber optic cable (sold separately)

◎ Application

• Protect cable from impact or cutting (unit:mm)

Model	Appearance and Dimension
FTH-310	
FTH-410	
FDH-610	

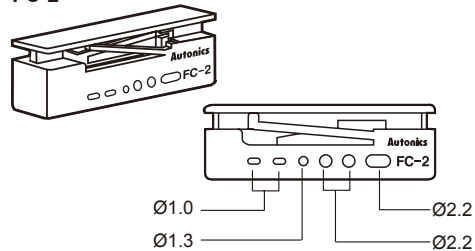
- ※500mm of protection tube can be customized.
- ※Additional 8mm is for tube coupling.

■ Accessory

◎ Fiber cutter

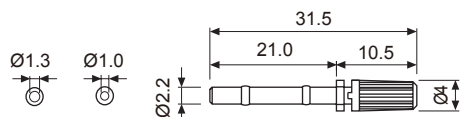
Applications: Cutting fiber optic cable, free cut type

• FC-2



◎ Adapter

Adapter : Adapter marked fiber optic cable should be used with adapter (unit: mm)



- ※The inside diameter Ø1.0(Standard and black)
- ※The inside diameter Ø1.3(Only applied to the receiver of FD-320-F1 and dark gray.)

Photo electric sensor

Fiber optic sensor

Door/Area sensor

Proximity sensor

Pressure sensor

Rotary encoder

Connector/Socket

Temp. controller

SSR/ Power controller

Counter

Timer

Panel meter

Tacho/ Speed/ Pulse meter

Display unit

Sensor controller

Switching mode power supply


Stepper motor & Driver&Controller

Graphic/ Logic panel

Field network device

## Auto door sensor [ADS-AF/AE]

### ■ Specifications

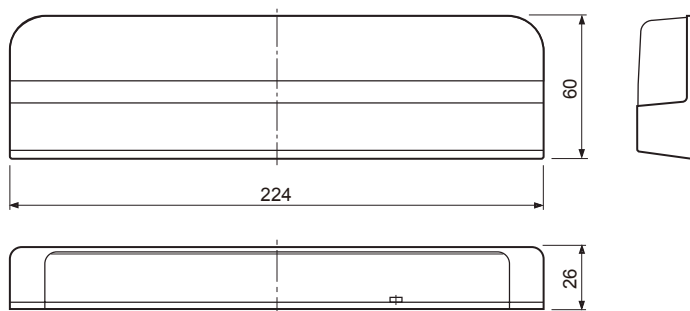
Model		ADS-AF	ADS-AE
Appearances			
Cover color		Silver	
Power supply		24-240VAC ±10% 50/60Hz, 24-240VDC ±10%(ripple P-P: Max. 10%)	12-24VAC ±10% 50/60Hz, 12-24VDC ±10%(ripple P-P: Max. 10%)
Power consumption		Max. 4VA(at 240VAC)	Max. 2VA(at 24VAC)
Control output	Contact type	1a	
	Contact capacity <sup>※1</sup>	50VDC 0.1A(Resistive load)	
Relay life cycle		Mechanical: Min. 20,000,000 times, Electrical: Min. 50,000 times	
Mounting height		2.0m to 2.7m(max. sensing distance: 3m)	
Sensing method		Infrared reflection method	
Output holding time		Time delay approx. 0.5sec.	
Holding time of stationary sensing		Selectable 2sec., 7sec., 15sec. (selectable by holding time setting switch)	
Interference prevention		H, L (selectable by interference prevention switch)	
Front sensing area		7.5°, 14.5°, 21.5°, 28.5°: 4 steps variable (adjusting by angle adjuster)	
Adjustable sensing area		(1, 2, 3 Area), (7, 8, 9 Area) Eliminate each by each : Adjusting with eliminating right/left sensing area lever	
Light source		Infrared emitting diode(modulated)	
Indicator		Operation indicator: Orange, Green, Red	
Connection method		Connector wire connection	
Insulation resistance		Min. 20MΩ(at 500VDC megger)	
Noise resistance		±2,000V the square wave noise(pulse width:1μs) by the noise simulator	
Dielectric strength		1,000VAC 50/60Hz for 1 minute	
Vibration		1.5mm amplitude at frequency of 10 to 55Hz in each of X, Y, Z directions for 2 hours	
Shock		100m/s <sup>2</sup> (approx. 10G) in each of X, Y, Z directions for 3 times	
Environment	Ambient illumination	Sunlight: Max. 3,000lx, Incandescent lamp: Max. 3,000lx (receiver illumination)	
	Ambient temperature	-20°C to 50°C, storage: -20 to 70°C	
	Ambient humidity	35 to 85%RH, storage: 35 to 85%RH	
Accessory		Cable: 2.5m, Mounting screw: 2EA, Mounting template	
Protection		IP50(IEC standard)	
Material		• Case: ABS • Lens: Acryl • Lens cover: Acryl	
Unit weight		Approx. 320g	

※1: Do not use Load which is beyond the rated capacity of contact point of Relay.

It can cause bad insulation, contact fusion, bad contact, relay breakdown, and fire etc.

※The temperature or humidity mentioned in Environment indicates a non freezing or condensation environment.

### ■ Dimensions




(unit:mm)



# Door side sensor [ADS-SE]

## Specifications

Model	ADS-SE	
Appearances		
Sensing type	Through-beam type	
Sensing distance	0 to 10m	
Power supply	12-24VAC/DC ±10%(ripple P-P: Max. 10%)	
Power/Current consumption	AC: Max. 2VA / DC: Max. 50mA	
Contact output ※1	<ul style="list-style-type: none"> <li>• Contact capacity: 50VDC 0.3A(resistive load)</li> <li>• Contact composition: 1c</li> <li>• Relay life cycle: Mechanical- Min. 5,000,000 operations, Electrical- Min. 100,000 operations</li> </ul>	
Response time	Approx. 50ms(from light OFF)	
Output holding time	Approx. 500ms(from light ON)	
Available sensor set	2set	
Indicator	Operation indicator: Red, Green	
Light source	Infrared LED(850nm modulated)	
Environment	Ambient illumination	Sunlight: Max. 100,000lx (receiver illumination)
	Ambient temperature	-20 to 55°C, storage: -25 to 60°C
	Ambient humidity	35 to 85%RH, storage: 35 to 85%RH
Protection	IP30(IEC standard)	
Sensor cable length	10m	
Material	• Case: ABS • Sensing part: PMMA	
Accessory	Sensor: 1 set(ADS-SH), Fixing bolt for controller: 2 pieces	
Unit weight	Approx. 300g	

※1: Do not use Load which is beyond the rated capacity of contact point of Relay.

It can cause bad insulation, contact fusion, bad contact, relay breakdown, and fire etc.

※Please purchase 1 set of sensor separately when mounting 2 sets of sensor.

※The mounting bracket of sensor (ADS-SB12, ADS-SB10) is sold separately.

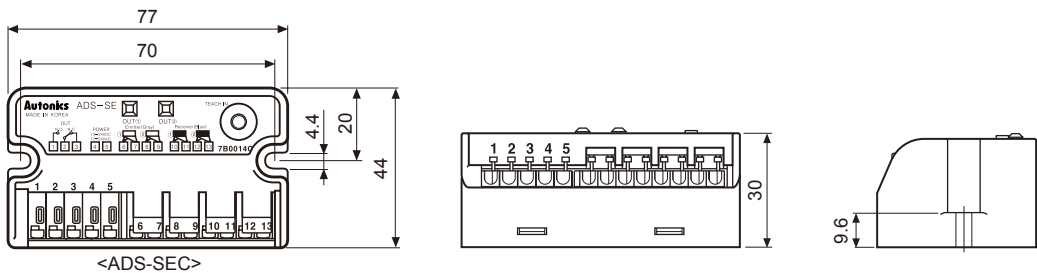
※It is enable to purchase a controller (ADS-SEC) separately.

※The temperature or humidity mentioned in Environment indicates a non freezing or condensation environment.

## Dimensions

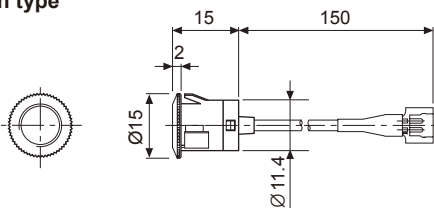
(unit: mm)

### Controller (ADS-SEC)

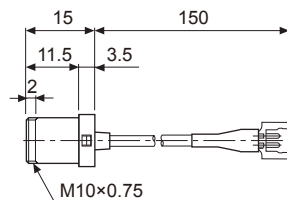


### Sensors (ADS-SH)

#### One push type




#### Screw type



- Photo electric sensor
- Fiber optic sensor
- Door/Area sensor**
- Proximity sensor
- Pressure sensor
- Rotary encoder
- Connector/Socket
- Temp. controller
- SSR/Power controller
- Counter
- Timer
- Panel meter
- Tacho/Speed/ Pulse meter
- Display unit
- Sensor controller
- Switching mode power supply
- Stepper motor& Driver&Controller
- Graphic/ Logic panel
- Field network device

## Door side sensor [ADS-SE1/2]

### Specifications

Model	ADS-SE1(1-channel)	ADS-SE2(2-channel)
Appearances		
Sensing type	Through-beam type	
Sensing distance	0 to 10m	
Power supply	12-24VAC ±10% 50/60Hz / 12-24VDC ±10%(ripple P-P: Max. 10% )	
Power consumption/Current	AC: Max. 2VA, DC: Max. 50mA	
Control output <sup>※1</sup>	<ul style="list-style-type: none"> <li>• Contact capacity: 50VDC 0.3A(resistive load)</li> <li>• Contact composition: 1c</li> <li>• Relay life cycle: Mechanical- Min. 5,000,000 operations, Electrical- Min. 100,000 operations</li> </ul>	
Response time	Approx. 50ms (from light OFF)	
Output holding time	Approx. 500ms (from light ON)	
Available sensor set	1 channel	2 channels
Indicator	OUT1 indicator: red, OUT2 indicator: green	
Light source	Infrared LED(850nm modulated)	
Vibration	1.5mm amplitude at frequency of 10 to 55Hz (for 1min.) in each of X, Y, Z directions for 2 hours	
Shock	500m/s <sup>2</sup> (approx. 50G) in each of X, Y, Z directions for 3 times	
Environment	Ambient illumination	Sunlight: Max. 100,000lx (receiver illumination)
	Ambient temperature	-20 to 55°C, storage: -25 to 60°C
	Ambient humidity	35 to 85% RH, storage: 35 to 85% RH
Protection	IP30(IEC standard)	
Sensor cable length	5m	
Cable	Ø2.4mm, 1-wire, length: 5m(AWG26, core diameter: 0.16mm, number of cores: 7, insulator out diameter: Ø1.32mm)	
Material	• Case: ABS • Lens: PMMA	
Accessory	Sensor 1set(ADS-SHP), Fixing bolt (M4×20) for controller: 2EA	
Approval	CE	
Unit <sup>※2</sup>	Approx. 450g (approx. 300g)	

※1: Do not use Load which is beyond the rated capacity of contact point of Relay.

It can cause bad insulation, contact fusion, bad contact, relay breakdown, and fire etc.

※2: The weight is with packaging and the weight in parentheses is only unit weight.

※Please purchase 1 set of sensor separately when mounting 2 sets of sensor.

※The mounting bracket of sensor (ADS-SB12, ADS-SB10) is sold separately.

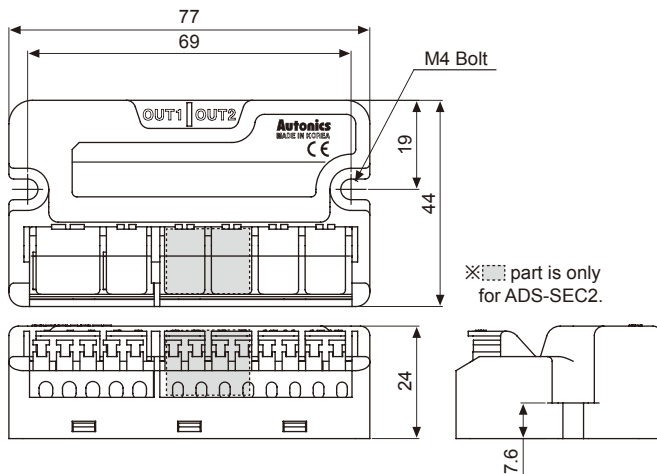
※It is enable to purchase a controller (ADS-SEC1/2) separately.

※The temperature or humidity mentioned in Environment indicates a non freezing or condensation environment.

### Dimensions

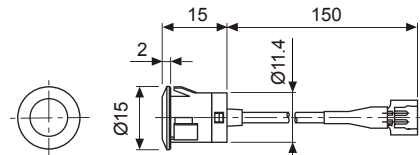
(unit:mm)

#### Controller(ADS-SEC1/2)

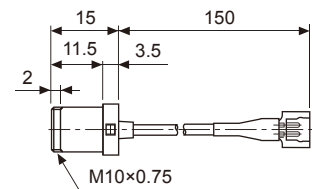


#### Sensor(ADS-SHP)

##### • One push method




##### • Screw method



## Cross-beam Area Sensor [BWC Series]

### ■ Specifications

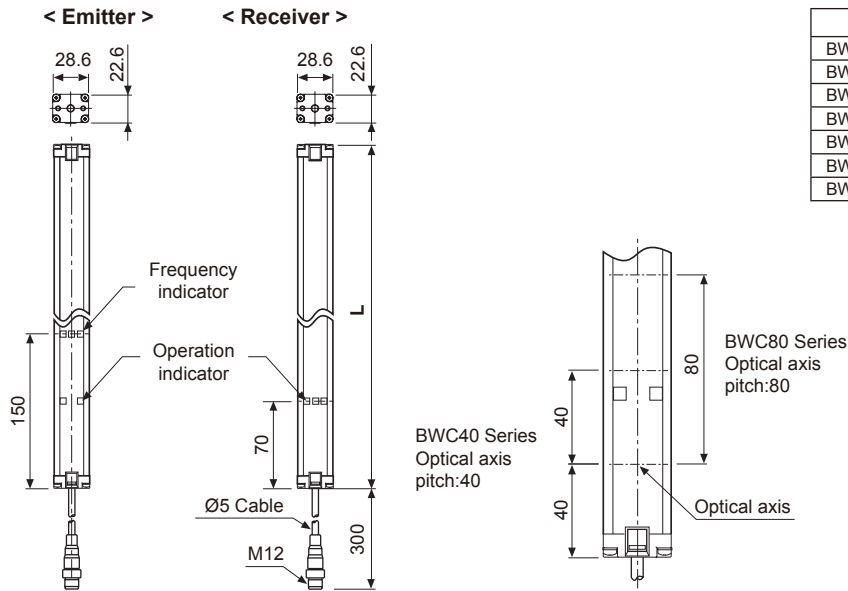
Model	BWC40-□□□H	BWC40-□□□HD	BWC80-14H	BWC80-14HD	
Appearances					
Sensing type	Through-beam type				
Sensing distance	1.0 to 7.0m				
Sensing target	Opaque material of min. Ø50mm		Opaque material of min. Ø90mm		
Optical axis pitch	40mm		80mm		
Number of optical axes	4/10/12/16/18/20EA		14EA		
Sensing height	120 to 760mm		1,040mm		
Beam pattern	3-point cross-beam netting type				
Power supply	12-24VDC ±10%(ripple P-P: max. 10%)				
Reverse polarity protection	Built-in				
Current consumption	Max. 100mA				
Control output	NPN open collector output •Load voltage: max. 30VDC, •Load current: Max. 100mA, •Residual voltage: Max. 1V				
Control output	Operation mode	Light ON	Dark ON	Light ON	Dark ON
	Short-circuit protection	Built-in			
	Response	Max. 50ms			
Light source	Infrared LED(850nm modulated light type)				
Synchronization type	Timing method by synchronous cable				
Self-diagnosis	Transmitted-received light monitoring, direct light monitoring, output circuit monitoring				
Interference protection	Interference protection by frequency changing setting				
Environment	Ambient illumination	Ambient light: Max. 100,000lx (received light side illumination)			
	Ambient temperature	-10 to 55°C, storage: -20 to 60°C			
	Ambient humidity	35 to 85%RH, storage: 35 to 85%RH			
Protection	IP65(IEC standard)				
Noise resistance	±240V the square wave noise (pulse width: 1μs) by the noise simulation				
Dielectric strength	1,000VAC 50/60Hz for 1 min.				
Insulation resistance	Min. 20MΩ (at 500VDC megger)				
Vibration	1.5mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 2 hour				
Shock	500m/s <sup>2</sup> (approx. 50G) in each of X, Y, Z directions for 3 times				
Material	• Case: Aluminum • Sensing part and indicator: Acrylic				
Cable	Ø5mm, 4-core, length: 300mm, M12 connector				
Accessory	Bracket A: 4EA, Bracket B: 4EA, Fixing bolt: 8EA				
Approval	CE				
Unit weight	Approx. 1.7kg (based on BWC80-14H)				

※The temperature or humidity mentioned in Environment indicates a non freezing or condensation environment.

- Photo electric sensor
- Fiber optic sensor
- Door/Area sensor
- Proximity sensor
- Pressure sensor
- Rotary encoder
- Connector/Socket
- Temp. controller
- SSR/ Power controller
- Counter
- Timer
- Panel meter
- Tacho/ Speed/ Pulse meter
- Display unit
- Sensor controller
- Switching mode power supply
- Stepper motor & Driver&Controller
- Graphic/ Logic panel
- Field network device

## ■ Dimensions

(unit: mm)



Model	L(mm)
BWC40-04H/HD	180mm
BWC40-10H/HD	420mm
BWC40-12H/HD	500mm
BWC40-16H/HD	660mm
BWC40-18H/HD	740mm
BWC40-20H/HD	820mm
BWC80-14H/HD	1140mm

## Area sensor [BW Series]

### ■ Specifications

Model	NPN open collector output (standard)	BW20-08	BW20-20	BW20-32	BW20-44	BW40-04	BW40-10	BW40-16	BW40-22
		BW20-12	BW20-24	BW20-36	BW20-48	BW40-06	BW40-12	BW40-18	BW40-24
Model	PNP open collector output	BW20-08P	BW20-20P	BW20-32P	BW20-44P	BW40-04P	BW40-10P	BW40-16P	BW40-22P
		BW20-12P	BW20-24P	BW20-36P	BW20-48P	BW40-06P	BW40-12P	BW40-18P	BW40-24P
		BW20-16P	BW20-28P	BW20-40P		BW40-08P	BW40-14P	BW40-20P	
Appearances									
Sensing type	Through-beam								
Sensing distance	0.1 to 7m								
Sensing target	Opaque materials of Min.Ø30mm					Opaque materials of Min.Ø50mm			
Optical axis pitch	20mm					40mm			
Number of optical axis	8 to 48EA					4 to 24EA			
Sensing width	140 to 940mm					120 to 920mm			
Power supply	12-24VDC ±10%(ripple P-P: Max. 10%)								
Reverse polarity protection	Built-in								
Current consumption	Emitter: Max. 80mA, Receiver: Max. 80mA								
Control output	NPN or PNP open collector output • Load voltage: Max. 30VDC • Load current: Max. 100mA • Residual voltage - NPN: Max. 1V, PNP: Min. 2.5V								
Operation mode	Light ON (fixed)								
Short-circuit protection	Built-in								

# Area sensor [BW Series]

## Specifications

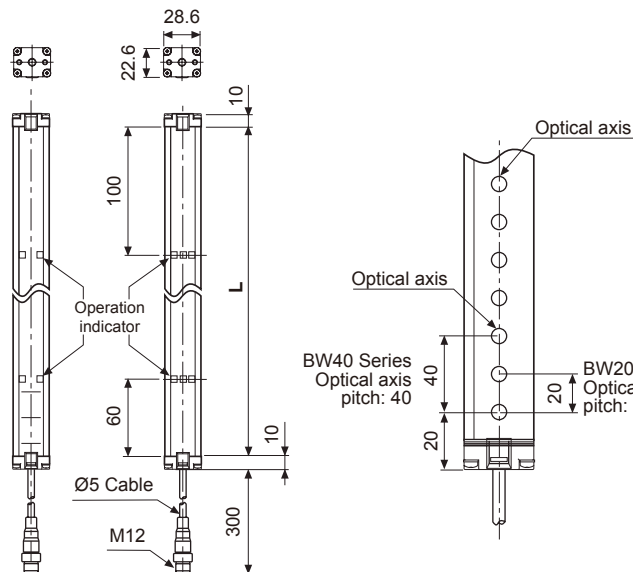
Model	NPN open collector output (standard)	BW20-08	BW20-20	BW20-32	BW20-44	BW40-04	BW40-10	BW40-16	BW40-22
		BW20-12	BW20-24	BW20-36	BW20-48	BW40-06	BW40-12	BW40-18	BW40-24
		BW20-16	BW20-28	BW20-40		BW40-08	BW40-14	BW40-20	
	PNP open collector output	BW20-08P	BW20-20P	BW20-32P	BW20-44P	BW40-04P	BW40-10P	BW40-16P	BW40-22P
		BW20-12P	BW20-24P	BW20-36P	BW20-48P	BW40-06P	BW40-12P	BW40-18P	BW40-24P
		BW20-16P	BW20-28P	BW20-40P		BW40-08P	BW40-14P	BW40-20P	
Response time		Max. 12ms							
Light source		Infrared LED(850nm modulated)							
Synchronization type		Synchronized by synchronous line							
Self-diagnosis		Ambient light monitoring, Emitter/Receiver light circuit monitoring, Output circuit monitoring							
Interference protection		Interference protection by master/slave function							
Environment	Ambient illumination	Sunlight: 10,000lx (received light side illumination)							
	Ambient temperature	-10 to 55°C, storage: -20 to 60°C							
	Ambient humidity	35 to 85%RH, storage: 35 to 85%RH							
Noise resistance		±240V the square wave noise (pulse width: 1μs) by the noise simulation							
Dielectric strength		1,000VAC 50/60Hz for 1minute							
Insulation resistance		Min. 20MΩ(at 500VDC megger)							
Vibration		1.5mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 2 hour							
Shock		500m/s <sup>2</sup> (approx. 50G) in X, Y, Z directions for 3 times							
Protection		IP65(IEC standard)							
Material		• Case: Aluminum • Cover, Sensing part: Acrylic							
Cable		Ø5mm, 4-core, length: 300mm, M12 connector							
Accessory		Bracket A: 4EA, Bracket B: 4EA, Fixing bolt: 8EA							
Approval		CE							
Unit weight		Approx. 1.4kg(for 48 optical axes)							

※The temperature or humidity mentioned in Environment indicates a non freezing or condensation environment.

## Dimensions

<Emitter>      <Receiver>

(unit: mm)




Model	L(mm)	Model	L(mm)
BW20-08(P)	160	BW20-32(P)	640
BW40-04(P)		BW40-16(P)	
BW20-12(P)	240	BW20-36(P)	720
BW40-06(P)		BW40-18(P)	
BW20-16(P)	320	BW20-40(P)	800
BW40-08(P)		BW40-20(P)	
BW20-20(P)	400	BW20-44(P)	880
BW40-10(P)		BW40-22(P)	
BW20-24(P)	480	BW20-48(P)	960
BW40-12(P)		BW40-24(P)	
BW20-28(P)	560		
BW40-14(P)			

- Photo electric sensor
- Fiber optic sensor
- Door/Area sensor
- Proximity sensor
- Pressure sensor
- Rotary encoder
- Connector/ Socket
- Temp. controller
- SSR/ Power controller
- Counter
- Timer
- Panel meter
- Tacho/ Speed/ Pulse meter
- Display unit
- Sensor controller
- Switching mode power supply
- Stepper motor & Driver&Controller
- Graphic/ Logic panel
- Field network device

## Area sensor with plastic case [BWP Series]

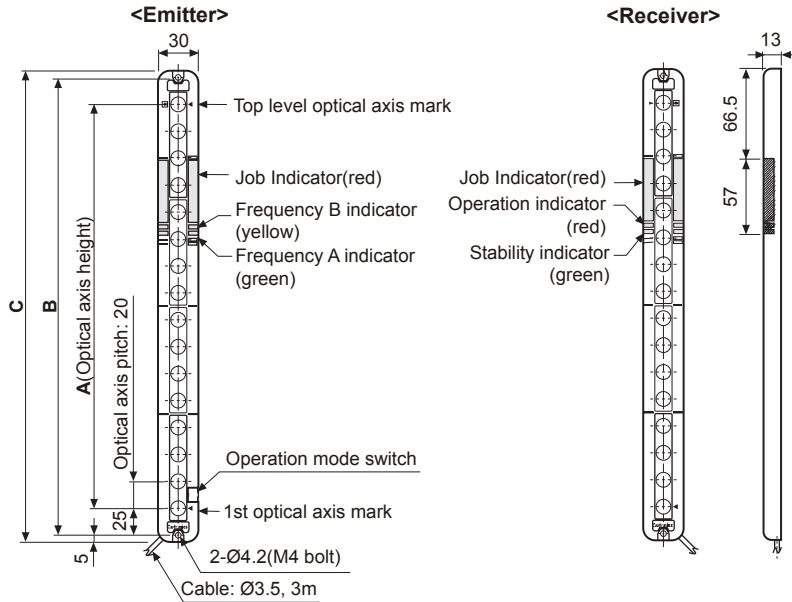
### ■ Specifications

Model	NPN open collector output	BWP20-08	BWP20-12	BWP20-16	BWP20-20
	PNP open collector output	BWP20-08P	BWP20-12P	BWP20-16P	BWP20-20P
Appearances					
Sensing type	Through-beam				
Sensing distance	0.1 to 5m				
Sensing target	Opaque materials of Min.Ø30mm				
Optical axis pitch	20mm				
Number of optical axis	8EA	12EA	16EA	20EA	
Sensing width	140mm	220mm	300mm	380mm	
Power supply	12-24VDC ±10%(ripple P-P: Max. 10%)				
Protection circuit	Built-in				
Current consumption	Emitter: Max. 80mA, Receiver: Max. 80mA				
Control output	NPN or PNP open collector output • Load voltage: Max. 30VDC • Load current: Max. 150mA • Residual voltage - NPN: Max. 1V, PNP: Min. 2.5V				
Operation mode	Light ON/Dark ON by switch				
Short-circuit protection	Built-in				
Response time	Max. 6ms(Frequency B selection is max. 7ms)				
Light source	Infrared LED(850nm modulated)				
Synchronization type	Synchronized by synchronous line				
Interference protection	Interference protection by transmission frequency selection				
Environment	Ambient illumination	Sunlight: Max. 10,000lx (received light side illumination)			
	Ambient temperature	-10 to 55°C, storage: -20 to 60°C			
	Ambient humidity	35 to 85%RH, storage: 35 to 85%RH			
Noise resistance	±240V the square wave noise (pulse width: 1μs) by the noise simulation				
Dielectric strength	1,000VAC 50/60Hz for 1minute				
Insulation resistance	Min. 20MΩ(at 500VDC megger)				
Vibration	1.5mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 2 hour				
Shock	500m/s <sup>2</sup> (approx. 50G) in each of X, Y, Z directions for 3 times				
Protection	IP40(IEC standard)				
Material	• Case: PC/ABS • Sensing part: PMMA				
Cable	Ø3.5mm, 4-wire, Length: 3m(Emitter: Ø3.5mm, 4-wire, Length: 3m) (AWG 24, Core diameter: 0.08mm, Number of cores: 40, Insulator out diameter: Ø1mm)				
Approval	CE				
Unit weight	Approx. 280g	Approx. 320g	Approx. 360g	Approx. 430g	

※The temperature or humidity mentioned in Environment indicates a non freezing or condensation environment.

## ■ Dimensions

(unit: mm)



Model	A	B	C
BWP20-08	140	180	190
BWP20-12	220	260	270
BWP20-16	300	340	350
BWP20-20	380	420	430

※Use M4 bolt for installing sensor, and tightening torque should be under 20kgf·cm

## Picking sensor [BWPK Series]

### ■ Specifications

Model	NPN open collector output	<b>BWPK25-05</b>
	PNP open collector output	<b>BWPK25-05P</b>
Appearances		
Sensing type	Through-beam	
Sensing distance	Long distance mode	0.1 to 3m
	Short distance mode	0.05 to 1m
Sensing target	Opaque materials of Min.Ø35mm	
Optical axis pitch	25mm	
Number of optical axis	5EA	
Sensing width	100mm	
Power supply	12-24VDC ±10%(ripple P-P: Max. 10%)	
Current consumption	Emitter: Max. 60mA, Receiver: Max. 60mA	
Control output	NPN or PNP open collector output • Load voltage: Max. 30VDC • Load current: Max. 150mA • Residual voltage - NPN: Max. 1V, PNP: Min.2.5V	
Operation mode	Selectable Light ON/Dark ON by switch	
Response time	Max. 30ms	
Light source	Infrared LED(850nm modulated)	
Interference protection	Interference protection by transmission frequency selection	

- Photo electric sensor
- Fiber optic sensor
- Door/Area sensor
- Proximity sensor
- Pressure sensor
- Rotary encoder
- Connector/Socket
- Temp. controller
- SSR/ Power controller
- Counter
- Timer
- Panel meter
- Tacho/ Speed/ Pulse meter
- Display unit
- Sensor controller
- Switching mode power supply
- Stepper motor& Driver&Controller
- Graphic/ Logic panel
- Field network device

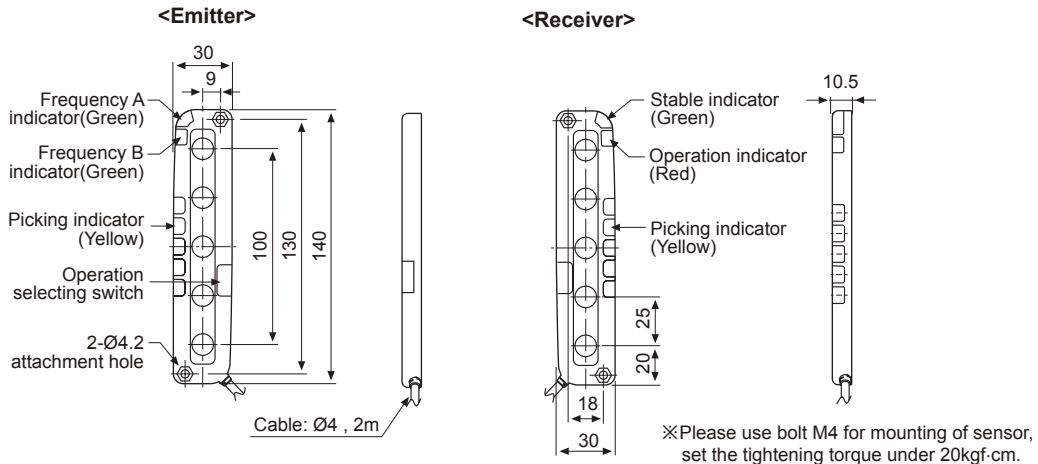
# Selection Guide

Model	NPN open collector output	<b>BWPK25-05</b>
	PNP open collector output	<b>BWPK25-05P</b>
Protection circuit	Reverse power polarity, Output short-circuit(Overcurrent) protection	
External picking input	Non-contact or contact input • NPN open collector output: Lighting(0-2V), Light out(5-30V or open) • PNP open collector output: Lighting(4-30V), Light out(0-3V or open)	
Environment	Ambient illumination	Sunlight: Max. 10,000lx, Incandescent lamp: Max. 3,000lx (received light side illumination)
	Ambient temperature	-10 to 55°C, storage: -20 to 60°C
	Ambient humidity	35 to 85%RH, storage: 35 to 85%RH
Insulation resistance	Min. 20MΩ(at 500VDC megger)	
Noise resistance	±240V the square wave noise (pulse width: 1μs) by the noise simulation	
Dielectric strength	1,000VAC 50/60Hz for 1minute	
Vibration	1.5mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 2 hour	
Shock	500m/s <sup>2</sup> (approx. 50G) in each of X, Y, Z directions for 3 times	
Protection	IP40(IEC standard)	
Material	• Case: PC/ABS • Sensing part: PMMA	
Cable	Ø4.0mm, 4-wire, Length: 2m(Emitter: Ø4.0mm, 3-wire, Length: 2m) (AWG 22, Core diameter: 0.08mm, Number of cores: 60, Insulator out diameter: Ø1.25mm)	
Approval	<b>CE</b>	
Unit weight	Approx. 250g	

※The temperature or humidity mentioned in Environment indicates a non freezing or condensation environment.

## ■ Dimensions

(unit: mm)








## Long distance proximity sensor

### ■ Specifications

#### ● DC 2-wire type

※When the □ model name is X, it is non-polarity model.

Model	PRDT12-4□D□ PRDT12-4□D□C PRDT12-4□D□O-V PRDT12-4□D□C-V PRDLT12-4□D□ PRDLT12-4□D□C PRDLT12-4□D□O-V PRDLT12-4□D□C-V PRDWT12-4□D□ PRDWT12-4□D□C PRDWT12-4□D□O-I PRDWT12-4□D□C-I PRDWT12-4□D□O-IV PRDWT12-4□D□C-IV	PRDT12-8□D□ PRDT12-8□D□C PRDT12-8□D□O-V PRDT12-8□D□C-V PRDLT12-8□D□ PRDLT12-8□D□C PRDLT12-8□D□O-V PRDLT12-8□D□C-V PRDWT12-8□D□ PRDWT12-8□D□C PRDWT12-8□D□O-I PRDWT12-8□D□C-I PRDWT12-8□D□O-IV PRDWT12-8□D□C-IV	PRDT18-7□D□ PRDT18-7□D□C PRDT18-7□D□O-V PRDT18-7□D□C-V PRDLT18-7□D□ PRDLT18-7□D□C PRDLT18-7□D□O-V PRDLT18-7□D□C-V PRDWT18-7□D□ PRDWT18-7□D□C PRDWT18-7□D□O-I PRDWT18-7□D□C-I PRDWT18-7□D□O-IV PRDWT18-7□D□C-IV PRDWLT18-7□D□O-IV PRDWLT18-7□D□C-IV	PRDT18-14□D□ PRDT18-14□D□C PRDT18-14□D□O-V PRDT18-14□D□C-V PRDLT18-14□D□ PRDLT18-14□D□C PRDLT18-14□D□O-V PRDLT18-14□D□C-V PRDWT18-14□D□ PRDWT18-14□D□C PRDWT18-14□D□O-I PRDWT18-14□D□C-I PRDWT18-14□D□O-IV PRDWT18-14□D□C-IV PRDWLT18-14□D□O-IV PRDWLT18-14□D□C-IV	PRDT30-15□D□ PRDT30-15□D□C PRDT30-15□D□O-V PRDT30-15□D□C-V PRDLT30-15□D□ PRDLT30-15□D□C PRDLT30-15□D□O-V PRDLT30-15□D□C-V PRDWT30-15□D□ PRDWT30-15□D□C PRDWT30-15□D□O-I PRDWT30-15□D□C-I PRDWT30-15□D□O-IV PRDWT30-15□D□C-IV	PRDT30-25□D□ PRDT30-25□D□C PRDT30-25□D□O-V PRDT30-25□D□C-V PRDLT30-25□D□ PRDLT30-25□D□C PRDLT30-25□D□O-V PRDLT30-25□D□C-V PRDWT30-25□D□ PRDWT30-25□D□C PRDWT30-25□D□O-I PRDWT30-25□D□C-I PRDWT30-25□D□O-IV PRDWT30-25□D□C-IV
Appearances	<p><b>Line-up 2-wire non-polarity</b></p>  <p>CE</p>					
Sensing distance	4mm	8mm	7mm	14mm	15mm	25mm
Hysteresis	Max. 10% of sensing distance					
Standard sensing target	12×12×1mm(Iron)	25×25×1mm (Iron)	20×20×1mm (Iron)	40×40×1mm (Iron)	45×45×1mm (Iron)	75×75×1mm (Iron)
Sensing distance	0 to 2.8mm	0 to 5.6mm	0 to 4.9mm	0 to 9.8mm	0 to 10.5mm	0 to 17.5mm
Power supply (Operating voltage)	12-24VDC (10-30VDC)					
Leakage current	Max. 0.6mA					
Response frequency※1	450Hz	400Hz	250Hz	200Hz	100Hz	
Residual voltage※2	Max. 3.5V(for non-polarity type, max. 5V)					
Affection by Temp.	Max. ±10% for sensing distance at ambient temperature 20°C					
Control output	2 to 100mA					
Insulation resistance	Min. 50MΩ(at 500VDC megger)					
Dielectric strength	1500VAC 50/60Hz for 1minute					
Vibration	1mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 2 hours					
Shock	500m/s²(approx. 50G) X, Y, Z directions for 3 times					
Indicator	Operation indicator(red LED)					
Environment	Ambient temperature: -25 to 70°C, Storage: -30 to 80°C					
	Ambient humidity: 35 to 95%RH, Storage: 35 to 95%RH					
Protection circuit	Surge protection circuit, Reverse polarity protection circuit, Overcurrent protection circuit					
Material	Case/Nut: Nickel plated Brass, Washer: Nickel plated Iron, Sensing surface: Heat-resistant ABS, Standard cable(Black): Polyvinyl chloride(PVC), Oil resistant cable(Gray): Oil resistant Polyvinyl chloride(PVC)					
Cable	ø4mm, 2-wire, 2m			ø5mm, 2-wire, 2m		
	(for cable type, 300mm, M12 connector), (AWG22, Core diameter: 0.08mm, Number of cores: 60, Insulator diameter: ø1.25mm)					
Approval	CE					
Protection	IP67(IEC Standard)					
Unit weight	PRDT: Approx. 74g PRDLT: Approx. 94g PRDWT: Approx. 44g	PRDT: Approx. 72g PRDLT: Approx. 92g PRDWT: Approx. 42g	PRDT: Approx. 115g PRDLT: Approx. 145g PRDWT: Approx. 80g PRDWLT: Approx. 42g	PRDT: Approx. 110g PRDLT: Approx. 140g PRDWT: Approx. 75g PRDWLT: Approx. 105g	PRDT: Approx. 175g PRDLT: Approx. 215g PRDWT: Approx. 140g	PRDT: Approx. 180g PRDLT: Approx. 220g PRDWT: Approx. 145g

※1: The response frequency is the average value. The standard sensing target is used and the width is set as 2 times of the standard sensing target, 1/2 of the sensing distance for the distance.

※2: Before using non-polarity type, check the condition of connected device because residual voltage is 5V.

※The '□' of model name is for power type. 'D' is 12-24VDC, 'X' is non-polarity 12-24VDC.

※The last 'V' of model name is for the model with oil-resistance reinforced cable.

※Environment resistance is rated at no freezing or condensation.

## ● DC 3-wire type

Model	PRD12-4DN PRD12-4DP PRD12-4DN2 PRD12-4DP2 PRDL12-4DN PRDL12-4DP PRDL12-4DN2 PRDL12-4DP2 PRDW12-4DN PRDW12-4DP PRDW12-4DN2 PRDW12-4DP2 PRDW12-4DN-V PRDW12-4DP-V PRDWL12-4DN PRDWL12-4DP PRDWL12-4DN2 PRDWL12-4DP2	PRD12-8DN PRD12-8DP PRD12-8DN2 PRD12-8DP2 PRDL12-8DN PRDL12-8DP PRDL12-8DN2 PRDL12-8DP2 PRDW12-8DN PRDW12-8DP PRDW12-8DN2 PRDW12-8DP2 PRDW12-8DN-V PRDW12-8DP-V PRDWL12-8DN PRDWL12-8DP PRDWL12-8DN2 PRDWL12-8DP2	PRD18-7DN PRD18-7DP PRD18-7DN2 PRD18-7DP2 PRDL18-7DN PRDL18-7DP PRDL18-7DN2 PRDL18-7DP2 PRDW18-7DN PRDW18-7DP PRDW18-7DN2 PRDW18-7DP2 PRDW18-7DN-V PRDW18-7DP-V PRDWL18-7DN PRDWL18-7DP PRDWL18-7DN2 PRDWL18-7DP2	PRD18-14DN PRD18-14DP PRD18-14DN2 PRD18-14DP2 PRDL18-14DN PRDL18-14DP PRDL18-14DN2 PRDL18-14DP2 PRDW18-14DN PRDW18-14DP PRDW18-14DN2 PRDW18-14DP2 PRDW18-14DN-V PRDW18-14DP-V PRDWL18-14DN PRDWL18-14DP PRDWL18-14DN2 PRDWL18-14DP2	PRD30-15DN PRD30-15DP PRD30-15DN2 PRD30-15DP2 PRDL30-15DN PRDL30-15DP PRDL30-15DN2 PRDL30-15DP2 PRDW30-15DN PRDW30-15DP PRDW30-15DN2 PRDW30-15DP2 PRDW30-15DN-V PRDW30-15DP-V PRDWL30-15DN PRDWL30-15DP PRDWL30-15DN2 PRDWL30-15DP2	PRD30-25DN PRD30-25DP PRD30-25DN2 PRD30-25DP2 PRDL30-25DN PRDL30-25DP PRDL30-25DN2 PRDL30-25DP2 PRDW30-25DN PRDW30-25DP PRDW30-25DN2 PRDW30-25DP2 PRDW30-25DN-V PRDW30-25DP-V PRDWL30-25DN PRDWL30-25DP PRDWL30-25DN2 PRDWL30-25DP2
Appearances						
Sensing distance	4mm	8mm	7mm	14mm	15mm	25mm
Hysteresis	Max. 10% of sensing distance					
Standard sensing target	12×12×1mm(Iron)	25×25×1mm(Iron)	20×20×1mm (Iron)	40×40×1mm (Iron)	45×45×1mm (Iron)	75×75×1mm (Iron)
Sensing distance	0 to 2.8mm	0 to 5.6mm	0 to 4.9mm	0 to 9.8mm	0 to 10.5mm	0 to 17.5mm
Power supply (Operating voltage)	12-24VDC (10-30VDC)					
Current consumption	Max. 10mA					
Response frequency <sup>※1</sup>	500Hz	400Hz	300Hz	200Hz	100Hz	100Hz
Residual voltage	Max. 1.5V					
Affection by Temp.	Max. ±10% for sensing distance at ambient temperature 20°C					
Control output	200mA					
Insulation resistance	Min. 50MΩ(at 500VDC megger)					
Dielectric strength	1500VAC 50/60Hz for 1minute					
Vibration	1mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 2 hours					
Shock	500m/s <sup>2</sup> (approx. 50G) X, Y, Z directions for 3 times					
Indicator	Operation indicator(red LED)					
Environment	Ambient temperature	-25 to 70°C, Storage: -30 to 80°C				
	Ambient humidity	35 to 95%RH, Storage: 35 to 95%RH				
Protection circuit	Surge protection circuit, Reverse polarity protection circuit, Overcurrent protection circuit					
Protection	IP67(IEC Standard)					
Material	Case/Nut: Nickel plated Brass, Washer: Nickel plated Iron, Sensing surface: Heat-resistant ABS, Standard cable(Black): Polyvinyl chloride(PVC), Oil resistant cable(Gray): Oil resistant Polyvinyl chloride(PVC)					
Cable	ø4mm, 3-wire, 2m			ø5mm, 3-wire, 2m		
	(for cable type, 300mm, M12 connector), (AWG22, Core diameter: 0.08mm, Number of cores: 60, Insulator diameter: ø1.25mm)					
Approval	CE					
Unit weight	PRD: Approx. 74g PRDL: Approx. 94g PRDW: Approx. 44g PRDWL: Approx. 64g	PRD: Approx. 72g PRDL: Approx. 92g PRDW: Approx. 42g PRDWL: Approx. 62g	PRD: Approx. 115g PRDL: Approx. 145g PRDW: Approx. 80g PRDWL: Approx. 110g	PRD: Approx. 110g PRDL: Approx. 140g PRDW: Approx. 75g PRDWL: Approx. 105g	PRD: Approx. 175g PRDL: Approx. 215g PRDW: Approx. 140g PRDWL: Approx. 180g	PRD: Approx. 180g PRDL: Approx. 220g PRDW: Approx. 145g PRDWL: Approx. 185g

※1: The response frequency is the average value. The standard sensing target is used and the width is set as 2 times of the standard sensing target, 1/2 of the sensing distance for the distance.

※The last 'V' of model name is for the model with oil-resistance reinforced cable.

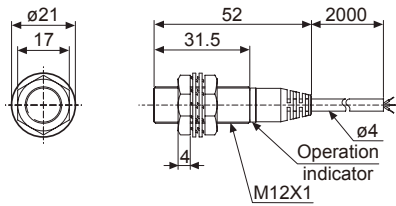
※Environment resistance is rated at no freezing or condensation.

Photo electric sensor
Fiber optic sensor
Door/Area sensor
Proximity sensor
Pressure sensor
Rotary encoder
Connector/Socket
Temp. controller
SSR/Power controller
Counter
Timer
Panel meter
Tacho/Speed/ Pulse meter
Display unit
Sensor controller
Switching mode power supply
Stepper motor & Driver&Controller
Graphic/Logic panel
Field network device

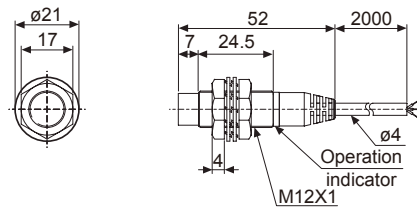
## ■ Dimensions

(unit: mm)

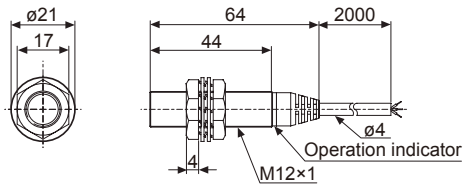
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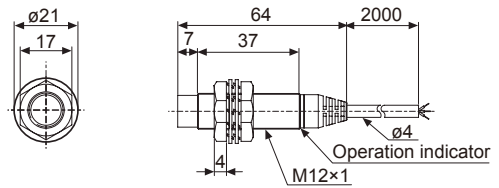
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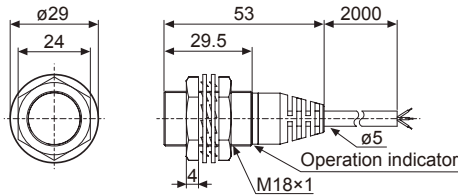
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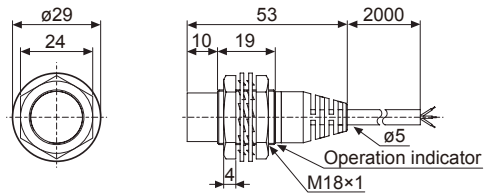
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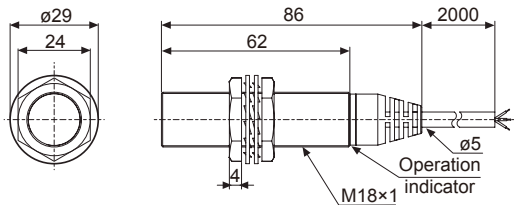
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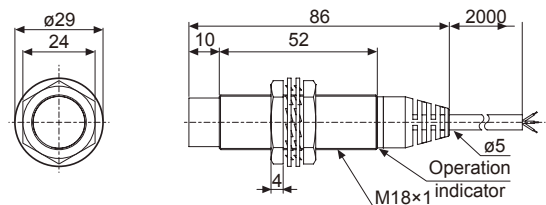
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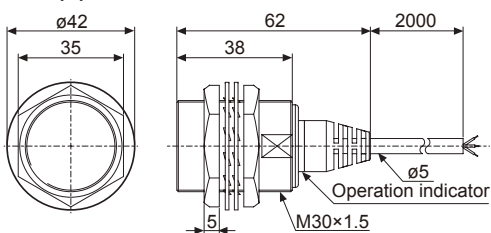
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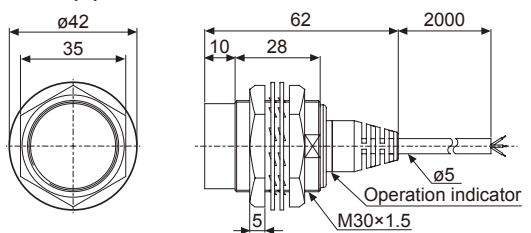
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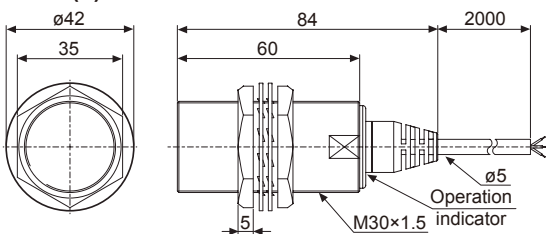
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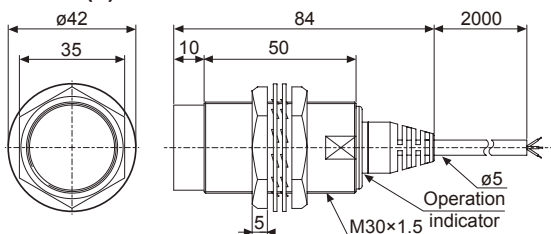
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### ● PRDL(T)30-15D□



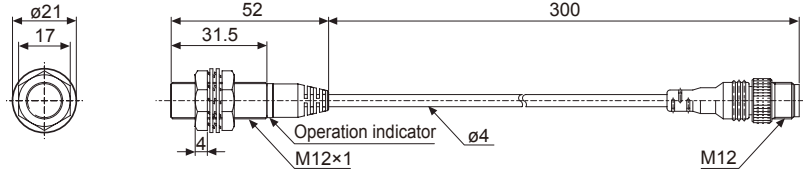
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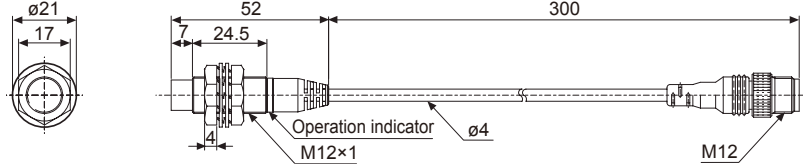
## ■ Dimensions

(unit: mm)

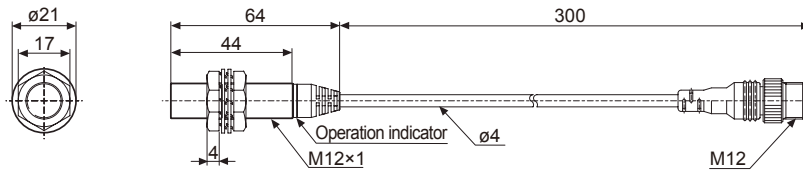
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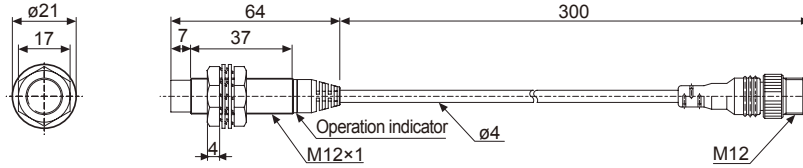
● PRDW(T)12-8D□



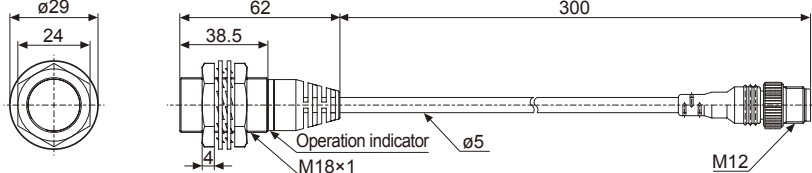
● PRDWL12-4D□



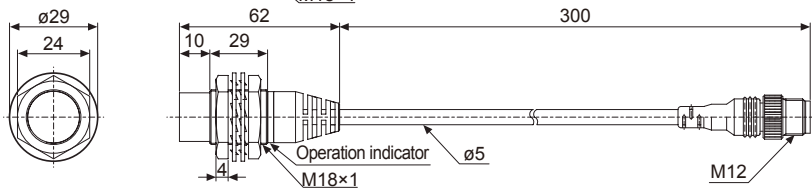
● PRDWL12-8D□



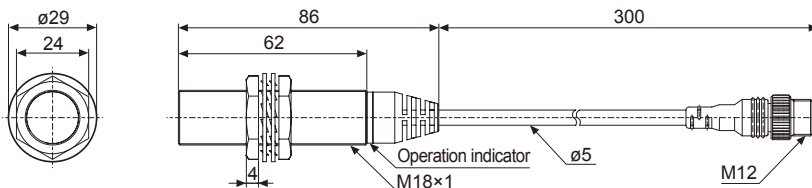
● PRDW(T)18-7D□



● PRDW(T)18-14D□



● PRDWL(T)18-7D□



● PRDWL(T)18-14D□

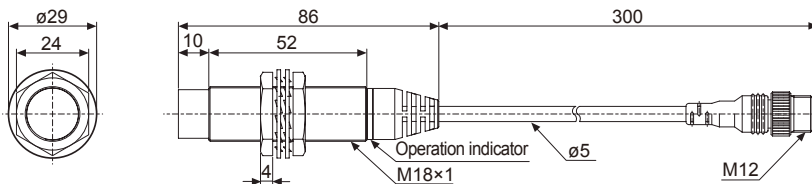


Photo electric sensor

Fiber optic sensor

Door/Area sensor

Proximity sensor

Pressure sensor

Rotary encoder

Connector/Socket

Temp. controller

SSR/Power controller

Counter

Timer

Panel meter

Tacho/Speed/Pulse meter

Display unit

Sensor controller

Switching mode power supply

Stepper motor & Driver&Controller

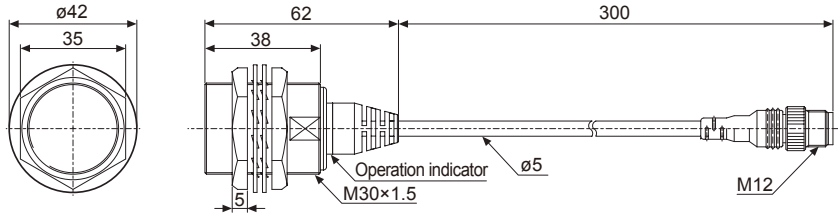
Graphic/Logic panel

Field network device

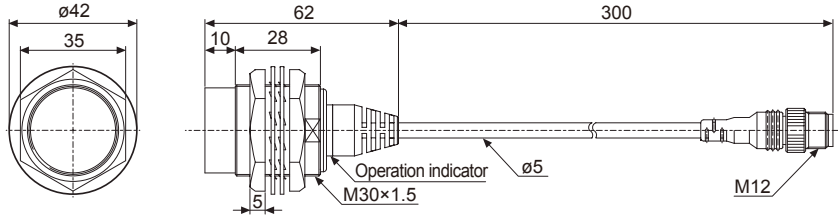
## ■ Dimensions

(unit: mm)

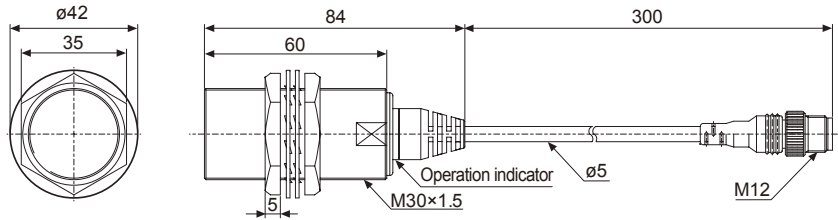
### ● PRDW(T)30-15D□



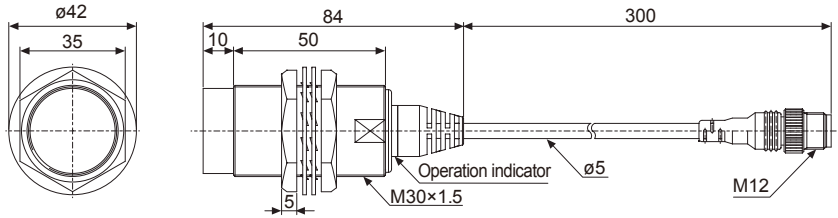
### ● PRDW(T)30-25D□



### ● PRDWL(T)30-15D□



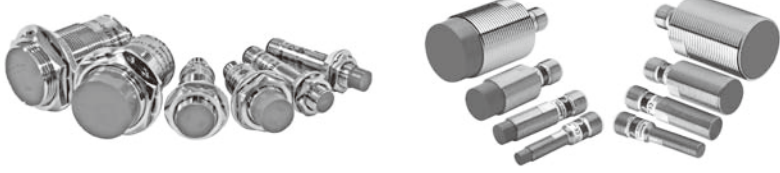
### ● PRDWL(T)30-25D□



# Long distance connector type proximity sensor

## ■ Specifications

### ● DC 2-wire type


Model <sup>※1</sup>	PRDCMT08-2DO PRDCMT08-2DC PRDCMT08-2DO-I PRDCMT08-2DC-I	PRDCMT08-4DO PRDCMT08-4DC PRDCMT08-4DO-I PRDCMT08-4DC-I	PRDCMT12-4DO PRDCMT12-4DC PRDCMT12-4DO-I PRDCMT12-4DC-I PRDCMLT12-4DO PRDCMLT12-4DC PRDCMLT12-4DO-I PRDCMLT12-4DC-I	PRDCMT12-8DO PRDCMT12-8DC PRDCMT12-8DO-I PRDCMT12-8DC-I PRDCMLT12-8DO PRDCMLT12-8DC PRDCMLT12-8DO-I PRDCMLT12-8DC-I	PRDCMT18-7DO PRDCMT18-7DC PRDCMT18-7DO-I PRDCMT18-7DC-I PRDCMLT18-7DO PRDCMLT18-7DC PRDCMLT18-7DO-I PRDCMLT18-7DC-I	PRDCMT18-14DO PRDCMT18-14DC PRDCMT18-14DO-I PRDCMT18-14DC-I PRDCMLT18-14DO PRDCMLT18-14DC PRDCMLT18-14DO-I PRDCMLT18-14DC-I	PRDCMT30-15DO PRDCMT30-15DC PRDCMT30-15DO-I PRDCMT30-15DC-I PRDCMLT30-15DO PRDCMLT30-15DC PRDCMLT30-15DO-I PRDCMLT30-15DC-I	PRDCMT30-25DO PRDCMT30-25DC PRDCMT30-25DO-I PRDCMT30-25DC-I PRDCMLT30-25DO PRDCMLT30-25DC PRDCMLT30-25DO-I PRDCMLT30-25DC-I	
Appearances									
Sensing distance	2mm	4mm	8mm	7mm	14mm	15mm	25mm		
Hysteresis	Max. 10% of sensing distance								
Standard sensing target	8×8×1mm (Iron)	12×12×1mm (Iron)	25×25×1mm (Iron)	20×20×1mm (Iron)	40×40×1mm (Iron)	45×45×1mm (Iron)	75×75×1mm (Iron)		
Setting distance	0 to 1.4mm	0 to 2.8mm	0 to 5.6mm	0 to 5.6mm	0 to 9.8mm	0 to 10.5mm	0 to 17.5mm		
Power supply (Operating voltage)	12-24VDC (10-30VDC)								
Leakage current	Max. 0.6mA								
Response frequency <sup>※2</sup>	600Hz	500Hz	450Hz	400Hz	250Hz	200Hz	200Hz	100Hz	
Residual voltage	Max. 3.5V								
Affection by Temp.	Max. ±10% for sensing distance at ambient temperature 20°C								
Control output	2 to 100mA								
Insulation resistance	Min. 50MΩ(at 500VDC megger)								
Dielectric strength	1500VAC 50/60Hz for 1minute								
Vibration	1mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 2 hours								
Shock	500m/s <sup>2</sup> (approx. 50G) in each of X, Y, Z directions for 3 times								
Indicator	Operation indicator(red LED)								
Environment	Ambient temperature	-25 to 70°C, storage: -30 to 80°C							
	Ambient humidity	35 to 95%RH, storage: 35 to 95%RH							
Protection circuit	Surge protection circuit, Reverse polarity protection circuit, Overcurrent protection circuit								
Material	Case/Nut: Nickel plated Brass, Washer: Nickel plated Iron, Sensing surface: Heat-resistant ABS (PRDCMT08 type - Case: SUS303)								
Approval	CE								
Protection	IP67(IEC Standard)								
Unit weight <sup>※3</sup>	Existing	—		PRDCMT: Approx. 26g PRDCMLT: Approx. 36g		PRDCMT: Approx. 48g PRDCMLT: Approx. 66g		PRDCMT: Approx. 142g PRDCMLT: Approx. 182g	
	Upgrade	Approx. 15.5g	Approx. 15g	Approx. 23.5g	Approx. 22g	Approx. 46.5g	Approx. 42.5g	Approx. 118.5g	Approx. 110.5g

※1: PRDCMT series is going to upgrade performance(4-side LED) and structure(comprehensive existing case and rear cap type).  
 ※2: The response frequency is the average value. The standard sensing target is used and the width is set as 2 times of the standard sensing target, 1/2 of the sensing distance for the distance.  
 ※3: **Upgrade unit weight is only for PRDCMT( Upgrade ). Refer to the existing unit weight for the other models or existing products.**  
 ※Environment resistance is rated at no freezing or condensation.

- Photo electric sensor
- Fiber optic sensor
- Door/Area sensor
- Proximity sensor
- Pressure sensor
- Rotary encoder
- Connector/Socket
- Temp. controller
- SSR/ Power controller
- Counter
- Timer
- Panel meter
- Tacho/ Speed/ Pulse meter
- Display unit
- Sensor controller
- Switching mode power supply
- Stepper motor& Driver&Controller
- Graphic/ Logic panel
- Field network device

## ■ Specifications

### ● DC 3-wire type

Model	PRDCM12-4DN PRDCM12-4DP PRDCM12-4DN2 PRDCM12-4DP2 PRDCML12-4DN PRDCML12-4DP PRDCML12-4DN2 PRDCML12-4DP2	PRDCM12-8DN PRDCM12-8DP PRDCM12-8DN2 PRDCM12-8DP2 PRDCML12-8DN PRDCML12-8DP PRDCML12-8DN2 PRDCML12-8DP2	PRDCM18-7DN PRDCM18-7DP PRDCM18-7DN2 PRDCM18-7DP2 PRDCML18-7DN PRDCML18-7DP PRDCML18-7DN2 PRDCML18-7DP2	PRDCM18-14DN PRDCM18-14DP PRDCM18-14DN2 PRDCM18-14DP2 PRDCML18-14DN PRDCML18-14DP PRDCML18-14DN2 PRDCML18-14DP2	PRDCM30-15DN PRDCM30-15DP PRDCM30-15DN2 PRDCM30-15DP2 PRDCML30-15DN PRDCML30-15DP PRDCML30-15DN2 PRDCML30-15DP2	PRDCM30-25DN PRDCM30-25DP PRDCM30-25DN2 PRDCM30-25DP2 PRDCML30-25DN PRDCML30-25DP PRDCML30-25DN2 PRDCML30-25DP2
Appearances						
Sensing distance	4mm	8mm	7mm	14mm	15mm	25mm
Hysteresis	Max. 10% of sensing distance					
Standard sensing target	12×12×1mm(Iron)	25×25×1mm(Iron)	20×20×1mm(Iron)	40×40×1mm(Iron)	45×45×1mm(Iron)	75×75×1mm(Iron)
Setting distance	0 to 2.8mm	0 to 5.6mm	0 to 4.9mm	0 to 9.8mm	0 to 10.5mm	0 to 17.5mm
Power supply (Operating voltage)	12-24VDC (10-30VDC)					
Current consumption	Max. 10mA					
Response frequency <sup>※1</sup>	500Hz	400Hz	300Hz	200Hz	100Hz	100Hz
Residual voltage	Max. 1.5V					
Affection by Temp.	Max. ±10% for sensing distance at ambient temperature 20°C					
Control output	Max. 200mA					
Insulation resistance	Min. 50MΩ(at 500VDC megger)					
Dielectric strength	1500VAC 50/60Hz for 1minute					
Vibration	1mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 2 hours					
Shock	500m/s <sup>2</sup> (approx. 50G) in each of X, Y, Z directions for 3 times					
Indicator	Operation indicator(Red LED)					
Environment	Ambient temperature	-25 to 70°C, storage: -30 to 80°C				
	Ambient humidity	35 to 95%RH, storage: 35 to 95%RH				
Protection circuit	Surge protection circuit, Reverse polarity protection circuit, Overcurrent protection circuit					
Protection	IP67(IEC specification)					
Material	Case/Nut: Nickel plated Brass, Washer: Nickel plated Iron, Sensing surface: Heat-resistant ABS					
Approval	CE					
Unit Weight	PRDCM: Approx. 26g PRDCML: Approx. 34g		PRDCM: Approx. 48g PRDCML: Approx. 66g		PRDCM: Approx. 142g PRDCML: Approx. 182g	

※1: The response frequency is the average value. The standard sensing target is used and the width is set as 2 times of the standard sensing target, 1/2 of the sensing distance for the distance.

※Environment resistance is rated at no freezing or condensation.

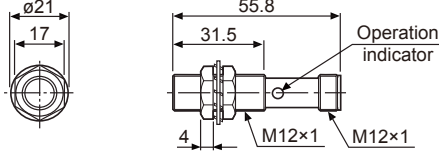


## ■ Dimensions

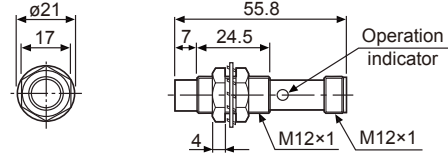
### ◎ PRDCM(T) Series

(unit: mm)

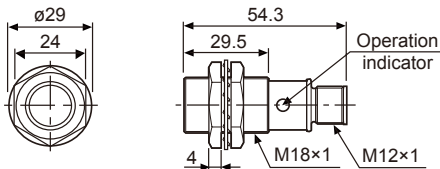
#### ● PRDCM(T)12-4D □



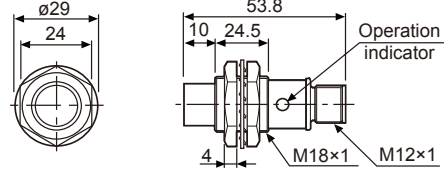
#### ● PRDCM12-8D □



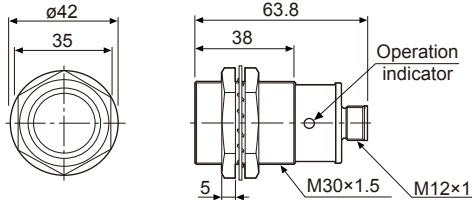
#### ● PRDCM(T)18-7D □



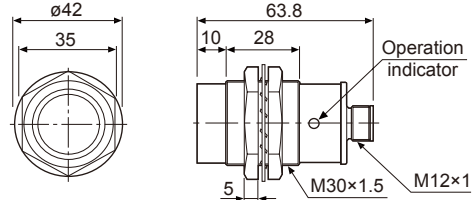
#### ● PRDCM(T)18-14D □



#### ● PRDCM(T)30-15D □

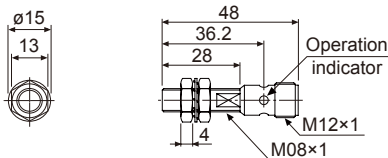


#### ● PRDCM(T)30-25D □

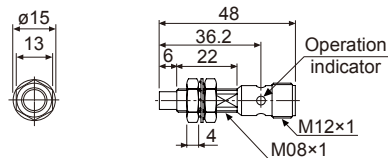


### ◎ PRDCMT Series Upgrade

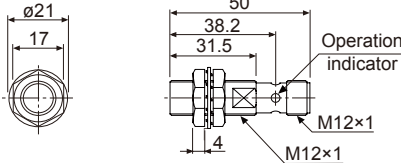
#### ● PRDCMT08-2D □



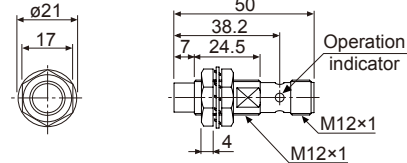
#### ● PRDCMT08-4D □



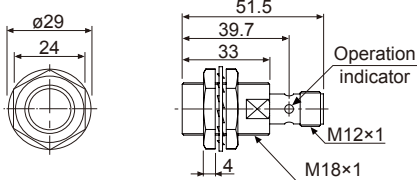
#### ● PRDCMT12-4D □



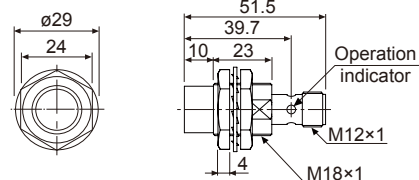
#### ● PRDCMT12-8D □



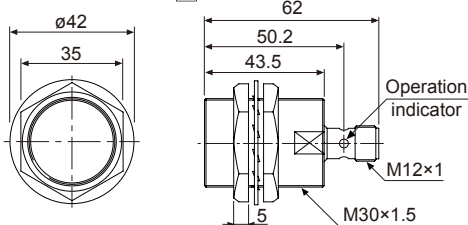
#### ● PRDCMT18-7D □



#### ● PRDCMT12-8D □



#### ● PRDCMT30-15D □



#### ● PRDCMT30-25D □

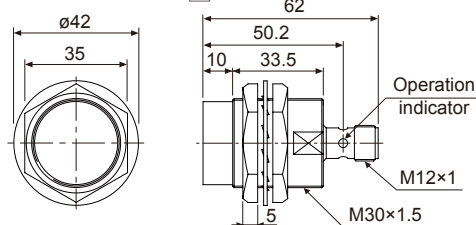


Photo electric sensor
Fiber optic sensor
Door/Area sensor
Proximity sensor
Pressure sensor
Rotary encoder
Connector/Socket
Temp. controller
SSR/Power controller
Counter
Timer
Panel meter
Tacho/Speed/Pulse meter
Display unit
Sensor controller
Switching mode power supply
Stepper motor & Driver&Controller
Graphic/Logic panel
Field network device

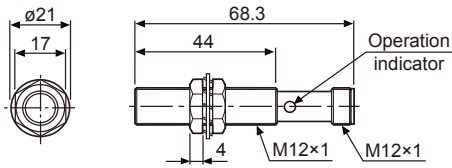
# Selection Guide

## ■ Dimensions

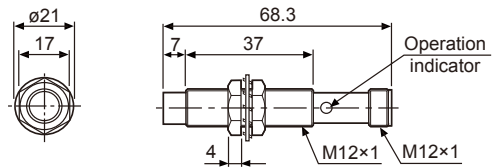
### ◎ PRDCML(T) Series

(unit: mm)

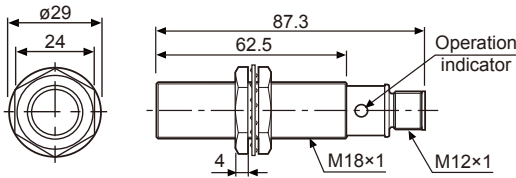
#### ● PRDCML(T)12-4D□



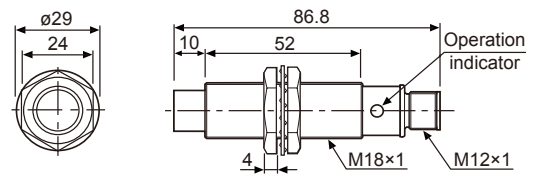
#### ● PRDCML(T)12-8D□



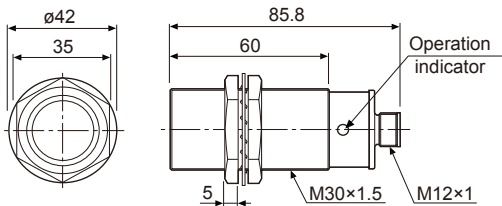
#### ● PRDCML(T)18-7D□



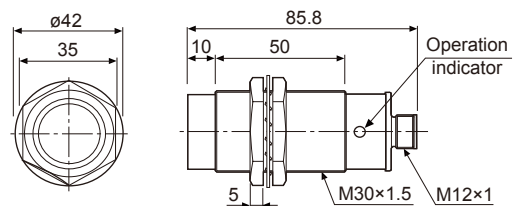
#### ● PRDCML(T)18-14D□



#### ● PRDCML(T)30-15D□



#### ● PRDCML(T)30-25D□



## Long distance inductive proximity sensor (spatter resistance type)

### ■ Specifications

#### ● DC 2-wire type

Model	PRDAT18-7DO PRDAT18-7DC PRDAT18-7DO-V PRDAT18-7DC-V	PRDAWT18-7DO PRDAWT18-7DC PRDAWT18-7DO-I PRDAWT18-7DC-I PRDAWT18-7DO-IV PRDAWT18-7DC-IV	PRDAT30-15DO PRDAT30-15DC PRDAT30-15DO-V PRDAT30-15DC-V	PRDAWT30-15DO PRDAWT30-15DC PRDAWT30-15DO-I PRDAWT30-15DC-I PRDAWT30-15DO-IV PRDAWT30-15DC-IV
Appearances	<div style="display: flex; align-items: center;"> <div style="margin-right: 20px;"> <p><b>NEW</b></p> <p>CE</p> </div> </div>			
Sensing distance	7mm		15mm	
Hysteresis	Max. 10% of sensing distance			
Standard sensing target	20×20×1mm(iron)		45×45×1mm(iron)	
Sensing distance	0 to 4.9mm		0 to 10.5mm	
Power supply (operating voltage)	12-24VDC (10-30VDC)			

Model	PRDAT18-7DO PRDAT18-7DC PRDAT18-7DO-V PRDAT18-7DC-V	PRDAWT18-7DO PRDAWT18-7DC PRDAWT18-7DO-I PRDAWT18-7DC-I PRDAWT18-7DO-IV PRDAWT18-7DC-IV	PRDAT30-15DO PRDAT30-15DC PRDAT30-15DO-V PRDAT30-15DC-V	PRDAWT30-15DO PRDAWT30-15DC PRDAWT30-15DO-I PRDAWT30-15DC-I PRDAWT30-15DO-IV PRDAWT30-15DC-IV	Photo electric sensor Fiber optic sensor Door/Area sensor Proximity sensor Pressure sensor Rotary encoder Connector/Socket Temp. controller SSR/Power controller Counter Timer Panel meter Tacho/Speed/Pulse meter Display unit Sensor controller Switching mode power supply Stepper motor & Driver&Controller Graphic/Logic panel Field network device
Leakage current	Max. 0.6mA				
Response frequency*1	250Hz		100Hz		
Residual voltage	Max. 3.5V				
Affection by Temp.	Max. ±10% for sensing distance at ambient temperature 20°C				
Control output	2 to 100mA				
Insulation resistance	Min. 50MΩ (at 500VDC megger)				
Dielectric strength	1,500VAC 50/60Hz for 1 min.				
Vibration	1mm amplitude at frequency of 10 to 55Hz (for 1 min.) in each of X, Y, Z directions for 2 hours				
Shock	500m/s <sup>2</sup> (approx. 50G) in each of X, Y, Z directions for 3 times				
Indicator	Operation indicator (red LED)				
Environment	Ambient temperature	-25 to 70°C, storage: -30 to 80°C			
	Ambient humidity	35 to 95%RH, storage: 35 to 95%RH			
Protection circuit	Surge protection circuit, overcurrent protection				
Protection	IP67(IEC standard)				
Material	Case/Nut: Teflon coated brass, Washer: Teflon coated Iron, Sensing surface: Teflon, Standard cable(black): Polyvinyl chloride(PVC), Oil resistant cable(gray): Polyvinyl chloride(oil resistant PVC)				
Cable	ø5mm, 2-wire, 2m (AWG22, Core diameter : 0.08mm, Number of cores: 60, Insulator out diameter:ø1.25mm)	ø5mm, 2-wire, 300mm, M12 connector	ø5mm, 2-wire, 2m (AWG22, Core diameter : 0.08mm, Number of cores: 60, Insulator out diameter:ø1.25mm)	ø5mm, 2-wire, 300mm, M12 connector	
Approval	CE				
Weight*2	Approx. 134g(approx. 122g)	Approx. 77g(approx. 65g)	Approx. 221g(approx. 184g)	Approx. 155g(approx. 143g)	

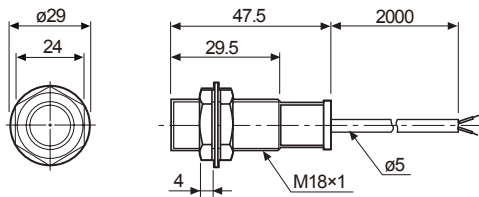
※1: The response frequency is the average value. The standard sensing target is used and the width is set as 2 times of the standard sensing target, 1/2 of the sensing distance for the distance.

※2: The weight with packaging and the weight in parentheses is only unit weight. ※ Environment resistance is rated at no freezing or condensation.

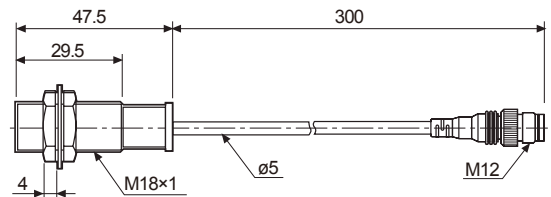
## ■ Dimensions

(unit: mm)

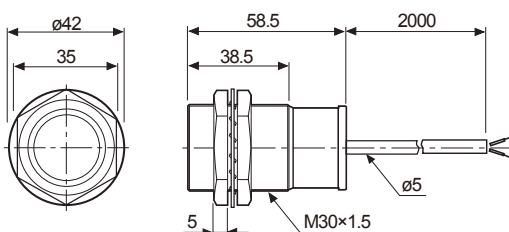
### ● PRDAT18-7D



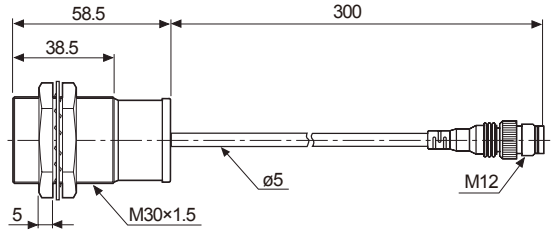
### ● PRDAWT18-7D



### ● PRDAT30-15D



### ● PRDAWT30-15D




## Cylindrical type proximity sensor

### ■ Specifications

#### ● DC 2-wire type

※When the □ model name is X, it is non-polarity model.

Model	PRT08-1.5DO PRT08-1.5DC	PRT08-2DO PRT08-2DC	PRT12-2□DO PRT12-2□DC	PRT12-4□DO PRT12-4□DC	PRT18-5□DO PRT18-5□DC	PRT18-8□DO PRT18-8□DC	PRT30-10□DO PRT30-10□DC PRT30-10□DO-V	PRT30-15□DO PRT30-15□DC
Appearances	<b>Line-up 2-wire non-polarity</b> 							
Sensing distance	1.5mm	2mm	2mm	4mm	5mm	8mm	10mm	15mm
Hysteresis	Max. 10% of sensing distance							
Standard sensing target	8×8×1mm (Iron)		12×12×1mm (Iron)		18×18×1mm (Iron)	25×25×1mm (Iron)	30×30×1mm (Iron)	45×45×1mm (Iron)
Sensing distance	0 to 1.05mm	0 to 1.4mm	0 to 1.4mm	0 to 2.8mm	0 to 3.5mm	0 to 5.6mm	0 to 7mm	0 to 10.5mm
Power supply (Operating voltage)	12-24VDC (10-30VDC)							
Leakage current	Max. 0.6mA							
Response frequency <sup>※1</sup>	1.5kHz	1kHz	1.5kHz	500Hz		350Hz	400Hz	200Hz
Residual voltage <sup>※2</sup>	Max. 3.5V(Non-polarity type is Max. 5V)							
Affection by Temp.	Max. ±10% for sensing distance at ambient temperature 20°C(for PRT08 Series : ±20% Max.)							
Control output	2 to 100mA							
Insulation resistance	Min. 50MΩ(at 500VDC megger)							
Dielectric strength	1500VAC 50/60Hz for 1minute							
Vibration	1mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 2 hours							
Shock	500m/s <sup>2</sup> (approx. 50G) in X, Y, Z direction for 3 times							
Indicator	Operation indicator(red LED)							
Environment	Ambient temperature	-25 to 70°C, storage: -30 to 80°C						
	Ambient humidity	35 to 95% RH, storage: 35 to 95% RH						
Protection circuit	Surge protection circuit		Surge protection circuit, Overcurrent protection circuit					
Protection	IP67(IEC standard)							
Cable	ø3.5mm, 3-wire, 2m (AWG24, Core diameter: 0.08mm, Number of cores: 40, Insulator diameter: ø1mm)		ø4mm, 2-wire, 2m		ø5mm, 2-wire, 2m			
	(AWG22, Core diameter: 0.08mm, Number of cores: 60, Insulator diameter: ø1.25mm)							
Material	Case/Nut: Nickel plated Brass, Washer: Nickel plated Iron, Sensing surface: PBT, Standard cable(Black): Polyvinyl chloride(PVC), Oil resistant cable(Gray): Oil resistant Polyvinyl chloride(PVC)							
Approval	CE							
Weight <sup>※3</sup>	Approx. 64g(approx. 52g)		Approx.84g(approx. 72g)		Approx.122g(approx. 110g)		Approx.207g(approx. 170g)	

※1: The response frequency is the average value. The standard sensing target is used and the width is set as 2 times of the standard sensing target, 1/2 of the sensing distance for the distance.

※2: Before using non-polarity type, check the condition of connected device because residual voltage is 5V.

※3: The weight with packaging and the weight in parentheses is only unit weight.


※The '□' of model name is for power type. 'D' is 12-24VDC, 'X' is non-polarity 12-24VDC.

※The last 'V' of model name is for the model with oil-resistance reinforced cable.

※Environment resistance is rated at no freezing or condensation.

## ■ Specifications

### ● DC 3-wire type

Model	PR08-1.5DN PR08-1.5DP PR08-1.5DN2 PR08-1.5DP2 PRL08-1.5DN PRL08-1.5DP PRL08-1.5DN2 PRL08-1.5DP2	PR08-2DN PR08-2DP PR08-2DN2 PR08-2DP2 PRL08-2DN PRL08-2DP PRL08-2DN2 PRL08-2DP2	PR12-2DN PR12-2DP PR12-2DN2 PR12-2DP2 PRS12-2DN PRS12-2DP PRS12-2DN2 PRS12-2DP2	PR12-4DN PR12-4DP PR12-4DN2 PR12-4DP2 PRS12-4DN PRS12-4DP PRS12-4DN2 PRS12-4DP2 PRL12-4DN PRL12-4DP	PR18-5DN PR18-5DP PR18-5DN2 PR18-5DP2 PR18-5DN-V PRL18-5DN PRL18-5DP PRL18-5DN2 PRL18-5DP2	PR18-8DN PR18-8DP PR18-8DN2 PR18-8DP2 PRL18-8DN PRL18-8DP PRL18-8DN2 PRL18-8DP2	PR30-10DN PR30-10DP PR30-10DN2 PR30-10DP2 PRL30-10DN PRL30-10DP PRL30-10DN2 PRL30-10DP2	PR30-15DN PR30-15DP PR30-15DN2 PR30-15DP2 PRL30-15DN PRL30-15DP PRL30-15DN2 PRL30-15DP2
Appearances								
Sensing distance	1.5mm	2mm	2mm	4mm	5mm	8mm	10mm	15mm
Hysteresis	Max. 10% of sensing distance							
Standard sensing target	8×8×1mm(Iron)		12×12×1mm(Iron)		18×18×1mm (Iron)	25×25×1mm (Iron)	30×30×1mm (Iron)	45×45×1mm (Iron)
Setting distance	0 to 1.05mm	0 to 1.4mm	0 to 1.4mm	0 to 2.8mm	0 to 3.5mm	0 to 5.6mm	0 to 7mm	0 to 10.5mm
Power supply (Operation voltage)	12-24VDC (10-30VDC)							
Current consumption	Max. 10mA							
Response frequency <sup>※1</sup>	1.5kHz	1kHz	1.5kHz	500Hz		350Hz	400Hz	200kHz
Residual voltage	Max. 2.0V		Max. 1.5V					
Affection by Temp.	Max. ±10% for sensing distance at ambient temperature 20°C, PR08 Series : Max. ±20%							
Control output	Max. 200mA							
Insulation resistance	Min. 50MΩ(at 500VDC megger)							
Dielectric strength	1500VAC 50/60Hz for 1minute							
Vibration	1mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 2 hours							
Shock	500m/s <sup>2</sup> (approx. 50G) in X, Y, Z direction for 3 times							
Indicator	Operation indicator(red LED)							
Environment	Ambient temperature	-25 to 70°C, storage: -30 to 80°C						
	Ambient humidity	30 to 95%RH, storage: 35 to 95%RH						
Protection circuit	Surge protection circuit, Reverse polarity protection circuit, Overcurrent protection circuit							
Protection	IP67(IEC standard)							
Material	Case/Nut: Nickel plated Brass, Washer: Nickel plated Iron, Sensing surface: PBT, Standard cable(Black): Polyvinyl chloride(PVC), Oil resistant cable(Gray): Oil resistant Polyvinyl chloride(PVC)							
Cable	ø3.5mm, 3-wire, 2m (AWG24, Core diameter: 0.08mm, Number of cores: 40, Insulator diameter: ø1mm)		ø4mm, 3-wire, 2m		ø5mm, 3-wire, 2m			
	AWG22, Core diameter: 0.08mm, Number of cores: 60, Insulator diameter: ø1.25mm)							
Approval	CE							
Weight <sup>※2</sup>	PR: Approx. 64g(approx. 52g) PRL: Approx. 66g(approx. 54g)		PR: Approx. 84g(approx. 72g) PRS: Approx. 82g(approx. 70g) PRL: Approx. 88g(approx. 76g)		PR: Approx. 122g(approx. 110g) PRL: Approx. 142g(approx. 130g)		PR: Approx. 207g(approx. 170g) PRL: Approx. 247g(approx. 210g)	

※1: The response frequency is the average value. The standard sensing target is used and the width is set as 2 times of the standard sensing target, 1/2 of the sensing distance for the distance.

※2: The weight with packaging and the weight in parentheses is only unit weight.


※Environment resistance is rated at no freezing or condensation.

Photo electric sensor
Fiber optic sensor
Door/Area sensor
Proximity sensor
Pressure sensor
Rotary encoder
Connector/Socket
Temp. controller
SSR/Power controller
Counter
Timer
Panel meter
Tacho/Speed/ Pulse meter
Display unit
Sensor controller
Switching mode power supply
Stepper motor& Driver&Controller
Graphic/Logic panel
Field network device

## Selection Guide

### ■ Specifications

#### ● AC 2-wire type

Model	PR12-2AO PR12-2AC	PR12-4AO PR12-4AC	PR18-5AO PR18-5AC PRL18-5AO PRL18-5AC	PR18-8AO PR18-8AC PRL18-8AO PRL18-8AC	PR30-10AO PR30-10AC PRL30-10AO PRL30-10AC	PR30-15AO PR30-15AC PRL30-15AO PRL30-15AC
Appearances						
Sensing distance	2mm	4mm	5mm	8mm	10mm	15mm
Hysteresis	Max. 10% of sensing distance					
Standard sensing target	12×12×1mm(Iron)		18×18×1mm(Iron)	25×25×1mm(Iron)	30×30×1mm(Iron)	45×45×1mm(Iron)
Setting distance	0 to 1.4mm	0 to 2.8mm	0 to 3.5mm	0 to 5.6mm	0 to 7mm	0 to 10.5mm
Power supply (Operation voltage)	100-240VAC (85-264VAC)					
Leakage current	Max. 2.5mA					
Response frequency <sup>※1</sup>	20Hz					
Residual voltage	Max. 10V					
Affection by Temp.	Max. ±10% for sensing distance at ambient temperature 20°C					
Control output	5 to 150mA		5 to 200mA			
Insulation resistance	Min. 50MΩ(at 500VDC megger)					
Dielectric strength	2,500VAC 50/60Hz for 1minute					
Vibration	1mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 2 hours					
Shock	500m/s <sup>2</sup> (approx. 50G) in X, Y, Z direction for 3 times					
Indicator	Operation indicator(red LED)					
Environment	Ambient temperature	-25 to 70°C, storage: -30 to 80°C				
	Ambient humidity	30 to 95%RH, storage: 35 to 95%RH				
Protection circuit	Surge protection circuit					
Protection	IP67(IEC standard)					
Material	ø4, 2-wire, 2m		ø5, 2-wire, 2m			
	(AWG22, Core diameter: 0.08mm, Number of cores: 60, Insulator diameter: ø1.25)					
Insulation type	Double insulation or reinforced insulation (Mark: □, dielectric strength between the measuring input part and the power part: 1kV)					
Material	Case/Nut: Nickel plated Brass, Washer: Nickel plated Iron, Sensing surface: PBT, Standard cable(Black): Polyvinyl chloride(PVC)					
Approval	CE					
Weight <sup>※2</sup>	Approx. 84g(approx. 66g)		PR: Approx. 130g(approx. 118g) PRL: Approx. 142g(approx. 130g)		PR: Approx. 207g(approx. 170g) PRL: Approx. 245g(approx. 208g)	

※1: The response frequency is the average value. The standard sensing target is used and the width is set as 2 times of the standard sensing target, 1/2 of the sensing distance for the distance.

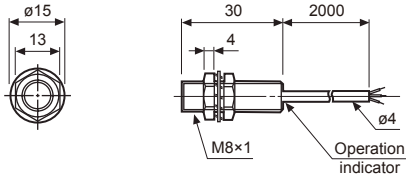
※2: The weight with packaging and the weight in parentheses is only unit weight.

※Environment resistance is rated at no freezing or condensation.

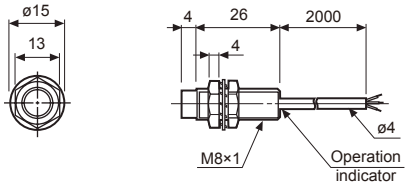
## ■ Dimensions

(unit: mm)

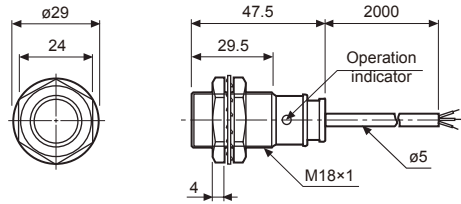
### ● PR(T)08-1.5D □



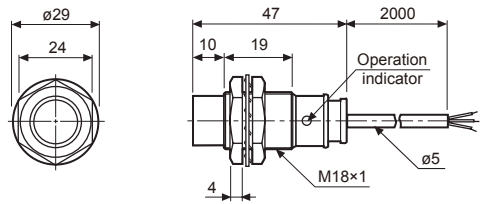
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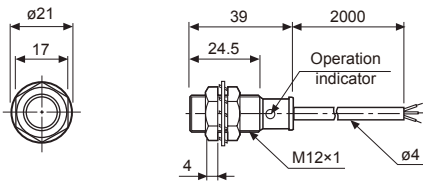
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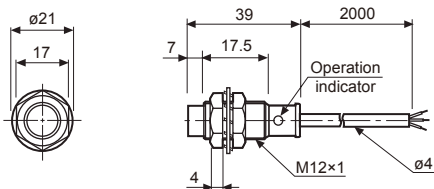
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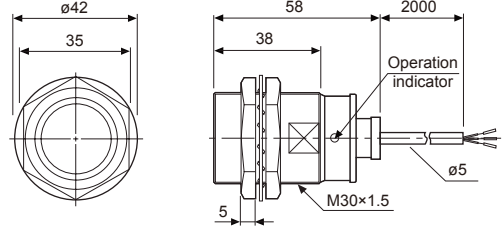
### ● PRS12-2D □



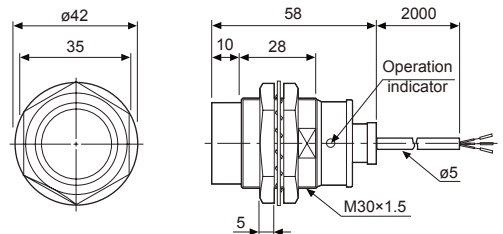
### ● PRS12-4D □



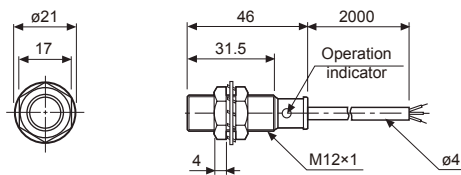
### ● PR(T)30-10D □



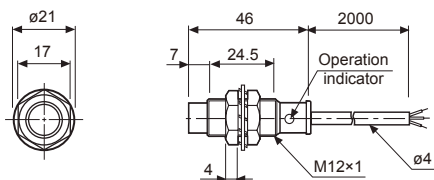
### ● PR(T)30-15D □



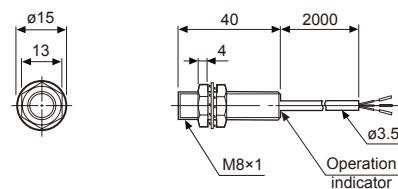
### ● PR(T)12-2D □



### ● PR(T)12-4D □



### ● PRL08-1.5D □



### ● PRL08-2D □

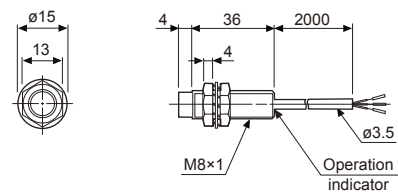


Photo electric sensor

Fiber optic sensor

Door/Area sensor

Proximity sensor

Pressure sensor

Rotary encoder

Connector/Socket

Temp. controller

SSR/ Power controller

Counter

Timer

Panel meter

Tacho/ Speed/ Pulse meter

Display unit

Sensor controller

Switching mode power supply

Stepper motor & Driver&Controller

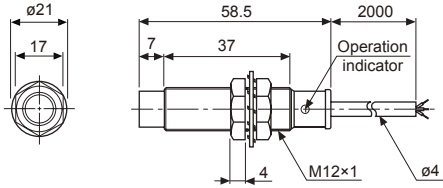
Graphic/ Logic panel

Field network device

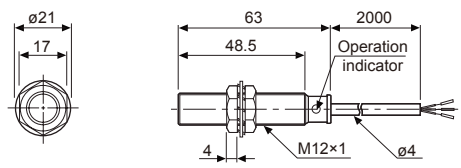
## ■ Dimensions

(unit: mm)

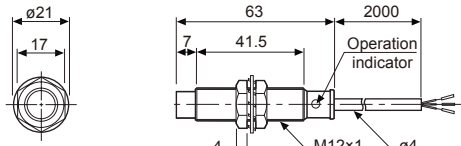
### ● PRL12-4D



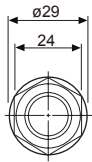
### ● PR12-2A



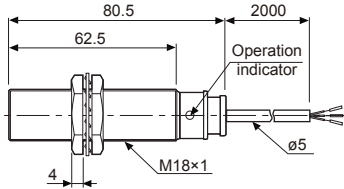
### ● PR12-4A



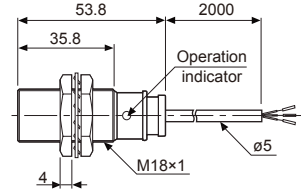
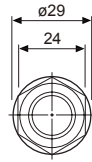
### ● PRL18-5D



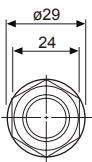
### ● PRL18-5A



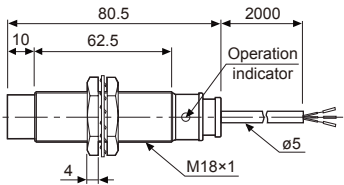
### ● PR18-5A



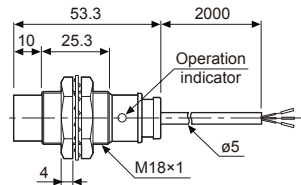
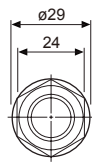
### ● PRL18-8D



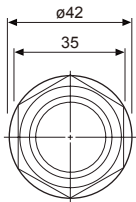
### ● PRL18-8A



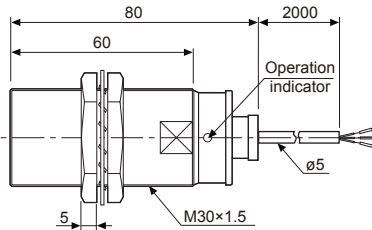
### ● PR18-8A



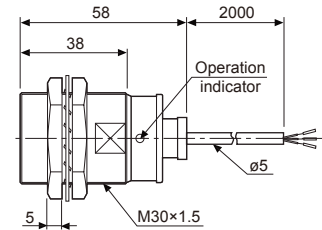
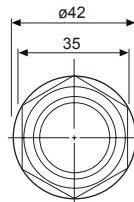
### ● PRL30-10D



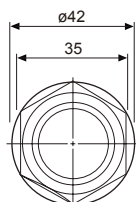
### ● PRL30-10A



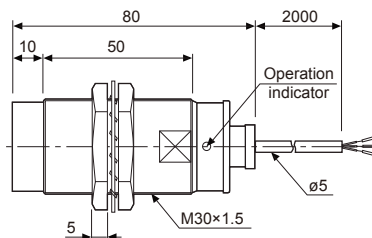
### ● PR30-10A



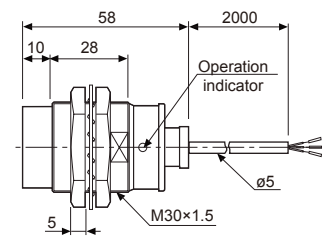
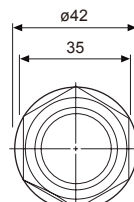
### ● PRL30-15D



### ● PRL30-15A



### ● PR30-15A






# Cylindrical cable connector type proximity sensor

## ● DC 2-wire type

※When the □ model name is X, it is non-polarity model.

Model	PRWT08-1.5DO PRWT08-1.5DC PRWT08-1.5DO-I PRWT08-1.5DC-I PRWT08-1.5DO-V PRWT08-1.5DC-V PRWT08-1.5DO-IV PRWT08-1.5DC-IV	PRWT08-2DO PRWT08-2DC PRWT08-2DO-I PRWT08-2DC-I PRWT08-2DO-IV PRWT08-2DC-IV	PRWT12-2□DO PRWT12-2□DC PRWT12-2□DO-I PRWT12-2□DC-I	PRWT12-4□DO PRWT12-4□DC PRWT12-4□DO-I PRWT12-4□DC-I	PRWT18-5□DO PRWT18-5□DC PRWT18-5□DO-I PRWT18-5□DC-I	PRWT18-8□DO PRWT18-8□DC PRWT18-8□DO-I PRWT18-8□DC-I	PRWT30-10□DO PRWT30-10□DC PRWT30-10□DO-I PRWT30-10□DC-I PRWT30-10□DO-IV PRWT30-10□DC-IV	PRWT30-15□DO PRWT30-15□DC PRWT30-15□DO-I PRWT30-15□DC-I PRWT30-15□DO-V PRWT30-15□DC-V
Appearances	<p><b>Line-up 2-wire non-polarity</b></p>  <p>CE</p>							
Sensing distance	1.5mm	2mm	4mm	5mm	8mm	10mm	15mm	
Hysteresis	Max. 10% of sensing distance							
Standard sensing target	8×8×1mm(Iron)		12×12×1mm(Iron)		18×18×1mm(Iron)	25×25×1mm(Iron)	30×30×1mm(Iron)	45×45×1mm(Iron)
Setting distance	0 to 1.05mm	0 to 1.4mm	0 to 2.8mm	0 to 3.5mm	0 to 5.6mm	0 to 7mm	0 to 10.5mm	
Power supply (Operation voltage)	12-24VDC (10-30VDC)							
Leakage current	Max. 0.6mA							
Response frequency※1	1.5kHz	1kHz	1.5kHz	500Hz	350Hz	400Hz	200Hz	
Residual voltage※2	Max. 3.5V(Non-polarity type is Max. 5V)							
Affection by Temp.	Max. ±10% for sensing distance at ambient temperature 20°C(for PRWT08 Series : ±20% Max.)							
Control output	2 to 100mA							
Insulation resistance	Min. 50MΩ(at 500VDC meggera)							
Dielectric strength	1500VAC 50/60Hz for 1 minute							
Vibration	1mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 2 hours							
Shock	500m/s <sup>2</sup> (approx. 50G) in each of X, Y, Z directions for 3 times							
Indicator	Operation indicator(red LED)							
Environment	Ambient temperature	-25 to 70°C, storage: -30 to 80°C						
	Ambient humidity	35 to 95%RH, storage: 35 to 95%RH						
Protection circuit	Surge protection circuit		Surge protection circuit, Overcurrent protection circuit					
Protection	IP67(IEC standard)							
Material	Case/Nut: Nickel plated Brass, Washer: Nickel plated Iron, Sensing surface: PBT, Standard cable(Black): Polyvinyl chloride(PVC), Oil resistant cable(Gray): Oil resistant Polyvinyl chloride(PVC)							
Cable	ø4mm, 2-wire, 300mm, M12 connector				ø5mm, 2-wire, 300mm, M12 connector			
Approval	CE							
Unit weight※3	Approx. 44g(approx. 32g)		Approx. 54g(approx. 42g)		Approx.70g(approx. 58g)		Approx. 134g(approx. 122g)	

※1: The response frequency is the average value. The standard sensing target is used and the width is set as 2 times of the standard sensing target, 1/2 of the sensing distance for the distance.

※2: Before using non-polarity type, check the condition of connected device because residual voltage is 5V.

※3: The weight with packaging and the weight in parentheses is only unit weight.

※Please fasten the vibration part with Teflon tape.

※The '□' of model name is for power type. 'D' is 12-24VDC, 'X' is non-polarity 12-24VDC.

※The last 'V' of model name is for the model with oil-resistance reinforced cable.

※Environment resistance is rated at no freezing or condensation.

Photo electric sensor

Fiber optic sensor

Door/Area sensor

Proximity sensor

Pressure sensor

Rotary encoder

Connector/Socket

Temp. controller

SSR/Power controller

Counter

Timer

Panel meter

Tacho/Speed/ Pulse meter

Display unit

Sensor controller

Switching mode power supply

Stepper motor& Driver&Controller


Graphic/Logic panel

Field network device


# Selection Guide

## ■ Specifications

### ● DC 3-wire type

Model	PRW08-1.5DN PRW08-1.5DP PRW08-1.5DN2 PRW08-1.5DP2 PRW08-1.5DN-V PRW08-1.5DP-V PRWL08-1.5DN PRWL08-1.5DP PRWL08-1.5DN2 PRWL08-1.5DP2	PRW08-2DN PRW08-2DP PRW08-2DN2 PRW08-2DP2 PRW08-2DN-V PRW08-2DP-V PRWL08-2DN PRWL08-2DP PRWL08-2DN2 PRWL08-2DP2	PRW12-2DN PRW12-2DP PRW12-2DN2 PRW12-2DP2	PRW12-4DN PRW12-4DP PRW12-4DN2 PRW12-4DP2	PRW18-5DN PRW18-5DP PRW18-5DN2 PRW18-5DP2 PRWL18-5DN PRWL18-5DP PRWL18-5DN2 PRWL18-5DP2	PRW18-8DN PRW18-8DP PRW18-8DN2 PRW18-8DP2 PRWL18-8DN PRWL18-8DP PRWL18-8DN2 PRWL18-8DP2	PRW30-10DN PRW30-10DP PRW30-10DN2 PRW30-10DP2 PRW30-10DN-V PRW30-10DP-V PRWL30-10DN PRWL30-10DP PRWL30-10DN2 PRWL30-10DP2	PRW30-15DN PRW30-15DP PRW30-15DN2 PRW30-15DP2 PRW30-15DN-V PRW30-15DP-V PRWL30-15DN PRWL30-15DP PRWL30-15DN2 PRWL30-15DP2
Appearances								
Sensing distance	1.5mm	2mm	4mm	5mm	8mm	10mm	15mm	
Hysteresis	Max. 10% of sensing distance							
Standard sensing target	8×8×1mm(Iron)		12×12×1mm(Iron)		18×18×1mm(Iron)	25×25×1mm(Iron)	30×30×1mm(Iron)	45×45×1mm(Iron)
Setting distance	0 to 1.05mm	0 to 1.4mm		0 to 2.8mm	0 to 3.5mm	0 to 5.6mm	0 to 7mm	0 to 10.5mm
Power supply (Operation voltage)	12-24VDC (10-30VDC)							
Current consumption	Max. 10mA							
Response frequency <sup>*1</sup>	1.5kHz	1kHz	1.5kHz	500Hz		350Hz	400Hz	200Hz
Residual voltage	Max. 2V		Max. 1.5V					
Affection by Temp.	Max. ±10% for sensing distance at ambient temperature 20°C(for PRW(L)08 series : ±20% Max.)							
Control output	200mA							
Insulation resistance	Min. 50MΩ(at 500VDC megger)							
Dielectric strength	1500VAC 50/60Hz for 1minute							
Vibration	1mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 2 hours							
Shock	500m/s <sup>2</sup> (approx. 50G) in each of X, Y, Z directions for 3 times							
Indicator	Operation indicator(red LED)							
Environment	Ambient temperature: -25 to 70°C, storage: -30 to 80°C Ambient humidity: 35 to 95%RH, storage: 35 to 95%RH							
Protection circuit	Surge protection circuit, Reverse polarity protection circuit, Overcurrent protection circuit							
Protection	IP67(IEC standard)							
Material	Case/Nut: Nickel plated Brass, Washer: Nickel plated Iron, Sensing surface: PBT, Standard cable(Black): Polyvinyl chloride(PVC), Oil resistant cable(Gray): Oil resistant Polyvinyl chloride(PVC)							
Cable	ø4mm, 3-wire, 300mm, M12 connector				ø5mm, 3-wire, 300mm, M12 connector			
Approval	CE							
Unit weight <sup>*2</sup>	PRW: Approx. 44g(approx. 32g) PRWL: Approx. 46g(approx. 34g)		Approx. 54g(approx. 42g)		PRW: Approx. 70g(approx. 58g) PRWL: Approx. 90g(approx. 78g)		PRW: Approx. 134g(approx. 122g) PRWL: Approx. 195g(approx. 158g)	

### ● AC 2-wire type

Model	PRW12-2AO PRW12-2AC	PRW12-4AO PRW12-4AC	PRW18-5AO PRW18-5AC PRWL18-5AO PRWL18-5AC	PRW18-8AO PRW18-8AC PRWL18-8AO PRWL18-8AC	PRW30-10AO PRW30-10AC PRWL30-10AO PRWL30-10AC	PRW30-15AO PRW30-15AC PRWL30-15AO PRWL30-15AC
Appearances						
Sensing distance	2mm	4mm	5mm	8mm	10mm	15mm
Hysteresis	Max. 10% of sensing distance					
Standard sensing target	12×12×1mm(Iron)		18×18×1mm(Iron)	25×25×1mm(Iron)	30×30×1mm(Iron)	45×45×1mm(Iron)
Setting distance	0 to 1.4mm	0 to 2.8mm		0 to 3.5mm	0 to 5.6mm	0 to 10.5mm
Power supply (Operation voltage)	100-240VAC (85-264VAC)					
Leakage current	Max. 2.5mA					

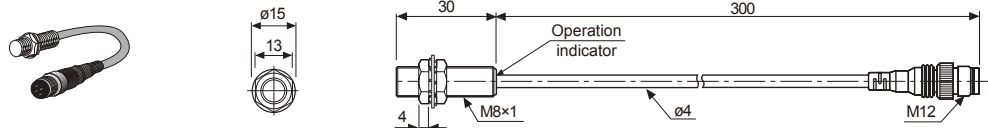
Model	PRW12-2AO PRW12-2AC	PRW12-4AO PRW12-4AC	PRW18-5AO PRW18-5AC PRWL18-5AO PRWL18-5AC	PRW18-8AO PRW18-8AC PRWL18-8AO PRWL18-8AC	PRW30-10AO PRW30-10AC PRWL30-10AO PRWL30-10AC	PRW30-15AO PRW30-15AC PRWL30-15AO PRWL30-15AC
Response frequency <sup>※1</sup>	20Hz					
Residual voltage	Max. 10V					
Affection by Temp.	Max. ±10% for sensing distance at ambient temperature 20°C					
Control output	5 to 150mA			5 to 200mA		
Insulation resistance	Min. 50MΩ(at 500VDC megger)					
Dielectric strength	2,500VAC 50/60Hz for 1minute					
Vibration	1mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 2 hours					
Shock	500m/s <sup>2</sup> (approx. 50G) in each of X, Y, Z directions for 3 times					
Indicator	Operation indicator(red LED)					
Environment	Ambient temperature	-25 to 70°C, storage: -30 to 80°C				
	Ambient humidity	35 to 95%RH, storage: 35 to 95%RH				
Protection circuit	Surge protection circuit					
Protection	IP67(IEC standard)					
Material	Case/Nut: Nickel plated Brass, Washer: Nickel plated Iron, Sensing surface: PBT, Standard cable(Black): Polyvinyl chloride(PVC)					
Cable	ø4mm, 2-wire, 300mm, M12 connector			ø5mm, 2-wire, 300mm, M12 connector		
Approval	<b>CE</b>					
Unit weight <sup>※2</sup>	Approx. 54g(approx. 42g)		PRW: Approx. 78g (approx. 66g) PRWL: Approx. 90g (approx. 78g)		PRW: Approx. 134g(approx. 122g) PRWL: Approx. 195g(approx. 158g)	

※1: The response frequency is the average value. The standard sensing target is used and the width is set as 2 times of the standard sensing target, 1/2 of the sensing distance for the distance.  
 ※2: The weight with packaging and the weight in parentheses is only unit weight.  
 ※The last 'V' of model name is for the model with oil-resistance reinforced cable. ※ Environment resistance is rated at no freezing or condensation.

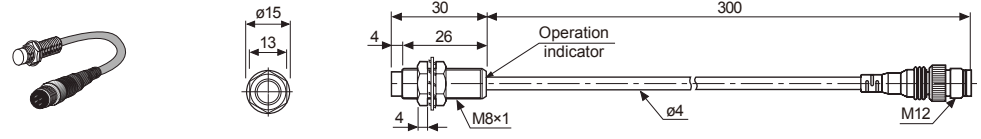
## ■ Dimensions

(unit: mm)

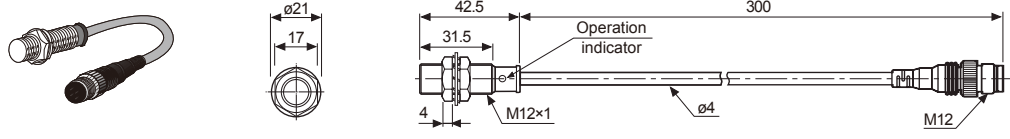
- PRWT08-1.5D□(-I) • PRW08-1.5D□



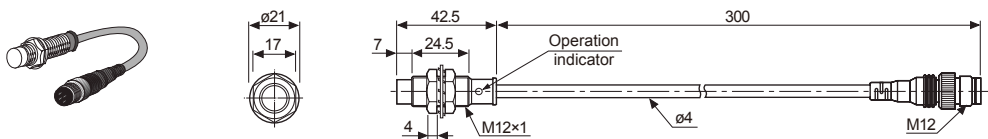
- PRWT08-2D□(-I) • PRW08-2D□



- PRWT12-2D□(-I) • PRW12-2D□



- PRWT12-4D□(-I) • PRW12-4D□

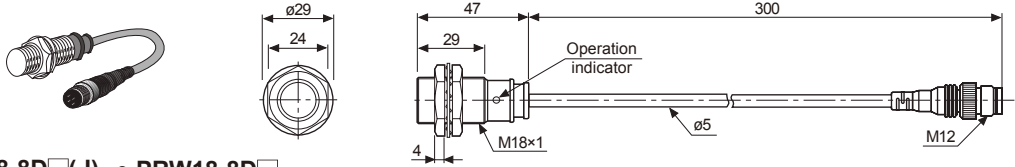


# Selection Guide

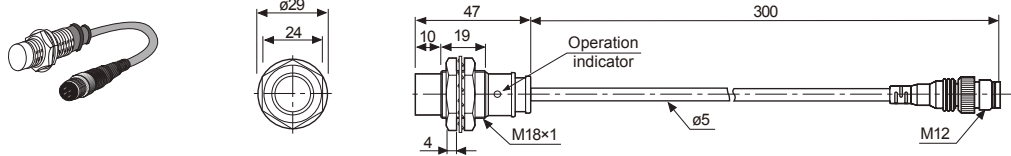
## ■ Dimensions

(unit: mm)

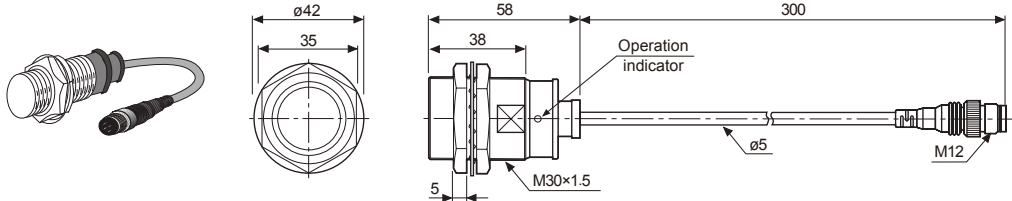
● PRWT18-5D□(-I) ● PRW18-5D□



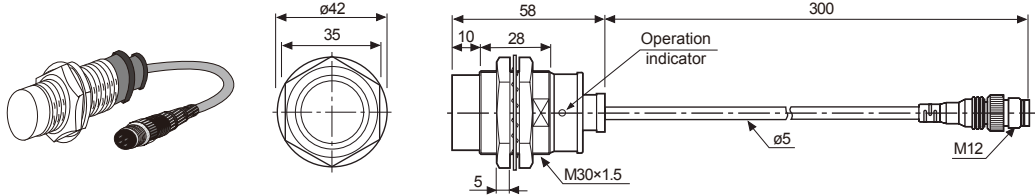
● PRWT18-8D□(-I) ● PRW18-8D□



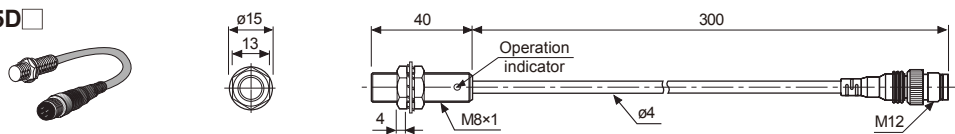
● PRWT30-10D□(-I) ● PRW30-10D□



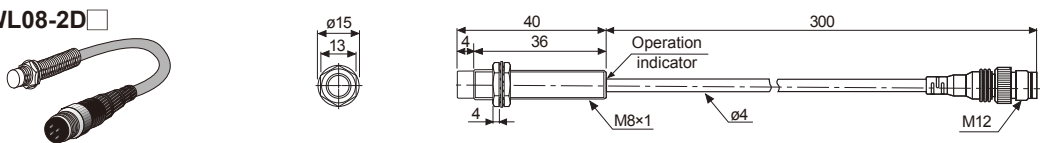
● PRWT30-15D□(-I) ● PRW30-15D□



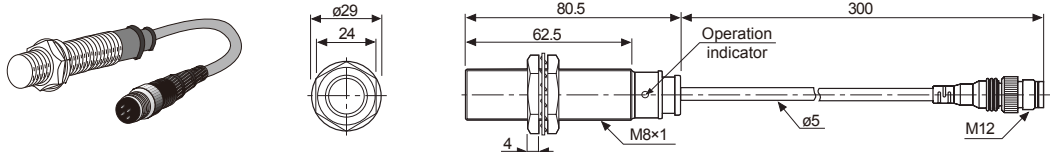
● PRWL08-1.5D□



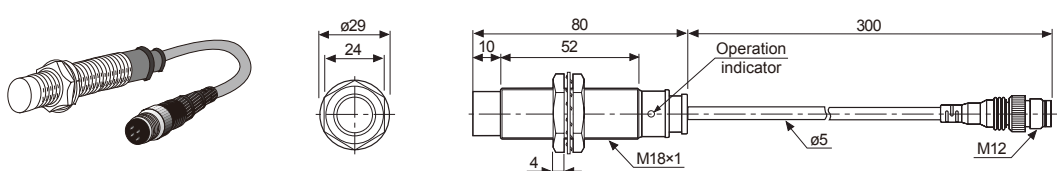
● PRWL08-2D□



● PRWL18-5D□ ● PRWL18-5A□



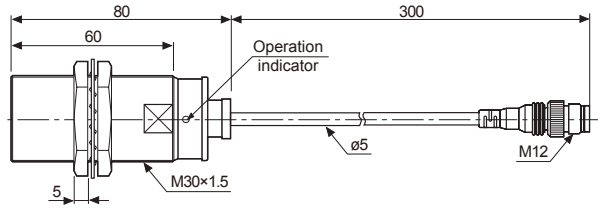
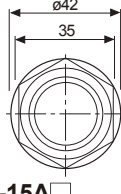
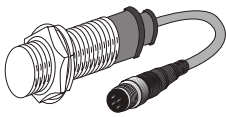
● PRWL18-8D□ ● PRWL18-8A□



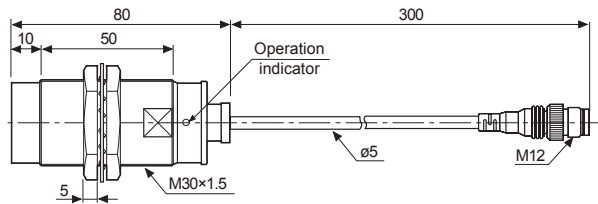
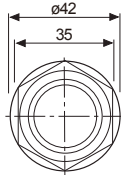
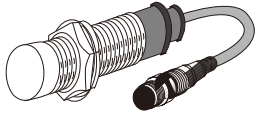
## Dimensions

(unit: mm)

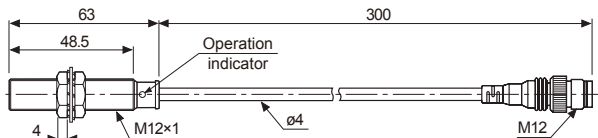
- PRWL30-10D
- PRWL30-10A



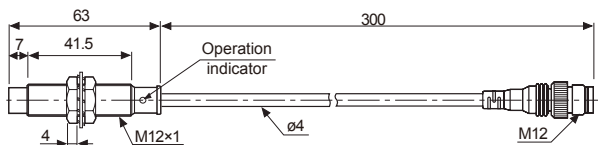
- PRWL30-15D
- PRWL30-15A



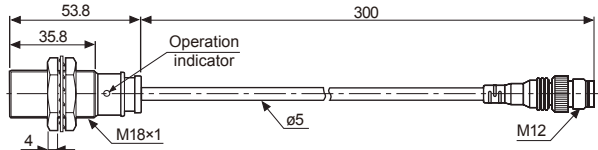
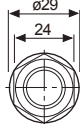
- PRW12-2A



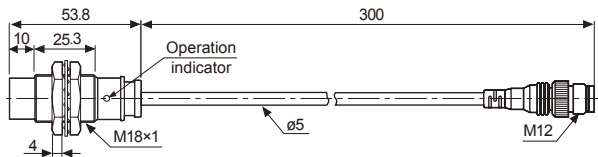
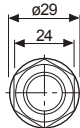
- PRW12-4A



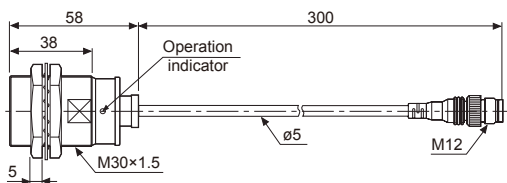
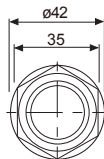
- PRW18-5A



- PRW18-8A



- PRW30-10A



- PRW30-15A

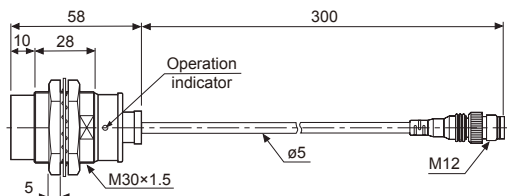
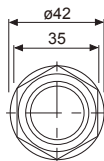



Photo electric sensor
Fiber optic sensor
Door/Area sensor
Proximity sensor
Pressure sensor
Rotary encoder
Connector/Socket
Temp. controller
SSR/Power controller
Counter
Timer
Panel meter
Tacho/Speed/Pulse meter
Display unit
Sensor controller
Switching mode power supply
Stepper motor & Driver&Controller
Graphic/Logic panel
Field network device

## Cylindrical connector type proximity sensor

### ■ Specifications

#### ● DC 2-wire type

Model	PRCMT12-2DO PRCMT12-2DC PRCMT12-2DO-I PRCMT12-2DC-I	PRCMT12-4DO PRCMT12-4DC PRCMT12-4DO-I PRCMT12-4DC-I	PRCMT18-5DO PRCMT18-5DC PRCMT18-5DO-I PRCMT18-5DC-I	PRCMT18-8DO PRCMT18-8DC PRCMT18-8DO-I PRCMT18-8DC-I	PRCMT30-10DO PRCMT30-10DC PRCMT30-10DO-I PRCMT30-10DC-I	PRCMT30-15DO PRCMT30-15DC PRCMT30-15DO-I PRCMT30-15DC-I
Appearances						
Sensing distance	2mm	4mm	5mm	8mm	10mm	15mm
Hysteresis	Max. 10% of sensing distance					
Standard sensing target	12×12×1mm(Iron)		18×18×1mm(Iron)	25×25×1mm(Iron)	30×30×1mm(Iron)	45×45×1mm(Iron)
Setting distance	0 to 1.4mm	0 to 2.8mm	0 to 3.5mm	0 to 5.6mm	0 to 7mm	0 to 10.5mm
Power supply (Operating voltage)	12-24VDC (10-30VDC)					
Leakage current	Max. 0.6mA					
Response frequency <sup>※1</sup>	1.5kHz	500Hz	350Hz	400Hz	200Hz	
Residual voltage	Max. 3.5V					
Affection by Temp.	Max. ±10% for sensing distance at ambient temperature 20°C					
Control output	2 to 100mA					
Insulation resistance	Min. 50MΩ(at 500VDC megger)					
Dielectric strength	1500VAC 50/60Hz for 1minute					
Vibration	1mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 2 hours					
Shock	500m/s <sup>2</sup> (approx. 50G) in each of X, Y, Z directions for 3 times					
Indicator	Operation indicator(red LED)					
Environment	Ambient temperature: -25 to 70°C, storage: -30 to 80°C					
	Ambient humidity: 35 to 95%RH, storage: 35 to 95%RH					
Protection circuit	Surge protection circuit, Overcurrent protection					
Protection	IP67(IEC Standard)					
Material	Case/Nut: Nickel plated Brass, Washer: Nickel plated Iron, Sensing surface: PBT Standard Cable(Black): Polyvinyl chloride(PVC), Oil resistant cable(Gray): Oil resistant Polyvinyl chloride(PVC)					
Approval	CE					
Weight <sup>※2</sup>	Approx. 38g(approx. 26g)		Approx. 60g(approx. 48g)		Approx. 154g(approx. 142g)	

※1: The response frequency is the average value. The standard sensing target is used and the width is set as 2 times of the standard sensing target, 1/2 of the sensing distance for the distance.


※2: The weight with packaging and the weight in parentheses is only unit weight.

※ There is IEC standard connector cable. Refer to the 148 page about IEC standard connector wires and specifications.

※ Environment resistance is rated at no freezing or condensation.

## ■ Specifications

### ● DC 3-wire type

Model	PRCM12-2DN PRCM12-2DP PRCM12-2DN2 PRCM12-2DP2	PRCM12-4DN PRCM12-4DP PRCM12-4DN2 PRCM12-4DP2	PRCM18-5DN PRCM18-5DP PRCM18-5DN2 PRCM18-5DP2 PRCML18-5DN PRCML18-5DP PRCML18-5DN2 PRCML18-5DP2	PRCM18-8DN PRCM18-8DP PRCM18-8DN2 PRCM18-8DP2 PRCML18-8DN PRCML18-8DP PRCML18-8DN2 PRCML18-8DP2	PRCM30-10DN PRCM30-10DP PRCM30-10DN2 PRCM30-10DP2 PRCML30-10DN PRCML30-10DP PRCML30-10DN2 PRCML30-10DP2	PRCM30-15DN PRCM30-15DP PRCM30-15DN2 PRCM30-15DP2 PRCML30-15DN PRCML30-15DP PRCML30-15DN2 PRCML30-15DP2
Appearances						
Sensing distance	2mm	4mm	5mm	8mm	10mm	15mm
Hysteresis	Max. 10% of sensing distance					
Standard sensing target	12×12×1mm(Iron)		18×18×1mm(Iron)	25×25×1mm(Iron)	30×30×1mm(Iron)	45×45×1mm(Iron)
Sensing distance	0 to 1.4mm	0 to 2.8mm	0 to 3.5mm	0 to 5.6mm	0 to 7mm	0 to 10.5mm
Power supply (Operating voltage)	12-24VDC (10-30VDC)					
Current consumption	Max. 10mA					
Response frequency <sup>※1</sup>	1.5kHz	500kHz	500kHz	350kHz	400kHz	200kHz
Residual voltage	Max. 1.5V					
Affection by Temp.	Max. ±10% for sensing distance at ambient temperature 20°C					
Control output	Max. 200mA					
Insulation resistance	Min. 50MΩ(at 500VDC megger)					
Dielectric strength	1500VAC 50/60Hz for 1minute					
Vibration	1mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 2 hours					
Shock	500m/s <sup>2</sup> (approx. 50G) in each of X, Y, Z directions for 3 times					
Indicator	Operation indicator(red LED)					
Environment	Ambient temperature	-25 to 70°C, storage: -30 to 80°C				
	Ambient humidity	35 to 95%RH, storage: 35 to 95%RH				
Protection circuit	Surge protection circuit, Reverse polarity protection circuit, Overcurrent protection					
Protection	IP67(IEC Standard)					
Material	Case/Nut: Nickel plated Brass, Washer: Nickel plated Iron, Sensing surface: PBT					
Approval	CE					
Weight <sup>※2</sup>	Approx. 38g(approx. 26g)		PRCM: Approx. 61g(approx. 49g) PRCML: Approx. 85g(approx. 73g)		PRCM: Approx. 146g(approx. 134g) PRCML: Approx. 181g(approx. 169g)	

※1: The response frequency is the average value. The standard sensing target is used and the width is set as 2 times of the standard sensing target, 1/2 of the sensing distance for the distance.

※2: The weight with packaging and the weight in parentheses is only unit weight.

※Environment resistance is rated at no freezing or condensation.

Photo electric sensor

Fiber optic sensor

Door/Area sensor

Proximity sensor

Pressure sensor

Rotary encoder

Connector/Socket

Temp. controller

SSR/Power controller

Counter

Timer

Panel meter

Tacho/Speed/Pulse meter

Display unit

Sensor controller

Switching mode power supply


Stepper motor & Driver&Controller

Graphic/Logic panel

Field network device

## ■ Specifications

### ● AC 2-wire type

Model	PRCM12-2AO PRCM12-2AC	PRCM12-4AO PRCM12-4AC	PRCM18-5AO PRCM18-5AC PRCML18-5AO PRCML18-5AC	PRCM18-8AO PRCM18-8AC PRCML18-8AO PRCML18-8AC	PRCM30-10AO PRCM30-10AC PRCML30-10AO PRCML30-10AC	PRCM30-15AO PRCM30-15AC PRCML30-15AO PRCML30-15AC
Appearances						
Sensing distance	2mm	4mm	5mm	8mm	10mm	15mm
Hysteresis	Max. 10% of sensing distance					
Standard sensing target	12×12×1mm(Iron)		18×18×1mm(Iron)	25×25×1mm(Iron)	30×30×1mm(Iron)	45×45×1mm(Iron)
Sensing distance	0 to 1.4mm	0 to 2.8mm	0 to 3.5mm	0 to 5.6mm	0 to 7mm	0 to 10.5mm
Power supply (Operating voltage)	100-240VAC (85-264VAC)					
Leakage current	Max. 2.5mA					
Response frequency <sup>※1</sup>	20Hz					
Residual voltage	Max. 10V					
Affection by Temp.	Max. ±10% for sensing distance at ambient temperature 20°C					
Control output	5 to 150mA		5 to 200mA			
Insulation resistance	Min. 50MΩ(at 500VDC megger)					
Dielectric strength	2,500VAC 50/60Hz for 1minute					
Vibration	1mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 2 hours					
Shock	500m/s <sup>2</sup> (approx. 50G) in each of X, Y, Z directions for 3 times					
Indicator	Operation indicator(red LED)					
Environment	Ambient temperature	-25 to 70°C, storage: -30 to 80°C				
	Ambient humidity	35 to 95%RH, storage: 35 to 95%RH				
Protection circuit	Surge protection circuit					
Protection	IP67(IEC Standard)					
Insulation type	Double insulation or reinforced insulation (Mark: <input type="checkbox"/> , dielectric strength between the measuring input part and the power part: 1kV)					
Material	Case/Nut: Nickel plated Brass, Washer: Nickel plated Iron, Sensing surface: PBT					
Approval	CE					
Weight <sup>※2</sup>	Approx. 42g(approx. 30g)		PRCM: Approx. 66g(approx. 54g) PRCML: Approx. 78g(approx. 66g)		PRCM: Approx. 154g(approx. 142g) PRCML: Approx. 194g(approx. 182g)	

※1: The response frequency is the average value. The standard sensing target is used and the width is set as 2 times of the standard sensing target, 1/2 of the sensing distance for the distance.

※2: The weight with packaging and the weight in parentheses is only unit weight.

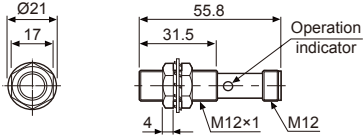
※Environment resistance is rated at no freezing or condensation.



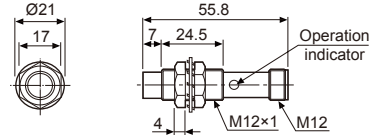
## ■ Dimensions

(unit: mm)

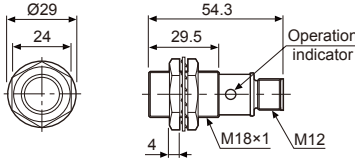
● **PRCM12-2D□ / PRCMT12-2D□(-I)**



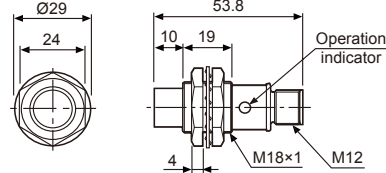
● **PRCM12-4D□ / PRCMT12-4D□(-I)**



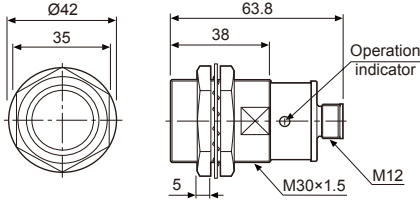
● **PRCM18-5D□ / PRCMT18-5D□(-I)**



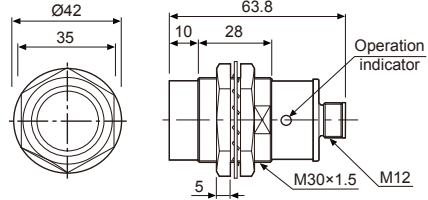
● **PRCM18-8D□ / PRCMT18-8D□(-I)**



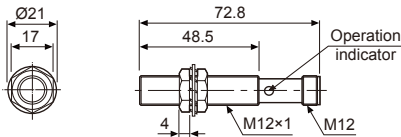
● **PRCM30-10D□ / PRCMT30-10D□(-I)**



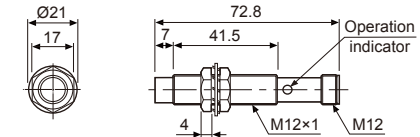
● **PRCM30-15D□ / PRCMT30-15D□(-I)**



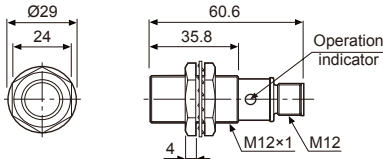
● **PRCM12-2A□**



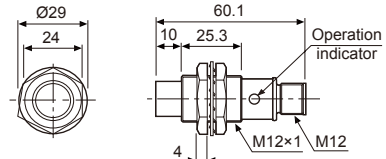
● **PRCM12-4A□**



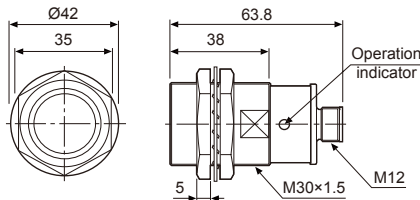
● **PRCM18-5A□**



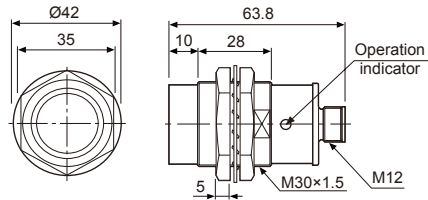
● **PRCM18-8A□**



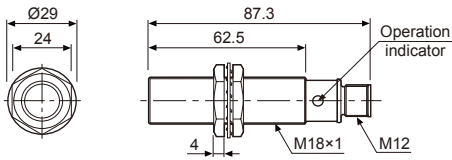
● **PRCM30-10A□**



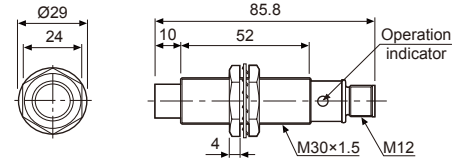
● **PRCM30-15A□**



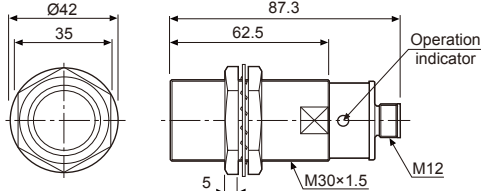
● **PRCML18-5D□ / PRCML18-5A□**



● **PRCML18-8D□ / PRCML18-8A□**



● **PRCML18-5D□ / PRCML18-5A□**



● **PRCML30-15D□ / PRCML30-15A□**

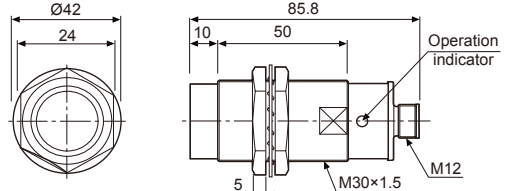



Photo electric sensor
Fiber optic sensor
Door/Area sensor
Proximity sensor
Pressure sensor
Rotary encoder
Connector/Socket
Temp. controller
SSR/Power controller
Counter
Timer
Panel meter
Tacho/Speed/Pulse meter
Display unit
Sensor controller
Switching mode power supply
Stepper motor& Driver&Controller
Graphic/Logic panel
Field network device

## Spatter-resistance type proximity sensor

### ■ Specifications

#### ● DC 2-wire type

※When the □ model name is X, it is non-polarity model.

Model	PRAT12-2□□O PRAT12-2□□C	PRAWT12-2□□O PRAWT12-2□□C PRAWT12-2□□O-I PRAWT12-2□□C-I	PRAT18-5□□O PRAT18-5□□C	PRAWT18-5□□O PRAWT18-5□□C PRAWT18-5□□O-I PRAWT18-5□□C-I	PRAT30-10□□O PRAT30-10□□C	PRAWT30-10□□O PRAWT30-10□□C PRAWT30-10□□O-I PRAWT30-10□□C-I
Appearances	<div style="display: flex; align-items: center;"> <div style="margin-right: 20px;"> <p>Line-up 2-wire non-polarity</p> <p>CE</p> </div>  </div>					
Sensing distance	2mm		5mm		10mm	
Hysteresis	Max. 10% of sensing distance					
Standard sensing target	12×12×1mm(Iron)		18×18×1mm(Iron)		30×30×1mm(Iron)	
Setting distance	0 to 1.4mm		0 to 3.5mm		0 to 7mm	
Power supply (Operating voltage)	12-24VDC (10 -30VDC)					
Leakage current	Max. 0.6mA					
Response frequency <sup>※1</sup>	1.5kHz		500Hz		400Hz	
Residual voltage <sup>※2</sup>	Max. 3.5V(Non-polarity type is Max. 5V)					
Affection by Temp.	Max. ±10% for sensing distance at ambient temperature 20°C					
Control output	2 to 100mA					
Insulation resistance	Min. 50MΩ(at 500VDC megger)					
Dielectric strength	1500VAC 50/60Hz for 1 minute(between all terminals and case)					
Vibration	1mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 2 hours					
Shock	500m/s <sup>2</sup> (approx. 50G) in each of X, Y, Z directions for 3 times					
Indicator	Operation indicator(red LED)					
Environment	Ambient temperature	-25 to 70°C, storage: -30 to 80°C				
	Ambient humidity	35 to 95%RH, storage: 35 to 95%RH				
Protection circuit	Surge protection circuit, Overcurrent protection circuit					
Protection	IP67(IEC standard)					
Cable	ø4mm, 2-wire, 2m		ø5mm, 2-wire, 2m			
	(for cable type, 300mm, M12 connector), (AWG22, Core diameter: 0.08mm, Number of cores: 60, Insulator diameter: ø1.25mm)					
Material	Case/Nut: Teflon coated Brass, Washer: Teflon coated Iron, Sensing surface: Teflon, Standard cable(Black): Polyvinyl chloride(PVC)					
Approval	CE					
Weight <sup>※3</sup>	Approx. 84g (approx. 72g)	Approx. 54g (approx. 42g)	Approx. 122g (approx. 110g)	Approx. 70g (approx. 58g)	Approx. 207g (approx. 170g)	Approx. 134g (approx. 122g)

※1: The response frequency is the average value. The standard sensing target is used and the width is set as 2 times of the standard sensing target, 1/2 of the sensing distance for the distance.

※2: Before using non-polarity type, check the condition of connected device because residual voltage is 5V.

※3: The weight with packaging and the weight in parentheses is only unit weight.


※Environment resistance is rated at no freezing or condensation.

※Refer to the 148 page for IEC standard connector cables and specifications.

※The '□' of model name is for power type. 'D' is 12-24VDC, 'X' is non-polarity 12-24VDC.

## ■ Specifications

### ● DC 3-wire type

Model	PRA12-2DN PRA12-2DP PRA12-2DN2 PRA12-2DP2	PRA18-5DN PRA18-5DP PRA18-5DN2 PRA18-5DP2	PRA30-10DN PRA30-10DP PRA30-10DN2 PRA30-10DP2
Appearances			
Sensing distance	2mm	5mm	10mm
Hysteresis	Max. 10% of sensing distance		
Standard sensing target	12×12×1mm(Iron)	18×18×1mm(Iron)	30×30×1mm(Iron)
Setting distance	0 to 1.4mm	0 to 3.5mm	0 to 7mm
Power supply (Operating voltage)	12-24VDC (10-30VDC)		
Current consumption	Max. 10mA		
Response frequency <sup>※1</sup>	1.5kHz	500Hz	400Hz
Residual voltage	Max. 1.5V		
Affection by Temp.	Max. ±10% for sensing distance at ambient temperature 20°C		
Control output	Max. 200mA		
Insulation resistance	Min. 50MΩ(at 500VDC megger)		
Dielectric strength	1500VAC 50/60Hz for 1 minute		
Vibration	1mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 2 hours		
Shock	500m/s <sup>2</sup> (approx. 50G) in each of X, Y, Z directions for 3 times		
Indicator	Operation indicator(red LED)		
Environment	Ambient temperature -25 to 70°C, storage: -30 to 80°C		
	Ambient humidity 35 to 95%RH, storage: 35 to 95%RH		
Protection circuit	Surge protection circuit, Reverse polarity protection circuit, Overcurrent protection circuit		
Protection	IP67(IEC standard)		
Cable	ø4mm, 3-wire, 2m		ø5mm, 2-wire, 2m
	(AWG22, Core diameter: 0.08mm, Number of cores: 60, Insulator diameter: ø1.25mm)		
Material	Case/Nut: Teflon coated Brass, Washer: Teflon coated Iron, Sensing surface: Teflon, Standard cable(Black): Polyvinyl chloride(PVC)		
Approval	CE		
Weight <sup>※2</sup>	Approx. 84g(approx. 72g)	Approx. 122g(approx. 110g)	Approx. 207g(approx. 170g)

### ● AC 2-wire type


Model	PRA12-2AO PRA12-2AC	PRA18-5AO PRA18-5AC	PRA30-10AO PRA30-10AC
Appearances			
Sensing distance	2mm	5mm	10mm
Hysteresis	Max. 10% of sensing distance		
Standard sensing target	12×12×1mm(Iron)	18×18×1mm(Iron)	30×30×1mm(Iron)
Setting distance	0 to 1.4mm	0 to 3.5mm	0 to 7mm
Power supply (Operating voltage)	100-240VAC (85-264VAC)		
Leakage current	Max. 2.5mA		
Response frequency <sup>※1</sup>	20Hz		
Residual voltage	Max. 10V		
Affection by Temp.	Max. ±10% for sensing distance at ambient temperature 20°C		

Photo electric sensor

Fiber optic sensor

Door/Area sensor

Proximity sensor

Pressure sensor

Rotary encoder

Connector/Socket

Temp. controller

SSR/Power controller

Counter

Timer

Panel meter

Tacho/Speed/ Pulse meter

Display unit

Sensor controller

Switching mode power supply

Stepper motor&amp; Driver&amp;Controller

Graphic/ Logic panel

Field network device

## ■ Specifications

### ● AC 2-wire type

Model	PRA12-2AO PRA12-2AC	PRA18-5AO PRA18-5AC	PRA30-10AO PRA30-10AC
Control output	5 to 150mA	5 to 200mA	
Insulation resistance	Min. 50MΩ(at 500VDC megger)		
Dielectric strength	2500VAC 50/60Hz for 1 minute		
Vibration	1mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 2 hours		
Shock	500m/s <sup>2</sup> (approx. 50G) in each of X, Y, Z directions for 3 times		
Indicator	Operation indicator(red LED)		
Environment	Ambient temperature -25 to 70°C, storage: -30 to 80°C		
	Ambient humidity 35 to 95%RH, storage: 35 to 95%RH		
Protection circuit	Surge protection circuit		
Protection	IP67(IEC standard)		
Cable	ø4mm, 2-wire, 2m	ø5mm, 2-wire, 2m	
	(for cable type, 300mm, M12 connector), (AWG22, Core diameter: 0.08mm, Number of cores: 60, Insulator diameter: ø1.25mm)		
Material	Case/Nut: Teflon coated Brass, Washer: Teflon coated Iron, Sensing surface: Teflon, Standard cable(Black): Polyvinyl chloride(PVC)		
Insulation type	Double insulation or reinforced insulation(Mark: □, Dielectric strength between the measuring input part and the power part: 1.5kVAC)		
Approval	CE		
Weight <sup>※2</sup>	Approx. 78g(approx. 66g)	Approx. 118g(approx. 106g)	Approx. 207g(approx. 170g)

※1: The response frequency is the average value. The standard sensing target is used and the width is set as 2 times of the standard sensing target, 1/2 of the sensing distance for the distance.

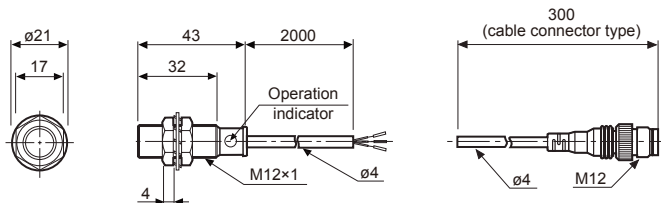
※2: The weight with packaging and the weight in parentheses is only unit weight.

※ Environment resistance is rated at no freezing or condensation.

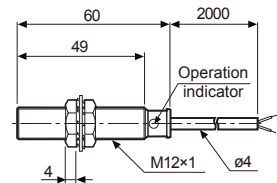
## ■ Dimensions

(unit: mm)

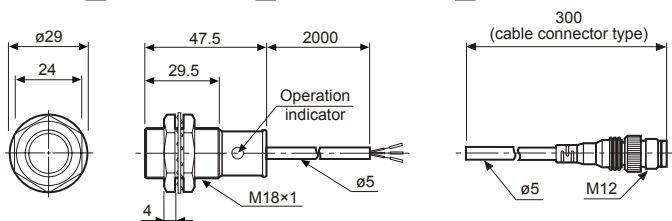
### ● PRA12-2D □ / PRAT12-2D □ / PRAWT12 -2D □



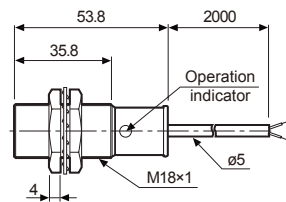
### ● PRA12-2A □



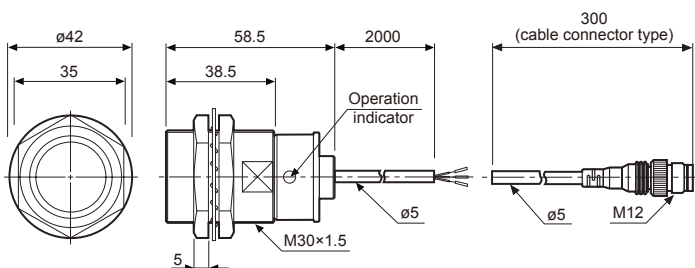
### ● PRA18-5D □ / PRAT18-5D □ / PRAWT18 -5D □



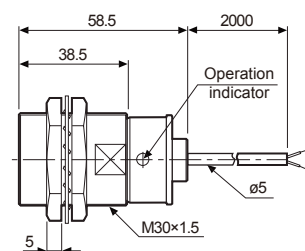
### ● PRA18-5A □



### ● PRA30-10D □ / PRAT30 -10D □ / PRAWT30 -10D □



### ● PRA 30-10A □




## Rectangular type proximity sensor

### ■ Specifications

#### ● DC 2-wire type

※The existing PST17 is upgraded its function and design and changed as PSN17.  
 ※The case color of Normal Close type is changed from orange to gray.

Model	PSNT17-5DO PSNT17-5DC	PSNT17-5DOU PSNT17-5DCU
Appearances		
Sensing distance	5mm	
Hysteresis	Max. 10% of sensing distance	
Standard sensing target	18×18×1mm(Iron)	
Setting distance	0 to 3.5mm	
Power supply (Operating voltage)	12-24VDC (10-30VDC)	
Leakage current	Max. 0.6mA	
Response frequency <sup>※1</sup>	700Hz	
Residual voltage	Max. 3.5V	
Affection by Temp.	Max. ±10% for sensing distance at ambient temperature 20°C	
Control output	2 to 100mA	
Insulation resistance	Min. 50MΩ(at 500VDC megger)	
Dielectric strength	1500VAC 50/60Hz for 1 minute	
Vibration	1mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 2 hours	
Shock	500m/s <sup>2</sup> (approx. 50G) in each of X, Y, Z directions for 3 times	
Indicator	Operation indicator(red LED)	
Environ- ment	Ambient temperature	-25 to 70°C, storage: -30 to 80°C
	Ambient humidity	35 to 95%RH, storage: 35 to 95%RH
Protection circuit	Surge protection circuit, Overcurrent protection circuit	
Protection	IP67(IEC standard)	
Cable	ø4mm, 3-wire, 2m (AWG22, Core diameter: 0.08mm, Number of cores: 60, Insulator out diameter: ø1.25mm)	
Approval	CE	
Unit weight	Approx. 71g	

※1: The response frequency is the average value. The standard sensing target is used and the width is set as 2 times of the standard sensing target, 1/2 of the sensing distance for the distance.

※Environment resistance is rated at no freezing or condensation.


- Photo electric sensor
- Fiber optic sensor
- Door/Area sensor
- Proximity sensor
- Pressure sensor
- Rotary encoder
- Connector/Socket
- Temp. controller
- SSR/ Power controller
- Counter
- Timer
- Panel meter
- Tacho/ Speed/ Pulse meter
- Display unit
- Sensor controller
- Switching mode power supply
- Stepper motor & Driver&Controller
- Graphic/ Logic panel
- Field network device

# Selection Guide

## ■ Specifications

### ● DC 3-wire type

※The case color of PNP output type is changed from orange to gray.

Model	PS12-4DN PS12-4DP PS12-4DN2 PS12-4DNU PS12-4DPU PS12-4DN2U	PSN17-5DN PSN17-5DP PSN17-5DN2 PSN17-5DP2 PSN17-5DNU PSN17-5DN2U PSN17-5DPU PSN17-5DP2U PSN17-5DN-F	PSN17-8DN PSN17-8DP PSN17-8DN2 PSN17-8DP2 PSN17-8DNU PSN17-8DN2U PSN17-8DP2U	PSN17-8DN-F PSN17-8DP-F PSN17-8DN2-F PSN17-8DP2-F PSN17-8DNU-F PSN17-8DPU-F PSN17-8DN2U-F PSN17-8DP2U-F	PSN25-5DN PSN25-5DP PSN25-5DN2 PSN25-5DP2	PSN30-10DN PSN30-10DP PSN30-10DN2 PSN30-10DP2	PSN30-15DN PSN30-15DP PSN30-15DN2 PSN30-15DP2	PSN40-20DN PSN40-20DP PSN40-20DN2 PSN40-20DP2	PS50-30DN PS50-30DP PS50-30DN2 PS50-30DP2
Appearances									
Sensing distance	4mm	5mm	8mm	5mm	10mm	15mm	20mm	30mm	
Hysteresis	Max. 10% of sensing distance								
Standard sensing target	12×12×1mm (Iron)	18×18×1mm (Iron)	25×25×1mm(Iron)			30×30×1mm (Iron)	45×45×1mm (Iron)	60×60×1mm (Iron)	90×90×1mm (Iron)
Setting distance	0 to 2.8mm	0 to 3.5mm	0 to 5mm	0 to 3.5mm	0 to 7mm	0 to 10.5mm	0 to 14mm	0 to 21mm	
Power supply (Operation voltage)	12-24VDC (10-30VDC)								
Current consumption	Max. 10mA								
Response frequency*1	500Hz	700Hz	200Hz	300Hz	250Hz	200Hz	100Hz	50Hz	
Residual voltage	Max. 1.5V								
Affection by Temp.	Max. ±10% for sensing distance at ambient temperature 20°C								
Control output	Max. 200mA								
Insulation resistance	Min. 50MΩ(at 500VDC megger)								
Dielectric strength	1500VAC 50/60Hz for 1minute								
Vibration	1mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 2 hours								
Shock	500m/s <sup>2</sup> (approx. 50G) in each of X, Y, Z directions for 3 times								
Indicator	Operation indicator(red LED)								
Environment	Ambient temperature	-25 to 70°C, storage: -30 to 80°C							
	Ambient humidity	35 to 95%RH, storage: 35 to 95%RH							
Protection circuit	Surge protection circuit, Overcurrent protection circuit, Reverse polarity protection circuit								
Protection	IP67(IEC standard)								
Cable	ø4mm, 3-wire, 2m								ø5mm, 3-wire, 2m
	(AWG22, Core diameter: 0.08mm, Number of cores: 60, Insulator out diameter: ø1.25mm)								
Material	Case: Heat-resistant ABS, Standard cable(Black): Polyvinyl chloride(PVC).								
Approval	CE								
Unit weight	Approx. 62g	Approx. 71g	Approx. 70g		Approx. 111g		Approx. 185g	Approx. 220g	

※1: The response frequency is the average value. The standard sensing target is used and the width is set as 2 times of the standard sensing target, 1/2 of the sensing distance for the distance.

※Environment resistance is rated at no freezing or condensation.

## ■ Specifications

### ● AC 2-wire type

※The case color of Normally Closed type is changed from orange to gray.

Model	PSN25-5AO PSN25-5AC	PSN30-10AO PSN30-10AC	PSN30-15AO PSN30-15AC	PSN40-20AO PSN40-20AC
Appearances				
Sensing distance	5mm	10mm	15mm	20mm
Hysteresis	Max. 10% of sensing distance			
Standard sensing target	25×25×1mm(Iron)	30×30×1mm(Iron)	45×45×1mm(Iron)	60×60×1mm(Iron)
Setting distance	0 to 3.5mm	0 to 7mm	0 to 10.5mm	0 to 14mm
Power supply(Operating voltage)	100-240VAC(85-264VAC)			
Leakage current	Max. 2.5mA			
Response frequency <sup>※1</sup>	20Hz			
Residual voltage	Max. 10V			
Affection by Temp.	Max. ±10% for sensing distance at ambient temperature 20°C			
Control output	5 to 200mA			
Insulation resistance	Min. 50MΩ(at 500VDC megger)			
Dielectric strength	1500VAC 50/60Hz for 1 minute			
Vibration	1mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 2 hours			
Shock	500m/s <sup>2</sup> (approx. 50G) in X, Y, Z direction for 3 times			
Indicator	Operation indicator(red LED)			
Environment	Ambient temperature	-25 to 70°C, storage: -30 to 80°C		
	Ambient humidity	35 to 95%RH, storage: 35 to 95%RH		
Protection circuit	Surge protection circuit			
Protection	IP67(IEC standard)			
Cable	φ4mm, 2-wire, 2m(AWG22, Core diameter: 0.08mm, Number of cores: 60, Insulator out diameter: φ1.25mm)			
Approval	CE			
Unit weight	Approx. 65g	Approx. 106g		Approx. 152g

※1: The response frequency is the average value. The standard sensing target is used and the width is set as 2 times of the standard sensing target, 1/2 of the sensing distance for the distance.

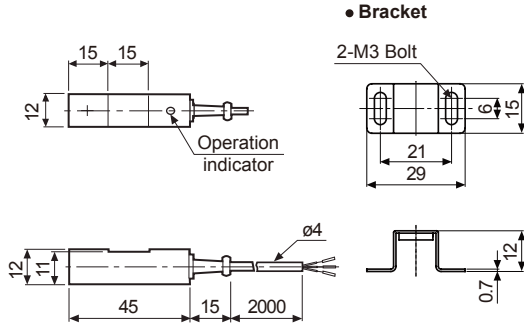
※Environment resistance is rated at no freezing or condensation.

Photo electric sensor
Fiber optic sensor
Door/Area sensor
<b>Proximity sensor</b>
Pressure sensor
Rotary encoder
Connector/Socket
Temp. controller
SSR/ Power controller
Counter
Timer
Panel meter
Tacho/ Speed/ Pulse meter
Display unit
Sensor controller
Switching mode power supply
Stepper motor& Driver&Controller
Graphic/ Logic panel
Field network device

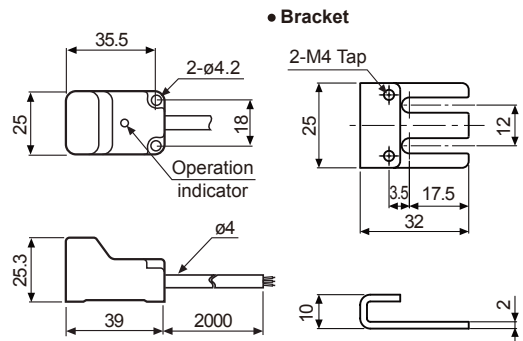
## ■ Dimensions

(unit: mm)

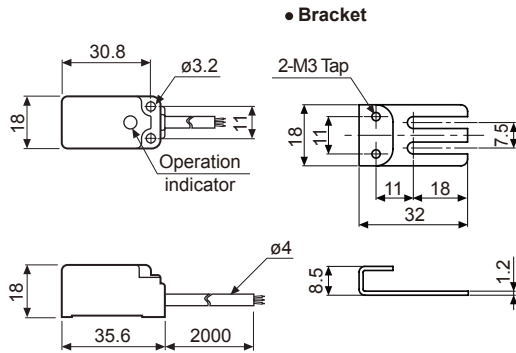
### ● PS12



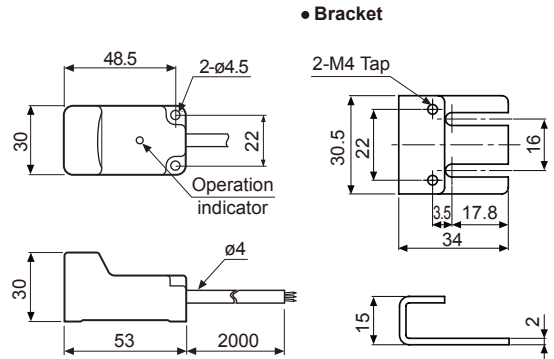
### ● PSN25



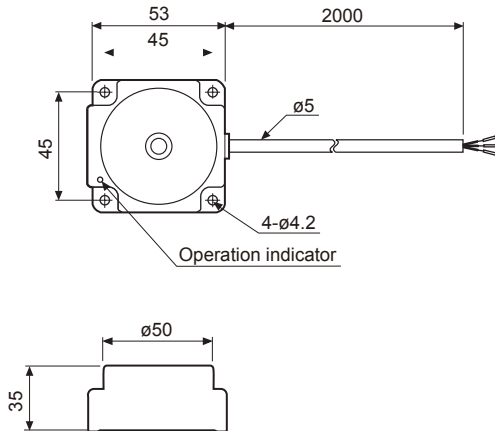
### ● PSN17 / PSNT17(former : PS17/ PST17)



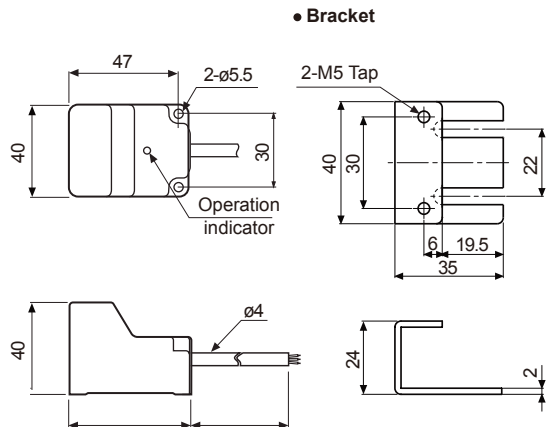
### ● PSN30



### ● PS50




### ● PSN40





# Flat type proximity sensor

## ■ Specification

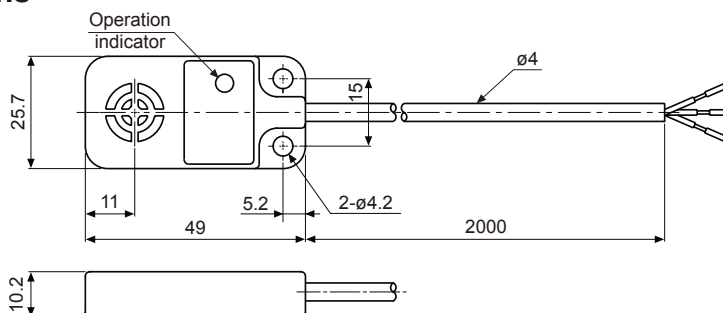
Model	PFI25-8DN PFI25-8DN2	PFI25-8DP PFI25-8DP2	PFI25-8AO PFI25-8AC
Appearances			
Sensing distance	8mm		
Hysteresis	Max. 10% of sensing distance		
Standard sensing target	25×25×1mm(Iron)		
Setting distance	0 to 5.6mm		
Power supply (Operating voltage)	12-24VDC (10-30VDC)		100-240VAC (85-264VAC)
Current/Leakage consumption	Max. 10mA		Max. 2.5mA
Response frequency <sup>※1</sup>	200Hz		20Hz
Residual voltage	Max. 1.5V		Max. 10V
Affection by Temp.	Max. ±10% for sensing distance at ambient temperature 20°C		
Control output	Max. 200mA		5 to 150mA
Insulation resistance	Min. 50MΩ(at 500VDC megger)		
Dielectric strength	1,500VAC 50/60Hz for 1 minute		2,500VAC 50/60Hz for 1 minute
Vibration	1mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 2 hours		
Shock	500m/s <sup>2</sup> (approx. 50G) in each of X, Y, Z directions for 3 times		
Indicator	Operation indicator(red LED)		
Environment	Ambient temperature	-25 to 70°C, storage: -30 to 80°C	
	Ambient humidity	35 to 95%RH, storage: 35 to 95%RH	
Protection circuit	Surge protection circuit, Reverse polarity protection circuit, Overcurrent protection circuit		Surge protection circuit
Cable	ø4mm, 3-wire, 2m		ø4mm, 2-wire, 2m
	(AWG22, Core diameter: 0.08mm, Number of cores: 60, Insulator out diameter: ø1.25mm)		
Material	Case: PPS, General cable(Black): Polyvinyl chloride(PVC)		
Protection	IP67(IEC standard)		
Approval	CE		
Unit weight	Approx. 70g		

※1: The response frequency is the average value. The standard sensing target is used and the width is set as 2 times of the standard sensing target, 1/2 of the sensing distance for the distance.

※Environment resistance is rated at no freezing or condensation.

## ■ Dimensions


(unit: mm)



- Photo electric sensor
- Fiber optic sensor
- Door/Area sensor
- Proximity sensor**
- Pressure sensor
- Rotary encoder
- Connector/Socket
- Temp. controller
- SSR/ Power controller
- Counter
- Timer
- Panel meter
- Tacho/ Speed/ Pulse meter
- Display unit
- Sensor controller
- Switching mode power supply
- Stepper motor& Driver&Controller
- Graphic/ Logic panel
- Field network device

## Long sensing distance type proximity sensor

### ■ Specification

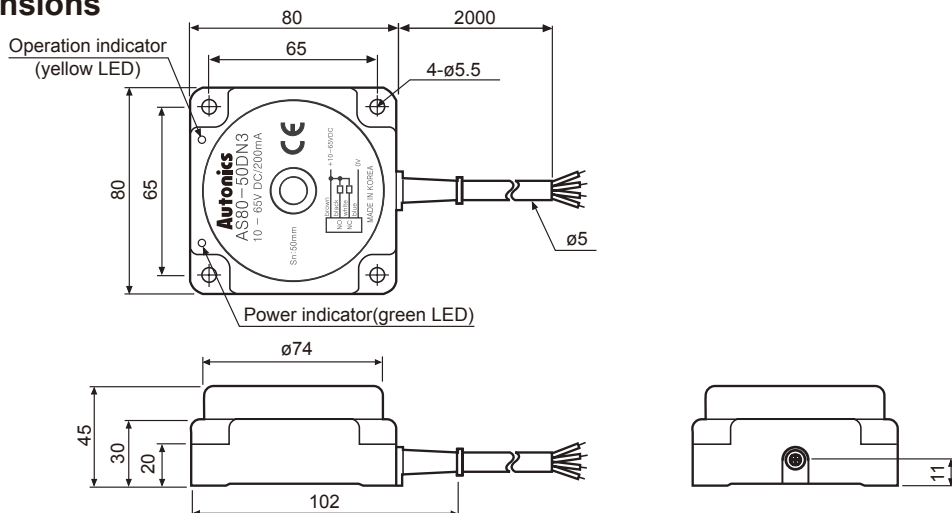
Model	AS80-50DN3	AS80-50DP3
Appearances		
Sensing type	NPN Normally Open + Normally Closed	PNP Normally Open + Normally Closed
Sensing distance	50mm	
Hysteresis	Max. 15% of sensing distance	
Standard sensing target	150×150×1mm(Iron)	
Setting distance	0 to 35mm	
Power supply (Operating voltage)	12-48VDC (10-65VDC)	
Current consumption	Max. 20mA	
Response frequency※1	30Hz	
Residual voltage	Max. 2V	
Affection by Temp.	Max. ±10% for sensing distance at ambient temperature 20°C	
Control output	Max. 200mA	
Insulation resistance	Min. 50MΩ(at 500VDC megger)	
Dielectric strength	1500VAC 50/60Hz for 1 minute	
Vibration	1mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 2 hours	
Shock	500m/s <sup>2</sup> (approx. 50G) in X, Y, Z direction for 3 times	
Indicator	Power indicator: green LED, Operation indicator: yellow LED	
Environment	Ambient temperature	-25 to 70°C, storage: -30 to 80°C
	Ambient humidity	35 to 95%RH, storage: 35 to 95%RH
Protection circuit	Surge protection circuit, Reverse polarity protection circuit, Overcurrent protection circuit	
Cable	ø5mm, 4-wire, 2m(AWG22, Core diameter: 0.08mm, Number of cores: 60, Insulator diameter: ø1.25mm)	
Approval	CE	
Protection	IP67(IEC standard)	
Unit weight	Approx. 470g	

※1: The response frequency is the average value. The standard sensing target is used and the width is set as 2 times of the standard sensing target, 1/2 of the sensing distance for the distance.

※Environment resistance is rated at no freezing or condensation.


### ■ Dimensions

(unit: mm)



# Electric capacitive type proximity sensor

## Specifications

Model	CR18-8DN CR18-3DP CR18-8DN2	CR30-15DN CR30-15DP CR30-15DN2	CR18-8AO CR18-8AC	CR30-15AO CR30-15AC
Appearances				
Sensing distance	8mm	15mm	8mm	15mm
Hysteresis	Max. 20% of sensing distance			
Standard sensing target	50×50×1mm(Iron)			
Sensing distance	0 to 5.6mm	0 to 10.5mm	0 to 5.6mm	0 to 10.5mm
Power supply (Operating voltage)	12-24VDC(10-30VDC)		100-240VAC 50/60Hz(85-264VAC)	
Current consumption	Max. 15mA		—	
Leakage current	—		Max. 2.2mA	
Response frequency <sup>※1</sup>	50Hz		20Hz	
Residual voltage	Max. 1.5V		Max. 20V	
Affection by Temp.	Max. ±10% for sensing distance at ambient temperature 20°C			
Control output	Max. 200mA			
Insulation resistance	Min. 50MΩ(at 500VDC megger)			
Dielectric strength	1500VAC 50/60Hz for 1minute			
Vibration	1mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 2 hours			
Shock	500m/s <sup>2</sup> (approx. 50G) in each of X, Y, Z directions for 3 times			
Indicator	Operation indicator(red LED)			
Environment	Ambient temperature: -25 to 70°C, storage: -30 to 80°C Ambient humidity: 35 to 95%RH, storage: 35 to 95%RH			
Protection circuit	Reverse polarity protection, Serge protection		Serge protection circuit	
Protection	IP66(IEC standard)	IP65(IEC standard)	IP66(IEC standard)	IP65(IEC standard)
Cable	ø4mm, 3-wire, 2m	ø5mm, 3-wire, 2m	ø4mm, 2-wire, 2m	ø5mm, 2-wire, 2m
	(AWG22, Core diameter: 0.08mm, Number of cores: 60, Insulator out diameter: ø1.25mm)			
Material	Case/Nut: Nickel plated Brass, Washer: Nickel plated Iron, Sensing surface: PBT, Standard cable(Black): Polyvinyl chloride(PVC), Oil resistant cable(Gray): Oil resistant Polyvinyl chloride(PVC)			
Weight <sup>※2</sup>	Approx. 64g(approx. 52g)		Approx.84g(approx. 72g)	

※1: The response frequency is the average value. The standard sensing target is used and the width is set as 2 times of the standard sensing target, 1/2 of the sensing distance for the distance.

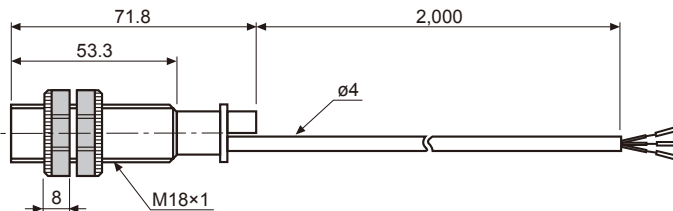
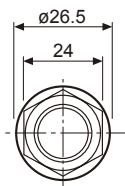
※2: The weight with packaging and the weight in parentheses is only unit weight.

※Environment resistance is rated at no freezing or condensation.

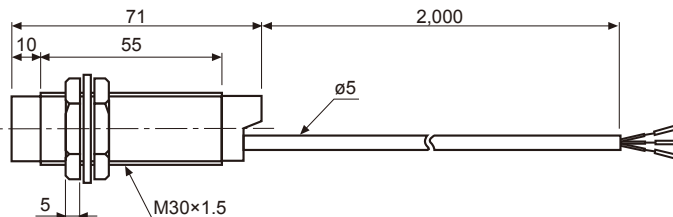
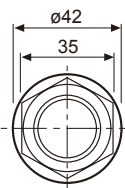
## Dimensions

(unit: mm)

### CR18-8




### CR30-15



- Photo electric sensor
- Fiber optic sensor
- Door/Area sensor
- Proximity sensor**
- Pressure sensor
- Rotary encoder
- Connector/Socket
- Temp. controller
- SSR/Power controller
- Counter
- Timer
- Panel meter
- Tacho/Speed/Pulse meter
- Display unit
- Sensor controller
- Switching mode power supply
- Stepper motor& Driver&Controller
- Graphic/Logic panel
- Field network device

## Transmission coupler

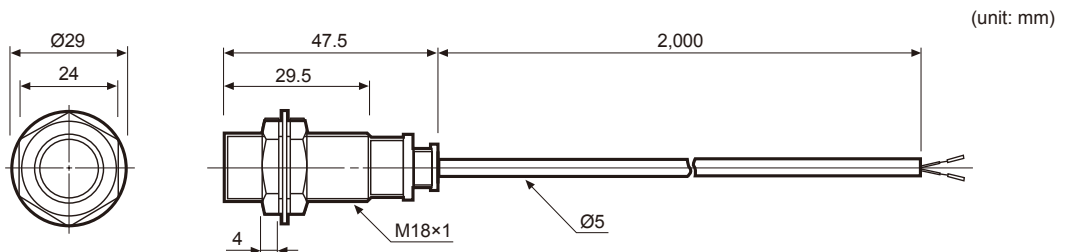
### ■ Specifications

Model	<b>PET18-5</b>			
Appearances				
Transmitting distance	5mm			
Set transmitting distance	1 to 4.5mm			
Response time	Max. 1ms			
Insulation resistance	Min. 50MΩ(at 500VDC megger)			
Dielectric strength	1,500VAC 50/60Hz for 1minute			
Vibration	1mm amplitude at frequency of 10 to 55Hz in each of X, Y, Z directions for 2 hours			
Shock	500m/s <sup>2</sup> (approx. 50G) in each of X, Y, Z directions for 3 times			
Environment	Ambient temperature	-25 to 70°C, storage: -30 to 80°C		
	Ambient humidity	35 to 95% RH, storage: 35 to 95% RH		
Protection	IP67(IEC standards)			
Cable	Ø5mm, 2-wire, 2m(AWG22, Core diameter: 0.08mm, Number of cores: 60, Insulator out diameter: Ø1.25mm)			
Material	Case and nut: Nickel-plated brass, Washer: Nickel-plated steel, Sensing part: PBT, General cable(Black): Polyvinyl chloride(PVC)			
Weight <sup>※1</sup>	Approx. 133g(approx. 121g)			
Application of proximity sensor	PR18-5DN	PRCM18-5DN	PRL18-5DN	PRT18-5DO
	PR18-5DP	PRCM18-5DP	PRL18-5DP	PRT18-5DC
	PR18-5DN2	PRCM18-5DN2	PRL18-5DN2	PRCMT18-5DO
	PR18-5DP2	PRCM18-5DP2	PRL18-5DP2	PRCMT18-5DC
	PRW18-5DN	PRWL18-5DN	PRCML18-5DN	
	PRW18-5DP	PRWL18-5DP	PRCML18-5DP	
	PRW18-5DN2	PRWL18-5DN2	PRCML18-5DN2	
	PRW18-5DP2	PRWL18-5DP2	PRCML18-5DP2	

※1: The Weight with packaging and the weight in parentheses is only unit weight.

※Environment resistance is rated at no freezing or condensation.

### ■ Dimensions





## Specifications

Pressure type		Gauge pressure							
Model ※1	Voltage(1-5VDC) output	Negative pressure		Standard pressure			Compound pressure		
	Current(DC4-20mA) output	PSAN-(L)V01C(P)V-□		PSAN-(L)01C(P)V-□			PSAN-(L)1C(P)V-□		
	Hold/Auto shift input	PSAN-(L)V01C(P)A-□		PSAN-(L)01C(P)A-□			PSAN-(L)1C(P)A-□		
Analog output ※3	Voltage output	• Output voltage: 1-5VDC ±2% F.S. • Linear: Within ±1% F.S. • Output impedance: 1kΩ • Zero point: Max. 1VDC ±2% F.S. • Span: Max. 4VDC ±2% F.S. • Response time: 50ms • Resolution: Automatically changed to 1/1000 or 1/2000 by display unit							
	Current output	• Output current: DC4-20mA ±2% • Linear: Max. ±1% F.S. • Zero-point: Max. DC4mA ±2% F.S. • Span: Max. DC16mA ±2% F.S. • Response time: 70ms • Resolution: Automatically changed to 1/1000 or 1/2000 by display unit							
Display digit		4½digit							
Display method		7 segment LED Display							
Min. Display interval ※4	Resolution	1000	2000	1000	2000	1000	2000	1000	2000
	Pressure unit	—	—	0.001	—	0.001	—	—	—
	MPa	—	—	0.001	—	1	—	—	0.1
	kPa	0.1	—	0.1	—	—	—	—	—
	kgf/cm <sup>2</sup>	0.001	—	0.001	—	0.01	—	—	0.001
	bar	0.001	—	0.001	—	0.01	—	—	0.001
	psi	—	0.01	—	0.01	—	0.1	—	0.02
	mmHg	—	0.4	—	—	—	—	—	0.8
	inHg	—	0.02	—	—	—	—	—	0.03
mmH <sub>2</sub> O	0.1	—	—	—	—	—	—	0.1	
Display accuracy		0°C to 50°C : Max. ±0.5% F.S., -10 to 0°C : Max. ±1% F.S.							
Dielectric strength		1000VAC 50/60Hz for 1 minute							
Insulation resistance		Min. 50MΩ(at 500VDC megger)							
Vibration		1.5mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z direction for 2 hours							
Environment	Ambient temperature	-10 to 50°C, storage : -20 to 60°C							
	Ambient humidity	30 to 80%RH, storage : 30 to 80%RH							
Protection		IP40(IEC specification)							
Material		• <b>Pneumatic type</b> - Front case: PC, Rear case: PC, Pressure port: Nickel Plated Brass • <b>Fluid type</b> - Front case: PC, Rear case: PA6, Pressure port: SUS316L							
Cable		Connector cable (ø4mm, 5-wire, Length: 2m) (AWG 24, Core diameter : 0.08mm, Number of cores : 40, Insulator out diameter: ø1mm)							
Approval		CE							
Weight ※5		• <b>Pneumatic type</b> - Approx. 165g(Approx. 80g) • <b>Fluid type</b> - Approx. 173g(Approx. 88g)							

※1: For '(L)', '(P)', '□' of model name, refer to 'Ordering information'.

※2: In hysteresis output mode, detection difference is variable.

※3: It is allowed to select one analog output type only.

※4: Resolution(1000/2000) of min. Display interval is automatically selected depend on pressure units.

※5: This weight is with packaging and the weight in parentheses is only unit weight.

※F.S. : Rated pressure.

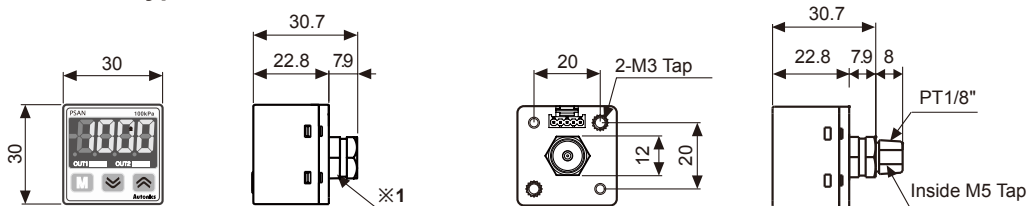
※There may be ±1digit error in hysteresis by pressure unit calculation error.

※Environment resistance is rated at no freezing or condensation.

## Dimensions

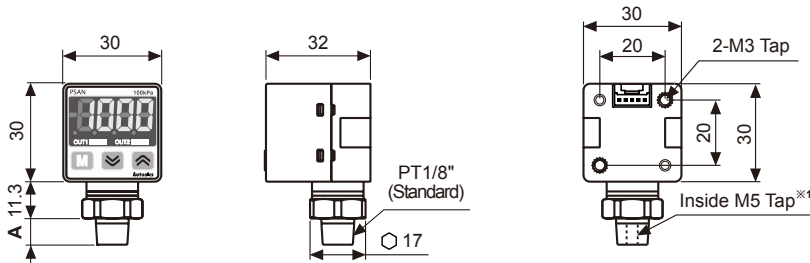
(unit: mm)

### ⊙ Pneumatic type



※1: PT1/8"(Standard), NPT1/8"(Option) Depth 8mm

## ◎ Fluid type

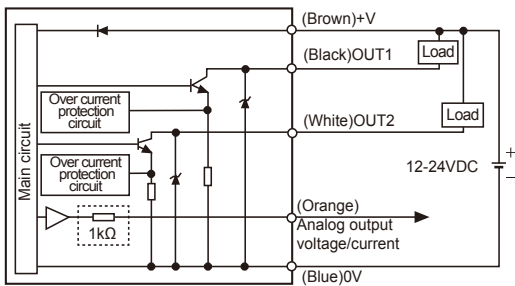


※(A) PT1/8" model(Standard): 8, NPT1/8" model: 8, 7/16"-20 UNF model: 11  
 ※1: Only for PT1/8" model, NPT1/8" model

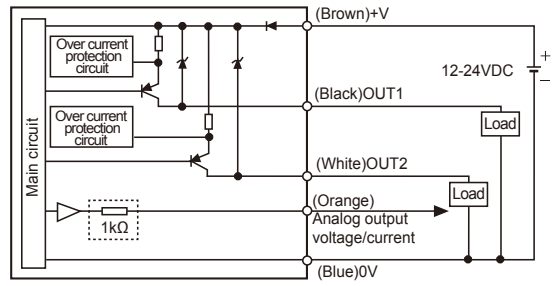
## ■ Control output diagram

◎ Voltage (1-5VDC) output type (PSAN-□□□□□ V-□)  
 Current(DC4-20mA) output type (PSAN-□□□□□ A-□)

### ● NPN open collector output type



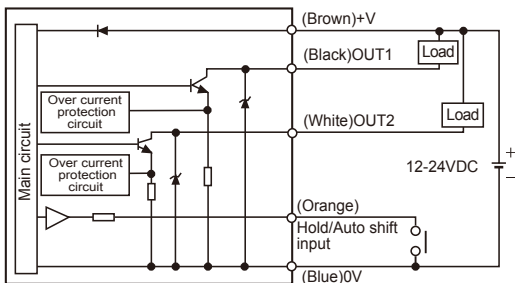
### ● PNP open collector output type



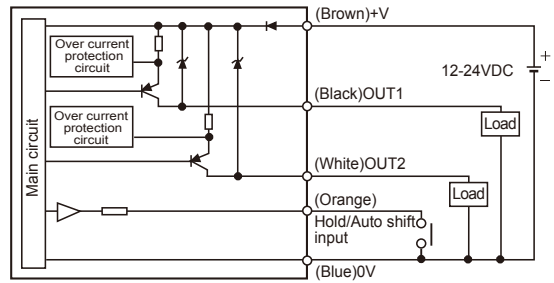
※In case of analog voltage output type models short-circuit protection is not embodied. ( : For voltage output type only.) Do not connect with power source or load directly.  
 ※Be careful with input impedance of connecting devices when using analog voltage output type models.  
 ※Be careful with voltage drop due to cable resistance when extending sensor cable.

◎ Hold/Auto shift input (PSAN-□□□□□ H-□)

### ● NPN open collector output type



### ● PNP open collector output type



- Photo electric sensor
- Fiber optic sensor
- Door/Area sensor
- Proximity sensor
- Pressure sensor
- Rotary encoder
- Connector/Socket
- Temp. controller
- SSR/Power controller
- Counter
- Timer
- Panel meter
- Tacho/Speed/ Pulse meter
- Display unit
- Sensor controller
- Switching mode power supply
- Stepper motor & Driver&Controller
- Graphic/Logic panel
- Field network device




## Small size, High accuracy pressure control digital pressure sensor [PSA/PSB Series]

### Ordering information

<b>PS</b>	<b>A</b>	<b>-</b>	<b>V</b>	<b>01</b>	<b>C</b>	<b>P</b>	<b>-</b>	<b>Rc1/8</b>	Pressure port	R1/8	Standard(PSA Series)
									Output type	NPT1/8	Option(PSA Series)
									Cable <sup>※1</sup>	M5	Standard(PSB Series)
									Pressure range	No mark	NPN open collector output
									Pressure type	P	PNP open collector output
									Appearance	No mark	Positive(Cable integrated type)
									Item	C	Connector type
										01	100kPa
										1	1,000kPa
										No mark	Standard pressure
										V	Negative pressure
										C	Compound pressure
										A	Regular square(30mm×30mm)
										B	Rectangular(10.2mm×54mm)
										PS	Pressure Sensor

※1: It is only applied to PSB Series.

### Specifications

Pressure type		Gauge pressure			
		Negative pressure	Standard pressure		Compound pressure
Model ※1	NPN open collector output	PSA-V01-□ PSB-V01-□ PSB-V01C-□	PSA-01-□ PSB-01-□ PSB-01C-□	PSA-1-□ PSB-1-□ PSB-1C-□	PSA-C01-□ PSB-C01-□ PSB-C01C-□
	PNP open collector output	PSA-V01P-□ PSB-V01P-□ PSB-V01CP-□	PSA-01P-□ PSB-01P-□ PSB-01CP-□	PSA-1P-□ PSB-1P-□ PSB-1CP-□	PSA-C01P-□ PSB-C01P-□ PSB-C01CP-□
Appearances		 <b>PSA Series</b>  <b>PSB Series</b>  <b>PSB Series connector type</b>			
Rated pressure range		0.0 to -101.3kPa	0.0 to 100.0kPa	0.0 to 1,000kPa	-100.0 to 100.0kPa
Display and set pressure range		5.0 to -101.3kPa	-5.0 to 110.0kPa	-50 to 1,100kPa	-101.2 to 110.0kPa
Max. pressure range		2 times of rated pressure		1.5 times of rated pressure	2 times of rated pressure
Applied fluid		Air, Non-corrosive gas			
Power supply		12-24VDC ±10%(Ripple P-P : Max. 10%)			
Current consumption		Max. 50mA			
Control output		NPN or PNP open collector output • Load voltage: Max. 30VDC • Load current: Max. 100mA • Residual voltage - NPN: Max. 1V, PNP: Max. 2V			
Hysteresis <sup>※2</sup>		1digit fixed(2digits for psi unit)			2digit fixed
Repeat error		±0.2% F.S. ±1digit			±0.2% F.S. ±2digit
Response time		Selectable 2.5ms, 5ms, 100ms, 500ms			
Short circuit protection		Built-in			
Analog output		• Output voltage: 1-5VDC ±2% F.S. • Zero-point: Within 1VDC ±2% F.S. • Span: Within 4VDC ±2% F.S. • Linear: Within ±2% F.S. • Resolution: Approx. 1/200 • Output impedance: 1kΩ			
Display digit		3½digit			
Display method		7Segment LED			
Min. display interval		1digit(psi unit: 2 digits are fixed)			2digits
Pressure unit		kPa, kgf/cm <sup>2</sup> , bar, psi, mmHg, mmH <sub>2</sub> O, inHg		kPa, kgf/cm <sup>2</sup> , bar, psi, mmHg, mmH <sub>2</sub> O, inHg	
Display accuracy		0°C to 50°C: Max. ±1% F.S., -10 to 0°C : Max. ±2% F.S.			
Environment	Ambient temperature	-10 to 50°C, storage: -20 to 60°C			
	Ambient humidity	35 to 95%RH, storage: 35 to 95%RH			



## Specifications

Vibration	1.5mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 2 hours	
Material	<ul style="list-style-type: none"> <li>• PSA: Front case: PC, Rear case: PC(Insert glass), Pressure port: die-cast(Zn)</li> <li>• PSB: Case, Pressure port: PA</li> <li>• PSB-C: Case, Pressure port, Cover: IXEF</li> </ul>	
Protection	IP40(IEC standard)	
Cable	Cable integrated type	∅4mm, 5-wire, Length : 2m (AWG24, Core diameter: 0.08mm, Number of cores: 40, Insulation out diameter: ∅1mm)
	Connector type	5-wire, Length : 3m(AWG24, Insulation out diameter : ∅1mm)
Approval	<b>CE</b>	
Unit weight	• PSA: Approx. 120g • PSB: Approx. 70g • PSB-C: Approx. 80g	

※1: '□' is pressure port type.

※2: In hysteresis output mode, detection difference is variable.

※F.S.: Rated pressure.

※There may be ±1digit error in hysteresis by pressure unit calculation error.

※The specification of pressure port is marked on the upper part of the case.

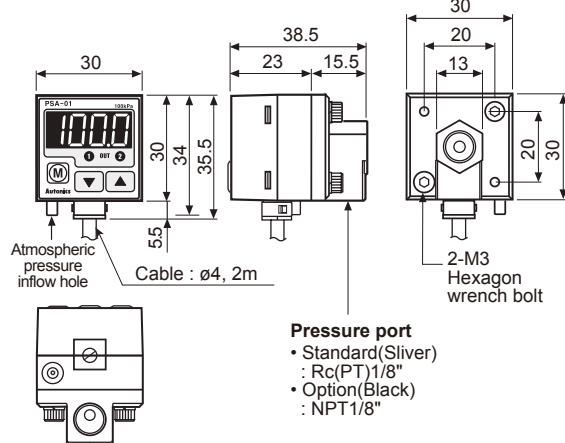
Pressure ports are distinguished by the colors, silver [Rc(PT)1/8] or black [NPT1/8].

※Environment resistance is rated at no freezing or condensation.

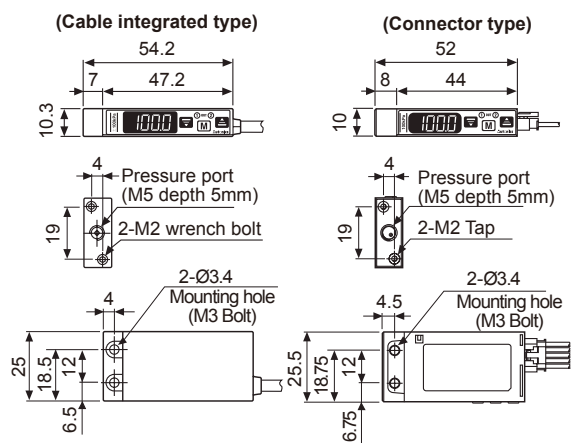
## Dimensions

(unit: mm)

### PSA Series

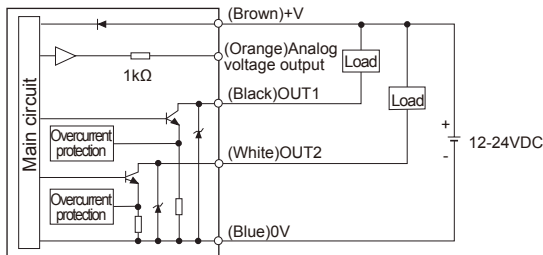


### PSB Series

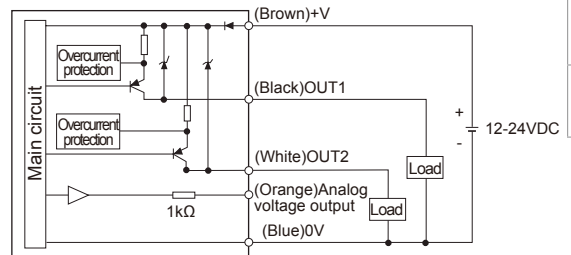


## Control output diagram(PSA/PSB)

### NPN open collector output type



### PNP open collector output type



※There is no short-circuit protection in analog voltage output. Do not connect this output to power supply or capacitive load directly.

※Please observe input impedance of connected equipment when use analog voltage output.

And be sure to check voltage drop caused by resistance of extended wire.


Photo electric sensor
Fiber optic sensor
Door/Area sensor
Proximity sensor
<b>Pressure sensor</b>
Rotary encoder
Connector/Socket
Temp. controller
SSR/Power controller
Counter
Timer
Panel meter
Tacho/Speed/ Pulse meter
Display unit
Sensor controller
Switching mode power supply
Stepper motor & Driver&Controller
Graphic/Logic panel
Field network device

## Small Pressure Sensor [PSS Series]

### Ordering information

<b>PS</b>	<b>S</b>	-	<b>V</b>	<b>01</b>	<b>V</b>	-	<b>R1/8</b>	
Item	Size		Pressure type	Pressure range	Output		Pressure port	
								R1/8
								Standard
								V
								Voltage(1-5VDC) output
								A
								Current(DC4-20mA) output
								01
								100kPa
								1
								1,000kPa
								No-mark
								Standard pressure
								V
								Negative pressure
								C
								Compound pressure
								S
								Small(19.8mm×12.8mm×11.8mm)
								PS
								Pressure Sensor

### Specifications

Pressure type		Gauge pressure			
		Negative pressure	Standard pressure		Compound pressure
Model	Voltage(1-5VDC) output	<b>PSS-V01V-R1/8</b>	<b>PSS-01V-R1/8</b>	<b>PSS-1V-R1/8</b>	<b>PSS-C01V-R1/8</b>
	Current(DC4-20mA) output	<b>PSS-V01A-R1/8</b>	<b>PSS-01A-R1/8</b>	<b>PSS-1A-R1/8</b>	<b>PSS-C01A-R1/8</b>
Appearances		 <div style="float: right; border: 1px solid black; padding: 2px; font-weight: bold;">NEW</div> (available soon)			
Rated pressure range		0.0 to -101.3kPa	0 to 100.0kPa	0 to 1,000kPa	-101.3 to 100.0kPa
Extended analog output		5.0 to -101.3kPa	-5.0 to 110.0kPa	-50 to 1,100kPa	-101.3 to 110.0kPa
Max. pressure range		2 times of rated pressure	2 times of rated pressure	1.5 times of rated pressure	2 times of rated pressure
Applied vapor		Air, non-corrosive gas			
Power supply		12V-24VDC ±10%(ripple P-P: Max. 10%)			
Current consumption		Voltage output: Max. 15mA, Current output: —			
Affection by power supply		Max. ±0.3% F.S.			
Protection circuit		Reverse polarity protection circuit			
Analog output	Voltage output	•Output voltage : 1-5VDC ±2% F.S.		•Linear: Max. ±1% F.S.	•Output impedance: 1kΩ
	Current output	•Output current: DC4-20mA ±2% F.S.		•Linear: Max. ±1% F.S.	
Temp. characteristics of analog output		Max. ±2% F.S. of output voltage/current at 25°C within temperature range 0 to 50°C			
Insulation resistance		Max. 50MΩ(at 500VDC megger)			
Dielectric strength		2000VAC 50/60Hz for 1 min.(between all terminals and case)			
Vibration		1.5mm amplitude at frequency of 10 to 55Hz (for 1 min.) in each of X, Y, Z directions for 2 hours			
Environment	Ambient temperature	0 to 50°C, storage: -10 to 60°C			
	Ambient humidity	35 to 85%RH, storage : 35 to 85%RH			
Protection		IP40(IEC standards)			
Material		Front case: PC, Rear case: PC, Pressure port: Nickel plated brass			
Cable		ø3mm, 4-wire, Length 1.1m (AWG28, Core diameter: 0.08mm, Number of cores: 19, Insulator out diameter: ø0.88mm)			
Sold separately		Sensor connector plug(CNE-P04-YG) <sup>※1</sup>			
Approval		CE (pending)			
Weight <sup>※2</sup>		Approx. 60g (approx. 26g)			

※1: For more information about sensor connector plug, refer to the 146 page.

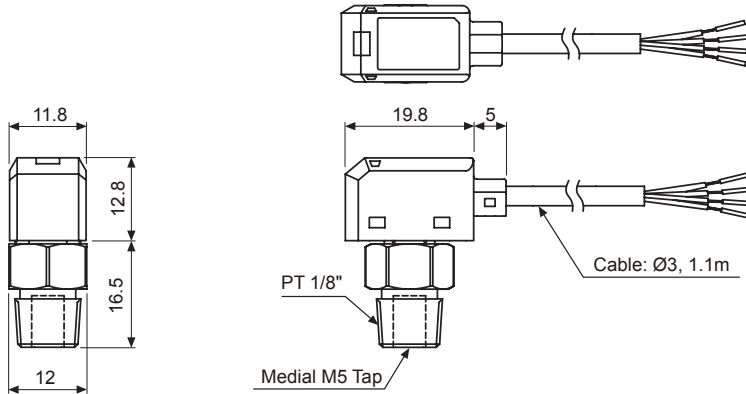
※2: The weight is with packaging and the weight in parentheses is only unit weight.

※Full scale is the rated pressure.

※Environment resistance is rated at no freezing or condensation.

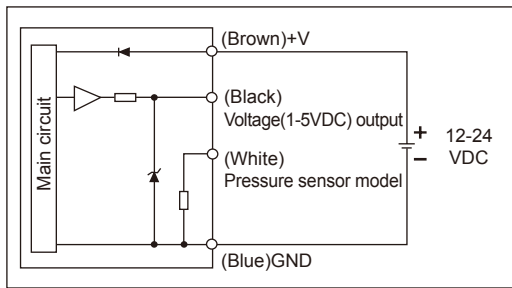
## ■ Dimensions

(unit : mm)

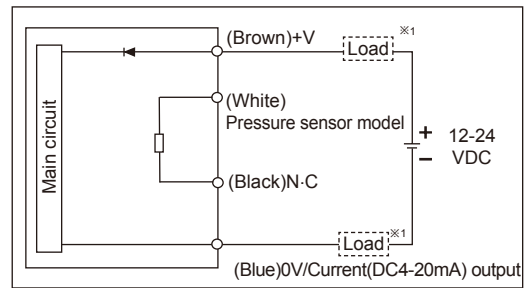


## ■ Connections

### ● Voltage(1-5VDC) output type



### ● Current(DC4-20mA) output type



※1 : Load can be connected to + or - side.  
 Allowable load impedance: Max. 100Ω for 12VDC power  
 Max. 500Ω for 24VDC power

Photo electric sensor
Fiber optic sensor
Door/Area sensor
Proximity sensor
Pressure sensor
Rotary encoder
Connector/Socket
Temp. controller
SSR/ Power controller
Counter
Timer
Panel meter
Tacho/ Speed/ Pulse meter
Display unit
Sensor controller
Switching mode power supply
Stepper motor& Driver&Controller
Graphic/ Logic panel
Field network device



## Display and alarm output for pressure/analog MV from up to 8 CH [PSM Series]

### Ordering information

<b>PS</b>	<b>M</b>	<b>4</b>	<b>-</b>	<b>V</b>	<b>□</b>	<b>D</b>
Item	Type	Number of channels		Input	Control output	Option
				V	No-mark	D
				A	P	R
				4		
				8		
				M		
				PS		

D	Digital input
R	RS485 communication
No-mark	NPN open collector output
P	PNP open collector output
V	Voltage
A	Current
4	4CH
8	8CH
M	Multi Channel
PS	Pressure Sensor

### Specifications

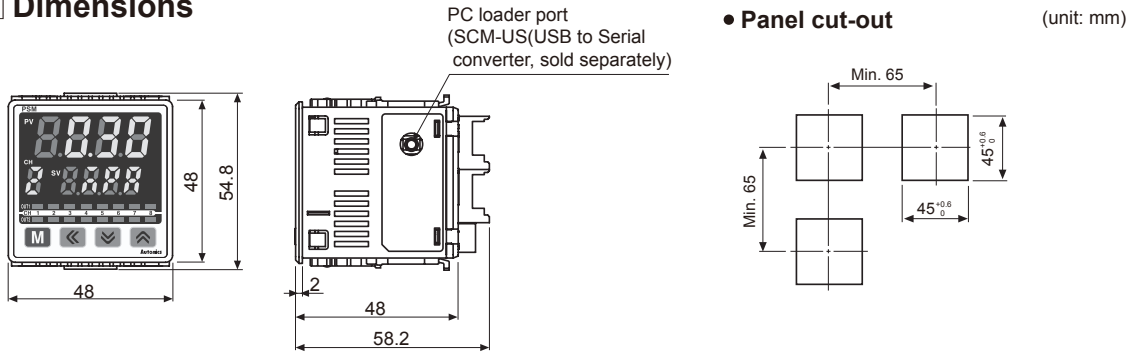
Model	PSM4-V□□□	PSM4-A□□□	PSM8-V□□□	PSM8-A□□□
Appearances				
			<b>NEW</b> (available soon)	
Display range	Depending on pressure type, pressure unit			
Power supply	12-24VDC(ripple P-P : max. 10%)			
Allowable voltage range	90 to 110% of rated voltage			
Power consumption	Max. 3W			
Current consumption	Max. 40mA			
Display digit	4digit			
Display method	Display part 1(PV)	7 Segment LED(red or green <sup>*1</sup> )		
	Display part 2	7 Segment LED(green)		
	CH display part	7 Segment LED(red)		
	Output display part	8EA	16EA	
Max. input points	4EA		8EA	
Sensor input	1-5VDC	4-20mA	1-5VDC	4-20mA
Power supply for sensor <sup>*2</sup>	12-24VDC 40mA for each channel			
Control output	NPN or PNP open collector output •Load voltage : Max. 30VDC •Load current: 100mA •Residual voltage-NPN : Max. 1V, PNP : Max. 2V			
Display accuracy	± 0.1% ± 2digit (at 23 ± 5°C)			
Hysteresis	Min. display interval			
Repeat error	±0.1% F.S. ±min. display range			
Response time	2.5 100, 500, 1000ms		5, 100, 500, 1000ms	
Resolution	1/2000			
Control output and display Temp. characteristics	0 to 50°C: ±0.2% F.S. ±2digit, -10 to 0°C: ±0.3% F.S. ±2digit			
Protection circuits	Output short overcurrent protection, reverse power polarity protection circuit			
Digital input <sup>*3</sup>	Digital input(1-point) •Contact input: LOW LEVEL input max. 0.2V •Non-contact input: ON- Residual voltage max. 1.0V, OFF- leakage current max. 0.1mA			
Communication	Serial	Serial communication with SCM-US(USB to Serial converter, sold separately)		
	RS485 <sup>*4</sup>	RS485 communication (Modbus RTU method)		
Connection	Sensor	Sensor connector terminal (CNE-P04-YG, sold separately) <sup>*5</sup>		
	Output	Hirose connector 20-pin(HIF3BA-20D-2.54R, flat cable 20-wire, sold separately) terminal block		
Dielectric strength	3000VAC 50/60Hz for 1 min.(between power terminal and case), 1000VAC 50/60Hz for 1 min.(between power terminal and RS485 terminal) <sup>*4</sup>			
Vibration	0.5mm amplitude at frequency of 10 to 50Hz(for 1 min.) in each of X, Y, Z directions for 2 hours			

## Specifications

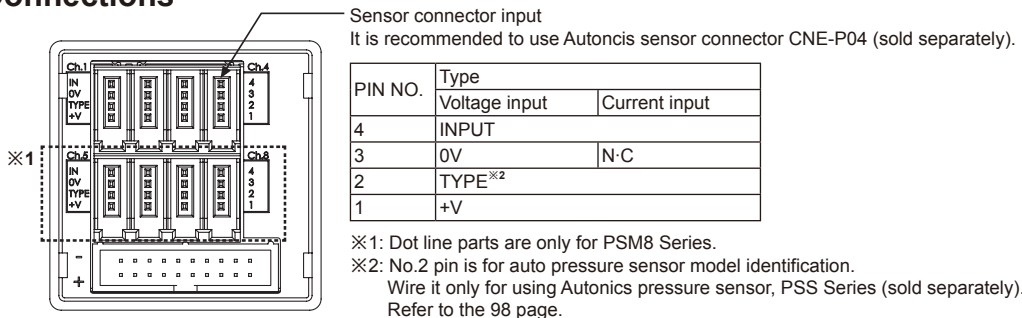
Insulation resistance	Max. 100MΩ	
Environment	Ambient temperature	-10 to 50°C, storage: -20 to 60°C
	Ambient humidity	30 to 85%RH, storage: 30 to 85%RH
Protection	IP65(front), the others IP30	
Accessory	Bracket 2EA	
Approval	CE (pending)	
Weight※6	Approx. 108g (approx. 65g)	

- ※1: It is able to select at display part 1 color [Color] in parameter 2 group.
- ※2: Do not short +V and 0V of sensor connector. It may cause break inner circuit.
- ※3: It is only for digital input option model (PSM□□□□D).
- ※4: It is only for RS485 communication option model(PSM□□□□R).
- ※5: For more information about sensor connector plug, refer to the 146 page.
- ※6: The weight is with packaging and the weight in parentheses is only unit weight.
- ※Environment resistance is rated at no freezing or condensation.

## Dimensions



## Connections



### Hirose connector (HIF3FB-20PA-2.54DSA) 20-pin

PIN NO.	1	2	6	8	10	12	14	16	18	20
Type	0V	Ch4_OUT2	Ch4_OUT1	Ch3_OUT2	Ch3_OUT1	Ch2_OUT2	Ch2_OUT1	Ch1_OUT2	Ch1_OUT1	DI(0V)/RS485(B-)
PIN NO.	1	3	5	7	8	11	13	15	17	19
Type	12-24 VDC	Ch8_OUT2	Ch8_OUT1	Ch7_OUT2	Ch7_OUT1	Ch6_OUT2	Ch6_OUT1	Ch5_OUT2	Ch5_OUT1	DI(input)/RS485(A+)

No. 19, 20 pins are sub I/O pins and support digital input function (DI) or RS485 communication.

- Photo electric sensor
- Fiber optic sensor
- Door/Area sensor
- Proximity sensor
- Pressure sensor**
- Rotary encoder
- Connector/Socket
- Temp. controller
- SSR/Power controller
- Counter
- Timer
- Panel meter
- Tacho/Speed/Pulse meter
- Display unit
- Sensor controller
- Switching mode power supply
- Stepper motor & Driver&Controller
- Graphic/Logic panel
- Field network device

## Diameter ø20mm Shaft type/Hollow shaft built-in type Incremental Rotary Encoder [E20 Series]




### Ordering information

<b>E20</b>	<b>S</b>	<b>2</b>	<b>360</b>	<b>3</b>	<b>N</b>	<b>12</b>	<b>R</b>
Series	Shaft type		Pulse/1Revolution	Output phase	Output	Power supply	Cable
Diameter ø20mm, S: Shaft type HB: Hollow shaft built-in type	External	Inner	100, 200, 320, 360	3: A, B, Z 6: A, $\bar{A}$ , B, $\bar{B}$ , Z, $\bar{Z}$	N: NPN open collector output V: Voltage output L: Line driver output(※)	5: 5VDC ±5% 12: 12VDC ±5%	R: Axial cable type S: Radial cable type
	2: ø2mm	2.5: ø2.5mm 3: ø3mm					

※Standard: E20S2-[PULSE]-3-N-12-R  
E20HB2-[PULSE]-3-N-12-R

※Standard: A, B, Z ※The power of Line  
driver is only for 5VDC

### Specifications

Item	Diameter ø20mm shaft/hollow shaft built-in type incremental rotary encoder		
Appearances	  		
Resolution(P/R)	100, 200, 320, 360 (Not indicated pulse and output type is customizable.)		
Electrical specification	Output phase	A, B, Z phase (line driver output A, $\bar{A}$ , B, $\bar{B}$ , Z, $\bar{Z}$ phase)	
	Phase difference of output	Phase difference between A and B: $\frac{T}{4} \pm \frac{T}{8}$ (T=1 cycle of A phase)	
	Control output	NPN open collector output	Load current: Max. 30mA, Residual voltage: Max. 0.4VDC
		Voltage output	Load current: Max. 10mA, Residual voltage: Max. 0.4VDC
		Line driver output	• Low - Load current: Max. 20mA, Residual voltage: Max. 0.5VDC • High - Load current: Max. -20mA, Output voltage: Min. 2.5VDC
	Response time (Rise/Fall)	NPN open collector output	Max. 1µs
		Voltage output	Max. 1µs
		Line driver output	Max. 0.5µs
	Max. Response frequency	100kHz	
	Power supply	• 5VDC ±5%(ripple P-P: Max. 5%) • 12VDC ±5%(ripple P-P: Max. 5%)	
Current consumption	Max. 60mA(disconnection of the load), Line driver output: Max. 50mA(disconnection of the load)		
Insulation resistance	Min. 100MΩ(at 500VDC megger between all terminals and case)		
Dielectric strength	500VAC 50/60Hz for 1 minute(between all terminals and case)		
Connection	Cable type(Axial / Radial)		
Mechanical specification	Starting torque	Max. 5gf·cm( $5 \times 10^{-4}$ N·m)	
	Moment of inertia	Max. 0.5g·cm <sup>2</sup> ( $5 \times 10^{-8}$ kg·m <sup>2</sup> )	
	Shaft loading	Radial: 200gf, Thrust: 200gf	
	Max. allowable revolution ※1	6000rpm	
Vibration	1.5mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 2 hours		
Shock	Approx. Max. 50G		
Environment	Ambient temperature	-10 to 70°C, storage: -20 to 80°C	
	Ambient humidity	35 to 85%RH, storage: 35 to 90%RH	
Protection	IP50(IEC standard)		
Cable	ø3mm, 5-wire(line driver output: 8-wire), Length: 1m, Shield cable		
Accessory	ø2mm Coupling(Shaft type), Bracket(Hollow shaft built-in type)		
Approval	CE (except line driver output)		
Unit weight	Approx. 35g		

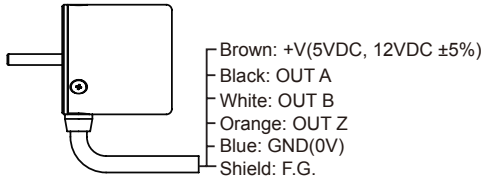
※1: Make sure that. Max response revolution should be lower than or equal to max. allowable revolution when selecting the resolution.

$$[\text{Max. response revolution}(\text{rpm})] = \frac{\text{Max. response frequency}}{\text{Resolution}} \times 60 \text{ sec}$$

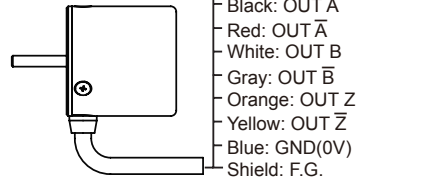
※Environment resistance is rated at no freezing or condensation.

## ■ Connections

### ● NPN open collector output / Voltage output



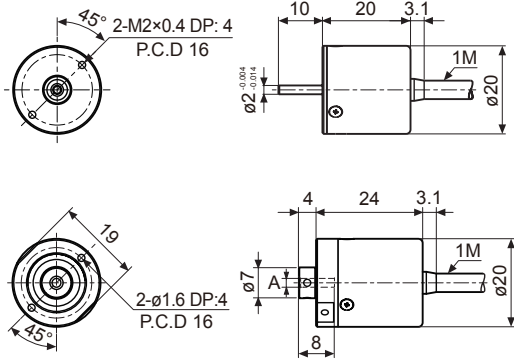
### ● Line driver output



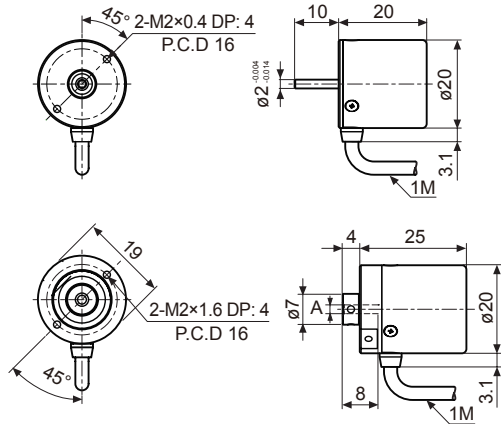
## ■ Dimensions

(unit: mm)

### ◎ Axial cable type



### ◎ Radial cable type



A	ø2	ø2.5	ø3
Tolerance	+0.014		
	+0.004		

## Diameter ø30mm Shaft type Incremental Rotary Encoder [E30S Series]

### ■ Ordering information



Series	Shaft diameter	Pulse/1Revolution	Output phase	Output	Power supply	Cable
Diameter ø30mm, shaft type	ø4mm	Refer to resolution	3: A, B, Z 6: A, A̅, B, B̅, Z, Z̅	T: Totem pole output N: NPN open collector output V: Voltage output L: Line driver output(※)	5: 5VDC ±5% 24: 12-24VDC ±5%	No mark: Cable type C: Connector cable type(※)

※Standard: E30S4-PULSE-3-N-24

※Standard: A, B, Z

※The power of Line driver is only for 5VDC

※Cable length: 250mm

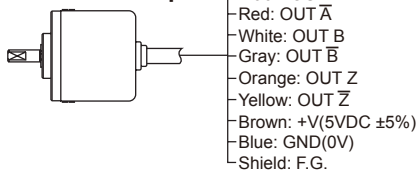
## ■ Connections

### ◎ Cable type

#### ● Totem pole output / NPN open collector output / Voltage output



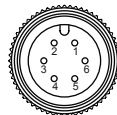
#### ● Line driver output



※Unused wires must be insulated.  
 ※The metal case and shield wire of encoder should be grounded(F.G.).

### ◎ Connector cable type

#### ● Totem pole output / NPN open collector output / Voltage output



#### ● Line driver output




Totem pole output NPN open collector output Voltage output			Line driver output		
Pin No	Function	Cable color	Pin No	Function	Cable color
①	OUT A	Black	①	OUT A	Black
②	OUT B	White	②	OUT A	Red
③	OUT Z	Orange	③	+V	Brown
④	+V	Brown	④	GND	Blue
⑤	GND	Blue	⑤	OUT B	White
⑥	F.G.	Shield	⑥	OUT B	Gray
			⑦	OUT Z	Orange
			⑧	OUT Z	Yellow
			⑨	F.G.	Shield

※F.G.(Field Ground):it should be grounded separately.

- Photo electric sensor
- Fiber optic sensor
- Door/Area sensor
- Proximity sensor
- Pressure sensor
- Rotary encoder
- Connector/ Socket
- Temp. controller
- SSR/ Power controller
- Counter
- Timer
- Panel meter
- Tacho/ Speed/ Pulse meter
- Display unit
- Sensor controller
- Switching mode power supply
- Stepper motor& Driver&Controller
- Graphic/ Logic panel
- Field network device

## Specifications

Item	Diameter ø30mm shaft type of incremental rotary encoder		
Appearances			
Resolution(P/R)	100, 200, 360, 500, 1000, 1024, 3000(Not indicated resolution is customizable.)		
Electrical specification	Output phase	A, B, Z phase(line driver: A, $\bar{A}$ , B, $\bar{B}$ , Z, $\bar{Z}$ phase)	
	Phase difference of output	Phase difference between A and B: $\frac{T}{4} \pm \frac{T}{8}$ (T=1cycle of A phase)	
	Control output	Totem pole output	<ul style="list-style-type: none"> <li>Low - Load current: Max. 30mA, Residual voltage: Max. 0.4VDC</li> <li>High - Load current: Max. 10mA, Output voltage(power voltage 5VDC): Min. (power voltage-2.0)VDC, Output voltage(power voltage 12-24VDC): Min. (power voltage-3.0)VDC</li> </ul>
		NPN open collector output	Load current: Max. 30mA, Residual voltage: Max. 0.4VDC
		Voltage output	Load current: Max. 10mA, Residual voltage: Max. 0.4VDC
		Line driver output	<ul style="list-style-type: none"> <li>Low - Load current: Max. 20mA, Residual voltage: Max. 0.5VDC</li> <li>High - Load current: Max. -20mA, Output voltage: Min. 2.5VDC</li> </ul>
	Response time (Rise/Fall)	Totem pole output	Max. 1 $\mu$ s
		NPN open collector output	Max. 1 $\mu$ s
		Voltage output	Max. 1 $\mu$ s(5VDC: Output resistance 820 $\Omega$ ), Max. 2 $\mu$ s(12-24VDC: Output resistance 4.7k $\Omega$ )
		Line driver output	Max. 0.5 $\mu$ s
	Max. Response frequency	300kHz	
	Power supply	<ul style="list-style-type: none"> <li>5VDC <math>\pm</math>5%(ripple P-P: Max. 5%)</li> <li>12-24VDC <math>\pm</math>5%(ripple P-P: Max. 5%)</li> </ul>	
	Current consumption	Max. 80mA(disconnection of the load), Line driver output: Max. 50mA(disconnection of the load)	
	Insulation resistance	Min. 100M $\Omega$ (at 500VDC megger between all terminals and case)	
Dielectric strength	750VAC 50/60Hz for 1 minute(between all terminals and case)		
Connection	Cable type, 250mm connector cable type		
Mechanical specification	Starting torque	Max. 20gf·cm(0.002N·m)	
	Moment of inertia	Max. 20g·cm <sup>2</sup> (2 $\times$ 10 <sup>-6</sup> kg·m <sup>2</sup> )	
	Shaft loading	Radial: Max. 2kgf, Thrust: Max. 1kgf	
	Max. allowable revolution <sup>*1</sup>	5000rpm	
Vibration	1.5mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 2 hours		
Shock	Approx. Max. 50G		
Environment	Ambient temperature	-10 to 70°C, storage: -25 to 85°C	
	Ambient humidity	35 to 85%RH, storage: 35 to 90%RH	
Protection	IP50(IEC standard)		
Cable	ø5mm, 5-wire, Length: 2m, Shield cable(line driver :ø5mm, 8-wire)		
Accessory	ø4mm coupling		
Approval	CE (except line driver output)		
Unit weight	Approx. 80g		

\*1: Make sure that. Max response revolution should be lower than or equal to max. allowable revolution when selecting the resolution.

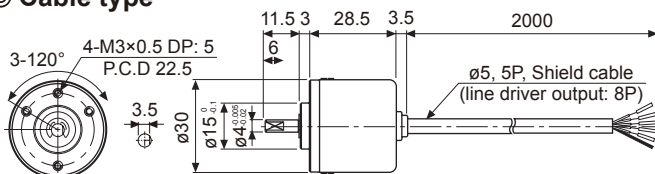
$$[\text{Max. response revolution(rpm)}] = \frac{\text{Max. response frequency}}{\text{Resolution}} \times 60 \text{ sec}$$

\*Environment resistance is rated at no freezing or condensation.

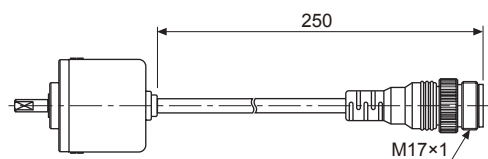
## Dimensions

(unit: mm)

### ◎ Cable type



### ◎ Connector cable type



\*Connector cable is customizable and refer to the 152 page for specifications.



# Diameter ø40mm Shaft type/Hollow type/Built-in type Incremental Rotary Encoder [E40 Series]


## Ordering information

<b>E40</b>	<b>H</b>	<b>8</b>	<b>5000</b>	<b>3</b>	<b>N</b>	<b>24</b>	
Series	Shaft type	Hollow type	Pulse/1Revolution	Output phase	Output	Power supply	Cable
S: Shaft type H: Hollow type HB: Hollow built-in type	External 6: ø6mm 8: ø8mm	Inner 6: ø6mm 8: ø8mm 10: ø10mm 12: ø12mm	Series	2: A, B 3: A, B, Z 4: A, $\bar{A}$ , B, $\bar{B}$ 6: A, $\bar{A}$ , B, $\bar{B}$ , Z, $\bar{Z}$	T: Totem pole output N: NPN open collector output V: Voltage output L: Line driver output	5: 5VDC ±5% 24: 12-24VDC ±5%	No mark: Cable type C: Connector cable type(※)

※Standard: E40S6-[PULSE]-3-N-24, E40H8-[PULSE]-3-N-24 ※Standard: A, B, Z  
E40HB8-[PULSE]-3-N-24

※Cable length : 250mm

## Specifications

Item	Diameter ø40mm shaft/hollow shaft/hollow built-in type of incremental rotary encoder							
Appearances	 <p style="text-align: center;"><b>E40S Series                      E40H Series                      E40HB Series</b></p>							
Resolution(P/R) <sup>*1</sup>	*1, *2, *5, 10, *12, 15, 20, 23, 25, 30, 35, 40, 45, 50, 60, 75, 100, 120, 150, 192, 200, 240, 250, 256, 300, 360, 400, 500, 512, 600, 800, 1000, 1024, 1200, 1500, 1800, 2000, 2048, 2500, 3000, 3600, 5000 (Not indicated resolution is customizable.)							
Electrical specification	Output phase	A, B, Z phase(line driver A, $\bar{A}$ , B, $\bar{B}$ , Z, $\bar{Z}$ phase)						
	Phase difference of output	Phase difference between A and B: $\frac{T}{4} \pm \frac{T}{8}$ (T=1cycle of A phase)						
	Control output	Totem pole output	• Low - Load current:Max. 30mA, Residual voltage: Max. 0.4VDC • High - Load current:Max. 10mA, Output voltage(power voltage 5VDC): Min. (power voltage-2.0)VDC, Output voltage(power voltage 12-24VDC):Min. (power voltage-3.0)VDC					
		NPN open collector output	Load current: Max. 30mA, Residual voltage: Max. 0.4VDC					
		Voltage output	Load current: Max. 10mA, Residual voltage: Max. 0.4VDC					
	Line driver output	Line driver output	• Low - Load current: Max. 20mA, Residual voltage: Max. 0.5VDC • High - Load current: -20mA, Output voltage(power voltage 5VDC): Min. 2.5VDC, Output voltage(power voltage 12-24VDC): Min. (power voltage-3.0)VDC					
		Response time (Rise/Fall)	<table border="1"> <tr> <td>Totem pole output</td> <td rowspan="3">Max. 1µs</td> <td rowspan="3">• Measuring condition - Cable length: 2m, I sink = 20mA</td> </tr> <tr> <td>NPN open collector output</td> </tr> <tr> <td>Voltage output</td> </tr> </table>	Totem pole output	Max. 1µs	• Measuring condition - Cable length: 2m, I sink = 20mA	NPN open collector output	Voltage output
		Totem pole output	Max. 1µs	• Measuring condition - Cable length: 2m, I sink = 20mA				
	NPN open collector output							
	Voltage output							
Line driver output	Max. 0.5µs							
Max. Response frequency	300kHz							
Power supply	• 5VDC ±5%(ripple P-P: Max. 5%) • 12-24VDC ±5%(ripple P-P: Max. 5%)							
Current consumption	Max. 80mA(disconnection of the load), Line driver output: Max. 50mA(disconnection of the load)							
Insulation resistance	Min. 100MΩ(at 500VDC megger between all terminals and case)							
Dielectric strength	750VAC 50/60Hz for 1 minute(between all terminals and case)							
Connection	Cable type, 250mm connector cable type							
Mechanical specification	Starting torque	Shaft type: Max. 40gf·cm(0.004N·m), Hole type: Max. 50gf·cm(0.005N·m)						
	Moment of inertia	Max. 40g·cm <sup>2</sup> (4×10 <sup>-6</sup> kg·m <sup>2</sup> )						
	Shaft loading	Radial: Max. 2kgf, Thrust: Max. 1kgf						
	Max. allowable revolution <sup>*2</sup>	5000rpm						
Vibration	1.5mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 2 hours							
Shock	Approx. Max. 50G							
Environment	Ambient temperature	-10 to 70°C, storage: -25 to 85°C						
	Ambient humidity	35 to 85%RH, storage: 35 to 90%RH						
Protection	IP50(IEC standard) ※Option type is available for IP64 (IEC standard).							
Cable	ø5mm, 5-wire, Length: 2m, Shield cable(line driver output: ø5mm, 8-wire) (AWG24, Core diameter: 0.08, Number of cores: 40, Insulator out diameter: ø1mm)							
Accessory	• Shaft type : ø6mm coupling standard, ø8mm coupling(Sold separately) • Hole type: Bracket							
Approval	CE (except line driver output)							
Unit weight	Approx. 160g							

※1: '\*' pulse is only for A, B phase(Line Driver output is for A,  $\bar{A}$ , B,  $\bar{B}$  phase)

※2: Make sure that. Max response revolution should be lower than or equal to max. allowable revolution when selecting the resolution.

$$[\text{Max. response revolution}(\text{rpm})] = \frac{\text{Max. response frequency}}{\text{Resolution}} \times 60 \text{ sec}$$

※Environment resistance is rated at no freezing or condensation.

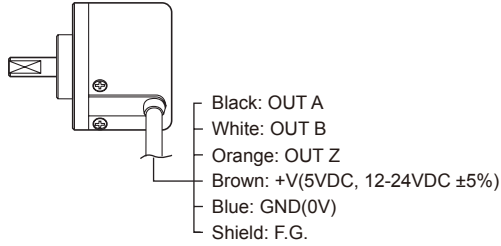
Photo electric sensor
Fiber optic sensor
Door/Area sensor
Proximity sensor
Pressure sensor
Rotary encoder
Connector/ Socket
Temp. controller
SSR/ Power controller
Counter
Timer
Panel meter
Tacho/ Speed/ Pulse meter
Display unit
Sensor controller
Switching mode power supply
Stepper motor& Driver&Controller
Graphic/ Logic panel
Field network device

# Selection Guide

## ■ Connections

### ◎ Cable type

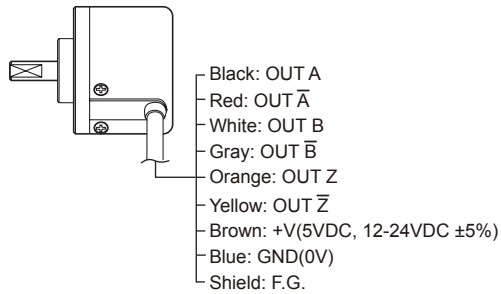
- Totem pole output / NPN open collector output / Voltage output



※Unused wires must be insulated.

※The metal case and shield wire of encoder should be grounded(F.G.).

- Line driver output



### ◎ Connector cable type

- Totem pole output / NPN open collector output / Voltage output
- Line driver output



Totem pole output/ NPN open collector output/ Voltage output			Line driver output		
Pin No	Function	Cable color	Pin No	Function	Cable color
①	OUT A	Black	①	OUT A	Black
②	OUT B	White	②	OUT $\bar{A}$	Red
③	OUT Z	Orange	③	+V	Brown
④	+V	Brown	④	GND	Blue
⑤	GND	Blue	⑤	OUT B	White
⑥	F.G.	Shield	⑥	OUT $\bar{B}$	Gray
—			⑦	OUT Z	Orange
			⑧	OUT $\bar{Z}$	Yellow
			⑨	F.G.	Shield

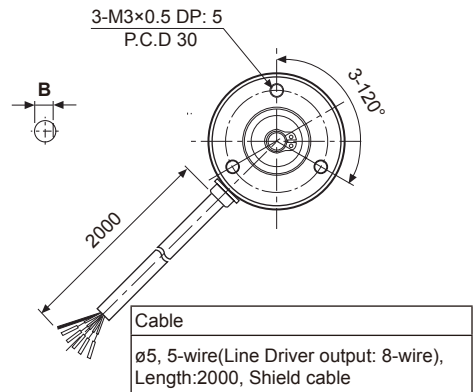
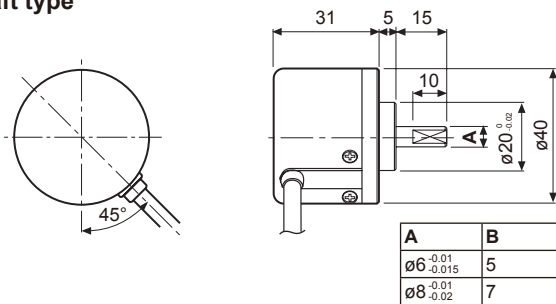
※F.G.(Field Ground): It should be grounded separately.

## ■ Dimensions

(unit: mm)

### ◎ Cable type

- Shaft type

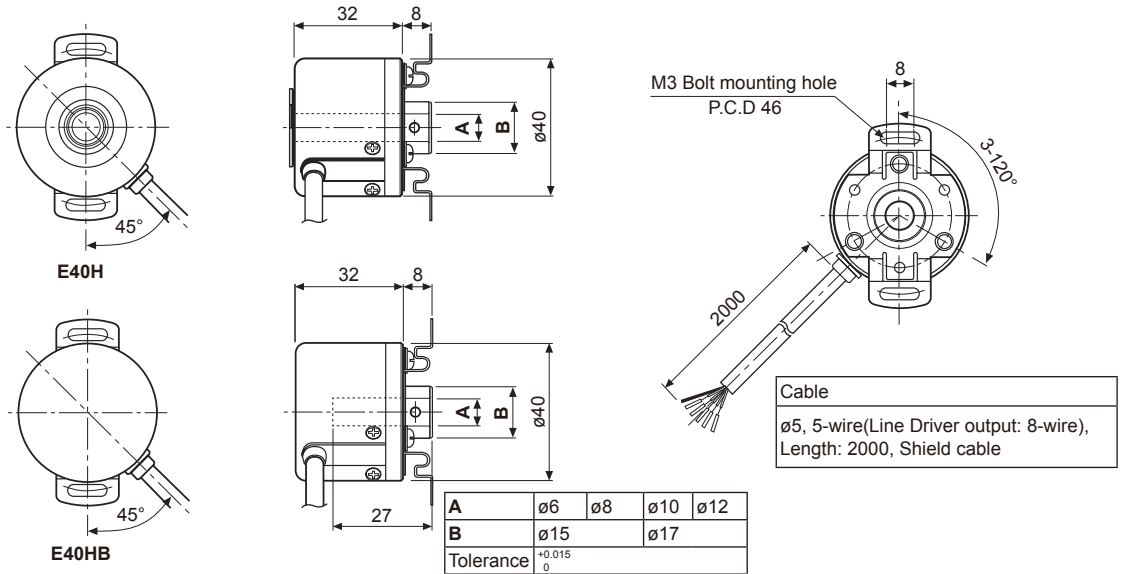


## ■ Dimensions

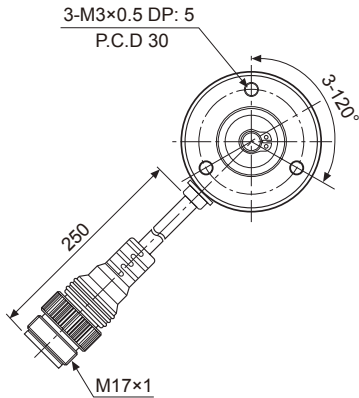
(unit: mm)

### ◎ Cable type

#### ● Hollow shaft / Hollow shaft built-in type



### ◎ Connector cable type



※Connector cable is customizable and refer to the 152 page for specifications.

Photo electric sensor
Fiber optic sensor
Door/Area sensor
Proximity sensor
Pressure sensor
<b>Rotary encoder</b>
Connector/Socket
Temp. controller
SSR/Power controller
Counter
Timer
Panel meter
Tacho/Speed/ Pulse meter
Display unit
Sensor controller
Switching mode power supply
Stepper motor & Driver&Controller
Graphic/Logic panel
Field network device

## Diameter $\phi$ 40mm Hollow shaft built-in type Incremental Rotary Encoder [E40HBP Series]

### Ordering information

**E40HB** **8** **P** - **600** - **3** - **N** - **24** -

Series	Shaft diameter	External material	Pulse/1 Revolution	Output phase	Control output	Power supply	Cable
Diameter $\phi$ 40mm HB: Hollow shaft built-in type	$\phi$ 8mm	Plastic	Refer to resolution	2: A, B 3: A, B, Z 4: A, $\bar{A}$ , B, $\bar{B}$ 6: A, $\bar{A}$ , B, $\bar{B}$ , Z, $\bar{Z}$	T: Totem pole output N: NPN open collector output V: Voltage output L: Line driver output(※)	5: 5VDC $\pm$ 5% 24: 12-24VDC $\pm$ 5%	No mark: Cable type C: Connector cable type(※)


※Standard: E40HB68P-[PULSE]-3-N-24

※Standard: A, B, Z

※The power of Line driver is only for 5VDC

※Cable length : 250mm

### Specifications

Item	Diameter $\phi$ 40mm hollow shaft built-in type of incremental rotary encoder		
Appearances			
Resolution(P/R) ※1	*1, *2, *5, 10, *12, 15, 20, 23, 25, 30, 35, 40, 45, 50, 60, 75, 100, 120, 125, 150, 192, 200, 240, 250, 256, 300, 360, 400, 500, 512, 600		
Electrical specification	Output phase	A, B, Z phase(line driver: A, $\bar{A}$ , B, $\bar{B}$ , Z, $\bar{Z}$ phase)	
	Phase difference of output	Phase difference between A and B: $\frac{T}{4} \pm \frac{T}{8}$ (T=1 cycle of A phase)	
	Control output	Totem pole output	• Low - Load current: Max. 30mA, Residual voltage: Max. 0.4VDC • High - Load current: Max. 10mA, Output voltage(power voltage 5VDC):Min. (power voltage -2.0)VDC, Output voltage(power voltage 12-24VDC): Min. (power voltage-3.0)VDC
		NPN open collector output	Load current: Max. 30mA, Residual voltage: Max. 0.4VDC
		Voltage output	Load current: Max. 10mA, Residual voltage: Max. 0.4VDC
	Response time (Rise/Fall)	Line driver output	• Low - Load current: Max. 20mA, Residual voltage: Max. 0.5VDC • High - Load current: Max. -20mA, Output voltage(power voltage 5VDC): Min. 2.5VDC, Output voltage(power voltage 12-24VDC): Min. (power voltage-3.0)VDC
		Totem pole output	Max. 1 $\mu$ s
		NPN open collector output	
		Voltage output	
	Line driver output	Max. 0.5 $\mu$ s	• Measuring condition - Cable length: 2m, I sink = 20mA
	Max. Response frequency	180kHz	
	Power supply	• 5VDC $\pm$ 5%(ripple P-P: Max. 5%) • 12-24VDC $\pm$ 5%(ripple P-P: Max. 5%)	
Current consumption	Max. 80mA(disconnection of the load)		
Insulation resistance	Min. 100M $\Omega$ (at 500VDC megger between all terminals and case)		
Dielectric strength	750VAC 50/60Hz for 1 minute(between all terminals and case)		
Connection	Cable type, 250mm connector cable type		
Mechanical specification	Starting torque	Max. 50gf·cm(0.005N·m)	
	Moment of inertia	Max. 40g·cm <sup>2</sup> (4 $\times$ 10 <sup>-6</sup> kg·m <sup>2</sup> )	
	Shaft loading	Radial: Max. 3kgf, Thrust: Max. 0.5kgf	
	Max. allowable revolution ※2	3000rpm	
Vibration	1.5mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 2 hours		
Shock	Approx. Max. 50G		
Environment	Ambient temperature	-10 to 70°C, storage: -25 to 85°C	
	Ambient humidity	35 to 85%RH, storage: 35 to 90%RH	
Protection	IP50(IEC standard)		
Cable	$\phi$ 5mm, 5-wire, Length: 2m, Shield cable(line driver output: $\phi$ 5mm, 8-wire) (AWG24, Core diameter: 0.08, Number of cores: 40, Insulator out diameter: $\phi$ 1mm)		
Accessory	Bracket		
Unit weight	Approx. 130g		

※1: '\*' pulse is only for A, B phase(Line Driver output is for A,  $\bar{A}$ , B,  $\bar{B}$  phase)

※2: Make sure that. Max response revolution should be lower than or equal to max. allowable revolution when selecting the resolution.

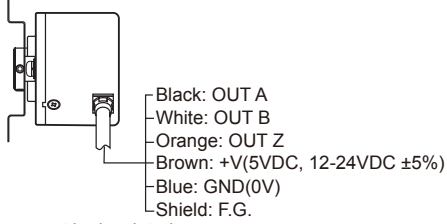
$$[\text{Max. response revolution}(\text{rpm})] = \frac{\text{Max. response frequency}}{\text{Resolution}} \times 60 \text{ sec}$$

※Environment resistance is rated at no freezing or condensation.

## ■ Connections

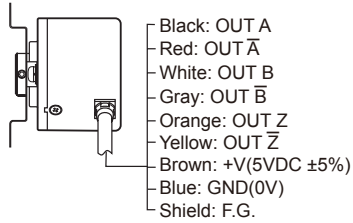
### ◎ Cable type

- Totem pole output / NPN open collector output / Voltage output



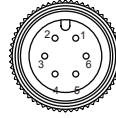
※Unused wires must be insulated.

- Line driver output



### ◎ Connector cable type

- Totem pole output / NPN open collector output / Voltage output
- Line driver output



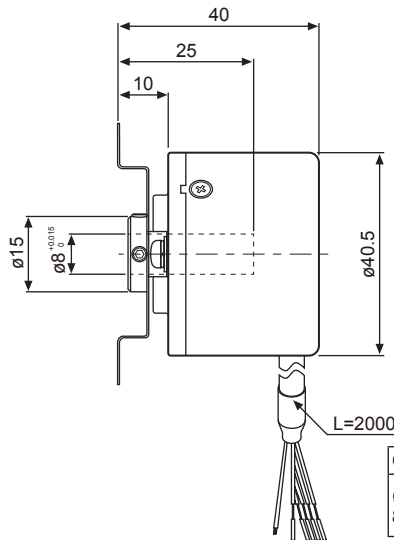
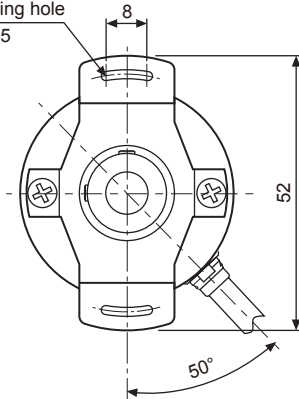
Totem pole output/ NPN open collector output/ Voltage output			Line driver output		
Pin No	Function	Cable color	Pin No	Function	Cable color
①	OUT A	Black	①	OUT A	Black
②	OUT B	White	②	OUT A-bar	Red
③	OUT Z	Orange	③	+V	Brown
④	+V	Brown	④	GND	Blue
⑤	GND	Blue	⑤	OUT B	White
⑥	F.G.	Shield	⑥	OUT B-bar	Gray
			⑦	OUT Z	Orange
			⑧	OUT Z-bar	Yellow
			⑨	F.G.	Shield

※F.G.(Field Ground): It should be grounded separately .

## ■ Dimensions

### ◎ Cable type

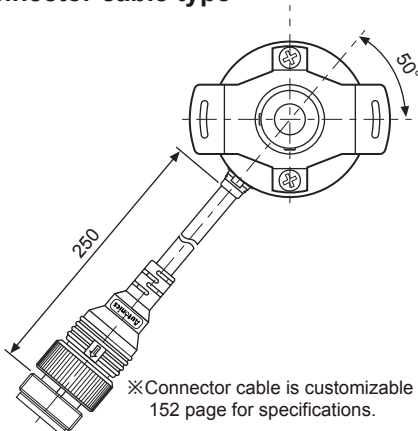
M3 Bolt mounting hole  
P.C.D 45



(unit: mm)

Cable  
ø5, 5-wire(Line Driver output:  
8-wire), Length:2000, Shield cable

### ◎ Connector cable type



※Connector cable is customizable and refer to the 152 page for specifications.

Photo electric sensor

Fiber optic sensor

Door/Area sensor

Proximity sensor

Pressure sensor

Rotary encoder

Connector/ Socket

Temp. controller

SSR/ Power controller

Counter

Timer

Panel meter

Tacho/ Speed/ Pulse meter

Display unit

Sensor controller

Switching mode power supply

Stepper motor& Driver&Controller

Graphic/ Logic panel

Field network device

## Diameter ø50mm Shaft type Incremental Rotary Encoder [E50S Series]



### Ordering information (Former name: ENB)

<b>E50S</b>	<b>8</b>	<b>8000</b>	<b>3</b>	<b>N</b>	<b>24</b>	
Series	Shaft diameter	Pulse/1 Revolution	Output phase	Output	Power supply	Cable
Diameter ø50mm, shaft type	ø8mm	Refer to resolution	2: A, B 3: A, B, Z 4: A, $\bar{A}$ , B, $\bar{B}$ 6: A, $\bar{A}$ , B, $\bar{B}$ , Z, $\bar{Z}$	T: Totem pole output N: NPN open collector output V: Voltage output L: Line driver output	5 :5VDC ±5% 24:12-24VDC ±5%	No mark: Cable type C: Connector cable type(※) CR: Axial connector type CS: Radial connector type

※Standard: E50S8-[PULSE]-3-N-24

※Cable length: 250mm

### Specifications

Item	Diameter ø50mm shaft type of incremental rotary encoder		
Appearances			
Resolution(P/R) <sup>※1</sup>	*1, *2, *5, 10, 12, 15, 20, 23, 25, 30, 35, 40, 45, 50, 60, 75, 100, 120, 125, 150, 192, 200, 240, 250, 256, 300, 360, 400, 500, 512, 600, 800, 1000, 1024, 1200, 1500, 1800, 2000, 2048, 2500, 3000, 3600, 5000, 6000, 8000		
Electrical specification	Output phase	A, B, Z phase(line driver: A, $\bar{A}$ , B, $\bar{B}$ , Z, $\bar{Z}$ phase)	
	Phase difference of output	Phase difference between A and B: $\frac{T}{4} \pm \frac{T}{8}$ (T=1cycle of A phase)	
	Control output	Totem pole output	• Low - Load current:Max. 30mA, Residual voltage: Max. 0.4VDC • High - Load current: Max. 10mA, Output voltage(power voltage 5VDC): Min. (power voltage-2.0)VDC, Output voltage(power voltage 12-24VDC):Min. (power voltage-3.0)VDC
		NPN open collector output	Load current: Max. 30mA, Residual voltage: Max. 0.4VDC
		Voltage output	Load current: Max. 10mA, Residual voltage: Max. 0.4VDC
	Response time (Rise/Fall)	Line driver output	• Low - Load current: Max. 20mA, Residual: Max. 0.5VDC • High - Load current: Max. -20mA, Output voltage(power voltage 5VDC): Min. 2.5VDC, Output voltage(power voltage 12-24VDC): Min. (power voltage-3.0)VDC
		Totem pole output	Max. 1μs
		NPN open collector output	
		Voltage output	Max. 0.5μs
		Line driver output	
	Max. Response frequency	300kHz	
	Power supply	• 5VDC ±5%(ripple P-P: Max. 5%) • 12-24VDC ±5%(ripple P-P: Max. 5%)	
	Current consumption	Max. 80mA(disconnection of the load), Line driver output: Max. 50mA(disconnection of the load)	
Insulation resistance	Min. 100MΩ(at 500VDC megger between all terminals and case)		
Dielectric strength	750VAC 50/60Hz for 1 minute(between all terminals and case)		
Connection	Cable type, 250mm connector cable type, Connector type(Axial, Radial)		
Mechanical specification	Starting torque	Max. 70gf·cm(0.007N·m) <sup>※2</sup> / Max. 800gf·cm(0.08N·m) <sup>※3</sup>	
	Moment of inertia	Max. 80g·cm <sup>2</sup> (8×10 <sup>-6</sup> kg·m <sup>2</sup> ) <sup>※2</sup> / Max. 400g·cm <sup>2</sup> (4×10 <sup>-5</sup> kg·m <sup>2</sup> ) <sup>※3</sup>	
	Shaft loading	Radial: 10kgf, Thrust: 2.5kgf	
	Max. allowable revolution <sup>※4</sup>	5000rpm	
Vibration	1.5mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 2 hours		
Shock	Approx. Max. 75G		
Environment	Ambient temperature	-10 to 70°C, storage: -25 to 85°C	
	Ambient humidity	35 to 85%RH, storage: 35 to 90%RH	
Protection	Cable type, Connector cable type: IP50(IEC standard) <sup>※5</sup> , Connector type: IP65(IEC standard)		
Cable	ø5mm, 5-wire, Length: 2m, Shield cable(line driver output: ø5mm, 8-wire) (AWG 24, Core diameter: 0.08mm, Number of cores: 40, Insulator out diameter: ø1mm)		
Accessory	ø8mm coupling, bracket		
Approval	Cable type  (except for line driver output)		
Unit weight	Approx. 275g, Connector type: 180g		

※1: "\*" pulse is only for A, B phase(line driver output is for A,  $\bar{A}$ , B,  $\bar{B}$  phase). ※2: This value is for Cable type, Connector cable type(Protection: IP50).

※3: This value is for Cable type, Connector cable type(Protection: IP64)/Connector type (Protection: IP65)

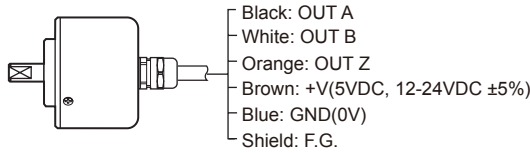
※4: Make sure that max. response revolution should be lower than or equal to max. allowable revolution when selecting the resolution.

【Max. response resolution(rpm) =  $\frac{\text{Max. response frequency}}{\text{Resolution}} \times 60 \text{ sec}$ 】 ※5: 'Cable type, Connector cable type is option as IP64 protection. ※Environment resistance is rated at no freezing or condensation.

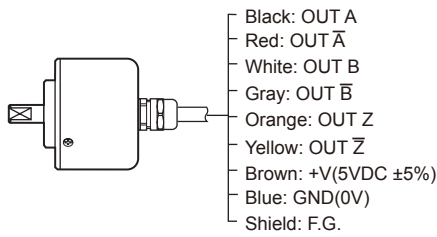
## ■ Connections

### ◎ Cable type

- Totem pole output / NPN open collector output / Voltage output



- Line driver output



※Unused wires must be insulated.

※The shield cable and metal case of encoder must be grounded(F.G.)

### ◎ Cable connector type / Connector type

- Totem pole output / NPN open collector output / Voltage output
- Line driver output



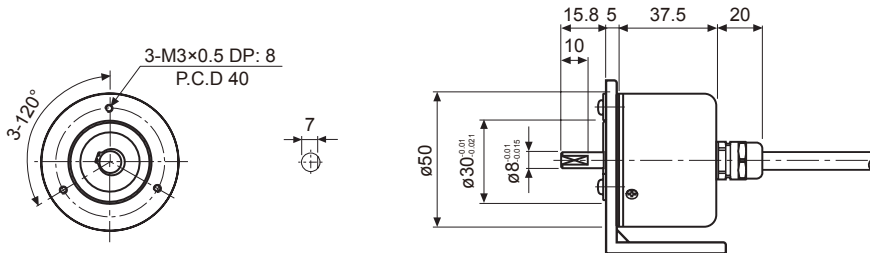
Totem pole output/ NPN open collector output/ Voltage output			Line driver output		
Pin No	Function	Cable color	Pin No	Function	Cable color
①	OUT A	Black	①	OUT A	Black
②	OUT B	White	②	OUT A-bar	Red
③	OUT Z	Orange	③	+V	Brown
④	+V	Brown	④	GND	Blue
⑤	GND	Blue	⑤	OUT B	White
⑥	F.G.	Shield	⑥	OUT B-bar	Gray
			⑦	OUT Z	Orange
			⑧	OUT Z-bar	Yellow
			⑨	F.G.	Shield

※F.G.(Field Ground): It must be grounded separately.

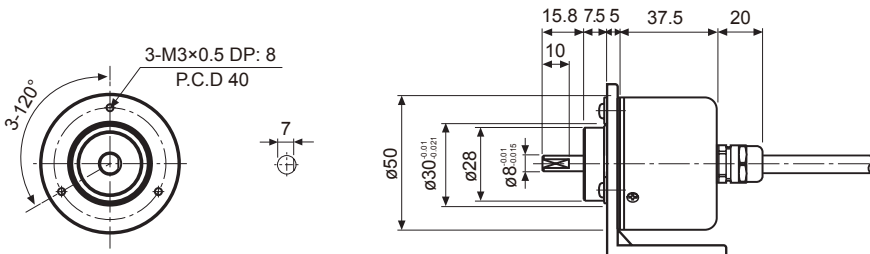
## ■ Dimensions

### ◎ Cable type, Connector cable type(Protection: IP50)

(unit: mm)



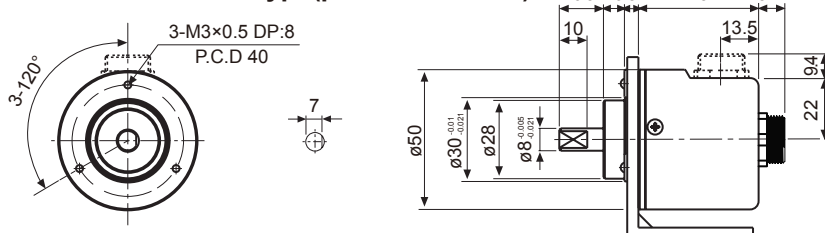
### ◎ Cable type, Connector cable type(Protection: IP64)



Cable for Cable type	Cable for Connector cable type
ø5, 5-wire(line driver output: 8-wire),Length: 2000mm, Shield cable	ø5, 5-wire(line driver output: 8-wire),Length: 250mm, Shield cable

※Connector cable is sold separately and refer to the 152 page for specifications.

### ◎ Axial / Radial connector type(Protection: IP65)



- Photo electric sensor
- Fiber optic sensor
- Door/Area sensor
- Proximity sensor
- Pressure sensor
- Rotary encoder
- Connector/ Socket
- Temp. controller
- SSR/ Power controller
- Counter
- Timer
- Panel meter
- Tacho/ Speed/ Pulse meter
- Display unit
- Sensor controller
- Switching mode power supply
- Stepper motor & Driver&Controller
- Graphic/ Logic panel
- Field network device

## Diameter ø50mm Shaft type Incremental Rotary Encoder [E50SP Series]

### ■ Ordering information


<b>E50S</b>	<b>8</b>	<b>P</b>	<b>600</b>	<b>3</b>	<b>N</b>	<b>24</b>	
Series	Shaft diameter	External material	Pulse/1Revolution	Output phase	Output	Power supply	Cable
Diameter ø50mm, shaft type	6: ø6mm 8: ø8mm	Plastic	Refer to resolution	2: A, B 3: A, B, Z 4: A, $\bar{A}$ , B, $\bar{B}$ 6: A, $\bar{A}$ , B, $\bar{B}$ , Z, $\bar{Z}$	T: Totem pole output N: NPN open collector output V: Voltage output L: Line driver output(※)	5: 5VDC ±5% 24: 12-24VDC ±5%	No mark: Cable type C: Connector cable type(※)

※Standard: E50S8P-[PULSE]-3-N-24

※The power of Line driver is only for 5VDC

※Cable length : 250mm

### ■ Specifications

Item	Diameter ø50mm shaft type of incremental rotary encoder			
Appearances				
Resolution(P/R) <sup>*1</sup>	*1, *2, *5, 10, 12, 15, 20, 23, 25, 30, 35, 40, 45, 50, 60, 75, 100, 120, 125, 150, 192, 200, 240, 250, 256, 300, 360, 400, 500, 512, 600			
Electrical specification	Output phase	A, B, Z phase(line driver: A, $\bar{A}$ , B, $\bar{B}$ , Z, $\bar{Z}$ phase)		
	Phase difference of output	Phase difference between A and B: $\frac{T}{4} \pm \frac{T}{8}$ (T=1 cycle of A phase)		
	Control output	Totem pole output	• Low - Load current: Max. 30mA, Residual voltage: Max. 0.4VDC • High - Load current: Max. 10mA, Output voltage(power voltage 5VDC):Min. (power voltage-2.0)VDC, Output voltage(power voltage 12-24VDC):Min. (power voltage-3.0)VDC	
		NPN open collector output	Load current: Max. 30mA, Residual voltage: Max. 0.4VDC	
		Voltage output	Load current: Max. 10mA, Residual voltage: Max. 0.4VDC	
		Line driver output	• Low - Load current: Max. 20mA, Residual voltage: Max. 0.5VDC • High - Load current: Max. -20mA, Output voltage: Min. 2.5VDC	
	Response time (Rise/Fall)	Totem pole output	• Measuring condition - Cable length: 2m, I sink = 20mA	
		NPN open collector output		Max. 1μs
		Voltage output		
		Line driver output		Max. 0.5μs
	Max. Response frequency	180kHz		
	Power supply	• 5VDC ±5%(ripple P-P: Max. 5%) • 12-24VDC ±5%(ripple P-P: Max. 5%)		
Current consumption	Max. 80mA(disconnection of the load), Line driver output: Max. 50mA(disconnection of the load)			
Insulation resistance	Min. 100MΩ(at 500VDC megger between all terminals and case)			
Dielectric strength	750VAC 50/60Hz for 1 minute(between all terminals and case)			
Connection	Cable type, 250mm connector cable type, Connector type(Axial, Radial)			
Mechanical specification	Starting torque	Max. 100gf·cm(0.01N·m)		
	Moment of inertia	Max. 40g·cm <sup>2</sup> (4×10 <sup>-6</sup> kg·m <sup>2</sup> )		
	Shaft loading	Radial: 2kgf, Thrust: 1kgf		
	Max. allowable revolution <sup>※2</sup>	5000rpm		
Vibration	1.5mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 2 hours			
Shock	Approx. Max. 75G			
Environment	Ambient temperature	-10 to 70°C, storage: -25 to 85°C		
	Ambient humidity	35 to 85%RH, storage: 35 to 90%RH		
Protection	IP50(IEC standard)			
Cable	ø5mm, 5-wire, Length: 2m, Shield cable(line driver output: ø5mm, 8-wire) (AWG 24, Core diameter: 0.08mm, Number of cores: 40, Insulator out diameter: ø1mm)			
Accessory	ø8(ø6)mm coupling, Bracket			
Unit weight	Approx. 235g			

※1: '\*' pulse is only for A, B phase(Line Driver output is for A,  $\bar{A}$ , B,  $\bar{B}$  phase)

※2: Make sure that. Max response revolution should be lower than or equal to max. allowable revolution when selecting the resolution.

$$[\text{Max. response revolution}(\text{rpm})] = \frac{\text{Max. response frequency}}{\text{Resolution}} \times 60 \text{ sec}$$

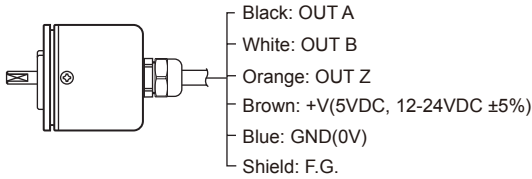
※Environment resistance is rated at no freezing or condensation.



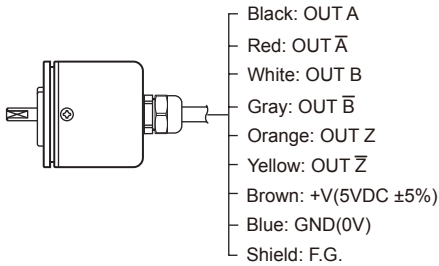
## ■ Connections

### ◎ Cable type

- Totem pole output / NPN open collector output / Voltage output



- Line driver output



※ Unused wires must be insulated.  
 ※ The shield cable and metal case of encoder must be grounded(F.G.).

### ◎ Connector cable type

- Totem pole output / NPN open collector output / Voltage output
- Line driver output



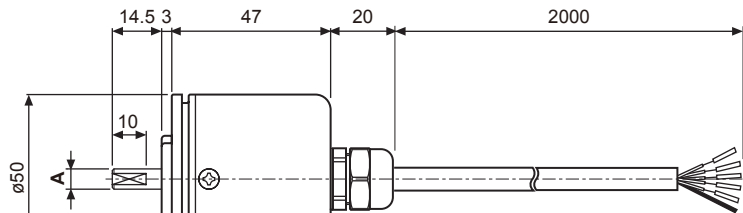
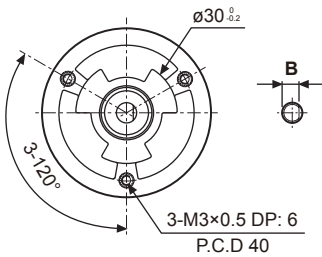
Totem pole output NPN open collector output Voltage output			Line driver output		
Pin No	Function	Cable color	Pin No	Function	Cable color
①	OUT A	Black	①	OUT A	Black
②	OUT B	White	②	OUT A-bar	Red
③	OUT Z	Orange	③	+V	Brown
④	+V	Brown	④	GND	Blue
⑤	GND	Blue	⑤	OUT B	White
⑥	F.G.	Shield	⑥	OUT B-bar	Gray
—			⑦	OUT Z	Orange
			⑧	OUT Z-bar	Yellow
			⑨	F.G.	Shield

※F.G.(Field Ground): It must be grounded separately.

## ■ Dimensions

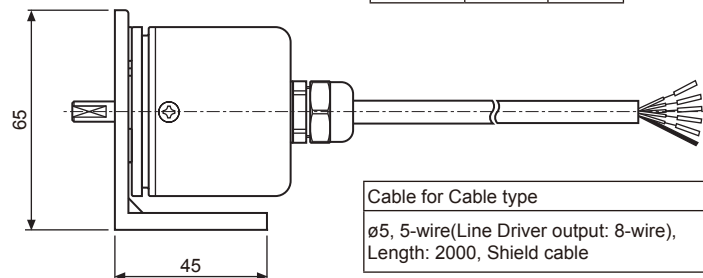
(unit: mm)

### ◎ Cable type



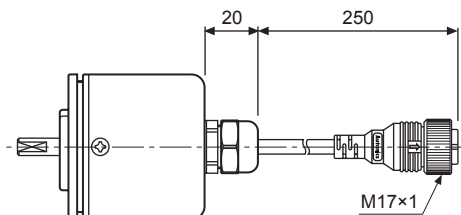
Model	A	B
E50S6P	ø6 <sup>-0.01</sup> <sub>-0.015</sub>	5
E50S8P	ø8 <sup>-0.01</sup> <sub>-0.02</sub>	7

- Connect the bracket



Cable for Cable type  
 ø5, 5-wire(Line Driver output: 8-wire),  
 Length: 2000, Shield cable

### ◎ Connector cable type



Cable for Connector cable type  
 ø5, 5-wire(Line Driver output: 8-wire),  
 Length: 250mm, Shield cable

※Connector cable is sold separately and refer to the 152 page for specifications.

- Photo electric sensor
- Fiber optic sensor
- Door/Area sensor
- Proximity sensor
- Pressure sensor
- Rotary encoder**
- Connector/Socket
- Temp. controller
- SSR/Power controller
- Counter
- Timer
- Panel meter
- Tacho/Speed/ Pulse meter
- Display unit
- Sensor controller
- Switching mode power supply
- Stepper motor & Driver&Controller
- Graphic/Logic panel
- Field network device

## Diameter ø58mm Shaft type/Hollow type/Built-in type Incremental Rotary Encoder [E58 Series]

### Ordering information

<b>E58SC</b>	<b>10</b>	<b>8000</b>	<b>3</b>	<b>N</b>	<b>24</b>		
Series Diameter ø58mm	Shaft diameter		Pulse/1Revolution	Output phase	Output	Power supply	Cable
SC: Shaft Clamping	External	10 ø10mm	Refer to resolution	2: A, B 3: A, B, Z(Standard) 4: A, $\bar{A}$ , B, $\bar{B}$ 6: A, $\bar{A}$ , B, $\bar{B}$ , Z, $\bar{Z}$	T: Totem pole output N: NPN open collector output V: Voltage output L: Line driver output	5: 5VDC ±5% 24: 12-24VDC ±5%	No mark: Cable type C: Connector cable type (Cable length: 250mm) CR: Axial connector type CS: Radial connector type
SS: Shaft Synchro	6 ø6mm						
H: Hollow	Inner	12 ø12mm					
HB: Hollow Built-in							

※Standard: E58SC10-[PULSE]-3-N-24-CR

※Customizable model specifications are available.

※Standard cable for shaft/built-in encoder is axial cable type. Standard cable for hollow shaft encoder is radial cable type.

### Specifications

Item	Diameter ø58mm incremental rotary encoder		
Appearances			
Resolution(P/R)*1	*1, *2, *5, 10, *12, 15, 20, 23, 25, 30, 35, 40, 45, 50, 60, 75, 100, 120, 125, 150, 192, 200, 240, 250, 256, 300, 360, 400, 500, 512, 600, 800, 1000, 1024, 1200, 1500, 1800, 2000, 2048, 2500, 3000, 3600, 5000, 6000, 8000		
Electrical specification	Output phase	A, B, Z phase(line driver output: A, $\bar{A}$ , B, $\bar{B}$ , Z, $\bar{Z}$ phase)	
	Phase difference of output	Phase difference between A and B: $\frac{T}{4} \pm \frac{T}{8}$ (T=1cycle of A phase)	
	Control output	Totem pole output	• Low - Load current: Max. 30mA, Residual voltage: Max. 0.4VDC • High - Load current: Max. 10mA, Output voltage(power voltage 5VDC): Min. (power voltage-2.0)VDC, Output voltage(power voltage 12-24VDC): Min. (power voltage-3.0)VDC
		NPN open collector output	Load current: Max. 30mA, Residual voltage: Max. 0.4VDC
		Voltage output	Load current: Max. 10mA, Residual voltage: Max. 0.4VDC
		Line driver output	• Low - Load current: Max. 20mA, Residual voltage: Max. 0.5VDC • High - Load current: Max. -20mA, Output voltage(power voltage 5VDC): Min. (power voltage-2.5)VDC, Output voltage(power voltage 12-24VDC): Min. (power voltage-3.0)VDC
	Response time (Rise/Fall)	Totem pole output	Max. 1μs
		NPN open collector output	
		Voltage output	
		Line driver output	
	Max. Response frequency	300kHz	
	Power supply	• 5VDC ±5%(ripple P-P: Max. 5%) • 2-24VDC ±5%(ripple P-P: Max. 5%)	
	Current consumption	Max. 80mA(disconnection of the load), Line driver output: Max. 50mA(disconnection of the load)	
	Insulation resistance	Min. 100MΩ(at 500VDC mega for all terminals and case)	
Dielectric strength	750VAC 50/60Hz for 1 minute(all terminals and case)		
Connection	Cable type, 250mm connector cable type, Connector type(Axial, Radial)		
Mechanical specification	Starting torque	• SC/SS type: Max. 40gf·cm(0.004N·m) • HB/H type: Max. 90gf·cm(0.009N·m)	
	Moment of inertia	• SC/SS type: Max. 15g·cm <sup>2</sup> (1.5×10 <sup>-6</sup> kg·m <sup>2</sup> ) • HB/H type: Max. 20g·cm <sup>2</sup> (2×10 <sup>-6</sup> kg·m <sup>2</sup> )	
	Shaft loading	• SC/SS type - Radia: Max. 10kgf, Thrust: Max. 2.5kgf • HB/H type - Radial: Max. 2kgf, Thrust: Max. 1kgf	
	Max. allowable revolution**2	5000rpm	
Vibration	1.5mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 2 hours		
Shock	Approx. Max. 75G		
Environment	Ambient temperature	-10 to 70°C, storage: -25 to 85°C	
	Ambient humidity	35 to 85%RH, storage: 35 to 90%RH	
Protection	IP50(IEC standard)		
Cable	ø5mm, 5-wire, Length: 2m, Shield cable(line driver output: ø5mm, 8-wire) (AWG24, Core diameter: 0.08mm, Number of cores: 40, Insulator out diameter: ø1mm)		
Accessory	ø10mm(SC type) / ø6mm(SS type) coupling, Fixing bracket		
Approval	CE (except Line driver output)		
Unit weight	• SC-CS/CR type: Approx. 230g, SS-CS/CR type: Approx. 205g, HB-CS/CR type: Approx. 200g • SC type: Approx. 310g, SS type: Approx. 285g, HB type: Approx. 270g, H type: Approx. 270g		

※1: 1, 2, 5, 12 P/R output A and B phase only.(But Line driver output: A,  $\bar{A}$ , B,  $\bar{B}$  phase) [In case of hollow shaft type, 6000, 8000 P/R excluded]

※2: Make sure that. Max response revolution should be lower than or equal to max. allowable revolution when selecting the resolution.

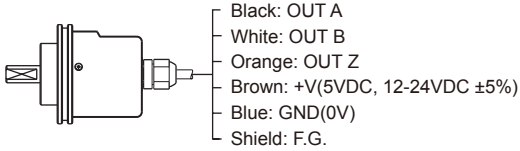
$$[\text{Max. response revolution(rpm)}] = \frac{\text{Max. response frequency}}{\text{Resolution}} \times 60 \text{ sec}$$

※Environment resistance is rated at no freezing or condensation.

## ■ Connections

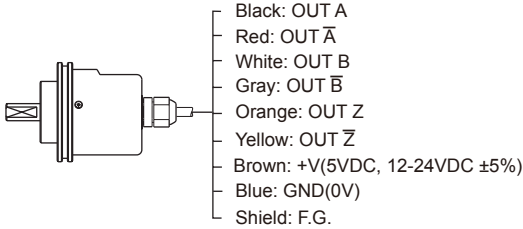
### ◎ Cable type

- Totem pole output / NPN open collector output / Voltage output



※Unused wires must be insulated.  
 ※The metal and shield cable of encoder should be grounded(F.G.)

- Line driver output



### ◎ Connector cable type / Connector type

- Totem pole output / NPN open collector output / Voltage output
- Line driver output



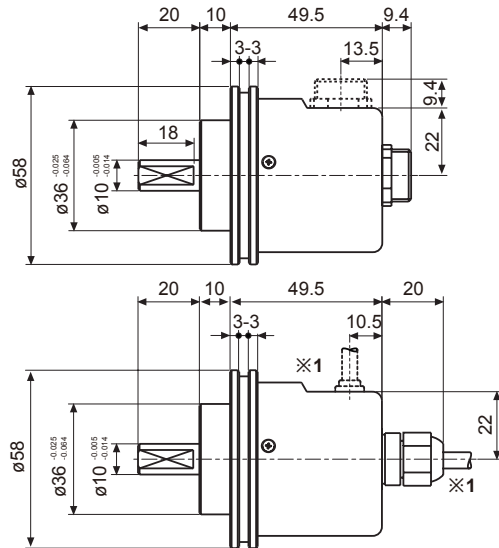
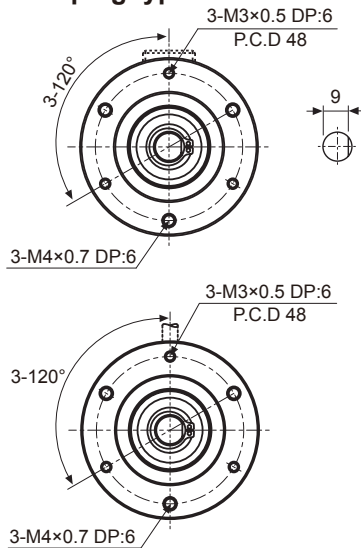
Totem pole output/ NPN open collector output/ Voltage output			Line driver output		
Pin No	Function	Cable color	Pin No	Function	Cable color
①	OUT A	Black	①	OUT A	Black
②	OUT B	White	②	OUT A-bar	Red
③	OUT Z	Orange	③	+V	Brown
④	+V	Brown	④	GND	Blue
⑤	GND	Blue	⑤	OUT B	White
⑥	F.G.	Shield	⑥	OUT B-bar	Gray
			⑦	OUT Z	Orange
			⑧	OUT Z-bar	Yellow
			⑨	F.G.	Shield

※F.G.(Field Ground): It should be grounded separately.

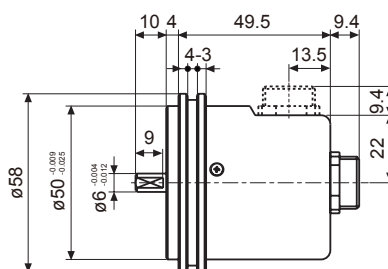
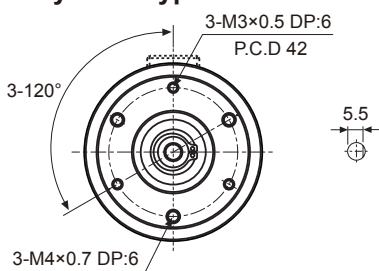
## ■ Dimensions

(unit: mm)

### ◎ Shaft clamping type



### ◎ Shaft synchro type

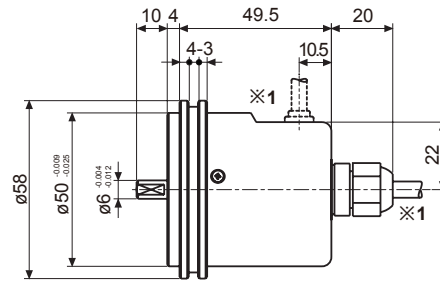
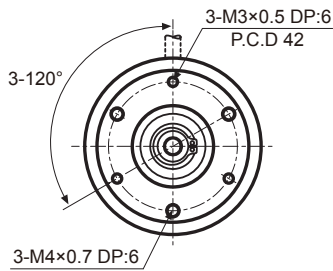


※1: Cable for cable type  
 ø5, 5-wire(line driver output: 8-wire),  
 Length: 2000, Shield cable

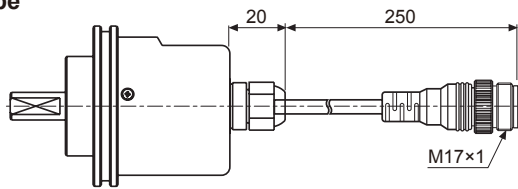
Photo electric sensor
Fiber optic sensor
Door/Area sensor
Proximity sensor
Pressure sensor
Rotary encoder
Connector/Socket
Temp. controller
SSR/Power controller
Counter
Timer
Panel meter
Tacho/Speed/Pulse meter
Display unit
Sensor controller
Switching mode power supply
Stepper motor & Driver&Controller
Graphic/Logic panel
Field network device

# Selection Guide

## ◎ Shaft synchro type

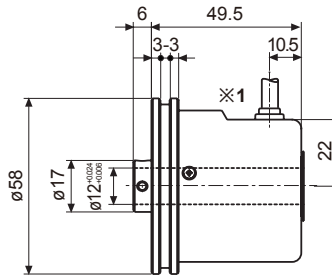
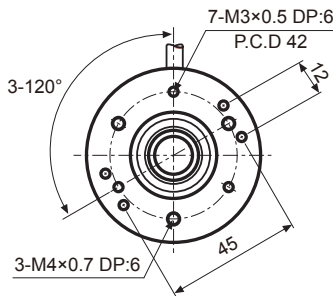


## ● Cable connector type

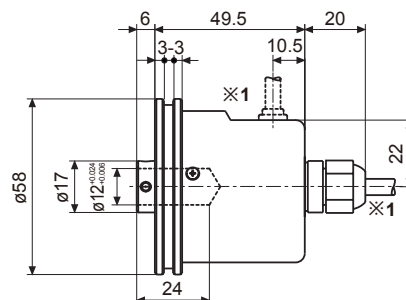
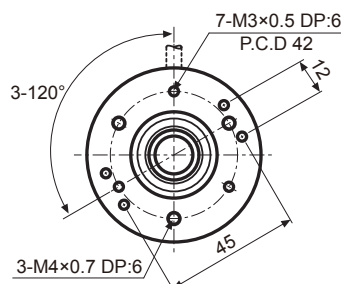
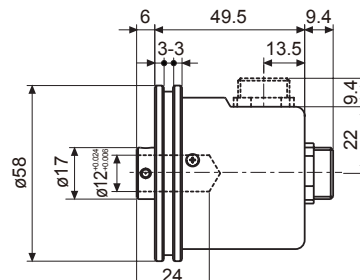
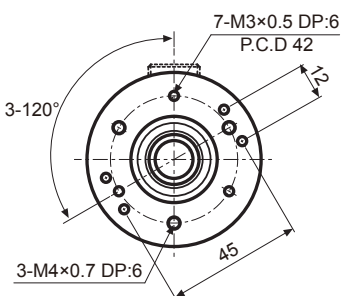


※Connector cable is customizable and refer to the 152 page for specifications.

## ◎ Hollow type



## ◎ Hollow built-in type



※1: Cable for cable type  
 ø5, 5-wire(line driver output: 8-wire),  
 Length: 2000, Shield cable

# Diameter ø60mm Hollow shaft type Incremental Rotary Encoder [E60H Series]

## Ordering information


**E60H** - **20** - **8192** - **3** - **N** - **24** -

Series	Shaft diameter	Pulse/1Revolution	Output phase	Output	Power supply	Cable
Diameter ø60mm, hollow shaft type	ø20mm	100, 1024, 500, 8192	3: A, B, Z 6: A, $\bar{A}$ , B, $\bar{B}$ , Z, $\bar{Z}$	T: Totem pole output N: NPN open collector output V: Voltage output L: Line driver output(※)	5: 5VDC ±5% 24: 12-24VDC ±5%	No mark: Cable type C: Connector cable type(※)

※Standard: E60H20-[PULSE]-3-N-24

※Cable length : 250mm

## Specifications

Item	Diameter ø60mm hollow shaft type of incremental rotary encoder		
Appearances			
Resolution(P/R) <sup>※1</sup>	100, 1024, 5000, 8192		
Electrical specification	Output phase	A, B, Z phase (line driver output A, $\bar{A}$ , B, $\bar{B}$ , Z, $\bar{Z}$ phase)	
	Phase difference of output	Phase difference between A and B: $\frac{T}{4} \pm \frac{T}{8}$ (T=1cycle of A phase)	
	Control output	Totem pole output	• Low - Load current:Max. 30mA, Residual voltage: Max. 0.4VDC • High - Load current:Max. 10mA, Output voltage(power voltage 5VDC):Min. (power voltage-2.0)VDC, Output voltage(power voltage 12-24VDC):Min. (power voltage-3.0)VDC
		NPN open collector output	Load current: Max. 30mA, Residual voltage: Max. 0.4VDC
		Voltage output	Load current: Max. 10mA, Residual voltage: Max. 0.4VDC
		Line driver output	• Low - Load current: Max. 20mA, Residual voltage: Max. 0.5VDC • High - Load current: Max. -20mA, Output voltage(power voltage 5VDC):Min. (power voltage-2.0)VDC, Output voltage(power voltage 12-24VDC):Min. (power voltage-3.0)VDC
	Res- ponse time (Rise/ Fall)	Totem pole output	Max. 1μs
		NPN open collector output	
		Voltage output	Max. 0.5μs
		Line driver output	
	Max. Response frequency	300kHz	
	Power supply	• 5VDC ±5%(ripple P-P:Max. 5%) • 12-24VDC ±5%(ripple P-P:Max. 5%)	
	Current consumption	Max. 80mA(disconnection of the load), Line driver output: Max. 50mA(disconnection of the load)	
Insulation resistance	Min. 100MΩ(at 500VDC megger between all terminals and case)		
Dielectric strength	750VAC 50/60Hz for 1 minute(between all terminals and case)		
Connection	Cable type, 250mm connector cable type		
Mechanical specification	Starting torque	Max. 150gf·cm(0.015N·m)	
	Moment of inertia	Max. 110g·cm <sup>2</sup> (11×10 <sup>-6</sup> kg·m <sup>2</sup> )	
	Shaft loading	Radial: 5kgf, Thrust: 2.5kgf	
	Max. allowable revolution <sup>※2</sup>	6000rpm	
Vibration	1.5mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 2 hours		
Shock	Approx. Max. 100G		
Environment	Ambient temperature	-10 to 70°C, storage: -25 to 85°C	
	Ambient humidity	35 to 85%RH, storage: 35 to 90%RH	
Protection	IP50(IEC standard)		
Cable	ø5mm, 5-wire, Length: 2m, Shield cable(line driver output: ø5mm, 8-wire) (AWG24, Core diameter: 0.08mm, Number of cores: 40, Insulator out diameter: ø1mm)		
Accessory	Bracket 2EA		
Unit weight	Approx. 300g		

※1: Not indicated type is customizable.

※2: Make sure that. Max response revolution should be lower than or equal to max. allowable revolution when selecting the resolution.

$$[\text{Max. response revolution}(\text{rpm}) = \frac{\text{Max. response frequency}}{\text{Resolution}} \times 60 \text{ sec}] \quad \text{※Environment resistance is rated at no freezing or condensation.}$$

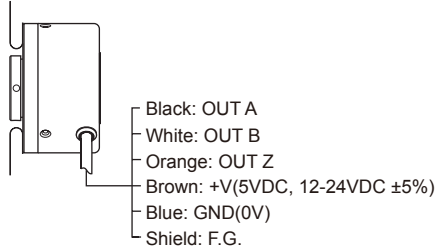
Photo electric sensor
Fiber optic sensor
Door/Area sensor
Proximity sensor
Pressure sensor
Rotary encoder
Connector/ Socket
Temp. controller
SSR/ Power controller
Counter
Timer
Panel meter
Tacho/ Speed/ Pulse meter
Display unit
Sensor controller
Switching mode power supply
Stepper motor& Driver&Controller
Graphic/ Logic panel
Field network device

# Selection Guide

## ■ Connections

### ◎ Cable type

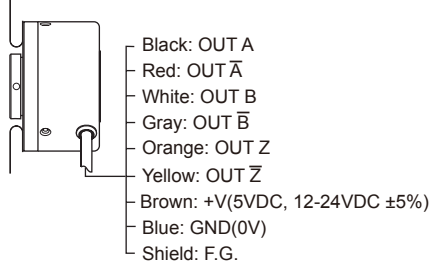
- Totem pole output / NPN open collector output / Voltage output



※Unused wires must be insulated.

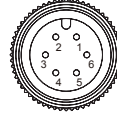
※The metal case and shield cable of encoder should be grounded(F.G.).

- Line driver output



### ◎ Connector cable type

- Totem pole output / NPN open collector output / Voltage output
- Line driver output

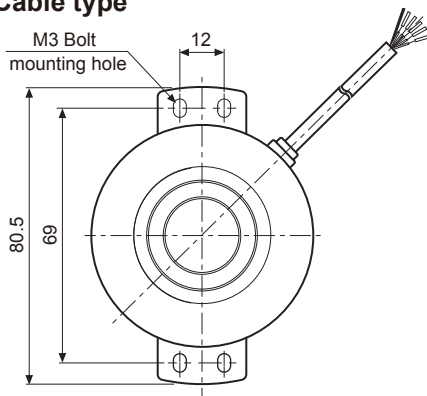


Totem pole output/ NPN open collector output/ Voltage output			Line driver output		
Pin No	Function	Cable color	Pin No	Function	Cable color
①	OUT A	Black	①	OUT A	Black
②	OUT B	White	②	OUT Ā	Red
③	OUT Z	Orange	③	+V	Brown
④	+V	Brown	④	GND	Blue
⑤	GND	Blue	⑤	OUT B	White
⑥	F.G.	Shield	⑥	OUT B̄	Gray
			⑦	OUT Z	Orange
			⑧	OUT Z̄	Yellow
			⑨	F.G.	Shield

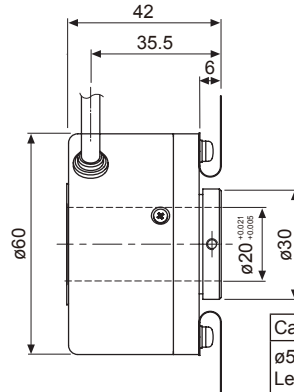
※F.G.(Field Ground): It should be grounded separately.

## ■ Dimension

### ◎ Cable type

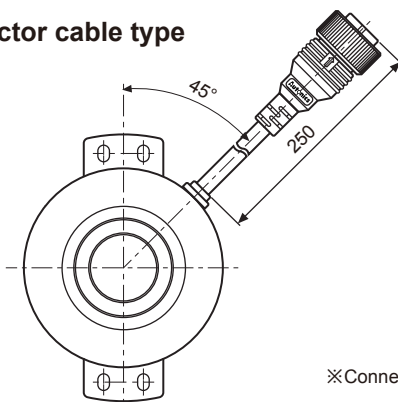


(unit: mm)



Cable
ø5, 5-wire(line driver output: 8-wire), Length: 2000m, Shield cable

### ◎ Connector cable type




※Connector cable is customizable and refer to the 152 page for specifications.

# Diameter ø68mm Shaft type Incremental Rotary Encoder [E68S Series]

## Ordering information

<b>E68S</b>	<b>15</b>	<b>1024</b>	<b>6</b>	<b>L</b>	<b>5</b>
Series	Shaft diameter	Pulse/1Revolution	Output phase	Output	Power supply
Diameter ø68mm, shaft type	ø15mm	500, 600, 1024	6: A, $\bar{A}$ , B, $\bar{B}$ , Z, $\bar{Z}$	L: Line driver output	5VDC ±5%

## Specifications

Item	Diameter ø68mm shaft type of incremental rotary encoder	
Appearances		
Resolution(P/R)*1	500, 600, 1024	
Electrical specification	Output phase	A, $\bar{A}$ , B, $\bar{B}$ , Z, $\bar{Z}$ pahse
	Phase difference of output	Phase difference between A and B: $\frac{T}{4} \pm \frac{T}{8}$ (T=1cycle of A phase)
	Control output	• Low - Load current: Max. 20mA, Residual voltage: Max. 0.5VDC • High - Load current: Max. -20mA, Output voltage: Min. 2.5VDC
	Response time(Rise/Fall)	Max. 0.5μs(Cable: 1m, I sink = 20mA)
	Power supply	5VDC ± 5%(ripple P-P: Max. 5%)
	Max. Response frequency	180kHz
	Current consumption	Max. 50mA(disconnection of the load)
	Insulation resistance	Min. 100MΩ(at 500VDC megger) (between all terminals and case)
	Dielectric strength	750VAC 50/60Hz for 1 minute(between all terminals and case)
	Connection	Connector type(MS3102A20-29P)
Mechanical specification	Starting torque	1.5kgf·cm(Max. 0.15N·m)
	Shaft loading	Radial: 20kgf, Thrust: 10kgf
	Max. allowable revolution*2	6500rpm
Vibration	1.5mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 2 hours	
Shock	Approx. Max. 50G	
Environment	Ambient temperature	-10 to 70°C, storage: -25 to 85°C
	Ambient humidity	35 to 85%RH, storage: 35 to 90%RH
Protection	IP65(IEC standard)	
Unit weight	Approx. 550g	

\*1: The number of pulse, output type not indicated in the resolution is available to order.

\*2: Make sure that. Max response revolution should be lower than or equal to max. allowable revolution when selecting the resolution.

$$[\text{Max. response revolution(rpm)}] = \frac{\text{Max. response frequency}}{\text{Resolution}} \times 60 \text{ sec}$$

\*Environment resistance is rated at no freezing or condensation.

Photo electric sensor

Fiber optic sensor

Door/Area sensor

Proximity sensor

Pressure sensor

Rotary encoder

Connector/Socket

Temp. controller

SSR/Power controller

Counter

Timer

Panel meter

Tacho/Speed/ Pulse meter

Display unit

Sensor controller

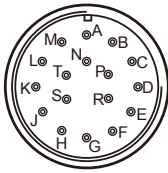
Switching mode power supply

Stepper motor& Driver&Controller

Graphic/Logic panel

Field network device

## ■ Connections



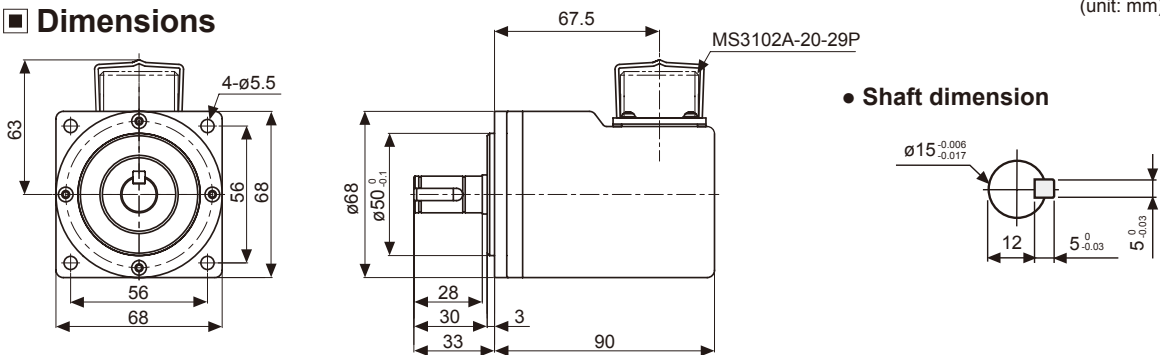
Pin No.	Connection	Pin No.	Connection
A	A phase	K	0V
B	Z phase	L	N·C
C	B phase	M	0V
D	N·C	N	$\bar{A}$ phase
E	5VDC	P	$\bar{Z}$ phase
F	N·C	R	$\bar{B}$ phase
G	N·C	S	N·C
H	5VDC	T	Shield(F.G.)
J	N·C	—	—

※N·C: Not Connected.

※E and H terminals, K and M terminals are connected internally.

## ■ Dimensions

(unit: mm)



## Diameter $\phi 80$ mm Hollow shaft type Incremental Rotary Encoder [E80H Series]

### ■ Ordering information

<b>E80H</b>	<b>30</b>	<b>3200</b>	<b>3</b>	<b>N</b>	<b>24</b>	
Series	Shaft diameter	Pulse/1Revolution	Output phase	Output	Power supply	Cable
Diameter $\phi 80$ mm, hollow shaft type	$\phi 30$ mm $\phi 32$ mm	60, 100, 360, 500, 512, 1024, 3200	3: A, B, Z 6: A, $\bar{A}$ , B, $\bar{B}$ , Z, $\bar{Z}$	T: Totem pole output N: NPN open collector output V: Voltage output L: Line driver output(※)	5: 5VDC $\pm 5\%$ 24: 12-24VDC $\pm 5\%$	No mark: Cable type C: Connector cable type(※)

※Shaft inner diameter  $\phi 32$ mm is customizable

※The power of Line driver is only for 5VDC

※Cable length : 250mm

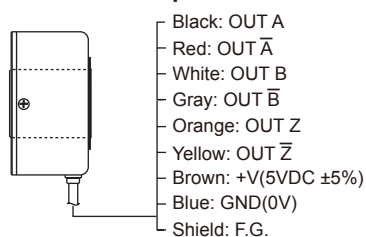
## ■ Connections

### ◎ Cable type

#### ● Totem pole output / NPN open collector output / Voltage output



#### ● Line driver output



※Unused wires must be insulated.

※The metal case and shield cable should be grounded(F.G.).



## ◎ Connector cable type

- Totem pole output / NPN open collector output / Voltage output



- Line driver output



Totem pole output NPN open collector output Voltage output			Line driver output		
Pin No	Function	Cable color	Pin No	Function	Cable color
①	OUT A	Black	①	OUT A	Black
②	OUT B	White	②	OUT A	Red
③	OUT Z	Orange	③	+V	Brown
④	+V	Brown	④	GND	Blue
⑤	GND	Blue	⑤	OUT B	White
⑥	F.G.	Shield	⑥	OUT $\bar{B}$	Gray
—	—	—	⑦	OUT Z	Orange
—	—	—	⑧	OUT $\bar{Z}$	Yellow
—	—	—	⑨	F.G.	Shield

※F.G.(Field Ground): It should be grounded separately.

## ■ Specifications

Item	Diameter ø80mm hollow shaft type of incremental rotary encoder			
Appearances				
Resolution(P/R) <sup>※1</sup>	60, 100, 360, 500, 512, 1024, 3200			
Electrical specification	Output phase	A, B, Z phase (line driver output A, $\bar{A}$ , B, $\bar{B}$ , Z, $\bar{Z}$ phase)		
	Phase difference of output	Phase difference between A and B: $\frac{T}{4} \pm \frac{T}{8}$ (T=1cycle of A phase)		
	Control output	Totem pole output	• Low - Load current:Max. 30mA, Residual voltage: Max. 0.4VDC • High - Load current:Max. 10mA, Output voltage(power voltage 5VDC):Min. (power voltage-2.0)VDC, Output voltage(power voltage 12-24VDC):Min. (power voltage-3.0)VDC	
		NPN open collector output	Load current: Max. 30mA, Residual voltage: Max. 0.4VDC	
		Voltage output	Load current: Max. 10mA, Residual voltage: Max. 0.4VDC	
		Line driver output	• Low - Load current: Max. 20mA, Residual voltage: Max. 0.5VDC • High - Load current: Max. -20mA, Output voltage: Min. 2.5VDC	
	Response time (Rise/Fall)	Totem pole output	• Measuring condition - Cable length: 2m, I sink = 20mA	
		NPN open collector output		Max. 1μs
		Voltage output		Max. 0.5μs
		Line driver output		
Max. Response frequency	200kHz			
Power supply	• 5VDC ±5%(ripple P-P:Max. 5%) • 12-24VDC ±5%(ripple P-P:Max. 5%)			
Current consumption	Max. 80mA(disconnection of the load), Line driver output: Max. 50mA(disconnection of the load)			
Insulation resistance	Min. 100MΩ(at 500VDC megger between all terminals and case)			
Dielectric strength	750VAC 50/60Hz for 1 minute(between all terminals and case)			
Connection	Cable type, 250mm connector cable type			
Mechanical specification	Starting torque	Max. 200gf·cm(0.02N·m)		
	Moment of inertia	Max. 800g·cm <sup>2</sup> (8×10 <sup>-5</sup> kg·m <sup>2</sup> )		
	Shaft loading	Radial: 5kgf, Thrust: 2.5kgf		
	Max. allowable revolution <sup>※2</sup>	3600rpm		
Vibration	1.5mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 2 hours			
Shock	Approx. Max. 75G			
Environment	Ambient temperature	-10 to 70°C, storage: -25 to 85°C		
	Ambient humidity	35 to 85%RH, storage: 35 to 90%RH		
Protection	IP50(IEC standard)			
Cable	ø5mm, 5-wire, Length: 2m, Shield cable(line driver output: ø5mm, 8-wire) (AWG24, Core diameter: 0.08mm, Number of cores: 40, Insulator out diameter: ø1mm)			
Accessory	Spring bracket			
Approval	CE (except for line driver output)			
Unit weight	Approx. 560g			

※1: Not indicated type is customizable.

※2: Make sure that. Max response revolution should be lower than or equal to max. allowable revolution when selecting the resolution.

$$[\text{Max. response revolution}(\text{rpm}) = \frac{\text{Max. response frequency}}{\text{Resolution}} \times 60 \text{ sec}]$$

※Environment resistance is rated at no freezing or condensation.

- Photo electric sensor
- Fiber optic sensor
- Door/Area sensor
- Proximity sensor
- Pressure sensor
- Rotary encoder
- Connector/ Socket
- Temp. controller
- SSR/ Power controller
- Counter
- Timer
- Panel meter
- Tacho/ Speed/ Pulse meter
- Display unit
- Sensor controller
- Switching mode power supply
- Stepper motor& Driver&Controller
- Graphic/ Logic panel
- Field network device

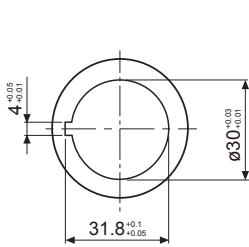
# Selection Guide

## ■ Dimensions

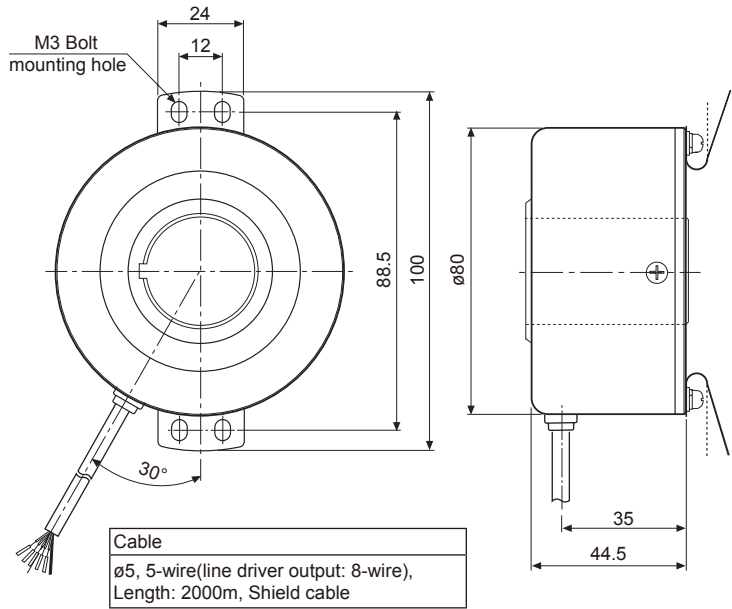
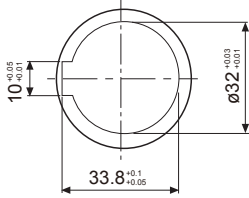
(unit: mm)

### ◎ Cable type

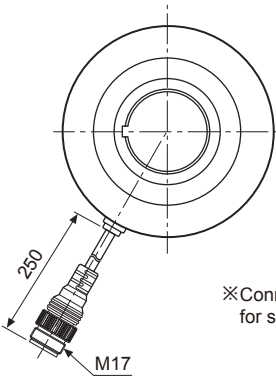
#### ● Shaft inner diameter standard



#### ● Shaft inner diameter (Option)



### ◎ Connector cable type




※Connector cable is sold separate and refer to the 152 page for specifications.

# Diameter ø100mm Hollow shaft type Incremental Rotary Encoder [E100H Series]

## Ordering information

<b>E100H</b>	<b>35</b>	<b>10000</b>	<b>6</b>	<b>L</b>	<b>5</b>
Series	Shaft diameter	Pulse/1Revolution	Output phase	Output	Power supply
Diameter ø100mm hollow shaft type	ø35mm	512, 1024, 10000	3: A, B, Z 6: A, $\bar{A}$ , B, $\bar{B}$ , Z, $\bar{Z}$	T: Totem pole output N: NPN open collector output V: Voltage output L: Line driver output(※)	5: 5VDC ±5% 24: 12-24VDC ±5%

## Specifications

Item	Diameter ø100mm hollow shaft type of incremental rotary encoder								
Appearances									
Resolution(P/R) <sup>※1</sup>	512, 1024, 10000								
Electrical specification	Output phase	A, B, Z phase (line driver output A, $\bar{A}$ , B, $\bar{B}$ , Z, $\bar{Z}$ phase)							
	Phase difference of output	Phase difference between A and B: $\frac{T}{4} \pm \frac{T}{8}$ (T=1 cycle of A phase)							
	Control output	Totem pole output	• Low - Load current:Max. 30mA, Residual voltage: Max. 0.4VDC • High - Load current:Max. 10mA, Output voltage(power voltage 5VDC):Min. (power voltage-2.0)VDC, Output voltage(power voltage 12-24VDC):Min. (power voltage-3.0)VDC						
		NPN open collector output	Load current: Max. 30mA, Residual voltage: Max. 0.4VDC						
		Voltage output	Load current: Max. 10mA, Residual voltage: Max. 0.4VDC						
	Line driver output	Line driver output	• Low - Load current: Max. 20mA, Residual voltage: Max. 0.5VDC • High - Load current: Max. -20mA, Output voltage(power voltage 5VDC):Min. (power voltage-2.0)VDC, Output voltage(power voltage 12-24VDC):Min. (power voltage-3.0)VDC						
		Response time (Rise/Fall)	<table border="1"> <tr> <td>Totem pole output</td> <td rowspan="4">Max. 1μs</td> <td rowspan="4">• Measuring condition - Cable length: 2m, I sink = 20mA</td> </tr> <tr> <td>NPN open collector output</td> </tr> <tr> <td>Voltage output</td> </tr> <tr> <td>Line driver output</td> </tr> </table>	Totem pole output	Max. 1μs	• Measuring condition - Cable length: 2m, I sink = 20mA	NPN open collector output	Voltage output	Line driver output
		Totem pole output	Max. 1μs	• Measuring condition - Cable length: 2m, I sink = 20mA					
	NPN open collector output								
	Voltage output								
	Line driver output								
	Max. Response frequency	300kHz							
	Power supply	• 5VDC ±5%(ripple P-P: Max. 5%) • 12-24VDC ±5%(ripple P-P: Max. 5%)							
	Current consumption	Max. 80mA(disconnection of the load), Line driver output: Max. 50mA(disconnection of the load)							
Insulation resistance	Min. 100MΩ(at 500VDC megger between all terminals and case)								
Dielectric strength	750VAC 50/60Hz for 1 minute(between all terminals and case)								
Connection	Connector type								
Mechanical specification	Starting torque	Max. 300gf·cm(0.03N·m)							
	Moment of inertia	Max. 800g·cm <sup>2</sup> (8×10 <sup>-5</sup> kg·m <sup>2</sup> )							
	Shaft loading	Radial: 5kgf, Thrust: 2.5kgf							
	Max. allowable revolution <sup>※2</sup>	3600rpm							
Vibration	1.5mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 2 hours								
Shock	Approx. Max. 75G								
Environment	Ambient temperature	-10 to 70°C, storage: -25 to 85°C							
	Ambient humidity	35 to 85%RH, storage: 35 to 90%RH							
Protection	IP50(IEC standard)								
Cable	ø5mm, 5-wire, Length: 2m, Shield cable(line driver output: ø5mm, 8-wire) (AWG24, Core diameter: 0.08mm, Number of cores: 40, Insulator out diameter: ø1mm)								
Accessory	Spring bracket 2EA								
Approval	CE (except for line driver output)								
Unit weight	Approx. 1200g								

※1: Not indicated type is customizable.

※2: Make sure that. Max response revolution should be lower than or equal to max. allowable revolution when selecting the resolution.

$$[\text{Max. response revolution}(\text{rpm}) = \frac{\text{Max. response frequency}}{\text{Resolution}} \times 60 \text{ sec}]$$

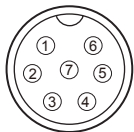
※Environment resistance is rated at no freezing or condensation.

Photo electric sensor
Fiber optic sensor
Door/Area sensor
Proximity sensor
Pressure sensor
Rotary encoder
Connector/ Socket
Temp. controller
SSR/ Power controller
Counter
Timer
Panel meter
Tacho/ Speed/ Pulse meter
Display unit
Sensor controller
Switching mode power supply
Stepper motor& Driver&Controller
Graphic/ Logic panel
Field network device

# Selection Guide

## ■ Connections

- Totem pole output / NPN open collector output / Voltage output



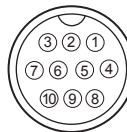
SCN-19-7P

Pin No.	Function	Cable color
①	+V	Brown
②	GND	Blue
③	OUT A	Black
④	OUT B	White
⑤	OUT Z	Orange
⑥	F.G.	Shield
⑦	N-C	N.C

※ Unused wires must be insulated.

※ The metal case and shield cable should be grounded(F.G.).

- Line driver output



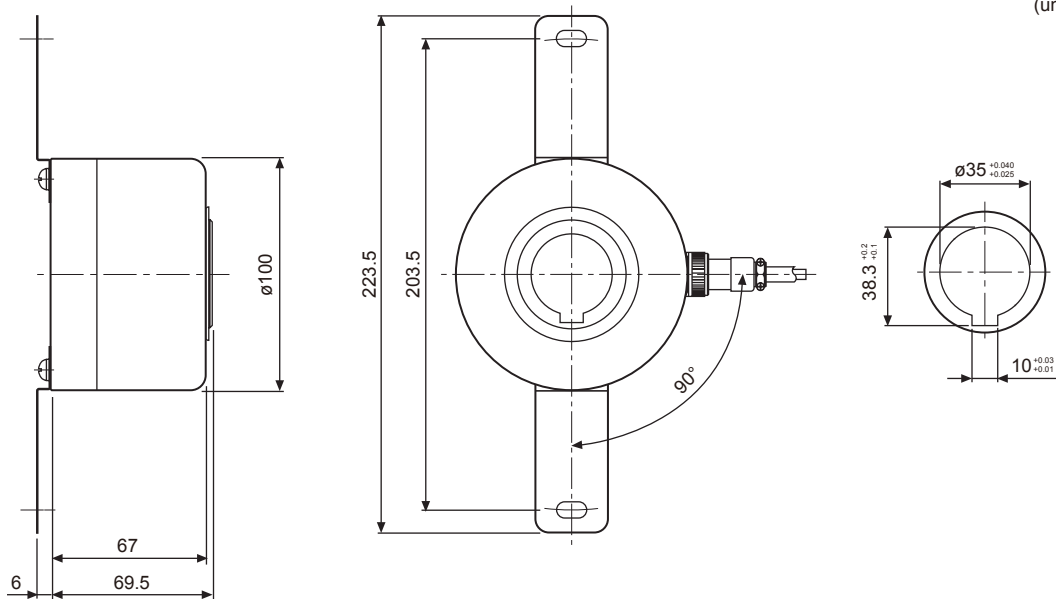
SCN-20-10P

Pin No.	Function	Cable color
①	+V	Brown
②	GND	Blue
③	OUT A	Black
④	OUT A	Red
⑤	F.G.	Shield
⑥	OUT B	White
⑦	OUT B	Gray
⑧	OUT Z	Orange
⑨	OUT Z	Yellow
⑩	N-C	N-C

※ N·C(Not Connected)

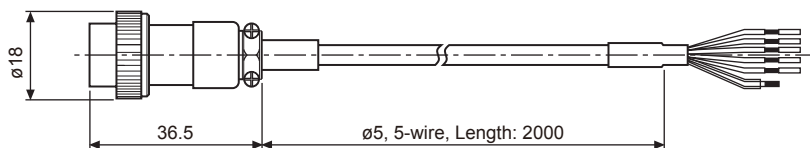
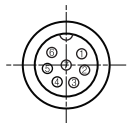
## ■ Dimensions

(unit: mm)

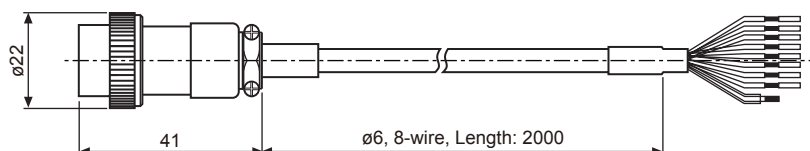
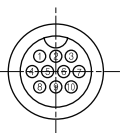


## ◎ Connector cable

- Totem pole output / NPN open collector output / Voltage output



- Line driver output



※ 10m connector cable is customizable.

※ Cable type is customizable.


# Side-mounting Shaft type Incremental Rotary Encoder [ENA Series]

## Ordering information

ENA	5000	2	N	24
Series	Pulse/1Revolution	Output phase	Output	Power supply
Side-mounting shaft type (External diameter of shaft :ø10mm)	Refer to resolution	2: A, B 3: A, B, Z	T: Totem pole output N: NPN open collector output V: Voltage output	5: 5VDC ±5% 24: 12-24VDC ±5%

※Standard: ENA--2-N-24

## Specifications

Item	Side-mounting shaft type of incremental rotary encoder		
Appearances			
Resolution(P/R) <sup>※1</sup>	*1, *2, *5, 10, 12, 15, 20, 23, 25, 30, 35, 40, 45, 50, 60, 75, 100, 120, 150, 192, 200, 240, 250, 256, 300, 360, 400, 500, 512, 600, 800, 1000, 1024, 1200, 1500, 1800, 2000, 2048, 2500, 3000, 3600, 5000		
Electrical specification	Output phase	A, B phase(OPTION: A, B, Z phase)	
	Phase difference of output	Phase difference between A and B: $\frac{T}{4} \pm \frac{T}{8}$ (T=1cycle of A phase)	
	Control output	Totem pole output	• Low - Load current:Max. 30mA, Residual voltage: Max. 0.4VDC • High - Load current:Max. 10mA, Output voltage(power voltage 5VDC):Min. (power voltage-2.0)VDC, Output voltage(power voltage 12-24VDC):Min. (power voltage-3.0)VDC
		NPN open collector output	Load current: Max. 30mA, Residual voltage: Max. 0.4VDC
		Voltage output	Load current: Max. 10mA, Residual voltage: Max. 0.4VDC
	Response time (Rise/Fall)	Totem pole output	Max. 1μs  • Measuring condition - Cable length: 2m, I sink = 20mA
		NPN open collector output	
		Voltage output	
	Max. Response frequency	300kHz	
	Power supply	• 5VDC ±5%(ripple P-P: Max. 5%) • 12-24VDC ±5%(ripple P-P: Max. 5%)	
Current consumption	Max. 80mA(disconnection of the load)		
Insulation resistance	Min. 100MΩ(at 500VDC megger between all terminals and case)		
Dielectric strength	750VAC 50/60Hz for 1 minute(between all terminals and case)		
Connection	Connector type		
Mechanical specification	Starting torque	Max. 70gf·cm(0.007N·m)	
	Moment of inertia	Max. 80g·cm <sup>2</sup> (8×10 <sup>-6</sup> kg·m <sup>2</sup> )	
	Shaft loading	Radial: 10kgf, Thrust: 2.5kgf	
	Max. allowable revolution <sup>※2</sup>	5000rpm	
Vibration	1.5mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 2 hours		
Shock	Approx. Max. 75G		
Environment	Ambient temperature	-10 to 70°C, storage: -25 to 85°C	
	Ambient humidity	35 to 85%RH, storage: 35 to 90%RH	
Protection	IP50(IEC standard)		
Cable	ø5mm, 5-wire, Length: 2m, Shield cable (AWG 24, Core diameter: 0.08mm, Number of cores: 40, Insulator out diameter: ø1mm)		
Accessory	ø10mm coupling		
Approval	CE		
Unit weight	Approx. 345g		

※1: '\*' pulse is only for A, B phase

※2: Make sure that. Max response revolution should be lower than or equal to max. allowable revolution when selecting the resolution.

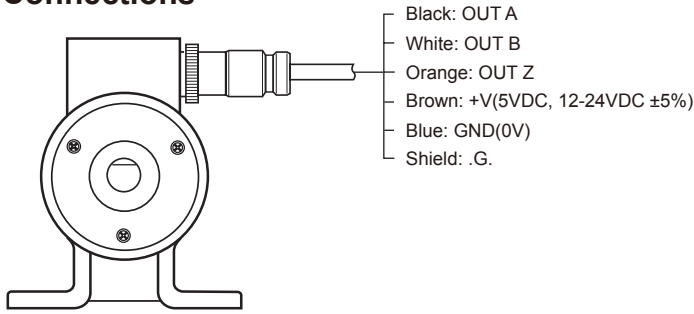
$$[\text{Max. response revolution(rpm)}] = \frac{\text{Max. response frequency}}{\text{Resolution}} \times 60 \text{ sec}$$

※Environment resistance is rated at no freezing or condensation.

- Photo electric sensor
- Fiber optic sensor
- Door/Area sensor
- Proximity sensor
- Pressure sensor
- Rotary encoder
- Connector/Socket
- Temp. controller
- SSR/Power controller
- Counter
- Timer
- Panel meter
- Tacho/Speed/ Pulse meter
- Display unit
- Sensor controller
- Switching mode power supply
- Stepper motor& Driver&Controller
- Graphic/Logic panel
- Field network device

# Selection Guide

## ■ Connections

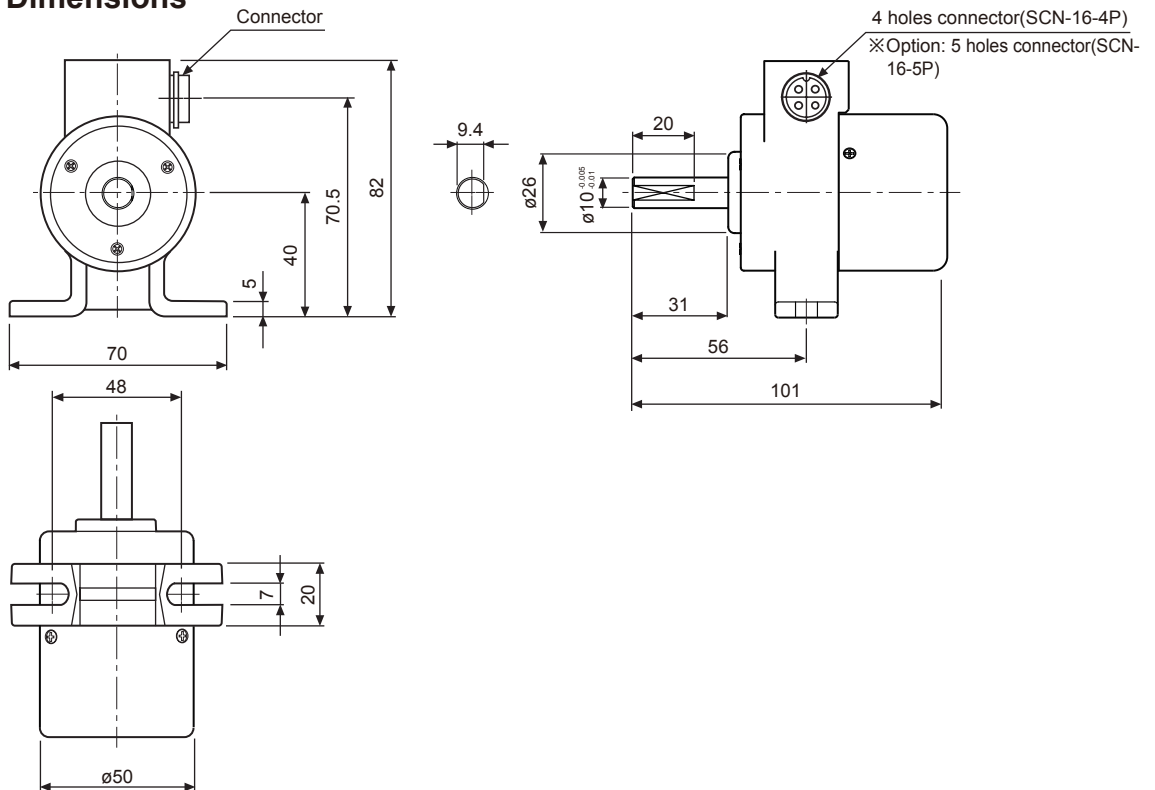


Pin No	Cable color	Function
①	Black	OUT A
②	White	OUT B
③	Brown	+V
④	Blue	GND
①	Black	OUT A
②	White	OUT B
③	Orange	OUT Z
④	Brown	+V
⑤	Blue	GND

- ※Z phase output is option.
- ※Unused wires must be insulated.
- ※The metal case and shield cable of encoder must be grounded(F.G.).

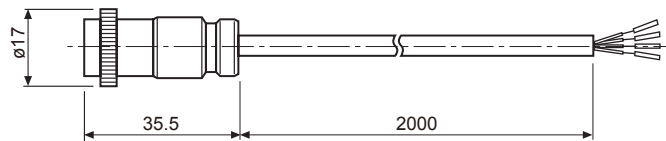
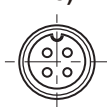
## ■ Dimensions

(unit: mm)

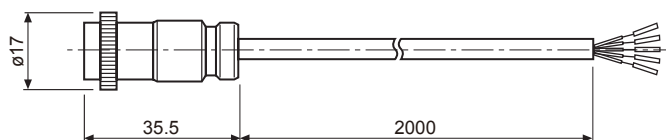
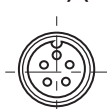


## ◎ Connector cable

- ENA(2m, 4-wire)



- ENA(2m, 5-wire) (Option)



# Wheel type of Incremental Rotary Encoder [ENC Series]


## Ordering information

ENC - 1 - 1 - N - 24 -

Series	Output phase	Min. measuring unit	Output	Power supply	Cable
Wheel type	1: A, B phase	1: 1mm 2: 1cm 3: 1m 4: 0.01yd 5: 0.1yd 6: 1yd	T: Totem pole output N: NPN open collector output V: Voltage output	5: 5VDC ±5% 24: 12-24VDC ±5%	No mark: Cable type C: Connector cable type(※)

※Cable length: 250mm

## Specifications

Item	Wheel type of incremental rotary encoder		
Appearances			
Resolution(P/R)	Refer to resolution		
Electrical specification	Output phase	A, B phase	
	Phase difference of output	Phase difference between A and B : $\frac{T}{4} \pm \frac{T}{8}$ (T=1 cycle of A phase)	
	Control output	Totem pole output	<ul style="list-style-type: none"> <li>Low - Load current: Max. 30mA, Residual voltage: Max. 0.4VDC</li> <li>High - Load current: Max. 10mA, Output voltage(power voltage 5VDC): Min. (power voltage-2.0)VDC, Output voltage(power voltage 12-24VDC): Min. (power voltage-3.0)VDC</li> </ul>
		NPN open collector output	Load current: Max. 30mA, Residual voltage: Max. 0.4VDC
		Voltage output	Load current: Max. 10mA, Residual voltage: Max. 0.4VDC
	Response time (Rise/Fall)	Totem pole output	Max. 1μs
		NPN open collector output	
		Voltage output	
	Max. Response frequency	180kHz	
	Power supply	5VDC ±5%(ripple P-P: Max. 5%), 12-24VDC ±5%(ripple P-P: Max. 5%)	
	Current consumption	Max. 80mA(disconnection of the load)	
	Insulation resistance	Min. 100MΩ(at 500VDC megger between all terminals and case)	
	Dielectric strength	750VAC 50/60Hz for 1 minute(between all terminals and case)	
Connection	Cable type, 250mm connector cable type		
Mechanical specification	Starting torque	Depend on coefficient of friction	
	Max. allowable revolution <sup>※1</sup>	5000rpm	
Vibration	1.5mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 2 hours		
Shock	Approx. Max. 75G		
Environment	Ambient temperature	-10 to 70°C(at non-freezing status), storage: -25 to 85°C	
	Ambient humidity	35 to 85%RH, storage: 35 to 90%RH	
Cable	ø5mm, 5-wire, Length: 2m, Shield cable(line driver output: ø5mm, 8-wire) (AWG24, Core diameter: 0.08mm, Number of cores: 40, Insulator out diameter: ø1mm)		
Protection	IP50(IEC standard)		
Approval	CE		
Unit weight	Approx. 494g		

※1: Make sure that. Max response revolution should be lower than or equal to max. allowable revolution when selecting the resolution.

$$[\text{Max. response revolution}(\text{rpm})] = \frac{\text{Max. response frequency}}{\text{Resolution}} \times 60 \text{ sec}$$

※Environment resistance is rated at no freezing or condensation.

Photo electric sensor

Fiber optic sensor

Door/Area sensor

Proximity sensor

Pressure sensor

Rotary encoder

Connector/Socket

Temp. controller

SSR/Power controller

Counter

Timer

Panel meter

Tacho/Speed/ Pulse meter

Display unit

Sensor controller

Switching mode power supply

Stepper motor& Driver&Controller

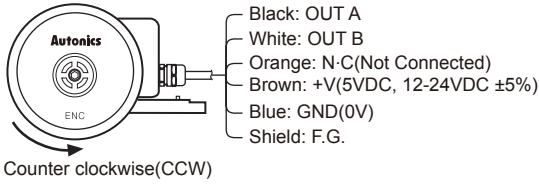
Graphic/Logic panel

Field network device

# Selection Guide

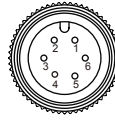
## ■ Connections

### ◎ Cable type



- ※ Unused wires must be insulated.
- ※ The metal case and shield wire of encoder must be grounded (F.G.)

### ◎ Connector cable type



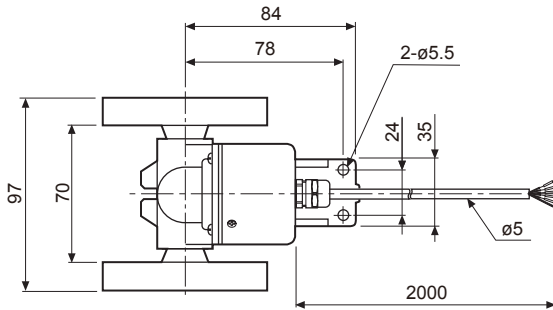
Pin No	Cable color	Function
①	Black	OUT A
②	White	OUT B
③	Orange	N-C
④	Brown	+V
⑤	Blue	GND
⑥	Shield	F.G.

※ F.G. (Field Ground): It must be grounded separately.

## ■ Dimensions

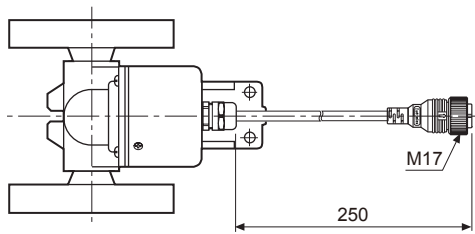
### ◎ Cable type

(unit: mm)



- ※ The wheel circumference is changed according to model (ø), please refer to resolution chart.
- ※ Connector cable is sold separately and see 152 page for specifications.

### ◎ Connector cable type



Cable for cable type	Cable for connector cable type
ø5, 5-wire, Length: 2000mm, Shield cable	ø5, 5-wire, Length: 250mm, Shield cable




# Incremental manual handle type Rotary encoder [ENH Series]

## Ordering information

<b>ENH</b>	-	<b>100</b>	-	<b>1</b>	-	<b>T</b>	-	<b>24</b>
Series		Pulse/1 Revolution		Clickstopper position		Control output		Power supply
Handle type		25 100		1: Normal "H" 2: Normal "L"		T: Totem pole output V: Voltage output L: Line driver output(※)		5: 5VDC ±5% 24: 12-24VDC ±5%

※The power of Line driver is only for 5VDC

## Specifications

Item	Incremental manual handle type of rotary encoder			
Appearances				
Resolution(P/R) ※1	25,100			
Electrical specification	Output phase	A, B phase(line driver output A, $\bar{A}$ , B, $\bar{B}$ phase)		
	Phase difference of output	Phase difference between A and B: $\frac{T}{2} \pm \frac{T}{8}$ (T= 1cycle of A phase)		
	Control output	Totem pole output	<ul style="list-style-type: none"> <li>• Low - Load current: Max. 30mA, Residual voltage: Max. 0.4VDC</li> <li>• High - Load current: Max. 10mA</li> </ul> Output voltage(power voltage 5VDC): Min. (power voltage-2.0)VDC, Output voltage(power voltage 12-24VDC): Min. (power voltage-3.0) VDC	
		Voltage output	Load current: Max. 10mA, Residual voltage: Max. 0.4VDC	
		Line driver output	<ul style="list-style-type: none"> <li>• Low - Load current: Max. 20mA, Residual voltage: Max. 0.5VDC</li> <li>• High - Load current: Max. -20mA, Output voltage: Min. 2.5VDC</li> </ul>	
	Response time (Rise/Fall)	Totem pole output	• Measuring condition - Cable length: 1m, I sink = 20mA	
		Voltage output		Max. 1μs
		Line driver output		Max. 0.2μs
	Power supply	• 5VDC ±5%(ripple P-P: Max.5%) • 12-24VDC ±5%(ripple P-P: Max.5%)		
	Current consumption	Max. 40mA(disconnection of the load), Line driver output: Max. 50mA(disconnection of the load)		
	Max. Response frequency	10kHz		
	Insulation resistance	Min. 100MΩ(at 500VDC megger between all terminals and case)		
	Dielectric strength	750VAC 50/60Hz for 1 minute(between all terminals and case)		
Connection	Terminal block type			
Mechanical specification	Starting torque	Max. 1kgf·cm(0.098N·m)		
	Shaft loading	Radial: 2kgf, Thrust: 1kgf		
	Max. allowable revolution ※2	Max. 200rpm(Normal), 600rpm(Peak)		
Vibration	1.5mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 2 hours			
Shock	Approx. Max. 50G			
Ambient temperature	-10 to 70°C, storage: -25 to 85°C			
Ambient humidity	35 to 85%RH, storage: 35 to 90°C			
Protection	IP50(IEC standard)			
Weight※3	Approx. 330g(approx. 260g)			

※1: Not indicated type is customizable.

※2: Make sure that. Max response revolution should be lower than or equal to max. allowable revolution when selecting the resolution.

$$[\text{Max. response revolution(rpm)}] = \frac{\text{Max. response frequency}}{\text{Resolution}} \times 60 \text{ sec}$$

※3: The weight with packaging and the weight in parentheses is only unit weight.

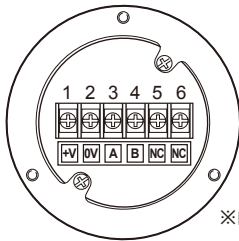
※Environment resistance is rated at no freezing or condensation.

- Photo electric sensor
- Fiber optic sensor
- Door/Area sensor
- Proximity sensor
- Pressure sensor
- Rotary encoder**
- Connector/ Socket
- Temp. controller
- SSR/ Power controller
- Counter
- Timer
- Panel meter
- Tacho/ Speed/ Pulse meter
- Display unit
- Sensor controller
- Switching mode power supply
- Stepper motor& Driver&Controller
- Graphic/ Logic panel
- Field network device

# Selection Guide

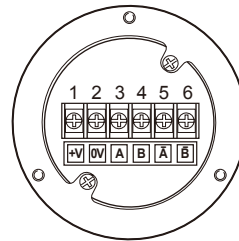
## ■ Connections

● Totem pole output / Voltage output



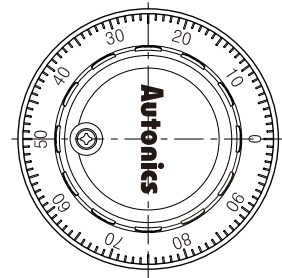
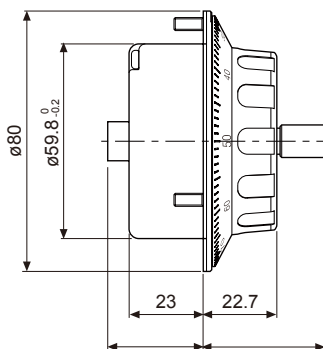
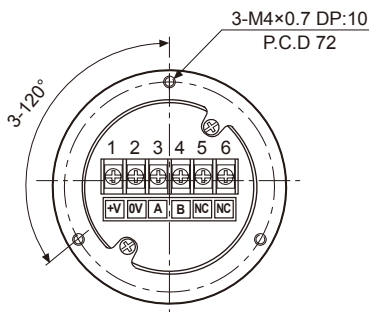
※Do not use terminal No. 5, 6.

● Line driver output



## ■ Dimensions

(unit: mm)



※ø70mm PCD mounting hole type is customizable.

## Portable Incremental type with Handle [ENHP Series]

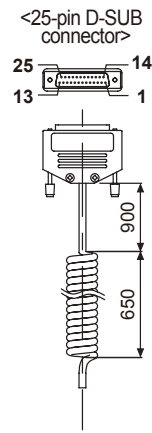
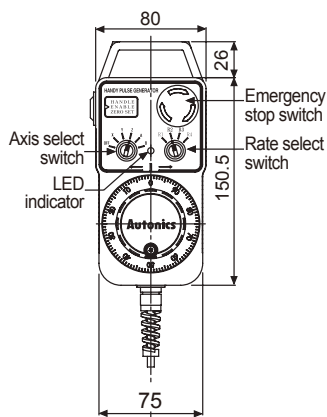
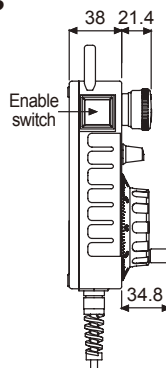
### ■ Ordering information

ENHP	100	1	L	5
Series	Pulse/1Revolution	Clickstopper position	Control output	Power supply
Portable encoder with handle	100	1: Normal "H" 2: Normal "L"	T: Totem pole output L: Line driver output	5: 5VDC ±5% 24: 12-24VDC ±5%


※Line driver power is only 5VDC.

### ■ Dimensions

(unit: mm)



■ Specifications

Item	Portable incremental type of rotary encoder with handle		
Appearances			
Resolution(P/R)	100		
Electrical specification	Output phase	A, B phase(line driver output A, $\bar{A}$ , B, $\bar{B}$ phase)	
	Phase difference of output	Phase difference between A and B: $\frac{T}{4} \pm \frac{T}{8}$ (T=1 cycle of A phase)	
	Rotary switch output	BCD Code output • Axis select switch(OFF, X, Y, Z, A, B) • Rate select switch(R1, R2, R3, R4)	
	Control output	Totem pole output	• Low - Load current: Max. 30mA, Residual voltage: Max. 0.4VDC • High - Load current: Max. 10mA, Output voltage(power voltage 5VDC): Min.(power voltage-2.0)VDC Output voltage(power voltage 12-24VDC): Min.(power voltage-3.0)VDC
		Line driver output	• Low - Load current: Max. 20mA, Residual voltage: Max. 0.5VDC • High - Load current: Max. -20mA, Output voltage: Min. 2.5VDC
	Response time (Rise/Fall)	Totem pole output	Max. 1 $\mu$ s
		Line driver output	Max. 0.5 $\mu$ s
	Power supply	• 5VDC $\pm$ 5%(ripple P-P: Max. 5%) • 12-24VDC $\pm$ 5%(ripple P-P: Max. 5%)	
	Current consumption	Max. 40mA(disconnection of the load), Line driver output: Max. 50mA(disconnection of the load)	
	Max. Response frequency	10kHz	
	Insulation resistance	Min. 100M $\Omega$ (at 500VDC megger between all terminals and case)	
	Dielectric strength	750VAC 50/60Hz for 1 minute(between all terminals and case)	
	Connection	25Pin D-SUB of connector type	
Mechanical specification	Starting torque	Max. 1kgf·cm(0.098N·m)	
	Shaft loading	Radial: 2kgf, Thrust: 1kgf	
	Max. allowable revolution <sup>※1</sup>	Max. 200rpm(Normal), 600rpm(Peak)	
Vibration	1.5mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 2 hours		
Shock	Approx. Max. 50G		
Environment	Ambient temperature	-10 to 70°C, storage: -25 to 85°C	
	Ambient humidity	35 to 85%RH, storage: 35 to 90%RH	
Cable	$\phi$ 5mm, 18-wire, Length: 8m, Spring code cable (AWG28, Core diameter: 0.08mm, Number of cores: 18, Insulator out diameter: $\phi$ 0.7mm)		
Protection <sup>※2</sup>	IP67(IEC standards) for Box		
Unit weight	Approx. 730g		

※1: Make sure that Max response revolution should be lower than or equal to max. allowable revolution when selecting the resolution.

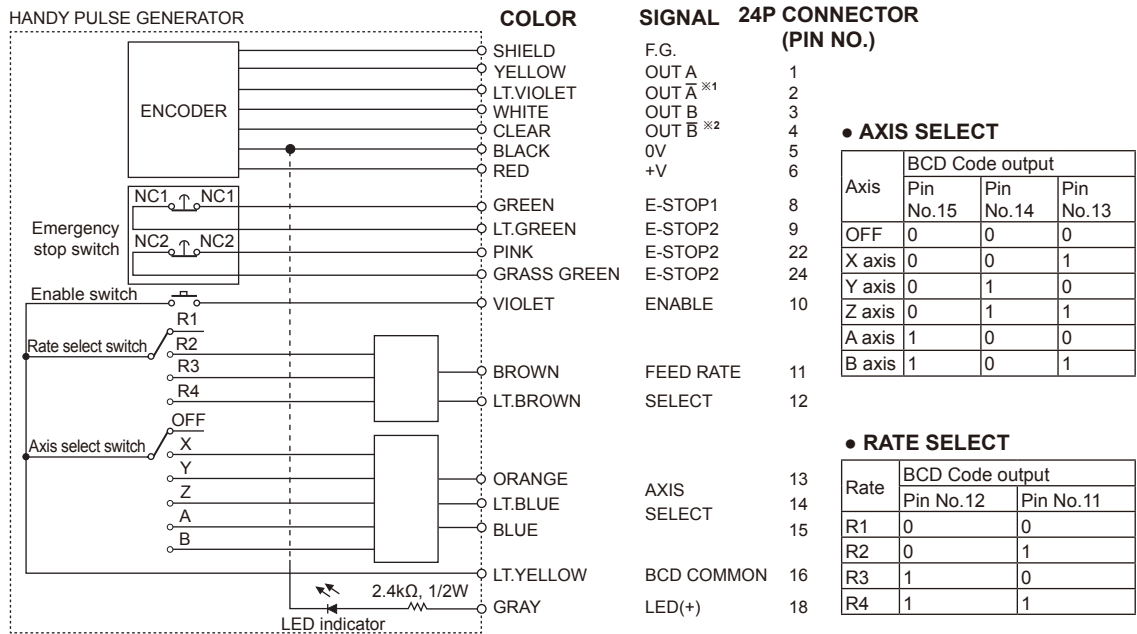
$$[\text{Max. response revolution}(\text{rpm})] = \frac{\text{Max. response frequency}}{\text{Resolution}} \times 60 \text{ sec}$$

※2: It is protection for the rear case and the wiring part.

※Environment resistance is rated at no freezing or condensation.

Photo electric sensor
Fiber optic sensor
Door/Area sensor
Proximity sensor
Pressure sensor
Rotary encoder
Connector/ Socket
Temp. controller
SSR/ Power controller
Counter
Timer
Panel meter
Tacho/ Speed/ Pulse meter
Display unit
Sensor controller
Switching mode power supply
Stepper motor& Driver&Controller
Graphic/ Logic panel
Field network device

## Connections



\*1: Totem pole output does not have  $\bar{A}$ ,  $\bar{B}$  output signal.

\*2: COMMON terminal(Pin No. 16) of Axis select switch and Rate select switch is common.

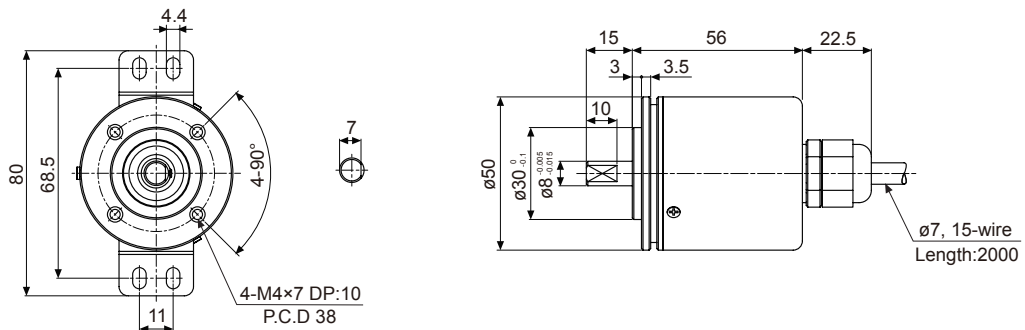
## Diameter $\phi 50$ mm Shaft type Absolute Rotary Encoder [EP50S Series]

### Ordering information


EP50S	8	1024	1	R	P	24
Series	Shaft diameter	Pulse/1Revolution	Output code	Revolution direction	Control output	Power supply
Diameter $\phi 50$ mm shaft type	$\phi 8$ mm	Refer to resolution	1: BCD Code 2: Binary Code 3: Gray Code	F: Output value increase at CW direction R: Output value increase at CCW direction	P: PNP open collector output N: NPN open collector output	5 : 5VDC $\pm 5\%$ 24: 12-24VDC $\pm 5\%$

### Dimensions

(unit: mm)



Specifications

Item	Diameter ø50mm shaft type of absolute rotary encoder												
Appearances													
Resolution	6, 8, 10, 12, 16, 20, 24, 32, 40, 45, 48, 64, 90, 128, 180, 256, 360, 512, 720, 1024												
Electrical specification	Output code	BCD Code	Binary Code	Gray Code		BCD Code	Binary Code	Gray Code					
	Output phase / Output angle*1	1024-division	TS: 0.3515°±15' (13bit)	TS: 0.3515°±15' (10bit)	TS: 0.703°±15' (10bit)	20-division	TP1:12°±60'(1bit) TP2:2°±60'(1bit) TS: 18°±60'(5bit) EP: 18°±60'(1bit)	TP1: 12°±60'(1bit) TP2: 2°±60'(1bit) TS: 18°±60'(5bit) EP: 18°±60'(1bit)	TP1: 12°±60'(1bit) TP2: 2°±60'(1bit) TS: 36°±60'(5bit) EP:18°±60'(1bit)				
		720-division	TS: 0.5°±25' (11bit)	TS: 0.5°±25' (10bit)	TS: 1°±25' (10bit)		16-division	TP1: 15°±60'(1bit) TP2:2°±60'(1bit) TS: 22.5°±60' (5bit) EP: 22.5°±60' (1bit)	TP1:15°±60'(1bit) TP2:2°±60'(1bit) TS: 22.5°±60' (4bit) EP: 22.5°±60' (1bit)	TP1:15°±60'(1bit) TP2: 2°±60'(1bit) TS:45°±60'(4bit) EP: 22.5°±60' (1bit)			
		512-division	TS: 0.703°±15' (11bit)	TS: 0.703°±15' (9bit)	TS: 1.406°±15' (9bit)			12-division	TP1:15°±60'(1bit) TP2:3°±60'(1bit) TS:30°±60'(5bit) EP:30°±60'(1bit)	TP1: 15°±60'(1bit) TP2: 3°±60'(1bit) TS: 30°±60'(4bit) EP: 30°±60'(1bit)	TP1: 15°±60'(1bit) TP2: 3°±60'(1bit) TS: 60°±60'(4bit) EP: 30°±60'(1bit)		
		360-division	TS: 1°±25'(10bit)	TS: 1°±25'(9bit)	TS: 2°±25'(9bit)				10-division	TP1:30°±60'(1bit) TP2: 2°±60'(1bit) TS: 36°±60'(4bit) EP: 36°±60'(1bit)	TP1: 30°±60'(1bit) TP2: 2°±60'(1bit) TS: 36°±60'(4bit) EP: 36°±60'(1bit)	TP1: 30°±60'(1bit) TP2: 2°±60'(1bit) TS: 72°±60'(4bit) EP: 36°±60'(1bit)	
		256-division	TS: 1.406°±15' (10bit)	TS: 1.406°±15' (8bit)	TS: 2.8125°±15' (8bit)	10-division				TP1:7°±60'(1bit) TP2: 2°±60'(1bit) TS: 11.25°±60'(5bit) EP: 11.25°±60'(1bit)	TP1:7°±60'(1bit) TP2: 2°±60'(1bit) TS: 22.5°±60'(5bit) EP: 45°±60'(1bit)	TP1: 7°±60'(1bit) TP2: 2°±60'(1bit) TS: 45°±60'(3bit) EP: 45°±60'(1bit)	
		180-division	TS: 2°±25'(9bit)	TS: 2°±25'(8bit)	TS: 4°±25'(8bit)		6-division			TP1:39°±60'(1bit) TP2: 15°±60'(1bit) TS: 45°±60'(3bit) EP: 45°±60'(1bit)	TP1: 39°±60'(1bit) TP2: 15°±60'(1bit) TS: 45°±60'(3bit) EP: 45°±60'(1bit)	TP1: 39°±60'(1bit) TP2: 15°±60'(1bit) TS: 90°±60'(3bit) EP: 45°±60'(1bit)	
		128-division	TS: 2.8125°±15' (9bit)	TS: 2.8125°±15' (7bit)	TS: 5.625°±15' (7bit)			6-division		TP1: 8°±60'(1bit) TP2: 3°±60'(1bit) TS: 15°±60'(6bit) EP: 15°±60'(1bit)	TP1: 8°±60'(1bit) TP2: 3°±60'(1bit) TS: 30°±60'(3bit) EP: 60°±60'(1bit)	TP1: 8°±60'(1bit) TP2: 3°±60'(1bit) TS: 60°±60'(3bit) EP: 60°±60'(1bit)	
		90-division	TS: 4°±25'(8bit)	TS: 4°±25'(7bit)	TS: 8°±25'(7bit)				6-division	TP1:15°±60'(1bit) TP2: 2°±60'(1bit) TS: 18°±60'(6bit) EP: 9°±60'(1bit)	TP1: 15°±60'(1bit) TP2: 2°±60'(1bit) TS: 18°±60'(6bit) EP: 9°±60'(1bit)	TP1: 15°±60'(1bit) TP2: 2°±60'(1bit) TS: 36°±60'(6bit) EP: 9°±60'(1bit)	
		64-division	TS: 5.625°±15'(7bit)	TS: 5.625°±15'(6bit)	TS: 11.25°±15'(6bit)	6-division				TP1:7°±60'(1bit) TP2: 2°±60'(1bit) TS: 11.25°±60'(5bit) EP: 11.25°±60'(1bit)	TP1:7°±60'(1bit) TP2: 2°±60'(1bit) TS: 22.5°±60'(5bit) EP: 45°±60'(1bit)	TP1: 7°±60'(1bit) TP2: 2°±60'(1bit) TS: 45°±60'(3bit) EP: 45°±60'(1bit)	
		48-division	TS: 7.5°±25'(7bit)	TS: 7.5°±25'(6bit)	TS: 15°±25'(6bit)		6-division			TP1: 8°±60'(1bit) TP2: 3°±60'(1bit) TS: 15°±60'(6bit) EP: 15°±60'(1bit)	TP1: 8°±60'(1bit) TP2: 3°±60'(1bit) TS: 30°±60'(3bit) EP: 60°±60'(1bit)	TP1: 8°±60'(1bit) TP2: 3°±60'(1bit) TS: 60°±60'(3bit) EP: 60°±60'(1bit)	
		45-division	TS: 8°±25'(7bit)	TS: 8°±25'(6bit)	TS: 16°±25'(6bit)			6-division		TP1:5°±60'(1bit) TP2: 2°±60'(1bit) TS: 9°±60'(6bit) EP: 9°±60'(1bit)	TP1: 5°±60'(1bit) TP2: 2°±60'(1bit) TS: 9°±60'(6bit) EP: 9°±60'(1bit)	TP1: 5°±60'(1bit) TP2: 2°±60'(1bit) TS: 18°±60'(6bit) EP: 9°±60'(1bit)	
		40-division	TP1: 5°±60'(1bit) TP2: 2°±60'(1bit) TS: 9°±60'(6bit) EP: 9°±60'(1bit)	TP1: 5°±60'(1bit) TP2: 2°±60'(1bit) TS: 9°±60'(6bit) EP: 9°±60'(1bit)	TP1: 5°±60'(1bit) TP2: 2°±60'(1bit) TS: 18°±60'(6bit) EP: 9°±60'(1bit)								
		32-division	TP1:7°±60'(1bit) TP2: 2°±60'(1bit) TS: 11.25°±60'(6bit) EP: 11.25°±60'(1bit)	TP1:7°±60'(1bit) TP2: 2°±60'(1bit) TS: 11.25°±60'(5bit) EP: 11.25°±60'(1bit)	TP1: 7°±60'(1bit) TP2: 2°±60'(1bit) TS: 22.5°±60'(5bit) EP: 11.25°±60'(1bit)								
		24-division	TP1: 8°±60'(1bit) TP2: 3°±60'(1bit) TS: 15°±60'(6bit) EP: 15°±60'(1bit)	TP1: 8°±60'(1bit) TP2: 3°±60'(1bit) TS: 15°±60'(5bit) EP: 15°±60'(1bit)	TP1: 8°±60'(1bit) TP2: 3°±60'(1bit) TS: 30°±60'(5bit) EP: 15°±60'(1bit)								
Control output	PNP open collector output	Output voltage: Min. (power supply-1.5)VDC, Load current: Max. 32mA											
	NPN open collector output	Load current: Max. 32mA, Residual voltage: Max. 1VDC											
Response time(Rise/Fall)	Ton=800nsec, Toff=Max. 800nsec(Cable length: 2m, I sink = 32mA)												
Max. Response frequency	35kHz												
Power supply	• 5VDC ±5%(ripple P-P: Max. 5%) • 12-24VDC ±5%(ripple P-P: Max. 5%)												
Current consumption	Max. 100mA(disconnection of the load)												
Insulation resistance	Min. 100MΩ(at 500VDC megger between all terminals and case)												
Dielectric strength	750VAC 50/60Hz for 1 minute(between all terminals and case)												
Connection	Cable type(Cable gland)												
Item	Diameter ø50mm shaft type of absolute rotary encoder												
Mechanical specification	Starting torque	Max. 40gf·cm(0.004N·m)											
	Moment of inertia	Max. 40g·cm <sup>2</sup> (4×10 <sup>-6</sup> kg·m <sup>2</sup> )											
	Shaft loading	Radial: 10kgf, Thrust: 2.5kgf											
	Max. allowable revolution*2	3000rpm											
Vibration	1.5mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 2 hours												
Shock	Approx. Max. 50G												
Environment	Ambient temperature	-10 to 70°C, storage: -25 to 85°C											
	Ambient humidity	35 to 85%RH, storage: 35 to 90%RH											
Protection	IP64(IEC standard)												
Cable	ø7mm, 15-wire, Length: 2m, Shield cable (AWG 28, Core diameter: 0.08mm, Number of cores: 40, Insulator out diameter: ø0.8mm)												
Accessory	Fixing bracket, Coupling												
Approval	CE												
Unit weight	Approx. 380g												

\*1: TS=Signal Pulse, Tp=Timing Pulse, EP=Even Parity

\*2: Make sure that. Max response revolution should be lower than or equal to max. allowable revolution when selecting the resolution.

$$[\text{Max. response revolution}(\text{rpm}) = \frac{\text{Max. response frequency}}{\text{Resolution}} \times 60 \text{ sec}]$$

\*Environment resistance is rated at no freezing or condensation.

Photo electric sensor
Fiber optic sensor
Door/Area sensor
Proximity sensor
Pressure sensor
Rotary encoder
Connector/Socket
Temp. controller
SSR/Power controller
Counter
Timer
Panel meter
Tacho/Speed/Pulse meter
Display unit
Sensor controller
Switching mode power supply
Stepper motor& Driver&Controller
Graphic/Logic panel
Field network device

## ■ Connections

### ● BCD Code

Resolution Color	6- divi- sion	8- divi- sion	10- divi- sion	12- divi- sion	16- divi- sion	20- divi- sion	24- divi- sion	32- divi- sion	40- divi- sion	45- divi- sion	48- divi- sion	64- divi- sion	90- divi- sion	128- divi- sion	80- divi- sion	256- divi- sion	360- divi- sion	512- divi- sion	720- divi- sion	1024- divi- sion	
Power	White	+V																			
	Boack	0V																			
Output wire	Brown	$2^0$																			
	Red	$2^1$																			
	Orange	$2^2$																			
	Yellow	N-C		$2^3$																	
	Blue	N-C			$2^9 \times 10$																
	Purple	N-C							$2^{21} \times 10$												
	Gray	N-C									$2^2 \times 10$										
	White/Brown	TP1									N-C			$2^3 \times 10$							
	White/Red	TP2									N-C			$2^0 \times 10$							
	White/Orange	EP									N-C			$2^1 \times 100$							
	White/Yellow	N-C															$2^2 \times 100$				
	White/Blue	N-C																		$2^3 \times 100$	
	White/Purple	N-C																			
	Shield wire	F.G.																			

※ Unused wires must be insulated.

※ Encoder case and shield wire must be grounded(F.G.).

※ N-C: Not Connected.

※ Output cable must not be short-circuited, because Driver IC is used in output circuit.

### ● Binary Code/Gray Code

Resolution Color	6- divi- sion	8- divi- sion	10- divi- sion	12- divi- sion	16- divi- sion	20- divi- sion	24- divi- sion	32- divi- sion	40- divi- sion	45- divi- sion	48- divi- sion	64- divi- sion	90- divi- sion	128- divi- sion	80- divi- sion	256- divi- sion	360- divi- sion	512- divi- sion	720- divi- sion	1024- divi- sion	
Power	White	+V																			
	Boack	0V																			
Output wire	Brown	$2^0$																			
	Red	$2^1$																			
	Orange	$2^2$																			
	Yellow	N-C		$2^3$																	
	Blue	N-C					$2^4$														
	Purple	N-C								$2^5$											
	Gray	N-C												$2^6$							
	White/Brown	TP1										N-C			$2^7$						
	White/Red	TP2										N-C			$2^8$						
	White/Orange	EP										N-C			$2^9$						
	Shield wire	F.G.																			

※ Unused wires must be insulated.

※ Encoder case and shield wire must be grounded(F.G.).

※ N-C: Not Connected.


※ Output cable must not be short-circuited, because Driver IC is used in output circuit.

# Diameter ø50mm Shaft type Absolute Rotary Encoder [EP50SP Series]

## Ordering information

<b>EP50S</b>	<b>6</b>	<b>P</b>	<b>360</b>	<b>3</b>	<b>F</b>	<b>N</b>	<b>24</b>
Series	Shaft diameter	Outer material	Pulse/1Revolution	Output code	Revolution direction	Control output	Power supply
Diameter ø50mm shaft type	6: ø6mm 8: ø8mm	Plastic	360	3: Gray Code	F: Output value increase at CW direction	N: NPN open collector output	5 : 5VDC ±5% 24: 12-24VDC ±5%

## Specifications

Item	Diameter ø50mm shaft type of absolute rotary encoder	
Appearances		
Resolution(P/R)	360	
Electrical specification	Output code	Gray Code(Shift Gray Code)
	Output phase / Output angle	TS: Signal Pulse(9bit), TS: 2°±25'
	Control output	NPN Open collector- Load current: Max. 15mA, Residual voltage: Max. 1VDC
	Response time(Rise/Fall)	Ton=Max. 1µs, Toff=Max. 1µs(Cable length: 2m, I sink = 15mA)
	Max. Response frequency	20kHz
	Power supply	• 5VDC ±5%(ripple P-P: Max. 5%) • 12-24VDC ±5%(ripple P-P: Max. 5%)
	Current consumption	Max. 80mA(disconnection of the load)
Connection	Cable type(Cable gland)	
Mechanical specification	Starting torque	Max. 40gf·cm(0.004N·m)
	Moment of inertia	Max. 50g·cm <sup>2</sup> (5×10 <sup>-7</sup> kg·m <sup>2</sup> )
	Shaft loading	Radial: 2kgf, Thrust: 1kgf
	Max. allowable revolution <sup>※1</sup>	3000rpm
Insulation resistance	Min. 100MΩ(at 500VDC megger between all terminals and case)	
Dielectric strength	750VAC 50/60Hz for 1 minute(between all terminals and case)	
Vibration	1.5mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 2 hours	
Shock	Approx. Max. 50G	
Environment	Ambient temperature	-10 to 70°C, storage: -25 to 85°C
	Ambient humidity	35 to 85%RH, storage: 35 to 90%RH
Protection	IP50(IEC standard)	
Cable	ø6mm, 12-wire, Length: 2m, Shield cable	
Accessory	Fixing bracket, Coupling	
Weight <sup>※2</sup>	Approx. 308g(Approx. 250g)	

※1: Make sure that. Max response revolution should be lower than or equal to max. allowable revolution when selecting the resolution.

$$[\text{Max. response revolution}(\text{rpm}) = \frac{\text{Max. response frequency}}{\text{Resolution}} \times 60 \text{ sec}]$$

※2: The weight is with packaging and the weight in parentheses is only unit weight.

※Environment resistance is rated at no freezing or condensation.

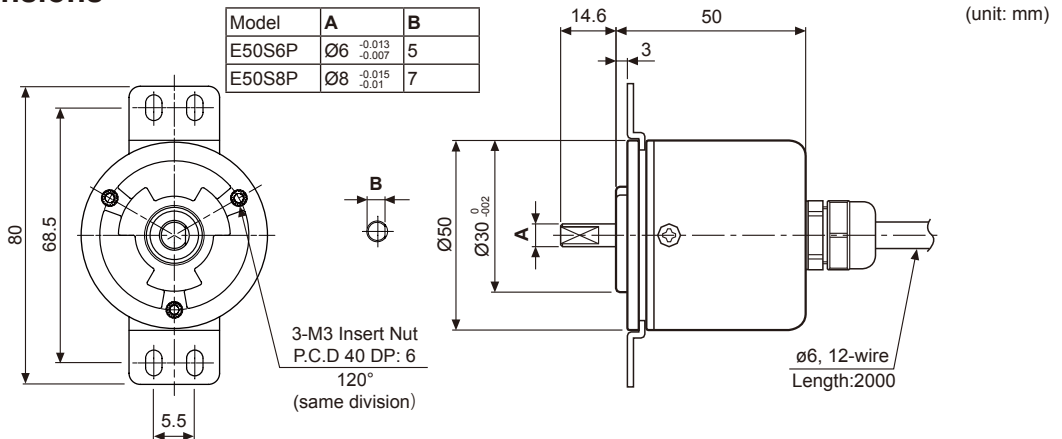
## Connections

### Gray Code

Resolution		360-division					
Power	White	+V(5VDC, 12-24VDC)					
	Black	0V(GND)					
Output wire	Brown	2 <sup>0</sup>	Blue	2 <sup>4</sup>	White/Red	2 <sup>8</sup>	
	Red	2 <sup>1</sup>	Purple	2 <sup>5</sup>	White/Orange	N-C	
	Orange	2 <sup>2</sup>	Gray	2 <sup>6</sup>	Shield wire	F.G.	
	Yellow	2 <sup>3</sup>	White/Brown	2 <sup>7</sup>			

Photo electric sensor
Fiber optic sensor
Door/Area sensor
Proximity sensor
Pressure sensor
Rotary encoder
Connector/Socket
Temp. controller
SSR/ Power controller
Counter
Timer
Panel meter
Tacho/ Speed/ Pulse meter
Display unit
Sensor controller
Switching mode power supply
Stepper motor& Driver&Controller
Graphic/ Logic panel
Field network device

## ■ Dimensions



## Diameter ø58mm Shaft/Hollow Built-in type Absolute Rotary Encoder [EP58SP Series]

### ■ Ordering information

<b>EP58SC</b>		<b>10</b>		<b>1024</b>		<b>1</b>		<b>R</b>		<b>P</b>		<b>24</b>	
Series Diameter ø58mm		Shaft diameter		Resolution/1revolution		Output code		Rotating direction		Control output		Power supply	
SC: Shaft clamping	External	10	ø10mm	Refer to resolution	1: BCD Code 2: Binary Code 3: Gray Code		F: Output value increases at CW direction R: Output value increases at CCW direction ※Shaft based		P:PNP open collector output N:NPN open collector output		5 : 5VDC ±5% 24: 12-24VDC ±5%		
SS: Shaft synchro		6	ø6mm										
HB: Hollow built-in	Inner	8	ø8mm										

※Gray code is customizable.

### ■ Connections

#### ● BCD Code

		Resolution (Division)	45-division	48-division	64-division	90-division	128-division	80-division	256-division	360-division	512-division	720-division	1024-division
F.G.	White		+V										
	Black		GND(0V)										
Output wire	Brown	2 <sup>0</sup>											
	Red	2 <sup>1</sup>											
	Orange	2 <sup>2</sup>											
	Yellow	2 <sup>3</sup>											
	Blue	(2 <sup>0</sup> ×10)											
	Purple	(2 <sup>1</sup> ×10)											
	Gray	(2 <sup>2</sup> ×10)											
	White/Brown	N-C	2 <sup>3</sup> ×10										
	White/Red	N-C	2 <sup>0</sup> ×100										
	White/Orange	N-C										2 <sup>1</sup> ×100	
	White/Yellow	N-C											2 <sup>2</sup> ×100
	White/Blue	N-C											2 <sup>3</sup> ×100
	White/Purple	N-C											2 <sup>0</sup> ×1000
	Shield wire	F.G.											

#### ● Binary Code / Gray Code

		Resolution (Division)	45-division	48-division	64-division	90-division	128-division	80-division	256-division	360-division	512-division	720-division	1024-division
Power	White		+V										
	Black		GND(0V)										
Output wire	Brown	2 <sup>0</sup>											
	Red	2 <sup>1</sup>											
	Orange	2 <sup>2</sup>											
	Yellow	2 <sup>3</sup>											
	Blue	2 <sup>4</sup>											
	Purple	2 <sup>5</sup>											
	Gray	N-C	2 <sup>6</sup>										
	White/Brown	N-C											2 <sup>7</sup>
	White/Red	N-C										2 <sup>8</sup>	
	White/Orange	N-C											2 <sup>9</sup>
	White/Yellow	N-C											
	White/Blue	N-C											
	White/Purple	N-C											
	Shield wire	F.G.											

※Unused wires must be insulated.

※Encoder case and shield wire must be grounded (F.G.).

※N-C: Not connected.

※Output cable must not be short-circuited, because Driver IC is used in output circuit.



## Specifications

Type	Diameter ø58mm absolute rotary encoder								
Appearances									
Resolution	720, 360, 180, 90, 45 division				1024, 512, 256, 128, 64 division				
Electrical specification	Output code	BCD Code	Binary Code	Gray Code	BCD Code	Binary Code	Gray Code		
	Output phase/ Output angle	720-division	TS:Signal Pulse (11bit) TS:0.5°±25'	TS:Signal Pulse (10bit) TS:0.5°±25'	TS:Signal Pulse (10bit) TS:1°±25'	1024 division	TS:Signal Pulse (13bit) TS:0.3515°±15'	TS:Signal Pulse (10bit) TS:0.3515°±15'	TS:Signal Pulse (10bit) TS:0.703°±15'
		360-division	TS:Signal Pulse (10bit) TS:1°±25'	TS:Signal Pulse (9bit) TS:1°±25'	TS:Signal Pulse (9bit) TS:2°±25'	512 division	TS:Signal Pulse (11bit) TS:0.703°±15'	TS:Signal Pulse (9bit) TS:0.703°±15'	TS:Signal Pulse (9bit) TS:1.406°±15'
		180-division	TS:Signal Pulse (9bit) TS:2°±25'	TS:Signal Pulse (8bit) TS:2°±25'	TS:Signal Pulse (8bit) TS:4°±25'	256 division	TS:Signal Pulse (10bit) TS:1.406°±15'	TS:Signal Pulse (8bit) TS:1.406°±15'	TS:Signal Pulse (8bit) TS:2.8125°±15'
		90-division	TS:Signal Pulse (8bit) TS:4°±25'	TS:Signal Pulse (7bit) TS:4°±25'	TS:Signal Pulse (7bit) TS:8°±25'	128 division	TS:Signal Pulse (9bit) TS:2.8125°±15'	TS:Signal Pulse (7bit) TS:2.8125°±15'	TS:Signal Pulse (7bit) TS:5.625°±15'
		45-division	TS:Signal Pulse (7bit) TS:8°±25'	TS:Signal Pulse (6bit) TS:8°±25'	TS:Signal Pulse (6bit) TS:16°±25'	64 division	TS:Signal Pulse (7bit) TS:5.625°±15'	TS:Signal Pulse (6bit) TS:5.625°±15'	TS:Signal Pulse (6bit) TS:11.25°±15'
	Control output	PNP open collector output NPN open collector output							
	Output voltage	Min. (power supply-1.5VDC), Load current: Max. 32mA							
	Load current	Max. 32mA, Residual voltage: Max. 1VDC							
	Response time(Rise/Fall)	Ton=800nsec, Toff=Max. 800nsec(Cable: 2m, I sink = 32mA)							
Max. Response frequency	35kHz								
Power supply	• 5VDC ±5%(ripple P-P: Max. 5%) • 12-24VDC ±5%(ripple P-P: Max. 5%)								
Current consumption	Max. 100mA(disconnection of the load)								
Insulation resistance	Min. 100MΩ(at 500VDC megger between all terminals and case)								
Dielectric strength	750VAC 50/60Hz for 1 minute(between all terminals and case)								
Connection	Cable type(Cable gland)								
Mechanical specification	Starting torque	• SC/SS type: Max. 40gf·cm(0.004N·m)			• HB type: Max. 90gf·cm(0.009N·m)				
	Moment of inertia	• SC/SS type: Max. 15g·cm <sup>2</sup> (1.5×10 <sup>-6</sup> kg·m <sup>2</sup> )			• HB type: Max. 20g·cm <sup>2</sup> (2.0×10 <sup>-6</sup> kg·m <sup>2</sup> )				
	Shaft loading	• SC/SS type: Radial: 10kg·f, Thrust: 2.5kg·f			• HB type: Radial: 2kg·f, Thrust: 1kg·f				
	Max. allowable revolution <sup>※1</sup>	3000rpm							
Vibration	1.5mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 2 hours								
Shock	Approx. Max. 50G								
Environment	Ambient temperature	-10 to 70°C, storage: -25 to 85°C							
	Ambient humidity	35 to 85%RH, storage: 35 to 90%RH							
Protection	IP50(IEC standard)								
Cable	ø7mm, 15-wire, Length: 2m, Shield cable (AWG28, Core diameter: 0.08mm, Number of cores: 40, Insulator out diameter: ø0.8mm)								
Accessories	ø10mm(SC type)/ø6mm(SS type) coupling, Fixing bracket								
Approval	CE								
Unit weight	• Clamping: Approx. 435g • Synchro: Approx. 415g • Built-in: Approx. 410g								

※1: Make sure that. Max response revolution should be lower than or equal to max. allowable revolution when selecting the resolution.

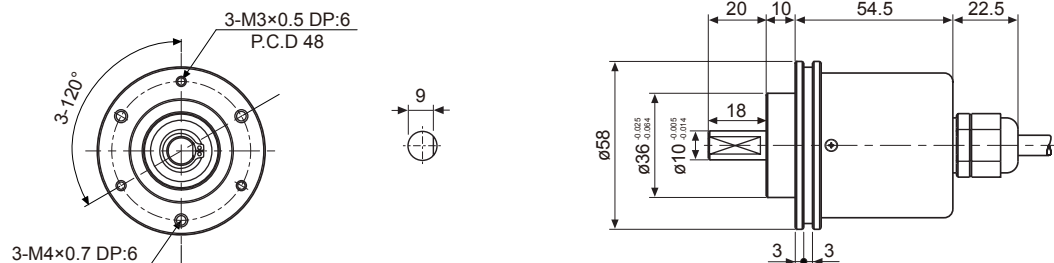
$$[\text{Max. response revolution}(\text{rpm})] = \frac{\text{Max. response frequency}}{\text{Resolution}} \times 60 \text{ sec}$$

※Environment resistance is rated at no freezing or condensation.

## Dimensions

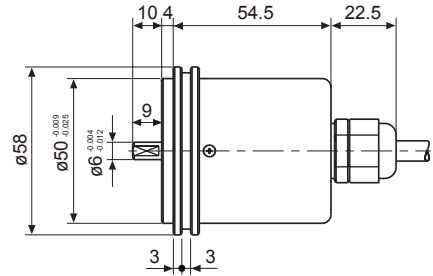
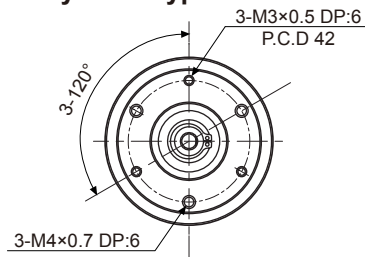
### Shaft clamping type

(unit: mm)

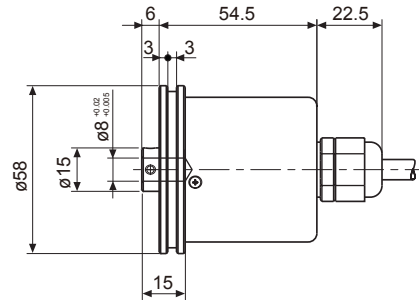
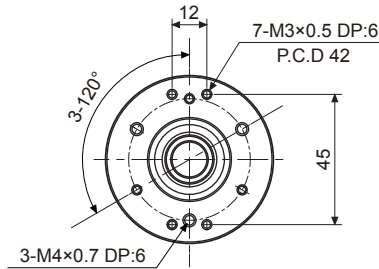


# Selection Guide

## ◎ Shaft synchro type



## ◎ Hollow built-in type



## Diameter $\phi 60$ mm Shaft type Absolute Rotary encoder [ENP Series]

### ■ Ordering information

<b>ENP</b>	-	<b>1</b>	-	<b>1</b>	-	<b>1</b>	-	<b>R</b>	-	<b>360</b>	-	<b>P</b>
Series	Output code	Output	Power supply	Revolution direction	Revolution/1 Pulse	control output						
Diameter $\phi 60$ mm shaft type (External shaft diameter: $\phi 10$ mm)	1: BCD Code	0: Negative logic 1: Positive logic	0: 5VDC $\pm 5\%$ 1: 12-24VDC $\pm 5\%$	F: Output value increase at CW direction R: Output value increase at CCW direction	006: 6-division 008: 8-division 012: 12-division	016: 16-division 024: 24-division 360: 360-division	P: PNP open collector output N: NPN open collector output					

### ■ Connections

Wire color		Resolution	6-division	8-division	12-division	16-division	24-division	360-division
Power wire	White <sup>※1</sup>		+V					
	Black <sup>※1</sup>		GND(0V)					
	Shield wire		F.G.					
Output wire	Black	TP1 <sup>※2</sup>						2 <sup>0</sup>
	Brown	2 <sup>0</sup>	2 <sup>0</sup>	2 <sup>0</sup>	2 <sup>0</sup>	2 <sup>0</sup>	2 <sup>0</sup>	2 <sup>1</sup>
	Red	2 <sup>1</sup>	2 <sup>1</sup>	2 <sup>1</sup>	2 <sup>1</sup>	2 <sup>1</sup>	2 <sup>1</sup>	2 <sup>2</sup>
	Orange	2 <sup>2</sup>	2 <sup>2</sup>	2 <sup>2</sup>	2 <sup>2</sup>	2 <sup>2</sup>	2 <sup>2</sup>	2 <sup>3</sup>
	Yellow	N-C	2 <sup>3</sup>	2 <sup>3</sup>	2 <sup>3</sup>	2 <sup>3</sup>	2 <sup>3</sup>	2 <sup>0</sup> ×10
	Green	N-C	N-C	2 <sup>0</sup> ×10	2 <sup>0</sup> ×10	2 <sup>0</sup> ×10	2 <sup>0</sup> ×10	2 <sup>1</sup> ×10
	Blue	N-C	N-C	N-C	N-C	N-C	2 <sup>1</sup> ×10	2 <sup>2</sup> ×10
	Purple	N-C						2 <sup>3</sup> ×10
	Gray	TP2 <sup>※2</sup>						2 <sup>0</sup> ×100
	White	EP(PARITY) <sup>※3</sup>						2 <sup>1</sup> ×100
Shield wire		F.G.						

※1: Insulator external diameter is  $\phi 1.5$ mm.

※2: TP1/TP2: Because low resolution model has long output signal period, this signal for enable is easy to determine signal recognition point about output.

※3: EP: Parity signal. It outputs odd parity.


※Unused wire must be insulated.

※Encoder case and shield wire must be grounded.

※N-C: Not connected.

※Output cable must not be short-circuited, because Driver IC is used in output circuit.

## Specifications

Item	Diameter ø60mm shaft type of absolute rotary encoder							
Model	PNP open collector output	ENP-111□-006-P	ENP-111□-008-P	ENP-111□-012-P	ENP-111□-016-P	ENP-111□-024-P	ENP-111□-360-P	
	NPN open collector output	ENP-111□-006-N	ENP-101□-008-N	ENP-101□-012-N	ENP-101□-016-N	ENP-101□-024-N	ENP-101□-360-N	
Appearances								
Resolution	6-division	8-division	12-division	16-division	24-division	360-division		
Electrical specification	Output phase	TP(Timing Pulse) : 2bit TS(Signal Pulse) : 4bit(BCD, EP)	TP(Timing Pulse) : 2bit TS(Signal Pulse) : 5bit(BCD, EP)	TP(Timing Pulse) : 2bit TS(Signal Pulse) : 6bit(BCD, EP)	TP(Timing Pulse) : 2bit TS(Signal Pulse) : 6bit(BCD, EP)	TP(Timing Pulse) : 2bit TS(Signal Pulse) : 7bit(BCD, EP)	TS(Signal Pulse) : 10bit(BCD)	
	Output of phase differences	TP1: 53° ±30' TP2: 15° ±30' P: 60° ±30' TS: 56° ±30'	TP1: 39° ±30' TP2: 15° ±30' P: 45° ±30' TS: 42° ±30'	TP1: 3° ±30' TP2: 15° ±30' P: 30° ±30' TS: 26° ±30'	TP1: 2° ±30' TP2: 11.25° ±30' P: 22.5° ±30' TS: 19.5° ±30'	TP1: 8° ±30' TP2: 3° ±30' P: 15° ±30' TS: 11° ±30'	TS: 1° ±30'	
	Control output	PNP open collector output	Output voltage: Min. (power supply-1.5V)VDC, Load current: Max. 32mA					
		NPN open collector output	Load current: Max. 32mA, Residual voltage: Max. 1VDC					
	Response time (Rise/Fall)	PNP open collector output	Ton=800ns, Toff=Max. 800ns(Cable length: 1m, I sink=32mA)					
		NPN open collector output	Ton=800ns, Toff=Max. 800ns(Cable length: 1m, I sink=32mA)					
	Max. Response frequency	20kHz						
	Power supply	• 5VDC ±5%(ripple P-P: Max. 5%) • 12-24VDC ±5%(ripple P-P: Max. 5%)						
	Current consumption	Max. 100mA(disconnection of the load)						
	Insulation resistance	Min. 100MΩ(at 500VDC megger between all terminals and case)						
Dielectric strength	750VAC 50/60Hz for 1 minute(between all terminals and case)							
Connection	Cable type							
Mechanical specification	Starting torque	Max. 500gf.cm(0.05N.m)						
	Moment of inertia	Max. 300g.cm <sup>2</sup> (3×10-5kg.m <sup>2</sup> )						
	Shaft loading	Radial: 10kgf, Thrust: 2.5kgf						
	Mechanical revolution <sup>*1</sup>	3,600rpm						
Vibration	1.5mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 2 hours							
Shock	Approx. Max. 75G							
Environment	Ambient temperature	-10 to 70°C, storage: -25 to 85°C						
	Ambient humidity	35 to 85%RH, storage: 35 to 90%RH						
Protection	IP50(IEC standard)							
Cable	ø8mm, 12-wire, Length: 1m, Double shield cable (AWG24, Core diameter: 0.08mm, Number of cores: 40, Insulator diameter: ø1mm)							
Accessory	Mounting bracket, coupling							
Weight <sup>*2</sup>	Approx. 478g(approx. 400g)							

\*1: Make sure that. Max response revolution should be lower than or equal to max. allowable revolution when selecting the resolution.  

$$[\text{Max. response revolution}(\text{rpm}) = \frac{\text{Max. response frequency}}{\text{Resolution}} \times 60 \text{ sec}]$$

\*2: The weight with packaging and the weight in parentheses is only unit weight.

※Environment resistance is rated at no freezing or condensation.

## Dimensions

(unit: mm)

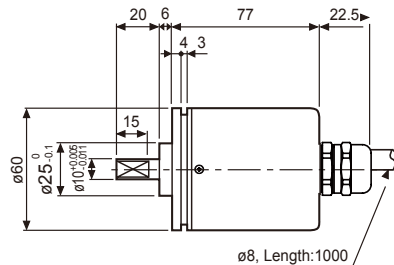
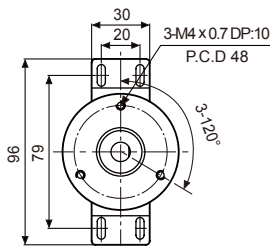


Photo electric sensor
Fiber optic sensor
Door/Area sensor
Proximity sensor
Pressure sensor
<b>Rotary encoder</b>
Connector/Socket
Temp. controller
SSR/Power controller
Counter
Timer
Panel meter
Tacho/Speed/ Pulse meter
Display unit
Sensor controller
Switching mode power supply
Stepper motor& Driver&Controller
Graphic/ Logic panel
Field network device

## Diameter ø50mm Shaft type Absolute Multi-turn Rotary Encoder [EPM50 Series]

### Ordering information

<b>EPM50S</b>	<b>8</b>	<b>10</b>	<b>13</b>	<b>B</b>	<b>PN</b>	<b>24</b>	
Series	Shaft diameter	Single-turn	Multi-turn	Output code	Control output	Power supply	Cable
Diameter ø50mm	ø8mm	10bit (1024 division)	13bit (8192 revolution)	Binary Code	PN: Parallel NPN open collector output S: SSI	12-24VDC±5%	No mark: Axial cable type S: Radial cable type

### Specifications

Type		ø50mm Multi-turn absolute encoder		
Model		<b>EPM50S8-1013-B-S-24</b>	<b>EPM50S8-1013-B-PN-24</b>	
Appearances				
Resolution	Single-turn	1024 division(10Bit)		
	Multi-turn	8192 revolution(13Bit)		
Rotation limit when power is off *1		±90°		
Electrical specification	Output	Output code	24bit, Binary 2 code	Binary 2 code
		Output Interface	SSI(Synchronous Serial Interface)	Parallel
		Output type	Line driver	NPN open collector output
		Output signal	Single-turn data, Multi-turn count, OVF alarm*2	
		Line driver output	<ul style="list-style-type: none"> <li>• Low: Sink current - max. 20mA, Residual voltage - max. 0.5VDC</li> <li>• High: Sink current - max. -20mA, Output voltage - max. 2.5VDC</li> </ul>	—
		NPN open collector output	—	Sink current: Max. 32mA, Residual voltage: Max. 1VDC
		Logic	—	Negative logic output
	Response time	—	Max. 1μs (Cable: 2m, I sink = 32mA)	
	Input	Input signal	Single-turn data reset *3, Multi-turn count reset *4, Direction, Clear	
			—	Latch
Input level		High: 5-24VDC, Low: 0-1.2VDC		
Input logic		Low active*5, HIGH or OPEN for common use		
Input time		Direction: Over 100ms		
		Single-turn data reset: Over 100ms		
	Multi-turn count reset: Over 100ms			
Clear: Over 100ms				
No Latch function	Latch: Over 500μs			
SSI Clock Input Frequency	100kHz to 1MHz		—	

\*1: It calibrates the multi-turn counts by comparing single-turn data before/after power off without counting multi-turn counts when power is off. It shall be used on the condition that no over-rated revolution occurred since proper multi-turn data may not be available if any revolutions occurred over ±90° from the position when power is off.

\*2: OVF alarm is ON when multi-turn count is out of counting range (0 to 8191 revolution).

It shall be initialized by changing the setting of direction or applying multi-turn count reset or clear signals.

\*3: Single-turn data shall be initialized as 「0」 when single-turn data reset is input.

\*4: Multi-turn count shall be initialized as 「0 revolution」 when multi-turn count reset is input.

\*5: High active is customizable.

## ■ Specifications

Type	ø50mm Multi-turn absolute encoder		
Model	<b>EPM50S8-1013-B-S-24</b>	<b>EPM50S8-1013-B-PN-24</b>	
Electrical specification	Max. Response frequency	— / 50kHz	
	Power supply	12-24VDC, ±5%(ripple P-P: Max. 5%)	
	Current consumption	Max. 150mA(Disconnection of the load)	Max. 100mA(Disconnection of the load)
	Insulation resistance	Min. 100MΩ(at 500VDC between all terminals and case)	
	Dielectric strength	750VAC 50/60Hz for 1 minute(between all terminals and case)	
	Connection	Cable type(Cable gland)	
Mechanical specification	Starting torque	Max. 40gf·cm(0.004N·m)	
	Moment of inertia	Max. 40g·cm <sup>2</sup> (4×10 <sup>-6</sup> kg·m <sup>2</sup> )	
	Shaft loading	Radial: 10kgf, Thrust: 2.5kgf	
	Max. revolution <sup>※6</sup>	3000rpm	
Vibration	1.5mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 2 hours		
Shock	Approx. Max. 50G		
Environment	Ambient temperature	-10 to 70°C, storage: -25 to 85°C	
	Ambient humidity	35 to 85%RH, storage: 35 to 90%RH	
Protection	IP64(IEC standard), Radial cable type: IP50(IEC standard)		
Cable	ø6mm, 10-wire, Length: 2m, Shield cable (AWG28, Core diameter: 0.08mm, Number of cores: 19, Insulation out diameter: ø0.8mm)	ø6mm, 17-wire×2, Length: 2m, Shield cable (AWG28, Core diameter: 0.08mm, Number of cores: 17, Insulation out diameter: ø0.8mm)	
Accessory	Mounting bracket, Coupling		
Approval	CE		
Unit weight	Approx. 322g	Approx. 475g	

※6: Make sure that. Max response revolution should be lower than or equal to max. allowable revolution when selecting the resolution.

$$[\text{Max. response revolution}(\text{rpm}) = \frac{\text{Max. response frequency}}{\text{Resolution}} \times 60 \text{ sec}]$$

※Environment resistance is rated at no freezing or condensation.

## ■ Connections

### ● SSI output

Cable			
Cable color	Description	Cable color	Description
Brown	CLOCK+	Gray	Single-turn data reset
Red	CLOCK-	Blue	Multi-turn count reset
Orange	DATA+	Purple	Clear
Yellow	DATA-	Green	Direction
White	+V(12-24VDC)		
Black	GND(0V)		
Shield wire	Signal shield cable(F.G.)		

### ● Parallel output

Multi-turn count cable(Sheath color: Black)		
Cable color	Description	
Brown	Multi-turn count	2 <sup>0</sup>
Red		2 <sup>1</sup>
Orange		2 <sup>2</sup>
Yellow		2 <sup>3</sup>
Green		2 <sup>4</sup>
Blue		2 <sup>5</sup>
Purple		2 <sup>6</sup>
Gray		2 <sup>7</sup>
Pink		2 <sup>8</sup>
Clear		2 <sup>9</sup>
Light brown		2 <sup>10</sup>
Light yellow		2 <sup>11</sup>
Light green	2 <sup>12</sup>	
Light blue	OVF	
Light purple	Multi-turn count reset	
White	+V(12-24VDC)	
Black	GND(0V)	
Shield wire	Signal shield cable(F.G.)	

Single-turn data cable(Sheath color: Gray)		
Cable color	Description	
Brown	Single-turn data	2 <sup>0</sup>
Red		2 <sup>1</sup>
Orange		2 <sup>2</sup>
Yellow		2 <sup>3</sup>
Green		2 <sup>4</sup>
Blue		2 <sup>5</sup>
Purple		2 <sup>6</sup>
Gray		2 <sup>7</sup>
Pink		2 <sup>8</sup>
Clear		2 <sup>9</sup>
Light brown	NC	
Light yellow	Direction	
Light green	Latch	
Light blue	Clear	
Light purple	Single-turn data reset	
White	+V(12-24VDC)	
Black	GND(0V)	
Shield wire	Signal shield cable(F.G.)	

※Please wire properly.

※As for parallel output, it is recommended to connect +V and GND of both multi-turn count cable and single-turn data cable.

※The metal case and shield wire of encoder should be grounded (F.G.).

※Input/Output cable must not be short-circuited, because Driver IC is used in output circuit.

Photo electric sensor

Fiber optic sensor

Door/Area sensor

Proximity sensor

Pressure sensor

Rotary encoder

Connector/Socket

Temp. controller

SSR/Power controller

Counter

Timer

Panel meter

Tacho/Speed/Pulse meter

Display unit

Sensor controller

Switching mode power supply

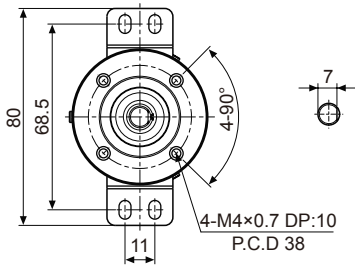
Stepper motor& Driver&Controller

Graphic/Logic panel

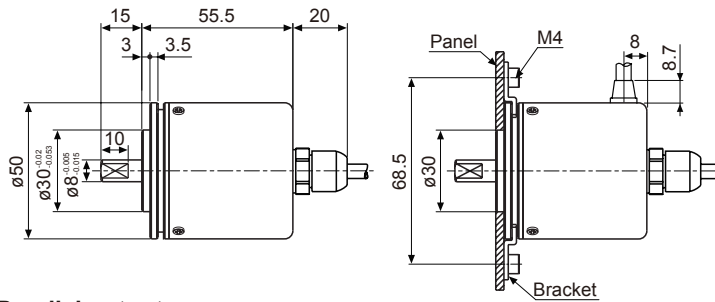
Field network device

## ■ Dimensions

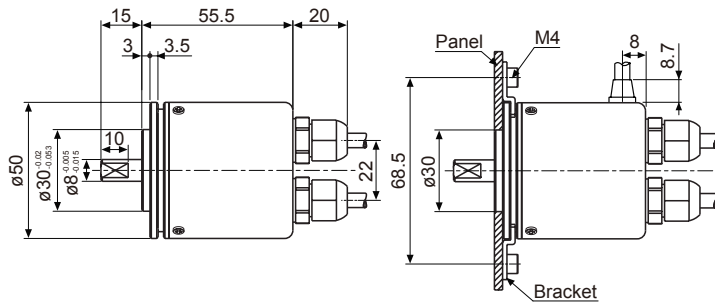
(unit: mm)



### ● SSI output



### ● Parallel output




# Absolute Wire-type Linear Scale encoder [EWLS Series]

## Ordering information

<b>EWLS</b>	-	<b>50</b>	-	<b>512</b>	-	<b>B</b>	-	<b>PN</b>	-	<b>P</b>
Series	Body size	Measuring range	Output code	Control output	Power supply					
Absolute Wire-type Linear Scale	50mm×50mm	512mm	B: Binary Code G: Gray Code	Parallel NPN open collector output	12-24VDC ±5%					

## Specifications

Item	Absolute Wire-type Linear Scale		
Model	EWLS50-512-B-PN-24      EWLS50-512-G-PN-24		
Appearances			
Measuring range	512mm		
Max. output pulse/mm	5,120division/512mm		
Min.resolution	0.1mm		
Accuracy	±0.1/100mm		
Response speed	Max. 500mm/sec.		
Wire movement limit when power is off <sup>※1</sup>	Max.±20mm		
Electrical specification	Output	Output code	Binary      Gray
		Output signal	Data, Overflow alarm
		Output type	NPN open collector output
		Output capacity	Load current: Max. 32mA, Residual voltage: Max. 1VDC
		Logic	Negative logic output
		Response time (Up/Down)	Max.1μs(Cable length: 2m, I sink=32mA)
	Input	Input signal	Reset
		Input level	High: 5-24VDC, Low: 0-1.2VDC
		Input logic	Low Active, OPEN or HIGH for common use
		Input time	Min. 100mS
	Max. Response frequency	50kHz	
	Power supply	12-24VDC ± 5%(ripple P-P: Max. 5%)	
	Current consumption	Max. 150mA (disconnection of the load)	
	Insulation resistance	Min. 100MΩ (500VDC megger)	
Dielectric strength	750VAC 50/60Hz for 1minute		
Connection	Cable type(Cable Gland)		
Wire tensile force	0.5N to 4N(50g-f to 400g-f)		
Vibration	1.5mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 2 hours		
Shock	Approx. Max. 50G		
Environment	Ambient temperature	-10 to 70°C, storage: -25 to 85°C	
	Ambient humidity	35 to 85%RH, storage: 35 to 90%RH	
Cable	ø6mm, 17-wire, Length: 2m, Shield cable (AWG28, Core diameter: 0.08mm, Number of cores: 19, Insulator out diameter: ø0.8mm)		
Material	Cap: SPCD, Body: A2024, Wire: SUS303		
Accessories	Hexagon wrench screw(M4×8)		
Approval	CE		
Unit weight	Approx. 450g		

※1: The product cannot process data when the power is OFF. It calibrates the data comparing values of before and after power ON status. It shall be used on the condition that wire movement limit because proper data may not be available if any wire movement occurred over ±20mm from the position when power is off.

※Environment resistance is rated at no freezing or condensation.

- Photo electric sensor
- Fiber optic sensor
- Door/Area sensor
- Proximity sensor
- Pressure sensor
- Rotary encoder
- Connector/Socket
- Temp. controller
- SSR/ Power controller
- Counter
- Timer
- Panel meter
- Tacho/ Speed/ Pulse meter
- Display unit
- Sensor controller
- Switching mode power supply
- Stepper motor& Driver&Controller
- Graphic/ Logic panel
- Field network device

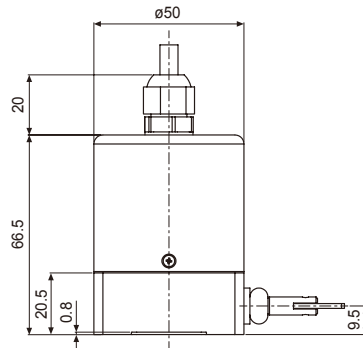
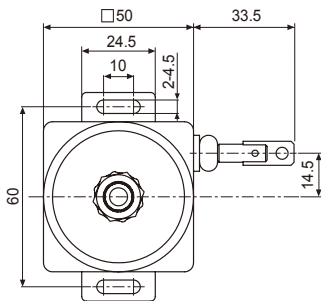
# Selection Guide

## ■ Connections

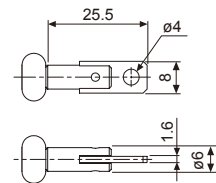
Cable color	Description	
Brown	Data signal output	2 <sup>0</sup>
Red		2 <sup>1</sup>
Orange		2 <sup>2</sup>
Yellow		2 <sup>3</sup>
Green		2 <sup>4</sup>
Blue		2 <sup>5</sup>
Purple		2 <sup>6</sup>
Gray		2 <sup>7</sup>
Pink		2 <sup>8</sup>
Clear		2 <sup>9</sup>
Light brown		2 <sup>10</sup>
Light yellow		2 <sup>11</sup>
Light green	2 <sup>12</sup>	
Light blue	Overflow alarm signal output	
Light Purple	Reset signal input	
White	+V(12-24VDC)	
Black	GND(0V)	
Shield wire	Signal shield cable(F.G.)	

## ■ Dimensions

(unit: mm)



### ● Hook



## Flexible coupling [ERB Series]



### ■ Ordering information

**ERB** **A** - **19** **C** - **d<sub>1</sub>/d<sub>2</sub>**

Item	ERB	Number/Number	Bore diameters
Type	A	Number	External diameter(mm)
External diameter	19	Number/Number	Bore diameters
Connection type	C	S	Set screw
Bore diameters	d <sub>1</sub> /d <sub>2</sub>	C	Clamp
		Number	External diameter(mm)
		A	Double beam(Normal Type)
		ERB	Radial beam type coupling



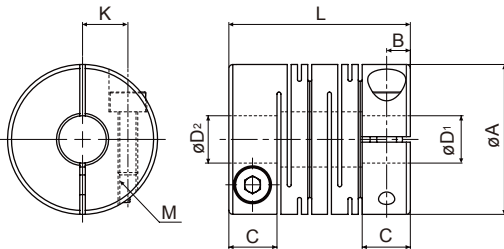
## Specifications

Model	ERB-A-19C-□	ERB-A-19S-□	ERB-A-26C-□	ERB-A-26S-□
Appearances				
Connection type	Clamp	Set screw	Clamp	Set screw
Max. revolutions	8000rpm	20000rpm	6000rpm	15000 rpm
Max. torque	1.2 N·m(12.17 kgf·cm)		3.0 N·m(30.42 kgf·cm)	
Rated torque	0.6 N·m(6.08 kgf·cm)		1.5 N·m(15.21 kgf·cm)	
Mounting bolt (Mounting torque)	M2.5(1N·m)	M3(0.7N·m)	M3(1.7N·m)	M4(1.7N·m)
Torsional stiffness	140 N·m/rad		240 N·m/rad	
Moment of inertia	$6.4 \times 10^{-7} \text{ kg}\cdot\text{m}^2$		$3.4 \times 10^{-6} \text{ kg}\cdot\text{m}^2$	
Max. allowable misalignment	Angular misalignment	2.5°		
	Parallel misalignment	0.15mm	0.2mm	
	End-play	±0.3mm	±0.4mm	
Standard bore diameter (tolerance h7)	ø4, ø5, ø6mm		ø6, ø8mm	
Min. allowable bore diameter	ø4mm		ø5mm	
Max. allowable bore diameter	ø8mm		ø12mm	
Material	Aluminum(AL 7075-T6), Alumite treated surface			
Unit weight	12g		33g	

## Dimensions

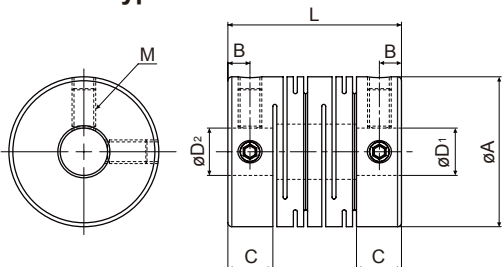
(unit: mm)

### Clamp type



Model	øA	L	øD <sub>1</sub>	øD <sub>2</sub>	M	C	B	K
ERB-A-19C-04/04	19	23	4 <sup>+0.018</sup> <sub>0</sub>	4 <sup>+0.018</sup> <sub>0</sub>	M2.5	6.1	3	5.75
ERB-A-19C-04/05				5 <sup>+0.018</sup> <sub>0</sub>				
ERB-A-19C-04/06				6 <sup>+0.018</sup> <sub>0</sub>				
ERB-A-19C-05/05			5 <sup>+0.018</sup> <sub>0</sub>					
ERB-A-19C-05/06			6 <sup>+0.018</sup> <sub>0</sub>					
ERB-A-19C-06/06			6 <sup>+0.018</sup> <sub>0</sub>					
ERB-A-26C-06/06	26	31.4	6 <sup>+0.018</sup> <sub>0</sub>	6 <sup>+0.018</sup> <sub>0</sub>	M3	7.4	3.7	8.55
ERB-A-26C-06/08				8 <sup>+0.018</sup> <sub>0</sub>				
ERB-A-26C-08/08				8 <sup>+0.018</sup> <sub>0</sub>				

### Set screw type



Model	øA	L	øD <sub>1</sub>	øD <sub>2</sub>	M	C	B
ERB-A-19S-04/04	19	22	4 <sup>+0.018</sup> <sub>0</sub>	4 <sup>+0.018</sup> <sub>0</sub>	M3	5.7	2.8
ERB-A-19S-04/05				5 <sup>+0.018</sup> <sub>0</sub>			
ERB-A-19S-04/06				6 <sup>+0.018</sup> <sub>0</sub>			
ERB-A-19S-05/05			5 <sup>+0.018</sup> <sub>0</sub>				
ERB-A-19S-05/06			6 <sup>+0.018</sup> <sub>0</sub>				
ERB-A-19S-06/06			6 <sup>+0.018</sup> <sub>0</sub>				
ERB-A-26S-06/06	26	30	6 <sup>+0.018</sup> <sub>0</sub>	6 <sup>+0.018</sup> <sub>0</sub>	M4	6.8	3.4
ERB-A-26S-06/08				8 <sup>+0.018</sup> <sub>0</sub>			
ERB-A-26S-08/08				8 <sup>+0.018</sup> <sub>0</sub>			

Photo electric sensor
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Connector/Socket
Temp. controller
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Display unit
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Switching mode power supply
Stepper motor& Driver&Controller
Graphic/Logic panel
Field network device

## Sensor connector

### Ordering information

<b>CNE</b> — <b>P</b> <b>03</b> — <b>WT</b>			
Item	Cover color(wire specifications) ※'Cover color and wire specifications' (Refer to the 147 page)		
	Pins	03   3-pins 04   4-pins	
	Connector type	P   Wire mount plug S   Wire mount socket	
		CNE   Sensor connector	
<b>CNE</b> — <b>B</b> <b>2</b> <b>03</b>			
Item	Pins	03   3-pins 04   4-pins	
	Lines	No-mark   1-line 2   2-line 4   4-line	
	Connector type	B   Board mount socket	
		CNE   Sensor connector	

### Specifications

Type	Wire mount plug	Wire mount socket	Board mount socket
Model	<b>CNE-P</b> □□	<b>CNE-S</b> □□	<b>CNE-B</b> □□
Appearances			
Applica- tion	Connector	Board mount socket/Wire mount socket	Wire mount plug
	Cable	AWG30 to 20(Ø0.6 to Ø2.0)	
	PCB	—	
Rated voltage	Max. 250VAC/DC		
Rated current	Max. 3.0A		
Temperature	-20 to 85°C(applying 1A), -20 to 75°C(applying 2A), -20 to 60°C(applying 3A)		
Humidity	40 to 80%RH		
Terminal retention	1.4kgf min.		
Pressure strength	• AWG30: 0.5kgf min. • AWG24 : 0.8kgf min. • AWG20 : 1.0kgf min.		
Extraction	0.49N(50gf)/pin min.		
Insertion	1.96N(200gf)/pin max.		
Dielectric strength	1,000VAC for 1min.(between terminals)		
Insulated resistance	Min. 1,000MΩ(between terminals)		
Contact resistance	Max. 0.05Ω (short-current : 1mA, max. open voltage : 20mV)		
Material	Body : PCABS(UL94V-0), Terminal : C5210(Gold 0.2μm), Case : PC(UL94-V0)		Body : PCABS(UL94-V0), Terminal : C5210(Gold 0.2μm)

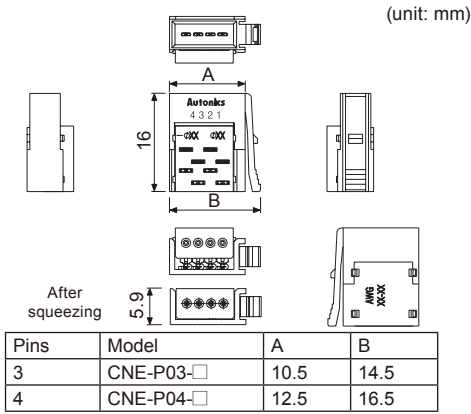
## ■ Cover color and wire specifications

Cover color	3-pin	4-pin	Applied wire specifications	
			Normal cross section area(mm <sup>2</sup> )	Cover diameter(mm)
Transparent(WT)	CNE-□03-WT	CNE-□04-WT	0.05 to 0.08 (AWG30 to 28)	Ø0.6 to 0.8
Yellow-Green(YG)	CNE-□03-YG	CNE-□04-YG		
Violet(VT)	CNE-□03-VT	CNE-□04-VT		
Red(RE)	CNE-□03-RE	CNE-□04-RE	0.13 to 0.21 (AWG26 to 24)	Ø0.8 to 1.0
Yellow(YW)	CNE-□03-YW	CNE-□04-YW		
Orange(OG)	CNE-□03-OG	CNE-□04-OG		
Green(GN)	CNE-□03-GN	CNE-□04-GN	0.32 to 0.5 (AWG22 to 20)	Ø1.0 to 1.2
Blue(BL)	CNE-□03-BL	CNE-□04-BL		
Gray(GY)	CNE-□03-GY	CNE-□04-GY		
				Ø1.2 to 1.6
				Ø1.6 to 2.0

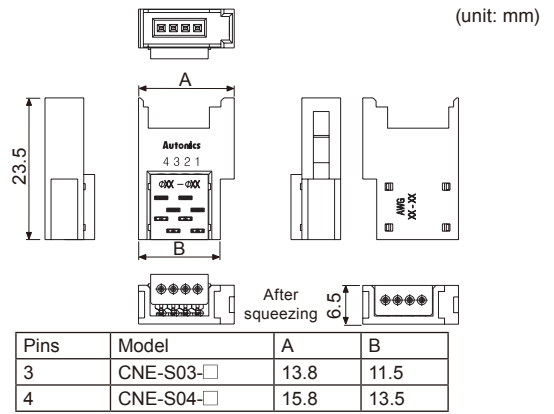
※□: P(Wire mount plug), S(Wire mount socket)

## ■ Dimensions

### ◎ Wire mount plug

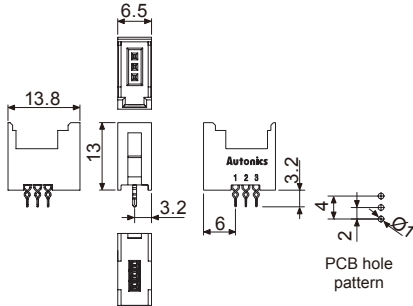


### ◎ Wire mount socket

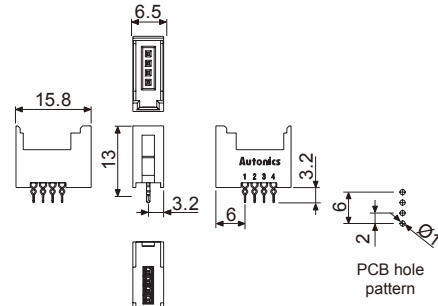


### ◎ Board mount socket

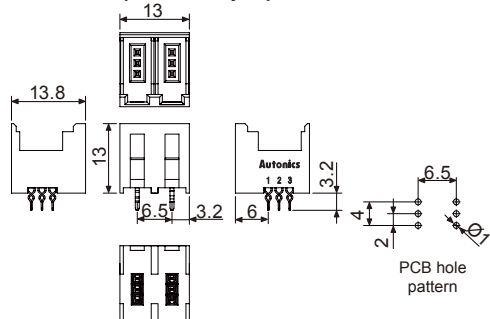
#### ● CNE-B03(1-line×3-pin)



#### ● CNE-B04(1-line×4-pin)



#### ● CNE-B203(2-line×3-pin)



#### ● CNE-B204(2-line×4-pin)

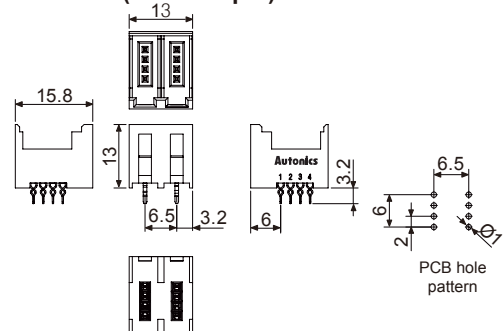


Photo electric sensor

Fiber optic sensor

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Proximity sensor

Pressure sensor

Rotary encoder

Connector/Socket

Temp. controller

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Counter

Timer

Panel meter

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Switching mode power supply

Stepper motor & Driver&Controller

Graphic/ Logic panel

Field network device

## Photoelectric/Proximity Sensor Connector Cable

### ■ Connector cable

#### ◎ M12 Connector

Appearance		Model	Length	Cable material
DC 2-wire type	Socket type	CID-2	2m	PVC
		CID-2-1※1		
		CID-5	5m	
	CID-5-1※1			
	Plug type	CLD-2	2m	
		CLD-2-1※1		
CLD-5		5m		
CLD-5-1※1				
DC 3-wire type	Socket type	CID2-2P	2m	
		CID2-5P	5m	
		CLD2-2P	2m	
	Plug type	CLD2-5P	5m	
		CID3-2	2m	
		CID3-5	5m	
DC 4-wire type	Socket type	CLD3-2	2m	
		CLD3-5	5m	
		CID3-2P	2m	
	Plug type	CLD3-2P	2m	
		CIDH4-3	3m	
		CIDH4-5	5m	
DC 2-wire type	Socket type	CIDH4-7	7m	
		CLDH4-3	3m	
		CLDH4-5	5m	
	Plug type	CLDH4-7	7m	
		CIDH4-3P	3m	
		CIDH4-5P	5m	
AC 2-wire type	Socket type	CIDH4-7P	7m	
		CLDH4-3P	3m	
		CLDH4-5P	5m	
	Plug type	CLDH4-7P	7m	
		CIA2-2	2m	
		CIA2-5	5m	
AC 2-wire type	Socket type	CLA2-2	2m	
		CLA2-5	5m	
		CIA2-2P	2m	
	Plug type	CIA2-5P	5m	
		CLA2-2P	2m	
		CLA2-5P	5m	

※1: This is IEC standard and it can be customized.  
 ※ Be careful of connection, because color is different when DC 4-wire connector cable is used for DC 2-wire sensor.

### ■ Connector connection cable

#### ◎ M12 Connector

Appearance		Model	Length	Cable material	
Socket - Plug type	DC type	C1D4-2	2m	PVC	
		C1D4-5	5m		
		AC type	C1A4-2		2m
			C1A4-5		5m
		DC type	C2D4-2		2m
			C2D4-5		5m
	AC type		C2A4-2		2m
			C2A4-5		5m
	DC type		C3D4-2		2m
			C3D4-5		5m
		AC type	C3A4-2		2m
			C3A4-5		5m
DC type		C4D4-2	2m		
		C4D4-5	5m		
	AC type	C4A4-2	2m		
		C4A4-5	5m		
	Plug - Plug type	DC type	C1D4-2P	2m	
			C1D4-5P	5m	
AC type		C1A4-2P	2m		
		C1A4-5P	5m		

#### ◎ M8 Connector

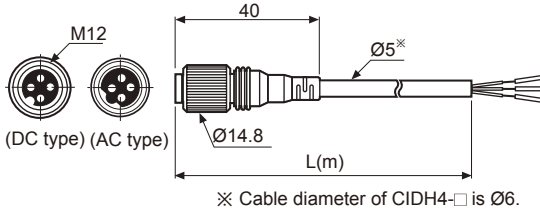
Appearance		Model	Length	Cable material
DC 4-wire type	Socket type	CID408-2	2m	PVC
		CID408-5	5m	
	Plug type	CLD408-2	2m	
		CLD408-5	5m	

## ■ Dimensions

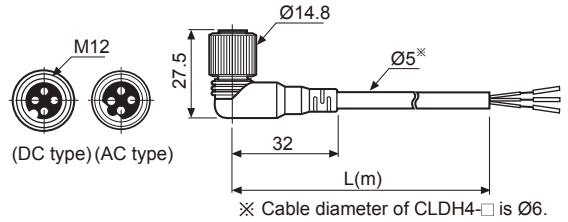
### ◎ Connector cable(socket type)

(unit: mm)

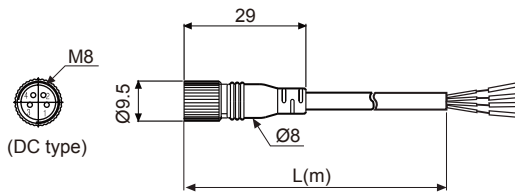
- CID2-□, CID2-□-I ● CID3-□ ● CIA2-□
- CIDH4-□



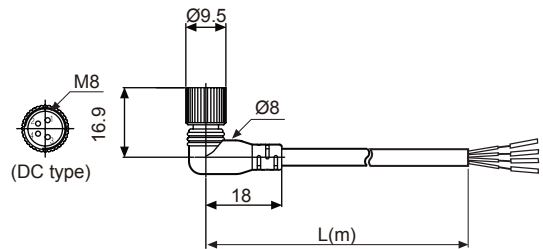
- CLD2-□, CLD2-□-I ● CLD3-□ ● CLA2-□
- CLDH4-□



- CID408-2, CID408-5



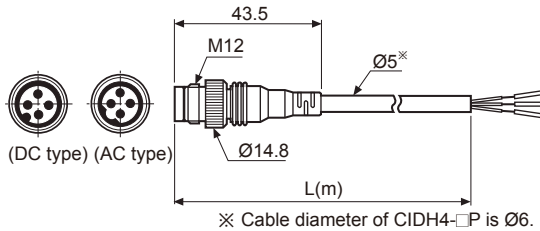
- CLD408-2, CLD408-5



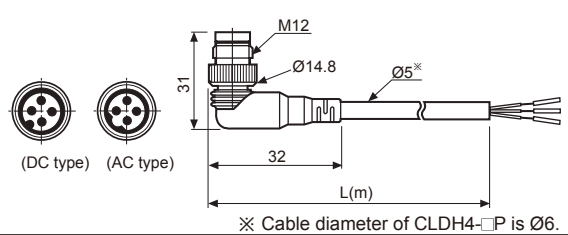
### ◎ Connector cable(plug type)

(unit: mm)

- CID2-2P ● CIA2-2P ● CID3-2P ● CIDH4-□P



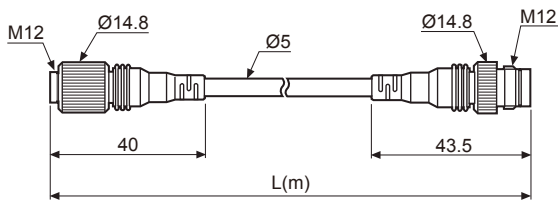
- CLD2-2P ● CLA2-2P ● CLD3-2P ● CLDH4-□P



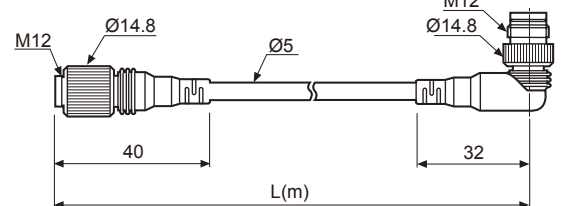
### ◎ Connector connection cable(socket-plug type)

(unit: mm)

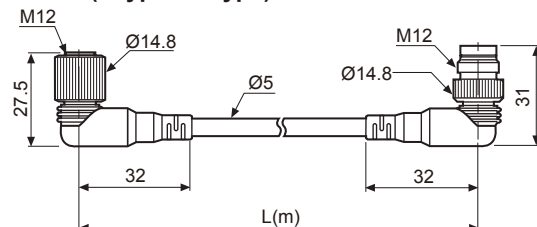
- C1□4-□(standard type)



- C3□4-□(straight type = L type)



- C2□4-□(L type = L type)



- C4□4-□(L type = straight type)

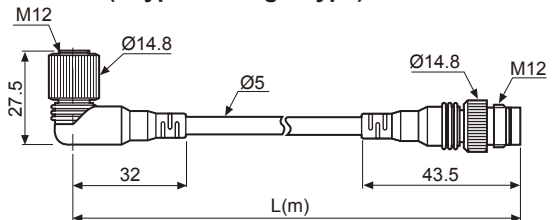


Photo electric sensor

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Pressure sensor

Rotary encoder

Connector/Socket

Temp. controller

SSR/ Power controller

Counter

Timer

Panel meter

Tacho/ Speed/ Pulse meter

Display unit

Sensor controller

Switching mode power supply

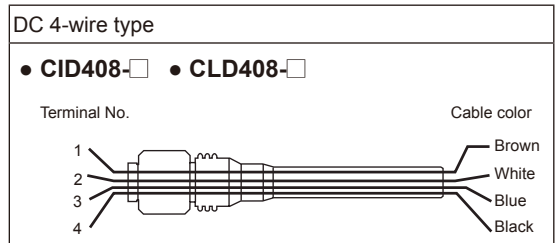
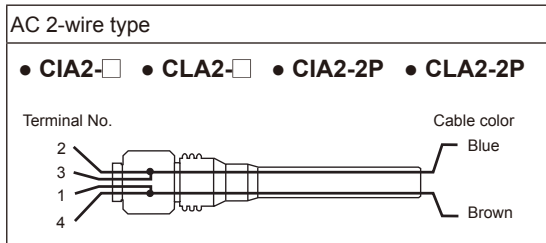
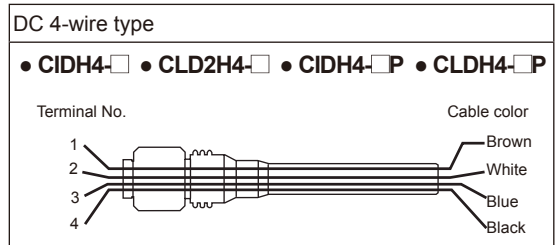
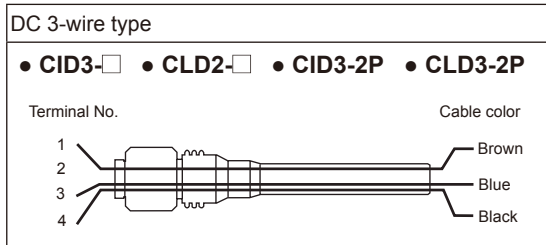
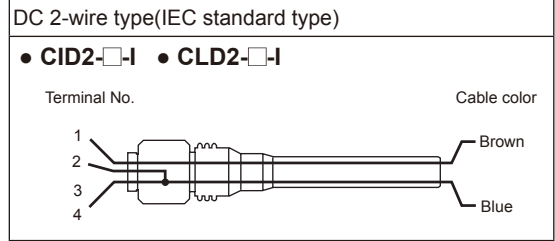
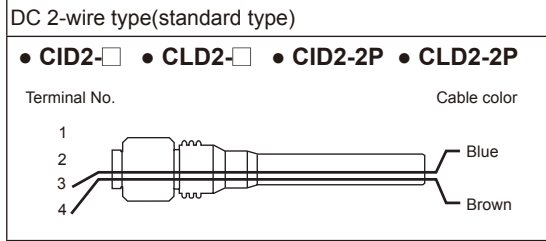
Stepper motor & Driver&Controller

Graphic/ Logic panel

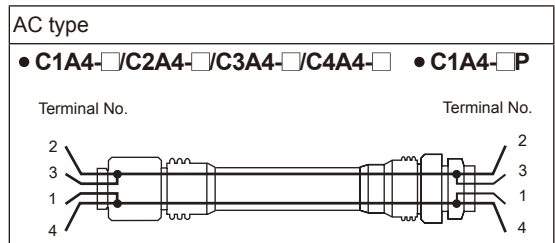
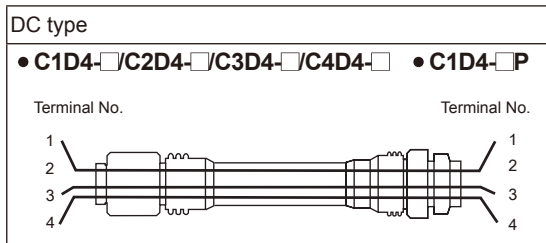
Field network device

## ■ Connections

### ◎ Connector cable



### ◎ Connector connection cable

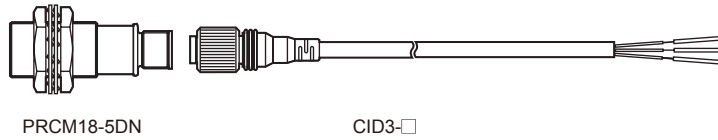
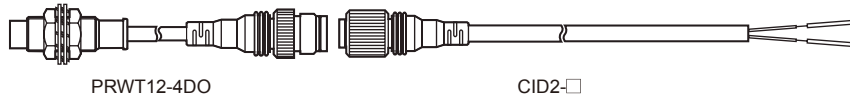


※ Pin 2 is N-C(Not Connected).

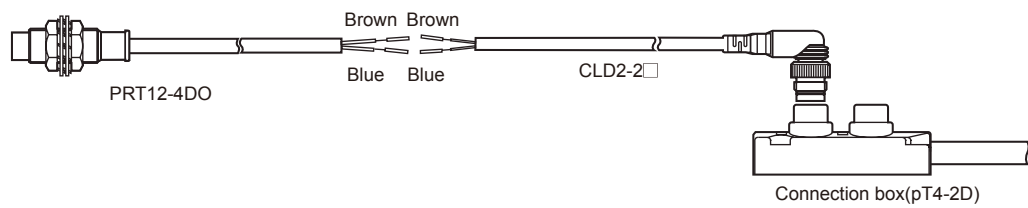
※ Pin 2 / 3, 1 / 4 are connected inside.

## ■ Connector cable connections

### ● Connector cable(socket type)



### ● Connector cable(plug type)



### ● Connector connection cable(socket-plug type)

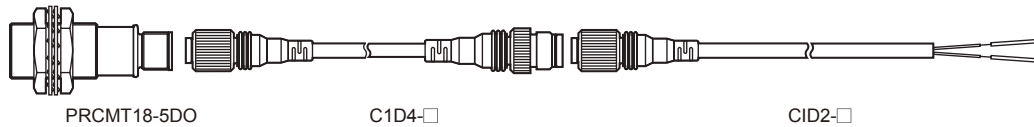
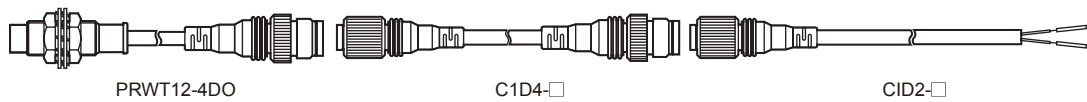
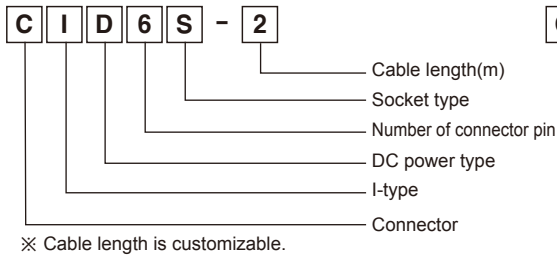


Photo electric sensor
Fiber optic sensor
Door/Area sensor
Proximity sensor
Pressure sensor
Rotary encoder
<b>Connector/Socket</b>
Temp. controller
SSR/ Power controller
Counter
Timer
Panel meter
Tacho/ Speed/ Pulse meter
Display unit
Sensor controller
Switching mode power supply
Stepper motor & Driver&Controller
Graphic/ Logic panel
Field network device

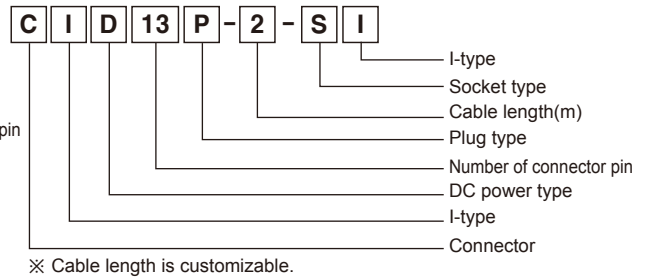
## Encoder connector cable / Connector connection cable

### Ordering information

#### Connector cable(Socket type)



#### Connector connection cable(Socket-Plug type)

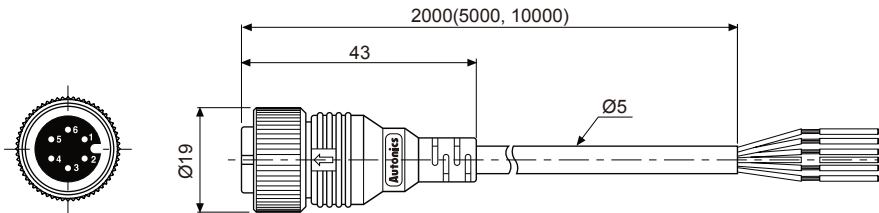


### Dimensions

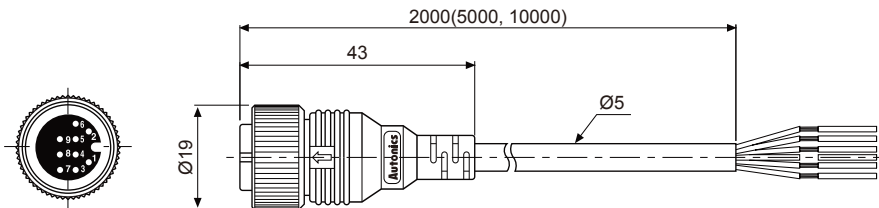
(unit: mm)

#### Connector cable(Socket type)

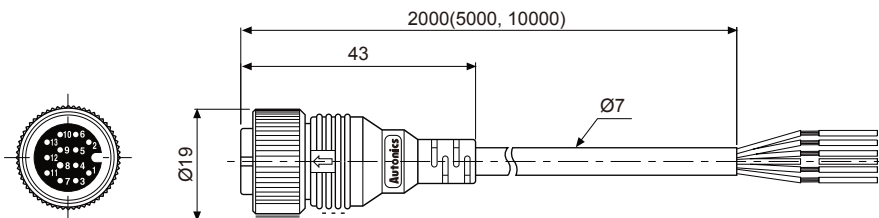
- CID6S-2, CID6S-5, CID6S-10 (Totem pole output / NPN open collector output / Voltage output)



- CID9S-2, CID9S-5, CID9S-10 (Line driver output)

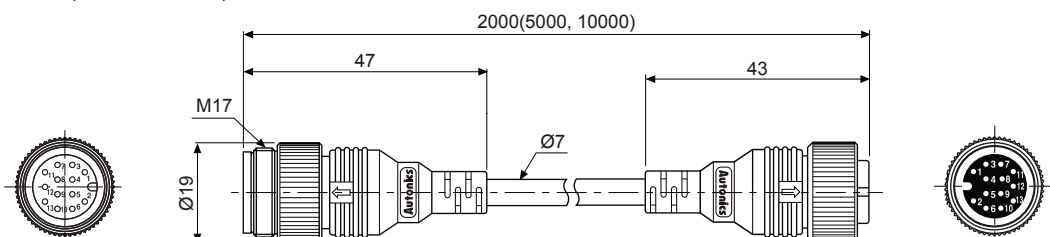


- CID13S-2, CID13S-5, CID13S-10



#### Connector connection cable(Socket-Plug type)

- CID13P-2-SI, CID13P-5-SI, CID13P-10-SI




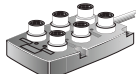



## Connection Box




### Ordering information

<b>PT</b>	<b>4</b>	—	<b>3DN</b>	
Item	Connector	Output	2D	2-wire type
			3DN	3-wire NPN type
			3DP	3-wire PNP type
Item	Connector	4	4EA	
		6	6EA	
		8	8EA	
PT	Connection Box			

### Type

Appearances		Model
	DC 2-wire type	<b>PT4-2D</b>
	DC 3-wire type	<b>PT4-3DN</b> <b>PT4-3DP</b>
	DC 2-wire type	<b>PT6-2D</b>
	DC 3-wire type	<b>PT6-3DN</b> <b>PT6-3DP</b>
	DC 2-wire type	<b>PT8-2D</b>
	DC 3-wire type	<b>PT8-3DN</b> <b>PT8-3DP</b>

### Specifications

Model	PT4-2D	PT4-3DN PT4-3DP	PT6-2D	PT6-3DN PT6-3DP	PT8-2D	PT8-3DN PT8-3DP
Appearances						
Power supply (Operating voltage)	12-24VDC (10-30VDC)					
Leakage current	Max. 0.5mA					
Connection life cycle	Min. 200 operations					
Cable tensile strength	10kgf(98N)/15S					
Insulation resistance	Min. 50MΩ(at 500VDC megger)					
Dielectric strength	1500VAC 50/60Hz for 1minute					
Vibration	1mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 2 hours					
Shock	500m/s <sup>2</sup> (50G) in each of X, Y, Z directions for 3 times					
Indicator	Power indicator : Green, Operation indicator : Red					
Environment	Ambient temperature -25 to 70°C, storage: -30 to 80°C					
	Ambient humidity 35 to 95%RH					
Cable	Ø9mm, 6-wire, Length:5m		Ø9mm, 8-wire, Length:5m		Ø9mm, 10-wire, Length:5m	
	(AWG22, Core diameter: 0.16mm(TA), Number of cores: 17, Insulator out diameter: Ø1.67mm)					
Protection*1	IP66(IEC standard)					
Material	Case: PC, General cable (gray): Polyvinyl chloride (PVC)					
Unit weight	Approx. 630g		Approx. 690g		Approx. 745g	

※1: When using a cover for waterproof(P96-M12-1, sold separately: IP67(IEC standard)

※Environment resistance is rated at no freezing or condensation.

Photo electric sensor

Fiber optic sensor

Door/Area sensor

Proximity sensor

Pressure sensor

Rotary encoder

Connector/Socket

Temp. controller

SSR/ Power controller

Counter

Timer

Panel meter

Tacho/ Speed/ Pulse meter

Display unit

Sensor controller

Switching mode power supply

Stepper motor& Driver&Controller

Graphic/ Logic panel

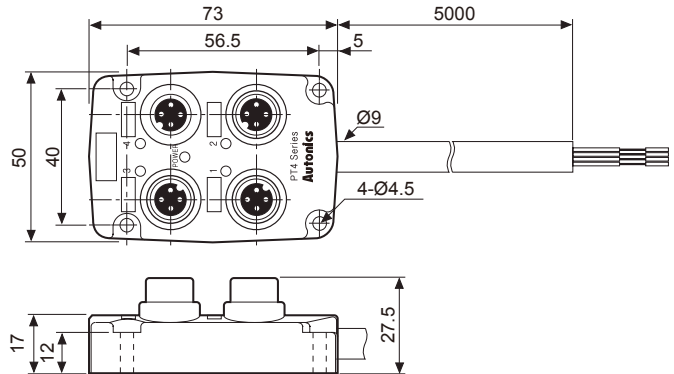
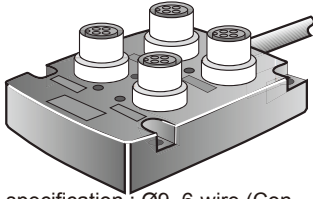
Field network device

# Selection Guide

## ■ Dimensions

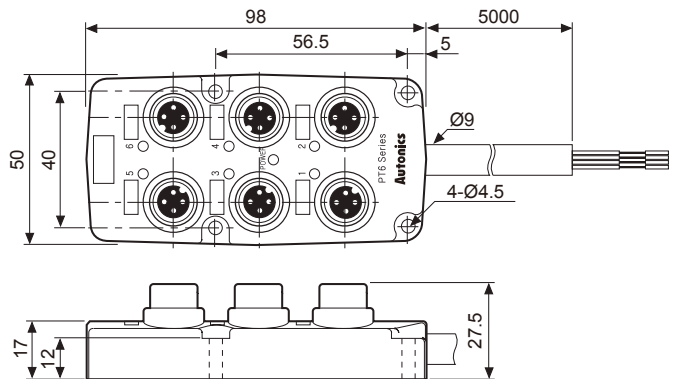
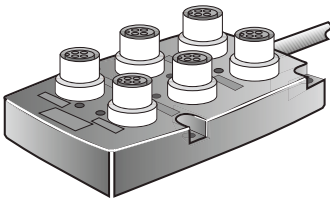
(unit:mm)

### ● PT4 - □□



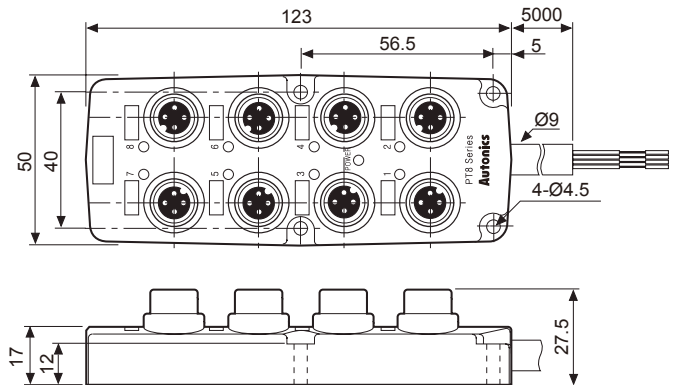
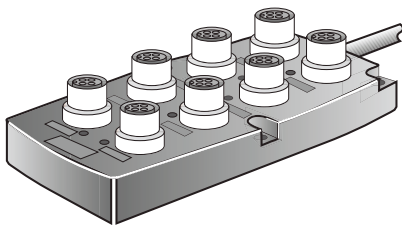
※Cable specification : Ø9, 6-wire (Conductor cross section: 0.3mm<sup>2</sup>, Insulator diameter: Ø1.67)

### ● PT6 - □□



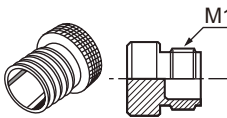
※Cable specification : Ø9, 8-wire (Conductor cross section: 0.3mm<sup>2</sup>, Insulator diameter: Ø1.67)

### ● PT8 - □□

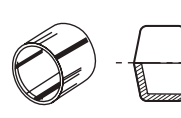


※Cable specification : Ø9, 10 cores (Conductor cross section: 0.3mm<sup>2</sup>, Insulator diameter: Ø1.67)

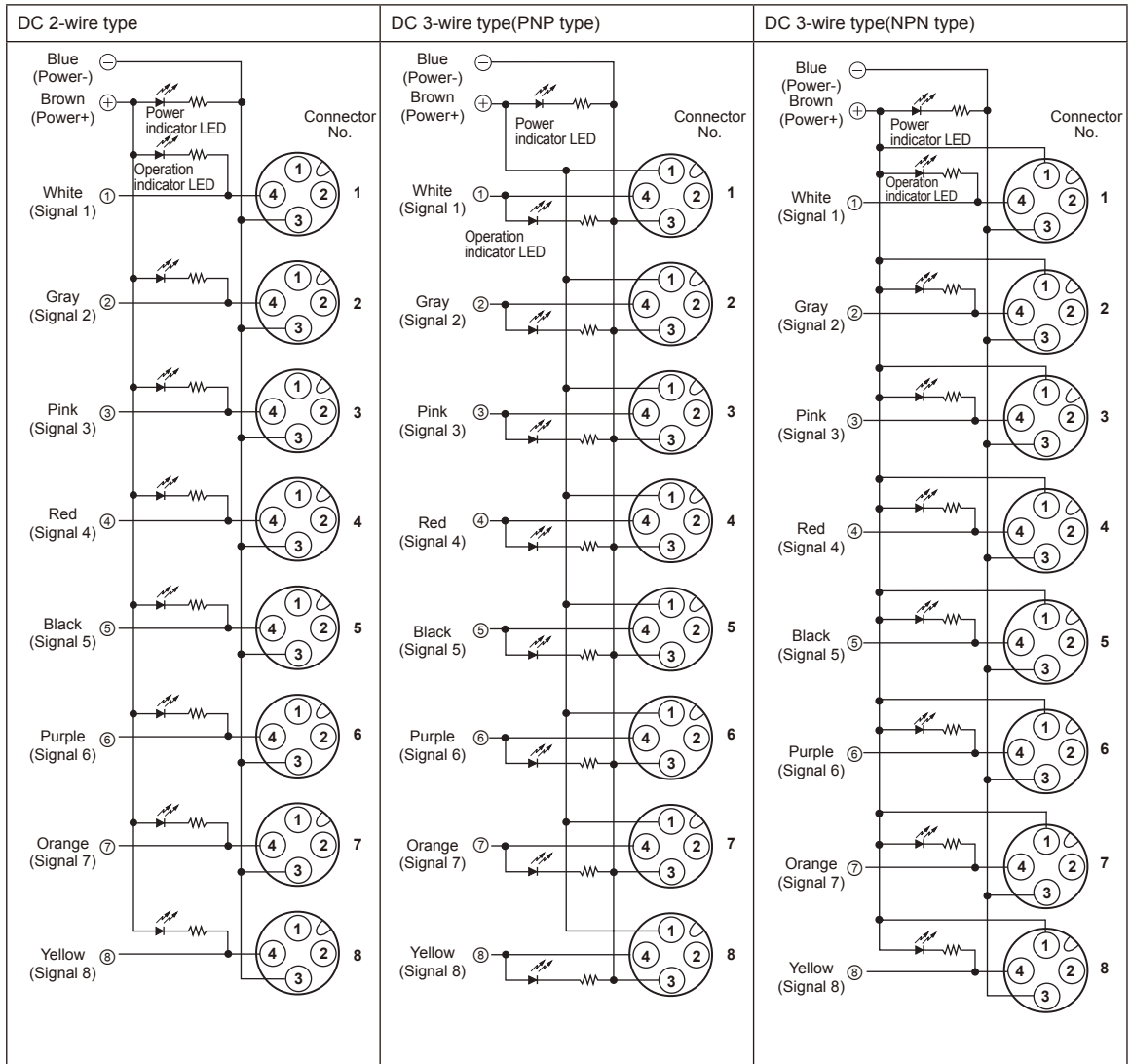
## ■ Waterproof cover(sold separately)

Form	Model	Applicable model
	P96-M12-1	<ul style="list-style-type: none"> <li>● PT4-□□□</li> <li>● PT6-□□□</li> <li>● PT8-□□□</li> </ul>
<p>※This protection cover is used for protecting unused connection hole from water or oil etc.                      ※If using waterproof cover, IP67 is available.                      ※Please tighten it.</p>		

## ■ Protection cover

Form	Applicable model
	<ul style="list-style-type: none"> <li>● PT4-□□□</li> <li>● PT6-□□□</li> <li>● PT8-□□□</li> </ul>
<p>※This protection cover is used for protecting unused connection hole from dust or particle etc.                      (IP67 is not available)                      ※Please push it into hole.</p>	

## ■ Connections

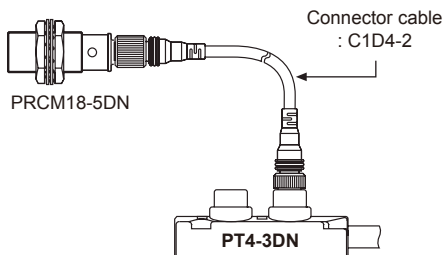


- Photo electric sensor
- Fiber optic sensor
- Door/Area sensor
- Proximity sensor
- Pressure sensor
- Rotary encoder
- Connector/Socket**
- Temp. controller
- SSR/ Power controller
- Counter
- Timer
- Panel meter
- Tacho/ Speed/ Pulse meter
- Display unit
- Sensor controller
- Switching mode power supply
- Stepper motor & Driver&Controller
- Graphic/ Logic panel
- Field network device

## ■ Connections

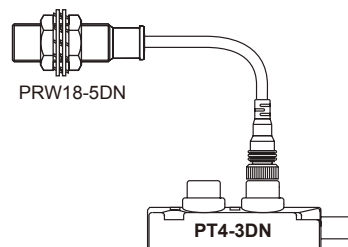
### ● Connector type

Connection cable should be used for connector type of proximity sensor (PRCM Series).



### ● Cable type

Cable type proximity sensor (PRW Series) can be connected directly when the installation distance is longer, please use connection cable.



## Cylindrical Type Connector

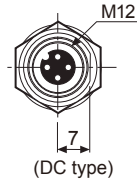
### ■ Connector for panel mounting

#### ◎ Connector for panel mounting (non-flush)

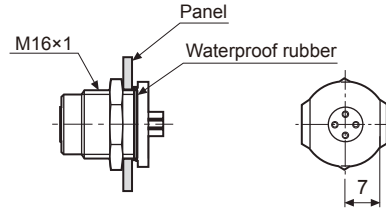
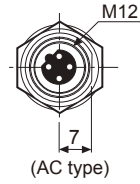
(unit: mm)



● PT1-D



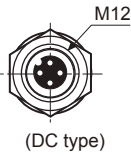
● PT1-A



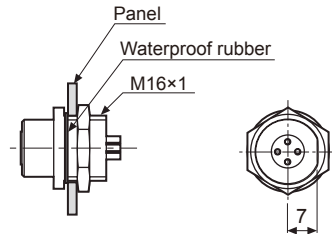
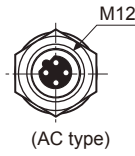
#### ◎ Connector for panel mounting (flush)



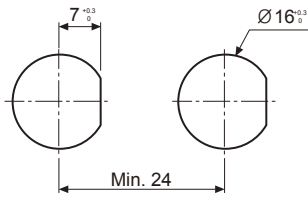
● PT2-D



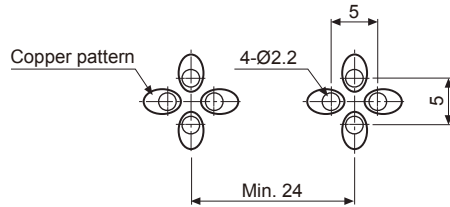
● PT2-A



#### ◎ Panel cut-out


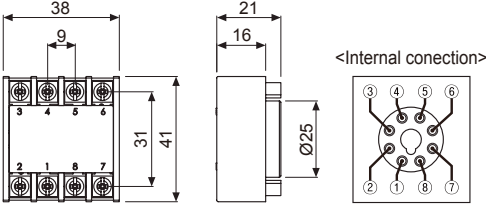
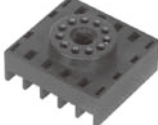
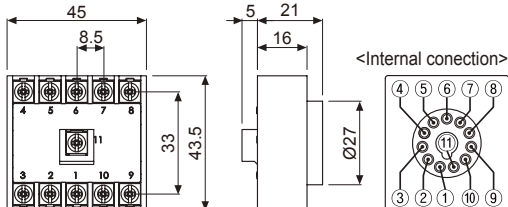


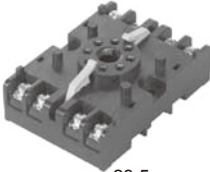
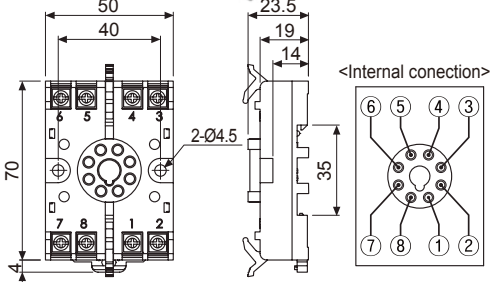

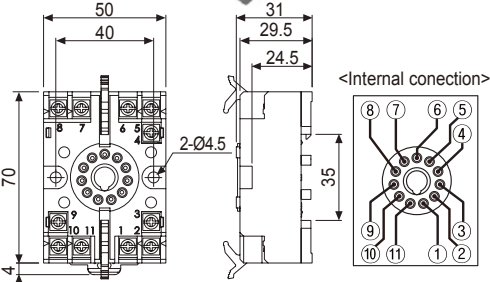
#### ◎ Printed circuit board (PCB) cut-out


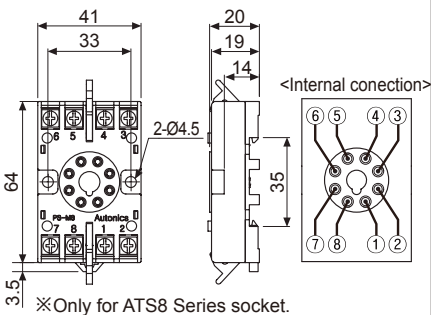
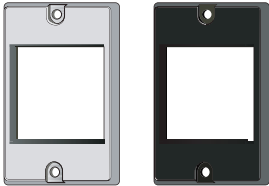
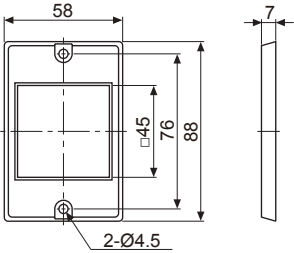
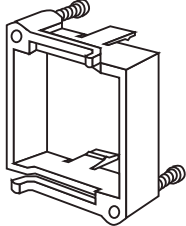


# Controller Socket(8 Pin, 11 Pin)

(unit: mm)

Model	Socket	
	PG-08	PG-11
Appearances & Dimensions	 	 

Model	Socket	
	PS-08	PS-11
Appearances & Dimensions	 	 

Model	Socket	Adaptor	Bracket
	PS-M8	Beige(FGB48-GR) / Black(FGB48-BL)	PGB48-W
Appearances & Dimensions	 	 	 <p>※ATE Series Bracket is sold separately.</p>

- Photo electric sensor
- Fiber optic sensor
- Door/Area sensor
- Proximity sensor
- Pressure sensor
- Rotary encoder
- Connector/Socket
- Temp. controller
- SSR/ Power controller
- Counter
- Timer
- Panel meter
- Tacho/ Speed/ Pulse meter
- Display unit
- Sensor controller
- Switching mode power supply
- Stepper motor & Driver&Controller
- Graphic/ Logic panel
- Field network device


## Multi-channel(4 channel / 2 channel) modular type PID control [TM Series]

### Ordering information

<b>TM</b>	<b>4</b>	<b>-</b>	<b>N</b>	<b>2</b>	<b>R</b>	<b>B</b>	
Item	Channel		Option input/output	Power supply	Control output	Module type	
	2		2 Channel	2	2 Channel	B	Basic module
	4		4 Channel	4	4 Channel	E	Expansion module <sup>※1</sup>
				24VDC	R		Relay output
					C		Current or SSR drive voltage output selectable
					R		Relay output
					S		SSR drive voltage output
					2		Alarm1+Alarm2 Relay output
					4		Alarm1+Alarm2+Alarm3+Alarm4 Relay output
					N		None(※No auxiliary input/output)
					2		2 Channel
					4		4 Channel
					TM		Multi-channel modular temperature controller

※Make sure to purchase both expansion module and basic module together because power supply/communication terminals are provided with basic modules only.

### Specifications


Series	TM2-22RB	TM2-42RB	TM2-22RE	TM2-42RE	TM2-22CB	TM2-42CB	TM2-22CE	TM2-42CE	TM4-N2RB	TM4-N2RE	TM4-N2SB	TM4-N2SE	
Appearances	<div style="display: flex; align-items: center;"> <div style="margin-right: 20px;"> <p>Line-up</p> <p>CE c RU us</p> </div>  </div>												
Channel	2 Channel (Each channel insulated-Dielectric strength 1,000VAC)								4 Channel (Each channel insulated-Dielectric strength 1,000VAC)				
Power Supply	24VDC												
Allowable voltage range	90 to 110% of rated voltage												
Power consumption	Max. 5W												
Display type	Non-display type Parameter setting & monitoring with external devices (PC or PLC)												
Input type	RTD	DPT100Ω, JPt100Ω 3 wire (allowable line resistance max. 5Ω per a wire)											
	Thermocouple	K, J, E, T, L, N, U, R, S, B, C, G, PLII (13types)											
Display accuracy	RTD	(PV ±0.5% or ±1°C, select the higher one) ±1digit Max.											
	Thermocouple <sup>※1</sup>	(PV ±0.5% or ±1°C, select the higher one) ±1digit Max.											
	CT input	±5% F.S. ±1digit Max.								—			
	Current output	±1.5% F.S. ±1digit Max.								—			
Influence of temperature <sup>※2</sup>	RTD	(PV ±0.5% or ±2°C, select the higher one) ±1digit Max.(In case of thermocouple input, it is ±5°C at -100°C below.)											
	Thermocouple	• Thermocouples L, U, C, G, R, S, B: (PV ±0.5% or ±5°C, select the higher one) ±1digit Max.											

※1: In case of thermocouple K, T, N, J, E at -100°C below and L, U, Platinell, it is ±2°C ±1digit Max.

In case of thermocouple B, display accuracy cannot be ensured under 400°C.

In case of thermocouple R, S at 200°C below and thermocouple C, G, it is 3°C ±1digit Max.

※2: Applied when used out of range 23 ±5°C.

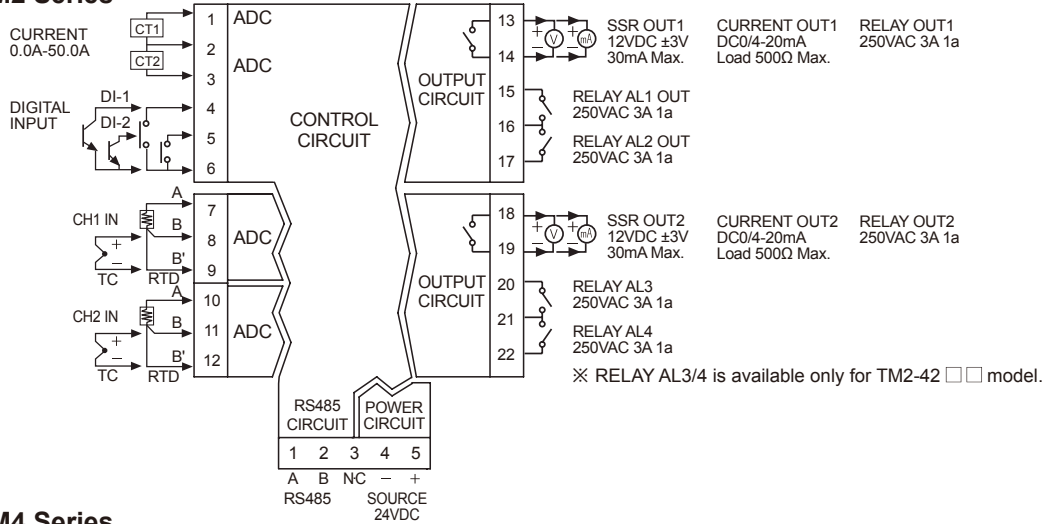
Series		TM2-22RB	TM2-42RB	TM2-22RE	TM2-42RE	TM2-22CB	TM2-42CB	TM2-22CE	TM2-42CE	TM4-N2RB	TM4-N2RE	TM4-N2SB	TM4-N2SE
Control output	Relay	250VAC 3A 1a				—				250VAC 3A 1a			
	SSR	—				12VDC ±3V 30mA Max.				—		22VDC ±3V30mA Max.	
	Current	—				DC 4-20mA or DC 0-20mA selectable(load 500Ω Max.)				—			
Option output	Relay	250VAC 3A 1a				—				—			
	Communication	RS485 Communication output (Modbus RTU)											
Option input	CT input	0.0-50.0A(Primary current measurement range) ※CT ratio = 1/1000								—			
	Digital input	<ul style="list-style-type: none"> <li>• Contact input: ON Max. 1kΩ, OFF Min. 100kΩ</li> <li>• Non-contact input: ON Max. 1.5V residual voltage, OFF Max. 0.1mA leakage current</li> <li>• Outflow current: Approx. 0.5mA</li> </ul>								—			
Control method	Heating, cooling	ON/OFF control mode, P, PI, PD, PID control mode											
	Heating&cooling												
Hysteresis		1 to 100°C/°F (0.1 to 100°C/°F) variable								1 to 100 digit			
Proportional band (P)		0.1 to 999.9°C/°F											
Integral time (I)		0 to 9999 sec.											
Derivative time (D)		0 to 9999 sec.											
Control period (T)		0.1 to 120.0 sec. (only relay output and SSR drive voltage output type)											
Manual reset value		0.0 to 100.0%											
Sampling period		50ms (2 channel synchronous sampling)								100ms (4 channel synchronous sampling)			
Dielectric strength		1,000VAC 50/60Hz for 1 min. (between power source terminal and input terminal)											
Vibration		0.75mm amplitude at frequency of 5 to 55Hz(for 1 min.) in each of X, Y, Z directions for 2 hours											
Relay life cycle	Mechanical	Min. 10,000,000 operations											
	Electrical	Min. 100,000 operations (250VAC 3A resistance load)											
Insulation resistance		100MΩ(at 500VDC megger)											
Noise resistance		±0.5kV the square wave noise (pulse width: 1us) by the noise simulator											
Environment	Ambient temperature	-10 to 50°C, storage: -20 to 60°C											
	Ambient humidity	35 to 85%RH, storage: 35 to 85%RH											
Accessory		Expansion connector Power / communication connector (※Basic module only)											
Insulation type		Double insulation or reinforced insulation (Mark: □, Dielectric strength between the measuring input part and the power part: 1kV)											
Approval													
Unit weight		Approx. 144g	Approx. 152g	Approx. 135g	Approx. 143g	Approx. 139g	Approx. 148g	Approx. 130g	Approx. 139g	Approx. 174g	Approx. 166g	Approx. 160g	Approx. 152g

※Environment resistance is rated at no freezing or condensation.

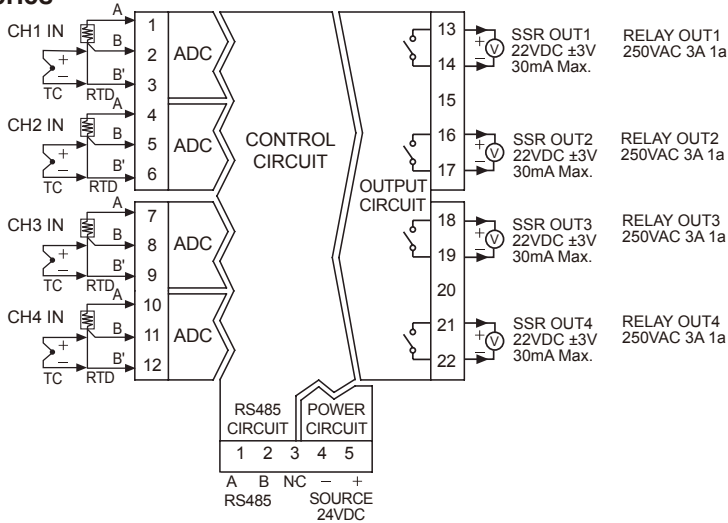
Photo electric sensor
Fiber optic sensor
Door/Area sensor
Proximity sensor
Pressure sensor
Rotary encoder
Connector/Socket
Temp. controller
SSR/ Power controller
Counter
Timer
Panel meter
Tacho/ Speed/ Pulse meter
Display unit
Sensor controller
Switching mode power supply
Stepper motor& Driver&Controller
Graphic/ Logic panel
Field network device

## ■ Connections and block diagram

### ● TM2 Series

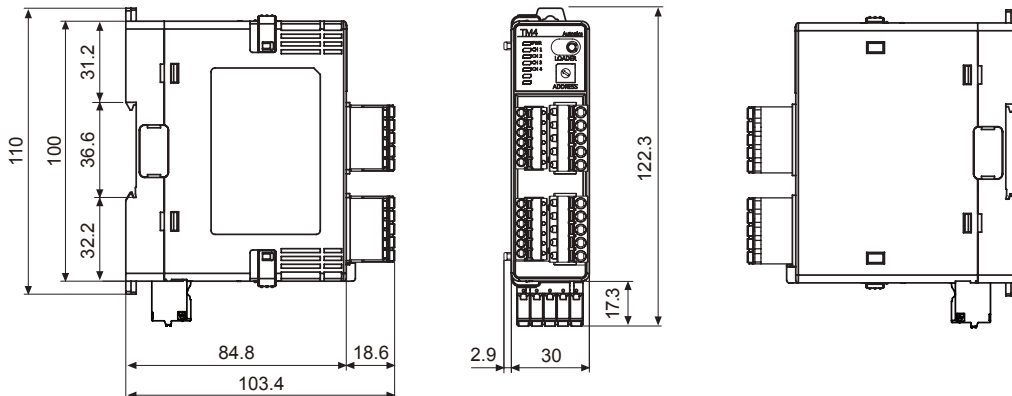


### ● TM4 Series



## ■ Dimensions

(unit: mm)





# High function/High performance PID control [TK Series]










## Ordering information

<b>TK</b>	<b>4</b>	<b>S</b>	<b>1</b>	<b>4</b>	<b>R</b>	<b>R</b>																														
							OUT2 control output <sup>※3</sup>	Standard N None ※Select in case of standard control(Heating or Cooling)																												
								Heating & Cooling R Relay output C Current output+SSR drive voltage output																												
							OUT1 control output <sup>※2</sup>	R Relay output S SSRP output C Current output+SSR drive voltage output																												
							Power supply	4 100-240VAC 50/60Hz																												
							Option input/output <sup>※1</sup>	<table border="1"> <tr> <td rowspan="2">N</td> <td>1</td> <td>Standard</td> <td>Alarm output1+CT input<sup>※4</sup></td> </tr> <tr> <td></td> <td>Heating&amp;Cooling</td> <td>Alarm output2<sup>※5</sup></td> </tr> <tr> <td rowspan="2">D</td> <td>2</td> <td>Standard</td> <td>Alarm output1+Alarm output2</td> </tr> <tr> <td></td> <td>Heating&amp;Cooling</td> <td>Digital input(DI-1, DI-2)</td> </tr> <tr> <td rowspan="2">R</td> <td></td> <td>Standard</td> <td>Alarm output1+Transmission output</td> </tr> <tr> <td></td> <td>Heating&amp;Cooling</td> <td>Transmission output</td> </tr> <tr> <td rowspan="2">T</td> <td></td> <td>Standard</td> <td>Alarm output1+RS485 communication output</td> </tr> <tr> <td></td> <td>Heating&amp;Cooling</td> <td>RS485 communication output</td> </tr> </table>	N	1	Standard	Alarm output1+CT input <sup>※4</sup>		Heating&Cooling	Alarm output2 <sup>※5</sup>	D	2	Standard	Alarm output1+Alarm output2		Heating&Cooling	Digital input(DI-1, DI-2)	R		Standard	Alarm output1+Transmission output		Heating&Cooling	Transmission output	T		Standard	Alarm output1+RS485 communication output		Heating&Cooling	RS485 communication output
N	1	Standard	Alarm output1+CT input <sup>※4</sup>																																	
		Heating&Cooling	Alarm output2 <sup>※5</sup>																																	
D	2	Standard	Alarm output1+Alarm output2																																	
		Heating&Cooling	Digital input(DI-1, DI-2)																																	
R		Standard	Alarm output1+Transmission output																																	
		Heating&Cooling	Transmission output																																	
T		Standard	Alarm output1+RS485 communication output																																	
		Heating&Cooling	RS485 communication output																																	
									SP 1	Alarm output1																										
							S M W H L	1	Alarm output1																											
								2	Alarm output1+Alarm output2																											
								R	Alarm output1+Transmission output																											
								T	Alarm output1+RS485 communication output																											
								A	Alarm output1+Alarm output2+Transmission output																											
								B	Alarm output1+Alarm output2+RS485 communication output																											
							Size	<table border="1"> <tr> <td>N</td> <td>DIN W48×H24mm</td> </tr> <tr> <td>SP</td> <td>DIN W48×H48mm(11pin plug type)<sup>※6</sup></td> </tr> <tr> <td>S</td> <td>DIN W48×H48mm(Terminal block type)</td> </tr> <tr> <td>M</td> <td>DIN W72×H72mm</td> </tr> <tr> <td>W</td> <td>DIN W96×H48mm</td> </tr> <tr> <td>H</td> <td>DIN W48×H96mm</td> </tr> <tr> <td>L</td> <td>DIN W96×H96mm</td> </tr> </table>	N	DIN W48×H24mm	SP	DIN W48×H48mm(11pin plug type) <sup>※6</sup>	S	DIN W48×H48mm(Terminal block type)	M	DIN W72×H72mm	W	DIN W96×H48mm	H	DIN W48×H96mm	L	DIN W96×H96mm														
N	DIN W48×H24mm																																			
SP	DIN W48×H48mm(11pin plug type) <sup>※6</sup>																																			
S	DIN W48×H48mm(Terminal block type)																																			
M	DIN W72×H72mm																																			
W	DIN W96×H48mm																																			
H	DIN W48×H96mm																																			
L	DIN W96×H96mm																																			
							Digit	4 9999(4digit)																												
							Item	TK Temperature / Process Controller																												

- ※1: In case of TK4N, TK4SP, option output may be limited due to number of terminals.
- ※2: In case of OUT1 control output, 'S' is able to SSR standard/cycle/phase control by SSRP voltage output as the voltage output model. 'C' is able to select one between current output or SSR drive(standard) voltage output.
- ※3: Select 'R' or 'C' type which has OUT2 control output to use heating&cooling control. Select 'N' type which does not have OUT2 control output to use standard control.
- ※4: (★) CT input of TK4N is available only for the standard model which has alarm output1.
- ※5: (★) The heating&cooling model of TK4N-1□□□ has only alarm output 2.
- ※6: Sockets for TK4SP (PG-11, PS-11) are sold separately.

Photo electric sensor
Fiber optic sensor
Door/Area sensor
Proximity sensor
Pressure sensor
Rotary encoder
Connector/ Socket
Temp. controller
SSR/ Power controller
Counter
Timer
Panel meter
Tacho/ Speed/ Pulse meter
Display unit
Sensor controller
Switching mode power supply
Stepper motor& Driver&Controller
Graphic/ Logic panel
Field network device

## Specifications

Series	TK4N(★)	TK4SP	TK4S	TK4M	TK4W	TK4H	TK4L	
Appearances & Dimensions	<b>NEW</b> CE C RU US 	<b>Upgrade</b> CE C RU US  [W48×H48×L64.5mm] 	<b>Upgrade</b> CE C RU US  [W48×H48×L72.2mm] 	<b>Upgrade</b> CE C RU US 	<b>Upgrade</b> CE C RU US 	<b>Upgrade</b> CE C RU US 	<b>Upgrade</b> CE C RU US 	
		[W48×H24×L93mm]	[W48×H48×L72.2mm]	[W72×H72×L64.5mm]	[W96×H48×L64.5mm]	[W48×H96×L64.5mm]	[W96×H96×L64.5mm]	
Power supply	100-240VAC 50/60Hz							
Allowable voltage range	90 to 110% of rated voltage							
Power consumption	Max. 6VA		Max. 8VA					
Display method	7 Segment (PV: red, SV: green), Other display part (green, yellow, red) LED method							
Character size	PV(W×H)	4.5×7.2mm	7.0×14.0mm		9.5×20.0mm	8.5×17.0mm	7.0×14.6mm	11.0×22.0mm
	SV(W×H)	3.5×5.8mm	5.0×10.0mm		7.5×15.0mm	6.0×12.0mm	6.0×12.0mm	7.0×14.0mm
Input type	RTD	JPt100Ω, DPt100Ω, DPt50Ω, Cu100Ω, Cu50Ω, Nickel 120Ω (6 types)						
	Thermocouple	K, J, E, T, L, N, U, R, S, B, C, G, PLII (13 types)						
	Analog	Voltage: 0-100mV, 0-5V, 1-5V, 0-10V (4 types) / Current: 0-20mA, 4-20mA (2 types)						
Display accuracy	RTD	<ul style="list-style-type: none"> <li>• At room temperature(23°C±5°C): (PV ±0.3% or ±1°C, select the higher one) ±1digit ※1</li> <li>• Out of room temperature range: (PV ±0.5% or ±2°C, select the higher one) ±1digit</li> <li>※In case of TK4SP Series, ±1°C will be added.</li> </ul>						
	Thermocouple	<ul style="list-style-type: none"> <li>• At room temperature(23°C±5°C): ±0.3% F.S. ±1digit, • Out of range of room temperature: ±0.5°C% F.S. ±1digit</li> </ul>						
	Analog	<ul style="list-style-type: none"> <li>• At room temperature(23°C±5°C): ±0.3% F.S. ±1digit, • Out of range of room temperature: ±0.5°C% F.S. ±1digit</li> </ul>						
Control output	Relay	OUT1, OUT2: 250VAC 3A 1a						
	SSR	11VDC±2V 20mA Max.						
	Current	DC4-20mA or DC0-20mA selectable (load 500Ω Max.)						
Alarm output	Relay	AL1, AL2 Relay: 250VAC 3A 1a ※TK4N AL2: 250VAC 0.5A 1a(Max.125VA), TK4SP has only AL1.						
	Transmission	DC4-20mA (load 500Ω Max., Accuracy: ±0.3% F.S.)						
Option output	Communication	RS485 communication output (Modbus RTU)						
	CT input	0.0-50.0A(primary heater current value measuring range) ※CT ratio = 1/1000 (except TK4SP)						
Option input	Digital input	<ul style="list-style-type: none"> <li>• Contact Input: ON - Max. 2kΩ, OFF - Min. 90kΩ</li> <li>• Non-contact Input: ON - Residual voltage max. 1.0V, OFF - Leakage current max. 0.1mA</li> <li>• Outflow current: Approx. 0.5mA</li> <li>※TK4S/M-1EA(Due to limited terminals), TK4N/H/W/L-2EA(except TK4SP)</li> </ul>						
	Heating,cooling	ON/OFF, P, PI, PD, PID control						
Control type	Heating&cooling	ON/OFF, P, PI, PD, PID control						
Hysteresis	<ul style="list-style-type: none"> <li>• Thermocouples / RTD: 1 to 100°C/°F (0.1 to 100.0°C/°F) variable</li> <li>• Analog: 1 to 100digit</li> </ul>							
Proportional band (P)	0.1 to 999.9°C/°F (0.1 to 999.9%)							
Integral time (I)	0 to 9999 sec.							
Derivative time (D)	0 to 9999 sec.							
Control period (T)	0.1 to 120.0 sec.(※relay output and SSR drive output only)							
Manual reset value	0.0 to 100.0%							
Sampling period	50ms							
Dielectric strength	2,000VAC 50/60Hz for 1min. (between power source terminal and input terminal)							
Vibration	0.75mm amplitude at frequency of 5 to 55Hz(for 1min.) in each of X, Y, Z direction for 2 hours							
Relay life cycle	Mechanical	OUT1/2: Over 5,000,000 times, AL1/2: Over 20,000,000 times (TK4H/W/L: Over 5,000,000 times)						
	Electrical	OUT1/2: Over 200,000 times, AL1/2: Over 100,000 times (TK4H/W/L: Over 200,000 times)						
Insulation resistance	Min. 100MΩ (at 500VDC megger)							
Noise resistance	±2kV R-phase, S-phase the square wave noise (pulse width: 1us) by the noise simulator							
Memory retention	Approx. 10 years (when using non-volatile semiconductor memory type)							

※1: ◎ At room temperature(23°C±5°C)

- Thermocouple K, J, T, N, E type, below -100°C / Thermocouple L, U, PLII type, RTD(★) Cu50Ω, DPt50Ω : (PV ±0.3% or ±2°C, select the higher one) ±1digit
- Thermocouple C, G, R, S type, below 200°C: (PV ±0.3% or ±3°C, select the higher one) ±1digit
- Thermocouple B type, below 400°C: There is no accuracy standards.

◎ Out of room temperature range

- RTD Cu50Ω, DPt50Ω: (PV ±0.5% or ±3°C, select the higher one) ±1digit
- Thermocouple R, S, B, C, G type: (PV ±0.5% or ±5°C, select the higher one) ±1digit
- Others, Below -100°C: Within ±5°C

In case of TK4SP Series, ±1°C will be added to the degree standard.

Series		TK4N(★)	TK4SP	TK4S	TK4M	TK4W	TK4H	TK4L
Environment	Ambient temperature	-10 to 50°C, storage: -20 to 60°C						
	Ambient humidity	35 to 85%RH, storage: 35 to 85%RH						
Protection		IP65 (Front panel) ※TK4SP: IP50 (Front panel)						
Insulation type		Double insulation or reinforced insulation (Mark: □, Dielectric strength between the measuring input part and the power part: 2kV)						
Approval								
Weight <sup>※2</sup>		Approx. 140g (Approx. 70g)	Approx. 130g (Approx. 85g)	Approx. 150g (Approx. 105g)	Approx. 210g (Approx. 140g)	Approx. 211g(Approx. 141g)	Approx. 294g (Approx. 198g)	Approx. 294g (Approx. 198g)

※2: The weight is with packaging and the weight in parentheses is only unit weight.  
 ※Environment resistance is rated at no freezing or condensation.

## ■ Connections

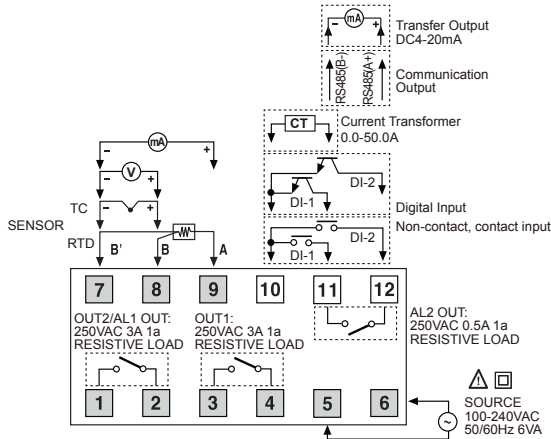
※Please check the polarity when connecting temperature sensor or analog input.  
 ※Standard model has shaded terminals only.

(★)Operation mode of heating&cooling OUT2 relay output model is heating or cooling, OUT2 is available as alarm output 3. (except TK4N Series).

(★)Operation mode of heating&cooling OUT2 current output model is heating or cooling, OUT2 is available as transmission output 2.

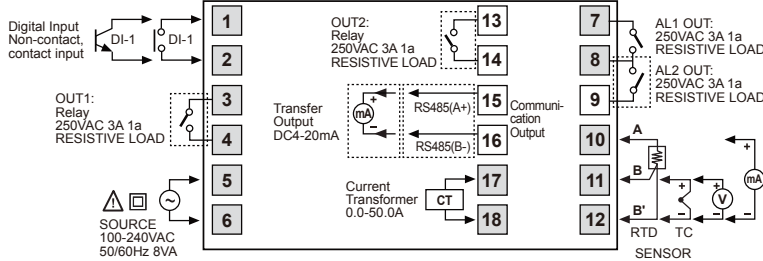
### ● TK4N

#### Line-up



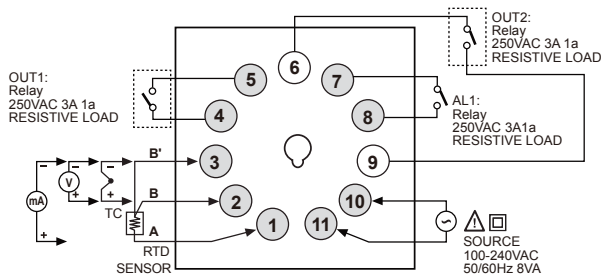
	SSR	Current
OUT1	 11VDC±2V 20mA Max.	 DC0-20mA Load 500Ω Max.
OUT2	 11VDC±2V 20mA Max.	 DC0-20mA Load 500Ω Max.

### ● TK4S



	SSR	Current
OUT1	 11VDC±2V 20mA Max.	 DC0/4-20mA Load 500Ω Max.
OUT2	 11VDC±2V 20mA Max.	 DC0/4-20mA Load 500Ω Max.

### ● TK4SP



	SSR	Current
OUT1	 11VDC±2V 20mA Max.	 DC0/4-20mA Load 500Ω Max.
OUT2	 11VDC±2V 20mA Max.	 DC0/4-20mA Load 500Ω Max.

- Photo electric sensor
- Fiber optic sensor
- Door/Area sensor
- Proximity sensor
- Pressure sensor
- Rotary encoder
- Connector/Socket
- Temp. controller
- SSR/Power controller
- Counter
- Timer
- Panel meter
- Tacho/Speed/Pulse meter
- Display unit
- Sensor controller
- Switching mode power supply
- Stepper motor& Driver&Controller
- Graphic/Logic panel
- Field network device

## ■ Connections

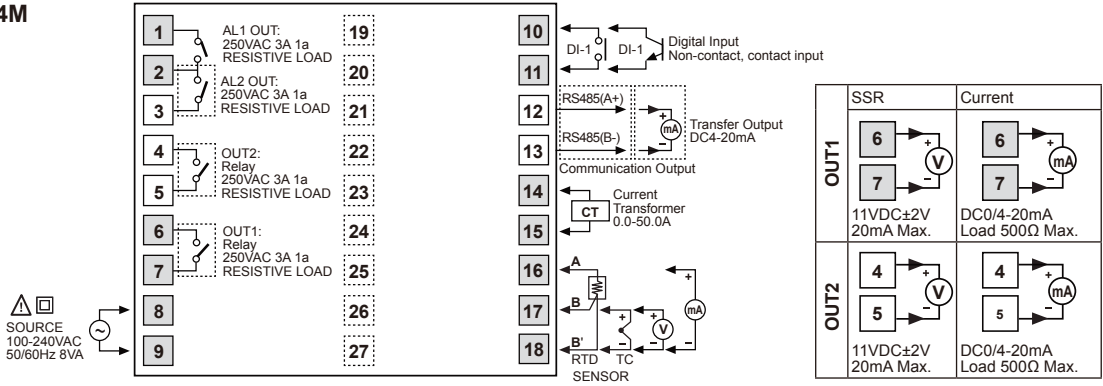
※Please check the polarity when connecting temperature sensor or analog input.

※Standard model has shaded terminals only.

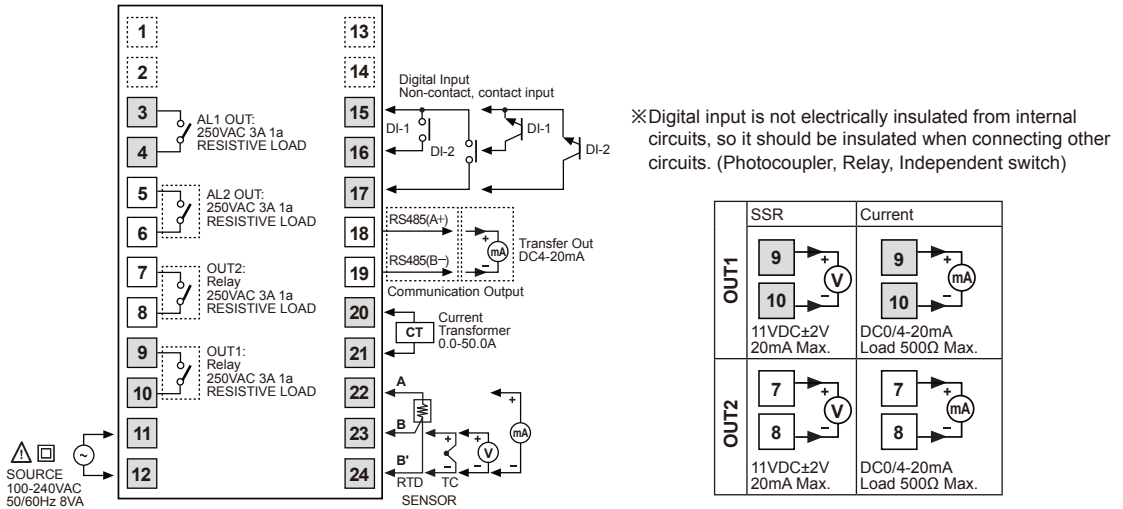
(★)Operation mode of heating&cooling OUT2 relay output model is heating or cooling, OUT2 is available as alarm output 3. (except TK4N Series).

(★)Operation mode of heating&cooling OUT2 current output model is heating or cooling, OUT2 is available as transmission output 2.

### ● TK4M



### ● TK4H / TK4W / TK4L







## Economical dual display type, PID control [TCN Series]

### Ordering information

<b>T</b>	<b>CN</b>	<b>4</b>	<b>S</b>	<b>—</b>	<b>2</b>	<b>4</b>	<b>R</b>
Item	Setting type	Digit	Size	Auxiliary output	Power supply	Control output	
	CN	4	S, M, H, L	2	2, 4	R	
	Dual display type, set by touch switch	9999(4digit)	DIN W48×H48mm DIN W72×H72mm DIN W48×H96mm DIN W96×H96mm	Alarm1+Alarm2 output	24VAC 50/60Hz, 24-48VDC 100-240VAC 50/60Hz	Relay contact output+SSRP output (AC power) Relay contact output+SSR output (AC/DC power)	
	T						Temperature controller

### Specifications

Series	TCN4S	TCN4M	TCN4H	TCN4L
Appearances & Dimensions	 [W48×H48×L65mm]	 [W72×H72×L65mm]	 [W48×H96×L65mm]	 [W96×H96×L65mm]
Power supply	AC power	100-240VAC 50/60Hz		
	AC/DC power	24VAC 50/60Hz, 24-48VDC		
Allowable voltage range	90 to 110% of rated voltage			
Power consumption	AC power	Max. 5VA(100-240VAC 50/60Hz)		
	AC/DC power	Max. 5VA(24VAC 50/60Hz), Max. 3W(24-48VDC)		
Display method	7 Segment (PV: red, SV: green), Other display(green, red) LED			
Character size	PV(W×H)	7.0×15.0mm	9.5×20.0mm	7.0×14.6mm
	SV(W×H)	5.0×9.5mm	7.5×15.0mm	6.0×12.0mm
Input type	RTD	DPT100Ω, Cu50Ω (allowable line resistance max. 5Ω per a wire)		
	Thermocouple	K(CA), J(IC), L(IC), T(CC), R(PR), S(PR)		
Display accuracy*1	RTD	• At room temperature (23°C ±5°C): (PV ±0.5% or ±1°C, select the higher one) ±1digit		
	Thermocouple	• Out of room temperature range: (PV ±0.5% or ±2°C, select the higher one) ±1digit		
Control output	Relay	250VAC 3A 1a		
	SSR	12VDC ±2V 20mA Max.		
Alarm output	AL1, AL2 Relay output: 250VAC 1A 1a			
Control method	ON/OFF control, P, PI, PD, PID control			
Hysteresis	1 to 100°C/°F (0.1 to 50.0°C/°F) variable			

\*1: ◎ At room temperature (23°C ±5°C)

- Thermocouple C R, S type, below 200°C: (PV ±0.5% or ±3°C, select the higher one) ±1digit
- Thermocouple R, S type, over 200°C: (PV ±0.5% or ±2°C, select the higher one) ±1digit
- Thermocouple L(IC) type, RTD Cu50Ω: (PV ±0.5% or ±2°C, select the higher one) ±1digit

◎ Out of room temperature range

- Thermocouple R, S type, below 200°C: (PV ±1.0% or ±6°C, select the higher one) ±1digit
- Thermocouple R, S type, over 200°C: (PV ±0.5% or ±5°C, select the higher one) ±1digit
- RTD Cu50Ω: (PV ±0.5% or ±3°C, select the higher one) ±1digit

Photo electric sensor

Fiber optic sensor

Door/Area sensor

Proximity sensor

Pressure sensor

Rotary encoder

Connector/Socket

Temp. controller

SSR/ Power controller

Counter

Timer

Panel meter

Tacho/ Speed/ Pulse meter

Display unit

Sensor controller



Switching mode power supply

Stepper motor& Driver&Controller

Graphic/ Logic panel

Field network device

## Specifications

Series	TCN4S	TCN4M	TCN4H	TCN4L
Proportional band (P)	0.1 to 999.9°C/°F			
Integral time (I)	0 to 9999 sec.			
Derivative time (D)	0 to 9999 sec.			
Control period (T)	0.5 to 120.0 sec.			
Manual reset	0.0 to 100.0%			
Sampling period	100ms			
Dielectric strength	AC Power	2,000VAC 50/60Hz 1min.(between input terminal and power terminal)		
	AC/DC power	1,000VAC 50/60Hz 1min.(between input terminal and power terminal)		
Vibration	0.75mm amplitude at frequency of 5 to 55Hz in each of X, Y, Z directions for 2 hours			
Relay life cycle	Mechanical	OUT: Over 5,000,000 times, AL1/2: Over 5,000,000 times		
	Electrical	OUT: Over 200,000 times(250VAC 3A resistive load) AL1/2: Over 300,000 times(250VAC 1A resistive load)		
Insulation resistance	Min. 100MΩ(at 500VDC megger)			
Noise resistance	±2kV R-phase, S-phase the square wave noise (pulse width: 1us) by the noise simulator			
Memory retention	Approx. 10 years (when using non-volatile semiconductor memory type)			
Environment	Ambient temperature	-10 to 50°C, storage: -20 to 60°C		
	Ambient humidity	35 to 85%RH, storage: 35 to 85%RH		
Insulation type	Double insulation or reinforced insulation (mark:  , Dielectric strength between the measuring input part and the power part: AC power 2kV, AC/DC Power 1kV)			
Approval				
Weight <sup>※2</sup>	Approx. 147g (Approx. 100g)	Approx. 203g (Approx. 133g)	Approx. 194g (Approx. 124g)	Approx. 275g (Approx. 179g)

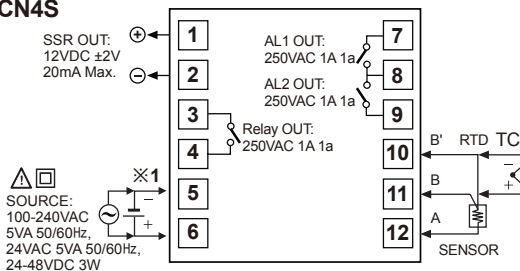
※2: The weight is with packaging and the weight in parentheses is only unit weight.

※Environment resistance is rated at no freezing or condensation.

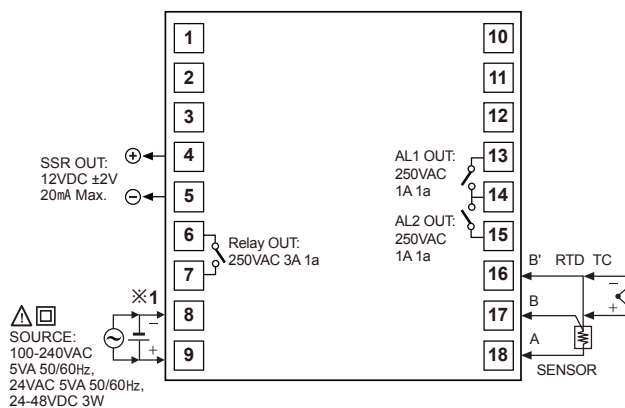
## Connections

※TCN4 Series has selectable control output; Relay output, and SSRP output. AC/DC voltage type has Relay output and SSR output and it is selectable.

### TCN4S



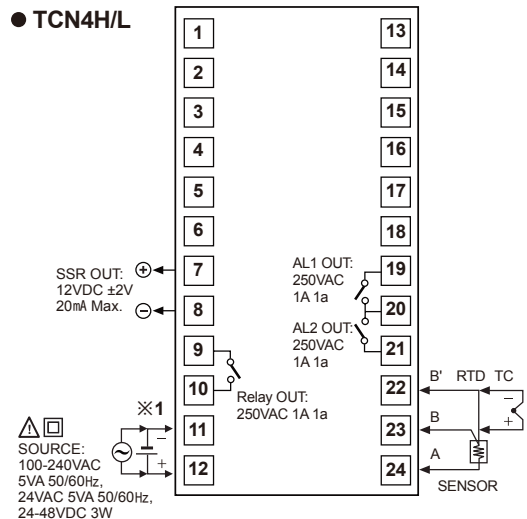
### TCN4M



※1: Power supply

- AC power: 100-240VAC 5VA 50/60Hz
- AC/DC power: 24VAC 5VA 50/60Hz, 24-48VDC 3W

### TCN4H/L





## Specifications

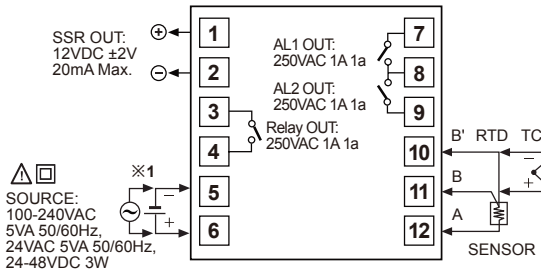
Series	TC4S	TC4SP	TC4Y	TC4M	TC4W	TC4H	TC4L
Control output	Relay	250VAC 3A 1a					
	SSR	12VDC $\pm 2V$ 20mA Max.					
Sub output	AL1, AL2 relay output: 250VAC 1A 1a(※TC4SP, TC4Y have AL1 only.)						
Control method	ON/OFF and P, PI, PD, PID control						
Hysteresis	1 to 100°C/°F (0.1 to 50.0°C/°F) variable						
Proportional band (P)	0.1 to 999.9°C/°F						
Integral time (I)	0 to 9999 sec.						
Derivative time (D)	0 to 9999 sec.						
Control period (T)	0.5 to 120.0 sec.						
Manual reset	0.0 to 100.0%						
Sampling period	100ms						
Dielectric strength	AC power	2,000VAC 50/60Hz for 1min.(between input terminal and power terminal)					
	AC/DC power	1,000VAC 50/60Hz for 1min.(between input terminal and power terminal)					
Vibration	0.75mm amplitude at frequency of 5 to 55Hz(for 1 min.) in each of X, Y, Z directions for 2 hours						
Relay life cycle	Mechanical	OUT: Over 5,000,000 times, AL1/2: Over 5,000,000 times					
	Electrical	OUT: Over 200,000 times(250VAC 3A resistive load) AL1/2: Over 300,000 times(250VAC 1A resistive load)					
Insulation resistance	Min. 100M $\Omega$ (at 500VDC megger)						
Noise resistance	$\pm 2kV$ R-phase, S-phase the square wave noise (pulse width: 1us) by the noise simulator						
Memory retention	Approx. 10 years (when using non-volatile semiconductor memory type)						
Environment	Ambient temperature	-10 to 50°C, storage: -20 to 60°C					
	Ambient humidity	35 to 85%RH, storage: 35 to 85%RH					
Insulation type	Double insulation or reinforced insulation (mark: $\square$ ), Dielectric strength between the measuring input part and the power part: AC power 2kV, AC/DC Power 1kV)						
Approval	CE c $\text{UL}$ US (Except for AC/DC power type)						
Unit weight	Approx. 97g	Approx. 84g	Approx. 127g	Approx. 127g	Approx. 118g	Approx. 118g	Approx. 172g

※Environment resistance is rated at no freezing or condensation.

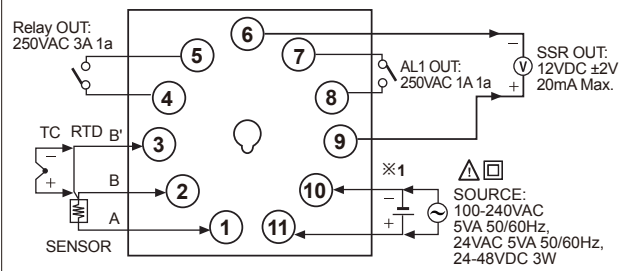
## Connections

※TC4 Series has selectable control output; Relay output, and SSRP output. AC/DC power type has Relay output and SSR output and it is selectable.

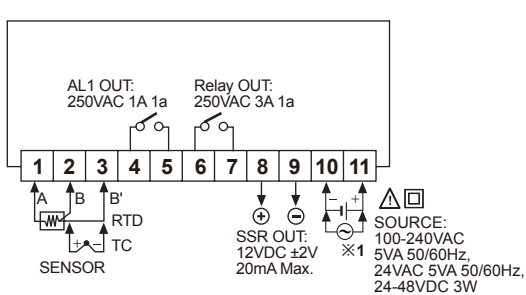
### TC4S



### TC4SP

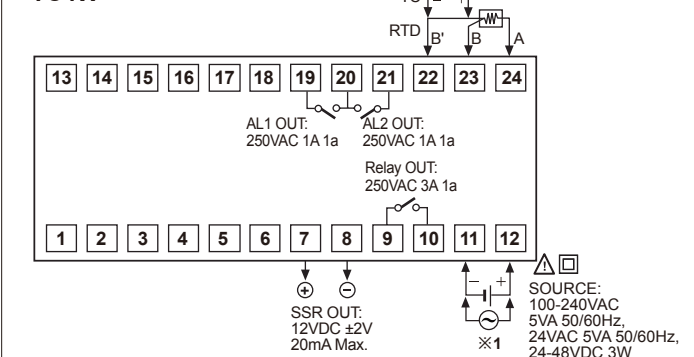


### TC4Y



※1: • AC power: 100-240VAC 5VA 50/60Hz  
• AC/DC power: 24VAC 5VA 50/60Hz, 24-48VDC 3W

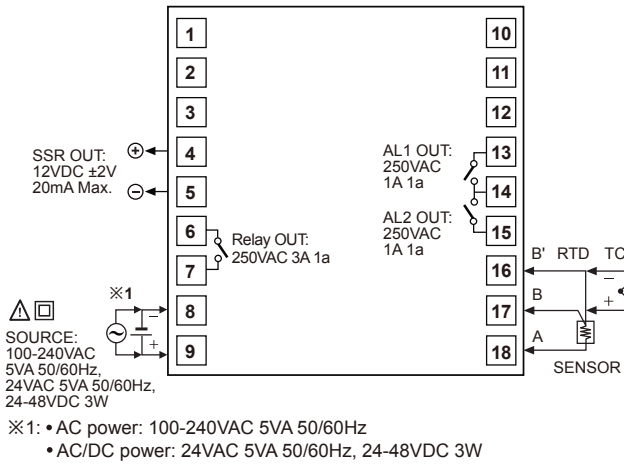
### TC4W



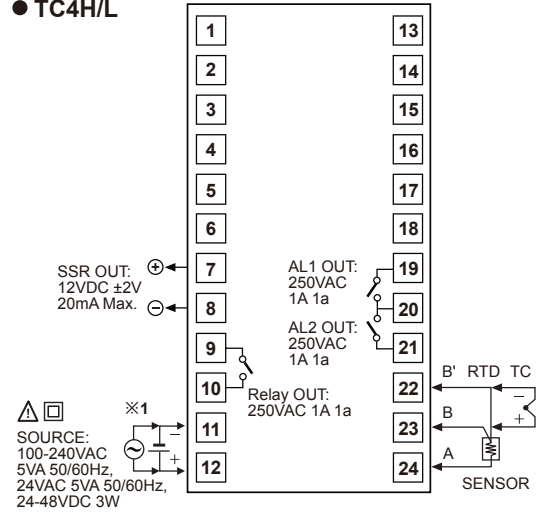


■ Connections

● TC4M



● TC4H/L



Analog and non-indicating type, PID control, set temperature by dial [TA Series]

■ Ordering information




TA S - B 4 R P 4 C

Unit	C	Celsius °C			
	F	Fahrenheit °F			
Temperature range for each sensor		°C	°F	Temperature sensor	
	0	-50 to 100	-58 to 212	Pt	—
	1	0 to 100	32 to 212	Pt	— K
	2	0 to 200	32 to 392	Pt	J K
	3	0 to 300	32 to 572	—	J —
	4	0 to 400	32 to 752	Pt	J K
	6	0 to 600	32 to 1,112	—	— K
	8	0 to 800	32 to 1,472	—	— K
	C	0 to 1,200	32 to 2,192	—	— K
Sensor input type	P	DpT100Ω			
	J	J(IC)			
	K	K(CA)			
Control output	R	Relay output			
	S	SSR drive voltage output			
Power supply	4	100-240VAC 50/60Hz			
Control method	B	ON/OFF control & PID control combined			
Size	S	DIN W48 x H48mm(8pin plug type) <sup>※1</sup>			
	M	DIN W72 x H72mm			
	L	DIN W96 x H96mm			
Item	TA	Analog setting type temperature controller			

※1: 8pin socket(PG-08, PS-08) is sold separately.

- Photo electric sensor
- Fiber optic sensor
- Door/Area sensor
- Proximity sensor
- Pressure sensor
- Rotary encoder
- Connector/Socket
- Temp. controller
- SSR/ Power controller
- Counter
- Timer
- Panel meter
- Tacho/ Speed/ Pulse meter
- Display unit
- Sensor controller
- Switching mode power supply
- Stepper motor & Driver&Controller
- Graphic/ Logic panel
- Field network device

## Specifications

Series	TAS	TAM	TAL
Appearances & Dimensions	 [W48×H48×L66.5mm]	 [W72×H72×L64.5mm]	 [W96×H96×L64.5mm]
	Power supply	100-240VAC 50/60Hz	
Allowable voltage range	90 to 110% of rated voltage		
Power consumption	Max. 4VA		
Size	DIN W48×H48mm	DIN W72×H72mm	DIN W96×H96mm
Display method	Deviation LED(red, green), Output LED(red)		
Setting type	Dial setting		
Setting accuracy <sup>※1</sup>	F.S. ±2% (room temperature 23°C±5°C)		
Input type	RTD	DPT100Ω (allowable line resistance max. 5Ω per a wire)	
	Thermocouples	K(CA), J(IC)	
Control	ON/OFF Control	Hysteresis: 2°C fixed	
	PID Control	Control period: Relay output - 20 sec. / SSR drive voltage output - 2 sec.	
Control output	Relay	250VAC 3A 1c	
	SSR	12VDC±2V 20mA Max.	
Functions	PV deviation indicatable, Error indicatable		
Dielectric strength	2,000VAC 50/60Hz for 1min.(between input terminal and power terminal)		
Vibration	0.75mm amplitude at frequency of 5 to 55Hz(for 1 min.) in each of X, Y, Z directions for 2 hours		
Relay life cycle	Mechanical	Min. 10,000,000 operations(18,000 operations/hr)	
	Electrical	Min. 100,000 operations(900 operations/hr)	
Insulation resistance	Min. 100MΩ(at 500VDC megger)		
Noise resistance	±2kV R-phase, S-phase the square wave noise (pulse width: 1us) by the noise simulator		
Memory retention	Approx. 10 years (when using non-volatile semiconductor memory type)		
Environment	Ambient temperature	-10 to 50°C, storage: -20 to 60°C	
	Ambient humidity	35 to 85%RH, storage: -35 to 85%RH	
Unit weight	Approx. 65g	Approx. 378g	Approx. 387g

※1: Out of room temperature range: Below 100°C model is F.S. ±4% , Over 100°C model is F.S. ±3%

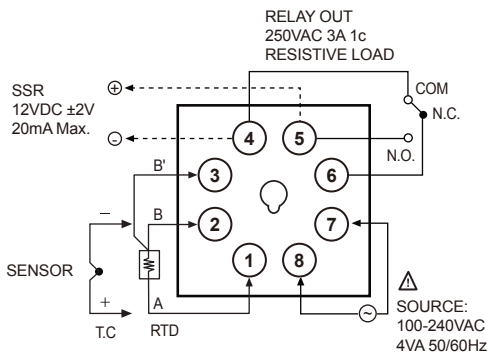
※Environment resistance is rated at no freezing or condensation.

## Connections

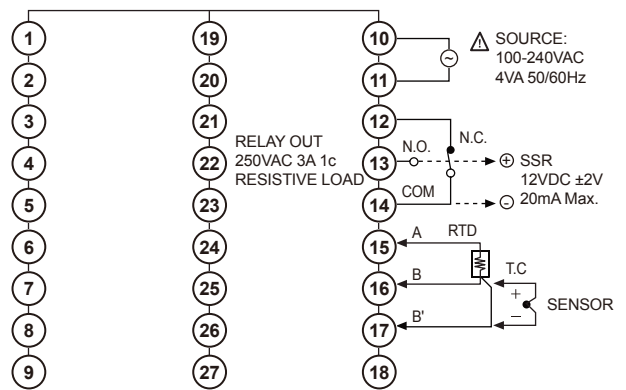
※RTD: DPT100Ω(3-wire type) ※Thermocouple: K(CA), J(IC)

### ● TAS

(※Socket(PG-08, PS-08) is sold separately)














### ● TAM





## Specifications

Series	TZ4SP TZN4S	TZ4ST	TZ4M TZN4M	TZ4W TZN4W	TZ4H TZN4H	TZ4L TZN4L
Appearances & Dimensions	 [W48×H48×L95mm]	 [W48×H48×L95mm]	 [W72×H72×L110mm]	 [W96×H48×L110mm]	 [W48×H96×L110mm]	 [W96×H96×L110mm]
	 [W48×H48×L90mm]		 [W72×H72×L85mm]	 [W96×H48×L100mm]	 [W48×H96×L100mm]	 [W96×H96×L100mm]
Power supply	AC Power	100-240VAC 50/60Hz				
	AC/DC Power <sup>※1</sup>	24VAC 50/60Hz / 24-48VDC				
Allowable voltage range	90 to 110% of rated voltage					
Power consumption	AC Power	Max. 5VA(100-240VAC 50/60Hz)		Max. 6VA(100-240VAC 50/60Hz)		
	AC/DC Power <sup>※1</sup>	Max. 8VA(24VAC 50/60Hz), Max. 7W(24-48VDC)				
Display accuracy	7 Segment (PV: red, SV: green) LED method					
Character size(W×H)	<b>TZ4SP:</b> 4.8×7.8mm <b>TZN4S:</b> PV:7.8×11.0mm SV:5.8×8.0mm	4.8×7.8mm	<b>TZ4M:</b> PV:9.8×14.2mm SV:8.0×10.0mm <b>TZN4M:</b> PV:8.0×13.0mm SV:5.0×9.0mm	8.0×10.0mm	<b>TZ4H:</b> 3.8×7.6mm <b>TZN4H:</b> PV:7.8×11.0mm SV:5.8×8.0mm	PV:9.8×14.2mm SV:8.0×10.0mm
Input type	RTD	DPT100Ω, JPT100Ω, 3wire (allowable line resistance max. 5Ω per a wire)				
	Thermocouple	K(CA), J(IC), R(PR), E(CR), T(CC), S(PR), N(NN), W(TT) (allowable line resistance max. 100Ω)				
	Analog	1-5VDC, 0-10VDC, DC4-20mA				
Control output	Relay	250VAC 3A 1c				
	SSR	12VDC ±3V 30mA Max.				
	Current	DC4-20mA (load 600Ω Max.)				
Sub output	PV transmission	—	DC4-20mA (load 600Ω Max.)			
	EVENT1	250VAC 1A 1a				
	EVENT2	—	250VAC 1A 1a			
	Communication	—	—	RS485(PV/SV transmission, SV setting)		
Control type	ON/OFF, P, PI, PD, PIDF, PIDS control					
Display accuracy	F.S. ±0.3% or 3°C, select the higher one					
Setting method	Front push buttons					
Hysteresis	1~100°C(0.1 to 100.0°C) variable(ON/OFF control)					
ALARM output	Adjustable ON/OFF 1 to 100 (0.1 to 100.0)°C of alarm output					
Proportional band (P)	0.0 to 100.0%					
Integral time (I)	0 to 3600 sec.					
Derivative time (D)	0 to 3600 sec.					
Control period (T)	1 to 120 sec.					
Sampling period	0.5 sec.					
LBA setting	1 to 999 sec.					
RAMP setting	Ramp Up, Ramp Down at 1 to 99min.					
Dielectric strength	2,000VAC 50/60Hz for 1min. (between power source terminal and input terminal)					

※1. AC/DC power type is only for TZ4SP, TZ4ST, TZN4M, TZ4L Series.

Series	TZ4SP TZN4S	TZ4ST	TZ4M TZN4M	TZ4W TZN4W	TZ4H TZN4H	TZ4L TZN4L
Vibration	0.75mm amplitude at frequency of 10 to 55Hz(for 1min.) in each of X, Y, Z direction for 2 hours					
Relay life cycle	Main output	Mechanical: Min. 10,000,000 operations, Electrical: Min. 100,000 operations(250VAC 3A resistive load)				
	Sub output	Mechanical: Min. 20,000,000 operations, Electrical: Min. 500,000 operations(250VAC 1A resistive load)				
Insulation resistance	Min. 100MΩ (at 500VDC megger)					
Noise resistance	±2kV the square wave noise (pulse width: 1us) by the noise simulator					
Memory retention	Approx. 10 years (when using non-volatile semiconductor memory type)					
Environment	Ambient temperature	-10 to 50°C, storage: -20 to 60°C				
	Ambient humidity	35 to 85%RH, storage: 35 to 85%RH				
Approval						
Unit weight	<b>TZ4SP:</b> Approx. 136g <b>TZN4S:</b> Approx. 150g	Approx. 136g	Approx. 270g	<b>TZ4W:</b> Approx. 270g <b>TZN4W:</b> Approx. 259g	Approx. 259g	Approx. 360g

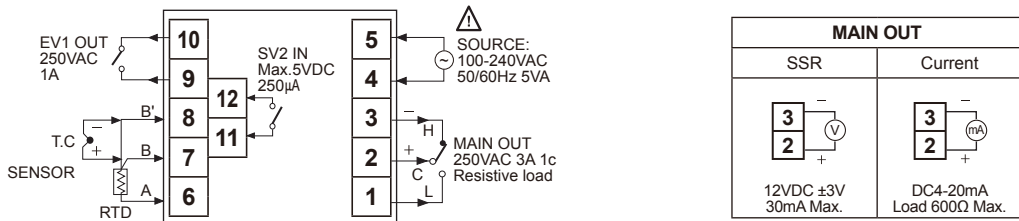
※Environment resistance is rated at no freezing or condensation.

## ■ Connections

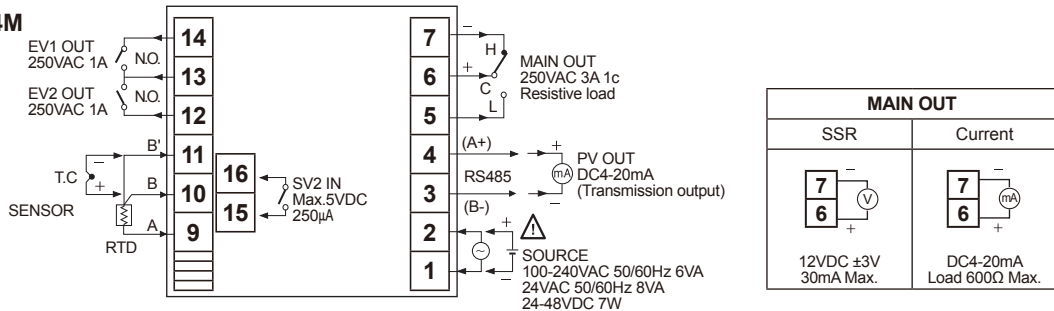
※RTD: DPt100Ω(3-wire type), JPt100Ω(3-wire type) ※T.C(Thermocouple): K, J, R, E, T, S, W, N

※In case of Analog input, please use T.C(Thermocouple) terminal and be careful about polarity.

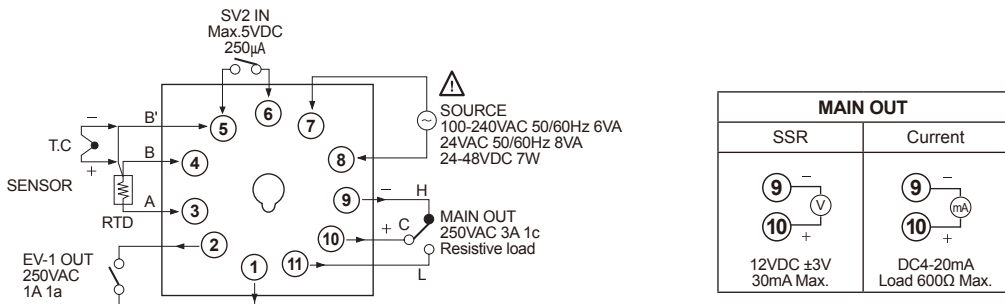
### ● TZN4S



### ● TZN4M



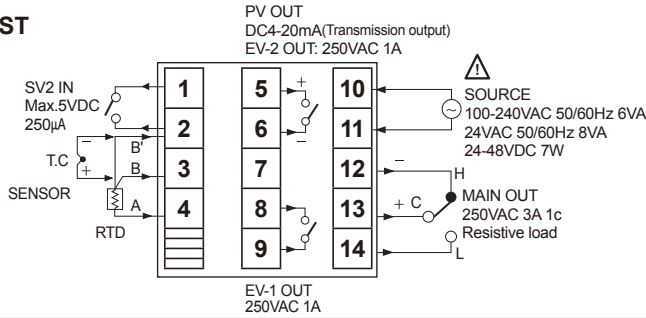
### ● TZ4SP



- Photo electric sensor
- Fiber optic sensor
- Door/Area sensor
- Proximity sensor
- Pressure sensor
- Rotary encoder
- Connector/Socket
- Temp. controller
- SSR/ Power controller
- Counter
- Timer
- Panel meter
- Tacho/ Speed/ Pulse meter
- Display unit
- Sensor controller
- Switching mode power supply
- Stepper motor & Driver&Controller
- Graphic/ Logic panel
- Field network device

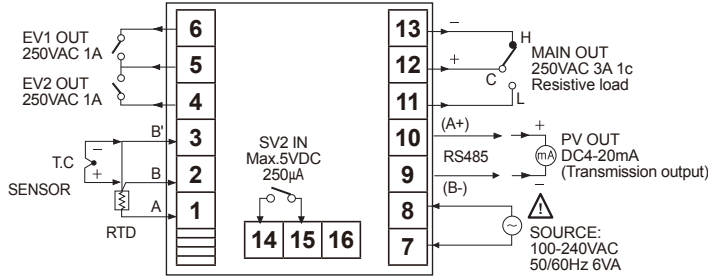
# Selection Guide

## ● TZ4ST



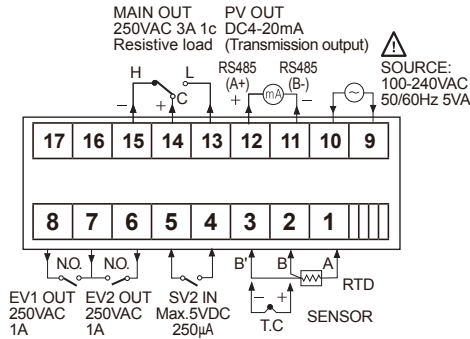
MAIN OUT		SUB OUT
SSR	Current	PV transmission output
12VDC ±3V 30mA Max.	DC4-20mA Load 600Ω Max.	DC4-20mA Load 600Ω Max.

## ● TZ4M



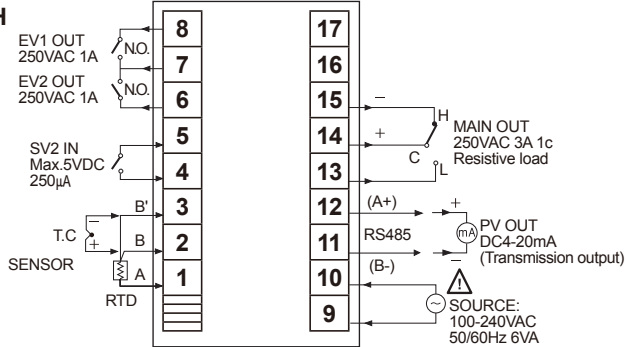
MAIN OUT	
SSR	Current
12VDC ±3V 30mA Max.	DC4-20mA Load 600Ω Max.

## ● TZ4W/TZ4N4W



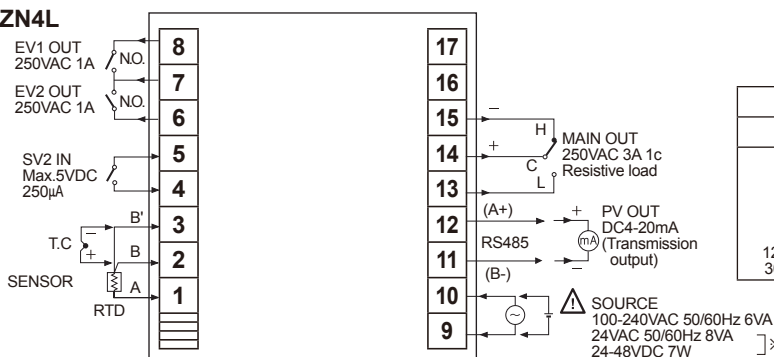
MAIN OUT	
SSR	Current
12VDC ±3V 30mA Max.	DC4-20mA Load 600Ω Max.

## ● TZ4H / TZ4N4H



MAIN OUT	
SSR	Current
12VDC ±3V 30mA Max.	DC4-20mA Load 600Ω Max.

## ● TZ4L / TZ4N4L







MAIN OUT	
SSR	Current
12VDC ±3V 30mA Max.	DC4-20mA Load 600Ω Max.

※Only for TZ4L.



## ■ Specifications

Series	T3S	T3H	T4M	T4L
Appearances & Dimensions				
	[W48×H48×L88mm]	[W48×H96×L134mm]	[W72×H72×L112mm]	[W96×H96×L100mm]
Power supply	100-240VAC 50/60Hz		110/220VAC 50/60Hz	
Allowable voltage range	90 to 110% of power supply			
Power consumption	Max. 5VA		Max. 3VA	
Display method	7 Segment(red) LED method			
Character size(W×H)	4.0×8.0mm	6.0×10.0mm	7.2×9.8mm	9.5×14.2mm
Display accuracy	F.S. ±1% rdg ±1digit		F.S. ±0.5% rdg ±1digit	
Setting type	Digital setting			
Setting accuracy	F.S. ±1%		F.S. ±0.5%	
Sensor input	Thermocouples: K(CA), J(IC), R(PR) / RTD: DPt100Ω ※There is no R(PR) in T3S, T3H Series.			
Input line resistance	Thermocouples: Max. 100Ω / RTD: Allowable line resistance max. 5Ω per a wire			
Control method	ON/OFF control	Hysteresis: F.S. 0.5% ±0.2% fixed	Hysteresis: F.S. 0.2 to 3% variable	
	P control	Proportional band: F.S. ±3% fixed Period: 20sec. fixed	Proportional band: F.S. 1 to 10% variable, Period: 20sec. fixed	
RESET adjuster range	F.S. ±3% variable(revision of control deviation)			
Control output	<ul style="list-style-type: none"> <li>Relay output : 250VAC 2A 1c</li> <li>SSR drive voltage output : 12VDC ±3V 20mA Max.</li> <li>Current output : DC4-20mA (load 600Ω Max.)</li> </ul>		<ul style="list-style-type: none"> <li>Relay output: 250VAC 3A 1c</li> <li>SSR output: 24VDC ±3V 20mA Max.</li> <li>Current output: DC4-20mA (load 600Ω Max.)</li> </ul>	
Self-diagnosis	Built-in burn out function (cut off output when sensor is disconnected)			
Insulation resistance	Min. 100MΩ (at 500VDC megger)			
Dielectric strength	2,000VAC 50/60Hz for 1 min.			
Noise resistance	±1kV the square wave noise(pulse width: 1μs) by the noise simulator			
Vibration	Mechanical	0.75mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 1 hour		
	Malfunction	0.5mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 10 min.		
Shock	Mechanical	300m/s <sup>2</sup> (approx. 30G) in each of X, Y, Z directions for 3 times		
	Malfunction	100m/s <sup>2</sup> (approx. 10G) in each of X, Y, Z directions for 3 times		
Relay life cycle	Mechanical	Min. 10,000,000 operations		
	Electrical	Min. 100,000 operations(250VAC 3A at resistive load)		
Environment	Ambient temperature	-10 to 50°C, storage:-25 to 65°C		
	Ambient humidity	35 to 85%RH, storage: 35 to 85%RH		
Unit weight	Approx. 196g	Approx. 496g	Approx. 399g	Approx. 468g

※F.S. is same with sensor measuring temperature range.

Ex) In case of measurement temperature range is from -99.9 to 199.9°C, Full scale is 299.8.

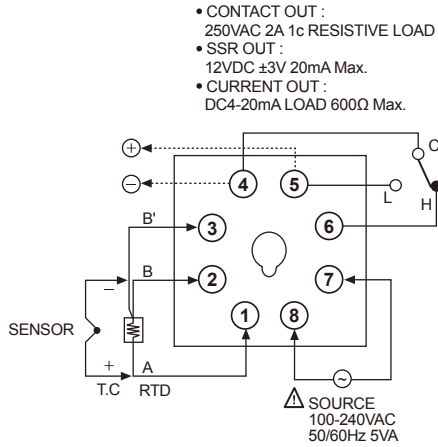
※Environment resistance is rated at no freezing or condensation.



## ■ Connections

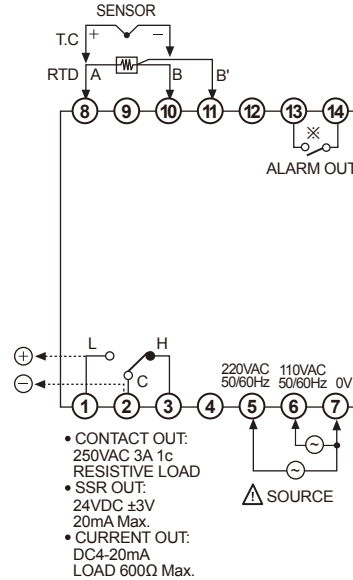
※RTD: DPt100Ω (3-wire type) ※Thermocouple: K, J, R

### ● T3S

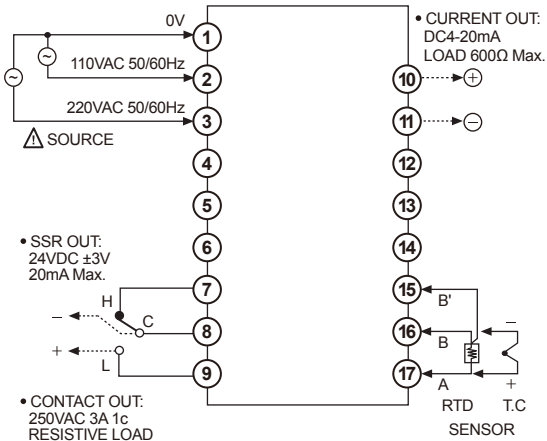


### ● T4M

※Although T4M has an alarm terminal, it does not work since it uses the same case with T4MA.



### ● T3H



### ● T4L

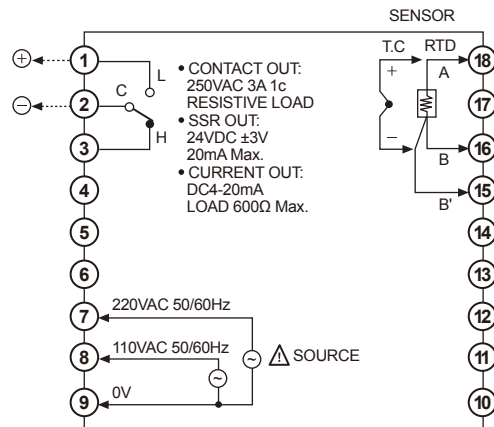






Photo electric sensor
Fiber optic sensor
Door/Area sensor
Proximity sensor
Pressure sensor
Rotary encoder
Connector/ Socket
Temp. controller
SSR/ Power controller
Counter
Timer
Panel meter
Tacho/ Speed/ Pulse meter
Display unit
Sensor controller
Switching mode power supply
Stepper motor & Driver&Controller
Graphic/ Logic panel
Field network device



■ Specifications

Series	T3HA	T3HS	T4MA	T4LA
Appearances & Dimensions		※SUB output type 		
	[W48×H96×L134mm]	[W48×H96×L134mm]	[W72×H72×L112mm]	[W96×H96×L110mm]
Power supply	110/220VAC 50/60Hz			
Allowable voltage range	90 to 110% of rated voltage			
Power consumption	Max. 3VA			
Display method	7 Segment(red) LED method			
Character size(W×H)	6.0×10.0mm		7.2×9.8mm	9.5×14.2mm
Display accuracy	F.S. ±0.5% rdg ±1digit			
Setting type	Digital setting			
Setting accuracy	F.S. ±0.5%			
Sensor input	Thermocouples: K(CA), J(IC), R(PR) / RTD: DPT100Ω ※There is no R(PR) in T3HA, T3HS Series.			
Input line resistance	Thermocouples: Max. 100Ω, RTD: Allowable line resistance max. 5Ω per a wire			
Control	ON/OFF control	Hysteresis: F.S. 0.2 to 3% variable		
	P control	Proportional band: F.S. 1 to 10% variable, Period: 20sec. fixed		
Alarm output	SUB	SUB: 0 to -50°C variable		
	Alarm	ALARM width F.S. 0 to 10% variable		
RESET adjuster range	F.S. ±3% variable (revision of control deviation / only for P control)			
Control output	<ul style="list-style-type: none"> <li>Relay contact output: 250VAC 3A 1c</li> <li>SSR drive voltage output: 24VDC ±3V 20mA Max.</li> <li>Current output: DC4-20mA (load 600Ω Max.)</li> </ul>			
	ALARM OUT: 250VAC 1A 1a	SUB OUT: 250VAC 1A 1a	ALARM OUT: 250VAC 1A 1a	ALARM OUT: 250VAC 1A 1c
Self-diagnosis	Built-in burn out function (cut off output when sensor is disconnected)			
Insulation resistance	Min. 100MΩ (at 500VDC megger)			
Dielectric strength	2,000VAC 50/60Hz for 1 min.			
Noise resistance	±1kV the square wave noise(pulse width: 1μs) by the noise simulator			
Vibration	Mechanical	0.75mm amplitude at frequency of 10 to 55Hz (for 1 min.) in each of X, Y, Z directions for 1 hour		
	Malfunction	0.5mm amplitude at frequency of 10 to 55Hz (for 1 min.) in each of X, Y, Z directions for 10 min.		
Shock	Mechanical	300m/s <sup>2</sup> (approx. 30G) in each of X, Y, Z directions for 3 times		
	Malfunction	100m/s <sup>2</sup> (approx. 10G) in each of X, Y, Z directions for 3 times		
Relay life cycle	Mechanical	Min. 10,000,000 operations		
	Electrical	Min. 100,000 operations(250VAC 3A at resistive load)		
Environment	Ambient temperature	-10 to 50°C, storage: -25 to 65°C		
	Ambient humidity	35 to 85%RH, storage: 35 to 85%RH		
Unit weight	Approx. 514g	Approx. 517g	Approx. 425g	Approx. 484g

※F.S. is same with sensor measuring temperature range.  
Ex) In case of using temperature is from -99.9 to 199.9°C, Full scale is 299.8.  
※Environment resistance is rated at no freezing or condensation.

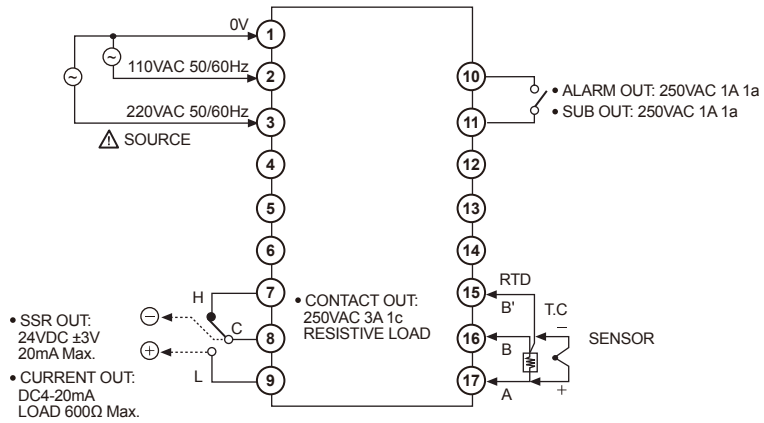
Photo electric sensor
Fiber optic sensor
Door/Area sensor
Proximity sensor
Pressure sensor
Rotary encoder
Connector/ Socket
Temp. controller
SSR/ Power controller
Counter
Timer
Panel meter
Tacho/ Speed/ Pulse meter
Display unit
Sensor controller
Switching mode power supply
Stepper motor& Driver&Controller
Graphic/ Logic panel
Field network device

# Selection Guide

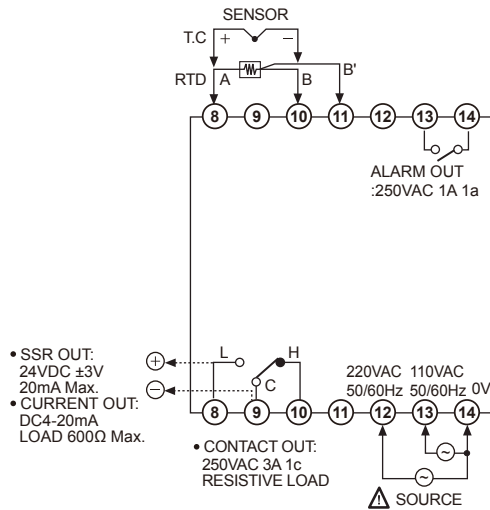
## ■ Connections

※RTD: DPT100Ω(3-wire type) ※Thermocouple: K, J, R

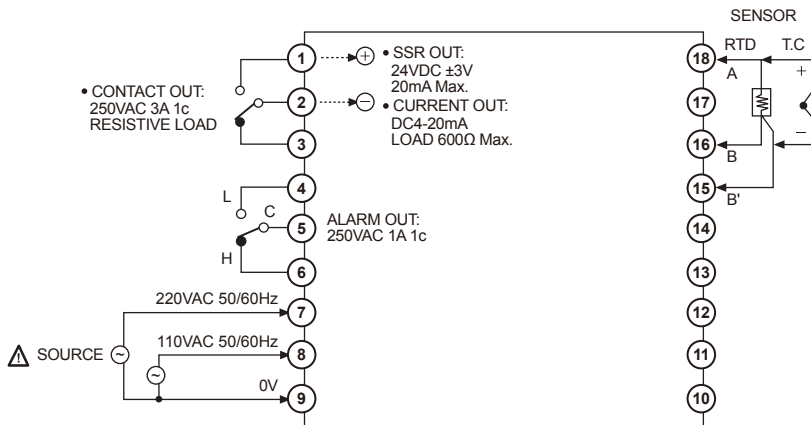
### ● T3HA, T3HS



### ● T4MA




### ● T4LA





## ■ Specifications

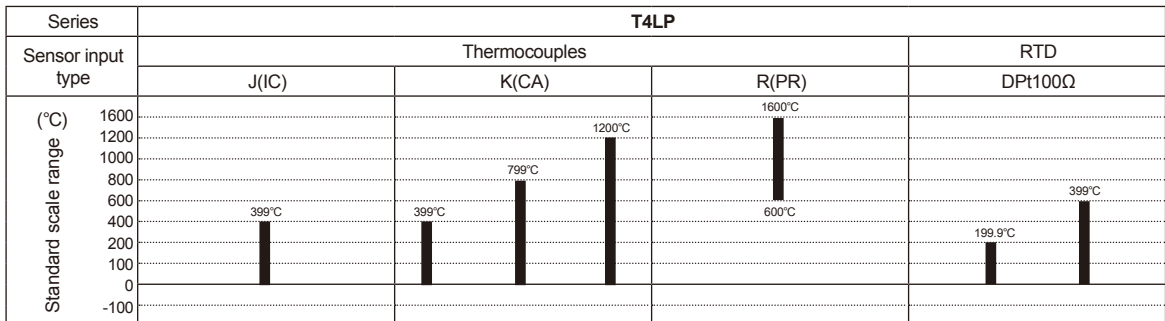
Series		T4LP
Appearances & Dimensions	※Dual setting type 	
	[W96×H96×L110mm]	
Power supply	110/220VAC 50/60Hz	
Allowable voltage range	90 to 110% of rated voltage	
Power consumption	Max. 3VA	
Display method	7 Segment(red) LED method	
Character size(W×H)	9.5×14.2mm	
Display accuracy	F.S. ±0.5% rdg ±1digit	
Setting type	Digital setting	
Setting accuracy	F.S. ±0.5%	
Sensor input	Thermocouples: K(CA), J(IC), R(PR) / RTD: DPT100Ω	
Input line resistance	Thermocouples: Max. 100Ω, RTD: Allowable line resistance max. 5Ω per a wire	
Control method	ON/OFF control	Hysteresis: F.S. 0.2 to 3% variable
	P control	Proportional band: F.S. 1 to 10%, Period: 20sec. fixed
RESET adjuster range	F.S. ±3% variable (revision of control deviation / only for P control)	
Control output	• Relay contact output: 1st out: 250VAC 3A 1c, 2nd out: 250VAC 2A 1c • SSR drive voltage output: 24VDC ±3V 20mA Max. • Current output: DC4-20mA (load 600Ω Max.)	
Self-diagnosis	Built-in burn out function (cut off output when sensor is disconnected)	
Insulation resistance	Min. 100MΩ(at 500VDC megger)	
Dielectric strength	2,000VAC 50/60Hz for 1 min.	
Noise resistance	±2kV the square wave noise(pulse width:1μs) by the noise simulator	
Vibration	Mechanical	0.75mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 1 hour
	Malfunction	0.5mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 10 min.
Shock	Mechanical	300m/s <sup>2</sup> (approx. 30G) in each of X, Y, Z directions for 3 times
	Malfunction	100m/s <sup>2</sup> (approx. 10G) in each of X, Y, Z directions for 3 times
Relay life cycle	Mechanical	Min. 10,000,000 operations
	Electrical	Min. 100,000 operations(250VAC 3A at resistive load)
Environment	Ambient temperature	-10 to 50°C, storage: -25 to 65°C
	Ambient humidity	35 to 85%RH, storage: 35 to 85%RH
Unit weight	Approx. 487g	

※F.S. is same with sensor measuring temperature range.

Ex) In case of using temperature is from 600 to 1600°C, Full scale is 1000.

※Environment resistance is rated at no freezing or condensation.

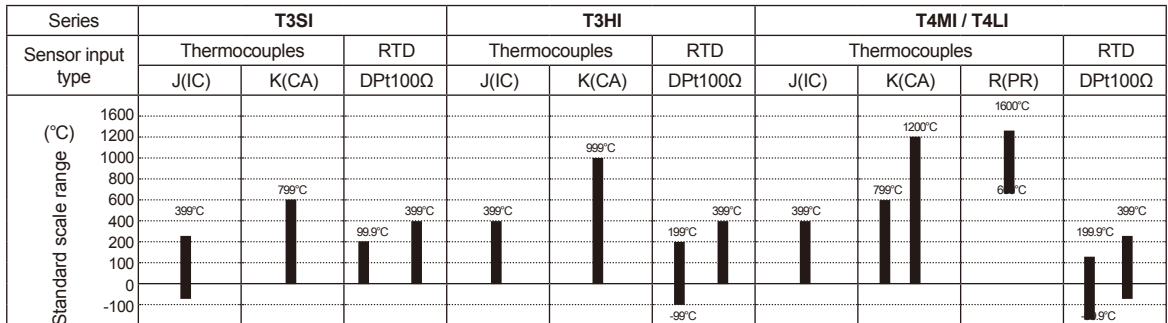
## ■ Temperature range for each sensor



※In case, the sensor is R(PR) type, it is not available to indicate the temperature and control correctly.










## Temperature range for each sensor



※In case input sensor is R(PR) type, it is not available to perform correct control under 600°C.

## Specifications

Series	T3NI	T4YI	T4WI	T3SI	T3HI	T4MI	T4LI
Appearances & Dimensions	 [W48×H24×L48mm]	 [W72×H36×L93mm]	 [W96×H48×L99.6mm]	 [W48×H48×L88mm]	 [W48×H96×L134mm]	 [W72×H72×L112mm]	 [W96×H96×L100mm]
Power supply	12-24VDC	100-240VAC 50/60Hz	110-220VAC 50/60Hz	100/240VAC 50/60Hz	110/220VAC 50/60Hz		
Allowable voltage range	90 to 110% of rated voltage						
Power consumption	Max. 2W	Max. 3VA					
Display method	7 Segment(red) LED method						
Character size(W×H)	5.0×8.0mm	9.8×14.2mm		4.0×8.0mm	6.0×10.0mm	7.2×9.8mm	9.5×14.2mm
Display accuracy	F.S. ±0.3% rdg ±1digit		F.S. ±0.5% rdg ±1digit				
Sensor input	DPt100Ω	Thermocouples(T.C): K(CA), J(IC), R(PR) / RTD: DPt100Ω ※There is no R(PR) in T4MI, T4LI Series.					
Input line resistance	Allowable line resistance max. 5Ω per a wire	Thermocouples: Max. 100Ω / RTD: Allowable line resistance max. 5Ω per a wire					
Insulation resistance	Min. 100MΩ(at 500VDC megger)						
Dielectric strength	2,000VAC 50/60Hz for 1 min.						
Noise resistance	±500V	±1kV the square wave noise(pulse width: 1μs) by the noise simulator					
Vibration	Mechanical	0.75mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 1 hour					
	Malfunction	0.5mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 10 min.					
Shock	Mechanical	300m/s <sup>2</sup> (approx. 30G) in each of X, Y, Z directions for 3 times					
	Malfunction	100m/s <sup>2</sup> (approx. 10G) in each of X, Y, Z directions for 3 times					
Environment	Ambient temperature	-10 to 50°C, storage: -25 to 65°C					
	Ambient humidity	35 to 85%RH, storage: 35 to 85%RH					
Unit weight	Approx. 34g	Approx. 170g	Approx. 322g	Approx. 107g	Approx. 368g	Approx. 356g	Approx. 433g

※F.S. is same with sensor measuring temperature range.

Ex) In case of using temperature is from -99.9 to 199.9°C, Full scale is 299.8.

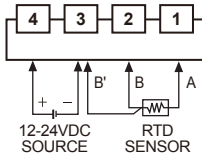
※Environment resistance is rated at no freezing or condensation.



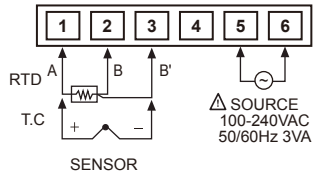
## ■ Connections

※RTD: DPT100Ω(3-wire type) ※Thermocouple: K, J, R

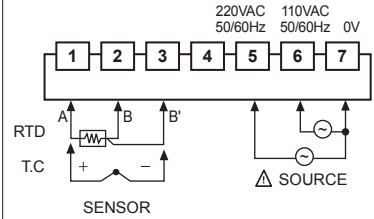
### ● T3NI



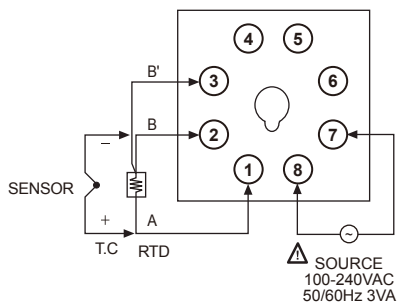
### ● T4YI



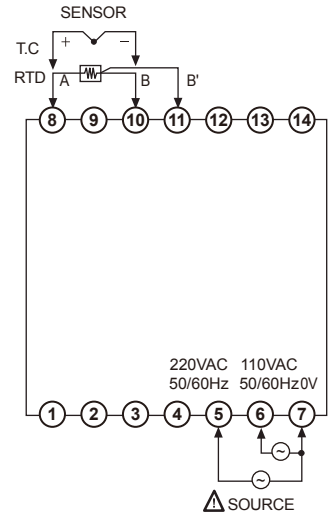
### ● T4WI



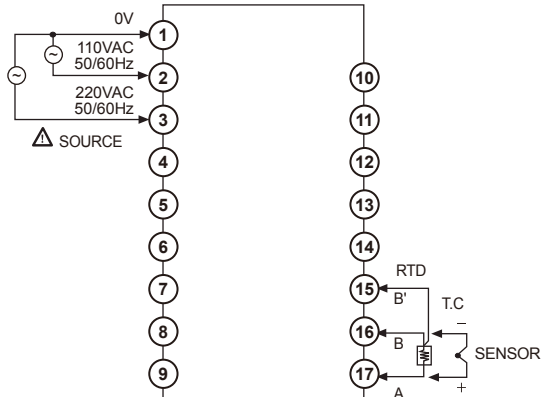
### ● T3SI



### ● T4MI



### ● T3HI



### ● T4LI

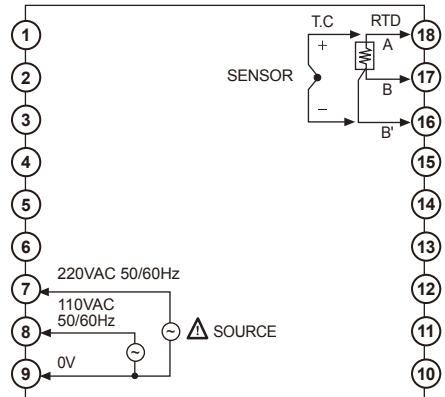


Photo electric sensor

Fiber optic sensor

Door/Area sensor

Proximity sensor

Pressure sensor

Rotary encoder

Connector/Socket

Temp. controller

SSR/ Power controller

Counter

Timer

Panel meter

Tacho/ Speed/ Pulse meter

Display unit

Sensor controller

Switching mode power supply





Stepper motor& Driver&Controller

Graphic/ Logic panel

Field network device



■ Specifications

Series	TOS	TOM	TOL
Appearances & Dimensions			
	[W48×H48×L79mm]	[W72×H72×L112mm]	[W96×H96×L100mm]
Power supply	100-240VAC 50/60Hz		110/220VAC 50/60Hz
Allowable voltage range	90 to 110% of rated voltage		
Power consumption	Max. 2.2VA		Max.3VA
Display method	LED ON		LED ON/OFF
Setting type	Dial setting		
Setting accuracy	F.S. ±2%		
Sensor input	Thermocouples: K(CA), J(IC) / RTD: DPt100Ω		
Input line resistance	Thermocouples: Max. 100Ω, RTD: Allowable line resistance max. 5Ω per a wire		
Control method	ON/OFF	Hysteresis: F.S. 0.5% ±0.2% fixed	
	Proportional	Proportional band: F.S. 3% fixed, Period: 20sec. fixed	
Control output	<ul style="list-style-type: none"> <li>Relay output: 250VAC 2A 1c</li> <li>SSR drive voltage output : 12VDC ±3V Load 20mA Max.</li> </ul>		<ul style="list-style-type: none"> <li>Relay output: 250VAC 3A 1c</li> <li>SSR drive voltage output: 12VDC ±3V 20mA Max.</li> </ul>
Self-diagnosis	Built-in burn out function (cut off output when sensor is disconnected)		
Insulation resistance	Min. 100MΩ (at 500VDC megger)		
Dielectric strength	2,000VAC 50/60Hz for 1 min.		
Noise resistance	±1kV the square wave noise(pulse width: 1μs) by the noise simulator		
Vibration	Mechanical	0.75mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 1 hour	
	Malfunction	0.5mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 10 min.	
Shock	Mechanical	300m/s <sup>2</sup> (approx. 30G) in each of X, Y, Z directions for 3 times	
	Malfunction	100m/s <sup>2</sup> (approx. 10G) in each of X, Y, Z directions for 3 times	
Relay life cycle	Mechanical	Min. 10,000,000 operations	
	Electrical	Min. 100,000 operations(250VAC 3A at resistive load )	
Environment	Ambient temperature	-10 to 50°C, storage: -25 to 65°C	
	Ambient humidity	35 to 85%RH, storage: 35 to 85%RH	
Approval		—	—
Unit weight	Approx. 104g	Approx. 419g	Approx. 426g

※F.S. is same with sensor measuring temperature range.  
 Ex) In case of using temperature is from 0 to 800°C, Full scale is "800".  
 ※Environment resistance is rated at no freezing or condensation.

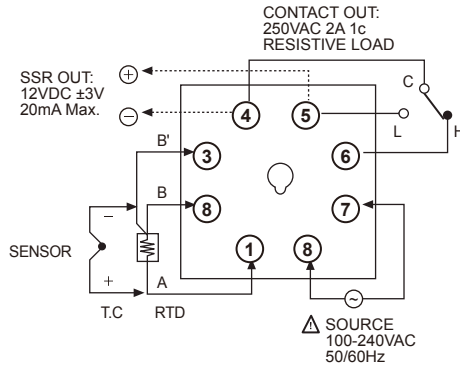
- Photo electric sensor
- Fiber optic sensor
- Door/Area sensor
- Proximity sensor
- Pressure sensor
- Rotary encoder
- Connector/ Socket
- Temp. controller
- SSR/ Power controller
- Counter
- Timer
- Panel meter
- Tacho/ Speed/ Pulse meter
- Display unit
- Sensor controller
- Switching mode power supply
- Stepper motor& Driver&Controller
- Graphic/ Logic panel
- Field network device

# Selection Guide

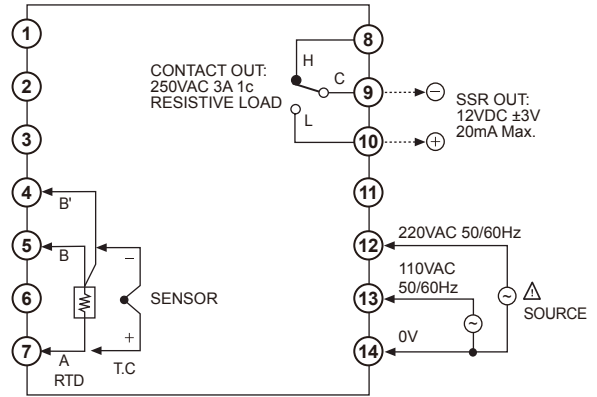
## ■ Connections

※RTD: DPt100Ω(3-wire type) ※Thermocouple: K, J

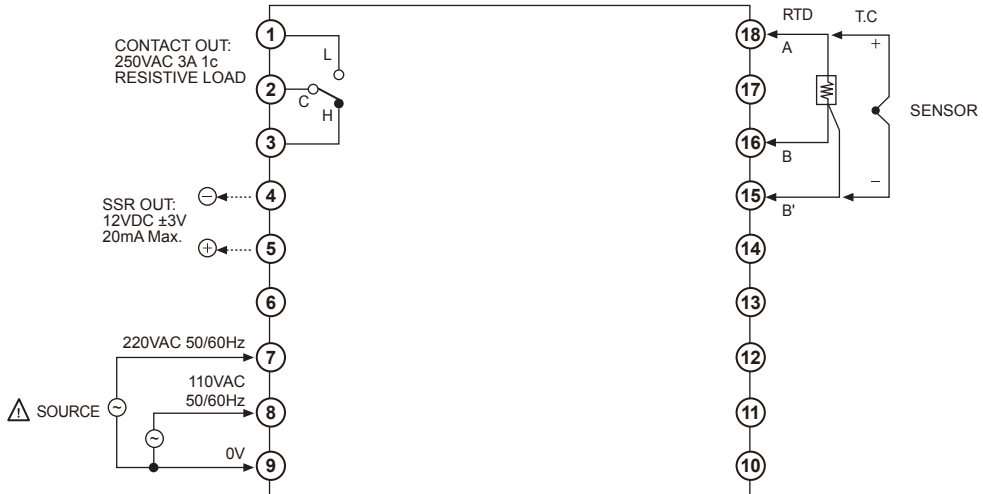
### ● TOS



### ● TOM



### ● TOL







## DIN W72×H36mm Freezing/Defrost type [TC3YF Series]

### ■ Ordering information

TC	3	Y	F	—	1	4	R	
Item	Digit	Size	Control mode	Control output type	Power supply	Control output		
							R	Relay output
							1	12-24VDC
							4	100-240VAC 50/60Hz
							1	Compressor output
							2	Compressor+Defrost output
							3	Compressor+Defrost+Evaporation output
							F	Freezing control
							Y	DIN W72×H36mm
							3	999(3digit)
							TC	Temperature Controller

## Specifications

Model	TC3YF-11R <sup>※1</sup>	TC3YF-14R <sup>※1</sup>	TC3YF-21R	TC3YF-24R	TC3YF-31R	TC3YF-34R
Appearances & Dimensions	 [W72×H36×L77mm]					
Power supply	12-24VDC	100-240VAC 50/60Hz	12-24VDC	100-240VAC 50/60Hz	12-24VDC	100-240VAC 50/60Hz
Allowable voltage range	90 to 110% of rated voltage					
Power consumption	Max. 8W	Max. 4VA	Max. 8W	Max. 4VA	Max. 8W	Max. 4VA
Display method	7 Segment(red) LED method					
Character size(W×H)	7.4×15.0mm					
Indication range	NTC: -40.0 to 99.9°C(40 to 212°F), RTD: -99.9 to 99.9°C(-148 to 212°F)					
Display accuracy	(PV ±0.5% or ±1°C, select the higher one) rdg ±1digit					
Sampling period	0.5sec.					
Input sensor <sup>※2</sup>	NTC: Thermistor, RTD: DPT 100Ω					
Input line resistance	Allowable line resistance is max. 5Ω per a wire					
Control method	ON/OFF control(adjustment sensitivity 0.5 to 5.0°C, 2 to 50°F variable)					
Control output	Compressor output (250VAC 5A 1a)		Compressor output (250VAC 5A 1a) Defrost output (250VAC 10A 1a)		Compressor output (250VAC 5A 1a) Defrost output (250VAC 10A 1a) Evaporation-fan output (250VAC 5A 1a)	
Memory protection	Approx. 10 years(when using non-volatile semiconductor memory)					
Insulation resistance	Min. 100MΩ(at 500VDC megger)					
Dielectric strength	2,000VAC 60Hz for 1 minute(between all external terminal and case)					
Noise resistance	±2kV R-phase, S-phase the square wave noise (pulse width: 1us) by the noise simulator					
Relay life cycle	COMP	Mechanical: Min. 20,000,000 times, Electrical: Min. 50,000 times(250VAC 5A resistive load)				
	DEF	Mechanical: Min. 20,000,000 times, Electrical: Min. 100,000 times(250VAC 10A resistive load)				
	FAN	Mechanical: Min. 20,000,000 times, Electrical: Min. 50,000 times(250VAC 5A resistive load)				
Vibration	Mechanical	0.75mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 2 hours				
	Malfunction	0.5mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 10 minutes				
Environment	Ambient temperature	-10 to 50°C, storage: -20 to 60°C				
	Ambient humidity	35 to 85%RH, storage: 35 to 85%RH				
Protection	Front part: IP65					
Approval	—		—		—	
Unit weight	Approx. 143g					

※1. There is no defrost function      ※2. RTD(DPt100Q) type is customizable.  
 ※ Environment resistance is rated at no freezing or condensation.

## Connections

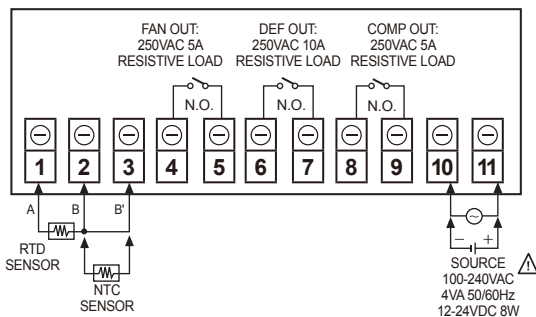
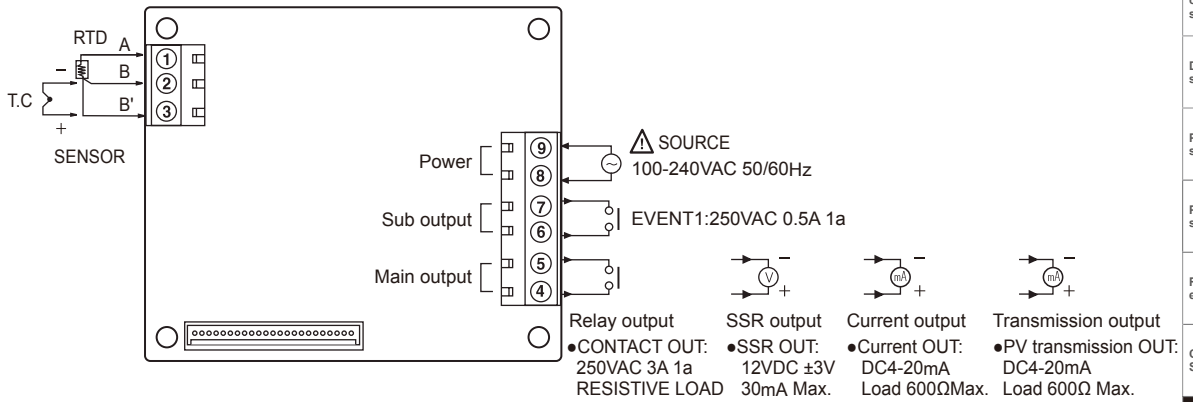


Photo electric sensor
Fiber optic sensor
Door/Area sensor
Proximity sensor
Pressure sensor
Rotary encoder
Connector/Socket
Temp. controller
SSR/Power controller
Counter
Timer
Panel meter
Tacho/Speed/ Pulse meter
Display unit
Sensor controller
Switching mode power supply
Stepper motor & Driver&Controller
Graphic/ Logic panel
Field network device



## ■ Connections

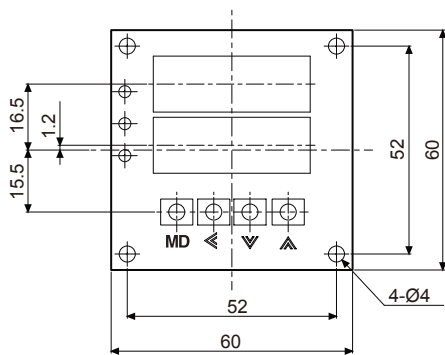
※RTD: DPT100Ω(3-wire type) ※Thermocouple: K, J



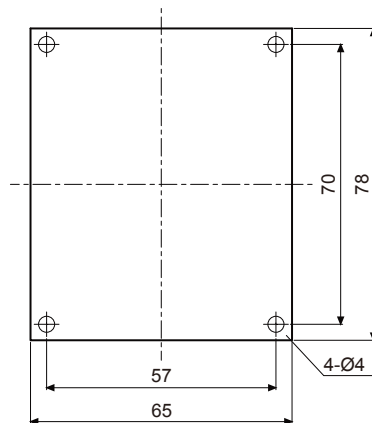
## ■ Dimensions

(unit: mm)

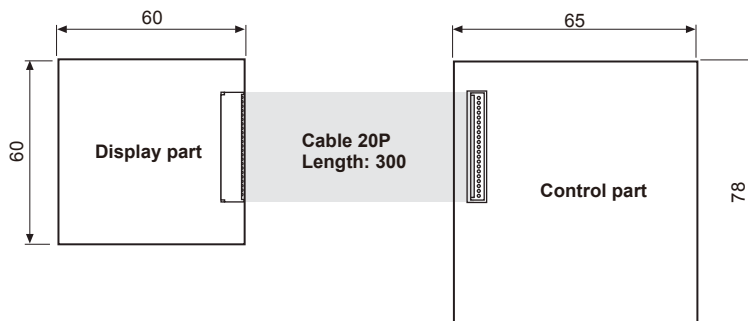
### ● Display part



### ● Control part



### ● Layout



※Cable length is 300mm.

※The size of board is based on user's application. (customizable)

Photo electric sensor
Fiber optic sensor
Door/Area sensor
Proximity sensor
Pressure sensor
Rotary encoder
Connector/Socket
Temp. controller
SSR/Power controller
Counter
Timer
Panel meter
Tacho/Speed/Pulse meter
Display unit
Sensor controller
Switching mode power supply
Stepper motor & Driver&Controller
Graphic/Logic panel
Field network device


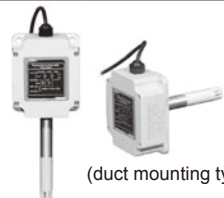

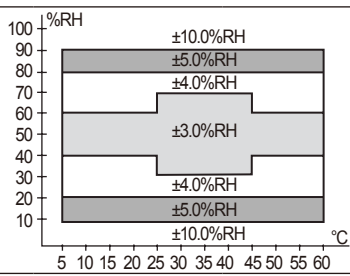
## Indoor, Duct & Wall mounting type Temperature/Humidity transducer [THD Series]

### Ordering information

<b>THD</b>	<b>D</b>	<b>D</b>	<b>1</b>	<b>C</b>	
Item	Mounting	Display	Length of sensor pole	Output	
				※ PT	DPT100Ω resistance value(Temp.)
				※ PT/C	DPT100Ω resistance value(Temp.) / DC4-20mA current output (Humidity)
				C	DC4-20mA current output (Temp./Humidity)
				V	1-5VDC voltage output (Temp./Humidity)
				T	RS485 communication output Modbus RTU (Temp./Humidity)
			※ No mark	Built-in	
			1	100mm	
			2	200mm	
			No mark	Non-Display type	
			D	Display type	
			R	Room type(For indoor)	
			D	Duct mounting type	
			W	Wall mounting type	
			THD	Temperature Humidity Double	

※It is only for THD-R.

### Specifications

Model	THD-R-PT	THD-R-PT/C	THD-R-C THD-R-V THD-R-T	THD-D□-□ THD-W□-□	THD-DD□-□ THD-WD□-□
Appearances	 (room type)	 (wall mounting type)	 (wall mounting type)		
Display type	—	Non-indicating type			7Segment LED display
Display digit	—	—			Each 3digits for temp./humidity
Character size	—	—			W6.2×H10.0mm
Power supply	—	24VDC			
Allowable voltage range	90 to 110% of rated voltage				
Power consumption	—	Max. 2.4W			
Measuring input	Temperature (Built-in sensor)	Temperature, Humidity(Built-in sensor)			
Output <sup>※1</sup>	Temp.	DPT100Ω resistance value		DC4-20mA, 1-5VDC, RS485 communication output(Modbus RTU)	
	Humidity	—	DC4-20mA		
Measurement range	Temp.	-19.9 to 60.0°C			
	Humidity	—	0.0 to 99.9%RH(THD-R is required to attend for using over 90%RH.)		
Accuracy	Temp.	Max. ±0.8°C			
	Humidity	—	Max. ±3%RH at 30 to 70%RH (at 25 to 45°C)		
					
Sampling cycle	—	Fixed in 0.5 sec.			

※1. The allowable impedance of current output is max. 600Ω



## Specifications

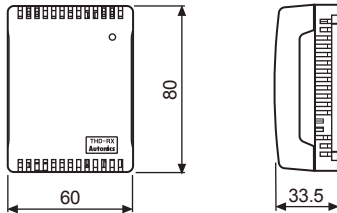
Model	THD-R-PT	THD-R-PT/C	THD-R-C THD-R-V THD-R-T	THD-D□-□ THD-W□-□	THD-DD□-□ THD-WD□-□
Insulation resistance	—		Min. 100MΩ(at 500VDC megger)		
Dielectric strength	—		500VAC 50/60Hz for 1 minute		
Noise resistance	—		±0.3kV the square wave noise(pulse width:1μs) by the noise simulator		
Vibration	Mechanical	—	0.75mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 1hour		
	Malfunction	—	0.5mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 10min.		
Shock	Mechanical	—	300m/s <sup>2</sup> (approx. 30G) in each of X, Y, Z directions for 3 times		
	Malfunction	—	100m/s <sup>2</sup> (approx. 10G) in each of X, Y, Z directions for 3 times		
Protection	IP10			IP65(except sensing part)	
Ambient temperature	-20 to 60°C, storage: -20 to 60°C				
Cable	Terminal type			4-wire, ø4mm, Length: 2m	
Approval	CE				
Unit weight	Approx. 55g			Approx. 160g	

※ Environment resistance is rated at no freezing or condensation.

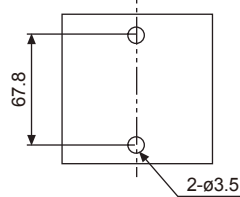
## Dimensions

(unit: mm)

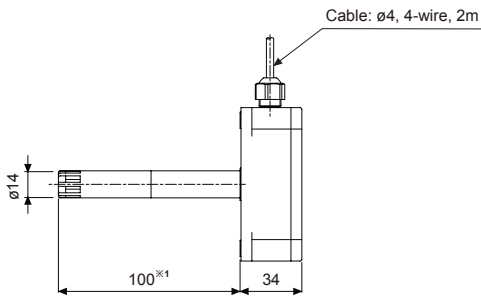
### ● THD-R□ / THD-R-PT / THD-R-PT/C



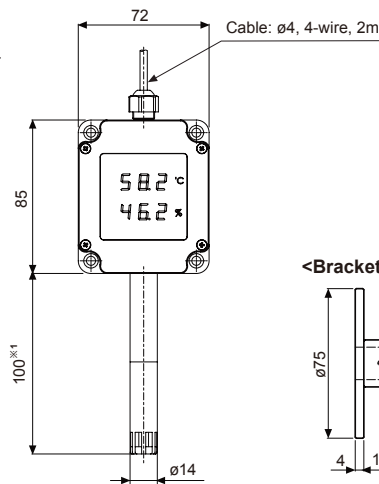
### ● Panel cut-out



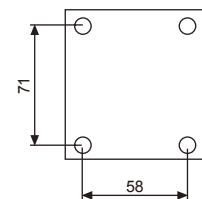
### ● THD-D□-□ / THD-DD□-□



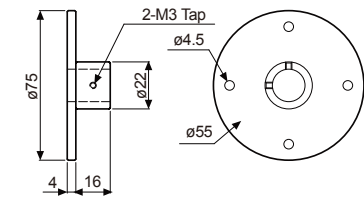
### ● THD-W□-□ / THD-WD□-□



### ● Panel cut-out



### <Bracket>



※1: Refer to the ordering information to select the one with 2 sensing poles (100m, 200m).

※Refer to the ordering information about display model, THD-DD□-□, THD-WD□-□.

## Connections

### ◎ THD-R

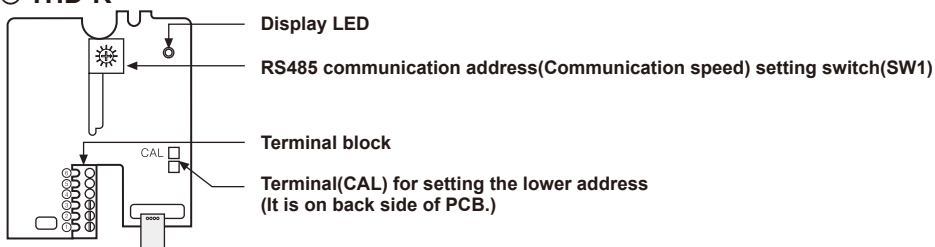


Photo electric sensor
Fiber optic sensor
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Pressure sensor
Rotary encoder
Connector/Socket
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Panel meter
Tacho/ Speed/ Pulse meter
Display unit
Sensor controller
Switching mode power supply
Stepper motor & Driver&Controller
Graphic/ Logic panel
Field network device

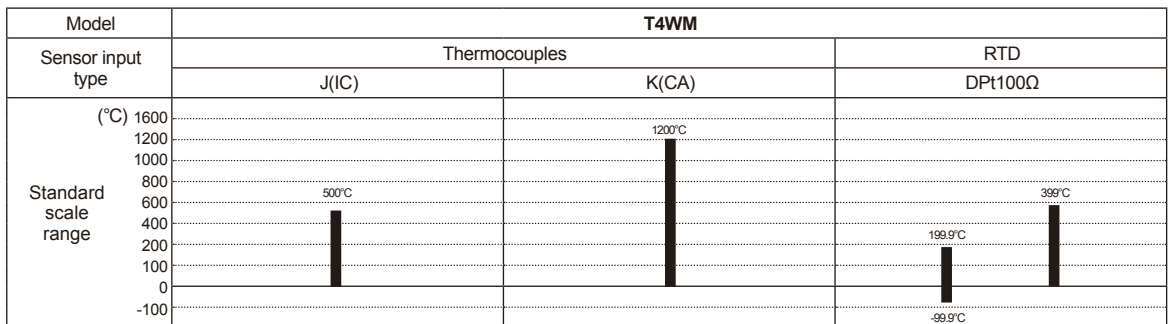
## Automatic switching function of 5 point temperature indication [T4WM Series]

### Ordering information


<b>T</b>	<b>4</b>	<b>W</b>	<b>M</b>	-	<b>N</b>	<b>3</b>	<b>N</b>	<b>P</b>	<b>4</b>	<b>C</b>
Item	Digit	Size	Input		Control method	Power supply	Control output	Sensor input type	Temperature range	Unit
										C °C
									0	-99.9 to 199.9
									4	0 to 399
									5	0 to 500
									C	0 to 1200
								P		DPt100Ω
								J		J(IC)
								K		K(CA)
								N		No output
								3		110/220VAC 50/60Hz
								N		No control
								M		5 Point Indicator
								W		DIN W96×H48mm
								4		9999(4digit)
								T		Temperature Controller

※Please check the range of temperature when select model.

### Temperature range for each sensor



## Specifications

Series	T4WM	
Appearances & Dimensions		
	[W96×H48×L99.6mm]	
Power supply	110/220VAC 50/60Hz	
Allowable voltage range	90 to 110% of rated voltage	
Power consumption	Max. 3VA	
Display method	7 Segment(red) LED method	
Character size(W×H)	9.8×14.2mm	
Display accuracy	F.S. ±0.5% rdg ±1digit	
Input sensor	Thermocouples : K(CA), J(IC) / RTD: DPT100Ω	
Input line resistance	Thermocouples: Max. 100Ω / RTD: Allowable line resistance max. 5Ω per a wire	
Connectable sensors	5EA(thermocouple, RTD are not used as mixed)	
Channel switch	Selectable Auto/Manual switching	
Auto switching time	Variable 1 to 10 sec.(by built-in VR)	
Insulation resistance	Min. 100MΩ(at 500VDC megger)	
Dielectric strength	2,000VAC 50/60Hz for 1 min.	
Noise strength	±1kV the square wave noise(pulse width: 1μs) by the noise simulator	
Vibration	Mechanical	0.75mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 1 hour
	Malfunction	0.5mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 10 min.
Shock	Mechanical	300m/s <sup>2</sup> (approx. 30G) in each of X, Y, Z directions for 3 times
	Malfunction	100m/s <sup>2</sup> (approx. 10G) in each of X, Y, Z directions for 3 times
Environment	Ambient temperature	-10 to 50°C, storage:-25 to 65°C
	Ambient humidity	35 to 85%RH, storage: 35 to 85%RH
Unit weight	Approx. 322g	

※Environment resistance is rated at no freezing or condensation.

## Connections

※RTD: DPT100Ω(3-wire type)    ※Thermocouple: K, J

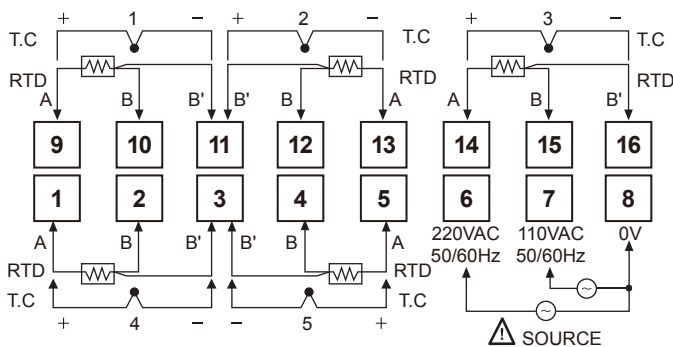


Photo electric sensor

Fiber optic sensor

Door/Area sensor

Proximity sensor

Pressure sensor

Rotary encoder

Connector/Socket

Temp. controller

SSR/ Power controller

Counter

Timer

Panel meter

Tacho/ Speed/ Pulse meter

Display unit

Sensor controller

Switching mode power supply


Stepper motor & Driver&Controller

Graphic/ Logic panel

Field network device

## Single phase, Heatsink separated type SSR [SR1 Series]

### Ordering information

<div style="display: flex; align-items: center;"> <div style="margin-right: 20px;"> <p><b>NEW</b></p> <p>CE c  US</p> </div> <div style="text-align: center;">  </div> </div>				
Appearances				
Model	Input voltage	Rated load current	Load voltage	Zero cross/Random turn-on
SR1-1215	4-30VDC	15A	24-240VAC	Zero cross turn-on
SR1-4215	90-240VAC			
SR1-1225	4-30VDC	25A		
SR1-4225	90-240VAC			
SR1-1240	4-30VDC	40A		
SR1-4240	90-240VAC			
SR1-1250	4-30VDC	50A		
SR1-4250	90-240VAC			
SR1-1275	4-30VDC	75A		
SR1-4275	90-240VAC			
SR1-1415	4-30VDC	15A	48-480VAC	Zero cross turn-on
SR1-1415R	4-30VDC			Random turn-on
SR1-4415	90-240VAC	Zero cross turn-on		
SR1-1425	4-30VDC	25A		Zero cross turn-on
SR1-1425R	4-30VDC			Random turn-on
SR1-4425	90-240VAC	Zero cross turn-on		
SR1-1440	4-30VDC	40A		Zero cross turn-on
SR1-1440R	4-30VDC			Random turn-on
SR1-4440	90-240VAC	Zero cross turn-on		
SR1-1450	4-30VDC	50A	Zero cross turn-on	
SR1-1450R	4-30VDC		Random turn-on	
SR1-4450	90-240VAC	Zero cross turn-on		
SR1-1475	4-30VDC	75A	Zero cross turn-on	
SR1-1475R	4-30VDC		Random turn-on	
SR1-4475	90-240VAC	Zero cross turn-on		

### Specifications

#### Input

	4-30VDC input voltage	90-240VAC input voltage
Input voltage range	4-32VDC	85-264VACrms(50/60Hz)
Max. input current	9mA(Zero cross turn-on), 13mA(Random turn-on)	7mArms(240VACrms)
Pick-up voltage	4VDC	85VACrms
Drop-out voltage	1VDC	10VACrms
Turn-on time	Zero cross turn-on	Max. 1.5 cycle of load source + 1ms
	Random turn-on	
Turn-off time	Max. 0.5 cycle of load source + 1ms	Max. 1.5 cycle of load source + 1ms

## ■ Specifications

### ○ Output

		24-240VAC load voltage					48-480VAC load voltage				
Load voltage range(50/60Hz)		24-264VACrms(50/60Hz)					48-528VACrms(50/60Hz)				
Rated load current Ta=25°C	Resistive load (AC-51)	15Arms	25Arms	40Arms	50Arms	75Arms	15Arms	25Arms	40Arms	50Arms	75Arms
	Motor load (AC-53a)	—					5Arms	8Arms		15Arms	
Min. load current		0.15Arms	0.2Arms		0.5Arms		0.5Arms				
Max. 1cycle surge current (60Hz)		190A	270A	330A	1000A		300A	500A		1000A	
Max. non-repetitive surgecurrent(I <sup>2</sup> t, t=8.3ms)		150A <sup>2</sup> S	300A <sup>2</sup> S	500A <sup>2</sup> S	4000A <sup>2</sup> S		350A <sup>2</sup> S	1000A <sup>2</sup> S		4000A <sup>2</sup> S	
Peak voltage(non-repetitive)		600V					1200V(zero cross turn-on), 1000V(random turn-on)				
Leakage current(Ta=25°C)		Max. 10mArms									
Output on voltage drop[Vpk] (Max. load current)		Max. 1.6V									
Static off-state dv/dt		500V/μs									

※For controlling motor load, use the product which load voltage range is within 48-480VACrms.

### ○ General Specifications

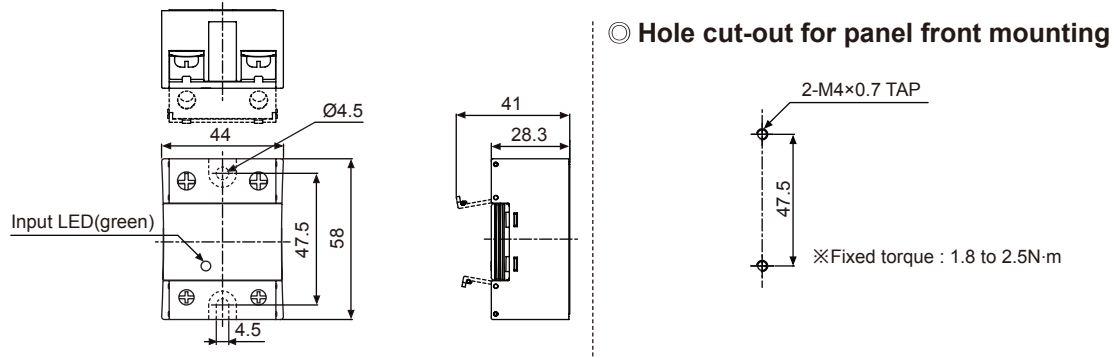
Certification	UL508, CSA22.2 No.14 and IEC/EN 60947-4-3	
Dielectric strength(Vrms)	4000VAC 50/60Hz 1min.(input-output, input/output-case)	
Insulation resistance	Min. 100MΩ(at 500VDC megger)	
Input LED	Green	
Environ-ment	Ambient temperature	-30 to 80°C, storage: -30 to 100°C (Rated load current capacity is different based on the surrounding temperature. )
	Ambient humidity	45 to 85%RH, storage: 45 to 85%RH
Input terminal connection	Min. 1×0.5mm <sup>2</sup> (1×AWG20) Max. 1×1.5mm <sup>2</sup> (1×AWG16) or 2×1.5mm <sup>2</sup> (2×AWG16)	
Output terminal connection	Min. 1×1.5mm <sup>2</sup> (1×AWG16) Max. 1×16mm <sup>2</sup> (1×AWG6) or 2×6mm <sup>2</sup> (2×AWG10)	
Input terminal fixed torque	0.75 to 0.95N·m	
Output terminal fixed torque	1.6 to 2.2N·m	
Unit weight	Approx. 73g	

※For wiring the terminal, an O-ring terminal must be used.

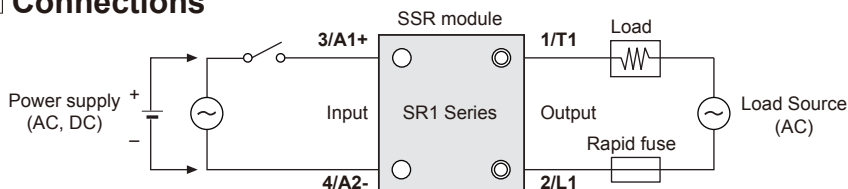
※Environment resistance is rated at no freezing or condensation.

## ■ Dimensions

(unit: mm)




## ■ Connections



- Photo electric sensor
- Fiber optic sensor
- Door/Area sensor
- Proximity sensor
- Pressure sensor
- Rotary encoder
- Connector/Socket
- Temp. controller
- SSR/Power controller
- Counter
- Timer
- Panel meter
- Tacho/Speed/Pulse meter
- Display unit
- Sensor controller
- Switching mode power supply
- Stepper motor & Driver&Controller
- Graphic/Logic panel
- Field network device

## Single phase, Slim heatsink separated type SSR [SRC1 Series]

### Ordering information

<div style="display: flex; align-items: center;"> <div style="margin-right: 20px;"> <p><b>NEW</b></p> <p>CE cRU<sub>us</sub></p> </div> <div style="text-align: center;">  </div> </div>				
Appearances				
Model	Input voltage	Rated load current	Load voltage	Zero cross turn-on/Random turn-on
SRC1-1215	4-30VDC	15A	24-240VAC	Zero cross turn-on
SRC1-4215	90-240VAC			
SRC1-1220	4-30VDC	20A		
SRC1-4220	90-240VAC			
SRC1-1230	4-30VDC	30A		
SRC1-4230	90-240VAC			
SRC1-1420	4-30VDC	20A	48-480VAC	Random turn-on
SRC1-4420	90-240VAC			
SRC1-1420R	4-30VDC			

### Specifications

#### Input

	4-30VDC input voltage	90-240VAC input voltage
Input voltage range	4-32VDC	85-264VACrms(50/60Hz)
Max. input current	9mA(Zero cross turn-on), 13mA(Random turn-on)	7mArms(240VACrms)
Pick-up voltage	4VDC	85VACrms
Drop-out voltage	1VDC	10VACrms
Turn-on time	Zero cross turn-on	Max. 1.5 cycle of load source + 1ms
	Random turn-on	—
Turn-off time	Max. 0.5 cycle of load source + 1ms	Max. 1.5 cycle of load source + 1ms

#### Output

	24-240VAC load voltage			48-480VAC load voltage
Load voltage range(50/60Hz)	24-264VACrms			48-528VACrms
Rated load current Ta=25°C	Resistive load (AC-51)	15Arms	20Arms	30Arms
	Motor load (AC-53a)	—		
Min. load current	0.15Arms	0.2Arms	0.2Arms	0.5Arms
Max. 1cycle surge current (60Hz)	190A	270A	330A	300A
Max. non-repetitive surge current(I <sup>2</sup> t, t=8.3ms)	150A <sup>2</sup> S	300A <sup>2</sup> S	500A <sup>2</sup> S	350A <sup>2</sup> S
Peak voltage(Non-repetitive)	600V			1200V(zero cross turn-on),1000V(random turn-on)
Leakage current (240VAC/60Hz, Ta=25°C)	Max. 10mArms			
Output on voltage drop[Vpk] (Max. load current)	Max. 1.6V			
Static off-state dv/dt	500V/μs			

■ Specifications

○ General Specifications

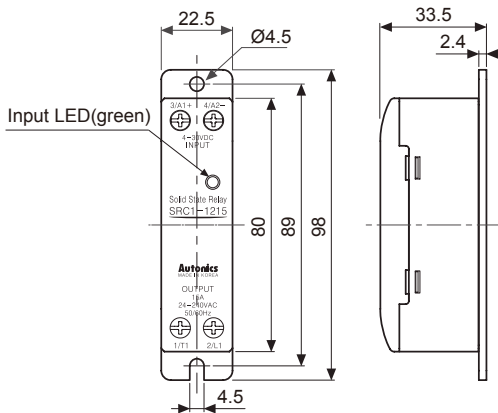
Certification	UL508, CSA22.2 No.14, IEC/EN 60947-4-3	
Dielectric strength(Vrms)	4000VAC 50/60Hz 1min.(Input-Output, Input/Output-Case)	
Insulation resistance	Min. 100MΩ(at 500VDC Megger)	
Vibration	10 to 55Hz double amplitude 0.75mm in each of X, Y, Z directions for 1 hour	
Input LED	Green	
Environ-ment	Ambient temperature	-30 to 80°C, storage: -30 to 100°C (Rated load current capacity is different based on the surrounding temperature. )
	Ambient humidity	45 to 85%RH
Input terminal connection	Min. 1×0.5mm <sup>2</sup> (1×AWG20), Max. 1×1.5mm <sup>2</sup> (1×AWG16) or 2×1.5mm <sup>2</sup> (2×AWG16)	
Output terminal connection	Min. 1×0.75mm <sup>2</sup> (1×AWG18), Max. 1×4mm <sup>2</sup> (1×AWG12) or 2×2.5mm <sup>2</sup> (2×AWG14)	
Input terminal fixed torque	0.75 to 0.95N·m	
Output terminal fixed torque	1 to 1.35N·m	
Unit weight	Approx. 85g	

※For wiring the terminal, an O-ring terminal must be used.  
 ※Environment resistance is rated at no freezing or condensation.

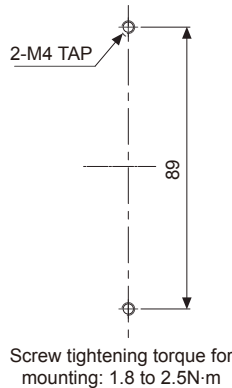
■ Dimensions & Mounting

(unit: mm)

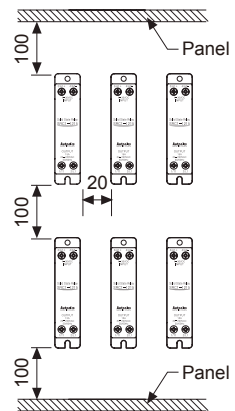
○ Dimensions



○ Hole cut-out for panel front mounting



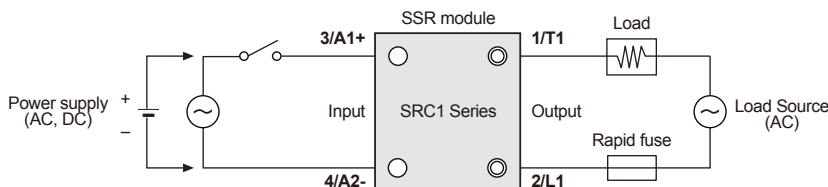
○ Installation interval



**High temperature caution**  
 Make sure do not touch the heat sink or the unit body while power is supplied or right after load power is turned off. If not, it may cause a burn.

※For mounting multiple SSR, please keep certain installation intervals for heat prevention.  
 For horizontal installation(when the heights of input part and output part are equal), it is recommended to apply 50% of rated load current.

■ Connections



- Photo electric sensor
- Fiber optic sensor
- Door/Area sensor
- Proximity sensor
- Pressure sensor
- Rotary encoder
- Connector/Socket
- Temp. controller
- SSR/Power controller
- Counter
- Timer
- Panel meter
- Tacho/Speed/ Pulse meter
- Display unit
- Sensor controller
- Switching mode power supply
- Stepper motor & Driver/Controller
- Graphic/ Logic panel
- Field network device

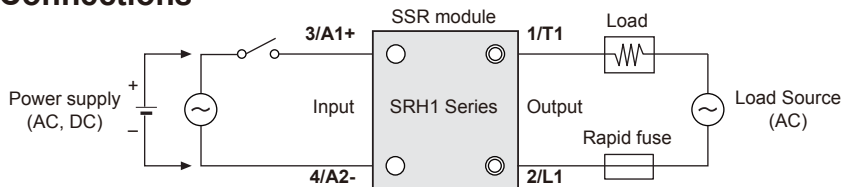
## Single phase, Intergrated heatsink type SSR [SRH1 Series]

### Ordering information



Model	Input voltage	Rated load current	Load voltage	Zero cross turn-on/Random turn-on
SRH1-1215	4-30VDC	15A	24-240VAC	Zero cross turn-on
SRH1-2215	24VAC			
SRH1-4215	90-240VAC			
SRH1-1220	4-30VDC	20A		
SRH1-2220	24VAC			
SRH1-4220	90-240VAC			
SRH1-1230	4-30VDC	30A		
SRH1-2230	24VAC			
SRH1-4230	90-240VAC			
SRH1-1240	4-30VDC	40A		
SRH1-2240	24VAC			
SRH1-4240	90-240VAC			
SRH1-1260	4-30VDC	60A		
SRH1-2260	24VAC			
SRH1-4260	90-240VAC			
SRH1-1420	4-30VDC	20A	48-480VAC	Zero cross turn-on
SRH1-1420R	4-30VDC			Random turn-on
SRH1-2420	24VAC			Zero cross turn-on
SRH1-1430	4-30VDC	30A		Zero cross turn-on
SRH1-1430R	4-30VDC			Random turn-on
SRH1-2430	24VAC			Zero cross turn-on
SRH1-1460	4-30VDC	60A		Zero cross turn-on
SRH1-1460R	4-30VDC			Random turn-on
SRH1-2460	24VAC			Zero cross turn-on

### Connections





■ Specifications

⊙ Input

4-30VDC input voltage	
Input voltage range	4-32VDC
Max. input current	9mA(Zero cross turn-on), 12mA(Random turn-on)
Pick-up voltage	4VDC
Drop-out voltage	1VDC
Turn-on time	Zero cross turn-on Max. 0.5 cycle of load source + 1ms Random turn-on Max. 1ms
Turn-off time	Max. 0.5 cycle of load source + 1ms
24VAC input voltage	
Input voltage range (50/60Hz)	19-30VACrms
Max. input current	12mArms(24VACrms)
Pick-up voltage	19VACrms
Drop-out voltage	4VACrms
Turn-on time	Max. 1.5 cycle of load source + 1ms
Turn-off time	Max. 1.5 cycle of load source + 1ms
90-240VAC input voltage	
Input voltage range (50/60Hz)	85-264VACrms
Max. input current	7mArms(240VACrms)
Pick-up voltage	85VACrms
Drop-out voltage	10VACrms
Turn-on time	Max. 1.5 cycle of load source + 1ms
Turn-off time	Max. 1.5 cycle of load source + 1ms

⊙ Output

24-240VAC load voltage						
Load voltage range (50/60Hz)		24-264VACrms				
Rated load current Ta=25°C	Resistive load (AC-51)	15Arms	20Arms	30Arms	40Arms	60Arms
Min. load current		0.15Arms	0.2Arms	0.2Arms	0.5Arms	0.5Arms
Max. 1 cycle surge current(60Hz)		190A	270A	330A	500A	1000A
Max. non-repetitivesurge current(I <sup>2</sup> t, t=8.3ms)		150A <sup>2</sup> S	300A <sup>2</sup> S	500A <sup>2</sup> S	1000A <sup>2</sup> S	4000A <sup>2</sup> S
Peak voltage(Non-repetitive)		600V				
Leakage current (240VAC/60Hz, Ta=25°C)		Max. 10mArms				
Output ON voltage drop[Vpk] (Max. load current)		Max. 1.6V				
Static off state dv/dt		500V/μs				
48-480VAC load voltage						
Load voltage range (50/60Hz)		48-528VACrms				
Rated load current Ta=25°C	Resistive load (AC-51)	20Arms		30Arms		60Arms
	Motor load (AC-53a)	5Arms		8Arms		15Arms
Min. load current		0.5Arms		0.5Arms		0.5Arms
Max. 1 cycle surge current(60Hz)		300A		500A		1000A
Max. non-repetitive surge current(I <sup>2</sup> t, t=8.3ms)		350A <sup>2</sup> S		1000A <sup>2</sup> S		4000A <sup>2</sup> S
Peak voltage(Non-repetitive)		1200V(Zero cross turn-on), 1000V(Random turn-on)				
Leakage current (480VAC/60Hz, Ta=25°C)		Max. 10mArms				
Output ON voltage drop[Vpk] (Max. load current)		Max. 1.6V				
Static off state dv/dt		500V/μs				

- Photo electric sensor
- Fiber optic sensor
- Door/Area sensor
- Proximity sensor
- Pressure sensor
- Rotary encoder
- Connector/Socket
- Temp. controller
- SSR/ Power controller
- Counter
- Timer
- Panel meter
- Tacho/ Speed/ Pulse meter
- Display unit
- Sensor controller
- Switching mode power supply
- Stepper motor & Driver&Controller
- Graphic/ Logic panel
- Field network device

## Specifications

### General Specifications

Certification	UL508, CSA22.2 NO. 14 and IEC/EN 60947-4-3	
Dielectric strength(Vrms)	400VAC 50/60Hz for 1 min.(Input-Output, I/O-Case)	
Insulation resistance	Min. 100MΩ(500VDC megger)	
Vibration	10 to 55Hz double amplitude 0.75mm in each X, Y, Z direction for 1 hour	
Input LED	Green	
Environment	Ambient temperature	-30 to 80°C, storage: -30 to 100°C (Rated load current capacity is different based on the surrounding temperature.)
	Ambient humidity	45 to 85%RH, storage: 45 to 85%RH
Input terminal connection	Min. 1×0.5mm <sup>2</sup> (1XAWG 20) Max. 1×1.5mm <sup>2</sup> (1XAWG 16) or 2×1.5mm <sup>2</sup> (2XAWG 16)	
Output terminal connection	<ul style="list-style-type: none"> <li>Case width 22.5mm(M4 terminal bolt): Min. 1×0.75mm<sup>2</sup>(1×AWG18) Max. 1×4mm<sup>2</sup>(1×AWG12) or 2×2.5mm<sup>2</sup>(2×AWG14)</li> <li>Case width 45mm(M5 terminal bolt): Min. 1×1.5mm<sup>2</sup>(1×AWG16) Max. 1×16mm<sup>2</sup>(1×AWG6) or 2×6mm<sup>2</sup>(2×AWG10)</li> </ul> ※Use wires compliant with load current capacity to connect to the terminal.	
Input terminal fixed torque	0.75 to 0.95N·m	
Output terminal fixed torque	<ul style="list-style-type: none"> <li>Case width 22.5mm(M4 terminal bolt): 15A/20A: 1 to 1.35N·m</li> <li>Case width 45mm(M5 terminal bolt): 30A/40A/60A: 1.6 to 2.2N·m</li> </ul>	
Unit weight	<ul style="list-style-type: none"> <li>Rated load current(Resistive load) 15A/20A : Approx. 225g</li> <li>Rated load current(Resistive load) 30A/40A : Approx. 410g</li> <li>Rated load current(Resistive load) 60A : Approx. 680g</li> </ul>	

※For wiring the terminal, an O-ring terminal must be used.

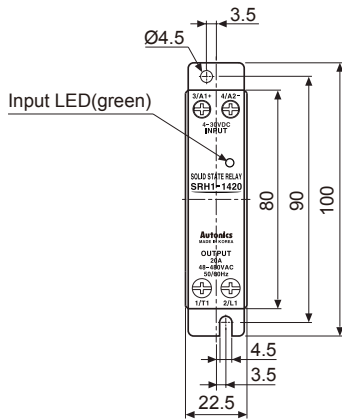
※Environment resistance is rated at no freezing or condensation.

## Dimensions & Mounting

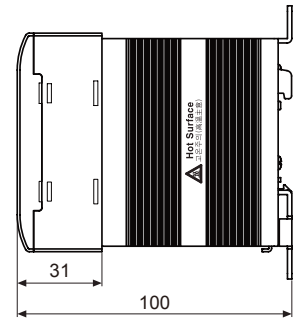
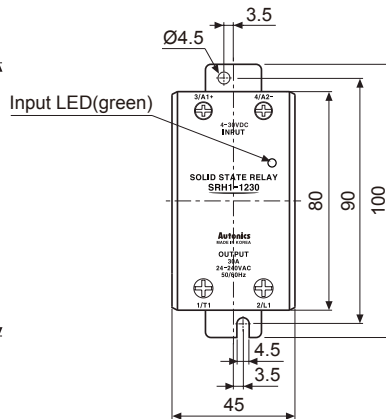
### Dimensions

(unit: mm)

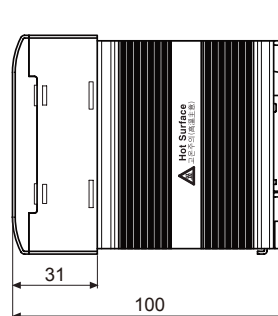
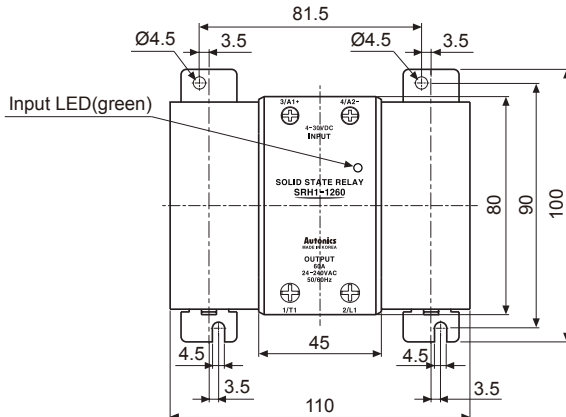
#### 15A/20A rated load current



#### 30A/40A rated load current

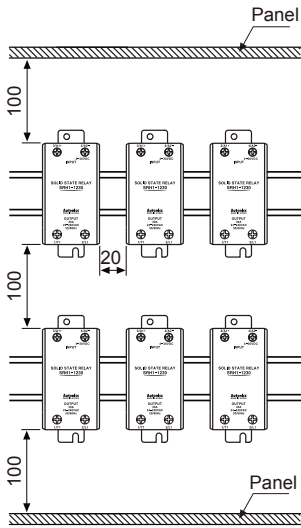


#### 60A rated load current



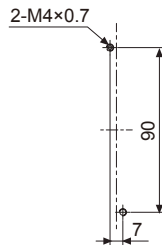
(unit: mm)

### ○ Installation interval

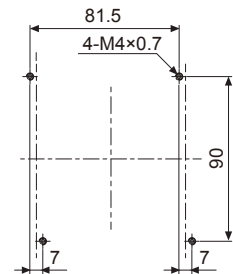


### ○ Hole cut-out for panel front mounting

● 15A/20A/30A/40A rated load current



● 60A rated load current



※Tightening torque for mounting: 1.8 to 2.5N·m

**⚠ High temperature caution**  
Make sure do not touch the heat sink or the unit body while power is supplied or right after load power is turned off. If not, it may cause a burn.

※For mounting multiple SSR, please keep certain installation intervals for heat prevention.  
For horizontal installation (when the heights of input part and output part are equal), it is recommended to apply 50% of rated load current.

## Single phase, Analog input type SSR [SRPH1 Series]

### ■ Ordering information

**NEW**

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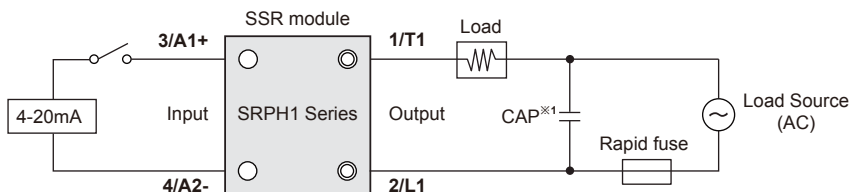
● 20A/30A Rated load current

● 60A Rated load current

Appearances

Model	Rated load current	Load voltage	Model	Rated load current	Load voltage
SRPH1-A220	20A	100-240VAC	SRPH1-A420	20A	100-240VAC
SRPH1-A230	30A		SRPH1-A430	30A	
SRPH1-A260	60A		SRPH1-A460	60A	

### ■ Connections



※1: As above connection, connect a capacitor. It is proper to EMC.  
CAP: Load voltage 100-240VAC → 1uF/250VAC, Load voltage 200-480VAC → 0.47uF/500VAC

- Photo electric sensor
- Fiber optic sensor
- Door/Area sensor
- Proximity sensor
- Pressure sensor
- Rotary encoder
- Connector/Socket
- Temp. controller
- SSR/Power controller**
- Counter
- Timer
- Panel meter
- Tacho/Speed/Pulse meter
- Display unit
- Sensor controller
- Switching mode power supply
- Stepper motor & Driver&Controller
- Graphic/Logic panel
- Field network device

## ■ Specifications

### ○ Input

4-20mA analog input	
Max. allowable input current	50mA
Pick-up current	4.2mA
Static off current	0.2mA
Power factor	Min. 0.9 (max. 25° of difference between voltage phase and current phase)
Input LED	Green
Start-up time	60Hz: 200ms, 50Hz: 250ms
Operation time	60Hz: 16.6ms, 50Hz: 20ms
Operation mode <sup>※1</sup>	Cycle control(fixed cycle, variable cycle) Phase control(phase equality division type, power equality division type)

※1: You can change operation mode by jumper pin. Default is Phase control(Power equality division type).

### ○ Output

100-240VAC load voltage				
Load voltage range(50/60Hz)		90-264VACrms(50/60Hz)		
Rated load current Ta=25°C	Resistive load (AC-51)	20Arms	30Arms	60Arms
Min. load current		0.5Arms		
Max. 1 cycle surge current (60Hz)		300A	500A	1000A
Max. non-repetitive surge current(I <sup>2</sup> t, t=8.3ms)		350A <sup>2</sup> S	1000A <sup>2</sup> S	4000A <sup>2</sup> S
Peak voltage(Non-repetitive)		600V		
Leakage current (240VAC/60Hz, Ta=25°C)		Max. 10mArms		
Output ON voltage drop[Vpk] (max. load current)		Max. 1.6V		
Static off state dv/dt		500V/μs		
200-480VAC load voltage				
Load voltage range(50/60Hz)		200-528VACrms		
Rated load current Ta=25°C	Resistive load(AC-51)	20Arms	30Arms	60Arms
	Motor load(AC-53a)	5Arms	8Arms	15Arms
Min. load current		0.5Arms		
Max. 1 cycle surge current(60Hz)		300A	500A	1000A
Max. non-repetitive surge current(I <sup>2</sup> t, t=8.3ms)		350A <sup>2</sup> S	1000A <sup>2</sup> S	4000A <sup>2</sup> S
Peak voltage(non-repetitive)		1000V		
Leakage current(480VAC/60Hz, Ta=25°C)		Max. 10mArms		
Output ON voltage drop[Vpk](Max. load current)		Max. 1.6V		
Static off state dv/dt		500V/μs		

### ○ General Specifications

Certification	UL508, CSA22.2, No.14, IEC/EN 60947-4-3			
Phase control (phase equality division type)	5 to 99%			
Phase control (power equality division type)	10 to 99%			
Frequency reading function	Yes			
Dielectric strength(Vrms)	4000VAC 50/60Hz for 1min. (Input-Output, Input/Output-Case)			
Insulation resistance	Min. 100MΩ(at 500VDC megger)			
Vibration	10 to 55Hz double amplitude 0.75mm in each of X, Y, Z directions for 1 hour			
Environ- -ment	Ambient temperature	-20 to 70°C, storage : -20 to 100°C (The rated load current capacity is different depending on ambient temperature.)		
	Ambient humidity	45 to 85%RH		
Input terminal connection	Min. 1×0.5mm <sup>2</sup> (1×AWG20) Max. 1×1.5mm <sup>2</sup> (1×AWG6) or Max. 2×1.5mm <sup>2</sup> (2×AWG16)			
Output terminal connection	Min. 1×1.5mm <sup>2</sup> (1×AWG16) Max. 1×16mm <sup>2</sup> (1×AWG6) or Max. 2×6mm <sup>2</sup> (2×AWG10) ※Connect appropriate cable for the load current capacity to output terminal.			
Input terminal fixed torque	0.75 to 0.95N·m			
Output terminal fixed torque	1.6 to 2.2N·m			
Unit weight	<ul style="list-style-type: none"> <li>• SRPH1-A220, SRPH1-A230, SRPH1-A420, SRPH1-A430 : Approx. 410g</li> <li>• SRPH1-A260, SRPH1-A460 : Approx. 680g</li> </ul>			

※For wiring the terminal, an O-ring terminal must be used.

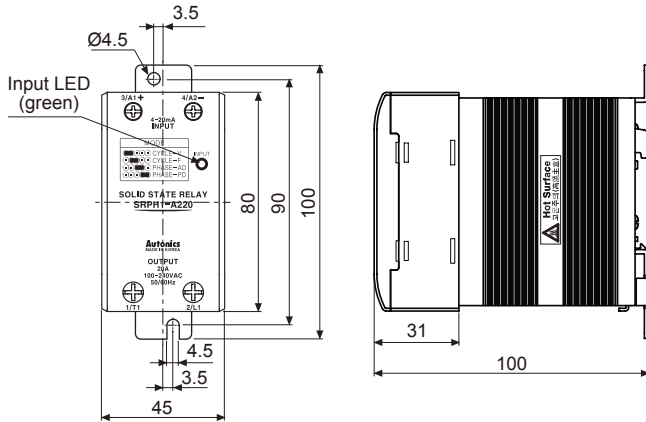
※Environment resistance is rated at no freezing or condensation.

## Dimensions & Mounting

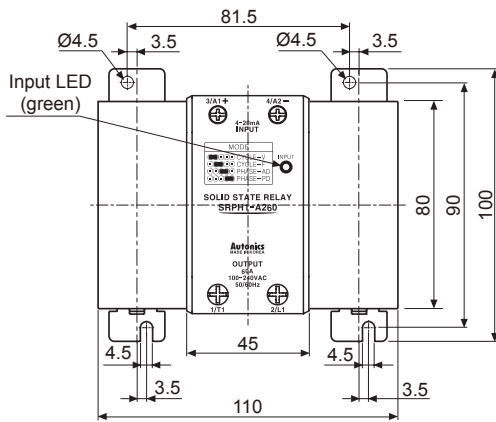
(unit: mm)

### Dimensions

#### 20A/30A rated load current



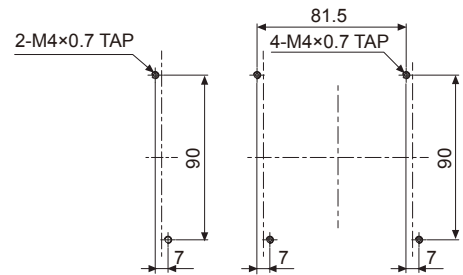
#### 60A rated load current



### Hole cut-out for panel front mounting

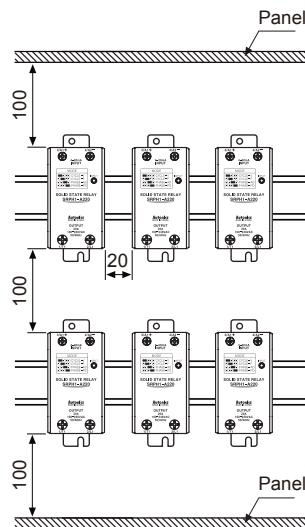
#### 20A/30A rated load current

#### 60A rated load current



※ Tightening torque for mounting: 1.8 to 2.5N·m

### Installation interval






**High temperature caution**  
 Make sure do not touch the heat sink or the unit body while power is supplied or right after load power is turned off. If not, it may cause a burn.

※ For mounting multiple SSR, please keep certain installation intervals for heat prevention. For horizontal installation (when the heights of input part and output part are equal), it is recommended to apply 50% of rated load current.

Photo electric sensor
Fiber optic sensor
Door/Area sensor
Proximity sensor
Pressure sensor
Rotary encoder
Connector/Socket
Temp. controller
<b>SSR/Power controller</b>
Counter
Timer
Panel meter
Tacho/Speed/Pulse meter
Display unit
Sensor controller
Switching mode power supply
Stepper motor & Driver&Controller
Graphic/Logic panel
Field network device

## Single phase, Socket heatsink separated type SSR [SRS1 Series]

### Ordering information

<b>NEW</b> 		<ul style="list-style-type: none"> <li>● SRS1-A (Autonics socket: SK-G05)</li> </ul>	<ul style="list-style-type: none"> <li>● SRS1-B(general socket: LY2)</li> </ul>			
Appearances						
Model	Input voltage	Rated load current	Load voltage	Zero cross turn-on/Random turn-on		
SRS1-A ※	4-24VDC	2A	24-240VAC	Zero cross turn-on		
		3A		Random turn-on		
				Zero cross turn-on		
		5A		Random turn-on		
			Zero cross turn-on			
		1A	5-100VDC	—		
				2A	5-200VDC	
						1A
				—		
SRS1-B ※	4-30VDC	2A (consists of 2 circuits)	90-240VAC	Zero cross turn-on		
		3A		Random turn-on		
				Zero cross turn-on		
		5A		Random turn-on		
				Zero cross turn-on		
		Random turn-on				

### Specifications

#### Input

	SRS1-A	SRS1-B
Input voltage range	4-26.4VDC	4-32VDC
Max. input current	15mA	13mA
Pick-up voltage	Min. 4VDC	
Drop-out voltage	Max. 1VDC	

#### Output(AC)

Model	SRS1-A1202(R)	SRS1-A1203(R)	SRS1-A1205(R)	SRS1-B1202(R)-2	SRS1-B1203(R)-2	SRS1-B1205(R)-1
Load voltage range	24-264VACrms(50/60Hz)			90-240VACrms(50/60Hz)		
Rated load current resistive load	2Arms	3Arms	5Arms	2Arms	3Arms	5Arms
Min. load current	0.15Arms	0.2Arms		0.15Arms		
Max. 1cycle surge current (60Hz)	126A	250A		126A		250A
Max. non-repetitive surge current(I <sup>2</sup> t, t=8.3ms)	65A <sup>2</sup> S	400A <sup>2</sup> S		65A <sup>2</sup> S		220A <sup>2</sup> S
Peak voltage(Non-repetitive)	600V					
Leakage current(Ta=25°C)	Max. 2mArms					
Output on voltage drop[Vpk] (Max. load current)	Max. 1.6V					
Static off-state dv/dt	500V/μs					
Turn-on time	Zero cross turn-on	0.5 cycle of load source + 1ms				
	Random turn-on	Max. 1ms				
Turn-off time	0.5 cycle of load source + 1ms					

## ■ Specifications

### ○ Output(DC, AC/DC)

Model	SRS1-A1D101	SRS1-A1D102	SRS1-A1D201	SRS1-A1X201
Load voltage range	3-120VDC		3-220VDC	3-264VAC 50/60Hz 3-220VDC
Rated load current resistive load	1Adc	2Adc	1Adc	1Arms/1Adc
Min. load current	10mA			
Max. surge current (t=10ms)	5A	10A	4A	
Leakage current	Max. 100uA			Max. 2mArms
Output on voltage drop[Vpk] (Max. load current)	Max. 1.1V			Max. 2.2V
Static off-state dv/dt	500V/μs			
Turn-on time	1ms	2ms	1ms	2ms
Turn-off time	1ms			

### ○ General Specifications

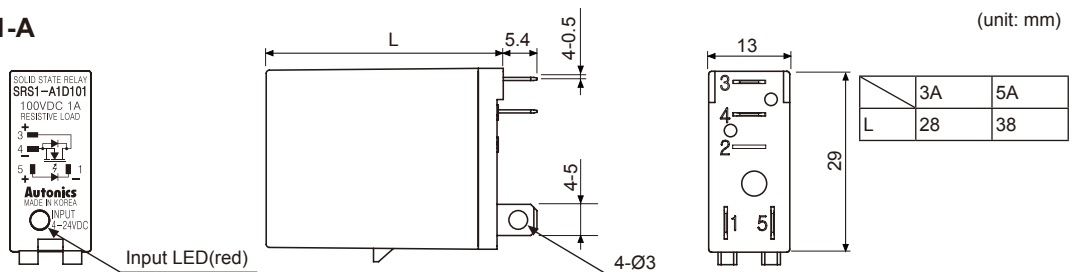
	SRS1-A	SRS1-B
Dielectric strength(Vrms)	2,500VAC 50/60Hz 1min.(Input-Output, Input/Output-Case)	
Insulation resistance	Min. 100MΩ(at 500VDC Megger)	
Input LED	Red	
Protection	According to protection of socket (SK-G05: IP10)	
Environ-ment	Ambient temperature	-20 to 70°C, storage: -30 to 100°C
	Ambient humidity	45 to 85%RH, storage: 45 to 85%RH (The rated load current capacity is different depending on ambient temperature.)
Unit weight	3A and below: Approx. 17g(approx. 270g), 5A: Approx. 28g (approx. 380g)	Approx. 30g (approx. 710g)

※1: The weight is per 1 unit and the weight in parentheses is with packaging .  
(packaging unit- SRS1-A: 10EA, SRS1-B: 20EA)

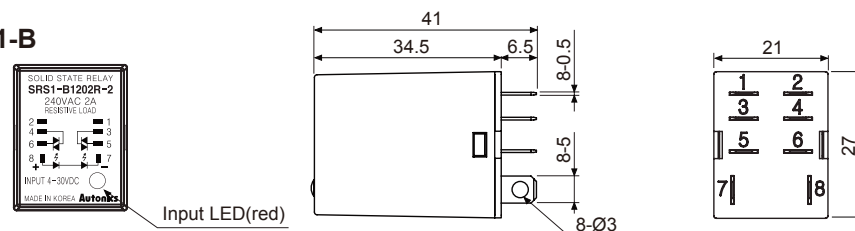
※Environment resistance is rated at no freezing or condensation.

## ■ Dimensions

### ○ SRS1-A



### ○ SRS1-B

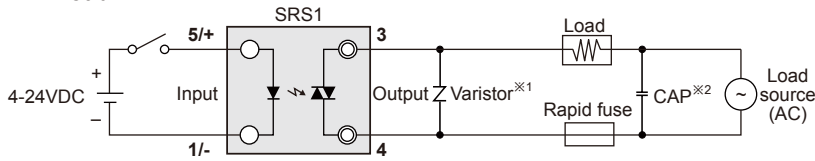


- Photo electric sensor
- Fiber optic sensor
- Door/Area sensor
- Proximity sensor
- Pressure sensor
- Rotary encoder
- Connector/Socket
- Temp. controller
- SSR/ Power controller
- Counter
- Timer
- Panel meter
- Tacho/ Speed/ Pulse meter
- Display unit
- Sensor controller
- Switching mode power supply
- Stepper motor & Driver&Controller
- Graphic/ Logic panel
- Field network device

## Example of connection

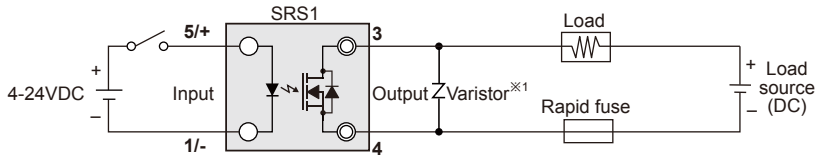
### SRS1-A

#### AC Load



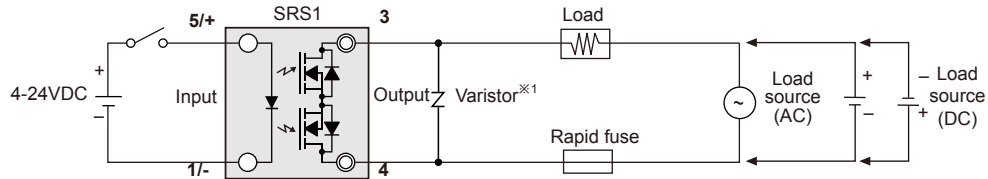
※1: Must use a Varistor(470V, 0.6W)  
 ※2: When connecting capacitor as above, it is appropriate for EMC.  
 CAP: 1uF/250VAC

#### DC Load(SRS1-A1D101/A1D102/A1D201)



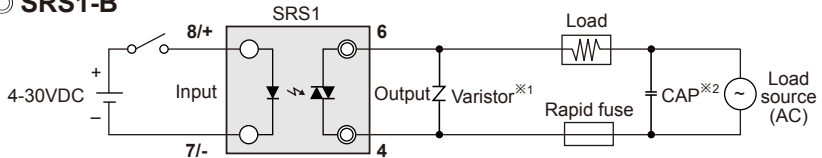
※1: Must use a Varistor(270V, 0.6W)

#### AC/DC Load(SRS1-A1X201)



※1: Must use a Varistor(470V, 0.6W)

### SRS1-B




※1: Must use a Varistor (470V, 0.6W)  
 ※2: When connecting capacitor as above, it is appropriate for EMC.  
 CAP: 1uF/250VAC

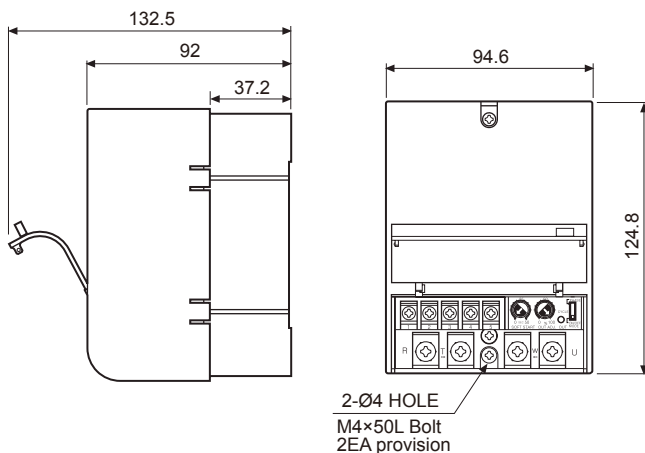


# Single phase, Power Controller [SPC1 Series]

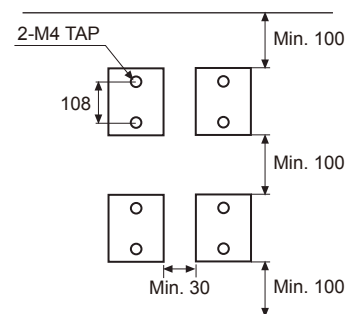
## Specifications

		
Appearances		
Model	<b>SPC1-35</b> <span style="float: right;"><b>SPC1-50</b></span>	
Power supply	220VAC 50/60Hz	
Allowable voltage range	90 to 110% of rated voltage	
Maximum rated current	35A(single phase) <span style="float: right;">50A(single phase)</span>	
Control power	220VAC	
Control range	Phase control: 0 to 98%, Cycle control: 0 to 100%	
Application load	Resistance load(min. load : over 5% of rated current)	
Cooling method	Natural cooling	
Control circuit	Micom control type	
Control input	<ul style="list-style-type: none"> <li>• 1-5VDC</li> <li>• DC4-20mA(250Ω)</li> <li>• ON/OFF(external relay contact or 24VDC)</li> <li>• External VR(1kΩ)</li> <li>• Output limit input(front OUT ADJ. VR)</li> </ul>	
Control type	By selection S/W <ul style="list-style-type: none"> <li>• Phase control<sup>※1</sup></li> <li>• Cycle control(zero cross)-Period 0.5sec., 2.0sec., 10sec. <sup>※1</sup></li> <li>• ON/OFF control(zero cross)</li> </ul>	
Starting type	Soft start(0 to 50 sec. variable)	
Display function	Output indication(LED)	
Insulation resistance	100MΩ(at 500VDC megger)	
Dielectric strength	2000VAC 50/60Hz for 1minute	
Noise strength	±2kV the square wave noise (pulse width: 1us) by the noise simulator	
Vibration	Mechanical	0.75mm amplitude at frequency of 10 to 55Hz (for 1 min.) in each of X, Y, Z directions for 1 hour
	Malfunction	0.5mm amplitude at frequency of 10 to 55Hz (for 1 min.) in each of X, Y, Z directions for 10 min.
Shock	Mechanical	300m/s <sup>2</sup> (approx. 30G) in each of X, Y, Z directions for 3 times
	Malfunction	100m/s <sup>2</sup> (approx. 10G) in each of X, Y, Z directions for 3 times
Environ-ment	Ambient temperature	0 to 50°C, storage: -25 to 65°C
	Ambient humidity	35 to 85%RH
Unit weight	Approx. 1kg	

## Dimensions



### Panel lay-out

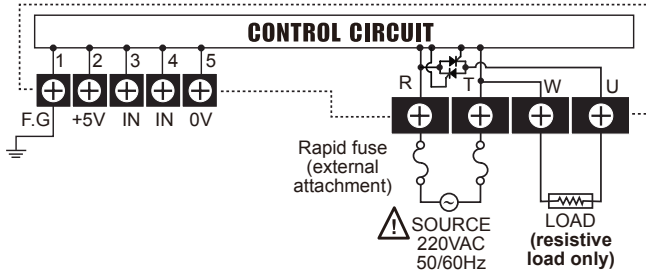


※It should have enough space between units for proper cooling.

- Photo electric sensor
- Fiber optic sensor
- Door/Area sensor
- Proximity sensor
- Pressure sensor
- Rotary encoder
- Connector/Socket
- Temp. controller
- SSR/ Power controller**
- Counter
- Timer
- Panel meter
- Tacho/ Speed/ Pulse meter
- Display unit
- Sensor controller
- Switching mode power supply
- Stepper motor & Driver&Controller
- Graphic/ Logic panel
- Field network device

## ■ Connections

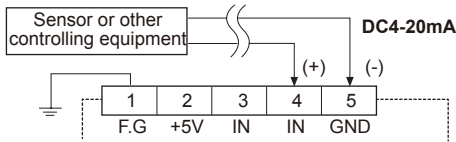
### 1. External connection



### 2. Connection of control input terminals

#### 1) DC4-20mA control input

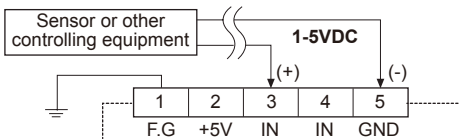
It controls 0 to 100% when you apply DC4-20mA on ④, ⑤ terminals when power is applied.



※It is not available in ON/OFF control mode.

#### 2) 1-5VDC control input

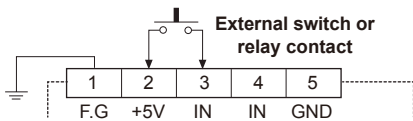
It controls 0 to 100% when you apply 1-5VDC on ③, ⑤ terminals when power is applied.



※It is not available in ON/OFF control mode.

#### 3) ON/OFF External contact control input

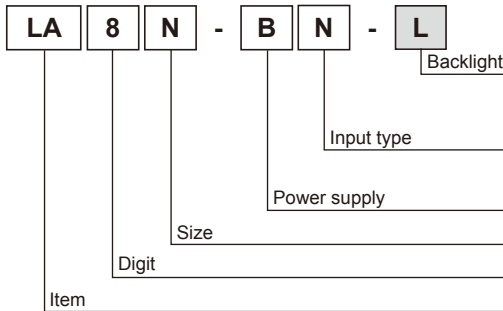
It controls 100% if you connect external switch or relay contact to ②, ③ terminal when it is ON, it controls 0% when it is OFF.



※It is available in all control modes.  
OUT ADJ. and SOFT START function are not available in ON/OFF control mode.

# DIN W48×H24mm, Indication only, LCD counter [LA8N Series]

## Ordering information



※A shaded (□) part is upgraded or added function.

No mark	None
L	Backlight function
N	No-voltage(Small signal) input
V	Voltage input
F	Free voltage input
B	Internal lithium battery
N	DIN W48×H24mm
8	9999999(8digit)
LA	LCD Counter

## Specifications

Model	LA8N-BN	LA8N-BN-L	LA8N-BV	LA8N-BV-L	LA8N-BF
Appearances & Dimensions	<p>[W48×H24×L54mm]</p>				
Digit	8digit(Count up, down: -9999999 to 99999999 / Count up mode: 0 to 99999999)				
Digit size	W3.4 × H8.7mm				
Display method	LCD Zero Blanking type(Character height size: 8.7mm)				
Operation method	Count up, down mode	Count up mode	Count up, down mode	Count up mode	Count up mode
Power supply	Built-in battery				
Battery life cycle	Approx. over 7 years at 20°C				
Backlight power supply	—	24VDC±10%	—	24VDC±10%	—
Input method	No-voltage input		Voltage input		Free voltage input
Count input	Residual voltage: Max. 0.5VDC Short-circuit impedance: Max. 10kΩ Open-circuit impedance: Min. 750kΩ		"H" level voltage: 4.5-30VDC "L" level voltage: 0-2VDC		"H" level voltage: 24-240VAC /6-240VDC "L" level voltage:0-2VAC/0-2.4VDC
RESET input	No-voltage input		Voltage input		No-voltage input
Min. signal width	UP/DOWN, RESET input: Min. 20ms	RESET input: Min. 20ms	UP/DOWN, RESET input: Min. 20ms	RESET input: Min. 20ms	RESET input: Min. 20ms
Max. counting speed	1cps / 30cps / 1kcps				20cps
External set switch	SW1※1, SW2※2, SW3※3				SW1※1, SW3※3
Insulation resistance	Min. 100MΩ(at 500VDC megger)				
Dielectric strength※4	2,000VAC 60Hz for 1minute				
Vibration	Mechanical	0.75mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 1 hour			
	Malfuction	0.3mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 10 minutes			
Shock	Mechanical	300m/s <sup>2</sup> (approx. 30G) in each of X, Y, Z directions for 3 times			
	Malfuction	100m/s <sup>2</sup> (approx. 10G) in each of X, Y, Z directions for 3 times			
Environment	Ambient temperature	-10 to 55°C, storage: -25 to 65°C			
	Ambient humidity	35 to 85%RH, storage: 35 to 85%RH			
Protection	IP66(When using waterproof rubber for front panel)				
Accessory	Mounting bracket, Rubber waterproof ring				
Approval					
Weight※5	Approx. 96g(Approx. 50g)				

※1: SW1 is the front panel RESET key enable/disable set switch.

※2: SW2 is the max. counting speed set switch.

※3: SW3 is the decimal point set switch.

※4: No-voltage input, voltage input: between terminals and the case / Free voltage input: between the free voltage input terminal and the RESET input terminal, between terminals and the case.

※5: This weight is with packaging and the weight in parentheses is only unit weight.

※Environment resistance is rated at no freezing or condensation.

Photo electric sensor
Fiber optic sensor
Door/Area sensor
Proximity sensor
Pressure sensor
Rotary encoder
Connector/ Socket
Temp. controller
SSR/ Power controller
<b>Counter</b>
Timer
Panel meter
Tacho/ Speed/ Pulse meter
Display unit
Sensor controller
Switching mode power supply
Stepper motor& Driver&Controller
Graphic/ Logic panel
Field network device

## ■ Connections

Input type	No-backlight	Backlight
No-voltage input type	<p>●LA8N-BN※1</p>	<p>●LA8N-BN-L</p> <p>※Terminal (1, 2, 3) and (4, 5) are insulated inside.</p>
Voltage input type	<p>●LA8N-BV※1</p>	<p>●LA8N-BV-L</p>
Free voltage input type	<p>●LA8N-BF</p> <p>※Terminal (1, 2) and (4, 5) are insulated inside.</p>	—

※1: Terminal 2 and 5 are connected inside. (Non-isolated)

※Use reliable contacts enough to flow 5μA current.

## DIN W48×H48mm, W72×H36mm, W72×H72mm counter/timer [CT Series]

### ■ Ordering information

CT 6 M - 2P 4 T








Item	CT	6	M	-	2P	4	T
Digit							
Size							
Output							
Power supply							
Communication							

※A shaded (■) part is upgraded or added function.

No mark	None
T	RS 485
4	100-240VAC 50/60Hz
2	24VAC 50/60Hz / 24-48VDC
2P	Dual preset
1P	Single preset
I	Indicator
S	DIN W48×H48mm
Y	DIN W72×H36mm
M	DIN W72×H72mm
4	9999(4digit)
6	999999(6digit)
CT	Counter/Timer

※4digit type does not exist in the indicator type.

## ■ Specifications

Series		CTS		CTY		CTM	
Digit		4		6		6	
Model	Dual Preset	CT4S-2P□□	CT6S-2P□□	CT6Y-2P□□	CT6M-2P□□		
	Single Preset	CT4S-1P□□	CT6S-1P□□	CT6Y-1P□□	CT6M-1P□□		
	Single Preset	—	CT6S-1□□	CT6Y-1□□	CT6M-1□□		
Appearances & Dimensions		  [W48×H48×L90mm]		  [W72×H36×L77mm]		  [W72×H72×L85mm]	
		Digit Size	Single Preset	11mm	10mm	10mm	13mm
Power Supply	Single Preset	100-240VAC 50/60Hz					
	Single Preset	24VAC 50/60Hz / 24-48VDC					
Allowable voltage range		90 to 110% of rated voltage(AC Power type)					
Power consumption	Single Preset	Max. 12VA					
	Single Preset	AC: Max. 10VA / DC: Max. 8W					
INA/INB Max. counting speed		Selectable 1cps / 30cps / 1kcps / 5kcps / 10kcps					
Min. input signal width	Counter	Reset signal: Selectable 1ms, 20ms					
	Timer	INA, INB RESET: Selectable 1ms, 20ms				INA, INH, RESET, INHIBIT, BATCH RESET: Selectable 1ms, 20ms	
Input		Selectable voltage input or No-voltage input [Voltage input] Input impedance is 5.4kΩ, 'H' level: 5-30VDC, 'L' level: 0-2VDC [No-voltage input] Short-circuit impedance: Max. 1kΩ, Residual voltage: Max. 2VDC					
One-shot output		Count, timer: Selectable 0.01s to 99.99s					
Control output	With-out com.	Contact output	Dual preset: SPST(1a) 2EA Single preset: SPDT(1c) 1EA		Dual preset: SPST(1a) 1EA, SPDT(1c) 1EA Single preset: SPDT(1c) 1EA		
		Solid state output	Dual preset: 1NPN open collector Single preset: 1NPN open collector		Dual preset: 3NPN open collector Single preset: 2NPN open collector		
	With-out com.	Contact output	Dual preset: SPST(1a)2EA Single preset: SPDT(1c)1EA		Dual preset: SPST(1a), SPDT(1c) Single preset: SPDT(1c)		
		Solid state output	—		Dual preset: - Single preset: 1NPN open collector		Dual preset: 2NPN open collector Single preset: 2NPN open collector
	With-out com.	Contact output	250VAC 5A resistive load		250VAC 3A resistive load		250VAC 5A resistive load
		Solid state output	30VDC Max. 100mA Max.				
External sensor power		12VDC ±10%, 100mA Max.					
Memory retention		10years(When using non-volatile semiconductor memory type)					
Timer	Repeat error						
	SET error	Power ON Start: Max. ±0.01% ±0.05 sec					
	Voltage error	Signal Start: Max. ±0.01% ±0.03 sec					
	Temperature error						
Insulation resistance		Min. 100MΩ(500VDC Megger)					
Dielectric strength		2,000VAC 50/60Hz for 1minute					
Noise strength (AC Power)		±2kV the square wave noise(pulse width:1μs) by the noise simulator					
Vibration	Mechanical	0.75mm amplitude at frequency of 10 to 55(for 1 min.)Hz in each of X, Y, Z directions for 1 hour					
	Malfunction	0.5mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 10 minutes					
Shock	Mechanical	300m/s <sup>2</sup> (approx. 30G) in each of X, Y, Z directions for 3 times					
	Malfunction	100m/s <sup>2</sup> (approx. 10G) in each of X, Y, Z directions for 3 times					
Relay Life cycle	Mechanical	Min. 10,000,000 operations					
	Electrical	Min. 100,000 operations					
Protection		IP65(Front panel only)					
Environment	Ambient temperature	-10 to 55°C, storage: -25 to 65°C					
	Ambient humidity	35 to 85%RH, storage: 35 to 85%RH					
Approval							
Unit weight		Approx. 159g		Approx. 149g		Approx. 253g	

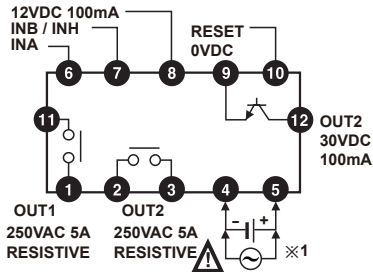
※Environment resistance is rated at no freezing or condensation.

Photo electric sensor
Fiber optic sensor
Door/Area sensor
Proximity sensor
Pressure sensor
Rotary encoder
Connector/Socket
Temp. controller
SSR/Power controller
Counter
Timer
Panel meter
Tacho/Speed/Pulse meter
Display unit
Sensor controller
Switching mode power supply
Stepper motor& Driver&Controller
Graphic/Logic panel
Field network device

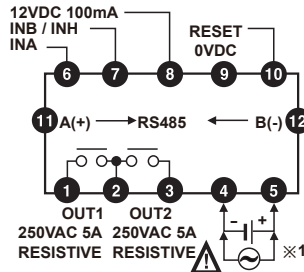
## ■ Connections

**⚠** Be careful that connections are different between communication model and non-communication model when wiring.

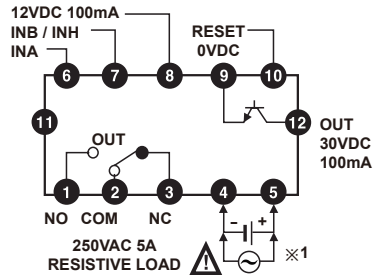
### ○ CT□S-2P□



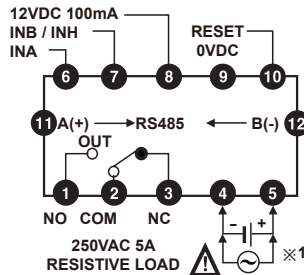
### ○ CT□S-2P□T



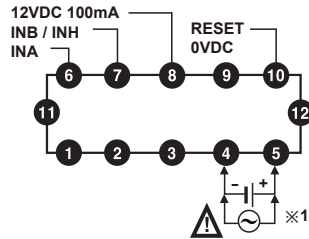
### ○ CT□S-1P□



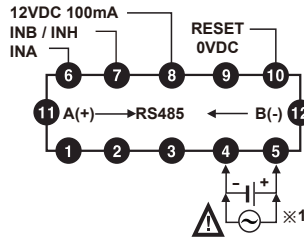
### ○ CT□S-1P□T



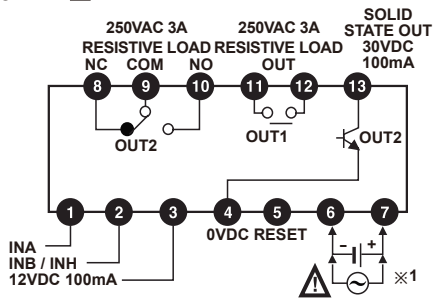
### ○ CT6S-I□



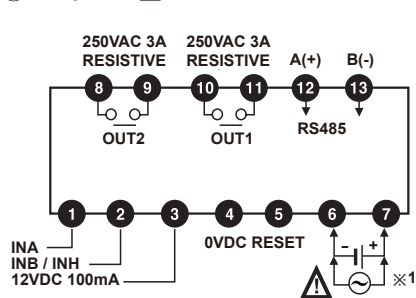
### ○ CT6S-I□T



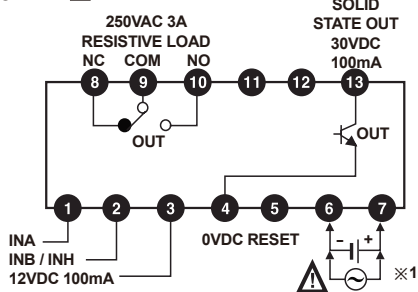
### ○ CT6Y-2P□



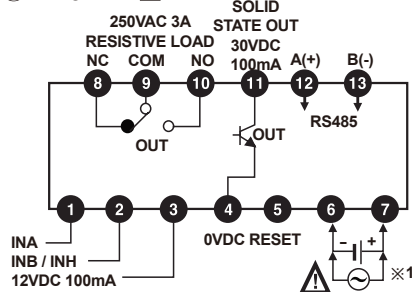
### ○ CT6Y-2P□T



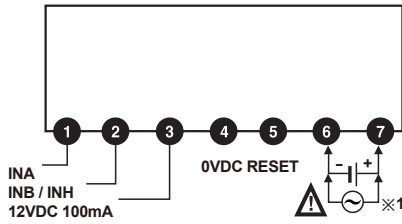
### ○ CT6Y-1P□



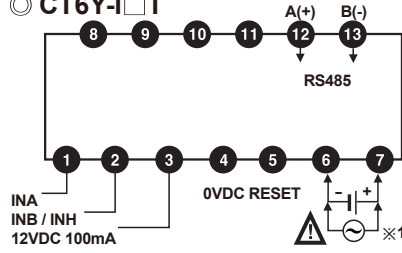
### ○ CT6Y-1P□T



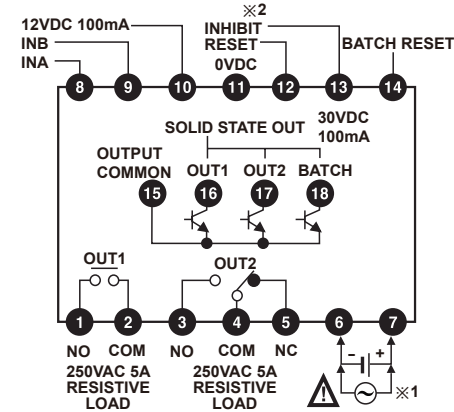
## ○ CT6Y-I □



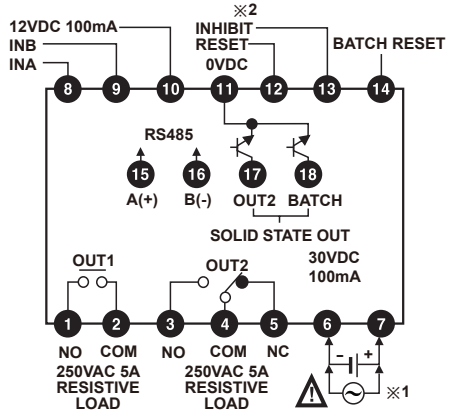
## ○ CT6Y-I □ T



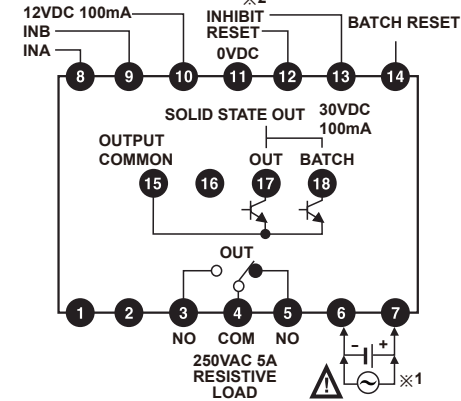
## ○ CT6M-2P □



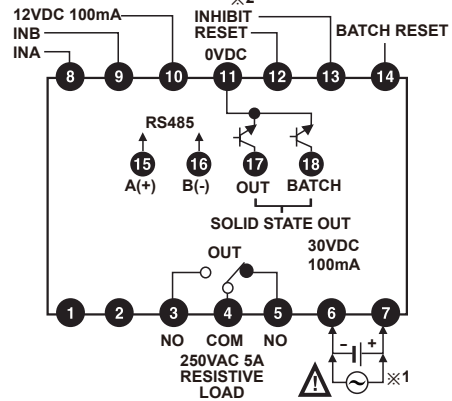
## ○ CT6M-2P □ T



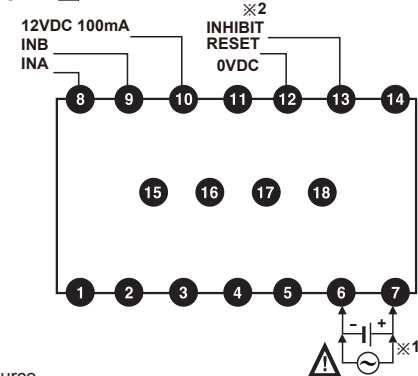
## ○ CT6M-1P □



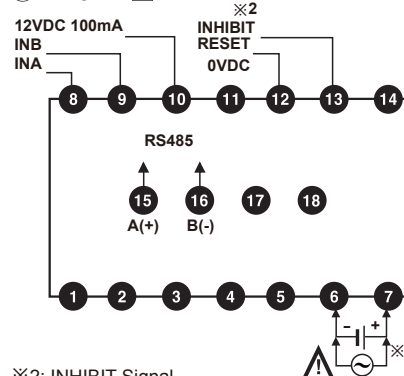
## ○ CT6M-1P □ T



## ○ CT6M-I □



## ○ CT6M-I □ T



※1: Source

- AC Power: 100-240VAC 50/60Hz
- AC/DC Power: 24-48VDC, 24VAC 50/60Hz

※2: INHIBIT Signal

- Counter operation: If INHIBIT signal is applied, count input will be prohibited.
- Timer operation: If INHIBIT signal is applied, time progressing will stop.(HOLD)

Photo electric sensor

Fiber optic sensor

Door/Area sensor

Proximity sensor

Pressure sensor

Rotary encoder

Connector/ Socket

Temp. controller

SSR/ Power controller

Counter

Timer

Panel meter

Tacho/ Speed/ Pulse meter

Display unit

Sensor controller

Switching mode power supply




Stepper motor & Driver&Controller

Graphic/ Logic panel

Field network device

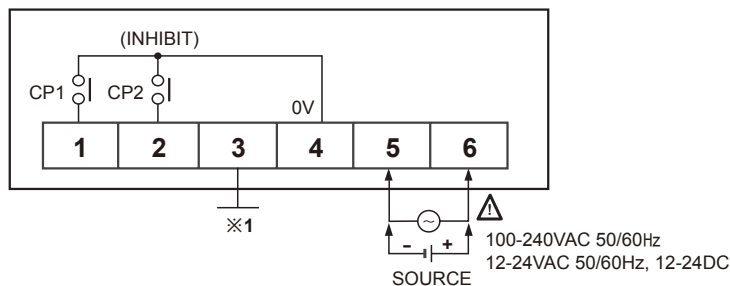
## DIN W72×H36mm of counter/timer with indication only [FX Series]

### Specifications

Model		FX4Y-I	FX6Y-I
Appearances & Dimensions		  [W72×H36×L83mm]	
Digit		4digit	6digit
Digit size		W8×H14mm	W4×H8mm
Power supply	AC Voltage type	100-240VAC 50/60Hz	
	AC/DC Voltage type	12-24VAC 50/60Hz, 12-24VDC universal	
Allowable voltage range		90 to 110% of rated voltage	
Power consumption	AC Voltage type	Approx. 4.5VA(240VAC 60Hz)	
	AC/DC Voltage type	Approx. 4.5VA(24VAC 60Hz), Approx. 2.8W(24VDC)	
Max. counting speed		Selectable 1cps/30cps/2kcps/5kcps by internal DIP switch	
Min. input signal width	INHIBIT input	Min. 20ms	
	RESET input		
Input	CP1, CP2 input	No voltage input - Impedance at short-circuit: Max. 470Ω,	
	RESET input	Residual voltage at short-circuit: Max. 1VDC Impedance at open-circuit: Min. 100kΩ	
Memory protection		Approx. 10 years(When using non-volatile semiconductor memory)	
External power		12VDC ±10% 50mA Max.	
Insulation resistance		Min. 100MΩ(at 500VDC megger)	
Dielectric strength		2000VAC 50/60Hz for 1 minute	
Noise strength	AC type	±2kV the square wave noise(pulse width: 1μs) by the noise simulator	
	DC type	±500V the square wave noise(pulse width: 1μs) by the noise simulator	
Vibration	Mechanical	0.75mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 1hour	
	Malfunction	0.5mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 10 minutes	
Shock	Mechanical	300m/s <sup>2</sup> (approx. 30G) in each of X, Y, Z directions for 3 times	
	Malfunction	100m/s <sup>2</sup> (approx. 10G) in each of X, Y, Z directions for 3 times	
Environment	Ambient temperature	10 to 55°C, storage: -25 to 65°C	
	Ambient humidity	35 to 85%RH, storage: 35 to 85%RH	
Approval			
Unit weight		Approx. 130g	Approx. 132g

※Environment resistance is rated at no freezing or condensation.

### Connections



※1: It can be selected RESET or sensor power(+12VDC 50mA) by internal PIN operation.

※CP1, CP2: Input signal terminals when using as counter.




※INHIBIT(CP2): Time Hold terminal when using for timer(Connect switch to ②+④ from the external.)

※Operated by a Power ON Start method when it is used as a timer.



# DIN W48×H48mm, Preset counter/timer [FXS Series]

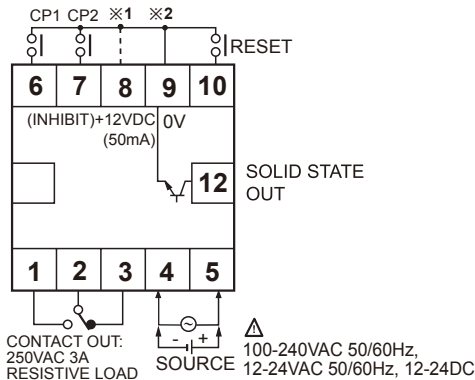
## Specifications

Model	Single preset	<b>FX4S</b>	—
	Indicator	—	<b>FX5S-I</b>
Appearances & Dimensions	  [W48×H48×L91mm]		
Digit	4digit		5digit
Digit size	W3.8×H7.6mm		W4×H8mm
Power supply	AC Voltage type	100-240VAC 50/60Hz	
	AC/DC Voltage type	100-240VAC 50/60Hz, 12-24VDC universal	
Allowable voltage range	90 to 110% of rated voltage		
Power consumption	AC Voltage type	• Indication type: Approx. 4.7VA, • Single preset: Approx. 5.7VA(240VAC 60Hz)	
	AC/DC Voltage type	• Indication type: Approx. 4.5VA, • Single preset: Approx. 5.6VA(240VAC 60Hz) • Indication type: Approx. 2.8W, • Single preset: Approx. 3W(240VDC)	
Max. counting speed for CP1, CP2	Selectable 1cps/30cps/2kcps/5kcps by internal DIP switch		
Min. input signal width	INHIBIT input	Approx. 20ms	
	RESET input	Approx. 20ms	
Input	CP1, CP2 input (INHIBIT)	Input logic is selectable [Voltage input] Input impedance: 5.4kΩ "H" level: 5-30VDC, "L" level: 0-2VDC [No-voltage input] Impedance at short-circuit: Max. 1kΩ, Residual voltage at short-circuit: Max. 2VDC, Impedance at open-circuit: Min. 100kΩ	
	RESET input		
One-shot output time	0.05 to 5sec		
Control output	Contact	Type	SPDT(1c)
		Capacity	250VAC 3A at resistive load
	Solid state	Type	NPN open collector
		Capacity	30VDC Max. 100mA Max.
Memory protection	Approx. 10 years(When using non-volatile semiconductor memory)		
External power	12VDC±10% 50mA Max.		
Insulation resistance	Min. 100MΩ(at 500VDC megger)		
Dielectric strength	2000VAC 50/60Hz for 1 minute		
Noise strength	AC power	±2kV the square wave noise(pulse width: 1μs) by the noise simulator	
	DC power	±500V the square wave noise(pulse width: 1μs) by the noise simulator	
Vibration	Mechanical	0.75mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 1 hour	
	Malfunction	0.5mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 10 minutes	
Shock	Mechanical	300m/s <sup>2</sup> (approx. 30G) in each of X, Y, Z directions for 3 times	
	Malfunction	100m/s <sup>2</sup> (approx. 10G) in each of X, Y, Z directions for 3 times	
Relay life cycle	Mechanical	Min. 10,000,000 operations	
	Electrical	Min. 100,000 operations(250VAC 3A at resistive load)	
Environment	Ambient temperature	10 to 55°C, storage: -25 to 65°C	
	Ambient humidity	35 to 85%RH	
Approval			
Unit weight	Approx. 153g		Approx. 143g

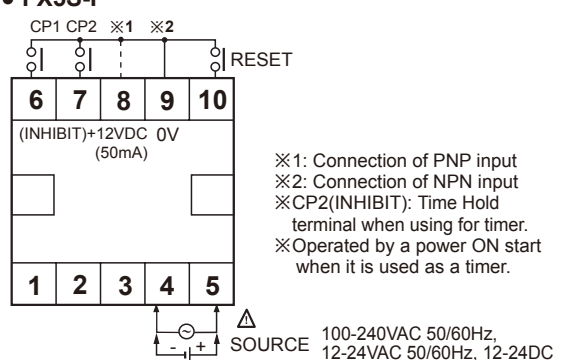
※Environment resistance is rated at no freezing or condensation.

## Connections

### FX4S






### FX5S-I



## DIN W72 × H72, W48 × H96, W144 × H72mm counter/timer [FX/FXH/FXL Series]

### Specifications

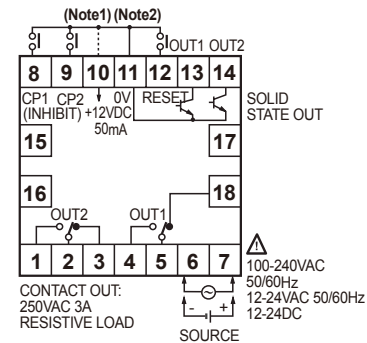
Model	Single preset	FX4	FX6	FX4H	—	—
	Dual preset	FX4-2P	FX6-2P	FX4H-2P	FX4L-2P	FX6L-2P
	Totalizer(Indicator)	FX4-I	FX6-I	FX4H-I	FX4L-I	FX6L-I
Appearances & Dimensions						
		[W72×H72×L112mm]		[W48×H96×L100mm]		[W144×H72×L112mm]
Digit		4 digit	6 digit	4 digit	4 digit	6 digit
Digit size		W8×H14mm	W4×H8mm	W6×H10mm	W8×H14mm	
Power supply	AC Voltage type	100-240VAC 50/60Hz				
	AC/DC Voltage type	12-24VAC 50/60Hz, 12-24VDC universal				
Allowable voltage range		90 to 110% of rated voltage				
Power consumption	AC Voltage type	• Indicator type: Approx. 6VA • Single preset: Approx. 7VA • Dual preset: Approx. 8VA(240VAC 50/60Hz)				
	AC/DC Voltage type	• Indicator type: Approx. 5.8VA • Single preset: Approx. 6.8VA • Dual preset: Approx. 7.6VA(240VAC 50/60Hz) • Indicator type: Approx. 2.7W • Single preset: Approx. 3.3W • Dual preset: Approx. 3.8W(24VDC)				
Max. counting speed for CP1, CP2		Selectable 1cps/30cps/2kcps/5kcps by internal DIP switch				
Min. input signal width	RESET input	Approx. 20ms				
	INHIBIT input					
Input	CP1, CP2 input (INHIBIT)	Input logic is selectable [Voltage input] Input impedance: 5.4kΩ, "H" level: 5-30VDC, "L" level: 0-2VDC [No-voltage input] Impedance at short-circuit: Max. 1kΩ, Residual voltage at short-circuit: Max. 2VDC, Impedance at open-circuit: Min. 100kΩ				
	RESET input					
	One-shot output time	• Single preset type - 0.05 to 5sec. • Dual preset type - 1st. output 0.5sec. fixed, 2st. output: 0.05 to 5sec.				
Control output	Contact	Type	Single preset type: SPDT(1c), Dual preset type: 1st output SPDT(1c), 2nd output SPDT(1c)			
		Capacity	250VAC 3A at resistive load			
	Solid-state	Type	Single preset: 1 NPN open collector Dual preset: 1st output 1 NPN open collector, 2nd output 1 NPN open collector			
		Capacity	30VDC Max. 100mA Max.			
Memory protection		Approx. 10 years(When using non-volatile semiconductor memory)				
External sensor power		12VDC±10% 50mA Max.				
Environment	Ambient temperature	-10 to 55°C, storage: -25 to 65°C				
	Ambient humidity	35 to 85%RH, storage: 35 to 85%RH				
Insulation resistance		Min. 100MΩ(at 500VDC megger)				
Dielectric strength		2000VAC 50/60Hz for 1 minute				
Noise strength	AC power	±2kV the square wave noise(pulse width: 1μs) by the noise simulator				
	DC power	±500V the square wave noise(pulse width: 1μs) by the noise simulator				
Vibration	Mechanical	0.75mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 1 hour				
	Malfunction	0.5mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 10 minutes				
Shock	Mechanical	300m/s <sup>2</sup> (approx. 30G) in each of X, Y, Z directions for 3 times				
	Malfunction	100m/s <sup>2</sup> (approx. 10G) in each of X, Y, Z directions for 3 times				
Relay life cycle	Mechanical	Min. 10,000,000 operations				
	Electrical	Min. 100,000 operations at 250VAC 2A(resistive load)				
Approval		cULus (Except for AC/DC power type)				
Weight <sup>*1</sup>		FX4: Approx. 385g (approx. 249g) FX4-2P: Approx. 396g (approx. 258g) FX4-I : Approx. 353g (approx. 216g)	FX6: Approx. 395g (approx. 259g) FX6-2P : Approx. 398g (approx. 262g) FX6-I : Approx. 351g (approx. 214g)	FX4H: Approx. 349g(approx. 234g) FX4H-2P: Approx. 375g(approx. 261g) FX4H-I: Approx. 321g(approx. 206g)	FX4L-2P: Approx. 651g (approx. 467g) FX4L-I : Approx. 593g (approx. 400g)	FX6L-2P: Approx. 678g (approx. 494g) FX6L-I : Approx. 586g (approx. 404g)

\*1: This weight is with packaging and the weight in parentheses is only unit weight.

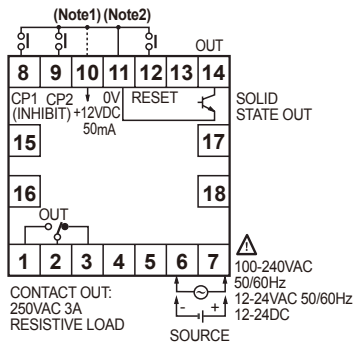
※Environment resistance is rated at no freezing or condensation.

## ■ Connections

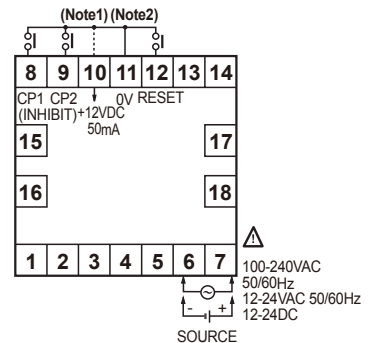
### ● FX□-2P



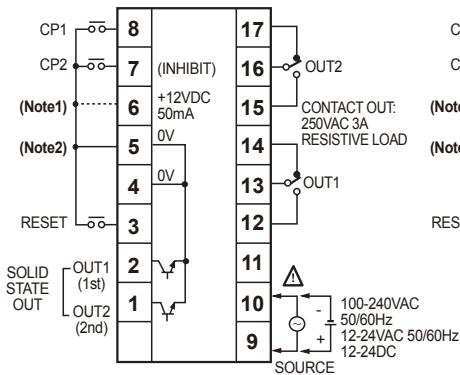
### ● FX□



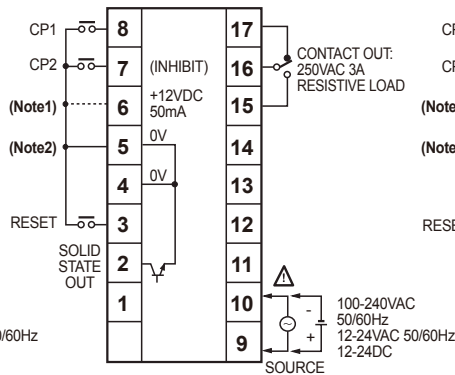
### ● FX□-I



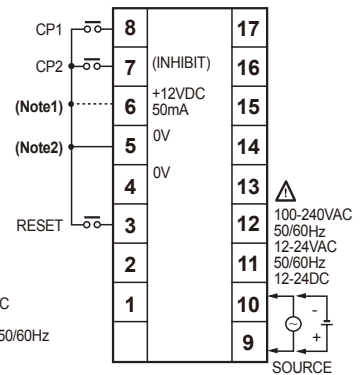
### ● FX4H-2P



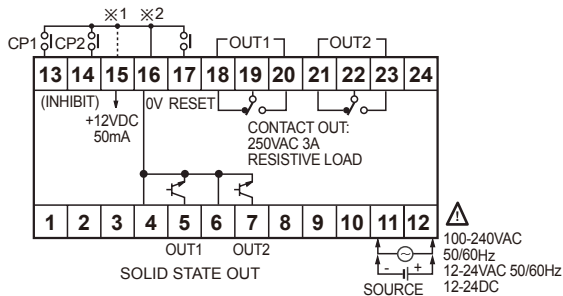
### ● FX4H



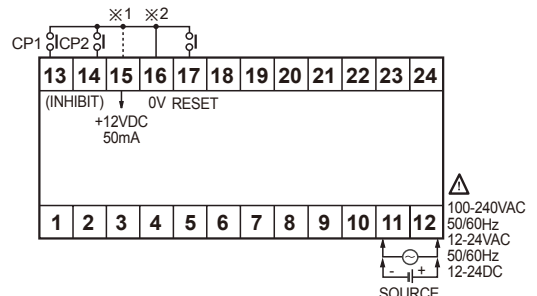
### ● FX4H-I



### ● FX□L-2P



### ● FX□L-I




※ CP2(INHIBIT): Time hold terminal when using for timer.  
 ※ It is operated by power ON start type when using for timer.

※ 1. Connection for PNP input  
 2. Connection for NPN input

Photo electric sensor
Fiber optic sensor
Door/Area sensor
Proximity sensor
Pressure sensor
Rotary encoder
Connector/Socket
Temp. controller
SSR/ Power controller
Counter
Timer
Panel meter
Tacho/ Speed/ Pulse meter
Display unit
Sensor controller
Switching mode power supply
Stepper motor & Driver&Controller
Graphic/ Logic panel
Field network device

## DIN W48×H48mm 8 Pin plug counter [FS Series]

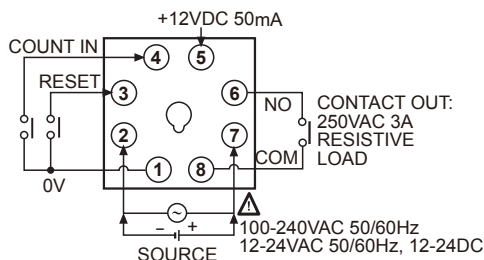
### Specifications

Model	Single preset	<b>FS4A</b>	—
	Totalizer(Indicator)	—	<b>FS5B</b>
Appearances & Dimensions	× 8Pin plug type		
	 [W48×H48×L85mm]		
Digit	4digit		5digit
Digit size	W3.8×H7.6mm		W4×H8mm
Power supply	AC Voltage type	100-240VAC 50/60Hz	
	AC/DC Voltage type	100-240VAC 50/60Hz, 12-24VAC/DC universal(option)	
Allowable voltage range	90 to 110% of rated voltage		
Power consumption	AC Voltage type	• Indicator: Approx. 4.7VA • Single preset: Approx. 5.7VA(240VAC 50/60Hz)	
	AC/DC Voltage type	• Indicator: Approx. 4.5VA • Single preset: Approx. 5.5VA(240VAC 50/60Hz) • Indicator: Approx. 2.8W • Single preset: Approx. 3W(24VDC)	
Max. counting speed for CP1, CP2	Selectable 1cps/30cps/2kcps/5kcps by internal DIP switch		
Min. input signal width	RESET input	Approx. 20ms	
Input	COUNT IN	No-voltage input	
	RESET	<ul style="list-style-type: none"> <li>• Impedance at short-circuit: Max. 470kΩ</li> <li>• Residual voltage at short-circuit: Max. 1VDC</li> <li>• Impedance at open-circuit: Min. 100kΩ</li> </ul>	
One-shot output time	0.05 to 5sec.		
Control output	Con-tact	Type	SPST(1a)
		Capacity	250VAC 3A resistive load
Memory protection	Approx. 10 years(When using non-volatile semiconductor memory)		
External power	12VDC ±10% 50mA max.		
Insulation resistance	100MΩ(at 500VDC megger)		
Dielectric strength	2000VAC 50/60Hz for 1 minute		
Noise strength	AC power	±2kV the square wave noise(pulse width: 1μs) by the noise simulator	
	DC power	±500V the square wave noise(pulse width: 1μs) by the noise simulator	
Vibration	Mechanical	0.75mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 1 hour	
	Malfunction	0.5mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 10 minutes	
Shock	Mechanical	300m/s <sup>2</sup> (approx. 30G) in each of X, Y, Z directions for 3 times	
	Malfunction	100m/s <sup>2</sup> (approx. 10G) in each of X, Y, Z directions for 3 times	
Relay life cycle	Mechanical	Min. 10,000,000 operations	—
	Electrical	Min. 100,000 operations(250VAC 3A at resistive load)	—
Environment	Ambient temperature	-10 to 55°C, storage: -25 to 65°C	
	Ambient humidity	35 to 85%RH, storage: 35 to 85%RH	
Unit weight	Approx. 130g		Approx. 120g

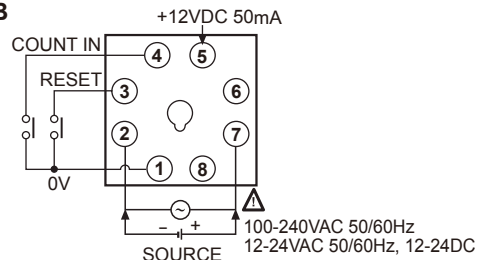
※Environment resistance is rated at no freezing or condensation.

### Connections

#### • FS4A





#### • FS5B



# DIN W72×H72, W144×H72mm of 8 digit Up/Down counter [F/L Series]

## ■ Specifications

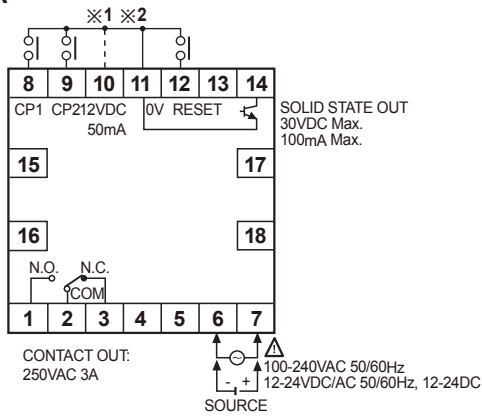
Model	Single preset	F8A	L8A
	Totalizer(Indicator)	F8B	L8B
Appearances & Dimensions	 [W72×H72×L112mm]		 [W144×H72×L112mm]
	Digit		8digit
Digit size		W4×H8mm	W6.3×H10mm
Power supply		100-240VAC 50/60Hz, 12-24VAC/DC(Option)	
Allowable voltage range		90 to 110% of rated voltage	
Power consumption	AC Voltage type	• Indicator: Approx. 5.4VA • Single preset: Approx. 6.1VA(240VAC 50/60Hz)	
	AC/DC Voltage type	• Indicator: Approx. 5.5VA • Single preset: Approx. 6.3VA(240VAC 50/60Hz) • Indicator: Approx. 2.6W • Single preset: Approx. 3.1W(24VDC)	
Max. counting speed		Selectable 1cps/30cps/2kcps/5kcps by internal DIP switch	
Min. signal width	RESET input	Approx. 20ms	
Input type	CP1, CP2 Input	[Voltage input] Input impedance: 5.4kΩ, "H" level voltage: 5-30VDC, "L" level voltage: 0-2VDC	
	RESET input	[No-Voltage input] Impedance at short-circuit: Max. 1kΩ, Residual voltage at short-circuit: Max. 2VDC, Impedance at open-circuit: Min. 100kΩ	
One-shot output time		0.05 to 5sec	
Control output	Con-tact	Type	Single preset: SPDT(1c)
		Capacity	250VAC 3A resistive load
	Solid-state	Type	Single preset type: 1 NPN open collector
		Capacity	30VDC Max. 100mA Max.
Memory protection		Approx. 10 years(When using non-volatile semiconductor memory)	
External power		12VDC±10% 50mA Max.	
Insulation resistance		100MΩ(at 500VDC megger)	
Noise strength	AC power	±2kV the square wave noise(pulse width: 1μs) by the noise simulator	
	DC power	±500V the square wave noise(pulse width: 1μs) by the noise simulator	
Vibration	Mechanical	0.75mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 1 hour	
	Malfunction	0.5mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 10 minutes	
Shock	Mechanical	300m/s <sup>2</sup> (approx. 30G) in each of X, Y, Z directions for 3 times	
	Malfunction	100m/s <sup>2</sup> (approx. 10G) in each of X, Y, Z directions for 3 times	
Relay life cycle	Mechanical	Min. 10,000,000 operations	
	Electrical	Min. 100,000 operations(250VAC 3A at resistive load)	
Environment	Ambient temperature	-10 to 55°C, storage: -25 to 65°C	
	Ambient humidity	35 to 85%RH, storage: 35 to 85%RH	
Unit weight		F8A: Approx. 287g, F8B: Approx. 253g	L8A: Approx. 500g, L8B: Approx. 446g

※Environment resistance is rated at no freezing or condensation.

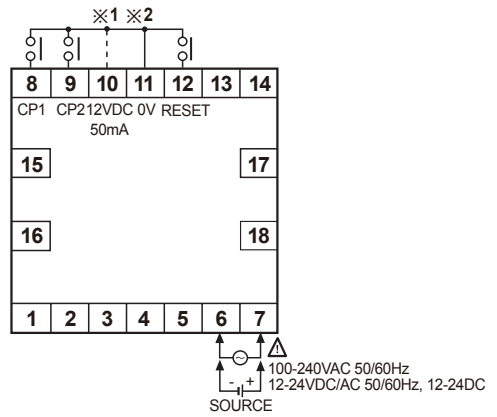
Photo electric sensor
Fiber optic sensor
Door/Area sensor
Proximity sensor
Pressure sensor
Rotary encoder
Connector/Socket
Temp. controller
SSR/Power controller
<b>Counter</b>
Timer
Panel meter
Tacho/Speed/ Pulse meter
Display unit
Sensor controller
Switching mode power supply
Stepper motor& Driver&Controller
Graphic/Logic panel
Field network device

## ■ Connections

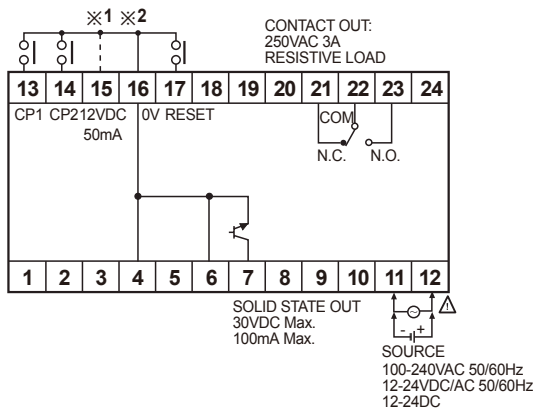
### ● F8A



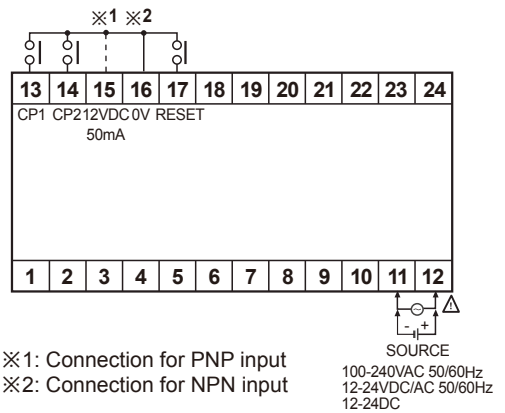
### ● F8B



### ● L8A



### ● L8B





※1: Connection for PNP input  
 ※2: Connection for NPN input

SOURCE  
 100-240VAC 50/60Hz  
 12-24VDC/AC 50/60Hz  
 12-24DC

# DIN W72×H72, W144×H72mm of Up / Down / Up-Down measure counter [FM/LM Series]

## Specifications

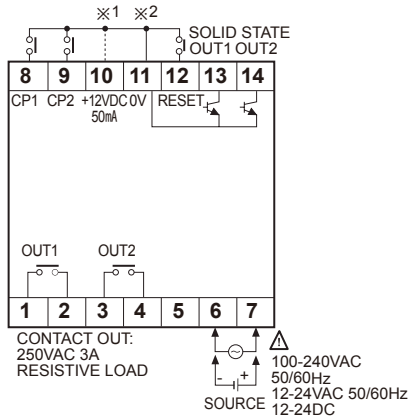
Model	Single preset	<b>F4AM</b>	<b>F6AM</b>	—	—	
	Dual preset	<b>F4AM-2P</b>	<b>F6AM-2P</b>	<b>L4AM-2P</b>	<b>L6AM-2P</b>	
	Totalizer(Indicator)	<b>F4BM</b>	<b>F6BM</b>	<b>L4BM</b>	<b>L6BM</b>	
Appearances & Dimensions	 [W72×H72×L112mm]			 [W144×H72×L112mm]		
	Digit	4digit	6digit	4digit	6digit	
Digit size	W8×H14mm		W4×H8mm	W8×H14mm		
Power supply	AC Voltage type	100-240VAC 50/60Hz				
	AC/DC Voltage type	100-240VAC 50/60Hz, 12-24VDC universal				
Allowable voltage range	90 to 110% of rated voltage					
Power consumption	AC Voltage type	• Indicator: Approx. 4.7VA • Single preset: Approx. 5.6VA • Dual preset: Approx. 6.5VA(240VAC 50/60Hz)				
	AC/DC Voltage type	• Indicator: Approx. 5.1VA • Single preset: Approx. 6VA • Dual preset: Approx. 6.5VA(24VAC 50/60Hz) • Indicator: Approx. 2.7W • Single preset: Approx. 3.3W • Dual preset: Approx. 3.8W(24VDC)				
Max. counting speed	Selectable 1cps/30cps/2kcps/5kcps by internal DIP switch					
Min. signal width	Approx. 20ms					
Input type	CP1,CP2 input	Input logic is selectable [Voltage input] Input impedance: 5.4kΩ, "H" level voltage: 5-30VDC, "L" level voltage: 0-2VDC [No-Voltage input] Impedance at short-circuit: Max. 1kΩ, Residual voltage at short-circuit: Max. 2VDC, Impedance at open-circuit: Min. 100kΩ				
	RESET input					
One-shot output time	• Single preset: 0.5sec. • Dual preset: 0.05 to 5sec.					
Control output	Contact	Type	Single preset: SPDT(1c) Dual preset: Single preset SPST(1a), Dual preset SPST(1a)		Dual preset: Single preset SPDT(1c), Dual preset SPDT(1c)	
		Capacity	250VAC 3A resistive load			
	Solid-state	Type	Single preset: 1 NPN open collector output, Dual preset: 2 NPN open collector output			
		Capacity	30VDC Max. 100mA Max.			
Memory protection	Approx. 10 years(When using non-volatile semiconductor memory)					
External power	12VDC±10% 50mA Max.					
Insulation resistance	100MΩ(at 500VDC megger)					
Dielectric strength	2000VAC 50/60Hz for 1 minute					
Noise strength	AC power	±2kV the square wave noise(pulse width: 1μs) by the noise simulator				
	DC power	±500V the square wave noise(pulse width: 1μs) by the noise simulator				
Vibration	Mechanical	0.75mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 1 hour				
	Malfunction	0.5mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 10 minutes				
Shock	Mechanical	300m/s <sup>2</sup> (approx. 30G) in each of X, Y, Z directions for 3 times				
	Malfunction	100m/s <sup>2</sup> (approx. 10G) in each of X, Y, Z directions for 3 times				
Relay life cycle	Mechanical	Min. 10,000,000 operations				
	Electrical	Min. 100,000 operations(250VAC 3A at resistive load)				
Environment	Ambient temperature	-10 to 55°C, storage: -25 to 65°C				
	Ambient humidity	35 to 85%RH, storage: 35 to 85%RH				
Unit weight	AC Voltage type	F4AM: Approx. 273g, F6AM: Approx. 280g, F4AM-2P: Approx. 275g, F6AM-2P: Approx. 282g, F4BM: Approx. 229g, F6BM: Approx. 236g, L4AM: Approx. 505g, L6AM-2P: Approx. 533g, L4AM-2P: Approx. 438g, L6BM: Approx. 445g				
	AC/DC Voltage type	F4AM: Approx. 268g, F6AM: Approx. 275g, F4AM-2P: Approx. 270g, F6AM-2P: Approx. 287g, F4BM: Approx. 224g, F6BM: Approx. 231g, L4AM-2P: Approx. 511g, L6AM-2P: Approx. 538g, L4BM-2P: Approx. 444g, L6BM: Approx. 450g				

※Environment resistance is rated at no freezing or condensation.

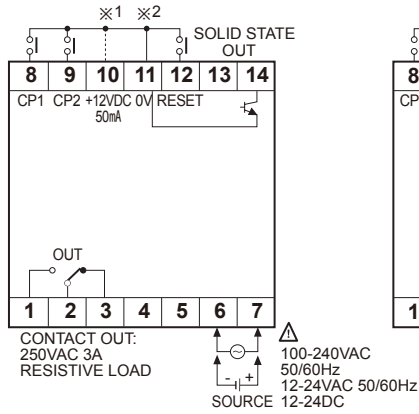
Photo electric sensor
Fiber optic sensor
Door/Area sensor
Proximity sensor
Pressure sensor
Rotary encoder
Connector/Socket
Temp. controller
SSR/Power controller
Counter
Timer
Panel meter
Tacho/Speed/Pulse meter
Display unit
Sensor controller
Switching mode power supply
Stepper motor& Driver&Controller
Graphic/Logic panel
Field network device

## ■ Connections

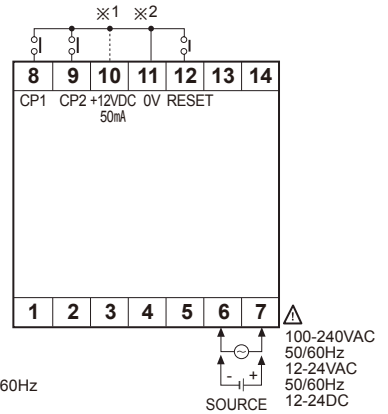
### ● F4AM-2P / F6AM-2P



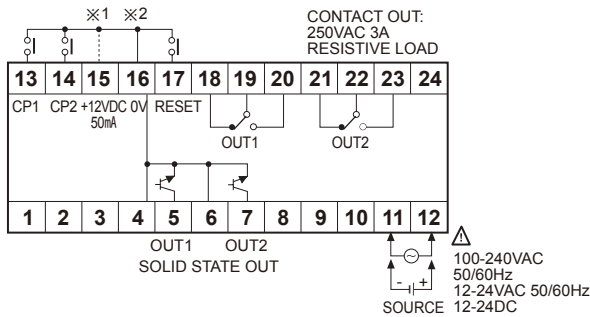
### ● F4AM / F6AM



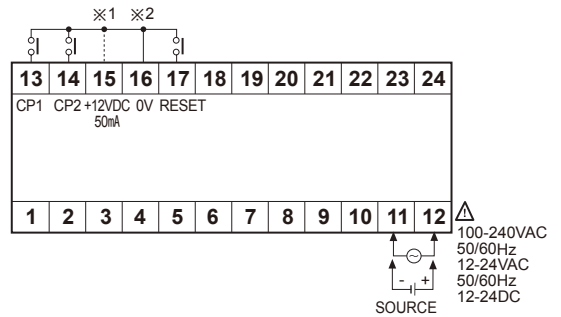
### ● F4BM / F6BM



### ● L4AM-2P / L6AM-2P



### ● L4BM / L6BM



※1: Connection for PNP input in contact input  
 ※2: Connection for NPN input in contact input




# DIN W48×H24mm, Indication only, LCD timer(hour meter) [LE8N Series]

## Ordering information

<b>LE</b>	<b>8</b>	<b>N</b>	-	<b>B</b>	<b>N</b>	-	<b>L</b>	
Item	Digit	Size		Power supply	Input type		Backlight	
								※ Shaded (□) parts are upgraded or added function.
								No mark
								None
								L
								Backlight function
								N
								No-voltage(Small signal) input
								V
								Voltage input
								F
								Free voltage input
								B
								Internal lithium battery
								N
								DIN W48×H24mm
								8
								99999999(8 digit)
								LE
								LCD Timer

## Specifications

Model	LE8N-BN	LE8N-BN-L	LE8N-BV	LE8N-BV-L	LE8N-BF
Appearances & Dimensions	 <p>Upgrade CE c RU us</p> <p>[W48×H24×L54mm]</p>				
Digit	8 digit(0 to 99999999)				
Digit size	W3.4 × H8.7mm				
Display method	LCD Zero Blanking type(character height size: 8.7mm)				
Operation method	Count up				
Power supply	Built-in battery				
Battery life cycle	Approx. over 10 years at 20°C				
Backlight power supply	—	24VDC±10%	—	24VDC±10%	—
Input method	No-voltage input		Voltage input		Free voltage input
Count input(Counter)	Residual voltage: Max. 0.5VDC Short-circuit impedance: Max. 10kΩ Open-circuit impedance: Min. 750kΩ		"H" level voltage: 4.5-30VDC "L" level voltage: 0-2VDC		"H" level voltage: 24-240VAC/6-240VDC "L" level voltage: 0-2VAC/0-2.4VDC
RESET input	No-voltage input		Voltage input		No-voltage input
Min. signal width	SIGNAL INPUT, RESET input: Min. 20ms				
Time specification(TS1)	99999999(h.m.s), 99999999(h.m), 99999999(h.m)				
Time specification(TS2)	9999.2359(d.h.m), 9999.239(d.h), 99999999(s)				
Time specification(TS3)	9999h599(h.m), 99999h59(h.m), 9999999h(h)				
Time error	±0.01%(time error, temperature error)				
External set switch	SW1 <sup>※1</sup> , SW2 <sup>※2</sup> , SW3 <sup>※3</sup>				
Insulation resistance	Min. 100MΩ(at 500VDC megger)				
Dielectric strength <sup>※4</sup>	2,000VAC 60Hz for 1minute				
Vibration	Mechanical	0.75mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 1 hour			
	Malfunction	0.3mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 10 minutes			
Shock	Mechanical	300m/s <sup>2</sup> (approx. 30G) in each of X, Y, Z directions for 3 times			
	Malfunction	100m/s <sup>2</sup> (approx. 10G) in each of X, Y, Z directions for 3 times			
Environment	Ambient temperature	-10 to 55°C, storage: -25 to 65°C			
	Ambient humidity	35 to 85%RH, storage: 35 to 85%RH			
Protection	IP66(using waterproof rubber for front panel)				
Accessory	Mounting bracket, Rubber waterproof ring				
Approval	CE c RU us				
Weight <sup>※5</sup>	Approx. 96g(approx. 50g)				

※1: SW1 is the front panel RESET key enable/disable set switch.      ※2: SW2 is the time range set switch.

※3: SW3 is available to select time specification TS1, TS2, or TS3.

※4: No-voltage input, voltage input: between terminals and the case / Free voltage input: between the free voltage input terminal and the RESET input terminal, between terminals and the case

※5: This weight is with packaging and the weight in parentheses is only unit weight.

※Environment resistance is rated at no freezing or condensation.

Photo electric sensor
Fiber optic sensor
Door/Area sensor
Proximity sensor
Pressure sensor
Rotary encoder
Connector/Socket
Temp. controller
SSR/Power controller
Counter
Timer
Panel meter
Tacho/Speed/Pulse meter
Display unit
Sensor controller
Switching mode power supply
Stepper motor& Driver&Controller
Graphic/Logic panel
Field network device

## ■ Connections

Input type	No-backlight	Backlight function
No-voltage input type	<p>•LE8N-BN<sup>※1</sup></p>	<p>•LE8N-BN-L<sup>※2</sup></p>
Voltage input type	<p>•LE8N-BV<sup>※1</sup></p>	<p>•LE8N-BV-L<sup>※2</sup></p> <p>※Backlight power is available as signal input (SIGNAL INPUT, RESET).</p>
Free voltage input type	<p>•LE8N-BF</p> <p>※Terminal (1, 2) and (4, 5) are insulated inside.</p>	

※1: Terminal 2 and 5 are connected inside. (Non-isolated)

※Use reliable contacts enough to flow 5μA current.

※2: Terminal (1, 2, 3) and (4, 5) are insulated inside.

## Digital LCD timer DIN W48×H48mm [LE3S Series]

### ■ Specifications

Model	LE3S	LE3SA	LE3SB
Appearances & Dimensions	  [W48×H48×L67mm]		
Function	Multi time and operation	Multi time range, Power ON Delay operation	
Display method	LCD display(character size: W4×H8mm)		
Power supply	24-240VAC 50/60Hz / 24-240VDC universal		
Allowable voltage range	90 to 110% of rated voltage		
Power consumption	Approx. 2.5VA(240VAC 50/60Hz), Approx. 1W(240VDC)	Approx. 3.3VA(240VAC 50/60Hz), Approx. 1.5W(240VDC)	
Reset time	Max. 200ms	Max. 100ms	

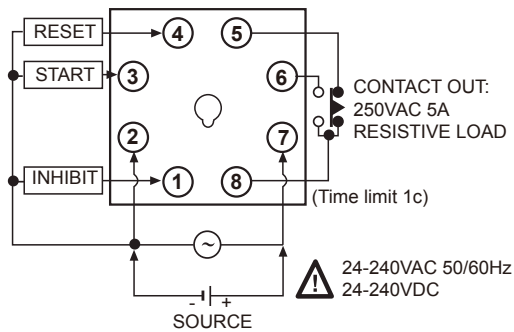
## Specifications

Model		LE3S	LE3SA	LE3SB
Min. input signal	START	Min. 20ms	—	
	INHIBIT			
	RESET			
Input	START	• No-voltage input Impedance at short-circuit: Max. 1kΩ Residual voltage: Max. 0.5VDC Impedance at open-circuit: Min. 100kΩ	—	
	INHIBIT			
	RESET			
Timing operation		Signal ON Start	Power ON Start	
Control output	Contact type	Time limit SPDT(1c)	Time limit DPDT(2c)	Time limit SPDT(1c), Instantaneous SPDT(1c)
	Contact capacity	250VAC 5A resistive load	250VAC 3A resistive load	
Relay life cycle	Mechanical	Min. 10,000,000 operations		
	Electrical	Min. 100,000 operations (250VAC 5A resistive load)	Min. 100,000 operations (250VAC 3A resistive load)	
Output mode		10 operation modes	Power ON Delay mode	
Environment	Ambient temperature	-10 to 55°C, storage: -25 to 65°C		
	Ambient humidity	35 to 85%RH		
Accessory		Bracket		
Repeat error	Max. ±0.01% ±0.05sec. (for Power ON Start)		Max. ±0.01% ±0.05sec.	
SET error	Max. ±0.005% ±0.03sec. (for Signal ON Start)			
Voltage error				
Temperature error				
Insulation resistance		100MΩ(at 500VDC megger)		
Dielectric strength		2000VAC 50/60Hz for 1 minute		
Noise strength		±2kV the square wave noise(pulse width: 1μs) by the noise simulator		
Vibration	Mechanical	0.75mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 1hour		
	Malfunction	0.5mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 10 minutes		
Shock	Mechanical	300m/s <sup>2</sup> (approx. 30G) in each of X, Y, Z directions for 3 times		
	Malfunction	100m/s <sup>2</sup> (approx. 10G) in each of X, Y, Z directions for 3 times		
Approval				
Unit weight		Approx. 100g	Approx. 105g	

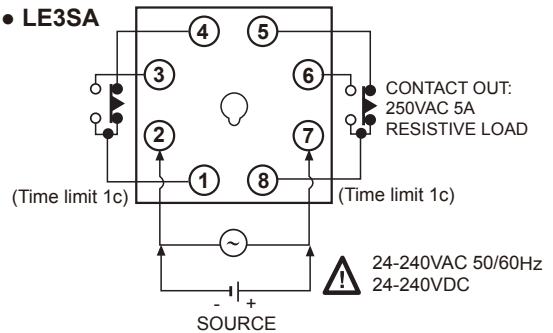
※Environment resistance is rated at no freezing or condensation.

## Connections

### LE3S



### LE3SA



### LE3SB

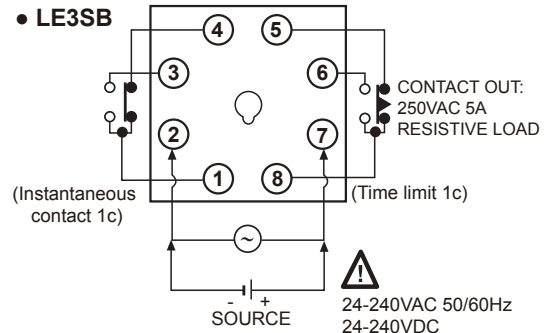


Photo electric sensor

Fiber optic sensor

Door/Area sensor

Proximity sensor

Pressure sensor

Rotary encoder

Connector/Socket

Temp. controller

SSR/Power controller

Counter

Timer

Panel meter

Tacho/Speed/ Pulse meter

Display unit

Sensor controller

Switching mode power supply



Stepper motor & Driver&Controller

Graphic/Logic panel

Field network device

## DIN W48×H48mm Digital backlight LCD timer [LE4S Series]

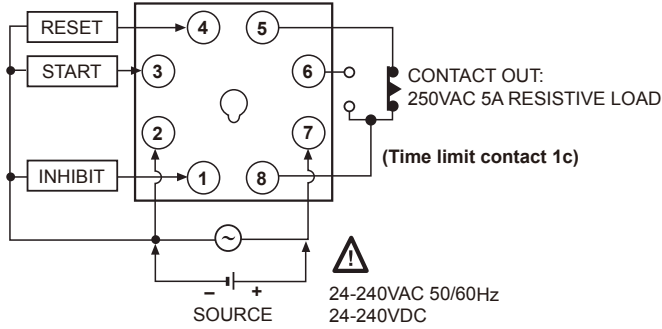
### Specifications

Model		LE4S	LE4SA
Appearances & Dimensions		 [W48×H48×L70mm]	
Function		Multi time and Multi operation	
Display method		LCD display(Backlight)	
Power supply		24-240VAC 50/60Hz, 24-240VDC universal	
Allowable voltage range		90 to 110% of rated voltage	
Power consumption		24-240VAC: Max. 4.5VA, 24-240VDC: Max. 2W	24-240VAC: Max. 4VA, 24-240VDC: Max. 1.6W
Return time		Max. 100ms	
Min. input signal	START	1ms, 20ms(selectable)	—
	INHIBIT		
	RESET		
Input	START	• No-voltage input Impedance at short-circuit: Max. 1k $\Omega$ , Residual voltage: Max. 0.5V, Impedance at open-circuit: Min. 100k $\Omega$	—
	INHIBIT		
	RESET		
Timing operation		Signal ON Start	Power ON Start
Control output	Contact type	Time limit SPDT(1c)	Selectable Time limit DPDT(2c), Time limit SPDT(1c)+ Instantaneous SPDT(1c) (depends on operation mode)
	Contact capacity	250VAC 5A resistive load	250VAC 3A resistive load
Relay life cycle	Mechanical	Min. 10,000,000 operations	
	Electrical	Min. 100,000 operations (at rated contact capacity)	
Output mode		10 operation modes	8 operation modes
Environment	Ambient temperature	-10 to 55°C, storage: -25 to 65°C	
	Ambient humidity	35 to 85%RH	
Accessory		Bracket	
Repeat error		Max. $\pm 0.01\% \pm 0.05\text{sec.}$ (Power ON Start) Max. $\pm 0.005\% \pm 0.03\text{sec.}$ (Signal ON Start)	Max. $\pm 0.01\% \pm 0.05\text{sec.}$
Setting error			
Voltage error			
Temperature error			
Insulation resistance		100M $\Omega$ (at 500VDC megger)	
Dielectric strength		2000VAC 50/60Hz for 1 minute	
Noise strength		$\pm 2\text{kV}$ the square wave noise(pulse width: 1 $\mu\text{s}$ ) by the noise simulator	
Vibration	Mechanical	0.75mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 1 hour	
	Malfunction	0.5mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 10 minutes	
Shock	Mechanical	300m/s <sup>2</sup> (approx. 30G) in each of X, Y, Z directions for 3 times	
	Malfunction	100m/s <sup>2</sup> (approx. 10G) in each of X, Y, Z directions for 3 times	
Approval			
Unit weight		Approx. 98g	

※Environment resistance is rated at no freezing or condensation.

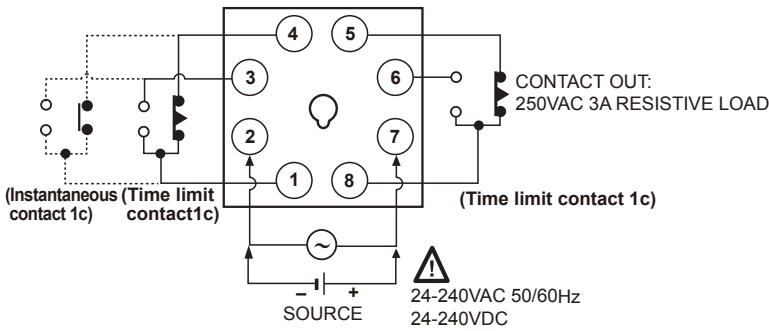
■ Connections

○ LE4S



○ LE4SA

- [ON.D] [ON.D.II] [FK] [FKI] [INT] [T] [T.I] mode



※Time limit contact 1c + Instantaneous contact 1c or Time limit contact 2c (Selectable)  
([T] [T.I]: Time limit 2c only.)

- [ $\lambda$ - $\Delta$ ] mode

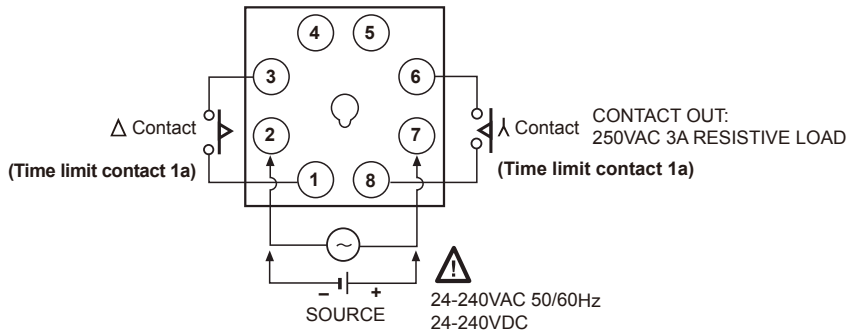



Photo electric sensor
Fiber optic sensor
Door/Area sensor
Proximity sensor
Pressure sensor
Rotary encoder
Connector/Socket
Temp. controller
SSR/Power controller
Counter
Timer
Panel meter
Tacho/Speed/Pulse meter
Display unit
Sensor controller
Switching mode power supply
Stepper motor & Driver&Controller
Graphic/Logic panel
Field network device

## DIN W48×H48mm 8 pin plug timer [FSE Series]

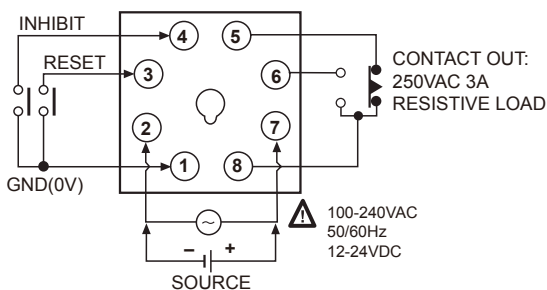
### Specifications

Model	FS4E		FS5EI
Appearances & Dimensions	 [W48×H48×L85mm]		
Function	Single preset Up/Down Timer		Up/Down indicator
Character size	W4×H8mm		
Power supply	100-240VAC 50 /60Hz, 12-24VAC/DC universal		
Allowable voltage range	90 to 110% of rated voltage		
Power consumption	Approx. 4.5VA(240VAC 60Hz), Approx. 2.5W(24VDC)	Approx. 3.5VA(240VAC 60Hz), Approx. 2.2W(24VDC)	
Return time	Min. 500ms		
Min. input signal width	RESET	Approx. 20ms	
	INHIBIT		
Input	RESET	No-voltage input - Impedance at short-circuit: Max. 470Ω, Residual voltage at short-circuit: Max. 1VDC Impedance at open circuit: Min. 100kΩ	
	INHIBIT		
Timing operation	Power ON Start		
One-shot output time	0.05 to 5sec.		
Control output	Contact type	Time-limit SPDT(1c)	—
	Contact capacity	250VAC 3A at resistive load	—
Relay life cycle	Mechanical	Min. 10,000,000 operations	—
	Electrical	Min. 100,000 operations (250VAC 3A resistive load)	—
Memory protection	10 years(When using non-volatile semiconductor memory)		
Repeat error	Max. ±0.01% ±0.05sec.		
SET error			
Voltage error			
Temperature error			
Insulation resistance	100MΩ(at 500VDC megger)		
Dielectric strength	2000VAC 50/60Hz for 1 minute		
Noise strength	AC power	±2kV the square wave noise(pulse width: 1μs) by the noise simulator	
	DC power	±500V the square wave noise(pulse width: 1μs) by the noise simulator	
Vibration	Mechanical	0.75mm amplitude at frequency of 10 to 55Hz (for 1 min.) in each of X, Y, Z directions for 1hour	
	Malfunaction	0.5mm amplitude at frequency of 10 to 55Hz (for 1 min.) in each of X, Y, Z directions for 10 minutes	
Shock	Mechanical	300m/s <sup>2</sup> (approx. 30G) in each of X, Y, Z directions for 3 times	
	Malfunaction	100m/s <sup>2</sup> (approx. 10G) in each of X, Y, Z directions for 3 times	
Environment	Ambient temperature	-10 to 55°C, storage: -25 to 65°C	
	Ambient humidity	35 to 85%RH	
Accessory	Bracket		
Unit weight	AC power	Approx. 122g	Approx. 112g
	DC power	Approx. 130g	Approx. 120g

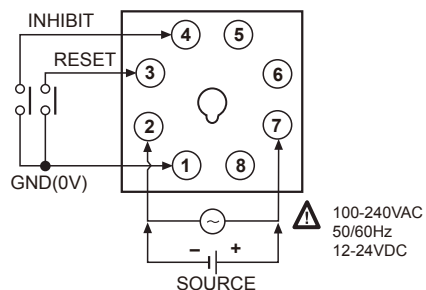
※Environment resistance is rated at no freezing or condensation.

### Connections

#### • FS4E



#### • FS5EI



# Multi Function Timer with Free power, Compact size W38×H42mm [ATS Series]

## Ordering information

<b>ATS</b>	<b>8</b>	—	<b>4</b>	<b>1</b>	
					Time range
					1 Time range 1(0.1 to 1)
					3 Time range 3(0.3 to 3)
					Power supply
					1 12VDC
					2 24VAC / 24VDC
					4 100-240VAC / 24-240VDC
					Number of plug pins
					8 8-pin plug type
					Item
					ATS Small Analog Timer

※Sockets (PG-08, PS-08, PS-M08) are sold separately.

<b>ATS</b>	<b>11</b>	—	<b>4</b>	<b>1</b>	<b>D</b>
					Output
					D Time limit 2c
					E Instant limit 1c + Time limit 1c
					Time range
					1 Time range 1(0.1 to 1)
					3 Time range 3(0.3 to 3)
					Power supply
					1 12VDC
					2 24VAC / 24VDC
					4 100-240VAC / 24-240VDC
					Number of plug pins
					11 11-pin plug type
					Item
					ATS Small Analog Timer

※Sockets (PG-11, PS-11) are sold separately.

## Specifications





Model	ATS8-□1	ATS8-□3	ATS11-□1D	ATS11-□3D	ATS11-□1E	ATS11-□3E
Appearances & Dimensions	 [W38×H42×L75.5mm]		 [W38×H42×L75.5mm]		 [W38×H42×L75.5mm]	
Function	<b>Multi Function Timer</b>					
Control time setting range	0.1sec to 10hour	0.3sec to 30hour	0.1sec to 10hour	0.3sec to 30hour	0.1sec to 10hour	0.3sec to 30hour
Power supply	•100-240VAC 50/60Hz, 24-240VDC, universal •24VAC 50/60Hz, 24VDC, universal •12VDC					
Allowable voltage range	90 to 110% of rated voltage					
Power consumption	•100-240VAC: 4.2VA, 24-240VDC: 2W •24VAC: 4.5VA, 24VDC: 2W •12VDC: 1.5W		•100-240VAC: 3.5VA, 24-240VDC: 1.5W •24VAC: 4VA, 24VDC :1.5W •12VDC: 1W		•100-240VAC: 4.2VA, 24-240VDC: 2W •24VAC: 4.5VA, 24VDC: 2W •12VDC: 1.5W	
Return time	Max. 100ms					
Min. input signal width	START INHIBIT RESET		—		Max. 50ms	
Input	START INHIBIT RESET		—		No-voltage input - Short-circuit impedance: Max. 1kΩ, Residual voltage: Max. 0.5V Open-circuit impedance: Max. 100kΩ	
Time operation	Power ON Start		Signal ON Start			
Control output	Contact type	Time limit DPDT(2c) or Instantaneous SPDT(1c)+Time limit SPDT(1c) selectable by output operation mode		Time limit DPDT (2c)		Time limit SPDT (1c), Instant limit SPDT (1c)
	Contact capacity	250VAC 3A resistive load				
Relay life cycle	Mechanical	Min. 10,000,000 operations				
	Electrical	Min. 100,000 operations (250VAC 3A resistive load)				

Photo electric sensor
Fiber optic sensor
Door/Area sensor
Proximity sensor
Pressure sensor
Rotary encoder
Connector/Socket
Temp. controller
SSR/ Power controller
Counter
<b>Timer</b>
Panel meter
Tacho/ Speed/ Pulse meter
Display unit
Sensor controller
Switching mode power supply
Stepper motor& Driver&Controller
Graphic/ Logic panel
Field network device

## Specifications

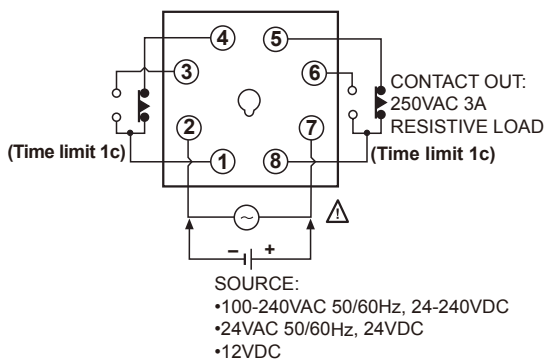
Model	ATS8-□1	ATS8-□3	ATS11-□1D	ATS11-□3D	ATS11-□1E	ATS11-□3E
Repeat error	Max. ±0.2% ±10ms					
Setting error	Max. ±5% ±50ms					
Voltage error	Max. ±0.5%					
Temperature error	Max. ±2%					
Insulation resistance	100MΩ(at 500VDC megger)					
Dielectric strength	2000VAC 50/60Hz for 1 min.					
Noise resistance	±2kV the square wave noise (pulse width 1μs) by noise simulator					
Vibration	Mechanical	0.75mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 1 hour				
	Malfunction	0.5mm mplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 10 min.				
Shock	Mechanical	300m/s <sup>2</sup> (approx. 30G) in each of X, Y, Z directions 3 times				
	Malfunction	100m/s <sup>2</sup> (approx. 10G) in each of X, Y, Z directions 3 times				
Environment	Ambient temperature	-10 to 55°C, storage: -25 to 65°C				
	Ambient humidity	35 to 85%RH, storage: 35 to 85%RH				
Approval	CE 					
Accessory	Bracket					
Unit weight	Approx. 72g					

※Environment resistance is rated at no freezing or condensation.

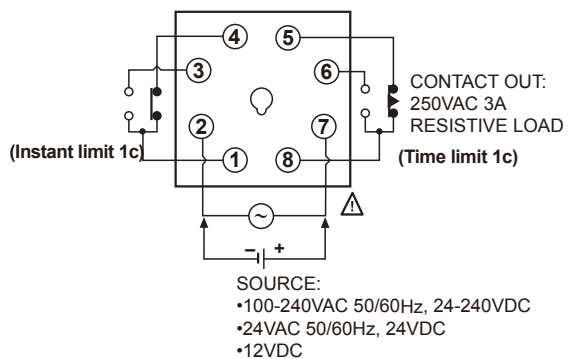
## Connections

### ATS8

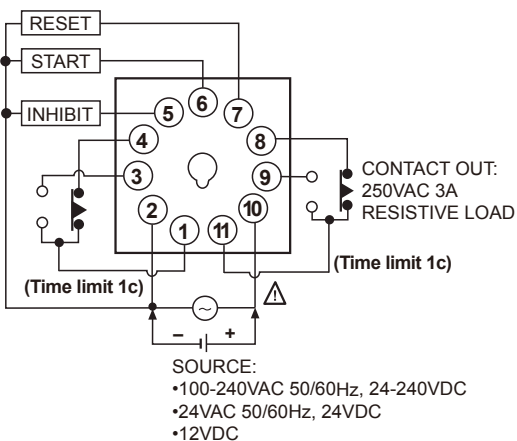
●When selecting [A], [F]  
output operation mode



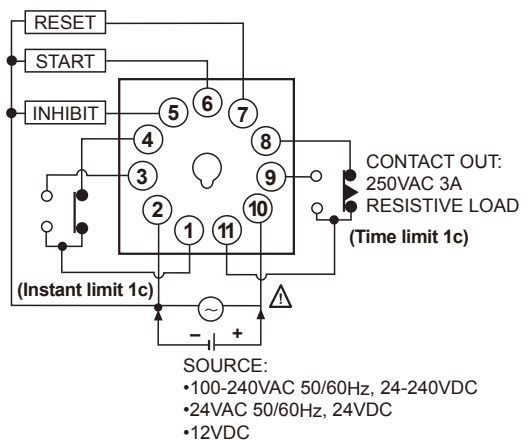
●When selecting [A1], [B], [F1], [I]  
output operation mode



### ATS11-□□D






### ATS11-□□E





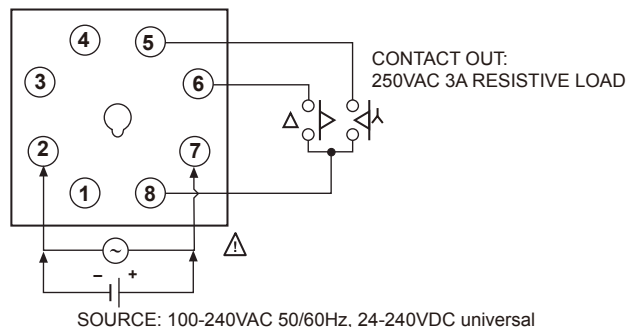
# Star-Delta Timer with Free power, compact size W38×H42mm [ATS8SD-4]

## Specifications

Model	ATS8SD-4	
Appearances & Dimensions	  [W38×H42×L75.5mm]	
Function	Star-Delta Timer	
Control time setting range	0.5sec to 100sec (max. time)	
Power supply	100-240VAC 50/60Hz /24-240VDC universal	
Allowable voltage range	90 to 110% of rated voltage	
Power consumption	100-240VAC: 3VA, 24-240VDC: 1.5W	
Return time	Max. 100ms	
Time operation	Power ON Start type	
Control output	Contact type	λ contact: SPST(1a), Δ contact: SPST(1a)
	Contact capacity	250VAC 3A resistive load
Relay life cycle	Mechanical	Min. 10,000,000 operations
	Electrical	Min. 100,000 operations (250VAC 3A resistive load)
Repeat error	Max. ±0.2% ±10ms	
λ setting error	Max. ±5% ±50ms	
Voltage error	Max. ±0.5%	
Temperature error	Max. ±2%	
λ -Δ switching time error	Max. ±25%	
Insulation resistance	100MΩ (at 500VDC megger)	
Dielectric strength	2000VAC 50/60Hz for 1 min.	
Noise resistance	±2kV the square wave noise (pulse width 1μs) by noise simulator	
Vibration	Mechanical	0.75mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 1 hour
	Malfunction	0.5mm mplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 10 min.
Shock	Mechanical	300m/s <sup>2</sup> (approx. 30G) in each of X, Y, Z directions 3 times
	Malfunction	100m/s <sup>2</sup> (approx. 10G) in each of X, Y, Z directions 3 times
Environment	Ambient temperature	-10 to 55°C, storage: -25 to 65°C
	Ambient humidity	35 to 85%RH, storage: 35 to 85%RH
Approval		
Accessory	Bracket	
Unit weight	Approx. 72g	

※Environment resistance is rated at no freezing or condensation.




## Connections



- Photo electric sensor
- Fiber optic sensor
- Door/Area sensor
- Proximity sensor
- Pressure sensor
- Rotary encoder
- Connector/Socket
- Temp. controller
- SSR/Power controller
- Counter
- Timer**
- Panel meter
- Tacho/Speed/ Pulse meter
- Display unit
- Sensor controller
- Switching mode power supply
- Stepper motor & Driver&Controller
- Graphic/Logic panel
- Field network device

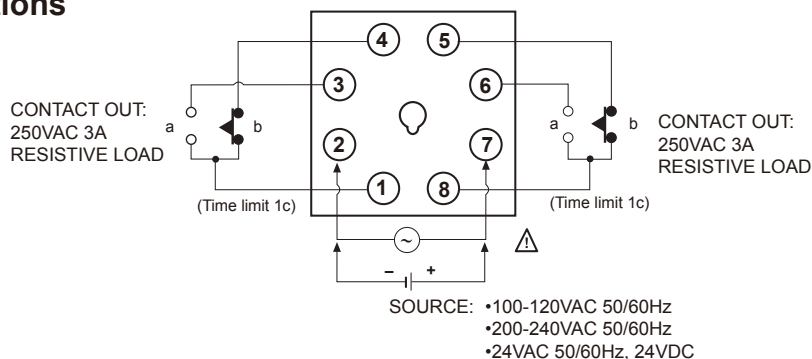
## Power-OFF Delay Timer, compact size W38×H42mm [ATS8P Series]

### Specifications

Model	ATS8P-2S	ATS8P-5S	ATS8P-6S	ATS8P-2M	ATS8P-5M	ATS8P-6M
Appearances & Dimensions	  [W38×H42×L75.5mm]					
Function	<b>Power OFF Delay</b>					
Control time setting range	0.1sec to 10sec			0.1min to 10min		
Power supply	•100-120VAC 50/60Hz 24VAC 50/60Hz, 24VDC universal	•200-240VAC 50/60Hz	•100-120VAC 50/60Hz	•24VAC 50/60Hz, 24VDC universal	•200-240VAC 50/60Hz	•100-120VAC 50/60Hz
Allowable voltage range	90 to 110% of rated voltage					
Power consumption	24VAC: 0.2VA, 24VDC: 0.2W	1.5VA	1.5VA	24VAC: 0.2VA, 24VDC: 0.2W	1.5VA	1.5VA
Time operation	Power OFF Start type					
Control output	Contact type	Time limit DPDT(2c)				
	Contact capacity	250VAC 3A resistive load				
Relay life cycle	Mechanical	Min. 10,000,000 operations				
	Electrical	Min. 100,000 operations (250VAC 3A resistive load)				
Repeat error	Max. ±0.2% ±10ms					
Setting error	Max. ±5% ±50ms					
Voltage error	Max. ±0.5%					
Temperature error	Max. ±2%					
Insulation resistance	100MΩ(at 500VDC megger)					
Dielectric strength	2000VAC 50/60Hz for 1 min.					
Noise resistance	±2kV the square wave noise (pulse width: 1μs) by noise simulator					
Vibration	Mechanical	0.75mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 1 hour				
	Malfunction	0.5mm mplitude at frequency of 10 to 55HHz(for 1 min.) in each of X, Y, Z directions for 10 min.				
Shock	Mechanical	300m/s <sup>2</sup> (approx. 30G) in each of X, Y, Z directions 3 times				
	Malfunction	100m/s <sup>2</sup> (approx. 10G) in each of X, Y, Z directions 3 times				
Environment	Ambient temperature	-10 to 55°C, storage: -25 to 65°C				
	Ambient humidity	35 to 85%RH, storage: 35 to 85%RH				
Approval						
Accessory	Bracket					
Unit weight	Approx. 80g			Approx. 85g		

※Environment resistance is rated at no freezing or condensation.

### Connections






# Twin Timer with free power, compact size W38×H42mm [ATS8W/ATS11W Series]

## Ordering information

<b>ATS</b>	<b>8</b>	<b>W</b>	—	<b>4</b>	<b>1</b>	※Sockets (PG-08, PS-08, PS-M8, PG-11, PS-11) are sold separately.		
						Time range		
						1	Time range 1(0.1 to 1)	
						3	Time range 3(0.3 to 3)	
						Power supply		
						1	12VDC	
						2	24VAC / 24VDC	
						4	100-240VAC / 24-240VDC	
						Time operation		
						W	Twin(Flicker) operation	
						Number of plug pins		
						8	8-pin plug type	
						11	11-pin plug type	
						Item	ATS	Small Analog Timer

## Specifications

Model	ATS8W-□1	ATS11W-□1	ATS8W-□3	ATS11W-□3
Appearances & Dimensions	  <p>[W38×H42×L75.5mm]</p>			
Function	<b>ON/OFF Flicker operation</b>			
Control time setting range	0.1sec to 10hour		0.3sec to 30hour	
Power supply	•100-240VAC 50/60Hz, 24-240VDC (universal)		•24VAC 50/60Hz, 24VDC (universal) •12VDC	
Allowable voltage range	90 to 110% of rated voltage			
Power consumption	•100-240VAC: 4.2VA, 24-240VDC: 2W •24VAC: 4.5VA, 24VDC: 2W •12VDC: 1.5W			
Return time	Max. 100ms			
Time operation	Power ON Start type			
Control output	Contact type	Time limit DPDT(2c), Instantaneous SPDT(1c)+Time limit SPDT(1c) selectable according to output operation mode		
	Contact capacity	250VAC 3A resistive load		
Relay life cycle	Mechanical	Min. 10,000,000 operations		
	Electrical	Min. 100,000 operations(250VAC 3A resistive load)		
Repeat error	Max. ±0.2% ±10ms			
Set error	Max. ±5% ±50ms			
Voltage error	Max. ±0.5%			
Temperature error	Max. ±2%			
Insulation resistance	100MΩ (at 500VDC megger)			
Dielectric strength	2000VAC 50/60Hz for 1 min.			
Noise resistance	±2kV the square wave noise (pulse width 1μs) by noise simulator			
Vibration	Mechanical	0.75mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 1 hour		
	Malfunction	0.5mm mplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 10 min.		
Shock	Mechanical	300m/s <sup>2</sup> (approx. 30G) in each of X, Y, Z directions 3 times		
	Malfunction	100m/s <sup>2</sup> (approx. 10G) in each of X, Y, Z directions 3 times		
Environment	Ambient temperature	-10 to 55°C, storage: -25 to 65°C		
	Ambient humidity	35 to 85%RH, storage: 35 to 85%RH		
Approval				
Accessory	Bracket			
Unit weight	Approx. 72g			

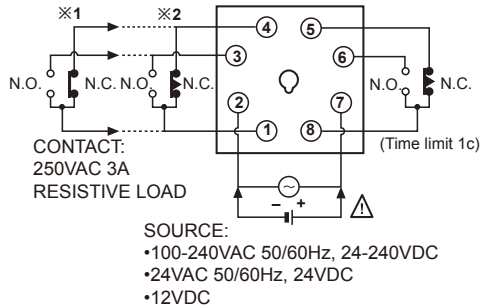
※Environment resistance is rated at no freezing or condensation.

Photo electric sensor
Fiber optic sensor
Door/Area sensor
Proximity sensor
Pressure sensor
Rotary encoder
Connector/Socket
Temp. controller
SSR/ Power controller
Counter
<b>Timer</b>
Panel meter
Tacho/ Speed/ Pulse meter
Display unit
Sensor controller
Switching mode power supply
Stepper motor& Driver&Controller
Graphic/ Logic panel
Field network device

## Connections

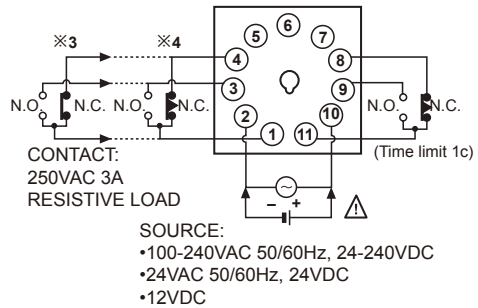
### ATS8W

- ※1: When selecting [F2], [N2] output operation mode
- ※2: When selecting [F1], [F3], [N1], [N3] output operation mode



### ATS11W

- ※3: When selecting [F2], [N2] output operation mode
- ※4: When selecting [F1], [F3], [N1], [N3] output operation mode



## DIN W48×H48mm, Universal voltage multi-function timer [ATN Series]

### Ordering information




AT	8	N	-	
Item	Power supply		No mark	100-240VAC/24-240VDC
			1	12VDC
			2	24VAC/DC
	Time operation		N	Time limit contact 2c or time limit contact 1c with instantaneous contact 1c by selecting output operation mode
	Number of plug pins		8	8-pin plug type
		AT	Analog Timer	

※Sockets (PG-08, PS-08) are sold separately.

AT	11	DN	-	
Item	Power supply		No mark	100-240VAC/24-240VDC
			1	12VDC
			2	24VAC/DC
	Time operation		DN	Time limit 2c
			EN	Time limit 1c, Instantaneous contact 1c
Number of plug pins		11	11-pin plug type	
		AT	Analog Timer	

※Sockets (PG-11, PS-11) are sold separately.

### Specifications

Model	AT8N-□	AT11EN-□	AT11DN-□
Appearances & Dimensions	 [W48×H48×L65mm]	 [W48×H48×L65mm]	 [W48×H48×L65mm]
Function	Multi function timer		
Control time setting range	0.05 sec. to 100 hour		
Power supply	• 100-240VAC 50/60Hz, 24-240VDC universal • 24VAC 50/60Hz, 24VDC universal • 12VDC		
Allowable voltage range	90 to 110% of rated voltage		
Power consumption	• 100-240VAC: 4.3VA, 24-240VDC: 2W • 24VAC: 4.5VA, 24VDC: 2W • 12VDC: 1.5W		• 100-240VAC: 3.5VA, 24-240VDC: 1.5W • 24VAC: 4VA, 24VDC: 1.5 • 12VDC: 1W
Reset time	Max. 100ms		
Min. input signal width	START	—	Min. 50ms
	INHIBIT		
	RESET		

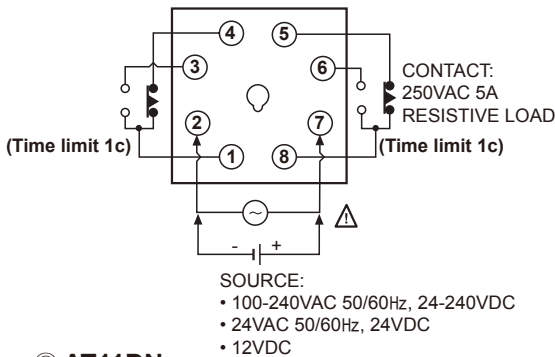
Model		AT8N-□	AT11EN-□	AT11DN-□
Input	START	—	No-voltage input - Short-circuit impedance: Max. 1kΩ Residual voltage: Max. 0.5V Open-circuit impedance: Min. 100kΩ	
	INHIBIT			
	RESET			
Timing operation		Power ON start type	Signal ON Start type	
Control output	Contact type	Time limit DPDT(2c), Time limit DPDT(1c)+ Instantaneous DPDT(1c) by selecting output operation mode	Time limit SPDT(1c), Instantaneous SPDT(1c)	Time limit DPDT(2c)
	Contact capacity	250VAC 5A resistive load		
Relay life cycle	Mechanical	Min. 10,000,000 operations		
	Electrical	Min. 100,000 operations(250VAC 5A resistive load)		
Repeat error		Max. ±0.2% ±10ms		
SET error		Max. ±5% ±50ms		
Voltage error		Max. ±0.5%		
Temperature error		Max. ±2%		
Insulation resistance		Min. 100MΩ(at 500VDC megger)		
Dielectric strength		2000VAC 50/60Hz for 1 minute		
Environ-ment	Ambient temperature	-10 to 55°C, storage: -25 to 65°C		
	Ambient humidity	35 to 85%RH		
Approval		CE  us		
Accessory		Bracket		
Unit weight		Approx. 90g		

※Environment resistance is rated at no freezing or condensation.

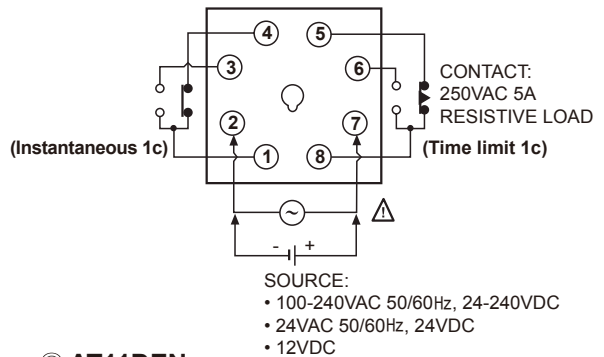
## ■ Connections

### ○ AT8N

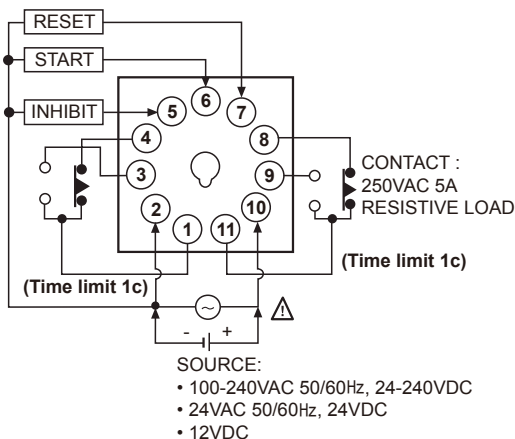
#### • [A], [F] mode



#### • [A1], [B], [F1], [I] mode



### ○ AT11DN



### ○ AT11DEN

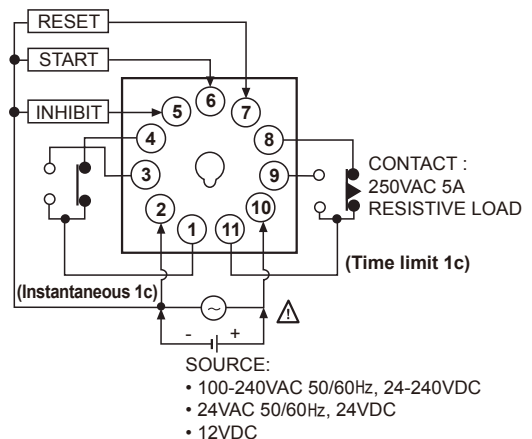


Photo electric sensor

Fiber optic sensor

Door/Area sensor

Proximity sensor

Pressure sensor

Rotary encoder

Connector/Socket

Temp. controller

SSR/ Power controller

Counter

Timer

Panel meter

Tacho/ Speed/ Pulse meter

Display unit

Sensor controller

Switching mode power supply




Stepper motor& Driver&Controller

Graphic/ Logic panel

Field network device

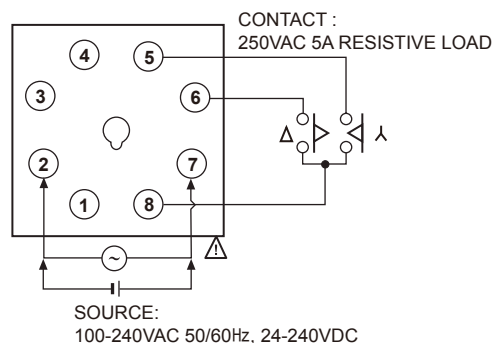
## DIN W48×H48mm Star-Delta timer [AT8SDN]

### ■ Specifications

Model	AT8SDN	
Appearances & Dimensions		
	 [W48×H48×L65mm]	
Function	Star-Delta timer	
Control time setting range	0.5 to 100 sec.	
Power supply	100-240VAC 50/60Hz / 24-240VDC universal	
Allowable voltage range	90 to 110% of rated voltage	
Power consumption	100-240VAC: 3.2VA, 24-240VDC: 1.5W	
Reset time	Max. 100ms	
Timing operation	Power ON start type	
Control output	Contact type	λ contact: SPST(1a), Δ contact: SPST(1a)
	Contact capacity	250VAC 5A resistive load
Relay life cycle	Mechanical	Min. 10,000,000 operations
	Electrical	Min. 100,000 operations(250VAC 5A resistive load)
Repeat error	Max. ±0.2 % ±10ms	
λSetting error	Max. ±5% ±50ms	
Voltage error	Max. ±0.5%	
Temperature error	Max. ±2%	
λ-Δ Switching time error	Max. ±25%	
Insulation resistance	100MΩ(at 500VDC megger)	
Dielectric strength	2000VAC 50/60Hz for 1 minute	
Noise strength	±2kV the square wave noise(pulse width: 1μs) by the noise simulator	
Vibration	Mechanical	0.75mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 1 hours
	Malfunction	0.5mm amplitude at frequency of 10 to 55Hz (for 1 min.) in each of X, Y, Z directions for 10 minutes
Shock	Mechanical	300m/s <sup>2</sup> (approx. 30G) in each of X, Y, Z directions for 3 times
	Malfunction	100m/s <sup>2</sup> (approx. 10G) in each of X, Y, Z directions for 3 times
Environment	Ambient temperature	-10 to 55°C, storage: -25 to 65°C
	Ambient humidity	35 to 85%RH, storage: 35 to 85%RH
Approval		
Accessory	Bracket	
Unit weight	Approx. 90g	

※Environment resistance is rated at no freezing or condensation.

### ■ Connections






## DIN W48×H48mm Solid-state, Power OFF Delay timer [AT8PSN/AT8PMN]

### Ordering information

<b>AT</b>	<b>8</b>	<b>P</b>	<b>SN</b>	-	
					Power supply
					Time unit
					Time operation
					Number of plug pins
					Item
No mark	200-240VAC				
2	24VAC/DC				
6	100-120VAC				
7	100/110VDC				
SN	sec				
MN	min				
P	Power OFF Delay				
8	8-pin plug type				
AT	Analog Timer				

※Sockets (PG-08, PS-08) are sold separately.

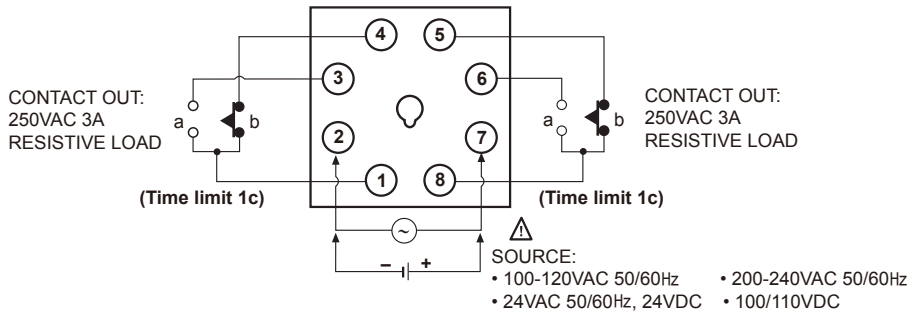
### Specifications

Model	AT8PSN-□	AT8PMN-□
Appearances & Dimensions	 [W48×H48×L65mm]	 [W48×H48×L65mm]
Function	<b>Power OFF Delay</b>	
Control time setting range	0.05 to 10 sec.	0.05 to 10 min.
Power supply	• 100-120VAC 50/60Hz • 200-240VAC 50/60Hz • 100/110VDC • 24VAC 50/60Hz, 24VDC (universal)	
Allowable voltage range	90 to 110% of rated voltage	
Power consumption	• 100-120VAC: 1.5VA • 200-240VAC: 1.5VA • 100/110VDC: 0.8W • 24VDC: 0.2VA, 24VDC 0.2W	
Timing operation	Power OFF start type	
Control output	Contact type	Time limit DPDT(2c)
	Contact capacity	250VAC 3A resistive load
Relay life cycle	Mechanical	Min.10,000,000 operations
	Electrical	Min. 100,000 operations(250VAC 3A resistive load)
Repeat error	Max. ±0.2 % ±10ms	
Setting error	Max. ±5% ±50ms	
Voltage error	Max. ±0.5%	
Temperature error	Max. ±2%	
Insulation resistance	100MΩ(at 500VDC megger)	
Dielectric strength	2000VAC 50/60Hz for 1 minute	
Noise strength	±2kV the square wave noise(pulse width: 1μs) by the noise simulator	
Vibration	Mechanical	0.75mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 1 hours
	Malfunction	0.5mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 10 minutes
Shock	Mechanical	300m/s <sup>2</sup> (approx. 30G) in each of X, Y, Z directions 3 times
	Malfunction	100m/s <sup>2</sup> (approx. 10G) in each of X, Y, Z directions 3 times
Environment	Ambient temperature	-10 to 55°C, storage: -25 to 65°C
	Ambient humidity	35 to 85%RH
Approval		
Accessory	Bracket	
Unit weight	Approx. 100g	

※Environment resistance is rated at no freezing or condensation.

Photo electric sensor
Fiber optic sensor
Door/Area sensor
Proximity sensor
Pressure sensor
Rotary encoder
Connector/Socket
Temp. controller
SSR/ Power controller
Counter
<b>Timer</b>
Panel meter
Tacho/ Speed/ Pulse meter
Display unit
Sensor controller
Switching mode power supply
Stepper motor& Driver&Controller
Graphic/ Logic panel
Field network device

## ■ Connections






## DIN W48×H48mm Solid state ON Delay timer [ATE Series]

### ■ Ordering information

<b>ATE</b>	<input type="checkbox"/>	<b>10</b>	<b>S</b>	
Item	Output	Time range	Time unit	
			S	sec.(1, 3, 6, 10, 30, 60)
			M	min.(3, 6, 10, 30, 60)
			H	hour(3, 6, 12, 24)
			Number	Max. time range
	No mark			Time-limit SPDT(1c), Instantaneous SPST(1a)
	1			Time-limit DPDT(2c)
	2			Time-limit SPDT(1c), Instantaneous SPST(1c)
	ATE			ON Delay timer

### ■ Specifications

Model	ATE – <input type="checkbox"/> S <input type="checkbox"/> M <input type="checkbox"/> H	ATE1 – <input type="checkbox"/> S <input type="checkbox"/> M <input type="checkbox"/> H	ATE2 – <input type="checkbox"/> S <input type="checkbox"/> M <input type="checkbox"/> H
Appearances & Dimensions	 [W48×H48×L79mm]	 [W48×H48×L79mm]	 [W48×H48×L79mm]
Function	<b>Power ON Delay</b>		
Control time setting range	sec.(1, 3, 6, 10, 30, 60), min.(3, 6, 10, 30, 60), hour(3, 6, 12, 24)		
Power supply	110/220VAC 50/60Hz	110VAC, 220VAC 50/60Hz, 12VDC, 24VDC(option)	
Allowable voltage range	90 to 110% of rated voltage		
Power consumption	Approx. 10VA(240VAC 60Hz), Approx. 2W(24VDC, 12VDC)		
Reset time	Max. 200ms		
Timing operation	Power ON start type		



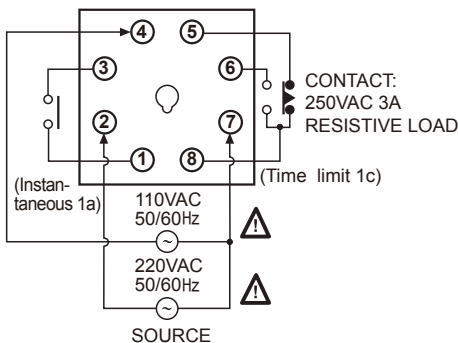
■ Specifications

Model		ATE – <input type="checkbox"/> S <input type="checkbox"/> M <input type="checkbox"/> H	ATE1 – <input type="checkbox"/> S <input type="checkbox"/> M <input type="checkbox"/> H	ATE2 – <input type="checkbox"/> S <input type="checkbox"/> M <input type="checkbox"/> H
Control output	Contact type	Time limit SPDT(1c), Instantaneous SPST(1a)		Time limit SPDT(1c), Instantaneous SPST(1c)
	Contact capacity	250VAC 3A resistive load		
Relay life cycle	Mechanical	Min.10,000,000 operations		
	Electrical	Min. 100,000 operations(250VAC 3A resistive load)		
Repeat error		Max. ±0.3%		
SET error		Max. ±5% ±0.05sec.		
Voltage error		Max. ±0.5%		
Temperature error		Max. ±2%		
Insulation resistance		100MΩ(at 500VDC megger)		
Dielectric strength		2000VAC 50/60Hz for 1 minute		
Noise strength		±2kV the square wave noise(pulse width: 1μs) by the noise simulator		
Vibration	Mechanical	0.75mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 1 hours		
	Malfunction	0.5mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 10 minutes		
Shock	Mechanical	300m/s <sup>2</sup> (approx. 30G) in each of X, Y, Z directions for 3 times		
	Malfunction	100m/s <sup>2</sup> (approx. 10G) in each of X, Y, Z directions for 3 times		
Environment	Ambient temperature	-10 to 55°C, storage: -25 to 65°C		
	Ambient humidity	35 to 80%RH		
Unit weight		Approx. 75g		

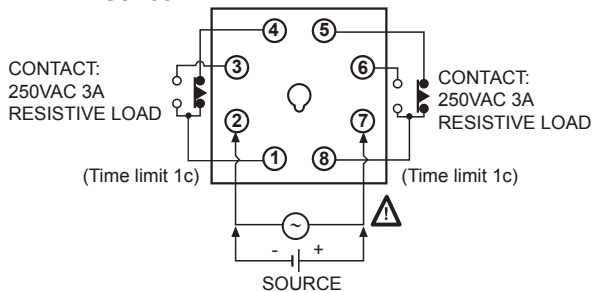
※Environment resistance is rated at no freezing or condensation.

■ Connections

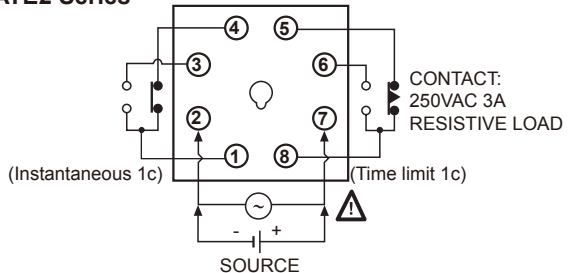
● ATE Series



● ATE1 Series




● ATE2 Series



- Photo electric sensor
- Fiber optic sensor
- Door/Area sensor
- Proximity sensor
- Pressure sensor
- Rotary encoder
- Connector/Socket
- Temp. controller
- SSR/ Power controller
- Counter
- Timer**
- Panel meter
- Tacho/ Speed/ Pulse meter
- Display unit
- Sensor controller
- Switching mode power supply
- Stepper motor& Driver&Controller
- Graphic/ Logic panel
- Field network device

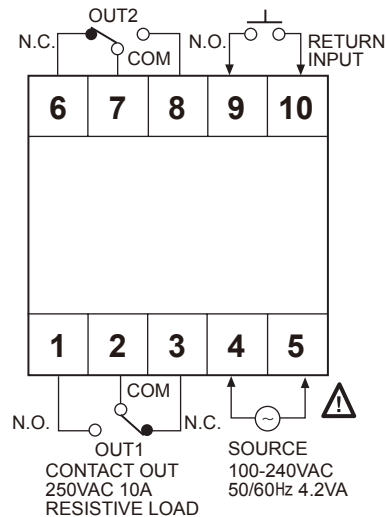
## W72×H72mm, Weekly/Yearly timer [LE7M-2]

### Specifications

Model	LE7M-2	
Appearances & Dimensions	 [W72×H72×L60mm]	
Power supply	100-240VAC 50/60Hz	
Allowable voltage range	90 to 110% of rated voltage	
Power consumption	Max. 4.2VA	
RETURN input	Short-circuit or open by switch or relay	
Timing program	48 steps for weekly, 24 steps for yearly	
Operation mode	ON/OFF mode, cycle mode, pulse mode	
Mounting	Front panel, surface, DIN rail	
Time deviation	±15sec./month(ambient temperature: 25°C) (±4sec. /week)	
Temperature error	±0.01% ±0.05sec.(ratio by set time)	
Memory protection	Over 5 years(at 25°C)	
Control Output	Contact type	SPDT(Single Pole Double Throw)
	Contact capacity	250VAC 10A resistive load
	Output number	Independent 2 output(1c × 2)
Relay life cycle	Mechanical	Min. 5,000,000 operations(switching capacity: 30 times/min)
	Electrical	Min. 50,000 operations<switching capacity: 20 times/min, 250VAC 10A(resistive load)>
Insulation resistance	Min. 100MΩ(at 500VDC megger)	
Dielectric strength	2000VAC 50/60Hz for 1minute	
Noise strength	±2kV the square wave noise(pulse width: 1μs) by the noise simulator	
Environment	Ambient temperature	-10 to 55°C, storage: -25 to 65°C
	Ambient humidity	35 to 80%RH
Unit weight	Approx. 272g	


※Environment resistance is rated at no freezing or condensation.

### Connections



## W48×H48mm, Weekly/Yearly timer [LE365S-41]

### Specifications

Model	LE365S-41	
Appearances & Dimensions	 <p>[W48×H48×L60mm]</p>	
Power supply	100-240VAC 50/60Hz	
Allowable voltage range	90 to 110% of rated voltage	
Power consumption	2.4VA	
Timing program	48 steps for weekly, 24 steps for yearly	
Operation mode	ON/OFF mode, cycle mode, pulse mode	
Mounting	Panel flush, surface, DIN rail	
Time deviation	±15sec/month(25°C) (±4sec/week)	
Temperature error	±0.01% ±0.05sec.	
Memory protection	Over 5 years(at 25°C)	
Control Output	Contact type	SPST(Single Pole Single Throw)
	Contact capacity	250VAC 15A resistive load
	Output number	Independent 1 output(1a)
Relay life cycle	Mechanical	Min. 5,000,000 operations(Switching capacity 30 times/minute)
	Electrical	50,000 operations<Switching capacity 20 times/1 minute, at 250VAC 15A(resistive load)>
Insulation resistance	Min. 100MΩ(at 500VDC megger)	
Dielectric strength	2000VAC 50/60Hz for 1minute	
Noise strength	±2kV the square wave noise(pulse width: 1μs) by the noise simulator	
Environment	Ambient temperature	-10 to 55°C, storage: -25 to 65°C
	Ambient humidity	35 to 85%RH, storage: 35 to 85%RH
Unit weight	Approx. 110g	

※Environment resistance is rated at no freezing or condensation.

### Connections

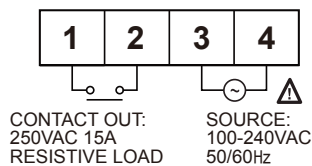


Photo electric sensor

Fiber optic sensor

Door/Area sensor

Proximity sensor

Pressure sensor

Rotary encoder

Connector/Socket

Temp. controller

SSR/Power controller

Counter

Timer

Panel meter

Tacho/Speed/ Pulse meter

Display unit

Sensor controller

Switching mode power supply

Stepper motor & Driver&Controller

Graphic/ Logic panel

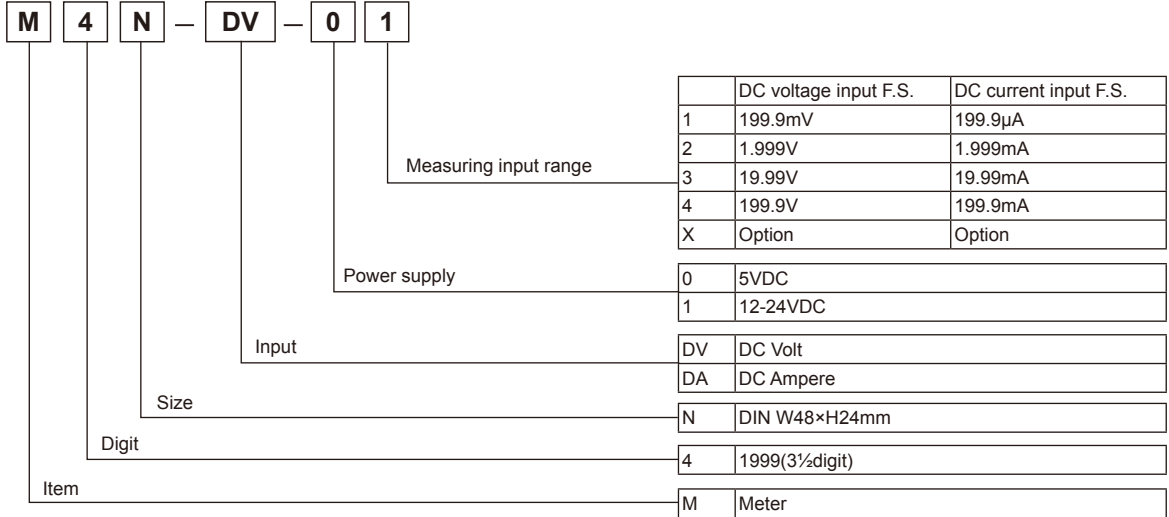
Field network device



## DIN W48×H24mm Small size digital panel meter [M4N Series]

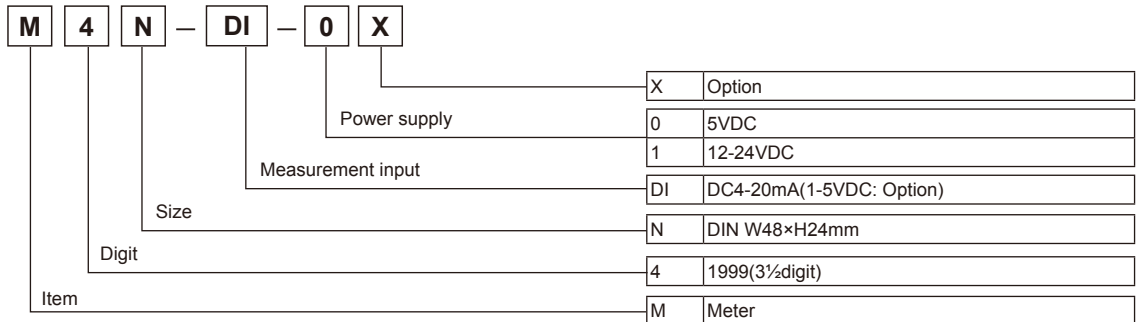
### Ordering information

#### DC VOLT METER / DC AMPERE METER



※M4N series is to measure DC only. AC voltage and AC current is not available to be measured.  
 ※Measuring range for direct connection is max. 200VDC, max. DC200mA.

#### DIGITAL SCALING METER




※1-5VDC measuring input is optional.  
 If there is no additional order, its factory default is DC4-20mA.

- Photo electric sensor
- Fiber optic sensor
- Door/Area sensor
- Proximity sensor
- Pressure sensor
- Rotary encoder
- Connector/Socket
- Temp. controller
- SSR/ Power controller
- Counter
- Timer
- Panel meter**
- Tacho/ Speed/ Pulse meter
- Display unit
- Sensor controller
- Switching mode power supply
- Stepper motor & Driver&Controller
- Graphic/ Logic panel
- Field network device

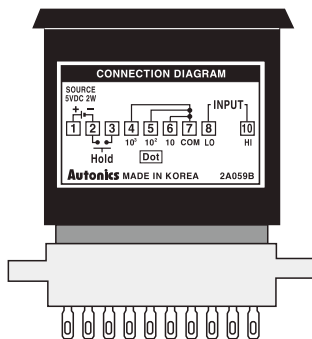
# Selection Guide

## Specifications

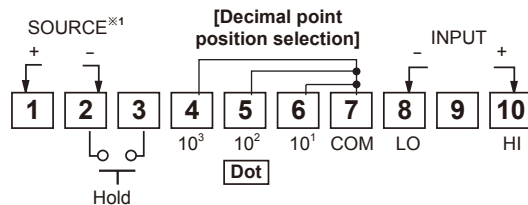
Model	M4N-DV-□□	M4N-DA-□□	M4N-DI-□□
Appearances & Dimensions	 W48×H24×L59mm		
Measurement input	DC voltage	DC ampere	DC4-20mA
Power supply	5VDC, 12-24VDC		
Allowable voltage range	90 to 110% of rated voltage		
Power consumption	2W		
Display method	7 Segment red LED display(Character height : 10mm)		
Max. display range	Max. 1999		
Display accuracy	F·S ±0.2% rdg ±1digit		
Sampling period	300ms		
A/D switching method	Dual integral method		
Response time	Approx. 2sec.(0 to 1999)		
Max. allowable input	150% of measurement input range		
Sampling time	2.5 times/sec.		
Insulation resistance	Min. 100MΩ(at 500VDC megger)		
Dielectric strength	2000VAC 50/60Hz for 1 minute		
Noise strength	±100V the square wave noise(pulse width : 1μs) by the noise simulator		
Vibration	Mechanical	0.75mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 1hour	
	Malfuction	0.5mm amplitude at frquency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 10minutes	
Shock	Mechanical	300m/s <sup>2</sup> (approx. 30G) in each of X, Y, Z directions for 3 times	
	Malfuction	100m/s <sup>2</sup> (approx. 10G)in each of X, Y, Z directions for 3 times	
Environ-ment	Ambient temperature	-10 to 50°C, storage : -20 to 60°C	
	Ambient humidity	35 to 85%RH, storage : 35 to 95%RH	
Unit weight	Approx. 44g		

※Environment resistance is rated at no freezing or condensation.

## Connection



※Socket Pin No : 1 2 3 4 5 6 7 8 9 10



※1: 5VDC, 12-24VDC

※In case of changing position of decimal point, disconnect switching pattern point on PCB and connect terminal contact according point to be changed.

※Socket pin 9, NC terminal, is not connected at inside.



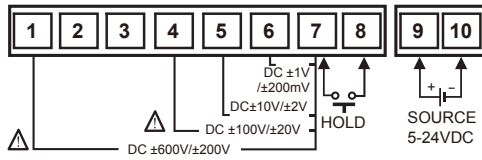
## Specifications

Model		M4NN-DV-1□	M4NN-DA-1□	M4NN-AV-1□	M4NN-AA-1□
Vibration	Mechanical	0.75mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 2 hours			
	Malfunction	0.5mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 10 min.			
Shock	Mechanical	100m/s <sup>2</sup> (approx. 10G) in each of X, Y, Z directions for 3 times			
	Malfunction	300m/s <sup>2</sup> (approx. 30G) in each of X, Y, Z directions for 3 times			
Environment	Ambient temperature	-10 to 50°C, storage: -20 to 60°C			
	Ambient humidity	35 to 85%RH, storage: 35 to 85%RH			
Connection		Plug/Socket terminal block(accessory)			
Insulation type		Double insulation or reinforced insulation (mark: □, dielectric strength between the measured input part and the power part: 1kV)			
Unit weight		Approx. 28g			

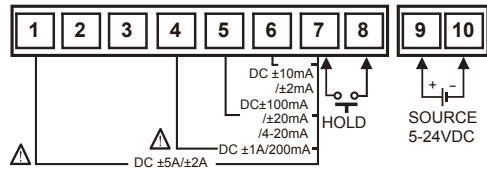
※ Environment resistance is rated at no freezing or condensation.

## Connections

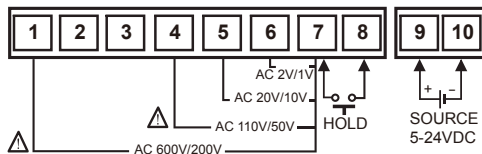
### • M4NN-DV-1□



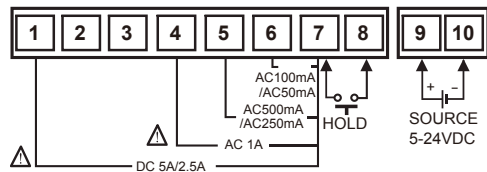
### • M4NN-DA-1□



### • M4NN-AV-1□

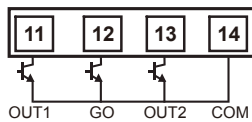


### • M4NN-AA-1□

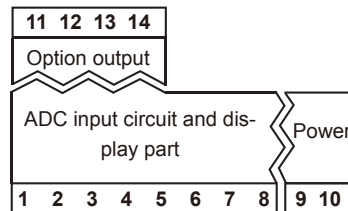
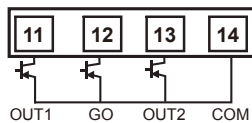


※Input and output are insulated from the power.

### • NPN Open Collector




### • PNP Open Collector





# W75×H25mm Digital graphic panel meter for mosaic panel [M4V]

## ■ Specifications

Model	<b>M4V</b>				
Appearances & Dimensions	 [W75×H25×L91mm]				
Measurement function	DC voltage		DC ampere		
Measurement input *1	0-2VDC	1-5VDC	0-10VDC	DC0-1mA	DC4-20mA
Max. allowable input	110% of measurement input				
Power supply	12-24VDC				
Allowable voltage range	90 to 110% of rated voltage				
Power consumption	Approx. 2W				
Display method	7 Segment red LED display(Segment height : 14mm)				
Display accuracy	0 to 50°C : F.S. ±0.2% rdg ±1digit -10 to 0°C : F.S. ±0.3% rdg ±1digit				
Sampling period	500ms				
Setting method	Scale set by front switches				
Set-diagnosis	Error indication				
Insulation resistance	Min. 100MΩ(at 500VDC megger)				
Dielectric strength	2000VAC 50/60Hz for 1 minute				
Noise strength	±300V the square wave noise(pulse width : 1μs) by the noise simulator				
Vibration	Mechanical	0.75mm amplitude at frequency of 10 to 50Hz(for 1 min.) in each of X, Y, Z directions for 1hour			
	Malfunction	0.5mm amplitude at frequency of 10 to 50Hz(for 1 min.) in each of X, Y, Z directions for 10minutes			
Shock	Mechanical	300m/s <sup>2</sup> (approx. 30G) in X, Y, Z direction for 3 times			
	Malfunction	100m/s <sup>2</sup> (approx. 10G) in X, Y, Z directions for 3 times			
Environment	Ambient temperature	-10 to 50°C, storage : 20 to 60°C			
	Ambient humidity	35 to 85%RH, storage : 35 to 85%RH			
Accessory	Mosaic graphic panel mounting bracket				
Unit weight	Approx. 83g				

※1: It is enable to customized with another specifications except for standard one.

※Environment resistance is rated at no freezing or condensation.

## ■ Application of Connections

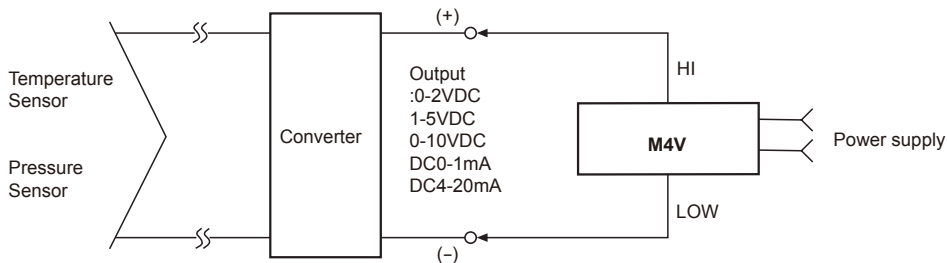


Photo electric sensor

Fiber optic sensor

Door/Area sensor

Proximity sensor

Pressure sensor

Rotary encoder

Connector/Socket

Temp. controller

SSR/Power controller

Counter

Timer

Panel meter

Tacho/Speed/ Pulse meter

Display unit

Sensor controller

Switching mode power supply

Stepper motor & Driver&Controller

Graphic/Logic panel

Field network device



## Specifications

Series	MT4N-DV-E□ MT4N-DA-E□	MT4N-AV-E□ MT4N-AA-E□	MT4N-DV-4□ MT4N-DA-4□	MT4N-AV-4□ MT4N-AA-4□
Sub output (Transmission output)	• RS485 communication output - Baud rate : 1200/2400/4800/9600, Communication method : 2 wires half duplex, Synchronous method: Sub-synchronization, Protocol : Modbus type • DC4-20mA output - Resolution : 12,000 division(Load resistance max. 600Ω)			
AC measuring function※1	Selectable RMS or AVG			
Frequency measuring function※1	Measurement range : 0.100 to 9999Hz(Differ according to decimal point position)			
Hold function※2	Includes(Outer hold function)			
Insulation resistance	Min. 20MΩ(at 500VDC megger)			
Dielectric strength	1000VAC for 1 minute (Between external terminal and case)		2000VAC for 1 minute (Between external terminal and case)	
Noise strength	±2kV the square wave noise(pulse width: 1μs) by the noise simulator			
Vibration	Mechanical	0.75mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 2hour		
	Malfunction	0.5mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 10minutes		
Shock	Mechanical	100m/s <sup>2</sup> (approx. 10G) in each of X, Y, Z directions for 3 times		
	Malfunction	300m/s <sup>2</sup> (approx. 30G) in each of X, Y, Z directions for 3 times		
Environment	Ambient temperature	-10 to 50°C, storage: -20 to 60°C		
	Ambient humidity	35 to 85%RH, storage: 35 to 85%RH		
Insulation type	Double insulation or reinforced insulation(Mark: □, dielectric strength between the measuring input part and the power part: 1kV)			
Approval	CE		—	
Weight※3	Approx. 125g(approx. 64g)			

※1: AC measuring function, and frequency measuring function are only for AC measuring input type.

※2: The indicator has no Hold function.

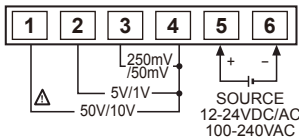
※3: The weight with packaging and the weight in parentheses is only unit weight.

※Environment resistance is rated at no freezing or condensation.

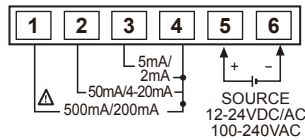
## Connections

### Measuring input terminal connection

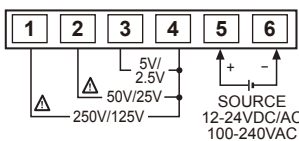
#### MT4N-DV-□□



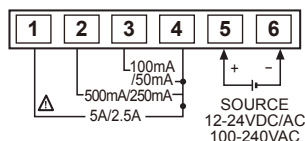
#### MT4N-DA-□□



#### MT4N-AV-□□

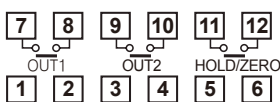


#### MT4N-AA-□□

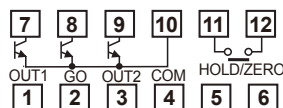


### <Option>

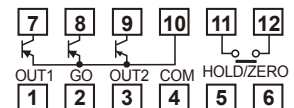
#### Relay output [MT4N-□□-□0]



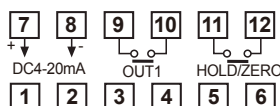
#### NPN open collector output [MT4N-□□-□1]



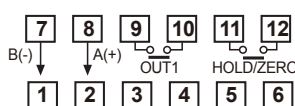
#### PNP open collector output [MT4N-□□-□2]



#### Relay+Current(DC4-20mA) output [MT4N-□□-□3]



#### Relay+RS485 communication output [MT4N-□□-□4]



#### Relay 2+Current(DC4-20mA) output [MT4N-□□-□5]

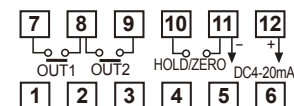
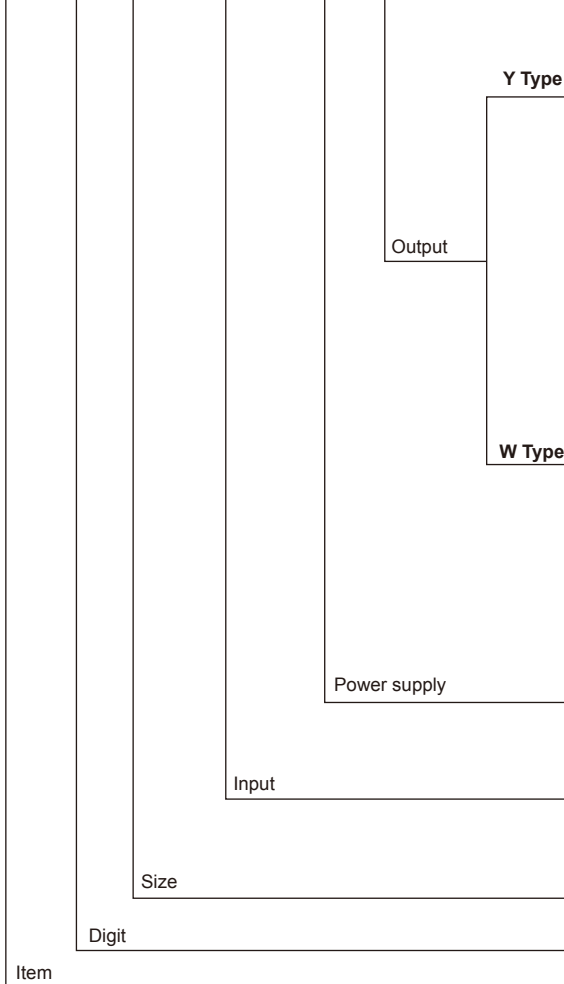


Photo electric sensor
Fiber optic sensor
Door/Area sensor
Proximity sensor
Pressure sensor
Rotary encoder
Connector/Socket
Temp. controller
SSR/Power controller
Counter
Timer
Panel meter
Tacho/Speed/ Pulse meter
Display unit
Sensor controller
Switching mode power supply
Stepper motor & Driver&Controller
Graphic/Logic panel
Field network device

## DIN W72×H36mm, W96×H48mm, digital multi panel meter [MT4Y/MT4W Series]

### Ordering information

**MT** **4** **W** - **DV** - **4** **N**









N	Indicator(Without output function)
0	Relay contact output
1	NPN open collector output
2	PNP open collector output
3*1	Relay contact output+Transmission output(DC4-20mA)
4*1	Relay contact output+RS485 communication output
5	BCD dynamic output
6	Low speed serial output
※Output(0 to 6) : Option	
※1: Relay contact output of 3, 4 is able only to Low out.	
N	Indication type(No output function)
0	Relay contact output+Transmission output(DC4-20mA)
1	Relay contact output
2	NPN open collector output+BCD dynamic output
3	PNP open collector output+BCD dynamic output
4	NPN open collector output+Transmission output(DC4-20mA)
5	PNP open collector output+Transmission output(DC4-20mA)
6	NPN open collector output+Low speed serial output
7	PNP open collector output+Low speed serial output
8	NPN open collector output+RS485 output
9	PNP open collector output+RS485 output
※Output(0 to 9) : Option	
1	12-24VDC
4	100-240VAC
DV	DC Voltage
DA	DC Ampere
AV	AC Voltage
AA	AC Ampere
Y	DIN W72×H36mm
W	DIN W96×H48mm
4	9999(4digit)
MT	Multi meter

※To measure the current over DC 5A, please select DV type because the shunt should be used.

※In case of selecting frequency display, no output will be provided even if it is output support models. (Main output, Sub output and RS485 output)

## ■ Specifications

Series	MT4Y-DV-4□ MT4Y-DA-4□	MT4Y-AV-4□ MT4Y-AA-4□	MT4W-DV-4□ MT4W-DA-4□	MT4W-AV-4□ MT4W-AA-4□	MT4W-DV-1□ MT4W-DA-1□	MT4W-AV-1□ MT4W-AA-1□
Appearances & Dimensions	 [W72×H36×L77mm]		 [W96×H48×L100mm]			
						
Measurement input	DC voltage, ampere	AC voltage, ampere, Frequency	DC voltage, ampere	AC voltage, ampere, Frequency	DC voltage, ampere	AC voltage, ampere, Frequency
Power supply	100-240VAC 50/60Hz (Allowable voltage range: 90 to 110%)				12-24VDC (Allowable voltage range: 90 to 110%)	
Power consumption	5VA				5W	
Display method	7Segment LED display(red)(Character height: 14.2mm)					
Display accuracy	<ul style="list-style-type: none"> <li>• 23°C±5°C - DC Type: F.S. ±0.1% rdg±2digit / AC Type: F.S. ±0.3% rdg±3digit DC/AC Type F.S +0.3% rdg +3digit max. only for 5A terminal.</li> <li>• -10°C to 50°C - DC/AC Type: F.S.±0.5% rdg±3digit</li> </ul>					
Max. allowable input	110% F.S for each measured input range					
A/D conversion method	Practical oversampling using successive approximation ADC					
Sampling cycle	DC type: 50ms, AC type: 16.6ms					
Max. indication range	-1999 to 9999(4digit)					
Preset output	<ul style="list-style-type: none"> <li>• Relay output - Contact capacity: 250VAC 3A, 30VDC 3A / Contact composition: N.O(1a)</li> <li>• NPN/PNP Open collector output - 12-24VDC ±2V 50mA Max. (Resistive load)</li> </ul>					
Sub output (Transmission output)	<ul style="list-style-type: none"> <li>• RS485 communication output - Baud rate: 1200/2400/4800/9600, Communication method: 2-wire half duplex, Synchronous method: Asynchronous method, Protocol: Modbus type</li> <li>• Serial/BCD output - NPN Open collector output: 12-24VDC Max. 50mA(Resistive load)</li> <li>• DC4-20mA output - Resolution: 12,000 division(Load resistance max. 600Ω)</li> </ul>					
AC measuring function <sup>※1</sup>	Selectable RMS or AVG					
Frequency measurement function <sup>※1</sup>	Measurement range : 0.100 to 9999Hz(Variable by decimal point position)					
Hold function <sup>※2</sup>	Includes(External hold function)					
Insulation resistance	Min. 100MΩ(at 500VDC megger) between external terminal and case					
Dielectric strength	2,000VAC for 1minute between external terminal and case					
Noise strength	±2kV the square wave noise(pulse width : 1μs) by the noise simulator					
Vibration	Mechanical	0.75mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 2hours				
	Malfunction	0.5mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 10minutes				
Shock	Mechanical	100m/s <sup>2</sup> (approx. 10G) in each of X, Y, Z directions for 3 times				
	Malfunction	300m/s <sup>2</sup> (approx. 30G) in each of X, Y, Z directions for 3 times				
Relay life cycle	Malfunction	Min. 20,000,000 operations				
	Mechanical	Min. 100,000 operations(250VAC 3A Load current)				
Environment	Ambient temperature	-10 to 50°C, storage: -20 to 60°C				
	Ambient humidity	35 to 85%RH, storage: 35 to 85%RH				
Insulation type	Double insulation or reinforced insulation (Mark: □, dielectric strength between the measuring input part and the power part: 1kV)					
Approval						
Unit weight	Approx. 134g			Approx. 211g		

※1: AC measuring function, and frequency measuring function are only for AC measuring input type.

If only frequency input the AC type(display method of measuring input) which option is in MT4V, MT4W will operate the only indicating type.

※2: MT4Y□-4N model has no hold function.

※Environment resistance is rated at no freezing or condensation.

Photo electric sensor

Fiber optic sensor

Door/Area sensor

Proximity sensor

Pressure sensor

Rotary encoder

Connector/Socket

Temp. controller

SSR/Power controller

Counter

Timer

Panel meter

Tacho/Speed/ Pulse meter

Display unit

Sensor controller

Switching mode power supply

Stepper motor & Driver&Controller

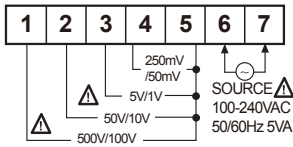
Graphic/ Logic panel

Field network device

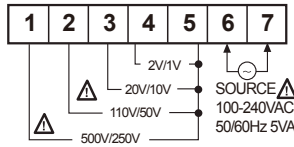
## ■ Connections

### ◎ Measuring input connection of MT4Y Series

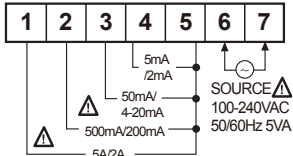
#### ● MT4Y-DV-4□



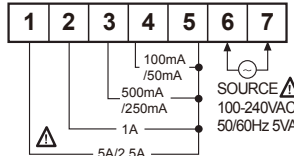
#### ● MT4Y-AV-4□



#### ● MT4Y-DA-4□

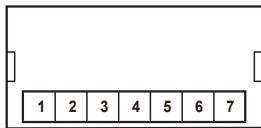


#### ● MT4Y-AA-4□



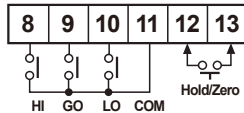
### ◎ Output terminal of connection of MT4Y Series

#### ● MT4Y-□-4N (Indicator)



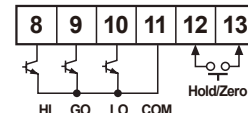
#### ● MT4Y-□-40

(Triple relay contact output)



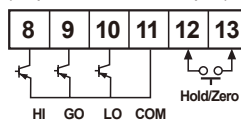
#### ● MT4Y-□-41

(Triple NPN O.C output)



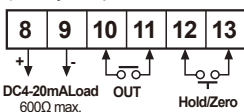
#### ● MT4Y-□-42

(Triple PNP O.C output)



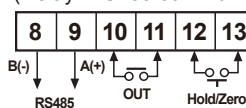
#### ● MT4Y-□-43

(Relay output+Transmission output)



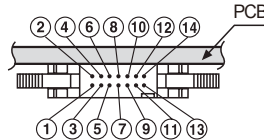
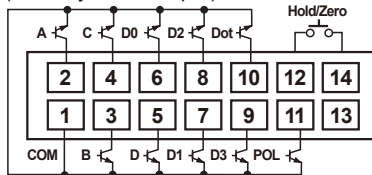
#### ● MT4Y-□-44

(Relay+RS485 communication output)



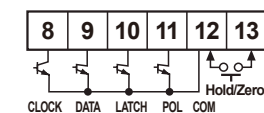
#### ● MT4Y-□-45

(BCD Dynamic output)



※ Hirose connector pin header model of the unit : HIF3BA-14PA-2.54DS  
 ※ Contact Hirose Electric to purchase socket and wires of Hirose connector.  
 [Socket : HIF3BA-14D-2.54R]

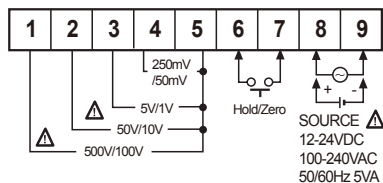
#### ● MT4Y-□-46 (Low speed serial output)



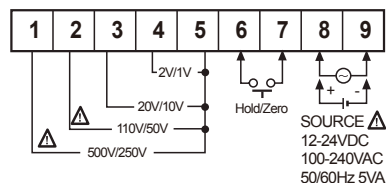
※ POL : When a display value is "-", the signal of "-" will be outputted.

### ◎ Measuring input connection of MT4W Series

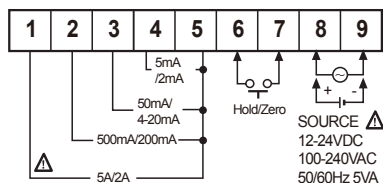
#### ● MT4W-DV-□□



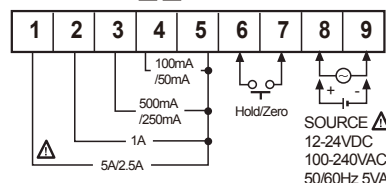
#### ● MT4W-AV-□□



#### ● MT4W-DA-□□

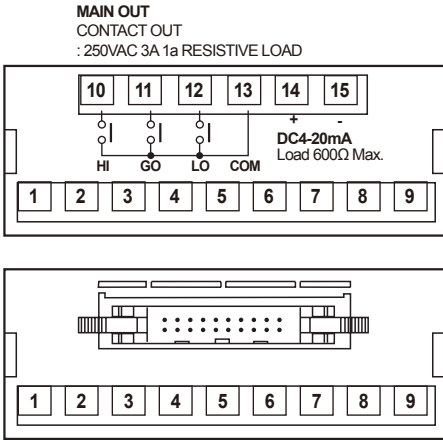


#### ● MT4W-AA-□□

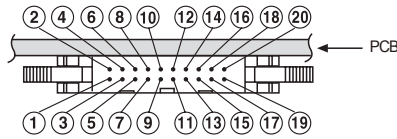
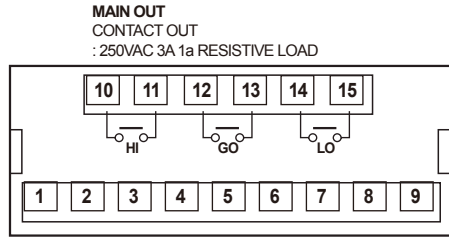


## ◎ Output terminal connection of MT4W Series

- **MT4W-□□0** (Triple relay contact output + Transmission output)

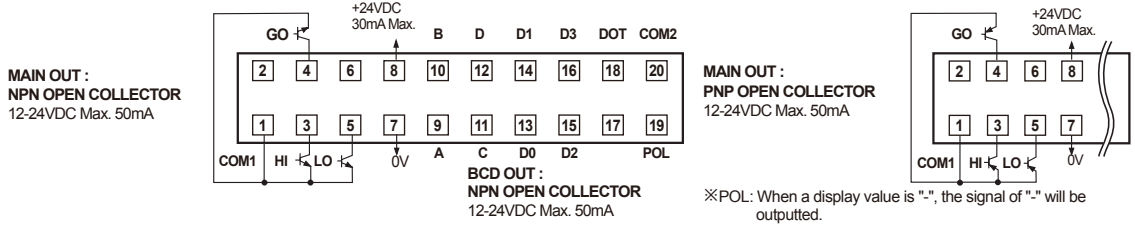


- **MT4W-□□1** (Triple relay contact output)

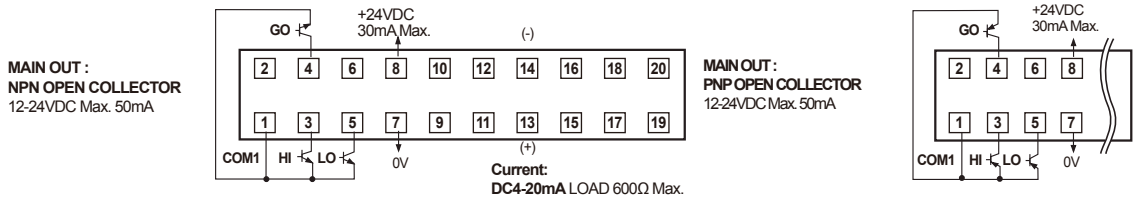


※Hirose connector pin header model of the unit : HIF3BA-20PA-2.54DS  
 ※Contact Hirose Electric to purchase socket and wires of Hirose connector. [Socket: HIF3BA-20D-2.54R]

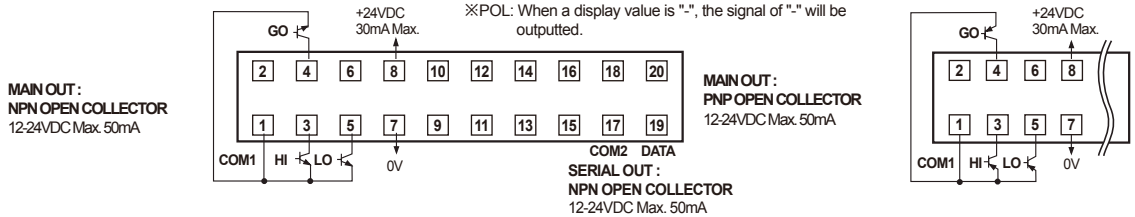
- **MT4W-□□2 / MT4W-□□3** (Triple NPN/PNP open collector output+BCD output)



- **MT4W-□□4/ MT4W-□□5** (Triple NPN/PNP open collector output+Transmission output)



- **MT4W-□□6/ MT4W-□□7** (Triple NPN/PNP open collector output+Low speed serial output)



- **MT4W-□□8/ MT4W-□□9** (Triple NPN/PNP open collector output+RS485 output)

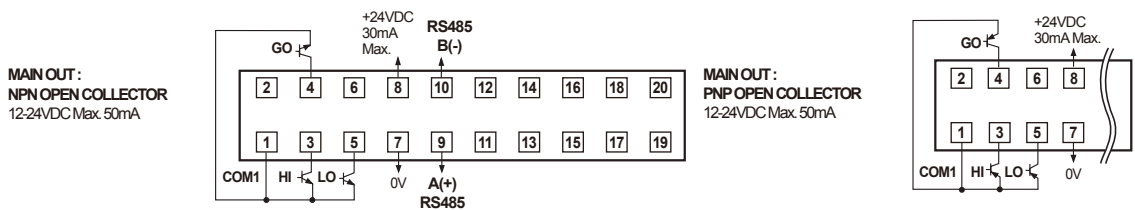






Photo electric sensor
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Display unit
Sensor controller
Switching mode power supply
Stepper motor & Driver&Controller
Graphic/ Logic panel
Field network device

## Digital panel meter [M4Y/M4W/M5W/M4M Series]

### Specifications

		M4Y	M4W	M5W	M4M
					
		[W72×H36×L93mm]	[W96×H48×L104mm]	[W96×H48×L104mm]	[W72×H72×L113mm]
Appearances & Dimensions					
Classification		Indicator		Single preset output type	Dual preset output type
Measurement	DC, AC voltage	M4Y-DV-□ M4Y-AV-□-□ M5W-DV-□ M5W-AV-□	M4W-DV-□ M4W-AV-□-□ M4M-DV-□ M4M-AV-□-□	M4W1P-DV-□ M4W1P-AV-□-□ M4M1P-DV-□ M4M1P-AV-□-□	M4W2P-DV-□ M4W2P-AV-□-□ M4M2P-DV-□ M4M2P-AV-□-□
	DC, AC ampere	M4Y-DA-□ M4Y-AA-□-□ M5W-DA-□ M5W-AA-□	M4W-DA-□ M4W-AA-□-□ M4M-DA-□ M4M-AA-□-□	M4W1P-DA-□ M4W1P-AA-□-□ M4M1P-DA-□ M4M1P-AA-□-□	M4W2P-DA-□ M4W2P-AA-□-□ M4M2P-DA-□ M4M2P-AA-□-□
	AC power (0-10VDC)	M4Y-W-□ M5W-W-□	M4W-W-□ M4M-W-□	M4W1P-W-□ M4M1P-W-□	M4W2P-W M4M2P-W
	rpm, speed (0-10VDC) (0-10VAC)	M4Y-T-□-□ M4Y-S-□-□ M5W-T-□ M5W-S-□	M4W-T-□-□ M4W-S-□-□ M4M-T-□ M4M-S-□	M4W1P-T-□-□ M4W1P-S-□-□ M4M1P-T-□ M4M1P-S-□	M4W2P-T-□-□ M4W2P-S-□-□ M4M2P-T-□ M4M2P-S-□
	Power factor (DC4-20mA)	—	M4W-P (Refer to the 261 page)	—	—
Max. allowable input		150% for each input specification (At 400VAC:120%)			
Power supply		100-240VAC 50/60Hz ★ 5VDC (Except for M5W) ★ 24-70VDC	110/220VAC 50/60Hz ★ 24-70VDC ★ 100-240VAC 50/60Hz		
Allowable voltage range		90 to 110% of rated voltage			
Power consumption		DC: 2W, AC: 4VA		DC: 3W, AC: 5VA	
Display method		7 Segment LED display			
Character height		M4Y, M4W, M5W : 14mm / M4W1P, M4W2P, M4M1P, M4M2P : 10mm			
Display accuracy		DC : F.S. ±0.2% rdg ±1digit AC : F.S. ±0.5% rdg ±1digit			
Sampling period		300ms			
A/D conversion method		Dual slope integral method			
Response time		2sec.(0 to Max.)			
Display frequency		2.5 times/sec.			
Contact capacity		—	Relay contact output : 250VAC 3A 1c		Relay contact output : 250VAC 3A 1c×2
Insulation resistance		100MΩ(at 500VDC megger)			
Dielectric strength		2000VAC 50/60Hz for 1 minute			
Noise strength		±1kV the square wave noise (pulse width: 1us) by the noise simulator			
Vibration	Mechanical	0.75mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 1 hour			
	Malfunction	0.5mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 10 minutes			
Shock	Mechanical	300m/s²(approx. 30G) in X, Y, Z directions for 3 times			
	Malfunction	100m/s²(approx. 10G) in X, Y, Z directions for 3 times			
Relay life cycle	Mechanical	—		Min. 10,000,000 operations	
	Malfunction	—		Min. 100,000 operations (250VAC 3A resistive load)	
Environment	Ambient temperature	-10 to 50°C, storage: -20 to 60°C			
	Ambient humidity	35 to 85%RH, storage: 35 to 85%RH			
Unit weight		M4Y: Approx. 144g M5W: Approx. 172g	M4W: Approx. 168g M4M: Approx. 262g (M4M-P: Approx. 268g)	M4W1P: Approx. 253g M4M1P: Approx. 290g	M4W2P: Approx. 278g M4M2P: Approx. 316g

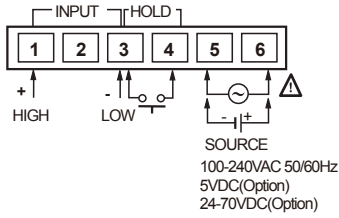
※"★" symbol in power supply is optional. (customizable)

※Environment resistance is rated at no freezing or condensation.

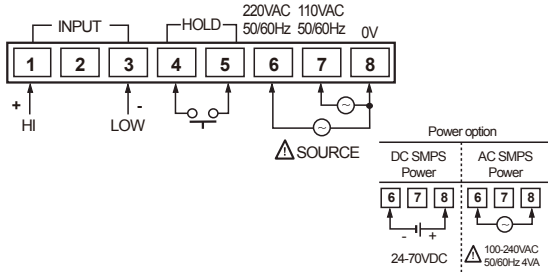


## ■ Connections

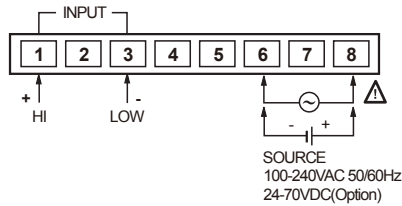
### ● M4Y



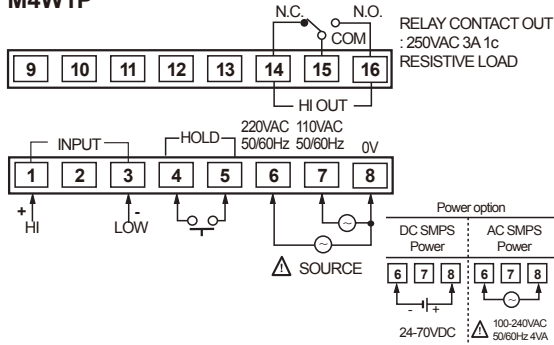
### ● M4W



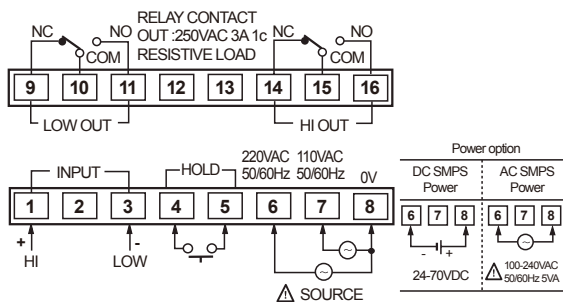
### ● M5W



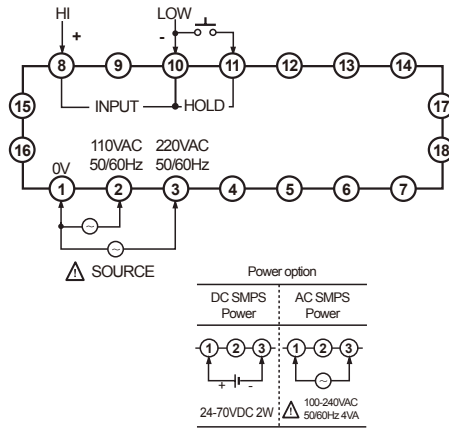
### ● M4W1P



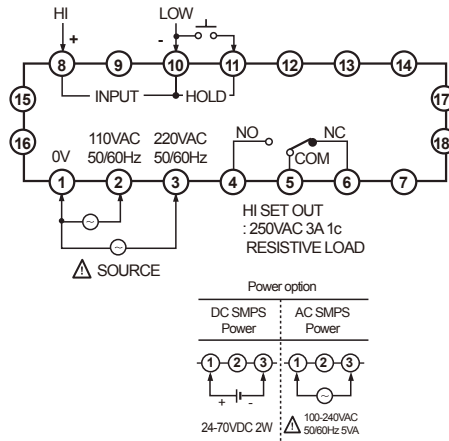
### ● M4W2P



### ● M4M



### ● M4M1P



### ● M4M2P

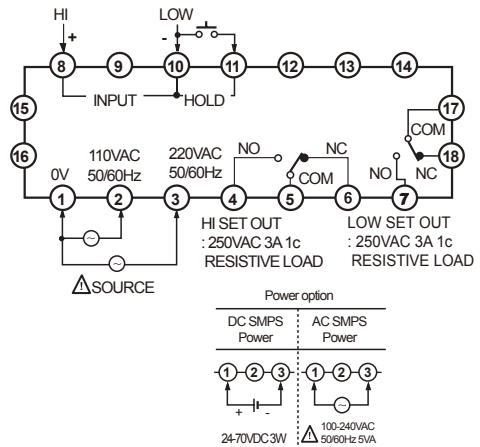


Photo electric sensor

Fiber optic sensor

Door/Area sensor

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Pressure sensor

Rotary encoder

Connector/Socket

Temp. controller

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Counter

Timer

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Display unit

Sensor controller

Switching mode power supply

Stepper motor & Driver&Controller

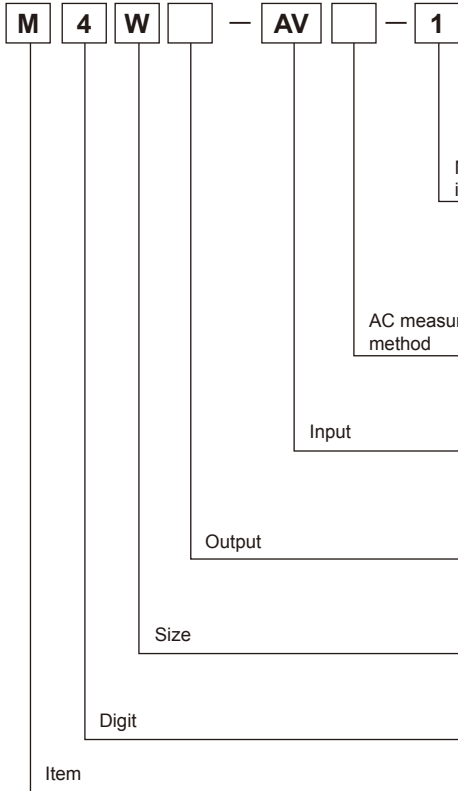
Graphic/Logic panel

Field network device

**DIN W72×H36mm, W96×H48mm, W72×H72mm**

**Digital panel meter for measuring voltage**

■ **Ordering information**



NO	M4Y / M4W / M4M		M5W	
	DC INPUT (F.S.)	AC INPUT (F.S.)	DC INPUT (F.S.)	AC INPUT (F.S.)
1	199.9mV	199.9mV	199.99mV	199.99mV
2	1.999V	1.999V	1.9999V	1.9999V
3	19.99V	19.99V	19.999V	19.999V
4	199.9V	199.9V	199.99V	199.99V
5 <sup>※2</sup>	300V	—	300.0V	400.0V
6 <sup>※2</sup>	—	400V	—	—
XX	Option		Option	
No mark	AVG value			
R <sup>※3</sup>	RMS value			
DV	DC Volt			
DA	DC Ampere			
AV	AC Volt			
AA	AC Ampere			
No mark	Indicator			
1P	Single setting			
2P	Dual setting			
Y <sup>※4</sup>	DIN W72×H36mm			
W <sup>※4</sup>	DIN W96×H48mm			
M	DIN W72×H72mm			
4	1999(3½digit)			
5	19999(4½digit)			
M	Meter			

※1: Measuring input and display are 1:1.

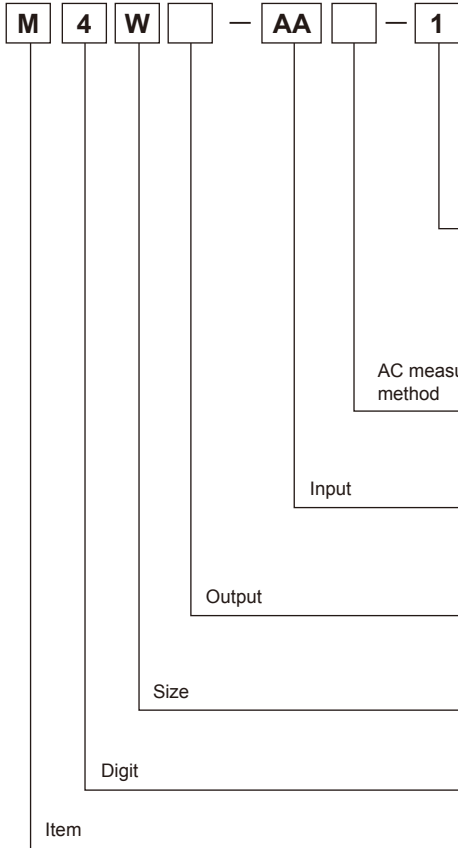
※2: Available input can be direct connection if under 300VDC, 400VAC.

※3: M5W AC measurement type has RMS only. It does not have "R" in model name.

※4: M4Y, M5W are indicator.

# DIN W72×H36mm, W96×H48mm, W72×H72mm Digital panel meter for measuring ampere

## Ordering information



NO	M4Y / M4W / M4M		M5W	
	DC INPUT (F.S.)	AC INPUT (F.S.)	DC INPUT (F.S.)	AC INPUT (F.S.)
1	199.9μA	19.99mA	199.99μA	19.999mA
2	1.999mA	199.9mA	1.9999mA	199.99mA
3	19.99mA	1.999A	19.999mA	1.9999A
4	199.9mA	19.99A	199.99mA	19.999A
5	1.999A	199.9A	1.9999A	199.99A
6	19.99A	1999A	19.999A	1999.9A
7	199.9A	—	199.99A	—
8	1999A	—	1999.9A	—
XX	Option		Option	
No mark	AVG value			
R <sup>※2</sup>	RMS value			
DV	DC Volt			
DA	DC Ampere			
AV	AC Volt			
AA	AC Ampere			
No mark	Indicator			
1P	Single setting			
2P	Dual setting			
Y <sup>※3</sup>	DIN W72×H36mm			
W <sup>※3</sup>	DIN W96×H48mm			
M	DIN W72×H72mm			
4	1999(3½digit)			
5	19999(4½digit)			
M	Meter			

※1: Measuring input and display is 1:1 for DC INPUT No.1to 5 and AC INPUT No.1 to 3, DC INPUT No.6 to 8 is used with DC50mV Shunt, AC INPUT No.4 to 6 are used with C.T(Current transformer)

※2: M5W AC measurement type has RMS only. It does not have "R" in model name.

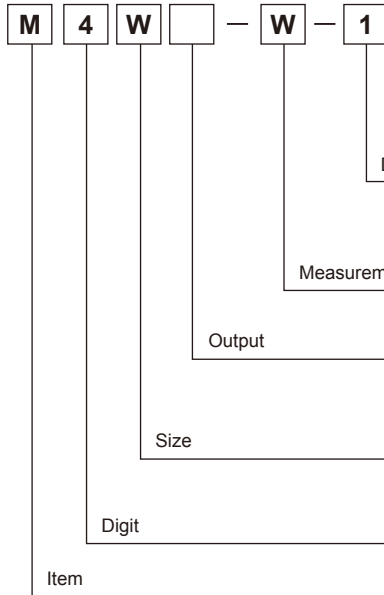
※3: M4Y, M5W are indicator.

- Photo electric sensor
- Fiber optic sensor
- Door/Area sensor
- Proximity sensor
- Pressure sensor
- Rotary encoder
- Connector/Socket
- Temp. controller
- SSR/ Power controller
- Counter
- Timer
- Panel meter**
- Tacho/ Speed/ Pulse meter
- Display unit
- Sensor controller
- Switching mode power supply
- Stepper motor & Driver&Controller
- Graphic/ Logic panel
- Field network device

**DIN W72×H36mm, W96×H48mm, W72×H72mm**

**Digital panel meter for measuring power**

■ **Ordering information**



NO	M4Y / M4W / M4M	M5W
		DISPLAY(F.S.)
1	199.9W	199.99W
2	1.999kW	1.9999kW
3	19.99kW	19.999kW
4	199.9kW	199.99kW
5	1999kW	1999.9kW
XX	Option	Option
W	Watt Meter	
No mark	Indicator	
1P	Single setting	
2P	Dual setting	
Y <sup>※2</sup>	DIN W72×H36mm	
W <sup>※2</sup>	DIN W96×H48mm	
M	DIN W72×H72mm	
4	1999(3½digit)	
5	19999(4½digit)	
M	Meter	

※1: When output specification of power converter is 0-10VDC, display value is maximum.

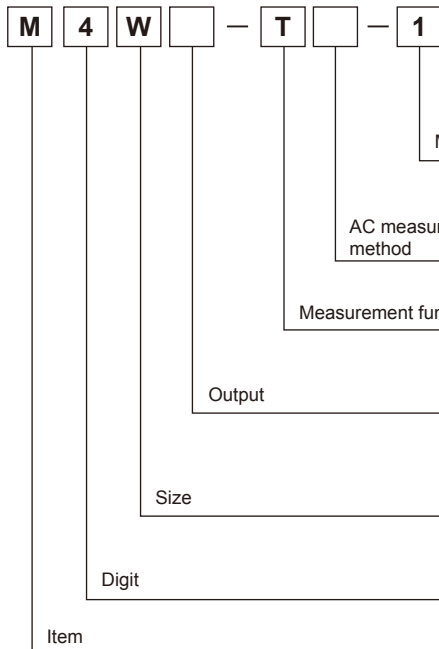
※2: M4Y, M5W are indicator.

※If output specification of Converter or power converter is DC4-20mA or 1-5VDC, please use scaling meter.

**DIN W72×H36mm, W96×H48mm, W72×H72mm**

**Digital panel meter for measuring Revolution/Speed**

■ **Ordering information**



NO	M4Y / M4W / M4M	M5W
		INPUT (F.S.)
1	0-10VDC / 1999	0-10VDC / 1999.9
2	0-10VAC / 1999	0-10VAC / 1999.9
DX	DC Input option	
XX	AC Input option	
No mark	AVG value	
R <sup>※1</sup>	RMS value	
T	Tachometer(rpm)	
S	Line Speed Meter(m/min)	
No mark	Indicator	
1P	Single setting output	
2P	Dual setting output	
Y <sup>※2</sup>	DIN W72×H36mm	
W <sup>※2</sup>	DIN W96×H48mm	
M	DIN W72×H72mm	
4	1999(3½digit)	
5	19999(4½digit)	
M	Meter	

※1: AC measuring type of M5W only applies to RMS and it is not marked with "R" in the model name.

※2: M4Y, M5W are indicator.

## DIN W72×H36mm, W96×H48mm, W72×H72mm

### Digital scaling meter

#### Ordering information


<b>M</b>	<b>4</b>	<b>W</b>		<b>DI</b>	<b>X</b>
Item	Digit	Size	Output	Input	Display scale
				X	Display range(Optional)
				DI	DC4-20mA(1-5VDC : Option <sup>※1</sup> )
				No mark	Indicator
				1P	Single setting
				2P	Dual setting
				Y <sup>※2</sup>	DIN W72×H36mm
				W <sup>※2</sup>	DIN W96×H48mm
				M	DIN W72×H72mm
				4	1999(3½digit)
				5	19999(4½digit)
				M	Meter

※1: 1-5VDC of measuring input specification is available by option. It will be a default value if there is no request for order.

※2: M4Y, M5W are indicator.

## DIN W96×H48mm, Digital panel meter for displaying power factor [M4W-P]

#### Specifications

Model	M4W-P	
Appearances & Dimensions		
Measurement function	Power factor	
Input	DC4-20mA	
Display	-0.50 to 1.00 to +0.50 cosφ	
Power supply	110/220VAC 50/60Hz	
Allowable voltage range	90 to 110% of rated voltage	
Power consumption	4VA	
Display method	7 Segment LED display	
Character height	14mm	
Display accuracy	F.S: ±3% rdg ±1digit	
Sampling period	300ms	
Response speed	2sec.(0 to Max.)	
Point display	Fixed point	
Insulation resistance	Min. 100MΩ(at 500VDC megger)	
Dielectric strength	2000VAC 50/60Hz for 1 minute	
Noise strength	±1kV the square wave noise(pulse width : 1μs) by the noise simulator	
Vibration	Mechanical	0.75mm amplitude at frequency of 10 to 55Hz (for 1 min.) in each of X, Y, Z directions for 1 hour
	Malfunction	0.5mm amplitude at frequency of 10 to 55Hz (for 1 min.) in each of X, Y, Z directions for 10 minutes
Shock	Mechanical	300m/s²(approx. 30G) in each of X, Y, Z directions for 3 times
	Malfunction	100m/s²(approx. 10G) in each of X, Y, Z directions for 3 times
Environment	Ambient temperature	-10 to 50°C, storage : -25 to 60°C
	Ambient humidity	35 to 85%RH, storage : 35 to 85%RH
Unit weight	Approx. 317g	

※Environment resistance is rated at no freezing or condensation.

#### Connections

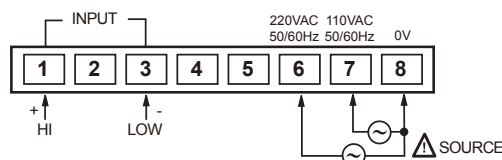



Photo electric sensor
Fiber optic sensor
Door/Area sensor
Proximity sensor
Pressure sensor
Rotary encoder
Connector/Socket
Temp. controller
SSR/ Power controller
Counter
Timer
Panel meter
Tacho/ Speed/ Pulse meter
Display unit
Sensor controller
Switching mode power supply
Stepper motor& Driver&Controller
Graphic/ Logic panel
Field network device

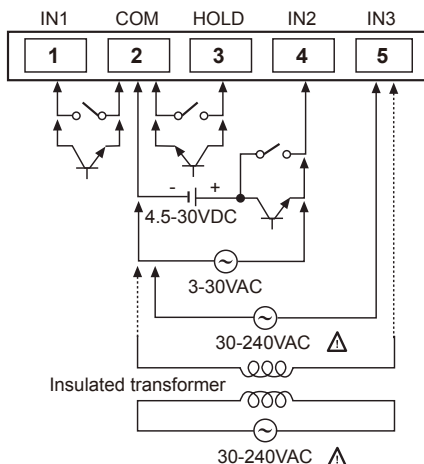
## DIN W48×H24mm, Indication only, LCD pulse meter(RPM, RPS, Hz) [LR5N-B]

### Specifications

Series	LR5N-B		
Appearances & Dimensions	 [W48×H24×L54mm]		
Input type	No-voltage input	Voltage input 1	Voltage input 2
Input signal level	<ul style="list-style-type: none"> <li>Impedance at short-circuit: Max. 10kΩ, residual voltage: Max. 0.5V</li> <li>Impedance at open-circuit: Min. 500kΩ</li> </ul>	DC High voltage : 4.5-30VDC Low voltage : 0-2VDC AC Voltage : 3-30VAC	Voltage : 30-240VAC
Battery life cycle	Approx. over 3 years at 20°C (replaceable)		
Display method	LCD zero blanking type(Height : 8.7mm)		
Digit	5digit		
Display range	RPM	1 to 10000RPM	
	0.1RPM	0.1 to 1000.0RPM	
	RPS	1 to 1000RPS	
	Hz	1 to 1000Hz	
	0.1Hz	0.1 to 100.0Hz	
Display accuracy	F.S. ±0.1% ±1digit		
HOLD function	Included(External HOLD terminal)		
Insulation resistance	Min. 100MΩ(at 500VDC megger)		
Dielectric strength	2000VAC 50/60Hz for 1 minute(Cutoff current=10mA)		
Vibration	Mechanical	0.75mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 1 hour	
	Malfunction	0.3mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 10 minutes	
Shock	Mechanical	300m/s <sup>2</sup> (approx. 30G) in each of X, Y, Z directions for 3 times	
	Malfunction	100m/s <sup>2</sup> (approx. 10G) in each of X, Y, Z directions for 3 times	
Protection	IP66(Front panel only)		
Environment	Ambient temperature	-10 to 50°C, storage : -25 to 65°C	
	Ambient humidity	35 to 85%RH, storage : 35 to 85%RH	
Unit weight	Approx. 58g		

※Environment resistance is rated at no freezing or condensation.

### Connections



※Please use reliable contacts enough to flow 5μA of current when using input signal or reset signal as a contact.

※IN1 - No-voltage input

IN2 - Voltage input

• DC voltage input

• AC voltage input : Display AC frequency.

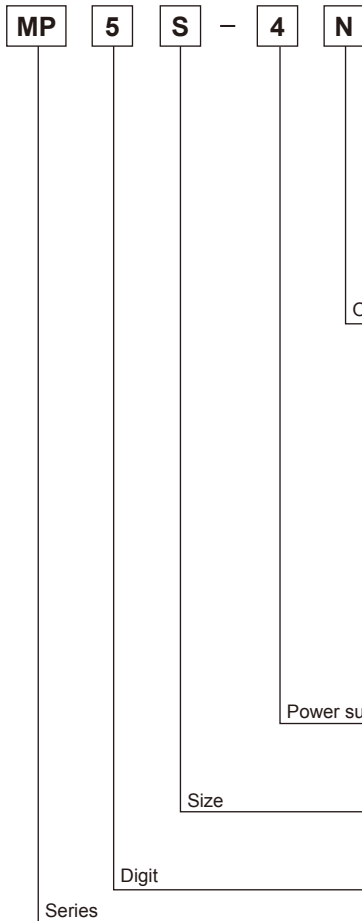
IN3 - AC voltage input : Display AC frequency.

※Choose one among IN1, IN2 and IN3 to use.

※Caution for IN3 input: If apply high voltage over 50VAC, it may cause an electric shock. Insulated transformer whose turn ratio is 1:1 must be installed, or countermeasures must be provided.

# High-performance, Digital Pulse Meter [MP5S / MP5Y / MP5W / MP5M Series]




## Ordering information



S Type		Main output(Comparative value output)	Sub output(Display value output)
N	Indicator		—
Y Type			
N	Indicator		—
1	NPN open collector quintuple output		—
2	PNP open collector quintuple output		—
3	Indicator		BCD Dynamic
4	Indicator		PV transmission output(DC4-20mA)
5	Indicator		RS485 communication output
W Type			
N	Indicator		—
A	Five relay(HH, H, GO, L, LL)		—
1	Triple relay(H, GO, L)		—
2	NPN open collector quintuple output		BCD dynamic
3	PNP open collector quintuple output		BCD dynamic
4	NPN open collector quintuple output		PV transmission output(DC4-20mA)
5	PNP open collector quintuple output		PV transmission output(DC4-20mA)
6	NPN open collector quintuple output		Low speed serial output
7	PNP open collector quintuple output		Low speed serial output
8	NPN open collector quintuple output		RS485 communication output
9	PNP open collector quintuple output		RS485 communication output
M Type			
N	Indicator		—
1	Relay single(High-limit) output + NPN open collector output		—
2	Relay dual(High/Low-limit) output + NPN open collector output		—
2	24VDC(Only for MP5Y-24)		
4	100-240VAC 50/60Hz		
S	DIN W48×H48mm		
Y	DIN W72×H36mm		
W	DIN W96×H48mm		
M	DIN W72×H72mm		
5	99999(5digit)		
MP	Pulse meter		




※PNP open collector output : Option

## Specifications (MP5S / MP5Y / MP5W Series)

Series	MP5S-4N	MP5Y-24	MP5Y-4□	MP5W-4□
Appearances & Dimensions	 [W48×H48×L90mm]	 [W72×H36×L102mm]		 [W96×H48×L100mm]
Display method	7 Segment LED display(Zero blanking type)			
Character size	W4 × H8mm	W6.8 × H13.8mm		
Max. indication	-19999 to 99999			
Power supply	100-240VAC 50/60Hz	24VDC	100-240VAC 50/60Hz	100-240VAC 50/60Hz
Allowable operation voltage	90 to 110%			
Power consumption	Max. 7.5VA	Max. 6W	Max. 7VA	Max. 6VA

- Photo electric sensor
- Fiber optic sensor
- Door/Area sensor
- Proximity sensor
- Pressure sensor
- Rotary encoder
- Connector/Socket
- Temp. controller
- SSR/Power controller
- Counter
- Timer
- Panel meter
- Tacho/Speed/ Pulse meter
- Display unit
- Sensor controller
- Switching mode power supply
- Stepper motor& Driver&Controller
- Graphic/ Logic panel
- Field network device

## ■ Specifications (MP5S / MP5Y / MP5W Series)

Series	MP5S-4N	MP5Y-24	MP5Y-4□	MP5W-4□
Power for external sensor	12VDC ±10%, 80mA			
Input frequency	<ul style="list-style-type: none"> <li>• Solid-state input : Max. 50kHz(Pulse width : Each over 10μs)</li> <li>• Contact input : Max. 45Hz(Pulse width : Over 11ms)</li> </ul>			
Input level	[Voltage input] High : 4.5-24VDC, Low : 0-1.0VDC, Input impedance : 4.5kΩ [No-voltage input] Impedance at short-circuit : Max. 300Ω, Residual voltage : Max. 1V Impedance at open-circuit : Min. 100kΩ			
Measuring range	<ul style="list-style-type: none"> <li>• Mode F1, F2, F7, F8, F9, F10 : 0.0005Hz to 50kHz</li> <li>• Mode F3 : 0.02s to 3,200s</li> <li>• Mode F4, F5, F6 : 0.01s to 3,200s</li> <li>• Mode F11, F12, F13 : 0 to 4 × 10 Count</li> </ul>			
Measuring accuracy (23 ±5°C)	<ul style="list-style-type: none"> <li>• Mode F1, F2, F7, F8, F9, F10 : F.S. ±0.05% rdg ±1digit</li> <li>• Mode F3, F4, F5, F6 : F.S. ±0.01% rdg ±1digit</li> </ul>			
Display period	0.05 / 0.5 / 1 / 2 / 4 / 8sec.(It is same with period of output update.)			
Operation mode	Number of revolution/Speed/Frequency(F1), Passing speed(F2), Cycle(F3), Passing time(F4), Time width(F5), Time difference(F6), Absolute ratio(F7), Error ratio(F8), Density(F9), Error(F10), Length measurement(F11), Interval(F12), Multiplication(F13)			
Prescale function	Direct input method(0.0001×10 <sup>-9</sup> to 9.9999×10 <sup>9</sup> )			
Hysteresis*1	0 to 9999			
Other functions	<ul style="list-style-type: none"> <li>• Lock setting function</li> <li>• Auto-Zero time setting function</li> <li>• Time unit selection function</li> <li>• Peak value monitoring function</li> <li>• Memory protection function (Mode F13 applied only)</li> </ul>			
Main output	Triple relay	—	—	250VAC 3A resistive load 3a
	Quintuple relay		12-24VDC 30mA Max.	12-24VDC 20mA max.
	NPN Open collector (Quintuple)			
	PNP Open collector (Quintuple)			
Sub output	BCD Dynamic	—	NPN Open collector 12-24VDC 30mA Max.	NPN Open collector 12-24VDC 20mA max.
	Low speed serial output	—	—	—
	PV transmission	—	DC4-20mA Load 600Ω Max. (Response time : Max. 800ms)	DC4-20mA Load 600Ω Max.
	RS485 communication	—	31 channels, Mutual direction communication function	
Memory protection	Non-volatile memory(Input : Min. 100,000 times)			
Insulation resistance	Min. 100MΩ(at 500VDC megger) Between charge part and non-charge part			
Dielectric strength	2000VAC 60Hz 1minute(Between terminals of AC power and case, Between terminals of AC power and measuring input terminals)			
Impulse noise strength	±2000VAC R-phase, S-phase the square wave noise(pulse width : 1μs) by the noise simulator, repeat frequency 60Hz			
Vibration	Mechanical	0.75mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 2 hour		
	Malfuction	0.5mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 10 minutes		
Shock	Mechanical	300m/s <sup>2</sup> (approx. 30G) in each of X, Y, Z directions for 3 times		
	Malfuction	100m/s <sup>2</sup> (approx. 10G) in each of X, Y, Z directions for 3 times		
Relay life cycle	Malfuction	—	Min. 10,000,000 operations	
	Mechanical	—	Min. 100,000 operations(250VAC 3A load current)	
Environ-ment	Ambient temperature	-10 to 50°C, storage : -20 to 60°C		
	Ambient humidity	35 to 85%RH, storage : 35 to 85%RH		
Approval		—		
Weight *3	Approx. 199.5g (approx. 141.5g)	Approx. 209g(approx. 117g)	Approx. 301.5g (approx. 177g)	


※1: The hysteresis setting range is changed by the setting position of decimal point.

※2: Data bank switching function is in MP5W Series only.

※3: The weight with packaging and the weight in parentheses is only unit weight.



■ Specifications (MP5M Series)

Model	MP5M-4N	MP5M-41	MP5M-42
	Indicator	High-limit setting type	High/Low-limit setting type
Appearances & Dimensions			
	CE c RU US [W72×H72×L113mm]		
Display method	7 Segment LED display(Zero blanking), Character size : W4 X H8mm		
Max. indication	0.0001 to 99999		
Power supply	100-240VAC 50/60Hz		
Allowable operation voltage	90 to 110%		
Power consumption	Approx. 7.5VA(240VAC)	Approx. 8VA(240VAC)	
Power for external sensor	12VDC ±10%, 80mA		
Input frequency	• Solid-state input : Max. 50kHz(pulse width : over 10μs) • Contact input : Max. 45Hz(pulse width:over 11ms)		
Input level	[Voltage input] High : 4.5-24VDC, Low : 0-1.0VDC, Input impedance : 4.5kΩ [No-voltage input] Impedance at short-circuit : Max. 300Ω, Residual voltage : Max. 1V Impedance at open-circuit : Min. 100kΩ		
Measuring range	• Mode F1, F2, F7, F8 : 0.0005Hz to 50kHz      • Mode F3 : 0.02s to 3,200s • Mode F4, F5, F6 : 0.01s to 3,200s          • Mode F9, F10, F11 : 0 to 4 × 10 <sup>9</sup> Count		
Measuring accuracy(23 ±5°C)	• Mode F1, F2, F7, F8 : F.S. ±0.05% rdg ±1digit      • Mode F3, F4, F5, F6 : F.S. ±0.01% rdg ±1digit		
Display period	0.05 / 0.5 / 1 / 2 / 4 / 8sec.(It is same with period of output update.)		
Operation mode	Number of revolution/Speed/Frequency(F1), Passing speed(F2), Cycle(F3), Passing time(F4), Time width(F5), Time difference(F6), Absolute ratio(F7), Density(F8), Length measurement(F9), Interval(F10), Multiplication(F11)		
Prescale function	Direct input method(0.0001×10 <sup>-9</sup> to 9.9999×10 <sup>9</sup> )		
Hysteresis	—	0 to 9999	
Other function	<ul style="list-style-type: none"> <li>• Lock setting function</li> <li>• Auto-Zero time setting function</li> <li>• Time unit selection function</li> <li>• Peak value monitoring function</li> <li>• Memory protection function (Mode F11 applied only)</li> </ul>	<ul style="list-style-type: none"> <li>• Lock setting function</li> <li>• Monitoring delay function</li> <li>• Auto-Zero time setting function</li> <li>• Time unit selection function</li> <li>• Peak value monitoring function</li> <li>• Memory protection function (Mode F11 applied only)</li> <li>• High-limit output function(H)</li> </ul>	<ul style="list-style-type: none"> <li>• Lock setting function</li> <li>• Monitoring delay function</li> <li>• Auto-Zero time setting function</li> <li>• Time unit selection function</li> <li>• Peak value monitoring function</li> <li>• Memory protection function (Mode F11 applied only)</li> <li>• Comparative output function(H, L)</li> <li>• Output mode selection function (S, H, L, B, I, F)</li> <li>• Deviation memory function (F output mode applied only)</li> </ul>
Main output	Relay	—	250VAC 3A resistive load 1c
	NPN Open Collector	—	30VDC 100mA Max.      30VDC 100mA Max. ×2
Memory protection	Non-volatile memory(Input : Min. 100,000 operations)		
Approval	CE c RU US		
Unit weight	Approx. 275g	Approx. 310g	Approx. 330g

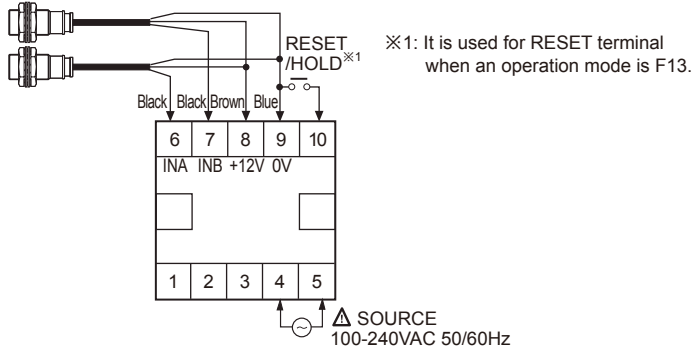
※MP5S, MP5Y, MP5W have same function.  
 ※Environment resistance is rated at no freezing or condensation.

Photo electric sensor
Fiber optic sensor
Door/Area sensor
Proximity sensor
Pressure sensor
Rotary encoder
Connector/Socket
Temp. controller
SSR/ Power controller
Counter
Timer
Panel meter
Tacho/ Speed/ Pulse meter
Display unit
Sensor controller
Switching mode power supply
Stepper motor & Driver&Controller
Graphic/ Logic panel
Field network device

## ■ Connections

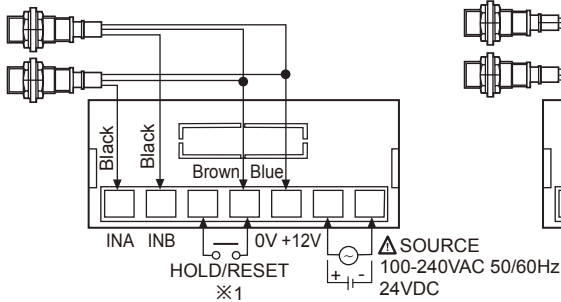
### ◎ MP5S Series

#### ● MP5S-4N(Indicator)

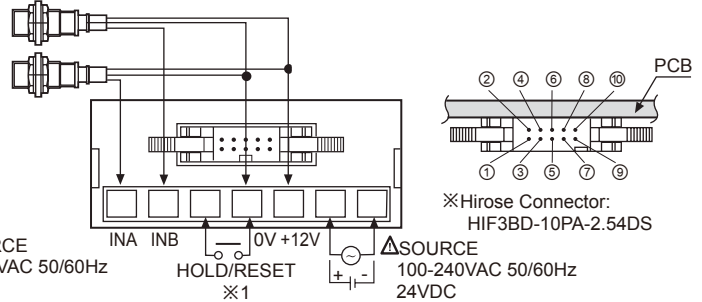


### ◎ MP5Y Series

#### ● MP5Y-□N(Indicator)



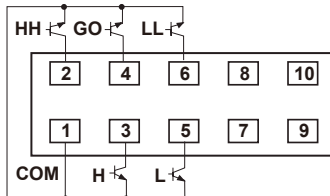
#### ● MP5Y-□4 to □5(Main/Sub output type)



#### ● Main output(Connector)

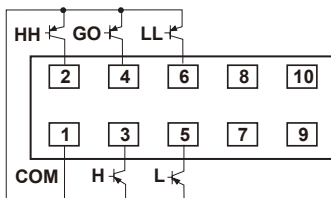
##### ● MP5Y-□1(NPN open collector output)

**MAIN OUT**  
(NPN OPEN COLLECTOR:12-24VDC Max. 30mA)



##### ● MP5Y-□2(PNP open collector output)

**MAIN OUT**  
(PNP OPEN COLLECTOR:12-24VDC Max. 30mA)

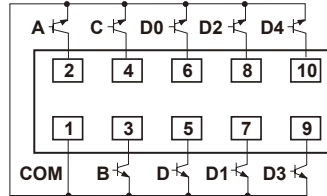


※Main output type & sub output type : Customizable

#### ● Sub output(Connector)

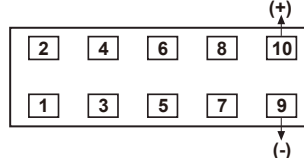
##### ● MP5Y-□3(BCD dynamic output)

**BCD OUT**  
(NPN OPEN COLLECTOR:12-24VDC Max. 30mA)



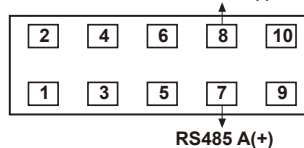
##### ● MP5Y-□4(PV transmission output)

**DC4-20mA**  
Load 600Ω Max.



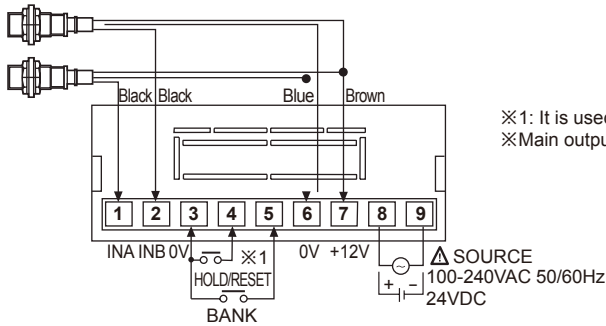
##### ● MP5Y-□5(RS485 communication output)

**RS485 B(-)**

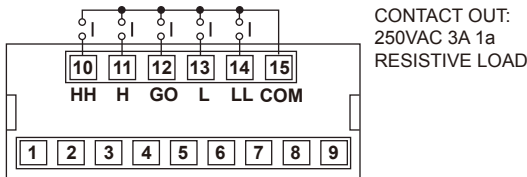


## ◎ MP5W Series

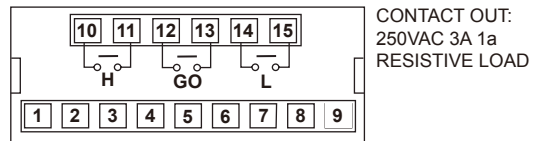
### ● MP5W-□N(Indicator)



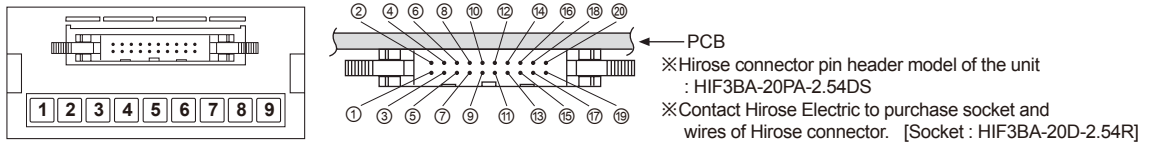
### ● MP5W-□A(Five relay output)



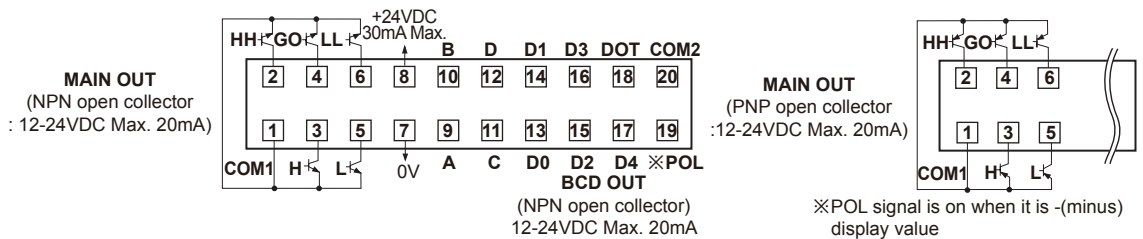
### ● MP5W-□1(Triple relay output)



### ● Main output+Sub output(Connector)



### ● MP5W-□2/ MP5W-□3(NPN/PNP open collector output + BCD output)



### ● MP5W-□4/ MP5W-□5(NPN/PNP open collector output + PV transmission output(DC4-20mA) output)

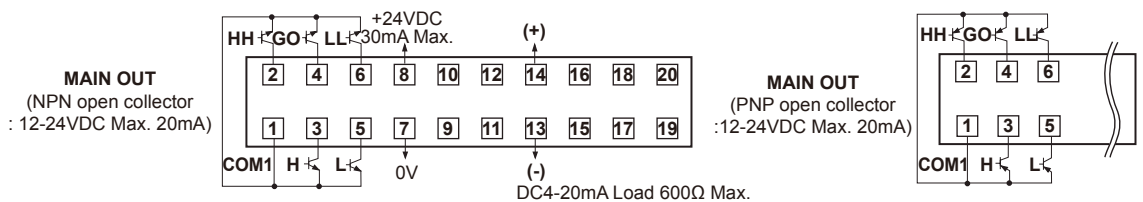
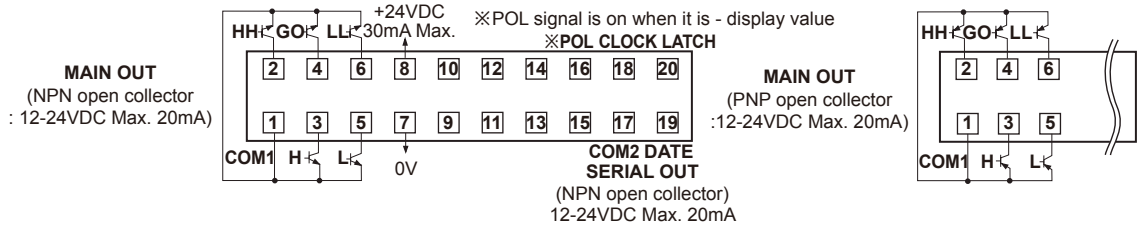


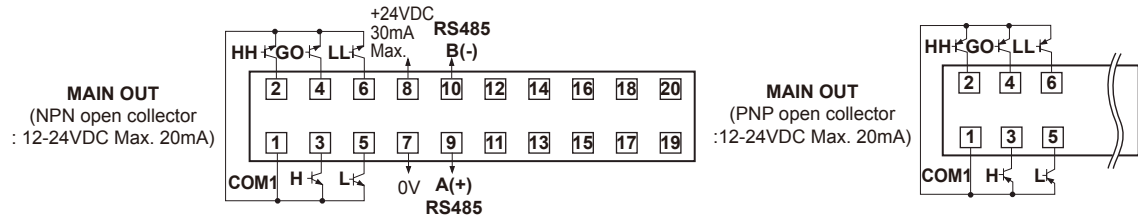
Photo electric sensor
Fiber optic sensor
Door/Area sensor
Proximity sensor
Pressure sensor
Rotary encoder
Connector/ Socket
Temp. controller
SSR/ Power controller
Counter
Timer
Panel meter
Tacho/ Speed/ Pulse meter
Display unit
Sensor controller
Switching mode power supply
Stepper motor & Driver&Controller
Graphic/ Logic panel
Field network device

# Selection Guide

- **MP5W-□6/ MP5W-□7**(NPN/PNP open collector output + Low speed serial output)

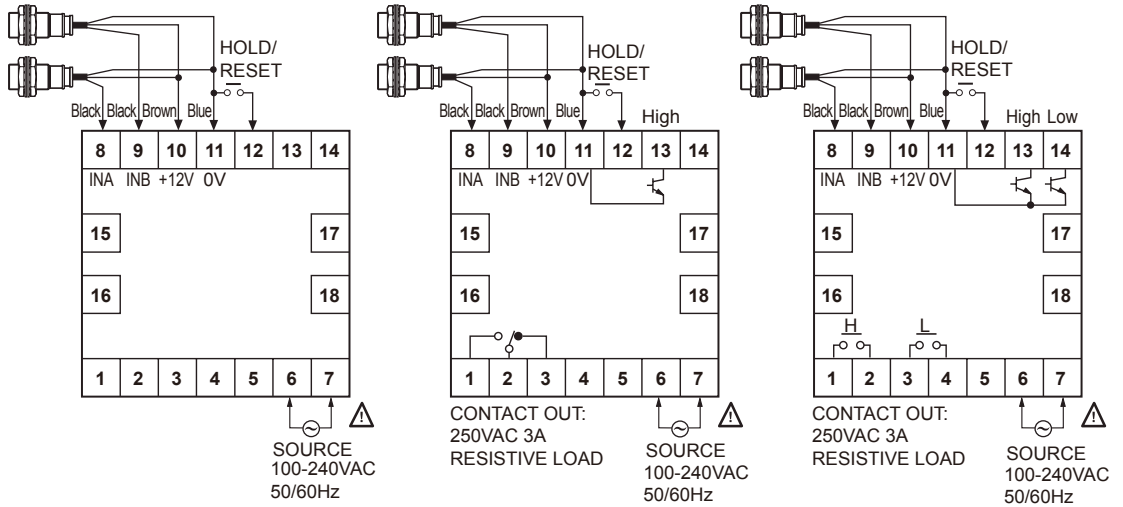


- **MP5W-□8/ MP5W-□9**(NPN/PNP open collector output + RS485 communication output)



## ◎ MP5M Series

- **MP5M-4N**(Indicator)      ● **MP5M-41**(High-limit setting type)      ● **MP5M-42**(High/Low-limit setting type)



# Serial/Parallel/RS485 communication input type Display Unit [DS / DA Series]

## Ordering information

<b>D</b>	<b>S</b>	<b>16</b>	<b>—</b>	<b>R</b>	<b>S</b>
Item					
Display method					
Size (character size)					
Display color					
Unit type					

S	Basic unit	Serial input
P		Parallel input
T		RS485 communication input
D <sup>※2</sup>		Temp./Humi. sensor module input
DT <sup>※2</sup>		Temp./Humi. sensor module input+RS485 com. output
R <sup>※2</sup>		Pt temp. sensor input
DR <sup>※2</sup>		Pt temp. sensor input+RS485 com. output
E	Expansion unit	
No-mark	Unit-display unit	
R	Red	
G	Green	
16 <sup>※1</sup>	W16×H24mm (W9.0×H16.0mm)	
22	W20×H33mm (W11.2×H22.5mm)	
40	W40×H60mm (W22.4×H40.0mm)	
60	W60×H96mm (W33.6×H60.0mm)	
S	7 Segment	
A	16 Segment	
U <sup>※3</sup>	Unit-display unit	
D	Display unit	

- ※1: The '16' size model does not have the parallel input model and does not support 16 Segment display method.
- ※2: Temp./Humi. module input, Temp./Humi. module input + RS485 com. output, Pt sensor input, Pt sensor input+RS485 com. output models will be available.
- ※3: Unit-display unit has only 16, 22 size.
- ※4: Temp./Humi. sensor module input, Temp./Humi. sensor module input+RS485 com. output, Pt temp. sensor input, Pt temp. sensor input+RS485 com. output models support only red display color.

## Specifications

Model	Basic unit	DS16-□S/T/D	D□22-□S/P/T/D/R	D□40-□S/P/T/D/DT/R/RT	D□60-□S/P/T/D/DT/R/RT
	Expansion unit	DS16-□E	D□22-□E	D□40-□E	D□60-□E
Appearances					
Input method		D□□□-□S: Serial D□□□-□P: Parallel(Dynamic Parallel 1, Dynamic Parallel 2) D□□□-□T: RS485 communication(Modbus protocol) DS□□-RD/RDT: Temp./Humi. sensor module(THD-RM-S) input(1 <sup>2</sup> C input type) DS□□-RR/RRT: Pt temp. sensor input(supports DPt100Ω, JPt 100Ω) <sup>※1</sup>			
Display color <sup>※2</sup>		Red, Green(selectable by model)			
Power supply		12-24VDC			
Allowable voltage range		90 to 110% of rated voltage			

- Photo electric sensor
- Fiber optic sensor
- Door/Area sensor
- Proximity sensor
- Pressure sensor
- Rotary encoder
- Connector/Socket
- Temp. controller
- SSR/Power controller
- Counter
- Timer
- Panel meter
- Tacho/Speed/Pulse meter
- Display unit
- Sensor controller
- Switching mode power supply
- Stepper motor & Driver&Controller
- Graphic/Logic panel
- Field network device

## ■ Specifications

Model	Basic unit	DS16-□S/T/D	D□22-□S/P/T/D/R	D□40-□S/P/T/D/DT/R/RT	D□60-□S/P/T/D/DT/R/RT	
	Expansion unit	DS16-□E	D□22-□E	D□40-□E	D□60-□E	
Current consumption	Red	D□□-RS/RP/RT/RE	Max. 20mA	Max. 25mA	Max. 55mA	Max. 65mA
		D□□-RD/RDT/RR/RT	Max. 40mA	Max. 40mA	Max. 55mA	Max. 65mA
	Green		Max. 15mA	Max. 20mA	Max. 40mA	Max. 45mA
Character size		W9×H16mm	W11.2×H22.5mm	W22.4×H40mm	W33.6×H60mm	
Max. Clock <sup>※3, ※4</sup>		• Serial input: Max. 2kHz • Parallel input: Dynamic Parallel 1: Max. 3kHz, Dynamic Parallel 2: Max. 1.5kHz				
Input logic <sup>※3</sup>		Selectable positive logic(PNP), negative logic(NPN)(change by the function set switch)				
Input resistance <sup>※3</sup>		20kΩ				
Input level <sup>※3</sup>		High: 4.5-24VDC, Low: 0-1.2VDC				
Display character <sup>※5</sup>		64 characters and signs(0 to 9, A to Z, 27 signs, decimal point)				
Display temp./humi. range		DS□-RD/RDT temperature: -19.9 to 60.0°C, humidity: 00.0 to 99.9%RH				
		DS□-RR/RRT temperature: -50.0 to 400.0°C or -58.0 to 752.0°F				
Display accuracy		DS□-RD/RDT temperature: ±1.0°C(room temperature <sup>※6</sup> ), humidity: ±2.0%RH(10 to 90%RH, room temperature <sup>※6</sup> )				
		DS□-RR/RRT: ±0.5% F.S.				
Output		—		RS485 com. output(Modbus RTU) <sup>※7</sup>		
The number of max. multi-stage connections		Serial/RS485 com. input: 24 units				
		Parallel: Dynamic Parallel 1 : 6 units(4Bit), 4 units(6Bit)/ Dynamic Parallel 2 : 24 units(6Bit)				
		Temp./Humi. sensor module input(+RS485 com. output): 6 units(3 units for temp. display, 3 units for humidity display, except unit-display unit)				
		Pt temperature sensor input(+RS485 com. output): 4EA(except unit-display unit)				
Noise resistance		±500V the square wave noise (puseL width: 1μs) by the noise simulator				
Envir- onment	Ambient temperature	-10 to 55°C, storage: -25 to 65°C (for THD-RM-S, -19.9 to 60°C, storage: -19.9 to 60°C)				
	Ambient humidity	35 to 85%RH (for THD-RM-S, 0 to 99.9%, storage: 0 to 99.9%)				
Accessory	Basic unit	Cap: right/left 1EA	Cap: right/left 1EA, Connector : 1EA	Connector: 1EA <sup>※8</sup>		
	Expansion unit	—			Ribbon cable: 1EA(50mm)	
	DS□-RD/RDT	Temp./Humi. sensor module(THD-RM-S)				
Protection		IP40 (front part)				
Approval <sup>※5</sup>		CE				
Weight <sup>※9</sup>	D□□-□S/P/T/R/RT	Approx. 53g (approx. 12g)	Approx. 58g (approx. 17g)	Approx. 70g (approx. 28g)	Approx. 115g (approx. 60g)	
	DS□-RD/RDT	Approx. 168g (approx. 12g)	Approx. 173g (approx. 17g)	Approx. 184g (approx. 28g)	Approx. 216g (approx. 60g)	
	D□□-□E	Approx. 77g (approx. 12g) <sup>※10</sup>	Approx. 92g (approx. 17g) <sup>※10</sup>	Approx. 70g (approx. 28g)	Approx. 115g (approx. 60g)	

※1: 16 size model does not support Pt temperature sensor input.

※2: Temp./Humi. sensor module input, Temp./Humi. sensor module input+RS485 com. output, Pt temp. sensor input, Pt temp. sensor input+RS485 com. output models support only red display color.

※3: It is only for Serial, Parallel input models.

※4: Max. Clock is for 1:1 of duty ratio (ON, OFF ratio).

※5: It is only for Serial, Parallel, RS485 com. input models.

※6: Room temperature 23°C±5°C

※7: RS485 com. output supports only DS40-R□T, DS60-R□T models.

※8: It is only for Parallel input model.

※9: The weight is with packaging and the weight in parentheses is only unit weight.

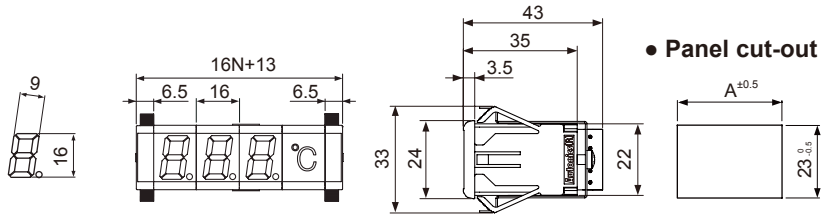
※10: This is 3 units' weight as packaging unit and the weight in parentheses is only unit weight.

※Environment resistance is rated at no freezing or condensation.

## ■ Dimensions

(unit : mm)

### ◎ DS16

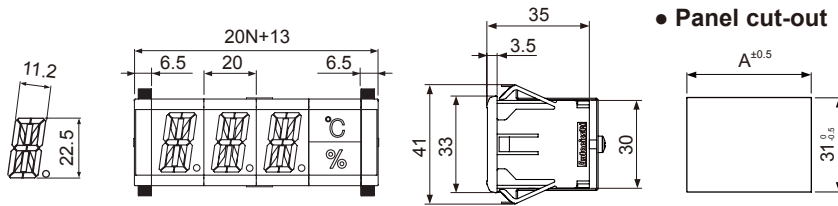


● Panel cut-out

※N: Number of units  
※Panel thickness: 1.5 to 4mm

Units(N)	A(16N+11)
1	27
2	43
3	59
4	75
5	91
:	:

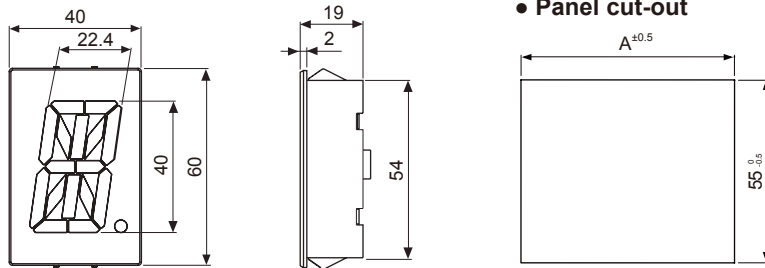
### ◎ DS22/DA22



● Panel cut-out

Units(N)	A(20N+11)
1	31
2	51
3	71
4	91
5	111
:	:

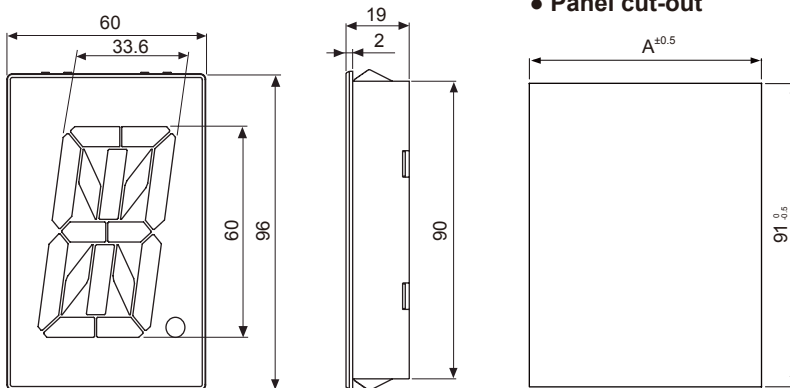
### ◎ DS40/DA40



● Panel cut-out

Units(N)	A(40N+2)
1	38
2	78
3	118
4	158
5	198
6	238
7	278
8	318
9	358
10	398
:	:

### ◎ DS60/DA60



● Panel cut-out



※N: Number of units  
※Panel thickness: 1.5 to 4mm

Units(N)	A(60N-3)
1	57
2	117
3	177
4	237
5	297
6	357
7	417
8	477
9	537
10	597
:	:

- Photo electric sensor
- Fiber optic sensor
- Door/Area sensor
- Proximity sensor
- Pressure sensor
- Rotary encoder
- Connector/Socket
- Temp. controller
- SSR/Power controller
- Counter
- Timer
- Panel meter
- Tacho/Speed/ Pulse meter
- Display unit
- Sensor controller
- Switching mode power supply
- Stepper motor& Driver&Controller
- Graphic/Logic panel
- Field network device

## 7 Segment Display Unit large(W32×H57mm) and high bright LED [D1SC-N / D1SA Series]

### ■ Specifications

Model	D1SC-N	D1SA-RN	D1SA-GN <sup>※1</sup>
Appearances			
Display method	7 Segment LED display(red)		7 Segment LED display(green)
Power supply	12-24VDC		
Allowable voltage range	90 to 110% of rated voltage		
Current consumption	Max. 70mA	Max. 35mA	
Character size	W32 × H57mm	W11×H22mm	
Display character <sup>※2</sup>	• Decimal number : 0 to 9, decimal point • Hexadecimal number : 0 to 9, A to F, decimal point		
Input	• Parallel : Parallel 4bit data, latch, zero blanking, decimal point • Serial : Serial 4bit or 5bit data, clock, zero blanking, latch, decimal point(for 4 bit input)		
Input resistance	12kΩ	20kΩ	
Input level	High : 4.5-24VDC, Low : 0-1.2VDC		
Max. response CLOCK	Max. 3kHz		
Output	Data output (serial input), zero blanking output		
Input logic	Selectable positive logic (PNP) or negative logic (NPN) (D1SC-N: by the function set switch, D1SA Series: by inner soldering)		
Noise strength	±300V the square wave noise (pulse width: 1us) by the noise simulator		
Environment	Ambient temperature 0 to 60°C, storage : -10 to 85°C		
	Ambient humidity 35 to 85%RH, storage: 35 to 85%RH		
Accessory	Housing[5264-10], Terminal[5263(PBT)], Sub-PCB for multi-stage connection		Connector(CT-10S), Cap
Unit weight	Approx. 100g		Approx. 22g(including right/left caps)

※1: It is option

※2: Only D1SC-N supports Minus displaying.

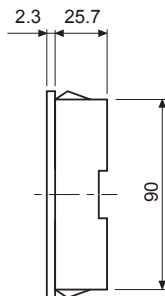
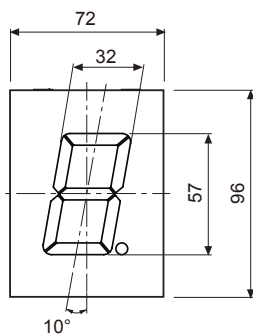
※The max. response CLOCK is when the duty ratio is 1:1.

※Environment resistance is rated at no freezing or condensation.

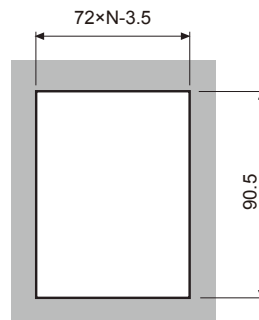
### ■ Dimensions

(unit: mm)

#### ◎ D1SC-N



#### ● Panel cut-out

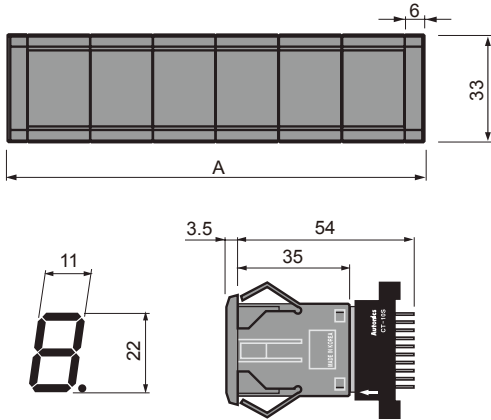


※N: Number of units

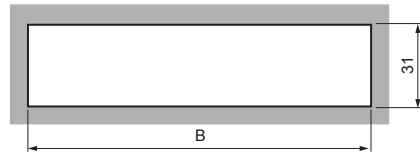
※Panel thickness: 2 to 4mm



◎ D1SA Series



● Panel cut-out



● Panel cut-out chart

Digit(N)	A(20×N+12)	B(20×N+10)
1	32	30±0.1
2	52	50±0.1
3	72	70±0.1
4	92	90±0.1
5	112	110±0.1
6	132	130±0.1
7	152	150±0.1
8	172	170±0.1

Small Display Unit for vivid display(W11×H20mm) and various 60 characters and signs [D1AA Series]

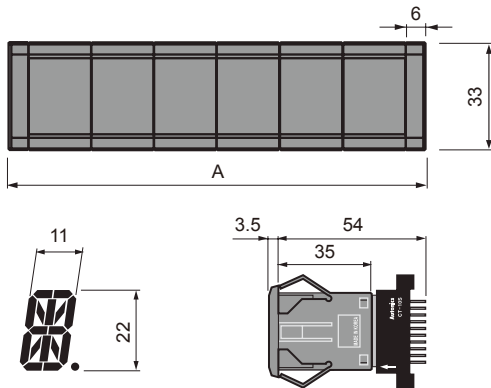
■ Specifications

Model	D1AA-RN	D1AA-GN <sup>※1</sup>
Appearances		
Display method	16 Segment LED display(Red)	16 Segment LED display(Green)
Power supply	12-24VDC	
Allowable voltage range	90 to 110% of rated voltage	
Current consumption	Max. 32mA	
Display character	60 characters (0 to 9, A to Z, symbol(24 kinds), decimal point)	
Character size	W11×H22mm	
Input	・Parallel : Parallel 6bit data, latch, decimal point ・Serial : Serial 6bit or 7bit data, clock, latch, decimal point(for 6bit input)	
Input level	High : 4.5-24VDC, Low : 0-1.2VDC	
Max. response CLOCK	Max. 3kHz	
Input resistance	20kΩ	
Output	Data output(Serial input)	
Input logic	Selectable and changeable positive(PNP) or negative(NPN)(By inner soldering)	
Noise strength	The square wave noise by simulator(pulse width:1 μs) ±300V	
Environment	Ambient temperature	0 to 60°C, storage : -10 to 85°C
	Ambient humidity	35 to 85%RH, storage: 35 to 85%RH
Sold separately	Connector	
Unit weight	Approx. 22g(including right/left caps)	

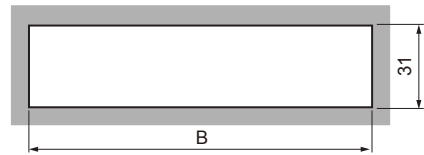
※1: This is option.  
 ※The max. clock is when the duty ratio is 1:1.  
 ※Environment resistance is rated at no freezing of condensation.

- Photo electric sensor
- Fiber optic sensor
- Door/Area sensor
- Proximity sensor
- Pressure sensor
- Rotary encoder
- Connector/Socket
- Temp. controller
- SSR/ Power controller
- Counter
- Timer
- Panel meter
- Tacho/ Speed/ Pulse meter
- Display unit
- Sensor controller
- Switching mode power supply
- Stepper motor& Driver&Controller
- Graphic/ Logic panel
- Field network device

## ■ Dimensions



### ● Panel cut-out





### ● Panel cut-out chart

Digit(N)	Dimension A(20×N+12)	Dimension B(20×N+10)
1	32	30±0.1
2	52	50±0.1
3	72	70±0.1
4	92	90±0.1
5	112	110±0.1
6	132	130±0.1
7	152	150±0.1
8	172	170±0.1

## Upgraded Display Unit from D4Y, D4W [D5Y / D5W Series]

### ■ Specifications

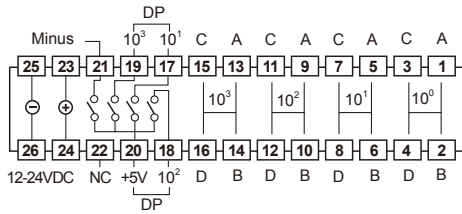
Model	D5Y-M	D5W-M	D5W-MX
Appearances & Dimensions	 [W72×H36×L91mm]	 [W96×H48×L99.5mm]	
Power supply	12-24VDC		110/220VAC 50/60Hz
Allowable voltage range	90 to 110% of rated voltage		
Current consumption	Max. 1.1W		Max. 2VA
Character size	W7×H14mm		
Display method	7Segment LED display (red)		
Display digit	Selectable 4digit(or 4 ½ digit including symbol bit), 5digit		
Max. CLOCK	100Hz to 5kHz		
Input logic	Selectable positive(PNP) or negative(NPN)		
Input method	Static parallel, Dynamic parallel, 4/5 Bit serial, Serial(16/20/25 Bit)		
Input level	High : 5-24VDC, Low : 0-1.2VDC		
Insulation resistance	100MΩ(at 500VDC megger)		
Dielectric strength	2000VAC 50/60Hz for 1 minute		
Noise strength	±1kV the square wave noise(pulse width : 1μs)by the noise simulator		
Vibration	Mechanical	0.75mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 1 hour	
	Malfunction	0.5mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 10 minutes	
Shock	Mechanical	300m/s <sup>2</sup> (approx. 30G) in each of X, Y, Z directions for 3 times	
	Malfunction	100m/s <sup>2</sup> (approx. 10G) in each of X, Y, Z directions for 3 times	
Environ-ment	Ambient temperature	-10 to 50°C, storage : -25 to 65°C	
	Ambient humidity	35 to 85%RH, storage : 35 to 85%RH	
Unit weight	Approx. 75g	Approx. 165g	Approx. 267g

※The max. CLOCK is when the duty ratio is 1:1.

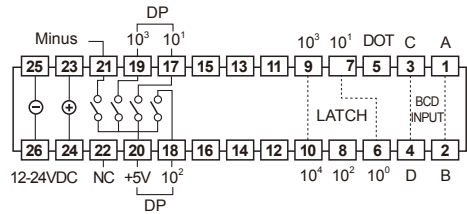
※Environment resistance is rated at no freezing or condensation.

■ Connections

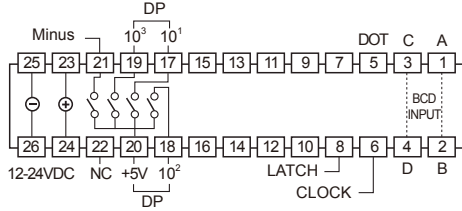
● Static parallel input



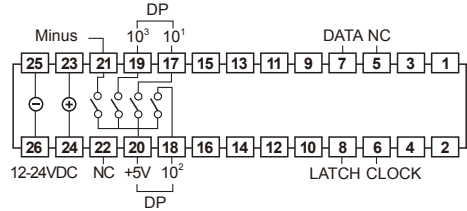
● Dynamic parallel input



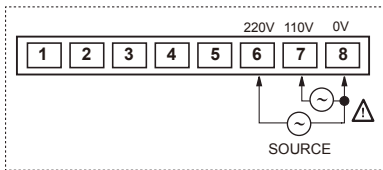
● 4/5Bit serial input



● Serial input



● Power terminal for AC power option of D5W series



※Above terminal connection diagrams's number set by pin no.1 of Hirose connector. Please note that "△" mark indicates pin no.1 of Hirose connector.

※In case of Static parallel input, 5digit cannot be used because of external terminal


※To display 5 digit in Dynamic parallel, 4/5 bit serial, serial input, display range is 0 to 99999 and it cannot display minus sign. Therefore, the applied signal to the external minus sign input terminal(pin no.21) is ignored.

※Regardless of input logic, connect external DP terminal(pin no.17, 18, 19) or external minus sign input terminal(pin no.21) to +5V(pin no.20) and it displays decimal point and minus sign.

Photo electric sensor
Fiber optic sensor
Door/Area sensor
Proximity sensor
Pressure sensor
Rotary encoder
Connector/ Socket
Temp. controller
SSR/ Power controller
Counter
Timer
Panel meter
Tacho/ Speed/ Pulse meter
Display unit
Sensor controller
Switching mode power supply
Stepper motor & Driver&Controller
Graphic/ Logic panel
Field network device

## Multifunctional sensor controller [PA10 Series]

### ■ Specifications

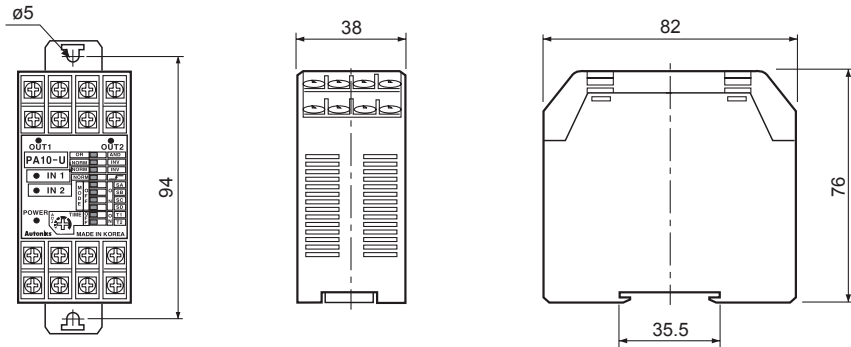
Model	PA10-U	PA10-V	PA10-VP	PA10-W	PA10-WP
Appearances					
Power supply	100-240VAC 50/60Hz				
Allowable operation voltage	90 to 110% of rated voltage				
Power consumption	100VAC 50/60Hz: Max. 9VA(Condotion:12VDC/200mA resistive load), 240VAC 50/60Hz: Max. 10VA				
Power for external sensor	12VDC ±10% Approx. 200mA				
Input(IN1)(IN2)	Selectable NORM/INV. Selectable OR/AND operation for IN1, IN2 input. Selection function for IN2 derivative action.		Selectable NORM/INV. Operation for IN1, IN2 AND.		Selectable NORM/INV. Operation for IN1, IN2 AND.
	NPN input type		NPN input type	PNP input type	NPN input type PNP input type
Input type	<ul style="list-style-type: none"> <li>● PA10-U(No-voltage input) Impedance at short-circuit: Max. 680Ω, Residual voltage at short-circuit: Max. 0.8V, Impedance at open: Min. 100kΩ</li> <li>● PA10-V/PA10-W(No-voltage input) Impedance at short-circuit: Max. 300Ω, Residual voltage at short-circuit: Max. 2V, Impedance at open: Min. 100kΩ</li> <li>● PA10-VP/PA10-WP(Voltage input) Input impedance: 5.6kΩ, "H" level voltage:5-30VDC, "L" level voltage: 0-2VDC</li> </ul>				
Output	Contact output	OUT : 250VAC 3A(resistive load)			OUT1, OUT2 : 250VAC 3A(resistive load)
	Solid-state output	O-C OUT1/O-C OUT2 : NPN open collector output Max. 30VDC 100mA	O-C OUT: NPN open collector output Max. 30VDC 100mA		—
Response time	Input : Min. 2μs, Relay contact output : Min. 10ms, Transistor output : Min. 0.5μs(When it is encoder mode)				
Time setting function by each mode ※Only for PA10-U	Have	<ul style="list-style-type: none"> <li>• ON Delay Mode</li> <li>• One-Shot Delay Mode</li> <li>• Flicker One-Shot Mode</li> <li>• High-Speed Detection Mode</li> </ul>			<ul style="list-style-type: none"> <li>• OFF Delay Mode</li> <li>• Flicker Mode</li> <li>• Low-Speed Detection Mode</li> <li>• ON/OFF Delay Mode</li> </ul>
	None	<ul style="list-style-type: none"> <li>• Normal Mode</li> <li>• Flip-Flop Mode</li> <li>• Encoder(Mode 9 to 11)</li> </ul>			
Relay life cycle	Mechanical	Min. 10,000,000 operations			
	Electrical	Min. 100,000 operations(250VAC 3A resistive load)			
Dielectric strength	2000VAC 50/60Hz for 1 minute				
Insulation resistance	Min. 100MΩ(at 500VDC megger)				
Environment	Ambient temperature	-10 to 55°C, storage: -25 to 60°C			
	Ambient humidity	35 to 85%RH, storage: 35 to 85%RH			
Unit weight	Approx. 150g			Approx. 160g	

※If the load is connected over 200mA at the sensor output, it may cause mechanical trouble.

※Environment resistance is rated at no freezing or condensation.

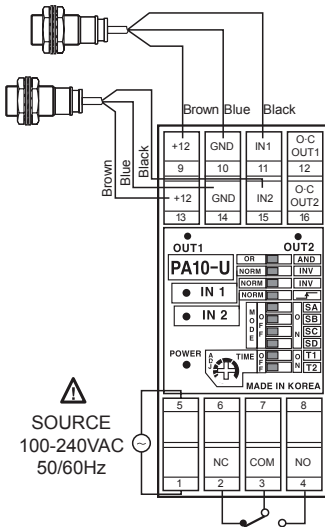
## Dimensions

(unit: mm)



## Connections

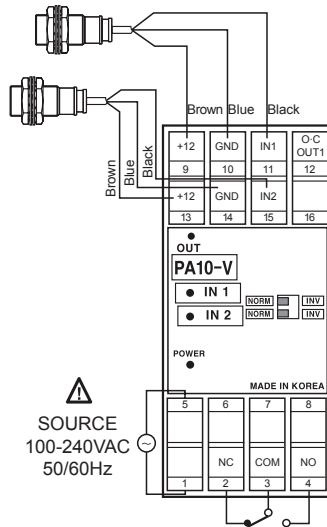
### PA10-U



⚠ SOURCE  
100-240VAC  
50/60Hz

CONTACT OUT:  
250VAC 3A  
RESISTIVE LOAD

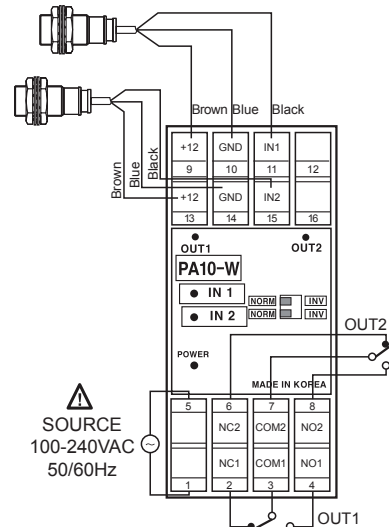
### PA10-V/PA10-VP



⚠ SOURCE  
100-240VAC  
50/60Hz

CONTACT OUT:  
250VAC 3A  
RESISTIVE LOAD

### PA10-W/PA10-WP




⚠ SOURCE  
100-240VAC  
50/60Hz

CONTACT OUT1,OUT2:  
250VAC 3A  
RESISTIVE LOAD

Photo electric sensor
Fiber optic sensor
Door/Area sensor
Proximity sensor
Pressure sensor
Rotary encoder
Connector/Socket
Temp. controller
SSR/ Power controller
Counter
Timer
Panel meter
Tacho/ Speed/ Pulse meter
Display unit
Sensor controller
Switching mode power supply
Stepper motor & Driver&Controller
Graphic/ Logic panel
Field network device

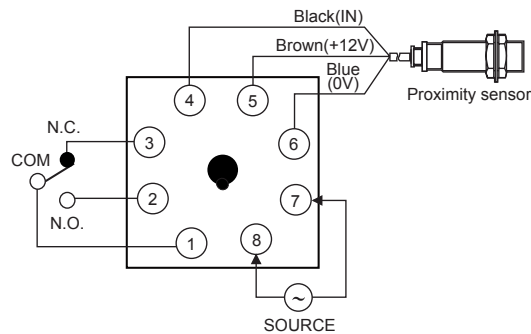
## General purpose sensor controller [PA12 Series]

### Specifications

Model	PA-12	
Appearances		
Type	Selectable NPN/PNP	
Power supply	Selectable 110/220VAC 50/60Hz	
Power consumption	Approx. 4VA	
Power for external sensor	12VDC 50mA	
Input signal	PNP	High level : 7-12VDC, Low level : 0-5VDC
	NPN	Short-circuit impedance : Max. 1kΩ, Residual voltage : Max. 2VDC, Open-circuit impedance : Min. 100kΩ
Response time	Input	Min. 0.2ms
	Output	Min. 10ms
Input resistance	10kΩ	
Control output	Contact composition	SPDT(1a1b)
	Contact capacity	250VAC 3A(For resistive load)
Environment	Ambient temperature	-10 to 50°C
	Ambient humidity	45 to 85%RH
Relay life cycle	Mechanical	Min. 10,000,000 operations
	Electrical	Min. 100,000 operations(250VAC 3A resistive load)
Unit weight	Approx. 269g	

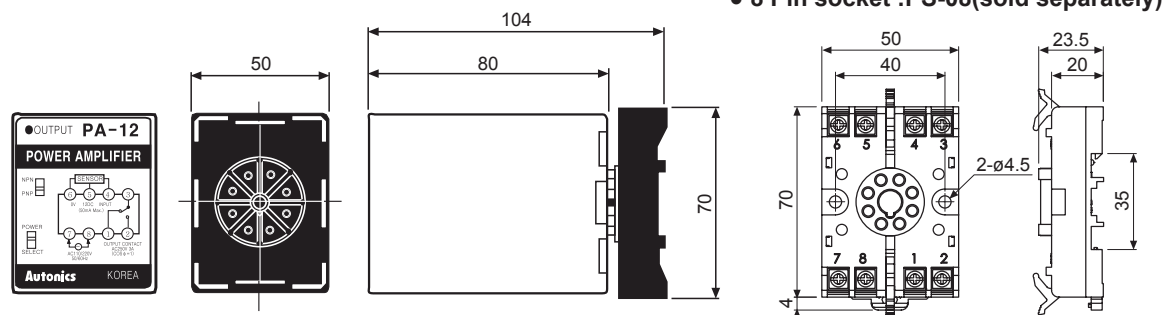
※Environment resistance is rated at no freezing or condensation.

### Connections




### Dimensions

(unit: mm)



# DIN rail mounting type switching mode power supply [SP Series]

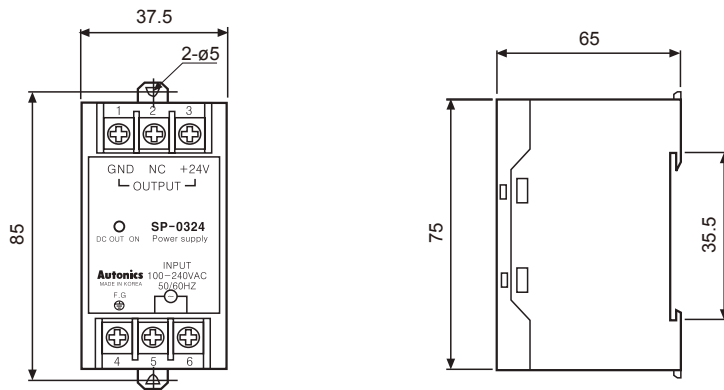
## Specifications

Model	SP-0305	SP-0312	SP-0324	
Appearances				
Output power	3W			
Input	Power supply	100-240VAC(85-264VAC)		
	Frequency	50/60Hz		
	Current consumption	Max. 0.15A		
	Efficiency	67 to 74%		
Output	Voltage	5VDC	12VDC	24VDC
	Current	0.6A	0.25A	0.13A
	Allowable voltage range	Max. ±5%		
	Ripple	Max. 5%		
	Voltage fluctuation ratio	Max. 0.5%(at 85-264VAC 100% Load)		
	Overcurrent protection	Min. 110%		
Series / Parallel operation	Not available			
Output indicator	Red LED			
Insulation resistance	100MΩ(at 500VDC megger)			
Dielectric strength	2000VAC 50/60Hz for 1 minute			
Vibration	0.75mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 2 hours			
Shock	300m/s <sup>2</sup> (approx. 30G) in each of X, Y, Z directions for 3 times			
Environment	Ambient temperature	-10 to 50°C, storage : -20 to 70°C		
	Ambient humidity	35 to 85%RH		
Unit weight	Approx. 100g			

※Environment resistance is rated at no freezing of condensation.

## Dimensions

(unit: mm)





- Photo electric sensor
- Fiber optic sensor
- Door/Area sensor
- Proximity sensor
- Pressure sensor
- Rotary encoder
- Connector/Socket
- Temp. controller
- SSR/ Power controller
- Counter
- Timer
- Panel meter
- Tacho/ Speed/ Pulse meter
- Display unit
- Sensor controller
- Switching mode power supply
- Stepper motor & Driver&Controller
- Graphic/ Logic panel
- Field network device

## Switching mode power supply with minimized noise and ripple [SPA Series]

### Ordering information

SPA	—	030	—	24	Output voltage	05	5VDC
						12	12VDC
						24	24VDC
						030	30W
						050	50W
						075	75W
						100	100W
Item						SPA	Switching Mode Power Supply

### Specifications

Model	SPA-030-05	SPA-050-05	SPA-030-12	SPA-050-12	SPA-030-24	SPA-050-24	SPA-075-05	SPA-100-05	SPA-075-12	SPA-100-12	SPA-075-24	SPA-100-24
Appearances												
Capacity	30W	50W	30W	50W	30W	50W	75W	100W	75W	100W	75W	100W
Input	Power supply <sup>※5</sup>						100-120/200-240VAC(85-132/170-264VAC) switching type					
	Frequency											
Input	Efficiency <sup>※1</sup>											
	Current consumption <sup>※1</sup>											
Output	Voltage											
	Current											
Output	Voltage adjustment range <sup>※4</sup>											
	Input fluctuation ratio <sup>※2</sup>											
Output	Load fluctuation ratio <sup>※1</sup>											
	Ripple <sup>※1</sup>											
Output	Starting time <sup>※1</sup>											
	Holding time <sup>※1</sup>											
Protection	Inrush current protection											
	Output overcurrent protection <sup>※3</sup>											
	Output overvoltage protection											
	Output short-circuit protection											
Output indicator												
Insulation resistance												
Dielectric strength												
Vibration												
Shock												
EMS												
EMI												
Protection												
Environment	Ambien temperature											
	Storage temperature											
	Ambient humidity											
Approval												
Unit weight												

※1: 100% load for rated input voltage(100VAC).

※2: Rated input voltage [ SPA-030/050 Series : 100-240VAC(85-264VAC) ] under 100% of load.

SPA-100-05 is under 100% of load for [100-120/200-240VAC(100-132/190-264VAC)].

※3: Rated input voltage(100VAC). ※4: Vary voltage by output voltage adjuster, it is changed over voltage variation range(±5%).

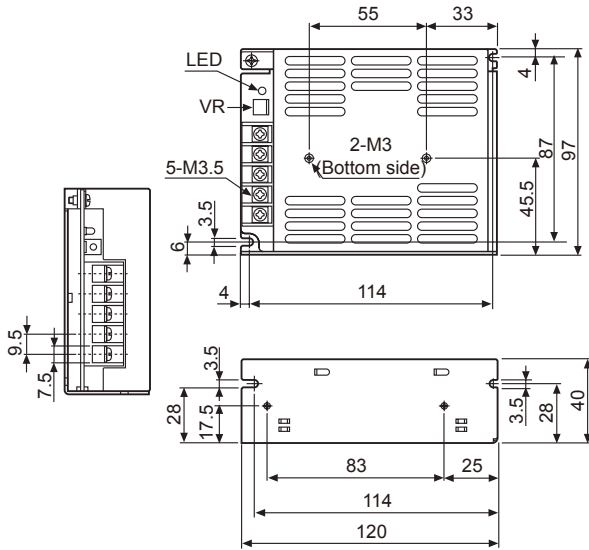
※5: The rated input volatge of SPA-100-05 is 100-120/200-240VAC(100-132/190-264VAC).

※Environment resistance is rated at no freezing or condensation.

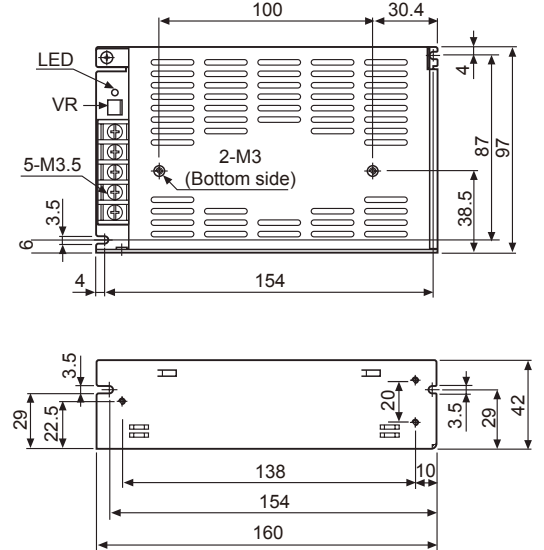


## ■ Dimensions

### ● SPA-030/050 Series



### ● SPA-075/100 Series






(unit: mm)

## DIN rail mounting switching mode power supply [SPB Series]

### ■ Ordering information

<b>SPB</b>	-	<b>060</b>	-	<b>24</b>							
				Output voltage	<table border="1" style="margin-left: 20px;"> <tr><td>12</td><td>12VDC</td></tr> <tr><td>24</td><td>24VDC</td></tr> <tr><td>48</td><td>48VDC</td></tr> </table>	12	12VDC	24	24VDC	48	48VDC
12	12VDC										
24	24VDC										
48	48VDC										
				Output power	<table border="1" style="margin-left: 20px;"> <tr><td>060</td><td>60W</td></tr> <tr><td>120</td><td>120W</td></tr> <tr><td>240</td><td>240W</td></tr> </table>	060	60W	120	120W	240	240W
060	60W										
120	120W										
240	240W										
				Item	<table border="1" style="margin-left: 20px;"> <tr><td>SPB</td><td>Switching Mode Power Supply</td></tr> </table>	SPB	Switching Mode Power Supply				
SPB	Switching Mode Power Supply										

### ■ Specifications

Model	SPB-060-12	SPB-060-24	SPB-120-24	SPB-240-12	SPB-240-24	SPB-240-48	
Appearances	<b>NEW</b> 		<b>NEW</b> 	<b>NEW</b> 			
Output power	60W		120W	240W			
Input	Voltage						100-240VAC(85-264VAC)
	Frequency						50/60Hz
	Efficiency <sup>*1</sup>		Min. 75%		Min. 80%	Min. 86%	Min. 88%
	Power factor <sup>*1</sup>		—				Min. 0.9
	Current consumption <sup>*1</sup>		Max. 1.6A		Max. 1.9A	Max. 3.8A	
Power factor correction circuit	—		Built-in				

\*1: It is for the rated input voltage 100-240VAC, and 100% load.

- Photo electric sensor
- Fiber optic sensor
- Door/Area sensor
- Proximity sensor
- Pressure sensor
- Rotary encoder
- Connector/Socket
- Temp. controller
- SSR/ Power controller
- Counter
- Timer
- Panel meter
- Tacho/ Speed/ Pulse meter
- Display unit
- Sensor controller
- Switching mode power supply
- Stepper motor & Driver&Controller
- Graphic/ Logic panel
- Field network device

## ■ Specifications

Model		SPB-060-12	SPB-060-24	SPB-120-24	SPB-240-12	SPB-240-24	SPB-240-48
Output	Voltage	12VDC	24VDC		12VDC	24VDC	48VDC
	Current	5A	2.5A	5A	20A	10A	5A
	Voltage adjustment range <sup>※2</sup>	Max. ±5%					
	Input variation <sup>※3</sup>	Max. ±0.5%					
	Load variation <sup>※1</sup>	Max. ±1%			Max. ±1.5%		
	Ripple <sup>※1</sup>	Max. ±1%			Max. ±3%	Max. 1.5%	Max. ±1%
	Start-up time <sup>※1</sup>	Max. 600ms		Max. 1000ms			
Protection	Hold time <sup>※1</sup>	Min. 10ms			Min. 20ms		
	Inrush current protection	Max. 25A (100VAC), Max. 40A(240VAC)			Max. 50A(100VAC), Max. 50A(240VAC)		
	Output over current protection <sup>※4</sup>	Min. 105%					
	Output over voltage protection	—		30.0V ±10%	16.0V ±10%	30.0V ±10%	58.0V ±10%
	Output short-circuit protection	Max. 10ms					
Output low-voltage indicate	9.6V±10%	20.0V±10%		10.0V±10%	20.0V±10%	43.0V±10%	
Output indicator	Green LED						
Insulation resistance	Min. 100MΩ(at 500VDC megger between all input terminals and output terminals)						
Dielectric strength	3000VAC 50/60Hz for 1 min. (between all input terminals and output terminals)						
	1500VAC 50/60Hz for 1 min. (between all input terminals and F.G.)						
Vibration	0.75mm amplitude at frequency of 10 to 55Hz (for 1 min.) in each of X, Y, Z directions for 2 hour						
Shock	300m/s <sup>2</sup> (approx. 30G) in each of X, Y, Z directions for 3 times						
EMS	Conforms to EN61000-6-2						
EMI	Conforms to EN61000-6-4						
Safety	IEC60950, IEC50178						
Environment	Ambient temperature	-10 to 50°C, storage: -25 to 65°C					
	Ambient humidity	25 to 85%RH, storage: 25 to 90%RH					
Protection	IP20(IEC standard)						
Unit weight <sup>※5</sup>	Approx. 347g(approx. 274g)		Approx. 570g (approx. 466g)		Approx. 866g(approx. 736g)		

※1: It is for the rated input voltage 100-240VAC, and 100% load.

※2: Adjusting voltage by the output adjuster (V.ADJ), it is changed the below voltage adjustment range(±5%).

※3: It is for the rated input voltage 100-240VAC(85-264VAC), and 100% load.

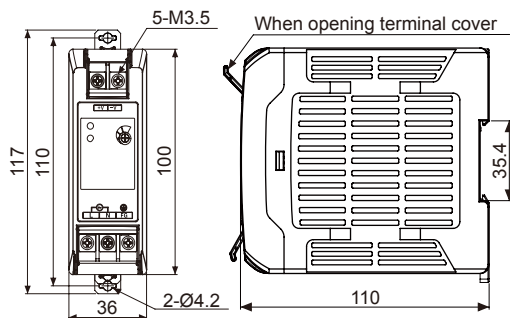
※4: It is for the rated input voltage 100-240VAC.

※5: The weight is with packaging and the weight in parentheses is only unit weight.

※Environment is rated at no freezing or condensation.

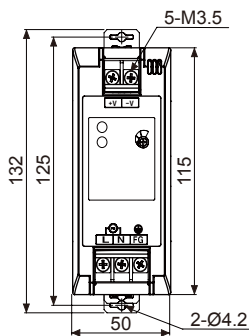
## ■ Dimensions

### ● SPB-060 Series

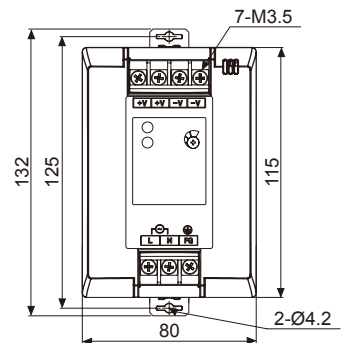


※Side sizes are same as SPB-060/120 /240 Series.

### ● SPB-120 Series













### ● SPB-240 Series



(unit: mm)

## Small, light and high speed and torque 5-phase stepper motor driver

### ■ Specifications

Model	MD5-HD14	MD5-HF14	MD5-HF14-AO	MD5-HF28	MD5-ND14
Appearances <sup>1</sup>					
Power supply	20-35VDC 3A <sup>※1</sup>	100-220VAC 50/60Hz			20-35VDC 3A
RUN current	0.4 to 1.4A / Phase			1.0 to 2.8A / Phase	0.5 to 1.5A / Phase
RUN method	Bipolar constant pentagon drive				
Basic step angle	0.72° / Phase				
Resolution	1, 2, 4, 5, 8, 10, 16, 20, 25, 40, 50, 80, 100, 125, 200, 250 division (0.72° to 0.00288° / Phase)				1, 2 division (0.72°, 0.36° / Phase)
Input pulse width	Min. 0.5μs			0.1μs	Min. 10μs
Pulse Duty	50%				
Rising/Falling time	Max. 120ns			Max. 1μs	Max. 120ns
Max. input pulse frequency <sup>※2</sup>	1MHz			500kHz	50kHz
Input voltage level	High : 4-8VDC, Low : 0-0.5VDC				
Input resistance	270Ω(CW, CCW) 390Ω(HOLD OFF, DIVISION SELECTION)		270Ω(CW, CCW) 390Ω(HOLD OFF)		270Ω(CW, CCW) 390Ω(HOLD OFF, DIVISION SELECTION)
Environment	Ambient temperature	0 to 40°C, storage: -20 to 60°C	0 to 50°C, storage: -10 to 60°C		0 to 40°C, storage: -20 to 60°C
	Ambient humidity	35 to 85%RH, storage: -10 to 90%RH	35 to 85%RH, storage: 35 to 85%RH		
Approval					
Unit weight	Approx. 220g	Approx. 660g	Approx. 650g	Approx. 1kg	Approx. 120g

※1: When using over 30VDC, it should be mounted at ventilated place due to increasing heat.

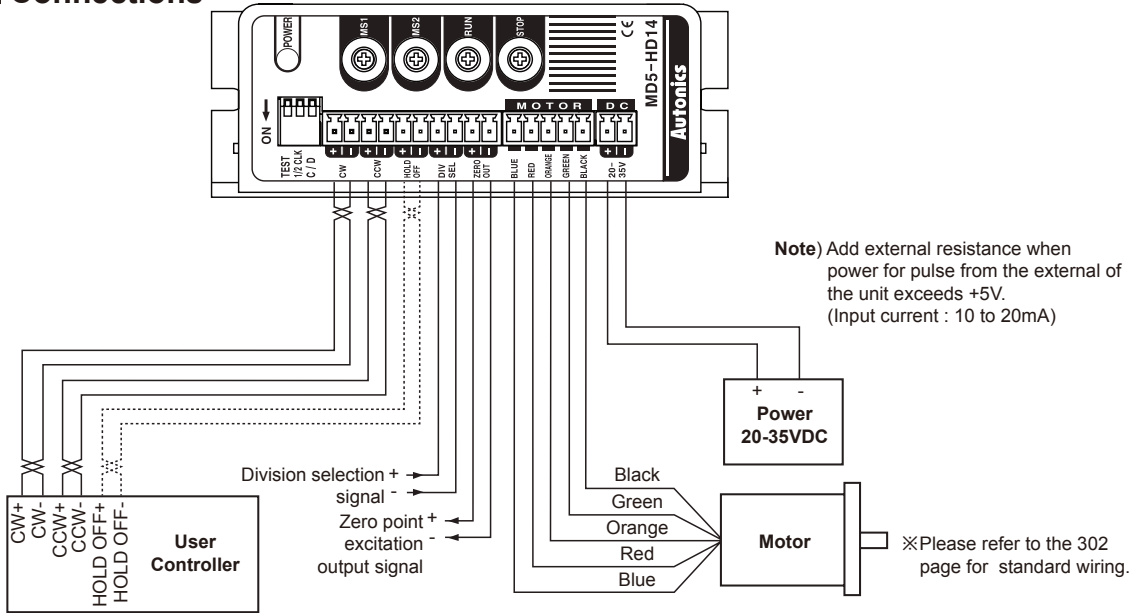
※2: Max. pull-out frequency and max. slewing frequency are variable depending on resolution, or load.

※Environment resistance is rated at no freezing of condensation.

- Photo electric sensor
- Fiber optic sensor
- Door/Area sensor
- Proximity sensor
- Pressure sensor
- Rotary encoder
- Connector/ Socket
- Temp. controller
- SSR/ Power controller
- Counter
- Timer
- Panel meter
- Tacho/ Speed/ Pulse meter
- Display unit
- Sensor controller
- Switching mode power supply
- Stepper motor & Driver & Controller
- Graphic/ Logic panel
- Field network device

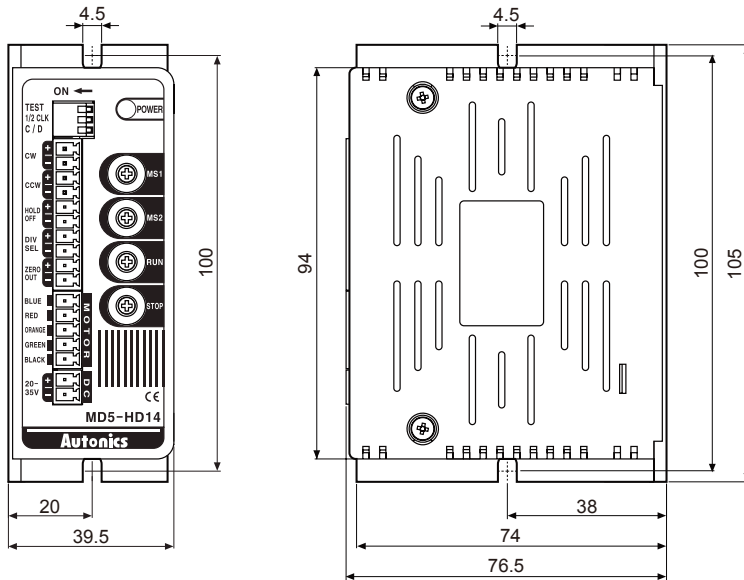
## 5-Phase micro stepper motor driver [MD5-HD14]

### ■ Connections



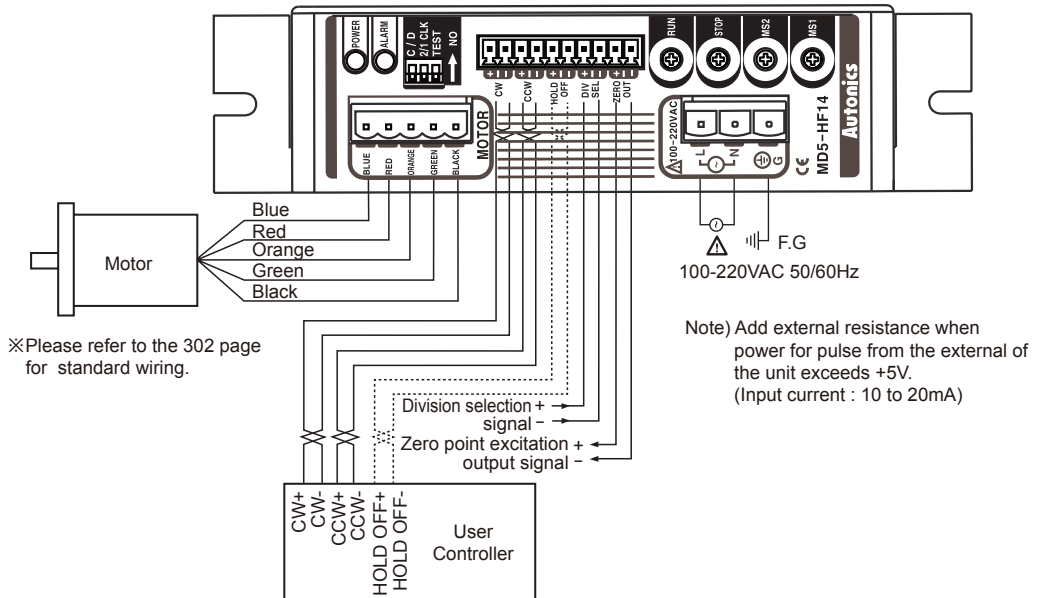
### ■ Dimensions

(unit: mm)



## 5-Phase Micro stepper motor driver [MD5-HF14]

### ■ Connections



### ■ Dimensions

(unit: mm)

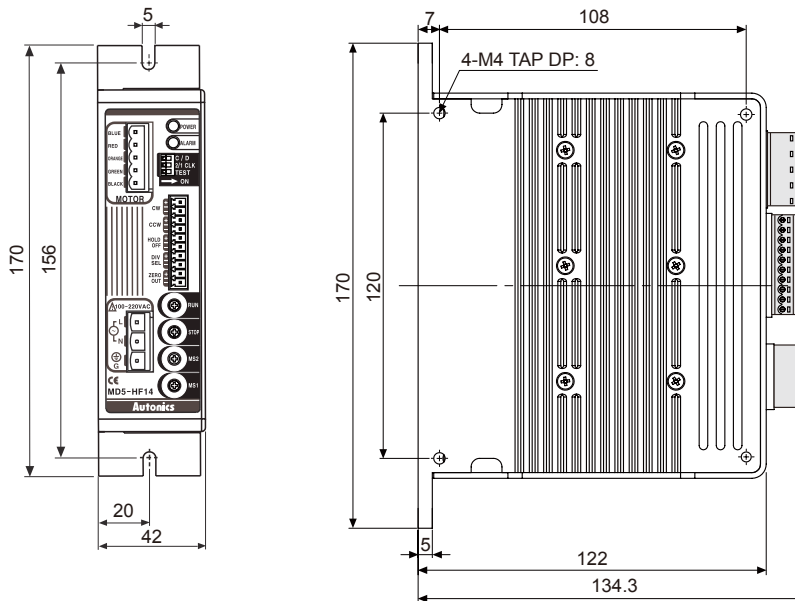
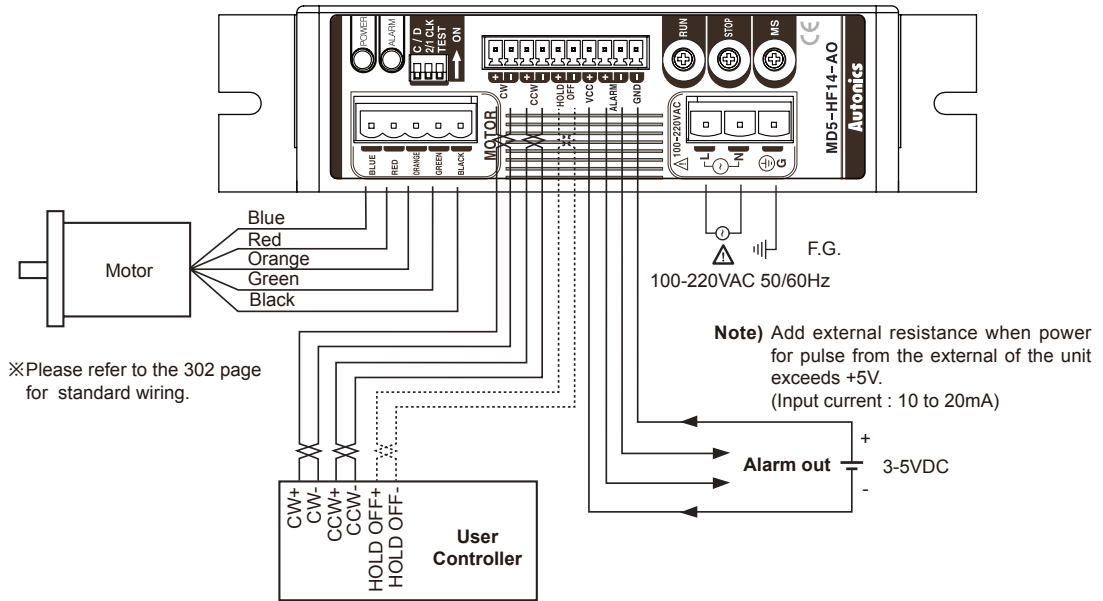


Photo electric sensor
Fiber optic sensor
Door/Area sensor
Proximity sensor
Pressure sensor
Rotary encoder
Connector/Socket
Temp. controller
SSR/ Power controller
Counter
Timer
Panel meter
Tacho/ Speed/ Pulse meter
Display unit
Sensor controller
Switching mode power supply
Stepper motor & Driver&Controller
Graphic/ Logic panel
Field network device

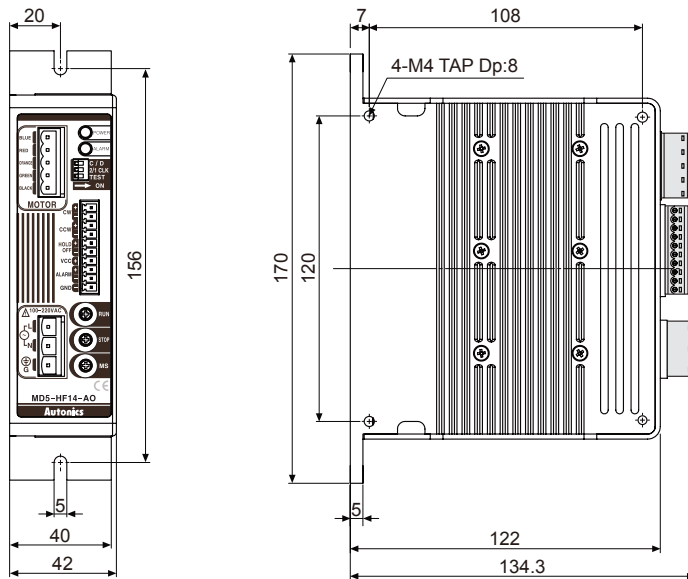
## 5-Phase Micro stepper motor driver [MD5-HF14-AO]

### ■ Connections



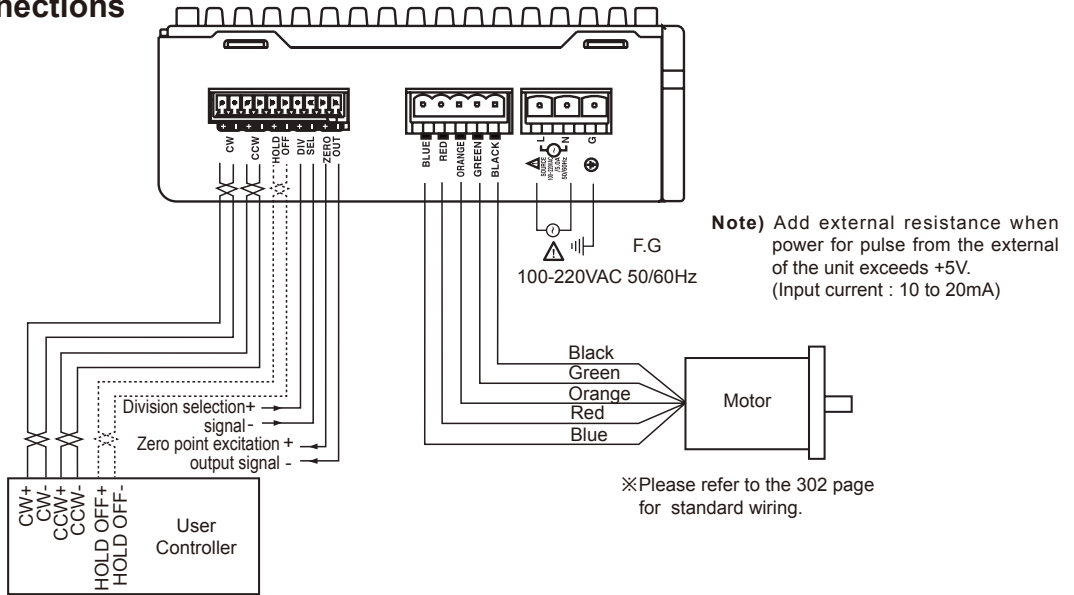
### ■ Dimensions

(unit: mm)



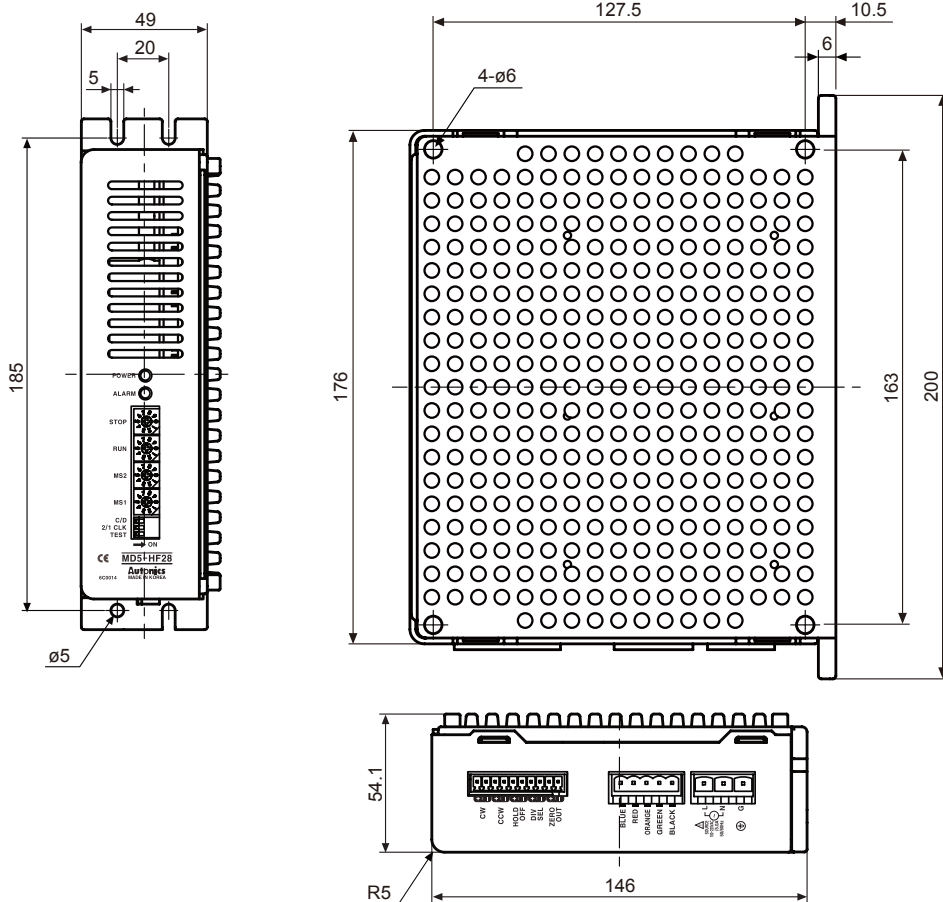
## 5-Phase Microstep motor driver [MD5-HF28]

### Connections



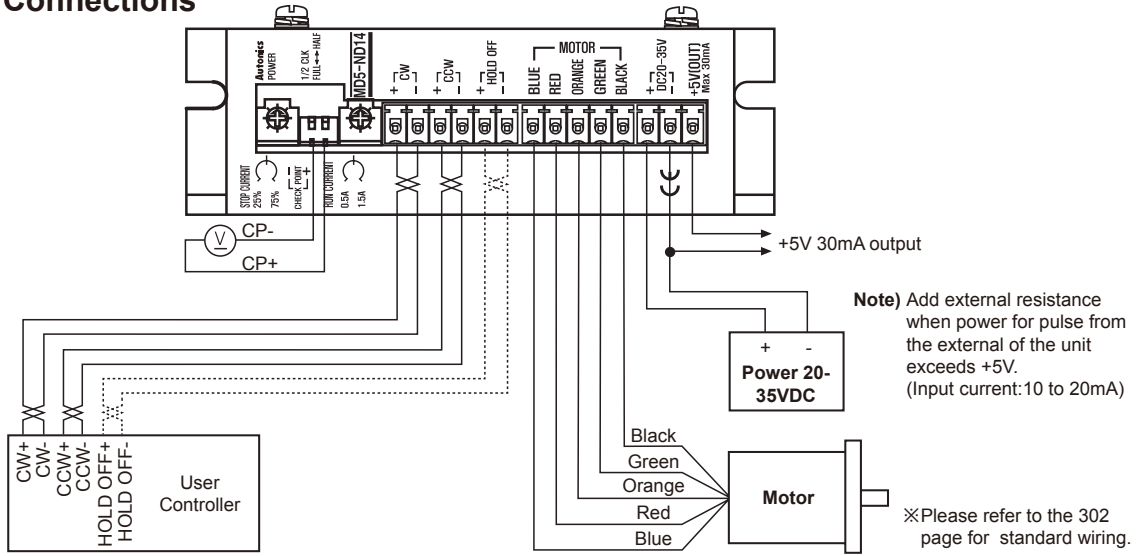
### Dimensions

(unit: mm)



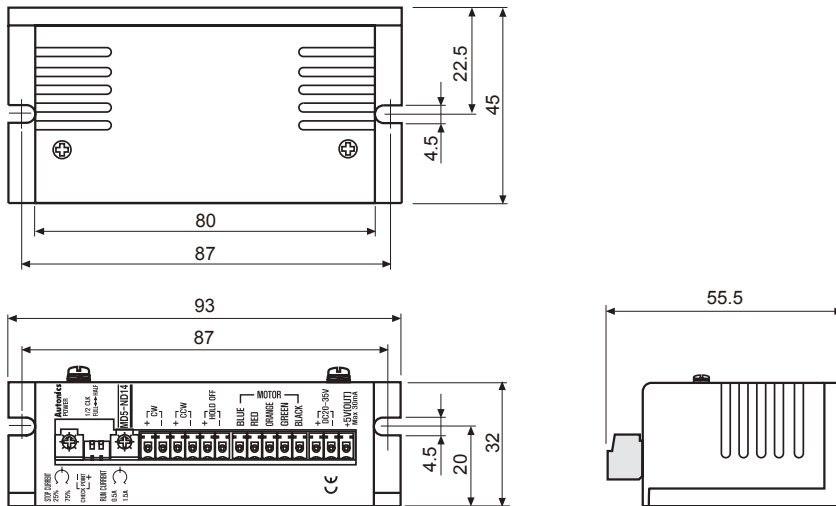
## 5-Phase stepper motor driver [MD5-ND14]

### ■ Connections



### ■ Dimensions


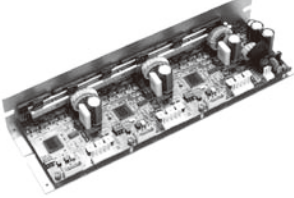
(unit: mm)





# Low noise, low vibration multi axis 5-phase stepper motor driver [MD5-HD14-2X/3X]

## ■ Specifications

Model	MD5-HD14-2X	MD5-HD14-3X
Appearances		
Power supply	20-35VDC 5A Max.(-10%, +20%)*1	20-35VDC 7A Max.(-10%, +20%)
RUN current	0.4 ~ 1.4A / Phase	
RUN method	Bipolar constant current pentagon drive	
Basic step angle	0.72°/ 1Step	
Resolution	1, 2, 4, 5, 8, 10, 16, 20, 25, 40, 50, 80, 100, 125, 200, 250 division (0.72°to 0.00288°/ 1Step)	
Input pulse width	Min. 0.5μs	
Pulse duty	50%	
Rising/Falling time	Max. each 120ns	
Max. input pulse frequency	1MHz	
Input voltage level	High : 4-8VDC, Low : 0-0.5VDC	
Input resistance	270Ω(CW, CCW). 390Ω(HOLD OFF)	
Environment	Ambient temperature 0 to 40°C, storage: -20 to 60°C	
	Ambient humidity 30 to 85%RH, storage: 30 to 85%RH	
Approval	CE	
Unit weight	Approx. 292g	Approx. 411g

※1: When using over 30VDC, it should be mounted at ventilated place due to increasing heat.

※Environment resistance is rated at no freezing of condensation.

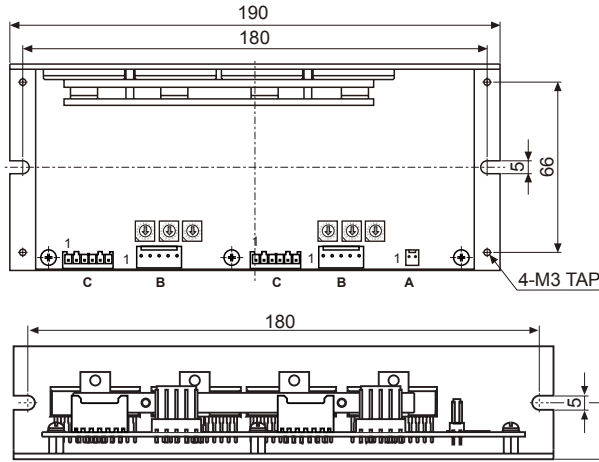
- Photo electric sensor
- Fiber optic sensor
- Door/Area sensor
- Proximity sensor
- Pressure sensor
- Rotary encoder
- Connector/Socket
- Temp. controller
- SSR/ Power controller
- Counter
- Timer
- Panel meter
- Tacho/ Speed/ Pulse meter
- Display unit
- Sensor controller
- Switching mode power supply
- Stepper motor & Driver&Controller
- Graphic/ Logic panel
- Field network device

# Selection Guide

## ■ Dimensions

(unit: mm)

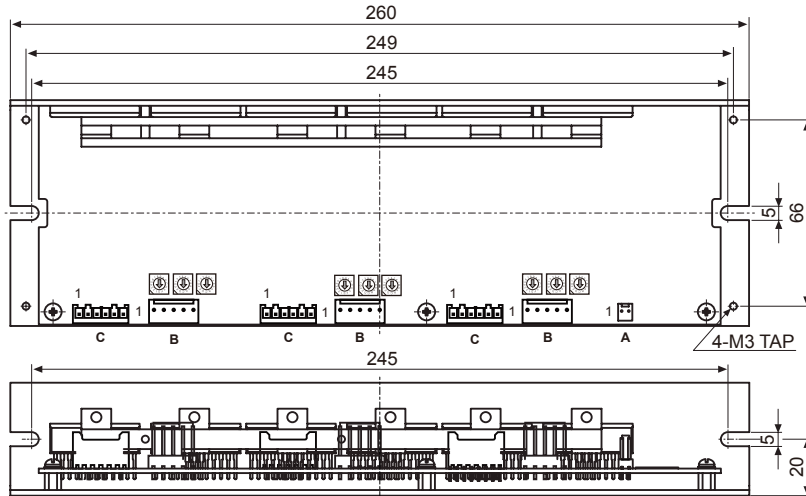
### ◎ MD5-HD14-2X



#### ※ Accessory connector specification

Accessory	Connector		Qty
	Manufacturer	Model No.	
A Power 2P Housing	Yeonho electronics	YH396-02V	1
B Motor 5P Housing	Yeonho electronics	YH396-05V	2
C Signal 6P Housing	JST	XAP-0.6V-1	2
— Power/Motor Terminal Pin	Yeonho electronics	YT396	12
— Signal Terminal Pin	JST	SXA -001T-P0.6	12

### ◎ MD5-HD14-3X



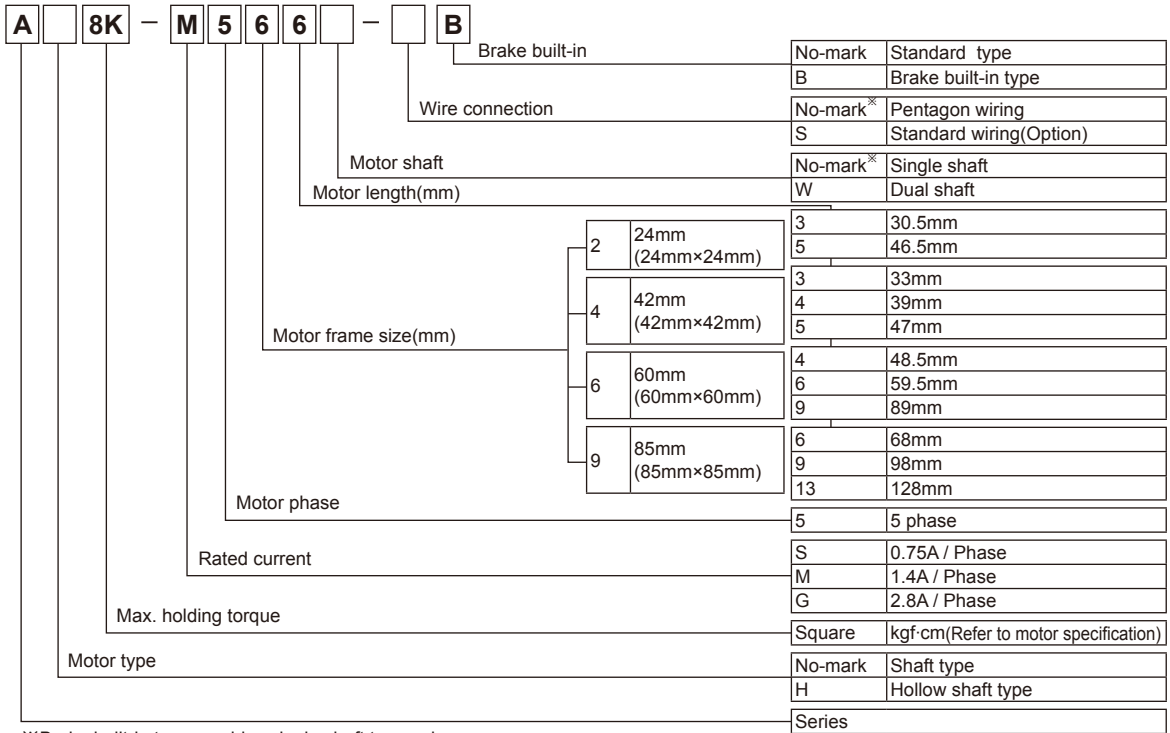
#### ※ Accessory connector specification

Accessory	Connector		Qty
	Manufacturer	Model No.	
A Power 2P Housing	Yeonho electronics	YH396-02V	1
B Motor 5P Housing	Yeonho electronics	YH396-05V	3
C Signal 6P Housing	JST	XAP-0.6V-1	3
— Power/Motor Terminal Pin	Yeonho electronics	YT396	17
— Signal Terminal Pin	JST	SXA -001T-P0.6	18

# 5-Phase Stepper motor

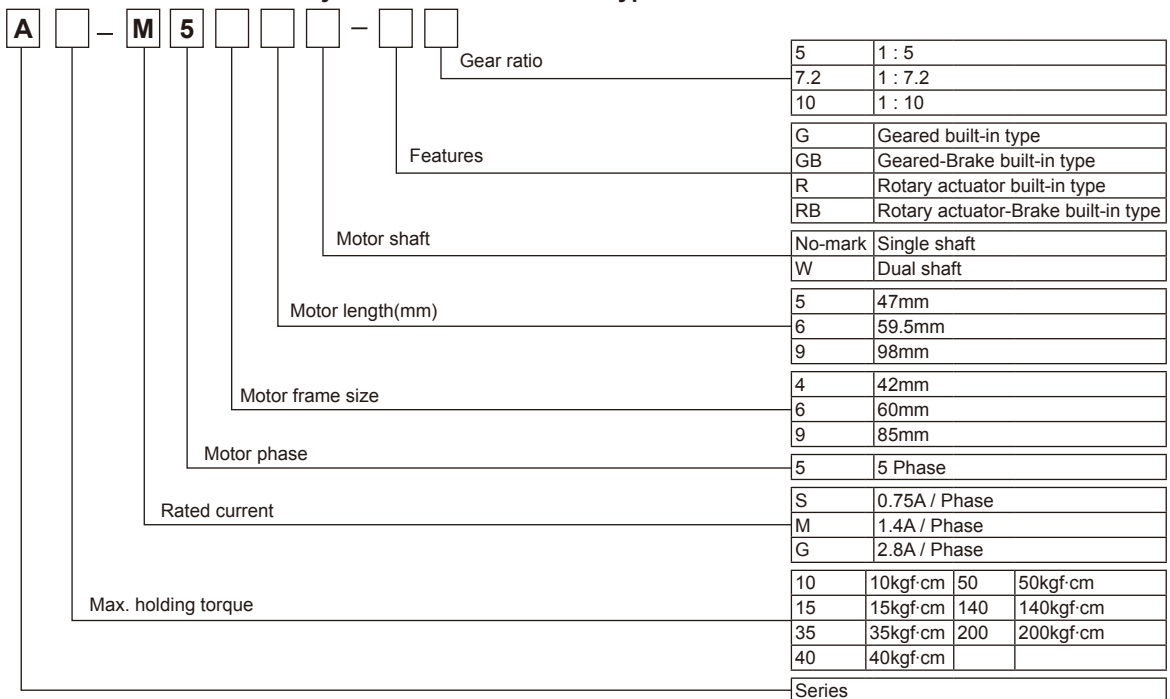
## Ordering information

Application model : Shaft type, Hollow shaft type, Shaft type+Brake built-in type



\*Brake built-in type provides single shaft type only.

Application model : Geared built-in type, Geared+Brake built-in type, Rotary actuator, Rotary actuator+Brake built-in type



\*Brake built-in type provides single shaft type only.

- Photo electric sensor
- Fiber optic sensor
- Door/Area sensor
- Proximity sensor
- Pressure sensor
- Rotary encoder
- Connector/Socket
- Temp. controller
- SSR/ Power controller
- Counter
- Timer
- Panel meter
- Tacho/ Speed/ Pulse meter
- Display unit
- Sensor controller
- Switching mode power supply
- Stepper motor & Driver&Controller
- Graphic/ Logic panel
- Field network device

## Specifications

Type		Model	A/phase (A)	Max. holding torque (kgf-cm)	Max. allowable torque (kgf-cm)	Moment of rotor inertia (g-cm <sup>2</sup> )	Winding resistance(Ω)	Motor length (mm)	
<b>24-square</b>	Shaft type	<b>02K-S523(W)</b>	0.75	0.18	—	4.2	1.1	30.5	
		<b>04K-S525(W)</b>	0.75	0.28	—	8.2	1.7	46.5	
<b>42-square</b>	Shaft type / Shaft + Brake built-in type	<b>A1K-S543(W)-B</b>	0.75	1.3	—	35	1.7	33	
		<b>A2K-S544(W)-B</b>	0.75	1.8	—	54	2.2	39	
		<b>A2K-M544(W)</b>	1.4	1.8	—	54	2.2	39	
		<b>A3K-S545(W)-B</b>	0.75	2.4	—	68	2.2	47	
	Hollow shaft type	<b>AH1K-S543-□</b>	0.75	1.3	—	35	1.7	33	
		<b>AH2K-S544-□</b>	0.75	1.8	—	54	2.2	39	
		<b>AH3K-S545-□</b>	0.75	2.4	—	68	2.2	47	
	Geared built-in type	<b>A10K-S545(W)-G5</b>	0.75	—	10	68	1.7	74.5	
		<b>A15K-S545(W)-G7.2</b>	0.75	—	15	68	2.2	74.5	
		<b>A15K-S545(W)-G10</b>	0.75	—	15	68	2.2	74.5	
	<b>60-square</b>	Shaft type / Shaft + Brake built-in type	<b>A4K-S564(W)-B</b>	0.75	4.2	—	175	2.6	48.5
			<b>A4K-M564(W)-B</b>	1.4	4.2	—	175	0.8	48.5
<b>A8K-S566(W)-B</b>			0.75	8.3	—	280	4.0	59.5	
<b>A8K-M566(W)-B</b>			1.4	8.3	—	280	1.1	59.5	
<b>A16K-M569(W)-B</b>			1.4	16.6	—	560	1.8	89	
<b>A16K-G569(W)-B</b>			2.8	16.6	—	560	0.56	89	
Hollow shaft type		<b>AH4K-S564(W)-□</b>	0.75	4.2	—	175	2.6	48.5	
		<b>AH4K-M564(W)-□</b>	1.4	4.2	—	175	0.8	48.5	
		<b>AH8K-S566(W)-□</b>	0.75	8.3	—	280	4.0	59.5	
		<b>AH8K-M566(W)-□</b>	1.4	8.3	—	280	1.1	59.5	
		<b>AH16K-M569(W)-□</b>	1.4	16.6	—	560	1.8	89	
		<b>AH16K-G569(W)-□</b>	2.8	16.6	—	560	0.56	89	
Geared built-in type		<b>A35K-M566(W)-G5</b>	1.4	—	35	280	1.1	94.5	
		<b>A40K-M566(W)-G7.2</b>	1.4	—	40	280	1.1	94.5	
		<b>A50K-M566(W)-G10</b>	1.4	—	50	280	1.1	94.5	
Geared + Brake built-in type		<b>A35K-M566-GB5</b>	1.4	—	35	280	1.1	136	
		<b>A40K-M566-GB7.2</b>	1.4	—	40	280	1.1	136	
		<b>A50K-M566-GB10</b>	1.4	—	50	280	1.1	136	
Rotary actuator type		<b>A35K-M566(W)-R5</b>	1.4	—	35	280	1.1	93.5	
		<b>A40K-M566(W)-R7.2</b>	1.4	—	40	280	1.1	93.5	
		<b>A50K-M566(W)-R10</b>	1.4	—	50	280	1.1	93.5	
Rotary actuator + Brake built-in type		<b>A35K-M566-RB5</b>	1.4	—	35	280	1.1	136	
		<b>A40K-M566-RB7.2</b>	1.4	—	40	280	1.1	136	
		<b>A50K-M566-RB10</b>	1.4	—	50	280	1.1	136	
<b>85-square</b>		Shaft type / Shaft + Brake built-in type	<b>A21K-M596(W)-B</b>	1.4	21	—	1400	1.76	68
			<b>A21K-G596(W)-B</b>	2.8	21	—	1400	0.4	68
			<b>A41K-M599(W)-B</b>	1.4	41	—	2700	2.6	98
			<b>A41K-G599(W)-B</b>	2.8	41	—	2700	0.58	98
	<b>A63K-M5913(W)-B</b>		1.4	63	—	4000	3.92	128	
	<b>A63K-G5913(W)-B</b>		2.8	63	—	4000	0.86	128	
	Hollow shaft type	<b>AH21K-M596(W)-□</b>	1.4	21	—	1400	1.76	68	
		<b>AH21K-G596(W)-□</b>	2.8	21	—	1400	0.4	68	
		<b>AH41K-M599(W)-□</b>	1.4	41	—	2700	2.6	98	
		<b>AH41K-G599(W)-□</b>	2.8	41	—	2700	0.58	98	
		<b>AH63K-M5913(W)-□</b>	1.4	63	—	4000	3.92	128	
		<b>AH63K-G5913(W)-□</b>	2.8	63	—	4000	0.86	128	
	Geared built-in type	<b>A140K-M599(W)-G5</b>	1.4	—	140	2700	2.6	145	
		<b>A140K-G599(W)-G5</b>	2.8	—	140	2700	0.58	145	
		<b>A200K-M599(W)-G7.2</b>	1.4	—	200	2700	2.6	145	
		<b>A200K-G599(W)-G7.2</b>	2.8	—	200	2700	0.58	145	
		<b>A200K-M599(W)-G10</b>	1.4	—	200	2700	2.6	145	
		<b>A200K-G599(W)-G10</b>	2.8	—	200	2700	0.58	145	
	Geared + Brake built-in type	<b>A140K-M599-GB5</b>	1.4	—	140	2700	2.6	182	
		<b>A140K-G599-GB5</b>	2.8	—	140	2700	0.58	182	
		<b>A200K-M599-GB7.2</b>	1.4	—	200	2700	2.6	182	
		<b>A200K-G599-GB7.2</b>	2.8	—	200	2700	0.58	182	
		<b>A200K-M599-GB10</b>	1.4	—	200	2700	2.6	182	
		<b>A200K-G599-GB10</b>	2.8	—	200	2700	0.58	182	

※(W) stands for dual shaft of motor. The brake built-in type provides single shaft type only.

※Motor length was measured without shaft.

※Hollow shaft type with standard wiring is customizable.(Except for 24mm)

## ■ Specifications

### ● 24-square

Model	<b>02K-S523(W)</b>	<b>04K-S525(W)</b>
Max. holding torque	0.18kgf·cm(0.018N·m)	0.28kgf·cm(0.028N·m)
Moment of rotor inertia	4.2g·cm <sup>2</sup> (4.2×10 <sup>-7</sup> kg·m <sup>2</sup> )	8.2g·cm <sup>2</sup> (8.2×10 <sup>-7</sup> kg·m <sup>2</sup> )
Rated current	0.75A/Phase	
Basic step angle	0.72°/ 0.36°(Full step/Half step)	
Insulation class	CLASS B type(130°C)	
Insulation resistance	Min. 100MΩ(at 500VDC megger) between motor coil-case	
Dielectric strength	1Min. at 0.5kVAC 50/60Hz between motor coil-case	
Environment	Ambient temperature	-10 to 50°C, storage: -25 to 85°C
	Ambient humidity	35 to 85%RH, storage: 35 to 85%RH
Protection	IP30(IEC34-5 standard)	
Unit weight	Approx. 0.07kg	Approx. 0.12kg

※Environment resistance is rated at no freezing of condensation.

### ● 42-square

Model	Shaft type	<b>A1K-S543(W)</b>	<b>A2K-S544(W)</b>	<b>A2K-M544(W)</b>	<b>A3K-S545(W)</b>	—	—	—
	Hollow shaft type	<b>AH1K-S543-□</b>	<b>AH2K-S544-□</b>	—	<b>AH3K-S545-□</b>	—	—	—
	Shaft type +Brake built-in type	<b>A1K-S543-B</b>	<b>A2K-S544-B</b>	—	<b>A3K-S545-B</b>	—	—	—
	Shaft type +Geared built-in type	—	—	—	—	<b>A10K-S545(W)-G5</b>	<b>A15K-S545(W)-G7.2</b>	<b>A15K-S545(W)-G10</b>
Max. allowable torque	—	—	—	—	10kgf·cm (1.0 N·m)	15kgf·cm (1.5 N·m)	15kgf·cm (1.5 N·m)	
Max. holding torque	1.3kgf·cm (0.13 N·m)	1.8kgf·cm (0.18 N·m)	—	2.4kgf·cm (0.24 N·m)	—	—	—	
Moment of rotor inertia	35g·cm <sup>2</sup> (35×10 <sup>-7</sup> kg·m <sup>2</sup> )	54g·cm <sup>2</sup> (54×10 <sup>-7</sup> kg·m <sup>2</sup> )	—	68g·cm <sup>2</sup> (68×10 <sup>-7</sup> kg·m <sup>2</sup> )	68g·cm <sup>2</sup> (68×10 <sup>-7</sup> kg·m <sup>2</sup> )	—	—	
Rated current	0.75A/Phase		1.4A/Phase	0.75A/Phase				
Basic step angle	0.72°/ 0.36(Full / Half step)				0.144°/ 0.072° (Full/Half step)	0.1°/ 0.05° (Full/Half step)	0.072°/ 0.036° (Full/Half step)	
Gear ratio	—				1:5	1 : 7.2	1:10	
Allowable speed range	—				0 to 360rpm	0 to 250rpm	0 to 180rpm	
Backlash[min]	—				±35' (0.58°)			
Electromagnetic brake	Rated excitation voltage	24VDC ±10%						
	Rated excitation current	0.2A						
	Static friction torque	1.8kgf·cm						
	Rotation part inertia	3.0×10 <sup>-7</sup> kg·cm <sup>2</sup>						
	Operating time	Max. 24ms						
	Releasing time	Max. 15ms						
Insulation class	B type(130°C)							
Insulation resistance	Min. 100MΩ(at 500VDC megger) between motor coil-case							
Dielectric strength	1Min. at 1kVAC(0.5kVAC for 0.75A/Phase) 50/60Hz between Motor coil-case							
Environment	Ambient temperature	-10 to 50°C, storage: -25 to 85°C						
	Ambient humidity	35 to 85%RH, storage: 35 to 85%RH						
Protection	IP30(IEC34-5 standard)							
Unit weight	Standard type / Geared type: Approx. 0.25kg Brake built-in type: Approx. 0.44kg (approx. 0.39kg) <sup>※1</sup>	Standard type / Geared type: Approx. 0.3kg Brake built-in type: Approx. 0.49kg (approx. 0.44kg) <sup>※1</sup>	Standard type / Geared type: Approx. 0.3kg Brake built-in type: Approx. 0.49kg (approx. 0.44kg) <sup>※1</sup>	Standard type / Geared type: Approx. 0.4kg Brake built-in type: Approx. 0.59kg (approx. 0.54kg) <sup>※1</sup>	Approx. 0.58kg			

※1: The weight with packaging and the weight in parentheses is only unit weight.

※Environment resistance is rated at no freezing of condensation.

Photo electric sensor
Fiber optic sensor
Door/Area sensor
Proximity sensor
Pressure sensor
Rotary encoder
Connector/Socket
Temp. controller
SSR/ Power controller
Counter
Timer
Panel meter
Tacho/ Speed/ Pulse meter
Display unit
Sensor controller
Switching mode power supply
Stepper motor & Driver&Controller
Graphic/ Logic panel
Field network device

## ■ Specifications

### ● 60-square

Model	Shaft type	A4K-S564(W)	A4K-M564(W)	A8K-S566(W)	A8K-M566(W)	A16K-M569(W)	A16K-G569(W)
	Hollow shaft type	AH4K-S564(W)-□	AH4K-M564(W)-□	AH8K-S566(W)-□	AH8K-M566(W)-□	AH16K-M569(W)-□	AH16K-G569(W)-□
	Shaft type+ Brake built-in type	A4K-S564-B	A4K-M564-B	A8K-S566-B	A8K-M566-B	A16K-M569-B	A16K-G569-B
Max. holding torque		4.2kgf·cm(0.42N·m)		8.3kgf·cm(0.83N·m)		16.6kgf·cm(1.66N·m)	
Moment of rotor inertia		175g·cm <sup>2</sup> (175×10 <sup>-7</sup> kg·m <sup>2</sup> )		280g·cm <sup>2</sup> (280×10 <sup>-7</sup> kg·m <sup>2</sup> )		560g·cm <sup>2</sup> (560×10 <sup>-7</sup> kg·m <sup>2</sup> )	
Rated current		0.75A/Phase	1.4A/Phase	0.75A/Phase	1.4A/Phase	1.4A/Phase	2.8A/Phase
Basic step angle		0.72°/ 0.36°(Full/Half step)					
Electromagnetic brake	Rated excitation voltage	24VDC ±10%					
	Rated excitation current	0.33A					
	Static friction torque	8kgf·cm					
	Rotation part inertia	29×10 <sup>-7</sup> kg·cm <sup>2</sup>					
	Operating time	Max. 25ms					
	Releasing time	Max. 20ms					
Insulation class		B type(130°C)					
Insulation resistance		Min. 100MΩ(at 500VDC megger) between motor coil-case					
Dielectric strength		1Min. at 1kVAC(0.5kVAC for 0.75A/Phase) 50/60Hz between motor coil-case					
Environ- ment	Ambient temperature	-10 to 50°C, storage: -25 to 85°C					
	Ambient humidity	35 to 85%RH, storage: 35 to 85%RH					
Protection		IP30(IEC34-5 standard)					
Unit weight		Standard type: 0.6kg, Brake built-in type: Approx. 1.03kg (approx. 0.95kg) <sup>※1</sup>		Standard type: 0.8kg, Brake built-in type: Approx. 1.33kg (approx. 1.25kg) <sup>※1</sup>		Standard type: 1.3kg, Brake built-in type: Approx. 1.73kg (approx. 1.65kg) <sup>※1</sup>	

※1: The weight with packaging and the weight in parentheses is only unit weight.

※Environment resistance is rated at no freezing of condensation.

### ● 60-square

Model	Shaft type+ Geared built-in type	A35K-M566(W)-G5	A40K-M566(W)-G7.2	A50K-M566(W)-G10
	Geared type+ Brake built-in type	A35K-M566-GB5	A40K-M566-GB7.2	A50K-M566-GB10
	Rotary actuator type	A35K-M566(W)-R5	A40K-M566(W)-R7.2	A50K-M566(W)-R10
	Rotary actuator type+ Brake built-in type	A35K-M566-RB5	A40K-M566-RB7.2	A50K-M566-RB10
Max. holding torque		35kgf·cm(3.5N·m)	40kgf·cm(4.0 N·m)	50kgf·cm(5.0 N·m)
Moment of rotor inertia		280g·cm <sup>2</sup> (280×10 <sup>-7</sup> kg·m <sup>2</sup> )		
Rated current		1.4A/Phase		
Basic step angle		0.144°/ 0.072°(Full/Half step)	0.1°/ 0.05°(Full/Half step)	0.072°/ 0.036°(Full/Half step)
Gear ratio		1:5	1: 7.2	1:10
Allowable speed range		0 to 360rpm	0 to 250rpm	0 to 180rpm
Backlash[min]		±20' (0.33°)		
Electromagnetic brake	Rated excitation voltage	24VDC(non-polarity)		
	Rated excitation current	0.33A		
	Static friction torque	Min. 4kgf·cm		
	Rotation part inertia	2.5×10 <sup>-6</sup> kgf·cm <sup>2</sup>		
	Operating time	Max. 22ms		
	Releasing time	Max. 37ms		
Absolute position error <sup>※1</sup>		±20 minute(0.33°)		
Lost motion <sup>※1</sup>		±20 minute(0.33°)		
Insulation class		CLASS B type(130°C)		
Insulation resistance		Min. 100MΩ(at 500VDC megger) between motor coil-case		
Dielectric strength		1Min. at 1kVAC 50/60Hz between motor coil-case		
Environ- ment	Ambient temperature	-10 to 50°C, storage: -25 to 85°C		
	Ambient humidity	35 to 85%RH, storage: 35 to 85%RH		
Protection		IP30(IEC34-5 standard)		
Unit weight		Geared type:1.3kg, Geared+Brake type:1.4kg, Rotary actuator type:1.5kg, Rotary actuator+Brake type:1.8kg		

※1: It is only available for rotary actuator type.

※Environment resistance is rated at no freezing of condensation.

■ Specifications

● 85-square

Model	Shaft type	<b>A21K-M596(W)</b>	<b>A21K-G596(W)</b>	<b>A41K-M599(W)</b>	<b>A41K-G599(W)</b>	<b>A63K-M5913(W)</b>	<b>A63K-G5913(W)</b>
	Hollow shaft type	<b>AH21K-M596(W)-□</b>	<b>AH21K-G596(W)-□</b>	<b>AH41K-M599(W)-□</b>	<b>AH41K-G599(W)-□</b>	<b>AH63K-M5913(W)-□</b>	<b>AH63K-G5913(W)-□</b>
	Shaft type+ Brake built-in type	<b>A21K-M596-B</b>	<b>A21K-G596-B</b>	<b>A41K-M599-B</b>	<b>A41K-G599-B</b>	<b>A63K-M5913-B</b>	<b>A63K-G5913-B</b>
Max. holding torque		21kgf·cm(2.1N·m)		41kgf·cm(4.1N·m)		63kgf·cm(6.3N·m)	
Moment of rotor inertia		1400g·cm <sup>2</sup> (1400×10 <sup>-7</sup> kg·m <sup>2</sup> )		2700g·cm <sup>2</sup> (2700×10 <sup>-7</sup> kg·m <sup>2</sup> )		4000g·cm <sup>2</sup> (4000×10 <sup>-7</sup> kg·m <sup>2</sup> )	
Rated current		1.4A/Phase	2.8A/Phase	1.4A/Phase	2.8A/Phase	1.4A/Phase	2.8A/Phase
Basic step angle		0.72°/ 0.36°(Full/Half step)					
Electromagnetic brake	Rated excitation voltage	24VDC ±10%					
	Rated excitation current	0.62A					
	Static friction torque	40kgf·cm					
	Rotation part inertia	153×10 <sup>-7</sup> kg·cm <sup>2</sup>					
	Operating time	Max. 60ms					
	Releasing time	Max. 15ms					
Insulation class		B type(130°C)					
Insulation resistance		Min. 100MΩ(at 500VDC megger) between motor coil-case					
Dielectric strength		1Min. at 1kVAC 50/60Hz between motor coil-case					
Environ- ment	Ambient temperature	-10 to 50°C, storage: -25 to 85°C					
	Ambient humidity	35 to 85%RH, storage: 35 to 85%RH					
Protection		IP30(IEC34-5 standard)					
Unit weight		Standard type: 1.7kg, Brake built-in type: Approx. 2.74kg (approx. 2.64kg) <sup>※1</sup>		Standard type: 2.8kg, Brake built-in type: Approx. 3.84kg (approx. 3.74kg) <sup>※1</sup>		Standard type: 3.8kg, Brake built-in type: Approx. 4.84kg (approx. 4.74kg) <sup>※1</sup>	

※1: The weight with packaging and the weight in parentheses is only unit weight.  
 ※Environment resistance is rated at no freezing of condensation.

● 85-square

Model	Shaft type+ Geared built-in type	<b>A140K-M599(W)-G5</b>	<b>A140K-G599(W)-G5</b>	<b>A200K-M599(W)-G7.2</b>	<b>A200K-G599(W)-G7.2</b>	<b>A200K-M599(W)-G10</b>	<b>A200K-G599(W)-G10</b>
	Geared type+ Brake built-in type	<b>A140K-M599-GB5</b>	<b>A140K-G599-GB5</b>	<b>A200K-M599-GB7.2</b>	<b>A200K-G599-GB7.2</b>	<b>A200K-M599-GB10</b>	<b>A200K-G599-GB10</b>
Max. holding torque		140kgf·cm(14N·m)		200kgf·cm(20N·m)		200kgf·cm(20N·m)	
Moment of rotor inertia		2700g·cm <sup>2</sup> (270×10 <sup>-7</sup> kg·m <sup>2</sup> )					
Rated current		1.4A/Phase	2.8A/Phase	1.4A/Phase	2.8A/Phase	1.4A/Phase	2.8A/Phase
Basic step angle		0.144°/ 0.072°(Full/Half step)		0.1°/ 0.05°(Full/Half step)		0.072°/ 0.036°(Full/Half step)	
Gear ratio		1:5		1:7.2		1:10	
Allowable speed range		0 to 360rpm		0 to 250rpm		0 to 180rpm	
Backlash[min]		±15' (0.25°)					
Electromagnetic brake	Rated excitation voltage	24VDC ±10%					
	Rated excitation current	0.62A					
	Static friction torque	40kgf·cm					
	Rotation part inertia	42.5×10 <sup>-6</sup> kgf·cm <sup>2</sup>					
	Operating time	Max. 80ms					
	Releasing time	Max. 70ms					
Insulation class		CLASS B type(130°C)					
Insulation resistance		Min. 100MΩ(at 500VDC megger) between motor coil-case					
Dielectric strength		1Min. at 1kVAC 50/60Hz between motor coil-case					
Environ- ment	Ambient temperature	-10 to 50°C, storage: -25 to 85°C					
	Ambient humidity	35 to 85%RH, storage: 35 to 85%RH					
Protection		IP30(IEC34-5 standard)					
Unit weight		Geared type: 4.4kg, Geared+Brake type: 5.6kg					

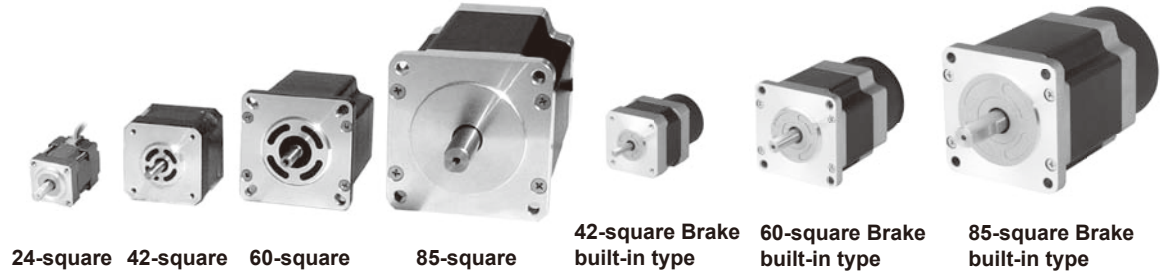
※Environment resistance is rated at no freezing of condensation.

Photo electric sensor
Fiber optic sensor
Door/Area sensor
Proximity sensor
Pressure sensor
Rotary encoder
Connector/Socket
Temp. controller
SSR/ Power controller
Counter
Timer
Panel meter
Tacho/ Speed/ Pulse meter
Display unit
Sensor controller
Switching mode power supply
Stepper motor & Driver&Controller
Graphic/ Logic panel
Field network device

# Selection Guide

- 24mm/ 42mm/ 60mm/ 85mm Shaft type
- 42mm/ 60mm/ 85mm Shaft type+Brake built-in type

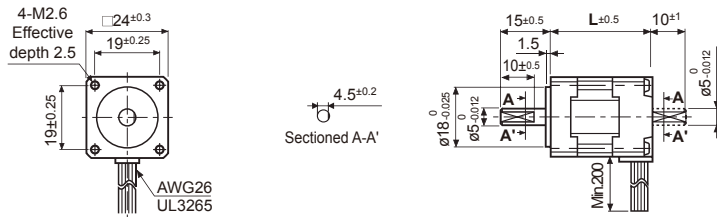
## ■ Appearances



## ■ Dimensions

(unit: mm)

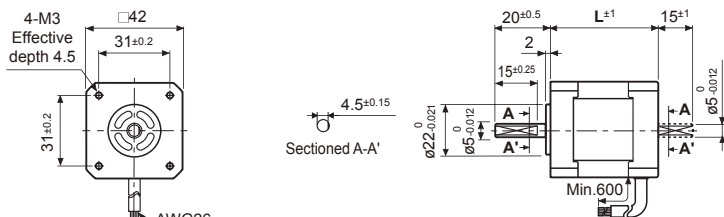
### ◎ 24-square



MODEL	L
02K-S523(W)	30.5
04K-S525(W)	46.5

※These dimensions are for dual shaft models. For single shaft models, ignore dotted line(.....) part.

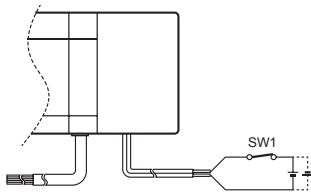
### ◎ 42-square



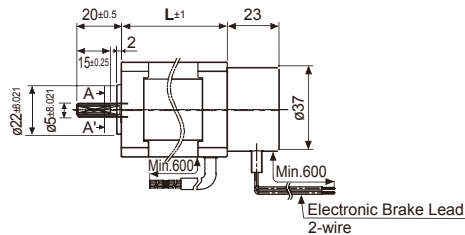
MODEL	L
A1K-S543(W)-[B]	33
A2K-□544(W)-[B]	39
A3K-S545(W)-[B]	47

※These dimensions are for dual shaft models. For single shaft models, ignore dotted line(.....) part.

<Shaft type>



※Brake is non-polar "B" type.  
Be sure to observe rated excitation voltage (24VDC).  
※SW1 ON-Brake release / SW1 OFF-Brake execute

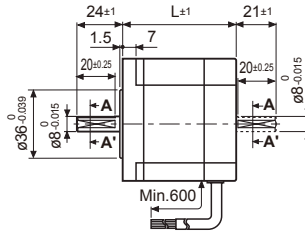
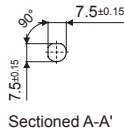
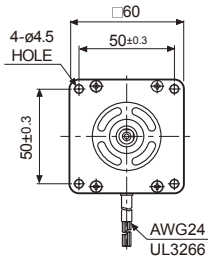


<Brake built-in type>



(unit: mm)

## ◎ 60-square

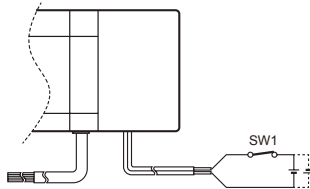


<Shaft type>

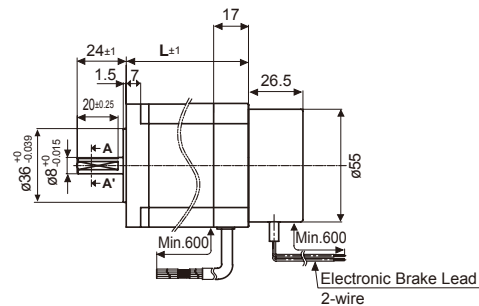
MODEL	L
A4K-□564(W)-[B]	48.5
A8K-□566(W)-[B]	59.5
A16K-□569(W)-[B]	89

※These dimensions are for dual shaft models. For single shaft models, ignore dotted line(.....) part.

※For flexible coupling(ERB Series) information, refer to the 144 page.

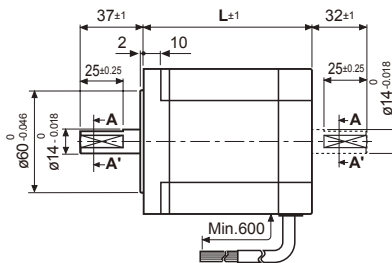
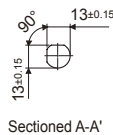
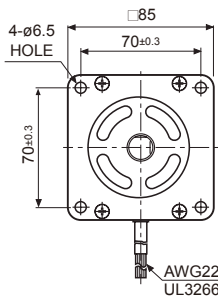


※Brake is non-polar "B" type.  
Be sure to observe rated excitation voltage (24VDC).  
※SWI ON-Brake release / SWI OFF-Brake execute



<Brake built-in type>

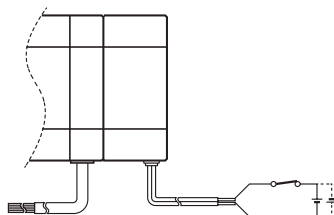
## ◎ 85-square



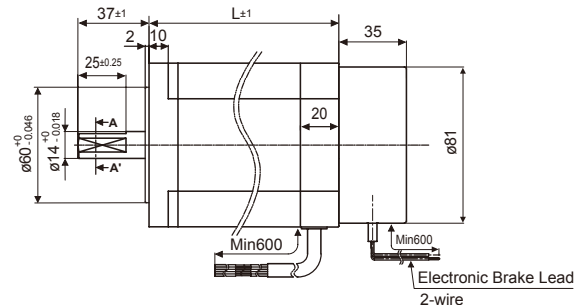
<Shaft type>

MODEL	L
A21K-□596(W)-[B]	68
A41K-□599(W)-[B]	98
A63K-□5913(W)-[B]	128

※These dimensions are for dual shaft models. For single shaft models, ignore dotted line(.....) part.



※Brake is non-polar "B" type.  
Be sure to observe rated excitation voltage (24VDC).  
※SWI ON-Brake release / SWI OFF-Brake execute



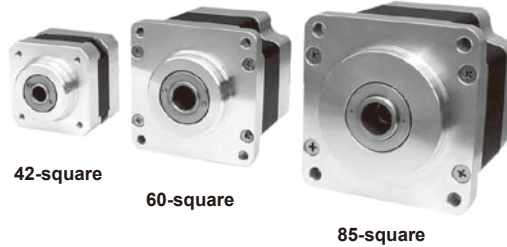
<Brake built-in type>

Photo electric sensor
Fiber optic sensor
Door/Area sensor
Proximity sensor
Pressure sensor
Rotary encoder
Connector/Socket
Temp. controller
SSR/ Power controller
Counter
Timer
Panel meter
Tacho/ Speed/ Pulse meter
Display unit
Sensor controller
Switching mode power supply
Stepper motor & Driver&Controller
Graphic/ Logic panel
Field network device

# Selection Guide

## □42mm/□60mm/□85mm Hollow shaft type

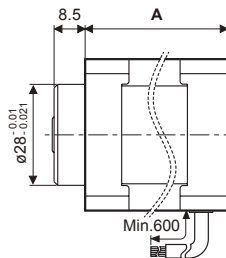
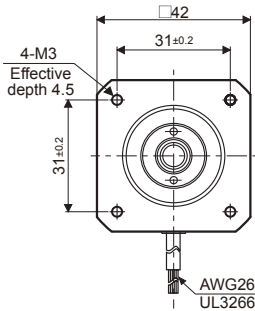
### ■ Appearances



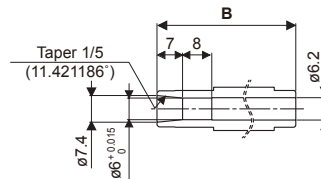
### ■ Dimensions

(unit: mm)

#### ◎ 42-square

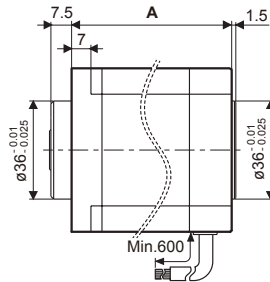
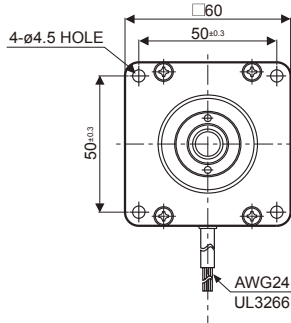


#### ● Hole Dimensions

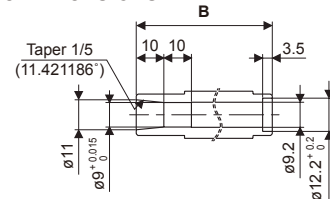


MODEL	A	B
AH1K-S543-□	33	38
AH2K-S544-□	39	44
AH3K-S545-□	47	52

#### ◎ 60-square

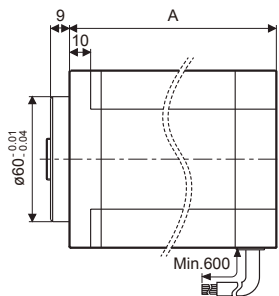
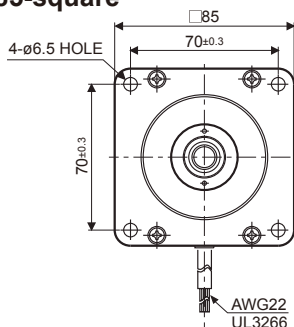


#### ● Hole Dimensions

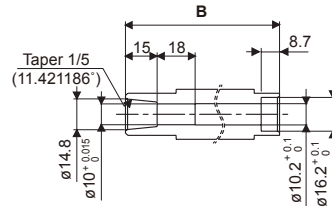


MODEL	A	B
AH4K-□564(W)-□	48.5	49.3
AH8K-□566(W)-□	59.5	60.3
AH16K-□569(W)-□	89	89.8

#### ◎ 85-square



#### ● Hole Dimensions



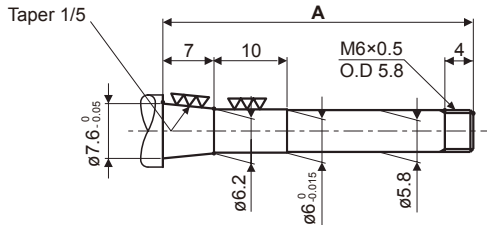
MODEL	A	B
AH21K-□596(W)-□	68	73
AH41K-□599(W)-□	98	102.5
AH63K-□5913(W)-□	128	133

※ Depending on processing of shaft to be assembled, hollow shaft type can be used both single and dual shaft.

## ■ Processing example for shaft assembly

In order to assemble external shafts into Autonics motors, the shafts must be processed as shown in the figures below. (unit: mm)

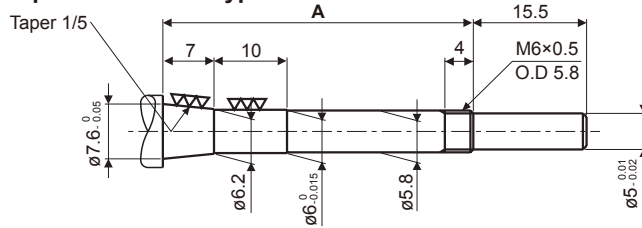
### ● 42-square single shaft type



MODEL	A
AH1K-S543-□	42.5
AH2K-S544-□	48.5
AH3K-S545-□	56.5

※Lock Nut is included.

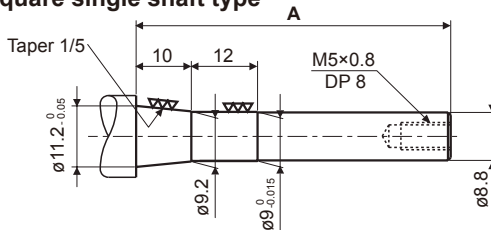
### ● 42-square dual shaft type



MODEL	A
AH1K-□543W-□	42.5
AH2K-□544W-□	48.5
AH3K-□545W-□	56.5

※Lock Nut is included.

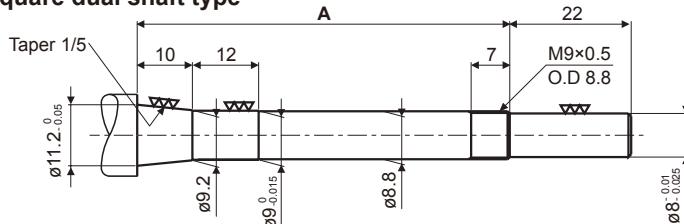
### ● 60-square single shaft type



MODEL	A
AH4K-□564-□	46
AH8K-□566-□	57
AH16K-□569-□	86.5

※Hexagon wrench bolt, Flat washer, Spring washer and Lock Nut are included.

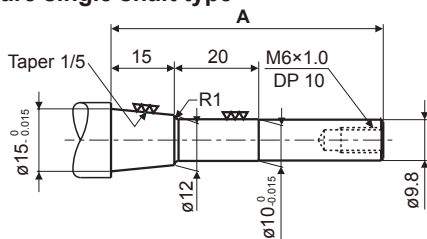
### ● 60-square dual shaft type



MODEL	A
AH4K-□564W-□	56.5
AH8K-□566W-□	67.5
AH16K-□569W-□	97

※Lock Nut is included.

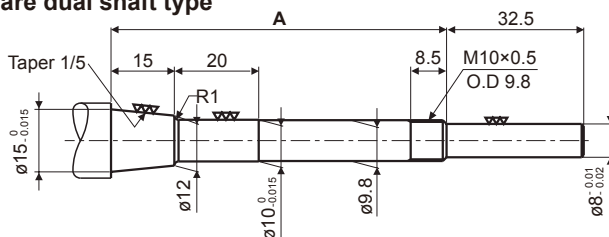
### ● 85-square single shaft type



MODEL	A
AH21K-□596-□	64.5
AH41K-□599-□	94
AH63K-□5913-□	124.5

※Hexagon wrench bolt, Flat washer, Spring washer and Lock Nut are included.

### ● 85-square dual shaft type



MODEL	A
AH21K-□596W-□	79.5
AH41K-□599W-□	109.5
AH63K-□5913W-□	139.5

※Lock Nut is included.

Photo electric sensor

Fiber optic sensor

Door/Area sensor

Proximity sensor

Pressure sensor

Rotary encoder

Connector/Socket

Temp. controller

SSR/ Power controller

Counter

Timer

Panel meter

Tacho/ Speed/ Pulse meter

Display unit

Sensor controller

Switching mode power supply

Stepper motor & Driver&Controller

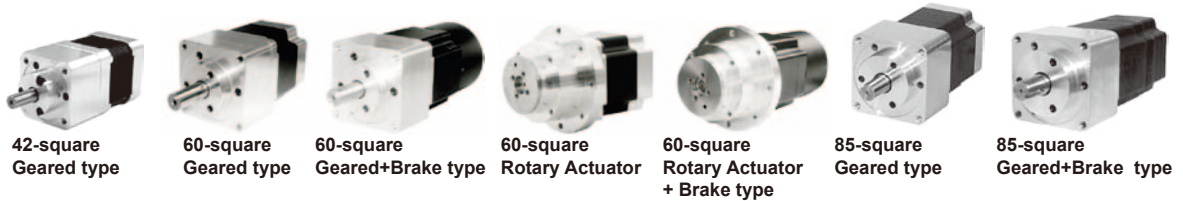
Graphic/ Logic panel

Field network device

# Selection Guide

- 42mm/ 60mm/ 85mm Geared type/Geared+Brake built-in type
- 60mm Rotary actuator type/ Rotary actuator+Brake built-in type

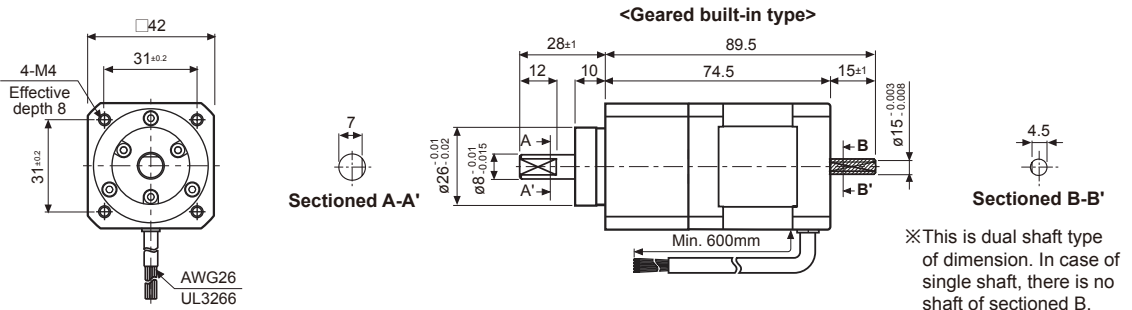
## Appearances



## Dimensions

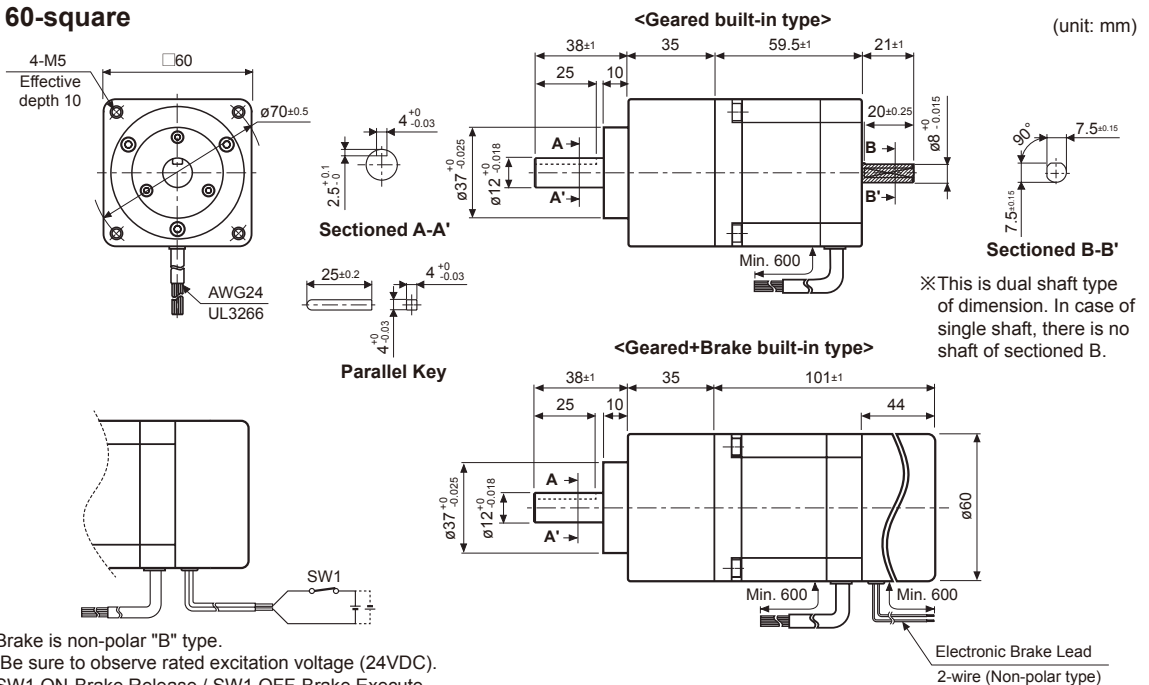
(unit: mm)

### 42-square



※For flexible coupling(ERB Series) information, refer to the 144 page.

### 60-square

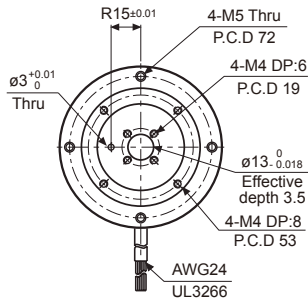


※Brake is non-polar "B" type.  
Be sure to observe rated excitation voltage (24VDC).  
※SW1 ON-Brake Release / SW1 OFF-Brake Execute

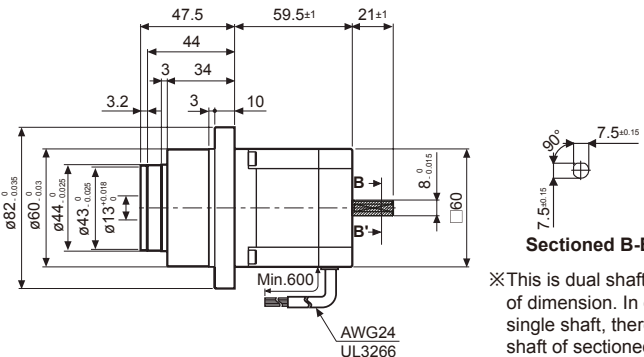
Electronic Brake Lead  
2-wire (Non-polar type)

(unit: mm)

## ◎ 60-square



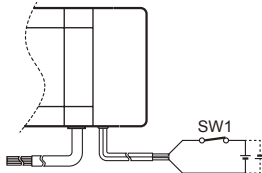
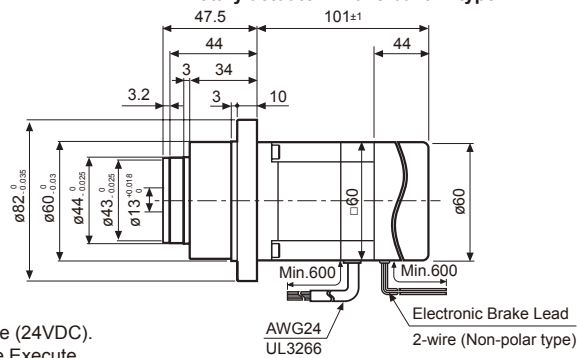
### <Rotary actuator type>



#### Sectioned B-B'

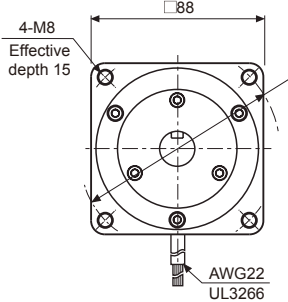
※This is dual shaft type of dimension. In case of single shaft, there is no shaft of sectioned B.

### <Rotary actuator+Brake built-in type>

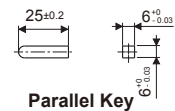


※Brake is non-polar "B" type.  
 Be sure to observe rated excitation voltage (24VDC).  
 ※SW1 ON-Brake Release / SW1 OFF-Brake Execute

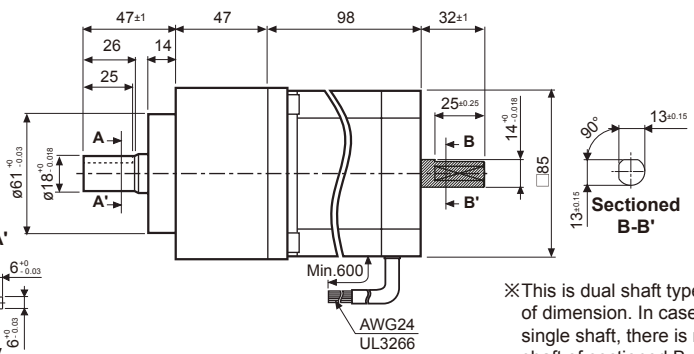
## ◎ 85-square



#### Sectioned A-A'



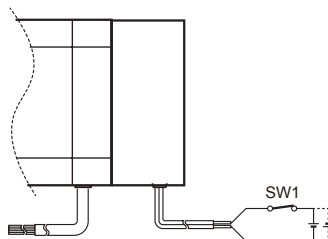
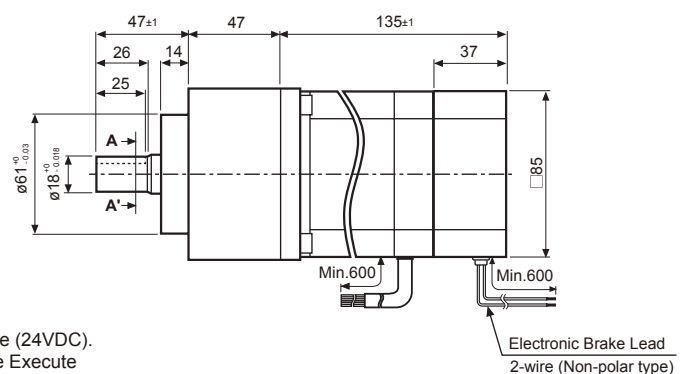
### <Geared type>



#### Sectioned B-B'

※This is dual shaft type of dimension. In case of single shaft, there is no shaft of sectioned B.

### <Geared+Brake built-in type>



※Brake is non-polar "B" type.  
 Be sure to observe rated excitation voltage (24VDC).  
 ※SW1 ON-Brake Release / SW1 OFF-Brake Execute

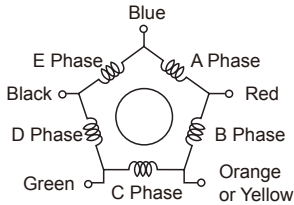
Photo electric sensor
Fiber optic sensor
Door/Area sensor
Proximity sensor
Pressure sensor
Rotary encoder
Connector/ Socket
Temp. controller
SSR/ Power controller
Counter
Timer
Panel meter
Tacho/ Speed/ Pulse meter
Display unit
Sensor controller
Switching mode power supply
Stepper motor & Driver&Controller
Graphic/ Logic panel
Field network device

## ■ Connection diagram of 5-phase stepper motor

Refer to below for correlations of motor's each phase(coil) and the color of lead wire.

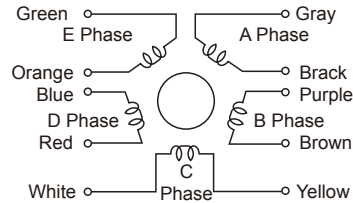
Note that pentagon connection type is a standard model. (Standard connection type is an option model.)

### ● Pentagon wiring(Standard)



In case of connecting standard connection type models to motor drivers, make sure that motor's lead wire connection must be made as specified in the table.



### ● Standard wiring(Optional)



Lead wire color for standard connection type	Lead wire color for pentagonconnection type
Gray+Red	Blue
Yellow+Black	Red
Orange+White	Orange
Brown+Green	Green
Blue+Purple	Black

## Compact and high-performance of 2-phase stepper motor driver

### ■ Specifications

Model	MD2U-MD20	MD2U-ID20
Appearances		
Power supply <sup>*1</sup>	24-35VDC	
Allowable voltage range	80 to 120% of the rating voltage	
RUN current <sup>*2</sup>	0.5 ~ 2A / Phase	
Drive method	Unipolar constant current drive type	
Current consumption <sup>*3</sup>	Max. 3A	
Resolution	1, 2, 4, 5, 8, 10, 16, 20 division <sup>*3</sup>	—
Input pulse spec.	Input pulse width	Min. 10μs
	Pulse duty	Max. 50%
	Rising/falling time	Max. 0.5μs
	Pulse input voltage	[H] 4-8VDC, [L] 0-0.5VDC
	Max. input pulse frequency	Max. 50kHz <sup>*4</sup>
Input resistance	300Ω(CW, CCW), 390Ω(HOLD OFF)	3.3kΩ(CW/CCW, RUN/STOP, HOLD OFF)
Insulation resistance	Min. 200MΩ(Based on 500VDC of electrification and non-electrification parts)	
Dielectric strength	1000VAC 60Hz for 1 minute(Between electrification and non-electrification parts)	
Noise resistance	±500V the square wave noise(pulse width: 1μs) by the noise simulator	
Vibration	1.5mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 2 hours	
Shock	Vibration 300m/s <sup>2</sup> (approx. 30G) in each of X, Y, Z directions for 3 times	
Environment	Ambient temperature	0 to 50°C, storage : -20 to 60°C
	Ambient humidity	35 to 85%RH, storage: 35 to 85%RH
Approval	CE	
Weight <sup>*5</sup>	Approx. 295g(approx. 180g)	Approx. 303g(approx. 190g)

※1: When using over 30VDC, it should be mounted at a well-ventilated place due to increasing heat.

※2: The max. value of RUN current is based on RMS value in accordance with frequency of running motor, peak power can be changed by load fluctuation.

※3: Ambient temperature is 25°C and ambient humidity is 55%RH.

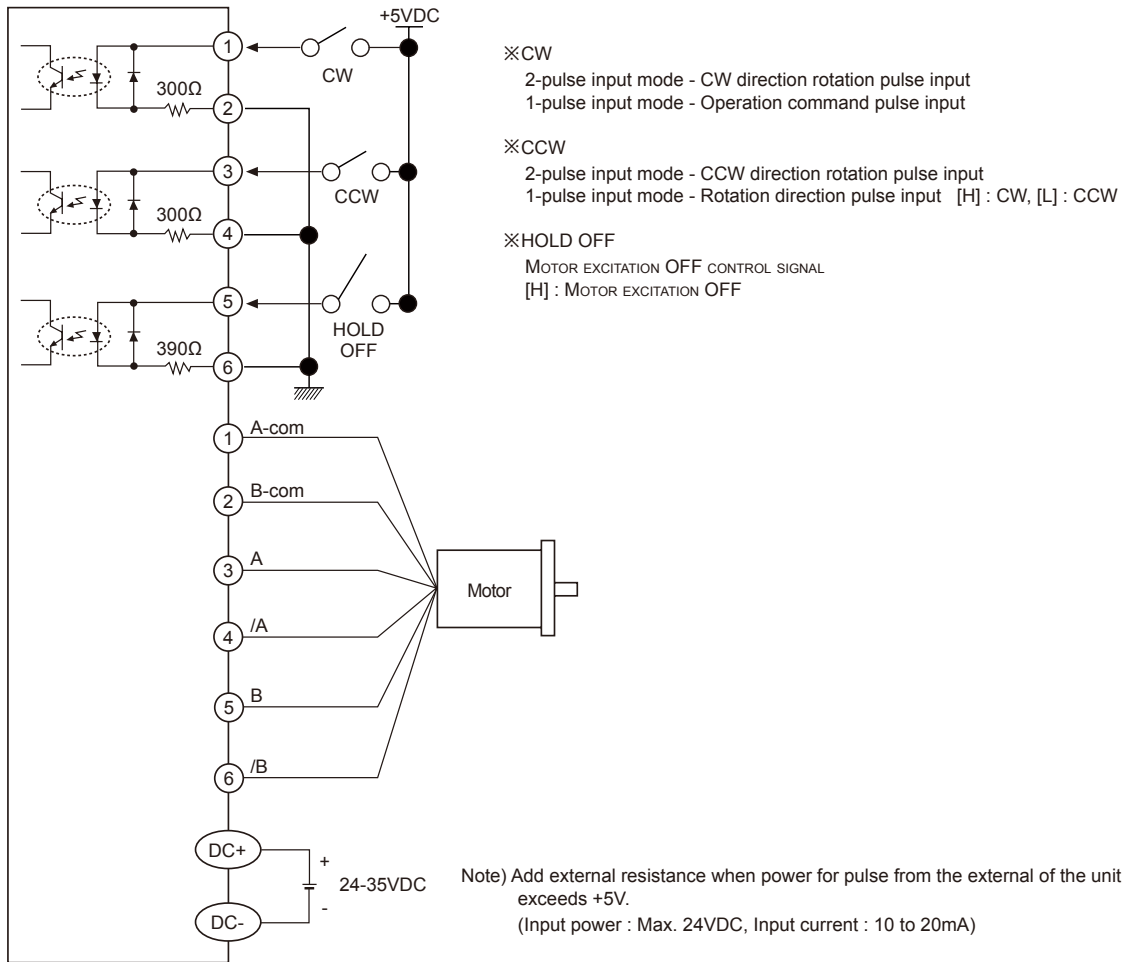
※4: It can be changed by pull-out frequency and max. slewing frequency range.

※5: The weight with packaging and the weight in parentheses is only unit weight.

※Environment resistance is rated at no freezing or condensation.

## 2-Phase micro stepper driver [MD2U-MD20]

### Input-Output diagram and connections



### Dimensions

(unit: mm)

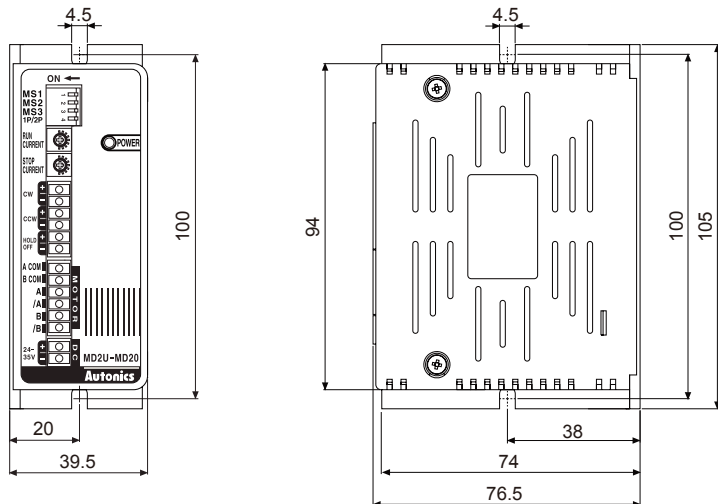
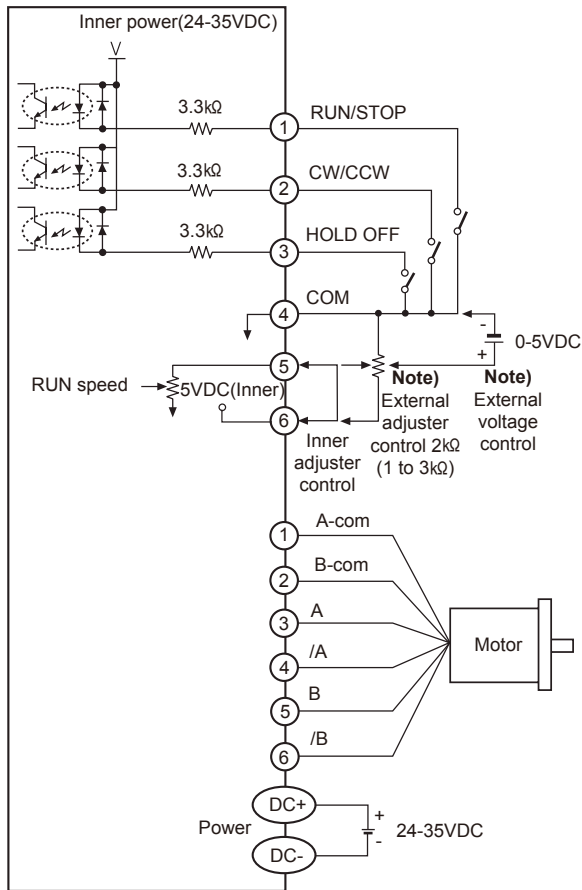


Photo electric sensor
Fiber optic sensor
Door/Area sensor
Proximity sensor
Pressure sensor
Rotary encoder
Connector/Socket
Temp. controller
SSR/ Power controller
Counter
Timer
Panel meter
Tacho/ Speed/ Pulse meter
Display unit
Sensor controller
Switching mode power supply
Stepper motor & Driver&Controller
Graphic/ Logic panel
Field network device

## 2-Phase intelligent stepper motor driver [MD2U-ID20]

### Input-Output diagram and connections



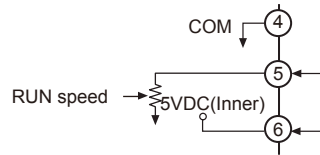
**Note)** Inner adjuster is correlated to external adjuster control and external voltage control. Make sure that inner adjuster must be set to maximum in order to set maximum RUN speed using external adjuster and external voltage.

RUN/STOP signal input  
→ [ON] : RUN, [OFF] : STOP

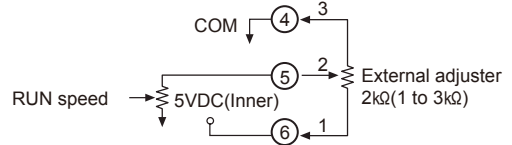
Direction signal input  
→ [ON] : CW, [OFF] : CCW

HOLD OFF signal input  
→ [ON] : HOLD OFF, [OFF] : HOLD ON

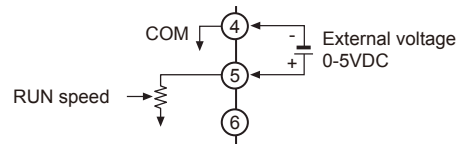
• **Inner adjuster control (Adjusting RUN speed with front VR)**  
Make the connection between terminal No.5 and No.6.



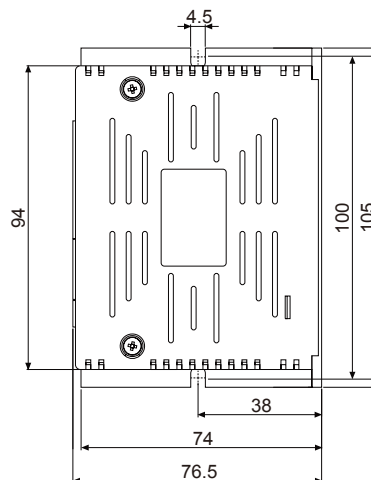
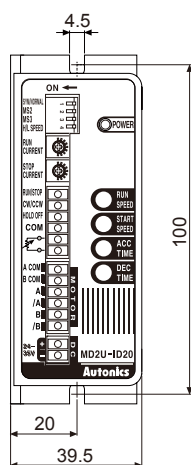
• **External adjuster control (Adjusting RUN speed with connecting external variable resistance)**  
Connect variable resistance 2kΩ(1 to 3kΩ) for external adjuster control. If variable resistance is too low, full range setting might not be possible. Make sure to adjust RUN speed VR to maximum for external adjuster control.



• **External voltage control (Adjusting RUN speed with external voltage input)**  
Make sure to adjust RUN speed VR to maximum external voltage control.



### Dimensions




(unit: mm)



## Compact 2-Phase stepper motor driver [MD2B-GD30]

### ■ Specifications

Model	MD2B-GD30	
Appearances		
Power supply	24VDC	
Allowable voltage range	90 to 110% of the rating voltage	
Drive method	Bipolar constant current drive type	
Current power <sup>*1</sup>	Max. 100W	
Drive consumption <sup>*2</sup>	0.6A, 1.5A, 2.25A, 3A/Phase	
Stop Current	0.6A, 1.5A, 2.25A, 3A/Phase	
Resolution	1, 2, 8, 16 division(1.8°~0.1125°)	
Pulse input method	1/2 pulse	
Input pulse characteristics	Input pulse width	Min. 25μs
	Input pulse width	50%
	Rising/falling time	Max. 20ns
	Pulse input voltage	[H] 4-8VDC, [L] 0-0.5VDC
	Max. input pulse frequency <sup>*3</sup>	80kHz
	Inner resistance	CW/CCW: 270Ω HOLD OFF: 300Ω
Dielectric strength	1000VAC 60Hz for 1 minute	
Insulation resistance	Min. 100MΩ(atn 500VDC megger)	
Vibration	1.5mm amplitude at frequency of 5 to 60Hz(for 1 min.) in each of X, Y, Z directions for 2 hours	
Shock	600m/s <sup>2</sup> (approx. 60G) in each of X, Y, Z directions for 3 times	
Environment	Ambient temperature <sup>*4</sup>	0 to 50°C, storage : -10 to 60°C
	Ambient humidity	35 to 85%RH, storage: 35 to 85%RH
Accessory	Input/Output connector(Installed)	
Approval	CE	
Weight <sup>*5</sup>	Approx. 150g(approx. 100g)	

※1: Ambient temperature is 25°C and ambient humidity is 55%RH.

※2: Run current is varied by input RUN current to driver and max. value of run current moment is varied by load change.

※3: Max. input pulse frequency is varied by max. pull-out frequency, max. run frequency area, decay mode and resolution.

※4: When running this unit below 10°C, test running for first 3 sec. is required before using.

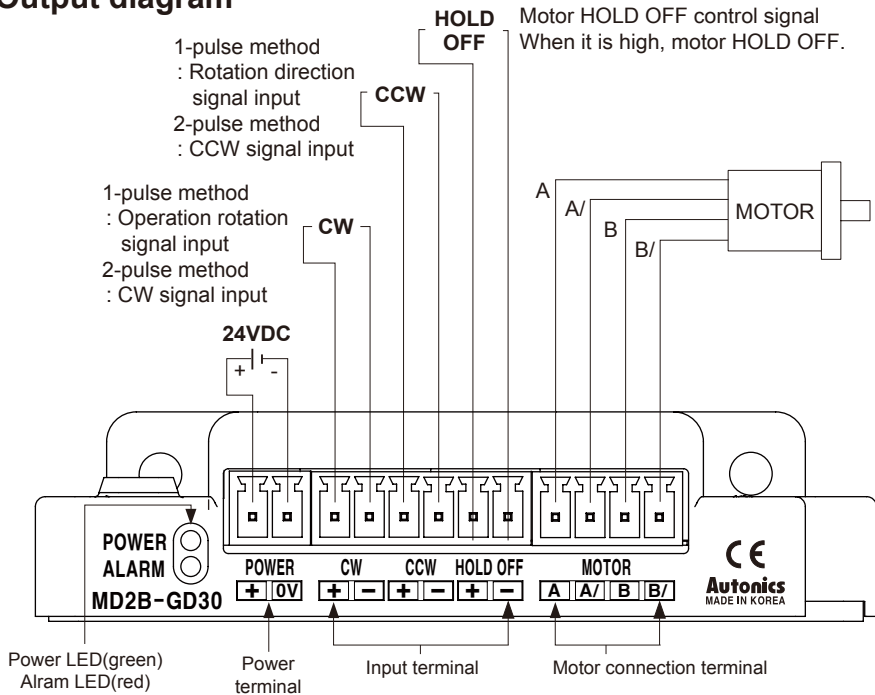
※5: The weight with packaging and the weight in parentheses is only unit weight.

※Environment resistance is rated at no freezing or condensation.

Photo electric sensor
Fiber optic sensor
Door/Area sensor
Proximity sensor
Pressure sensor
Rotary encoder
Connector/ Socket
Temp. controller
SSR/ Power controller
Counter
Timer
Panel meter
Tacho/ Speed/ Pulse meter
Display unit
Sensor controller
Switching mode power supply
Stepper motor & Driver&Controller
Graphic/ Logic panel
Field network device

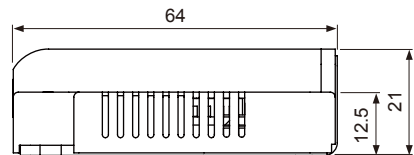
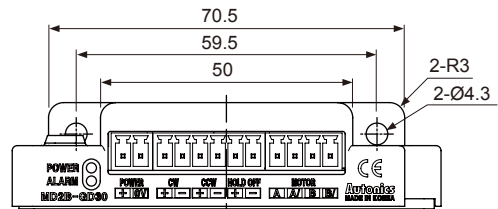
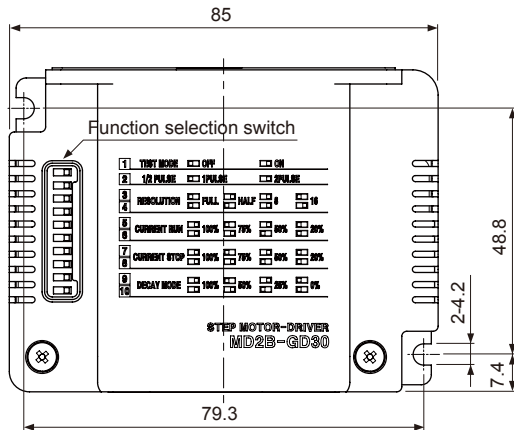
# Selection Guide

## Input-Output diagram



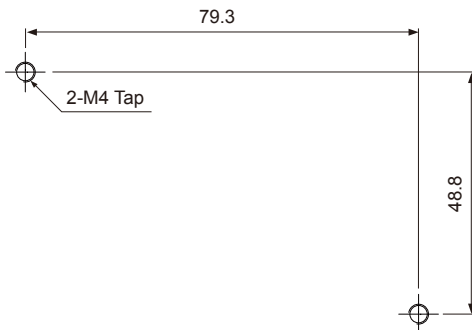
## Dimensions

(unit: mm)

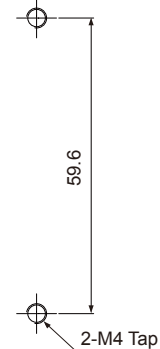


### Panel cut-out

#### Horizontal mounting




#### Vertical mounting



## AK-2 Series

### ■ Specifications

#### ● 42-square

Model	A2K-M243	A3K-M244(W)	A4K-M245
Appearances			
Max. holding torque	2.06kgf·cm(0.206N·m)	2.97kgf·cm(0.297N·m)	3.48kgf·cm(0.348N·m)
Moment of rotor inertia	33g·cm <sup>2</sup> (33×10 <sup>-7</sup> kg·m <sup>2</sup> )	56g·cm <sup>2</sup> (56×10 <sup>-7</sup> kg·m <sup>2</sup> )	72g·cm <sup>2</sup> (72×10 <sup>-7</sup> kg·m <sup>2</sup> )
Rated current	1.2A/Phase		
Basic step angle	1.8°/ 0.9°(Full/Half step)		
Insulation class	CLASS B type(130°C)		
Insulation resistance	Min. 100MΩ(at 500VDC megger) between motor coil-case		
Dielectric strength	0.5kVAC 50/60Hz for 1 min. between motor coil-case		
Environ- -ment	Ambient temperature	0 to 50°C, storage: -20 to 70°C	
	Ambient humidity	20 to 90%RH, storage: 15 to 95%RH	
Protection	IP30(IEC34-5 standard)		
Unit weight	Approx. 0.23kg	Approx. 0.29kg	Approx. 0.43kg

#### ● 56-square


Model	A6K-G264(W)	A9K-G265(W)	A16K-G268
Appearances			
Max. holding torque	5.70kgf·cm(0.570N·m)	9.25kgf·cm(0.925N·m)	15.70kgf·cm(1.570N·m)
Moment of rotor inertia	145g·cm <sup>2</sup> (145×10 <sup>-7</sup> kg·m <sup>2</sup> )	245g·cm <sup>2</sup> (245×10 <sup>-7</sup> kg·m <sup>2</sup> )	470g·cm <sup>2</sup> (470×10 <sup>-7</sup> kg·m <sup>2</sup> )
Rated current	2.0A/Phase	2.0A/Phase	2.0A/Phase
Basic step angle	1.8°/ 0.9°(Full/Half step)		
Insulation class	CLASS B type(130°C)		
Insulation resistance	Min. 100MΩ(at 500VDC megger) between motor coil-case		
Dielectric strength	0.5kVAC 50/60Hz for 1 min. between motor coil-case		
Environ -ment	Ambient temperature	0 to 50°C, storage: -20 to 70°C	
	Ambient humidity	20 to 90%RH, storage: 15 to 95%RH	
Protection	IP30(IEC34-5 standard)		
Unit weight	Approx. 0.5kg	Approx. 0.7kg	Approx. 1.1kg

Photo electric sensor

Fiber optic sensor

Door/Area sensor

Proximity sensor

Pressure sensor

Rotary encoder

Connector/ Socket

Temp. controller

SSR/ Power controller

Counter

Timer

Panel meter

Tacho/ Speed/ Pulse meter

Display unit

Sensor controller

Switching mode power supply

Stepper motor & Driver&Controller

Graphic/ Logic panel

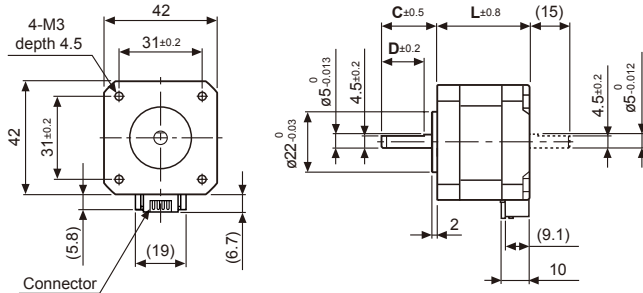
Field network device

## □ 42mm/□ 56mm/ 2-Shaft type

### ▣ Dimensions

(unit: mm)

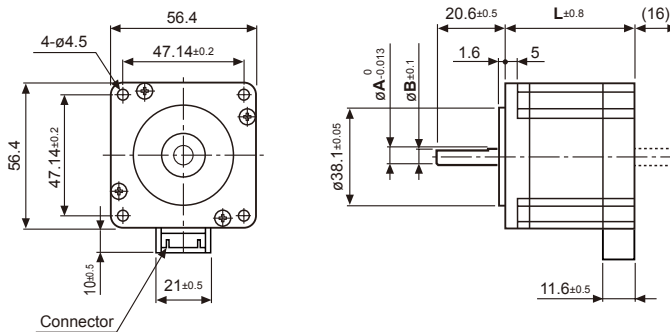
#### ◎ 42-square



MODEL	L	C	D
A2K-M243	34	20	15
A3K-M244(W)	40	20	15
A4K-M245	47.5	23	18

※ These dimensions are for dual shaft models.  
For single shaft models, ignore dotted line(.....) part.  
※ Including connector head and cable(320mm)  
Manufacture: J.S.T.MFG.CO.,LTD  
Model: S6B-PH-K-S

#### ◎ 56-square



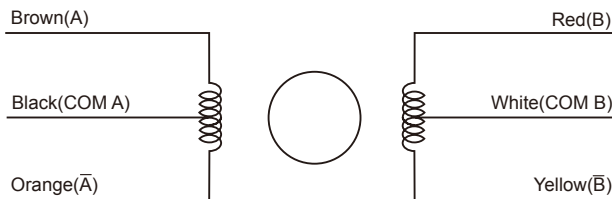
MODEL	L	C	D
A6K-M243	42	6.35	5.85
A9K-M265(W)	54.5	6.35	5.85
A16K-G268	77.5	8	7.5

※ These dimensions are for dual shaft models.  
For single shaft models, ignore dotted line(.....) part.  
※ Including connector head and cable(400mm)  
Manufacture: J.S.T.MFG.CO.,LTD  
Model: S6B-PH-K-S

※ For flexible coupling(ERB Series), refer to the 144 page.





### ▣ Connection diagram of 2-phase stepper motor

Autonics 2-phase stepper motor is the pentagon connection and color of each phase and lead wire is shown as follows.



# 1-2-Axis high speed programmable motion controller [PMC-1HS / PMC-2HS]

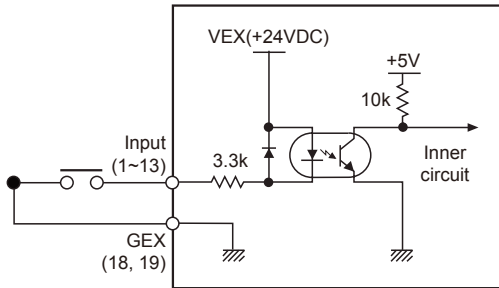
## ■ Specifications

Model	PMC-1HS-232	PMC-1HS-USB	PMC-2HS-232	PMC-2HS-USB	
Appearances					
Control axis	1-Axis		2-Axis (Each axis can be independently programmed)		
Motor for control	Pulse string input stepper motor or servo motor				
Power supply	24VDC ±10%				
Power consumption	Max. 6W				
Operation mode	Scan / Continuous / Index / Program				
Positioning type	Absolute position / Incremental position				
Index step numbers	64 indexes per each axis				
Positioning range	-8,388,608 to 8,388,607(Available pulse scaling function)				
Drive speed numbers	4EA				
Drive speed	1 pps to 4 Mpps(1 to 8,000 × Magnification 1 to 500)				
Output pulse type	2 Pulse output(Line driver)				
Home search mode	High speed near home search(Step1) → Low speed home search(Step2) → Low speed encoder Z-phase search(Step3) → High speed offset movement(Step4) Configuring the detection method and Enable/Disable in each step.				
Program function	Memory	EEPROM			
	Step	64 Steps			
	Control	ABS, INC, HOM, IJP, OUT, OTP, JMP, REP, RPE, END, TIM, NOP(12 EA)			
	Start	Power ON program auto-start function			
	Home search	Power ON home search auto-start function			
Teaching unit (Sold separately)	Adding operation mode, parameter, program drive handling (Scan operation, program execution, home search, etc)				
Common output	1 point		2 point		
Control interface	Parallel I/F				
Environment	Ambient temperature	0 to 45°C			
	Ambient humidity	35 to 85%RH			
Accessory	Common	User manual & CD			
	Power connector	CN1 : MC1,5/2-ST-3.5(PHOENIX) 1EA			
	RS232C connector	CN2 : RS-232C communication cable(1.5m) 1EA			
	P I/F connector	CN3 : 20P MIL standard, 2.54mm connector 1EA			
	X axis input/ output connector	CN4 : 16P MIL standard, 2.54mm connector 1EA(2HS : 2EA)			
	Y axis input/ output connector	—		CN5 : 16P MIL standard, 2.54mm connector 1	
	USB connector	—		USB communication cable(1m) 1EA	USB communication cable(1m) 1EA
Unit weight	Approx. 96g		Approx. 102g		

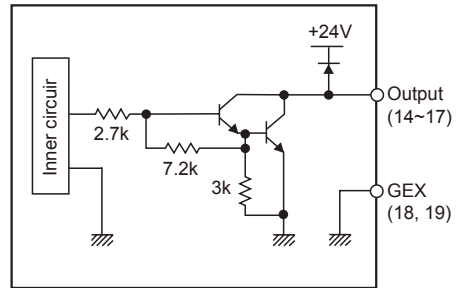
※Environment resistance is rated at no freezing of condensation.

Photo electric sensor
Fiber optic sensor
Door/Area sensor
Proximity sensor
Pressure sensor
Rotary encoder
Connector/Socket
Temp. controller
SSR/Power controller
Counter
Timer
Panel meter
Tacho/Speed/ Pulse meter
Display unit
Sensor controller
Switching mode power supply
Stepper motor & Driver&Controller
Graphic/Logic panel
Field network device

## Input/Output connections(CN3)



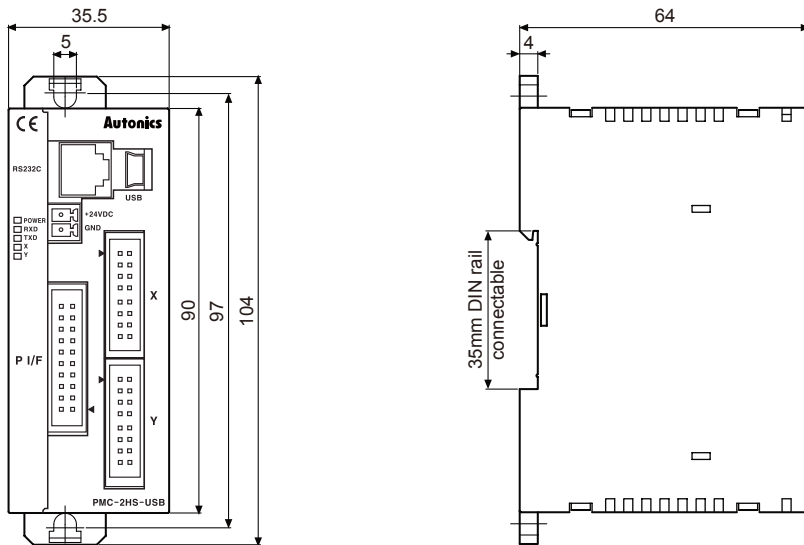
< CN3 control input connections >



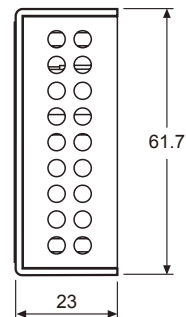
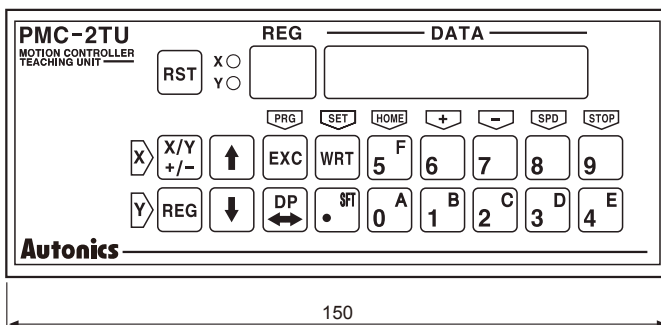
< CN3 control output connections >

## Dimensions

(unit: mm)



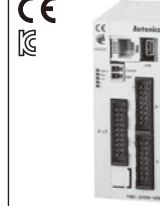
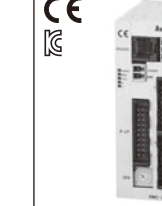


## Teaching unit PMC-2TU-232(Sold separately)



## 2-Axis high speed interpolation/normal motion controller [PMC-2HSP / PMC-2HSN]

### ■ Specifications

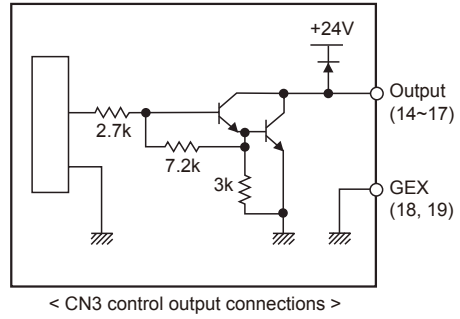
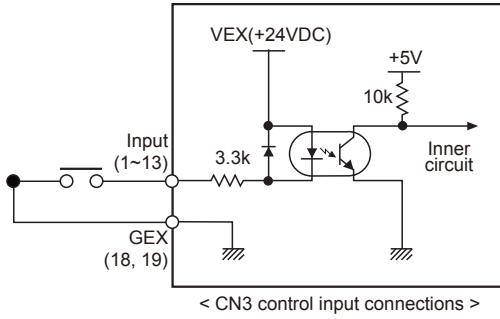
Model	PMC-2HSP-USB	PMC-2HSP-485	PMC-2HSN-USB	PMC-2HSN-485			
Appearances		<b>NEW</b> 		<b>NEW</b> 			
Control axis	2-Axis						
Motor for control	Pulse string input stepper motor or servo motor						
Power supply	24VDC						
Power consumption	Max. 6W						
Inposition range	-8,388,608 to 8,388,607(Selectable Absolute/Relative value, Available pulse-scaling function)						
Range for the drive speed	1 pps to 4 Mpps(1 to 8,000pps × Magnification 1 to 500)						
Output pulse type	1 Pulse/2 Pulse output(Line driver)						
RUN mode	Scan/Continuous/Index(Number of index: 64EA)						
	Power on program start function / Program step : 200 step						
	Program mode	ABS	Move absolute position	RID	2-axis CCW arc interpolation <sup>※1</sup>	IRD	Stand-by external input
		INC	Move relative positon	TIM	Timer	OPC	ON/OFF output port
		HOM	Home search	JMP	Jump	OPT	ON pulse from output port
		LID	2-axis CCW linear interpolation <sup>※1</sup>	REP	Start repetition	NOP	No Operation
		CID	2-axis CW circular interpolation <sup>※1</sup>	RPE	End repetition	END	End program
		FID	2-axis CW arc interpolation <sup>※1</sup>	ICJ	Jump input condition		
Home search mode	4 Step : High speed near home search, Low speed home search, Low speed Z-phase search, High speed offset movement Power on home search function						
I/O	<ul style="list-style-type: none"> <li>Parallel I/F(CN3) : Input 13EA, Output 4EA</li> <li>X-axis(CN 4) / Y-axis(CN 5) : Input 8EA, Output 6EA(General-purpose I/O, 2EA each)</li> </ul>						
Environment	Ambient temperature	0 to 45°C, storage: -15 to 70°C					
	Ambient humidity	20 to 90%RH					
Accessory	<ul style="list-style-type: none"> <li>[Common] Power connector, I/O connector(P I/F, X-axis, Y-axis), RS232C communication cable(1.5m) 1EA, Manual</li> <li>[USB type] USB communication cable 1m 1EA</li> <li>[RS485 type] RS485 connector 1EA</li> </ul>						
Unit weight	Approx. 102g	Approx. 101g	Approx. 102g	Approx. 101g			

※1: These commands are only for PMC-2HSP series.

※Environment resistance is rated at no freezing of condensation.

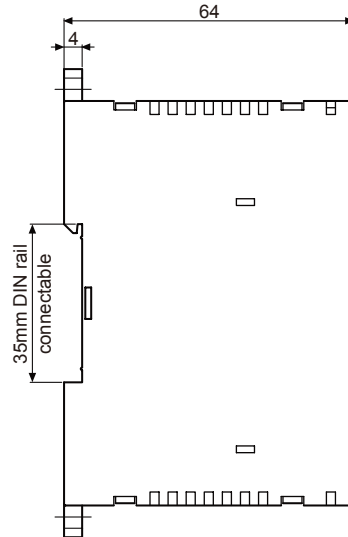
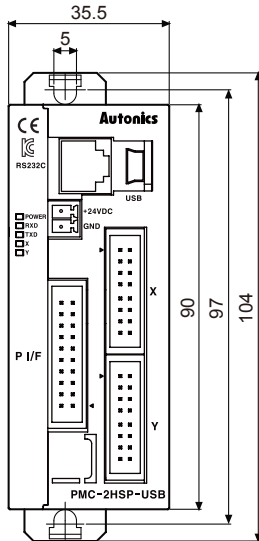
Photo electric sensor
Fiber optic sensor
Door/Area sensor
Proximity sensor
Pressure sensor
Rotary encoder
Connector/ Socket
Temp. controller
SSR/ Power controller
Counter
Timer
Panel meter
Tacho/ Speed/ Pulse meter
Display unit
Sensor controller
Switching mode power supply
Stepper motor & Driver&Controller
Graphic/ Logic panel
Field network device

## Input/Output connections(CN3)



## Dimensions

(unit: mm)





## 4-Axis board type programmable motion controller [PMC-4B-PCI]

### ■ Specifications

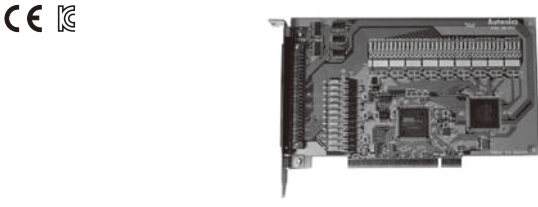

Model	PMC-4B-PCI	
Appearances		
Control axis	4-Axis	
Power supply	5VDC(uses PC inner power)	
External power supply	12-24VDC	
Allowable voltage range	90 to 110% of rated voltage	
CPU data bus	8/16 Bit selectable	
2/3-Axis linear interpolation	Interpolation range	-2,147,483,648 to 2,147,483,647 for each axis
	Interpolation speed	1pps to 4 Mpps
	Shortcut position accuracy	Max. ±0.5LSB(Within all interpolation range)
Circular interpolation	Interpolation range	Uses PC inner power
	Interpolation speed	1pps to 4 Mpps
	Shortcut position accuracy	Max. ±1 LSB(Within all interpolation range)
2/3-Axis bit pattern interpolation speed	1 to 4MPPS(Depends on CPU data setup)	
Other interpolations	Selectable the axis, constant linear velocity, consecutive interpolation, interpolation step transmission(Command, external signal)	
X, Y-axis common specifications	Output speed range : 1 pps to 4 Mpps	
	Output speed accuracy : Max ±0.1%(For setting value)	
	Speed magnification: 1 to 500	
	S jerk speed: 954 to 62.5×10 <sup>6</sup> pps/sec. (Mag.=1) (Accel/Decel increase rate) 477×10 <sup>3</sup> to 31.25×10 <sup>9</sup> pps/sec. (Mag.=500)	
	Accel/Decel: 125 to 1×10 <sup>8</sup> pps/sec. (Mag.=1) 62.5×10 <sup>3</sup> to 500×10 <sup>6</sup> pps/sec. (Mag.=500)	
	Initial velocity: 1 to 8,000pps(Mag.=1)/500 to 4×10 <sup>6</sup> pps(Mag.=500)	
	Drive speed: 1 to 8,000pps(Mag.=1) / 500 to 4×10 <sup>6</sup> pps(Mag.=500)	
	Number of output pulses: 0 to 4,294,967,295(Fixed pulse drive)	
	Speed curve: Constant speed/Symmetric, Asymmetric linear accel/decel/Parabola S curve drive	
	Fixed pulse drive deceleration mode auto deceleration(asymmetric linear accel/decel function)/ Manual deceleration	
	Changeable output pulse for driving, drive speed	
	Selectable individual 2-pulse/1-pulse direction method	
	Selectable drive pulse logic level, changeable output terminal	
Encoder input pulse	Inputtable 2-phase pulse/Up-Down pulse, Selectable 2-phase pulse 1, 2, 4 multiply	
Position counter	Logic position counter(For output pulse) count range: -2,147,483,648 to +2,147,483,647 Actual position counter(For input pulse) count range: -2,147,483,648 to 2,147,483,647	
Compare register	Comp.+ register position compare range: -2,147,483,648 to +2,147,483,647	
	Comp.- register position compare range: -2,147,483,648 to +2,147,483,647	
	Status output for position counter size, signal output	
Auto home search	Enables to operate as software limit	
Interrupt function (Except interpolation)	Step 1(High speed near home search) → Step2(Low speed near home search)	
Interrupt function (Except interpolation)	1drive pulse output When changes position counter ≥ COMP-, When changes position counter ≤ COMP+ When changes position counter < COMP-, When changes position counter < COMP+ When starting constant speed in accel/decel drive, when ending constant speed in accel/decel drive when ending drive, when ending auto home search, Synchronous operation	

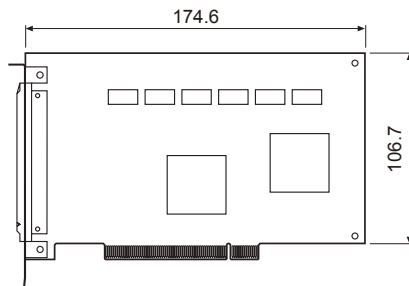
Photo electric sensor
Fiber optic sensor
Door/Area sensor
Proximity sensor
Pressure sensor
Rotary encoder
Connector/Socket
Temp. controller
SSR/ Power controller
Counter
Timer
Panel meter
Tacho/ Speed/ Pulse meter
Display unit
Sensor controller
Switching mode power supply
Stepper motor & Driver&Controller
Graphic/ Logic panel
Field network device

## Specifications

Drive adjustment by external signal	Enable to fixed/continuous pulse drive of +/- direction by EXP+/EXP- signal Enable to drive 2-phase encoder signal mode(Encoder input)	
External deceleration stop/ immediate stop signal	IN 0 to 3 each axis 4-point Selectable signal valid/invalid and logical level, usable as general input	
Input signal for servo motor	Selectable alarm, INPOS signal valid/invalid and logic level	
General output signal	OUT4 to 7 each axis 4-point(Uses same terminal with drive status output signal)	
Drive status signal output	ASND (Accelerating), DSND(Decelerating)	
Overrun limit signal input	Selectable + direction, - direction each 1-point and logic level At active, selectable immediate stop/decelerate stop	
Emergency stop signal input	EMG 1-point, stops drive pulse of all axes by low level	
Integral filter	Built-in integral filter at each input signal input terminal, selectable pass time(8 types)	
Others	Selectable the axis, constant linear velocity, consecutive interpolation, interpolation step transmission(Command, external signal)	
Environment	Ambient temperature	0 to 45°C, storage: -10 to 55°C
	Ambient humidity	35 to 85%RH, storage: 35 to 85%RH
Approval	CE 	
Unit weight	Approx. 98g	

※Environment resistance is rated at no freezing of condensation.

## Dimensions



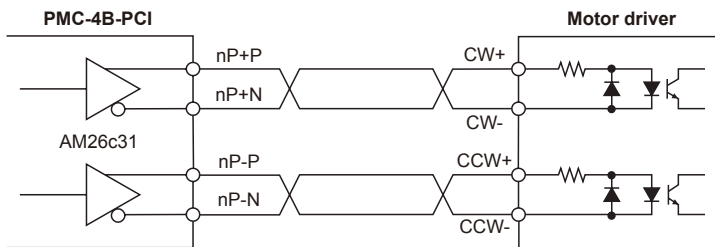
(unit: mm)

## Connections

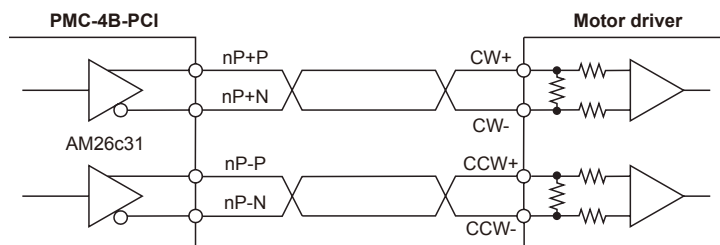
### ◎ Connection of pulse output signal for operating driver(nP+P/N, nP-P/N)

PMC-4B-PCI outputs pulse for operating driver as +/- of CW/CCW output using Line driver (AM26c31) and refer to the follows connections of motor driver with photocoupler and line driver input.

#### ● Connection to motor driver with photocoupler



#### ● Connection to motor driver with line driver

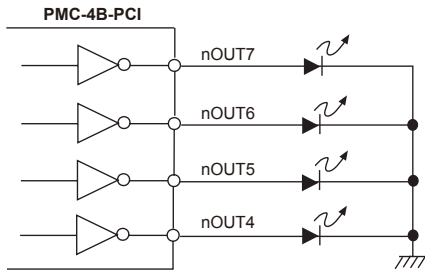


※It is recommended to use twisted pair shield wire for pulse output signal of driver operation regarding EMC.

■ Connections

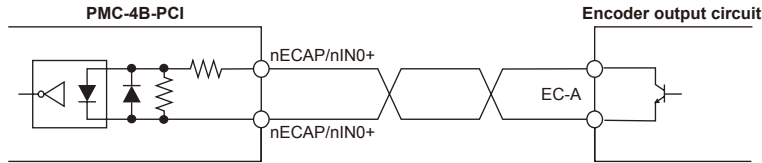
◎ Connection of common output signal (nOUT4 to 7)

Output signal is outputted by buffer(74LS06), and all outputs are OFF after reset.



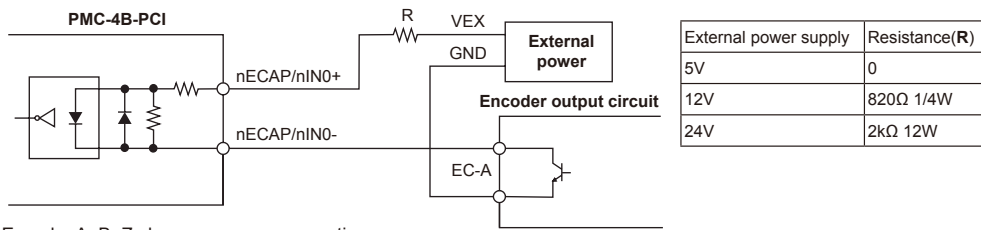
◎ Connection of encoder input signal(nECAP/N, nECBP/N) and nINO+/- signal

● Connection of encoder input signal and auto output line driver



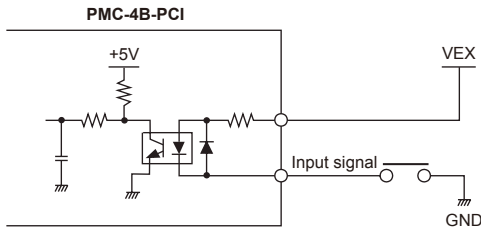
※Encoder A, B, Z phase are same connection.

◎ Example for the connection of encoder input signal and NPN open collector output encode



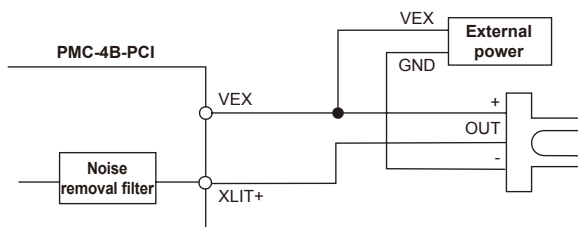
※Encoder A, B, Z phase are same connection.

◎ Connection of input signal (nIN1 to 3, nINPOS, nALRAM, nEXP+/-, EMG)



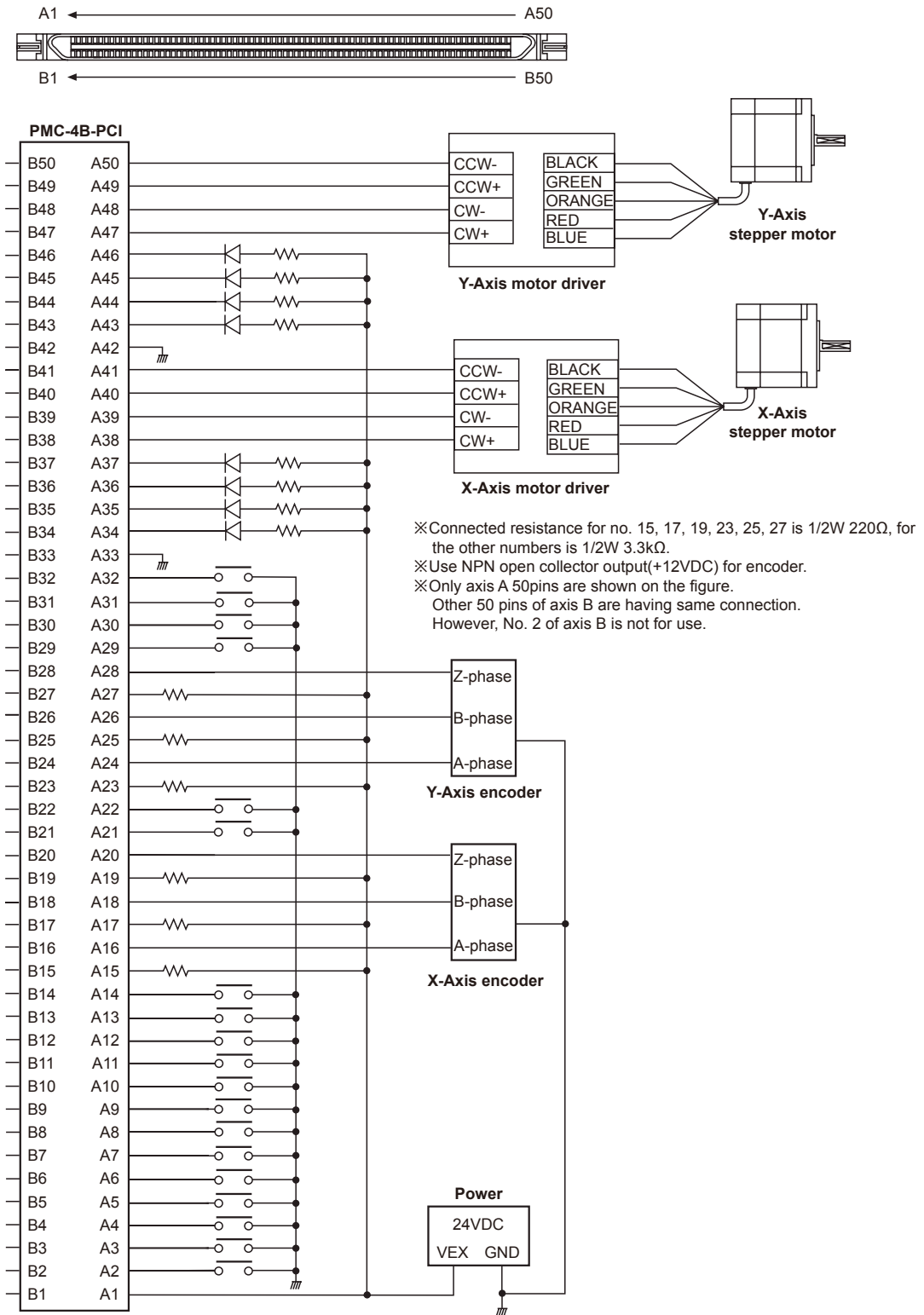
◎ Connection of limit input signal(nLMIT+/-)

The outgoing cable of limit signal can be affected by noise, it can not be removed only with photocoupler, so, the filter circuit is built in and set enough passing time. (FL=2, 3)



- Photo electric sensor
- Fiber optic sensor
- Door/Area sensor
- Proximity sensor
- Pressure sensor
- Rotary encoder
- Connector/ Socket
- Temp. controller
- SSR/ Power controller
- Counter
- Timer
- Panel meter
- Tacho/ Speed/ Pulse meter
- Display unit
- Sensor controller
- Switching mode power supply
- Stepper motor & Driver&Controller
- Graphic/ Logic panel
- Field network device



## Entire I/O connections



# 38mm Slim design, touch screen, and better reliability

## Graphic panel, GP-S044

### ■ Specifications

Model		GP-S044-S1D0	GP-S044-S1D1
Appearances			
Power supply		24VDC	
Allowable voltage range		90 to 110% of power supply	
Power consumption		Max. 3.6W	
Display performance	LCD type	4.4 inch STN Blue Negative	
	Resolution	240×80 dots	
	Display area	112.8mm×37.6mm	
	Color	MONO(blue, white)	
	LCD view angle	Top/Bottom/Left/Right 30° in each direction	
	Backlight	White LED	
	Brightness	Adjustable by software	
Graphic drawing performance	Language*1	English, Korean, Japanese, Chinese, Russian, Vietnamese, Portuguese	
	Text	<ul style="list-style-type: none"> <li>• High resolution display up to 400 letters(6×8 font)</li> <li>• 6×8, 8×8 ASCII characters, high definition numbers</li> <li>• 8×16 ASCII characters, 16×16 regional characters(1-8 times bigger for width, 0.5-5 times bigger for height)</li> </ul>	
	Graphic drawing memory	512 KB	
	Number of user screen	500 pages	
	Touch switch	Width 15×Height 4 = 60	
Serial interface	Each port of RS232C, RS422(asynchronous method)	Two ports of RS232C(asynchronous method)	
Real-time controller	RTC embedded		
Battery life cycle	Approx. 3 years at 25°C		
Insulated resistance	Min. 100MΩ(at 500VDC megger)		
Ground	3rd grounding(max. 100Ω)		
Noise resistance	± 0.5kV the square wave noise(pulse width: 1μs) by the noise simulator		
Dielectric strength	500VAC(50/60Hz) for 1 min.		
Vibration	Mechanical	0.75mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 1 hour	
	Malfunction	0.5mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 10 min.	
Shock	Mechanical	300m/s²(approx. 30G) in each of X, Y, Z directions for 3 times	
	Malfunction	100m/s²(approx. 10G) in each of X, Y, Z directions for 3 times	
Environ-ment	Ambient temperature	0°C to 50°C, storage: -20°C to 60°C	
	Ambient humidity	35 to 85% RH, storage: 35 to 85% RH	
Protection ratings	IP65F(for front panel)		
Accessory	Fixing bracket: 4EA, Rubber waterproof ring, Battery(included)		
Approval			
Weight*2	Approx. 413g(approx. 284g)		

\*1: Language can be customized.


\*2: This weight is with packaging and the weight in parentheses is only unit weight.

\*Environment resistance is rated at no freezing or condensation.

Photo electric sensor
Fiber optic sensor
Door/Area sensor
Proximity sensor
Pressure sensor
Rotary encoder
Connector/Socket
Temp. controller
SSR/Power controller
Counter
Timer
Panel meter
Tacho/Speed/ Pulse meter
Display unit
Sensor controller
Switching mode power supply
Stepper motor& Driver&Controller
Graphic/Logic panel
Field network device

## High visibility with 5.7inch wide screen Graphic panel GP-S057

### Specifications

Model		GP-S057-S1D0	GP-S057-S1D1
Appearances			
Power supply		24VDC	
Allowable voltage range		90 to 110% of power supply	
Power consumption		Max. 3.6W	
Display performance	LCD type	5.7inch STN blue negative	
	Resolution	320×240 dots	
	Display area	119mm×91mm	
	Color	MONO(blue, white)	
	LCD view angle	Top/Bottom/Left/Right 30°in each direction	
	Backlight	White LED	
	Brightness	Adjustable by software	
Graphic drawing performance	Language <sup>※1</sup>	English, Korean, Japanese, Chinese, Russian, Vietnamese, Portuguese	
	Text	<ul style="list-style-type: none"> <li>• High resolution display up to 1590 letters(6×8 font)</li> <li>• 6×8, 8×8 ASCII character, high definition numbers</li> <li>• 8×16 ASCII characters, 16×16 regional characters(1-8 times bigger for width, 0.5-5 times bigger for height)</li> </ul>	
	Graphic drawing memory	512 KB	
	Number of user screen	500 pages	
	Touch switch	Width 16×Height 12 = 192	
Serial interface		Each port of RS232C, RS422(asynchronous method)	Two ports of RS232C(asynchronous method)
Real-time controller		RTC embedded	
Battery life cycle		Approx. 3 years at 25°C	
Insulated resistance		Min. 100MΩ(at 500VDC megger)	
Ground		3rd grounding(max. 100Ω)	
Noise resistance		± 0.5kV the square wave noise(pulse width : 1μs) by the noise simulator	
Dielectric strength		500VAC(50/60Hz) for 1 min.	
Vibration	Mechanical	0.75mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 1 hour	
	Malfunction	0.5mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 10 min.	
Shock	Mechanical	300m/s <sup>2</sup> (approx. 30G) in each of X, Y, Z directions for 3 times	
	Malfunction	100m/s <sup>2</sup> (approx. 10G) in each of X, Y, Z directions for 3 times	
Environment	Ambient temperature	0 to 50°C, storage : -20 to 60°C	
	Ambient humidity	35 to 85%RH, storage : 35 to 85%RH	
Protection ratings		IP65F(for front panel)	
Accessory		Fixing bracket : 4EA, Rubber waterproof ring, Battery(included)	
Approval		CE	
Weight <sup>※2</sup>		Approx. 555g(approx. 376g)	


※1: Language can be customized.

※2: This weight is with packaging and the weight in parentheses is only unit weight.

※Environment resistance is rated at no freezing or condensation.

# 7 inch wide screen, TFT Color LCD type Graphic touch panel GP-S070

## Specifications

Model		GP-S070-T9D6	GP-S070-T9D7
Appearances			
Power supply		24VDC	
Allowable voltage range		90 to 110% of power supply	
Power consumption		Max. 7.2W	
Display performance	LCD type	7 inch TFT Color LCD	
	Resolution	800×480 dots	
	Display area	152.4mm×94.44mm	
	Color	16,777,216 color	
	LCD view angle	Within each 50°/ 60°/ 65°/ 65°of top/bottom/left/right	
	Backlight	White LED	
	Brightness	Adjustable by software	
Graphic drawing performance	Language <sup>※1</sup>	English, Korean	
	Text	<ul style="list-style-type: none"> <li>• Vector font      • 6×8, 8×8 ASCII character, high definition numbers</li> <li>• 8×16 ASCII characters, 16×16 regional characters(1 to 8 times bigger for width, 0.5 to 5 times bigger for height)</li> </ul>	
	Graphic drawing memory	16MB	
	Number of user screen	500 pages	
	Touch switch	Analog touch	
Serial interface		Asynchronous method: Each port of RS232C, RS422	
		Each port of RS232C, RS422	Two ports of RS232C
USB interface		Each of USB HOST, USB Device(Version 1.1)	
Ethernet interface		IEEE802.3(U), 10/100Base-T	
Real-time controller		RTC embedded	
Battery life cycle		Approx. 3 years at 25°C	
Insulated resistance		Min. 100MΩ(at 500VDC megger)	
Ground		3rd grounding(max. 100Ω)	
Noise resistance		± 0.5kV the square wave noise(pulse width: 1μs) by the noise simulator	
Withstanding voltage		500VAC 50/60Hz for a minute	
Vibration	Mechanical	0.75mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 1 hour	
	Malfunction	0.5mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 10 min.	
Shock	Mechanical	300m/s <sup>2</sup> (approx. 30G) in each of X,Y,Z directions for 3 times	
	Malfunction	100m/s <sup>2</sup> (approx. 10G) in each of X,Y,Z directions for 3 times	
Environment	Ambient temperature	0 to 50°C, storage: -20 to 60°C	
	Ambient humidity	35 to 85% RH, storage: 35 to 85%RH	
Protection		IP65F for front panel	
Accessory		Fixing bracket: 4EA, Battery(included)	
Approval		CE mark	
Unit weight		Approx. 520g	


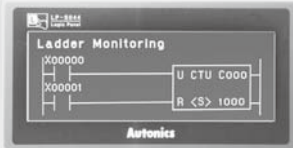

※1: Language can be customized.

※Environment resistance is rated at no freezing or condensation.

Photo electric sensor
Fiber optic sensor
Door/Area sensor
Proximity sensor
Pressure sensor
Rotary encoder
Connector/Socket
Temp. controller
SSR/ Power controller
Counter
Timer
Panel meter
Tacho/ Speed/ Pulse meter
Display unit
Sensor controller
Switching mode power supply
Stepper motor& Driver&Controller
Graphic/ Logic panel
Field network device

## Graphic panel + PLC function Logic panel LP-S044

### ■ Specifications

Model	LP-S044-S1D0-C5T-A	LP-S044-S1D0-C5R-A	LP-S044-S1D1-C5T-A	LP-S044-S1D1-C5R-A
Appearances	 			
I/O connector type	Terminal block connector	Ribbon cable connector	Terminal block connector	Ribbon cable connector
Power supply	24VDC			
Allowable voltage range	90 to 110% of power supply			
Power consumption	Max. 3.6W			
Display performance	LCD type	4.4inch STN Blue Negative		
	Resolution	240×80 dots		
	Display area	112.8mm×37.6mm		
	Color	MONO(blue, white)		
	LCD view angle	Top/Bottom/Left/Right 30° in each direction		
	Backlight	White LED		
	Brightness	Adjustable by software		
Graphic drawing performance	Language <sup>※1</sup>	English, Korean, Japanese, Chinese, Russian, Vietnamese, Portuguese		
	Text	<ul style="list-style-type: none"> <li>• High resolution display up to 400 letters • 6×8, 8×8 ASCII character, high definition numbers</li> <li>• 8×16 ASCII characters, 16×16 regional characters(1 to 8 times bigger for width, 0.5 to 5 times bigger for height)</li> </ul>		
	Graphic drawing memory	384 KB		
	Number of user screen	500 pages		
Touch switch	Width 15×Height 4 = 60			
Control performance	Command	Basic command : 28, application command : 220		
	Program capacity	8K step		
	Processing time	Average : 6 to 7μs/step		
	I/O control type	Batch processing		
	Computer control mode	Repeated-doubling method, interrupt processing		
	Device range	*Refer to LP-S044 user manual		
Serial interface	Each port of RS232C, RS422(asynchronous method)	Two ports of RS232C(asynchronous method)		
Real-time controller	RTC embedded			
Battery life cycle	Approx. 3 years at 25°C			
Insulated resistance	Min. 100MΩ(at 500VDC megger)			
Ground	3rd grounding(max. 100Ω)			
Noise strength	± 0.5kV the square wave noise(pulse width : 1μs) by the noise simulator			
Dielectric strength	500VAC(50/60Hz) for a minute			
Vibration	Mechanical	0.75mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 1 hour		
	Malfunction	0.5mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 10 min.		
Shock	Mechanical	300m/s <sup>2</sup> (approx. 30G) in each of X, Y, Z directions for 3 times		
	Malfunction	100m/s <sup>2</sup> (approx. 10G) in each of X, Y, Z directions for 3 times		
Environ-ment	Ambient temperature	0 to 50°C, storage : -20 to 60°C		
	Ambient humidity	35 to 85% RH, storage : 35 to 85% RH		
Protection ratings	IP65F(for front panel)			
Accessory	Fixing bracket : 4EA, Rubber waterproof ring, Battery included			
Approval				
Weight <sup>※2</sup>	Approx. 454g(approx. 312g)			

※1: Language can be customized.


※2: This weight is with packaging and the weight in parentheses is only unit weight.

※Environment resistance is rated at no freezing or condensation.



# 7inch wide screen, TFT Color LCD type Graphic panel + PLC function Logic panel LP-S070

## ■ Specifications

Model	LP-S070-T9D6-C5T	LP-S070-T9D6-C5R	LP-S070-T9D7-C5T	LP-S070-T9D7-C5R
Appearances				
I/O connector type	Terminal block connector	Ribbon cable connector	Terminal block connector	Ribbon cable connector
Power supply	24VDC			
Allowable voltage range	90 to 110% of power supply			
Power consumption	Max. 7.2W			
Display performance	LCD type	7 inch TFT Color LCD		
	Resolution	800×480 dots		
	Display area	152.4mm×94.44mm		
	Color	16,777,216 color		
	LCD view angle	Within each 50°/ 60°/ 65°/ 65° of top/bottom/left/right		
	Backlight	White LED		
	Brightness	Adjustable by software		
Graphic drawing performance	Language*1	English, Korean		
	Text	• Vector font      • 6×8, 8×8 ASCII character, high definition numbers • 8×16 ASCII characters, 16×16 regional characters(1 to 8 times bigger for width, 0.5 to 5 times bigger for height)		
	Graphic drawing memory	16MB		
	Number of user screen	500 pages		
Control performance	Touch switch	Analog touch		
	Command	Basic command : 28, application command : 233		
	Program capacity	8K step		
	Processing time	Average : Approx. 2us/basic command, application command		
	I/O control type	Batch processing		
	Computer control mode	Repeated-doubling method, interrupt processing		
	Device range	*Refer to LP-S070 user manual		
Special function	Positioning function *Refer to LP-S070 user manual			
Serial interface	Asynchronous method: Each port of RS232C, RS422		Each port of RS232C, RS422	
USB interface	Each of USB Host, USB Device(Version 1.1)			
Ethernet interface	IEEE802.3(U), 10/100Base-T			
Real-time controller	RTC embedded			
Battery life cycle	Approx. 3 years at 25°C			
Insulated resistance	Min. 100MΩ(at 500VDC megger)			
Ground	3rd grounding(max. 100Ω)			
Noise immunity	The square wave noise(pulse width 1μs) by the noise simulator with ± 0.5kV			
Withstanding voltage	500VAC 50/60Hz for a minute			
Vibration	Mechanical	0.75mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 1 hour		
	Malfuction	0.5mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 10 min.		
Shock	Mechanical	300m/s <sup>2</sup> (approx. 30G) in each of X,Y,Z directions for 3 times		
	Malfuction	100m/s <sup>2</sup> (approx. 10G) in each of X,Y,Z directions for 3 times		
Environment	Ambient temperature	0 to 50°C, storage: -20 to 60°C		
	Ambient humidity	35 to 85%RH, storage: 35 to 85%RH		
Protection	IP65F(for front panel)			
Accessory	Fixing bracket: 4EA, Battery(included)			
Approval	CE mark			
Unit weight	Approx. 540g			

\*1: Language can be customized.

※Environment resistance is rated at no freezing or condensation.

Photo electric sensor
Fiber optic sensor
Door/Area sensor
Proximity sensor
Pressure sensor
Rotary encoder
Connector/Socket
Temp. controller
SSR/ Power controller
Counter
Timer
Panel meter
Tacho/ Speed/ Pulse meter
Display unit
Sensor controller
Switching mode power supply
Stepper motor& Driver&Controller
Graphic/ Logic panel
Field network device

# Selection Guide

## Input/Output performance

### • LP-S044

Input performance		Output performance	
Input point	16 points	Output point	16 points
Insulation method	Photo coupler insulation	Insulation method	Photo coupler insulation
Voltage range	19.2 to 28.8VDC	Voltage range	19.2 to 28.8VDC
Rated input voltage	24VDC	Rated input voltage	24VDC
Rated input current	Approx. 4mA	Max. load current	0.1A/1point, 1A/1COM
Input resistance	5.6kΩ	Max. voltage falling when ON	Max. 0.2VDC
Response time	1ms	Response time	1ms
Common method	16 points/1COM	Common method	16 points/1COM

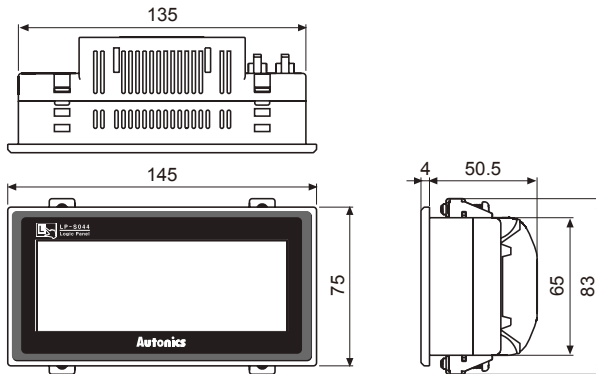
### • LP-S070

Input performance		Output performance	
Input point	16 points	Output point	16 points
Insulation method	Photo coupler insulation	Insulation method	Photo coupler insulation
Voltage range	19.2 to 28.8VDC	Voltage range	19.2 to 28.8VDC
Rated input voltage	24VDC	Rated input voltage	24VDC
Input resistance	Contact X0 to X5: Approx. 10mA Contact X6 to XF: Approx. 4mA	Max. load current	0.1A/1point, 1.6A/1COM
Input resistance	Contact X0 to X5: 2.2kΩ, Contact X6 to XF: 5.6kΩ	Max. voltage falling when ON	Max. 0.2VDC
Response time	1ms	Response time	1ms
Common method	16 points/1COM	Common method	16 points/1COM
Acceptable wire	0.3 to 0.7mm <sup>2</sup>	Acceptable wire	0.3 to 0.7mm <sup>2</sup>

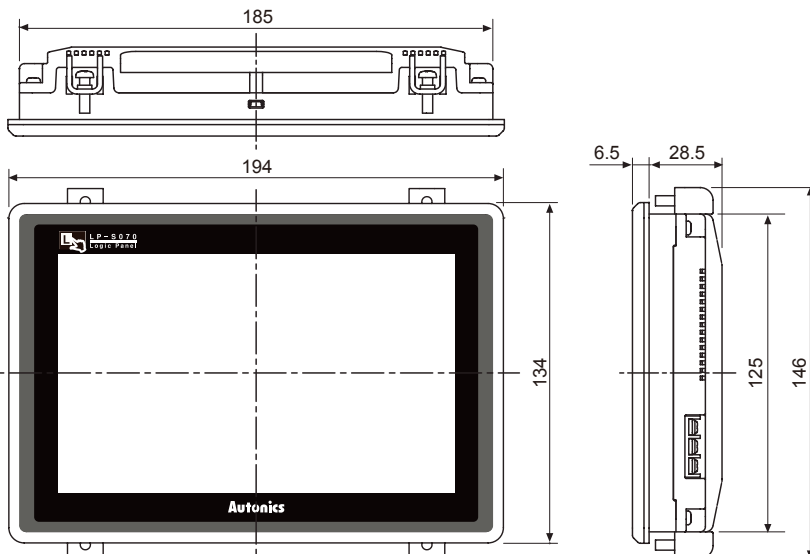
## Dimensions

(unit: mm)

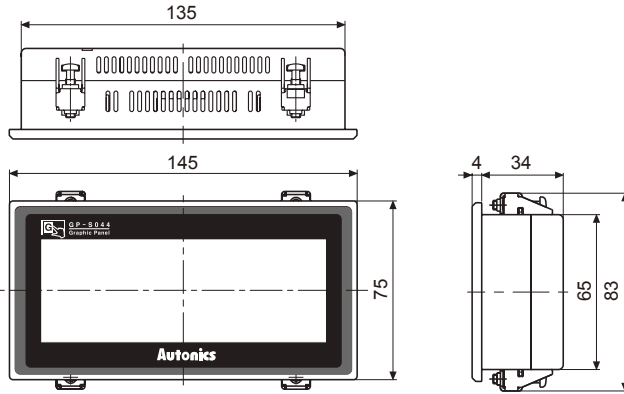
### • LP-S044



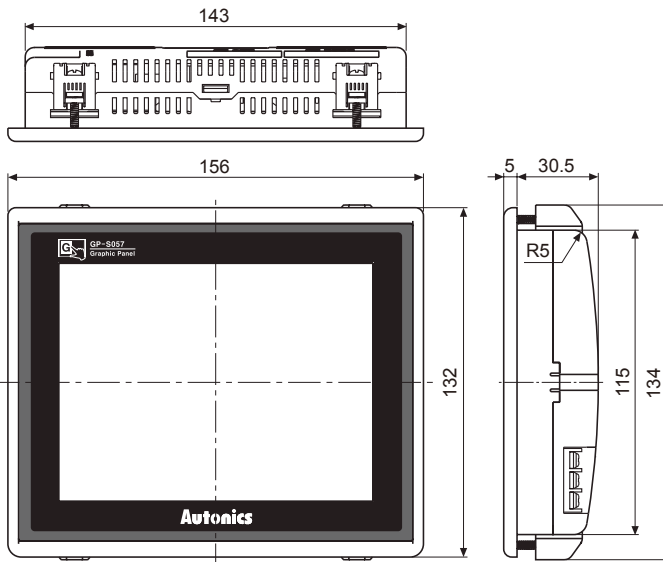
### • LP-S070



• GP-S044



• GP-S057



• GP-S070

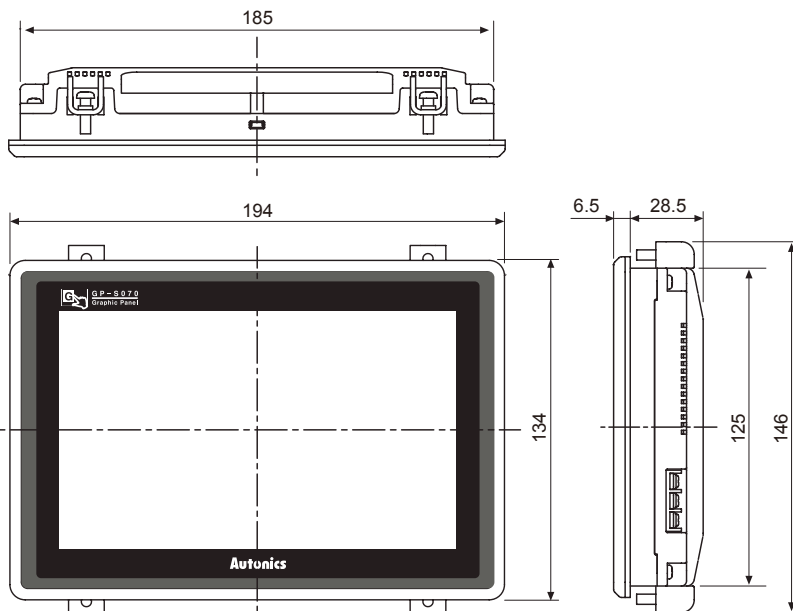


Photo electric sensor
Fiber optic sensor
Door/Area sensor
Proximity sensor
Pressure sensor
Rotary encoder
Connector/Socket
Temp. controller
SSR/Power controller
Counter
Timer
Panel meter
Tacho/Speed/ Pulse meter
Display unit
Sensor controller
Switching mode power supply
Stepper motor & Driver&Controller
Graphic/Logic panel
Field network device

## DeviceNet Digital Remote I/O [ARD-D Series]

### Ordering information

<b>AR</b>	<b>D</b>	<b>-</b>	<b>D</b>	<b>I</b>	<b>08</b>	<b>A</b>	<b>E</b>	<b>-</b>	<b>4S</b>	Terminal block <sup>※2</sup>
Structure										
I/O specification <sup>※1</sup>										
I/O point										
I/O type										
Digital/Analog										
Network										
Item										
No-mark	Standard terminal block type									
4S	Sensor connector type(4pin)									
No-mark	Basic unit									
E <sup>※4</sup>	Expansion unit									
A	AC voltage	R	Relay							
N	NPN open collector	S	SSR							
P	PNP open collector									
08	8 points type									
16	16 points type									
I	Input type									
O	Output type									
X	I/O mixed type									
D	Digital type									
A <sup>※5</sup>	Analog type									
D	Basic unit(DeviceNet type)									
X <sup>※3</sup>	Expansion unit(use in DeviceNet/Modbus)									
AR	Autonics Remote I/O									

※1: Sensor connector type (ARD-□□□-4S) model is only for NPN, PNP I/O specifications.


※2: Sensor connector(CNE-P04-□) is sold separately. It is compatible with e-CON connector.

※3: It is only for an expansion unit of sensor connector type.

※4: It is only for an expansion unit of standard terminal block type.

※5: For ARD-A Series as analog type, refer to the 328 page.


### Specifications

Type	Standard terminal block type									
Model	Basic unit	ARD-DI08A	ARD-DI16N	ARD-DI16P	ARD-DO08R	ARD-DO08S	ARD-DO16N	ARD-DO16P	ARD-DX16N	ARD-DX16P
	Expansion unit	ARD-DI08AE	ARD-DI16NE	ARD-DI16PE	ARD-DO08RE	ARD-DO08SE	ARD-DO16NE	ARD-DO16PE	ARD-DX16NE	ARD-DX16PE
Appearances										
Power supply	Rated voltage: 24VDC, Voltage range: 12-28VDC									
Power consumption	Max. 3W									
Insulation type	Photocoupler isolated									
I/O points	AC input 8-point	NPN input 16-point	PNP input 16-point	Relay output 8-point	SSR output 8-point	NPN output 16-point	PNP output 16-point	NPN input 8-point + output 8-point	PNP input 8-point + output 8-point	
Control I/O	Voltage	75-250VAC	10-28VDC		Normally open(N.O.) 250VAC 2A 1a	30-250VAC	10-28VDC(voltage drop: max. 0.5VDC)			
	Current	13mA/point	10mA/point			1A/point	0.5A/point (leakage current: max. 0.5 mA)		Input: 10mA, Output: 0.5A/point (leakage current: max. 0.5mA)	

## ■ Specifications

Type		Standard terminal block type								
Model	Basic unit	ARD-DI08A	ARD-DI16N	ARD-DI16P	ARD-DO08R	ARD-DO08S	ARD-DO16N	ARD-DO16P	ARD-DX16N	ARD-DX16P
	Expansion unit	ARD-DI08AE	ARD-DI16NE	ARD-DI16PE	ARD-DO08RE	ARD-DO08SE	ARD-DO16NE	ARD-DO16PE	ARD-DX16NE	ARD-DX16PE
Common		8-point, common			1-point, COM	8-point, common				
Insulation resistance		Min. 200MΩ(at 500VDC megger)								
Noise resistance		±240 V the square wave noise (pulse width: 1μs) by the noise simulator								
Dielectric strength		1000 VAC 50/60 Hz for 1 min.								
Vibration		1.5 mm amplitude at frequency of 10 to 55Hz (for 1 min.) in each of X, Y, Z directions for 2 hours								
Shock		500 m/s <sup>2</sup> (approx. 50G) in X, Y, Z directions for 3 times								
Environment	Ambient temperature	-10 to 50°C, storage : -25 to 75 °C								
	Ambient humidity	35 to 85%RH, storage : 35 to 85%RH								
Protection		IP20(IEC standard)								
Protection circuit		Surge protection circuit, Reverse polarity protection circuit (common) ● Transistor output type - Overcurrent protection circuit (NPN type : operated at min. 1.9A → re-supply power in overcurrent status, PNP type : operated at min. 0.7A), Overheating protection circuit(Min. 165°C), Short-circuit protection circuit								
Indicator		Network status (NS) LED (green, red), Unit status (MS) LED (green, red), I/O status LED (input: green, output: red)								
Material		Front case, Body Case: PC, Rubber cap: NBR								
Mounting		DIN rail or screw lock type								
Approval		DeviceNet CE DeviceNet		DeviceNet		CE DeviceNet				
Unit weight		Approx. 150g		Approx. 140g		Approx. 160g		Approx. 170g		Approx. 140g

※Environment resistance is rated at no freezing or condensation.

Type		Sensor connector type							
Model	Basic unit	ARD-DI08N-4S		ARD-DI08P-4S		ARD-DO08N-4S		ARD-DO08P-4S	
	Expansion unit	ARX-DI08N-4S		ARX-DI08P-4S		ARX-DO08N-4S		ARX-DO08P-4S	
Appearances									
Power supply		Rated voltage: 24VDC, Voltage range: 12-28VDC)							
Power consumption		Max. 3W							
Insulation type		Photocoupler isolated							
I/O points		NPN input 8-point		PNP input 8-point		NPN output 8-point		PNP output 8-point	
Control I/O	Voltage	10-28VDC				10-28VDC(voltage drop: max. 0.5VDC)			
	Current	10mA/point(Sensor current: 150 mA/point)				0.3A/point(leakage current: max.0.5mA)			
Common		8-point, common							
Insulation resistance		Min. 200MΩ(at 500VDC megger)							
Noise resistance		±240V the square wave noise (pulse width: 1μs) by the noise simulator							
Dielectric strength		1,000VAC 50/60Hz for 1min. (between external terminals and case)							
Vibration		1.5mm amplitude at frequency of 10 to 55 Hz (for 1 min.) in each of X, Y, Z directions for 2 hours							
Shock		500m/s <sup>2</sup> (approx. 50 G) in X, Y, Z directions for 3 times							
Environment	Ambient temperature	-10 to 50°C, storage : -25 to 75°C							
	Ambient humidity	35 to 85%RH, storage : 35 to 85%RH							
Protection		IP20(IEC standard)							
Protection circuit		Surge, Short-circuit, Overheating (over 165 °C) and ESD protection, Reverse polarity protection circuit Overcurrent protection circuit(operated at min. 0.17A)      Over current protection circuit(operated at min. 0.7A)							
Indicator		Network status (NS) LED (green, red), Unit status (MS) LED (green, red), I/O status LED (Input: green, Output: red)							
Material		Front case, Body Case: PC							
Mounting		DIN rail or screw lock type							
Approval		CE DeviceNet							
Unit weight	Basic unit	Approx. 64 g		Approx. 64 g		Approx. 65 g		Approx. 67 g	
	Expansion unit	Approx. 56 g		Approx. 57 g		Approx. 58 g		Approx. 59 g	

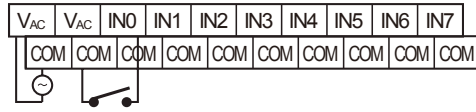
※Environment resistance is rated at no freezing or condensation.

- Photo electric sensor
- Fiber optic sensor
- Door/Area sensor
- Proximity sensor
- Pressure sensor
- Rotary encoder
- Connector/Socket
- Temp. controller
- SSR/Power controller
- Counter
- Timer
- Panel meter
- Tacho/Speed/Pulse meter
- Display unit
- Sensor controller
- Switching mode power supply
- Stepper motor& Driver&Controller
- Graphic/Logic panel
- Field network device

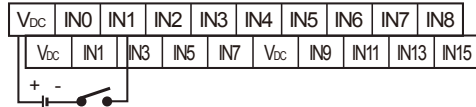
## ■ Connections

### ◎ Standard terminal block type

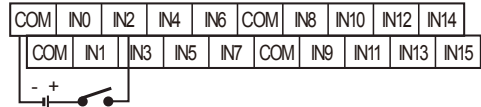
#### ● ARD-DI08A(E) [AC input]



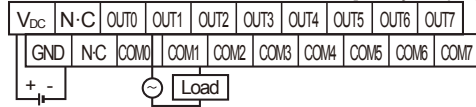
#### ● ARD-DI16N(E) [DC NPN input]



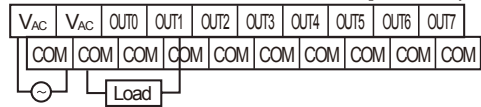
#### ● ARD-DI16P(E) [DC PNP input]



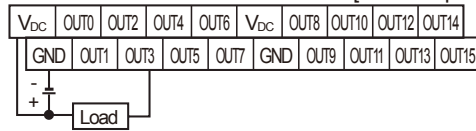
#### ● ARD-DO08R(E) [Relay output]



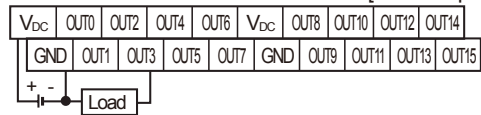
#### ● ARD-DO08S(E) [SSR output]



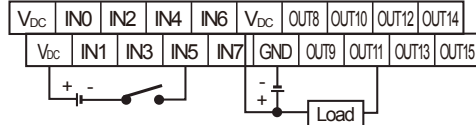
#### ● ARD-DO16N(E) [NPN output]



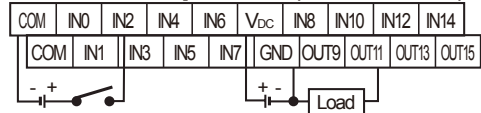
#### ● ARD-DO16P(E) [PNP output]



#### ● ARD-DX16N(E) [DC NPN input/DC NPN output]

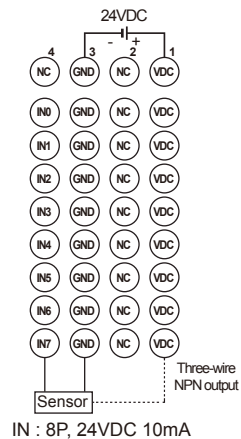


#### ● ARD-DX16P(E) [DC PNP input/DC PNP output]

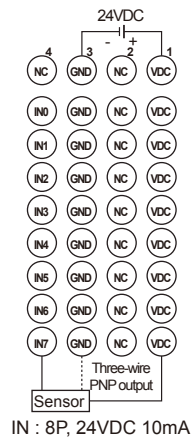


### ◎ Sensor connector type

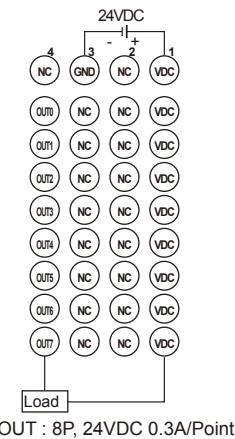
#### ● AR□-DI08N-4S



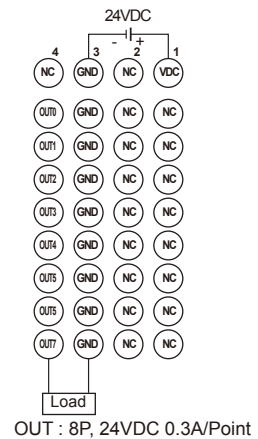
#### ● AR□-DI08P-4S



#### ● AR□-DO08N-4S



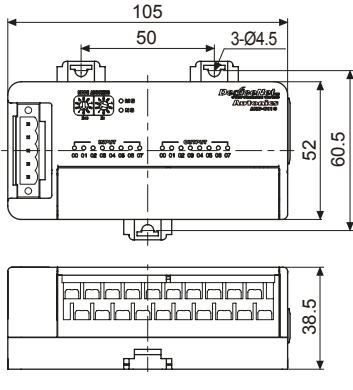
#### ● AR□-DO08P-4S



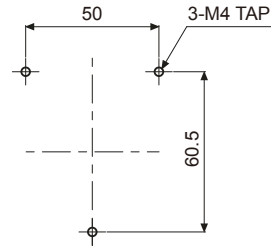
## ■ Dimensions

(unit:mm)

### ◎ Standard terminal block type



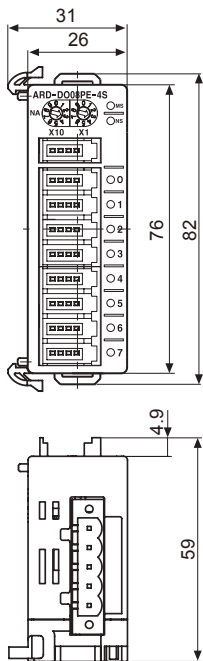
### ● Panel cut-out



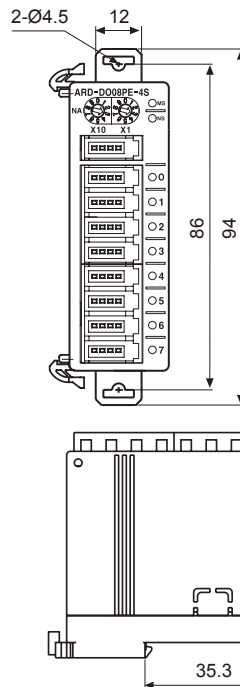
- ※ Tightening torque: 1.8 to 2.5N·m
- ※ Same dimensions are applied to both basic and expansion unit.
- ※ Connecting connectors are included for expansion units.

### ◎ Sensor connector type

#### ● Mounting on DIN rail



#### ● Mounting with screws



※ Tightening torque: 1.8 to 2.5N·m

※ Same dimensions are applied to both basic and expansion unit.

Photo electric sensor
Fiber optic sensor
Door/Area sensor
Proximity sensor
Pressure sensor
Rotary encoder
Connector/Socket
Temp. controller
SSR/Power controller
Counter
Timer
Panel meter
Tacho/Speed/Pulse meter
Display unit
Sensor controller
Switching mode power supply
Stepper motor & Driver&Controller
Graphic/Logic panel
Field network device


## DeviceNet Analog Remote I/O [ARD-A Series]

### Ordering information

<b>AR</b>	<b>D</b>	<b>A</b>	<b>I</b>	<b>04</b>		
Item					AR	Autonics Remote I/O
Network					D <sup>※1</sup>	Digital type
Digital/Analog					A	Analog type
I/O type					I	Input type
					O	Output type
I/O points					04	4-point type

※1. For digital type ARD-D Series, refer to the 324 page.

### Specifications

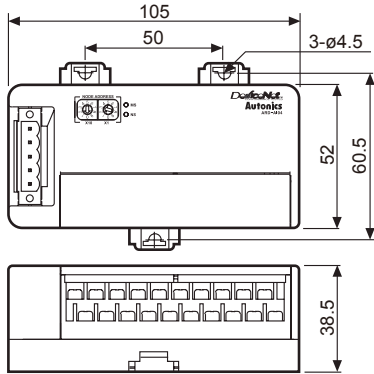
Model		ARD-AI04	ARD-AO04
Appearances		 <p style="text-align: right;"><b>DeviceNet</b> CONFIDENCE TESTED™</p>	
Power supply		Rated voltage: 24 VDC, Voltage range: 12-28 VDC	
Power consumption		Max. 3 W	
Insulation type		Photocoupler isolated	
I/O points		Input 4-point (switchable voltage/current)	Output 4-point (voltage 2CH, current 2CH)
Control I/O	Voltage	0-10 VDC, -10-10 VDC, 0-5 VDC, 1-5 VDC, -5-5 VDC (input impedance: max. 1 MΩ)	0-10 VDC, -10-10 VDC, 0-5 VDC, 1-5 VDC, -5-5 VDC (load resistance: max. 1 KΩ)
	Current	DC4-20 mA, DC0-20mA (input impedance: 250Ω)	DC4-20 mA, DC0-20 mA (load resistance: max. 600 Ω)
Max. allowable I/O		±5% F.S of rated I/O range	
Sampling cycle		1 ms/point	
Accuracy	25±5 °C	±0.3% F.S	
	-10 ±20 °C	±0.6% F.S.	
	30 to 50 °C		
Resolution		1/16,000	
Insulation resistance		Min. 200 MΩ(at 500 VDC megger)	
Noise resistance		±240 V the square wave noise (pulse width: 1 μs) by the noise simulator	
Dielectric strength		500 VAC 50/60Hz for 1 min. (between external terminals and case, between i/o and power terminals)	
Vibration		1.5 mm amplitude at frequency of 10 to 55 Hz (for 1 min.) in each of X, Y, Z directions for 2 hours	
Shock		500m/s <sup>2</sup> (approx. 50 G) in each of X, Y, Z directions for 3 times	
Environment	Ambient temperature	-10 to 50 °C, storage: -25 to 75 °C	
	Ambient humidity	35 to 85%RH, storage: 35 to 85%RH	
Protection		IP20(IEC standard)	
Protection circuit		Surge, ESD protection, Reverse polarity protection circuit	
Indicator		Network status(NS) LED(green, red), Unit status(MS) LED(green, red)	
Material		Front case, Body Case: PC	
Mounting		DIN rail or screw lock type	
Approval		<b>CE DeviceNet</b>	
Weight <sup>※1</sup>		Approx. 210 g (approx. 145 g)	

※1. The weight is with packaging and the weight in parentheses is only unit weight.

※Environment resistance is rated at no freezing or condensation.

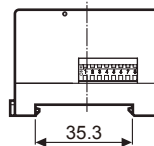
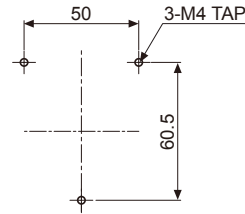


■ Dimensions



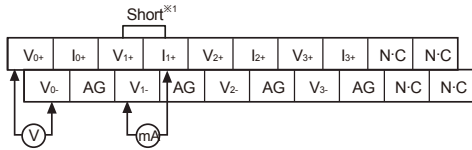
● Panel cut-out

(unit : mm)

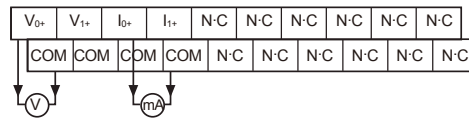


■ Connections

●ARD-AI04



●ARD-AO04



※1: For current input, short between V<sub>1+</sub> and I<sub>1+</sub>.

Voltage	0-5 VDC
	1 to 5 VDC
	-5-5 VDC
	0-10 VDC
Current	-10-10 VDC
	DC 0-20 mA
	DC 4-20 mA

Modbus sensor connector type digital remote I/O [ARM Series]


■ Ordering information

AR M - D I 08 N - 4S

Item	AR	Autonics Remote I/O
Network	M	Basic unit(Modbus RTU type)
	X	Expansion unit(Use in DeviceNet/Modbus)
Digital/Analog	D	Digital type
I/O type	I	Input type
	O	Output type
I/O points	08	8 points type
I/O specifications	N	NPN open collector
	P	PNP open collector
Terminal block	4S	Sensor connector 4-pin socket

- Photo electric sensor
- Fiber optic sensor
- Door/Area sensor
- Proximity sensor
- Pressure sensor
- Rotary encoder
- Connector/Socket
- Temp. controller
- SSR/ Power controller
- Counter
- Timer
- Panel meter
- Tacho/ Speed/ Pulse meter
- Display unit
- Sensor controller
- Switching mode power supply
- Stepper motor & Driver&Controller
- Graphic/ Logic panel
- Field network device

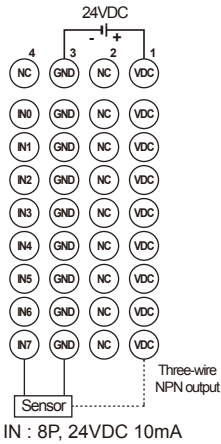
## ■ Specifications

Model	Basic unit	ARM-DI08N-4S	ARM-DI08P-4S	ARM-DO08N-4S	ARM-DO08P-4S
	Expansion unit	ARX-DI08N-4S	ARX-DI08P-4S	ARX-DO08N-4S	ARX-DO08P-4S
Appearances	<div style="display: flex; align-items: center;"> <div style="margin-right: 20px;"> <p><b>NEW</b></p> <p>CE</p> </div>  </div>				
Power supply	Rated voltage: 24VDC, Voltage range: 12-28VDC				
Power consumption	Max. 3W				
I/O points	NPN input 8 points		PNP input 8 points		NPN output 8 points
					PNP output 8 points
Control Voltage	10-28VDC			10-28VDC Output(voltage drop: Max. 0.5V)	
I/O Current	10mA/point (sensor current: 150mA/points)			0.3A/point (leakage current: Max. 0.5mA)	
Common	8 points, common				
Communication speed	2400, 4800, 9600, 19200, 38400, 57600, 115200bps(default 9600bps)				
Communication method	2-wire half duplex				
Communication distance	Max. 800m				
Multi-drop	Max. 32 Multi-Drop				
Medium access	POLL				
Application standard	Compliance with EIA RS485				
Protocol	Modbus RTU				
Data bit	8 bits				
Stop bit	1 or 2 bits(default: 2)				
Parity bit	None/Odd/Even(default: None)				
Isolation type	I/O and inner circuit: Photocoupler insulation Modbus to internal bus and inner circuit: Insulation Unit power: Non-insulation				
Insulation resistance	Min. 200MΩ (at 500VDC megger)				
Noise resistance	±240V the square wave noise (pulse width: 1μs) by the noise simulator				
Dielectric strength	1,000VAC 50/60Hz for 1 minute				
Vibration	1.5mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 2 hours				
Shock	500m/s <sup>2</sup> (approx. 50G) in each of X, Y, Z directions for 3 times				
Environment	Ambient temperature	-10 to 55°C, storage: -25 to 75°C			
	Ambient humidity	35 to 85%RH, storage: 35 to 85%RH			
Protection	IP20(IEC standards)				
Protection circuit	Surge, Short-circuit, Overheating and static protection, Reversed polarity protection circuit				
	Over current protection(Operated at min. 0.17A)		Over current protection(Operated at min. 0.7A)		
Indicator	Network status(NS) LED (Green, Red), Module status(MS) LED (Green, Red) I/O status LED (Input: Green, Output: Red)				
Material	Front case: PC, Body case: PC				
Mounting	DIN Rail or Screw lock type				
Approval	CE				
Unit weight	Basic unit	Approx. 65g	Approx. 65g	Approx. 65g	Approx. 66g
	Expansion unit	Approx. 55g	Approx. 55g	Approx. 55g	Approx. 56g

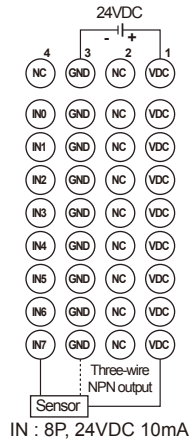
※ Environment resistance is rated at no freezing or condensation.

## ■ Connections

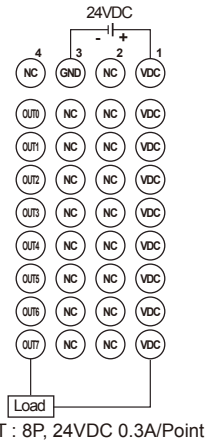
- ARM-DI08N-4S
- ARX-DI08N-4S



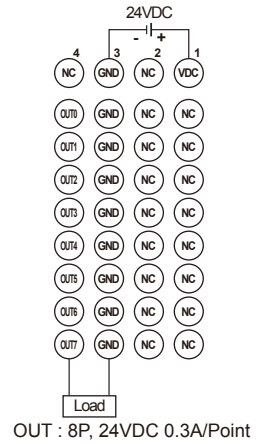
- ARM-DI08P-4S
- ARX-DI08P-4S



- ARM-DO08N-4S
- ARX-DO08N-4S

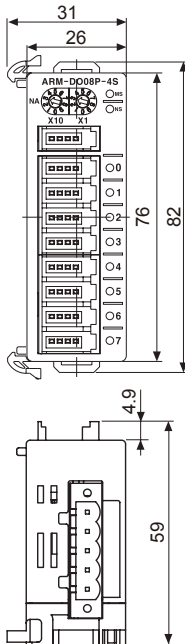


- ARM-DO08P-4S
- ARX-DO08P-4S



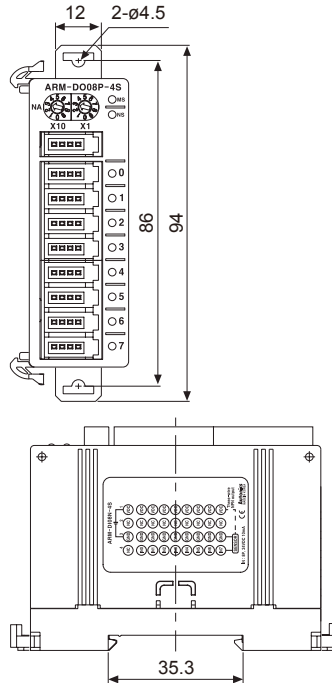
## ■ Dimensions

- Mounting DIN rail



- Mounting with screws

(unit:mm)





※ Same dimensions are applied to both basic and expansion unit.

Photo electric sensor
Fiber optic sensor
Door/Area sensor
Proximity sensor
Pressure sensor
Rotary encoder
Connector/Socket
Temp. controller
SSR/ Power controller
Counter
Timer
Panel meter
Tacho/ Speed/ Pulse meter
Display unit
Sensor controller
Switching mode power supply
Stepper motor & Driver&Controller
Graphic/ Logic panel
Field network device

## Communication Converter

- **SCM-WF48:** Wi-Fi/RS485, USB wireless communication converter
- **SCM-US48I:** USB to Serial converter
- **SCM-38I:** RS232C to RS485 converter
- **SCM-US:** USB to Serial converter

### ■ Specifications(SCM-WF48)

Model	SCM-WF48	
Appearances	<div style="display: flex; align-items: center;"> <div style="margin-right: 20px;"> <p><b>NEW</b> (available soon)</p> <p>CE  (pending)</p> </div>  </div>	
Power supply	24VDC	
Allowable voltage range	12-28VDC	
Communication type	RS485, USB, Wi-Fi	
Isolation resistance	Min. 200 MΩ(at 500 VDC megger between external terminal and case)	
Protection circuit	Reverse polarity protection circuit, surge protection circuit	
Dielectric strength	1,000VAC 50/60Hz for 1 min.(between external terminal and case)	
Noise resistance	±500 V the square wave noise(pulse width: 1μs) by the noise simulator	
Vibration	1.5 mm amplitude at frequency of 10 to 55 Hz(for 1min.) in each of X, Y, Z directions for 2 hours	
Shock	500m/s <sup>2</sup> (approx. 50G) in each of X, Y, Z directions for 3 times	
Environment	Ambient temperature	-10 to 55°C, storage: -20 to 60°C
	Ambient humidity	35 to 80%RH, storage: 35 to 80%RH
Protection	IP20(IEC standards)	
Mounting	DIN rail or panel mounting	
Accessories	USB 2.0 Mini 5P type cable (length: 1 m), Connector for RS-485 (4-pin, male type) 1EA	
Weight <sup>※1</sup>	Approx. 160g(approx. 57g)	

※1: The weight is with packaging and the weight in parentheses is only unit weight.

※Environment resistance is rated at no freezing or condensation.

#### ● RS485 communication specifications

Connection	RS485
Standard	EIA RS485
Protocol	Modbus RTU
Com. method	2-wire half duplex
Synchronous method	Asynchronous
Effective com. distance	Max. 800m
Com. speed <sup>※1</sup>	4800, 9600, 19200, 38400, 57600, 115200bps (factory default: 115200bps)
Data bit <sup>※1</sup>	5bit,6bit,7bit,8bit(factory default:8bit)
Stop bit <sup>※1</sup>	1bit, 2bit(factory default: 1bit)
Parity bit <sup>※1</sup>	None, Even, Odd(factory default: None)
Multi-drop	Max. 31 Multi-drop
Connection type	4-wire screw terminal (2-wire communication method)

※1: You can set this by DAQMaster.





#### ● Wi-Fi communication specifications

Protocol	TCP/IP(IPv4)
Standard	802.11 b/g/n(IEEE 802.11b) compatible
Com. speed	Max. 11 Mbps
Frequency range	2.4 to 2.497 GHz
Security	WEP, WPA, WPA2-PSK, Enterprise
Antenna	2dBi external antenna
Com. distance	Max. 100 m

#### ● USB communication specifications

Power	5 V, 500 mA
Standard	USB 2.0(compatible sub-transmission)
Com. method	2-wire half duplex
Connections	USB 2.0 Mini 5P type(Male)

## ■ Specifications(SCM-US48I, SCM-38I, SCM-US)

Model	SCM-US48I	SCM-38I	SCM-US
Appearances			
Power supply	5VDC USB bus Power	12-24VDC ± 10%	5VDC USB bus Power <sup>※1</sup>
Power consumption	Max. 1W	Max. 1.7W	Max. 1W
Max. com speed <sup>※2</sup>	1,200 to 115,200bps(Recommended : 9,600bps)		
Communication type	Half duplex type		
Available com. distance	USB: Max. 1m ± 30% RS485: Max. 1.2km	Max. 1.2km	1.5m(not extension)
Multi-drop	Max. 31 multi-drop		
Protocol <sup>※2</sup>	Data bit	5 to 8 data bits	
	Stop bit	1 or 2 stop bits	
	Parity bit	None/Odd/Even	
Connection type	USB: B type connector	RS232: D-sub 9Pin	USB: A type connector
	RS485: 4-wire screw terminal(2wire communication type)		Earphone jack(4 pole stereo phone plug)
Isolation type	Isolation		Non-isolation
Dielectric strength	●Between terminals and case: 200VAC 50/60Hz for 1 min. ●Between USB and RS485: 2500VAC 50/60Hz for 1 min.		●Between terminals and case: 200VAC 50/60Hz for 1 min. ●Between RS232C and RS485: 2500VAC 50/60Hz for 1 min.
	Insulation resistance		
Noise strength	±500V the square wave noise(pulse width: 1μs) by the noise simulator		
Vibration	Mechanical	0.75mm amplitude at frequency of 10 to 55Hz in each of X, Y, Z directions for 1 hour	
	Malfunction	0.5mm amplitude at frequency of 10 to 55Hz in each of X, Y, Z directions for 10 minutes	
Shock	Mechanical	300m/s <sup>2</sup> (approx. 30G) in each of X, Y, Z directions for 3 times	
	Malfunction	100m/s <sup>2</sup> (approx. 10G) in each of X, Y, Z directions for 3 times	
Environ-ment	Ambient temperature	-10 to 55°C, storage: -20 to 60°C	
	Ambient humidity	35 to 85%RH, storage: 35 to 85%RH	
Approval			
Accessory	USB 2.0 AB type connector (length: 1m)	—	
Unit weight	Approx. 34.5g	Approx. 46g	Approx. 41g

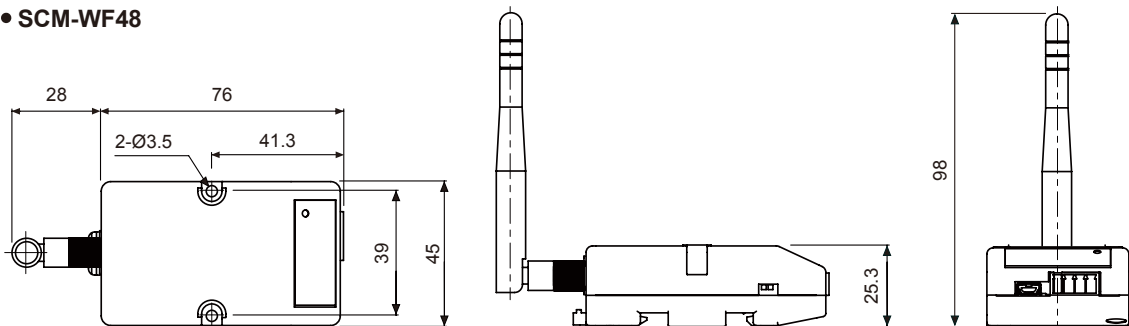
※There might be some differences in the specification above depending on PC environment.

※Environment resistance is rated at no freezing or condensation.

## ■ Dimensions

(unit: mm)

### • SCM-WF48

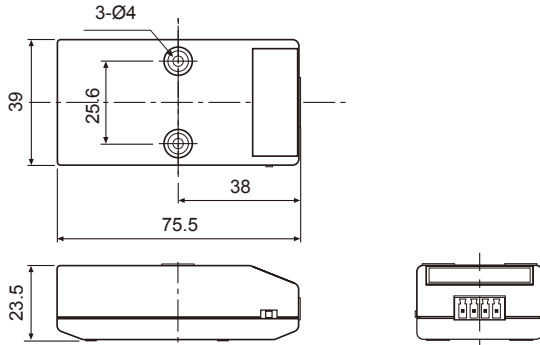


- Photo electric sensor
- Fiber optic sensor
- Door/Area sensor
- Proximity sensor
- Pressure sensor
- Rotary encoder
- Connector/Socket
- Temp. controller
- SSR/Power controller
- Counter
- Timer
- Panel meter
- Tacho/Speed/ Pulse meter
- Display unit
- Sensor controller
- Switching mode power supply
- Stepper motor & Driver&Controller
- Graphic/ Logic panel
- Field network device

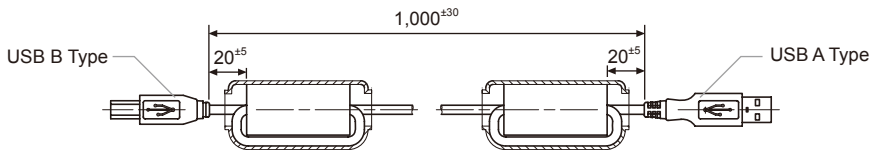
# Selection Guide

## • SCM-US48I

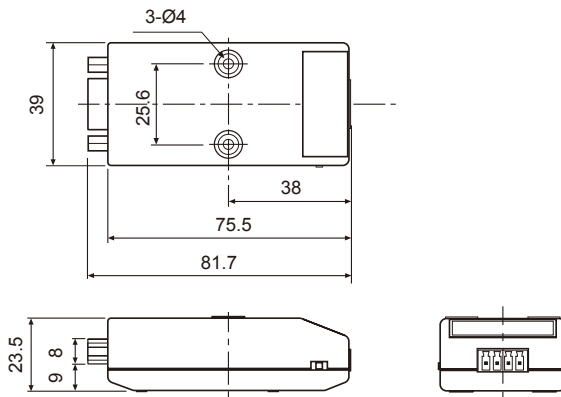
※USB 2.0 AB type cable is including the product and is also sold separately.  
(model: USB AB CABLE)



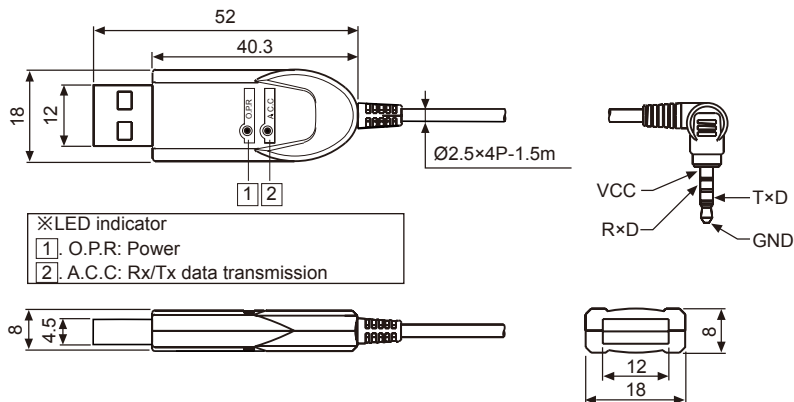
### < USB 2.0 AB type cable >



## • SCM-US38I



## • SCM-US



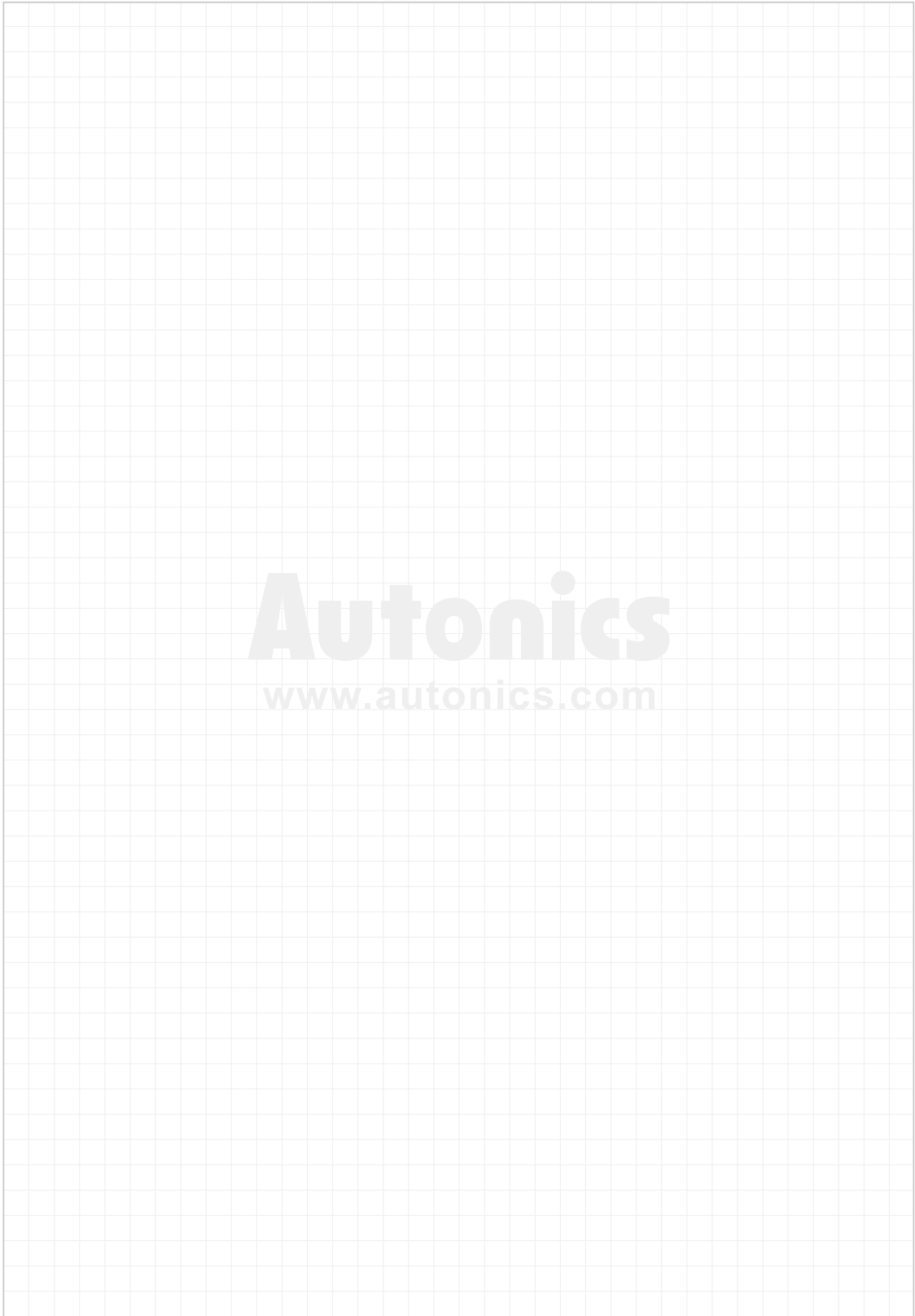


Photo electric sensor

Fiber optic sensor

Door/Area sensor

Proximity sensor

Pressure sensor

Rotary encoder

Connector/Socket

Temp. controller

SSR/Power controller

Counter

Timer

Panel meter

Tacho/Speed/ Pulse meter

Display unit

Sensor controller

Switching mode power supply

Stepper motor& Driver&Controller

Graphic/Logic panel

Field network device

# Dreaming an **ORANGE** World through Autonics **ORANGE** Solutions

## Global partner for Industrial Automation

Established in 1977, Autonics is a leading company of sensors & controllers in Korea and the No.1 exporting company as well. Its world class products over 6,000 items are marketed in more than 100 countries worldwide to satisfy customer needs in various fields of Industrial Automation.

## Orange Solution by **Autonics**

Orange is the corporate color of Autonics, and also implies unique IA solution offered by Autonics.

Autonics ORANGE solution is a New and Advanced, Reliable and Economical sensing and control equipment offering the Optimized IA solution to the customers around the world.

**Autonics** Corporation

www.autonics.com



**Distributor**

- Photoelectric sensors • Fiber optic sensors • Door/Door side sensors • Area sensors • Proximity sensors
- Pressure sensors • Rotary encoders • Temperature controllers • Temperature/Humidity transducers
- SSR/Power controllers • Counters • Timers • Panel meters • Tachometer/Pulse/Rate meters • Display units
- Sensor controllers • Switching power supplies • Control switch/Lamps/Buzzers/Sockets • I/O terminal block/Cable
- 2/5-phase stepper motors/drivers • motion controllers • Touch Screen/Logic panels • Field network device
- Laser marking systems(Fiber, CO<sub>2</sub>, Nd:YAG) • Laser welding/soldering systems

■ Any proposal for a product improvement and development: Product@autonics.com

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