HANYOUNG NUX

PRODUCT SELECTION GUIDE

WORLD LEADER IN CONTROL & MEASUREMENT

HANYOUNG NUX

PRODUCT
SELECTION GUIDE

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VX series

Specifications

Classification			VX2	VX3	VX4	VX7	VX9
Appearance							
Input	Thermocouple		K, J, E, T, R, B, S, L, N, U, W, PLII				
	Reference junction compensation accuracy		±1.5 °C (within -10~50 °C)				
	RTD		JPT100, PT100				
	Allowable line resistance		Each 3 wire within 10 Ω (but the resistance among 3 lines should be same)				
	DC voltage / current		1 ~ 5 V (4 ~ 20 mA), 0 ~ 5 V, 0 ~ 10 V, 0 ~ 50 mV, 0 ~ 100 mV				
	Sampling cycle		50 ms				
Control output	Relay output (OVC II, Resistive load)		• Rated switching capacity : 5 A 240 V a.c., 5 A 30 V d.c. • Max. switching power : 750 VA, 90 W • Max. switching voltage : 240 V a.c., 110 V d.c. • Max. switching current : 5 A • Mechanical life : 20 million times (at 180 CPM)				
			(VX3) Rated switch capacity: 3 A 240 V a.c. , 3 A 30 V d.c. , maximum switching current: 3 A				
	AC voltage type voltage pulse output		12 V d.c. ± 1 V d.c. pulse voltage (load resistance min. 600 Ω)				
	DC voltage type voltage pulse output		12 − 15 V d.c. pulse voltage (load resistance min. 600 Ω)				
	Current output		4 ~ 20 mA ± 0.2% of FS ± 1 digit, load resistance: max. 600 Ω				
Control	Control type		ON/OFF, PID control, 2DOF PID control				
	Output operation		Reverse action, direct action				
Memory	Non-volatile memory life		EEPROM unlocked: when setting E2P.L: OFF in G.SET group (EEPROM life: 1 million times write guaranteed) /EEPROM locked: when setting E2P.L: ON in G.SET group (store in RAM)				
Display part	Display method		Wide viewing angle LCD				
	PV character		20.5 x 6.9	19.7 x 7.2	15.2 x 6.8	19.8 x 9.3	29.0 x 13.6
(H∗W) ㎜	SV character		12.8 x 5.9	10.7 x 4.7	7.4 x 3.9	10.2 x 4.9	15.0 x 7.2
	MV character		9.3 x 4.4	7.3 x 3.5	7.4 x 3.9	7.5 x 3.3	11.0 x 4.8
USB Loader	Communication method		USB 2.0				
	Protocol		• Protocol : PC-LINK • Baudrate : 38400 bps • Start bit : 1 bit • Data bit : 8 bit • Parity bit : None • Stop bit : 1 bit				
	Communication distance		Within 5 m				
Option	Sub output		Relay 1 ~ 4 outputs, rated switching capacity: 5A 240 V a.c., 5 A 30 V d.c.				
	Digital input		2 points or 4 point Contact input ON : 1 KΩ max., OFF: 100 KΩ min., Non-contact input ON : 1.5 V max., OFF: 0.1 mA max. Current Flow : approx. 2 mA per contact, Voltage at open : Approx. 5 V d.c.				
	Retransmission output		1 output, 4 ~ 20 mA ± 0.2% of FS ± 1 digit, load resistance: max. 600 Ω				
	Remote input		1 input, 4 ~ 20 mA (1 ~ 5 V)				
	Current detection input		1 input or 2 inputs, 0.0 - 50.0 A, CT-70 current transformer (sold separately)				
	RS-485	Communic. method	EIA RS485 standard, 2-wire half-duplex				
		Max. connections	31 (address setting 1~99 available)				
		Communic.sequence	No sequence				
		Communic.distance	Within 1.2 ㎞				
		Communic. speed	4800, 9600, 14400, 19200, 38400, 57600 BPS				
		bit	Start bit : 1 bit, Data bit : 7 or 8 bit, Parity bit : NONE / EVEN / ODD, Stop bit : 1 or 2 bit				
		Protocol	PC-LINK STD, PC-LINK WITH SUM, MODBUS-ASCII, MODBUS-RTU				
		Response time	Actual response time = processing time + (response time X 50 ㎳)				
Power	AC Power Supply Voltage		100 - 240 V a.c., 50/60 Hz				
	DC Power Supply Voltage		24 V d.c., Class2				
	Voltage fluctuation rate		±10 % of power voltage				
	Insulation resistance		Min. 20 ㏁, 500 V d.c.				
	Dielectric strength		3,000 V a.c., 50/60 Hz for 1 minute (between 1st and 2nd terminal)				
	AC voltage type power consumption		Max. 8.5 VA	Max. 8.5 VA	Max. 8.2 VA	Max. 8.5 VA	Max. 9.0 VA
	DC voltage type power consumption		Max. 2.7 W	Max. 2.7 W	Max. 2 W	Max. 2.8 W	Max. 3.2 W
	Ambient temperature & humidity		-10 ~ 50 °C, 35 ~ 85 % RH (without condensation)				
	Storage temperature		-25 ~ 65 °C				
Approval							
			• Electrostatic discharge (ESD) : KN61000-4-2 • EFT(RS) : KN61000-4-3 • Conductive RF (CS) : KN61000-4-6 • SURGE : KN61000-4-5				
			IP65 (front panel)	IP65 (front panel)	IP66 (front panel)	IP65 (front panel)	IP65 (front panel)
Weight (g)			202	202	120	194	290
Basic components			Main body, Bracket, 250 Ω resistor (1%) , Rubber packing, Instruction manual				

Suffix code

Model	Code	Content
VX	□-□□□□-□□□□□□	LCD Digital Temperature Controller
Size	2	48(W) x 96(H) x 63(D) ㎜
	3	96(W) x 48(H) x 62.5(D) ㎜
	4	48(W) x 48(H) x 63(D) ㎜
	7	72(W) x 72(H) x 63(D) ㎜
	9	96(W) x 96(H) x 63(D) ㎜
Sensor	U	Universal input
OUT 1 (Control Output 1)	M	Relay output
	S	Voltage pulse output (voltage pulse output for SSR drive)
	C	Current output (4-20 mA current output for SCR drive)
OUT 2 (Control Output 2)	N	None
	M	Relay output
Power	A	100 - 240 V a.c. 50/60 Hz
	D	24 V d.c., Class2
Sub output	A1	1 relay output (VX4 basic option)
	A2	2 relay outputs (VX2, VX7, VX9 basic option)
	A4	4 relay outputs (※ *1)
Communication	C	RS-485 communication
Retransmission output (RET)	T	Retransmission output (4 ~ 20 mA)
Digital Input (DI)	D2	2 digital inputs (DI 1 ~ 2)
Current Detection Input (CT)	H1	Current detection input (CT) 1 contact
Remote input (REM)	R	1 input, 4 ~ 20 mA (1 ~ 5 V)

※ *1) You can select from VX2, VX3, VX7, VX9 (VX4 is excluded)

※ Please refer to our user's manual, catalog or homepage for the model names of VX available for order.

Input Type INP Parameters and Input Sensor Type and Range

Thermocouple and side temperature resistor

Classification	kind	Parameter Settings		Temperature range		Error
		Display	Communication	℃	℉	
THERMO COUPLE	K	K0	1	-200 ~ 1370	-328 ~ 2498	±0.2 % of FS ± 1 digit
		K1	2	-100.0 ~ 500.0	-148 ~ 932	
	J	J0	3	-200 ~ 1200	-328 ~ 2192	
		J1	4	-199.9 ~ 900.0	-328 ~ 1652	
	E	E1	5	-199.9 ~ 900.0	-328 ~ 1652	
	T	T1	6	-199.9 ~ 400.0	-328 ~ 752	
	R	R0	7	0 ~ 1700	32 ~ 3092	
	B	B0	8	100 ~ 1800	212 ~ 3272	±0.2 % of FS ± 1 digit 100~200 ℃ : ±2.0 % of FS ± 1 digit
	S	S0	9	0 ~ 1700	32 ~ 3092	±0.2 % of FS ± 1 digit
	L	L1	10	-199.9 ~ 900.0	-328 ~ 1652	
	N	N0	11	-200 ~ 1300	-328 ~ 2372	
	U	U1	12	-199.9 ~ 400.0	-328 ~ 752	
	W	W0	13	0 ~ 2300	32 ~ 4172	
	PLII	PL0	14	0 ~ 1300	32 ~ 2372	
RTD	JPt100	JPt0	20	-200 ~ 500	-328 ~ 932	±0.2 % of FS ± 1 digit
		JPt1	21	-199.9 ~ 500.0	-328 ~ 932	
	Pt100	Pt0	22	-200 ~ 640	-328 ~ 1184	
		Pt1	23	-199.9 ~ 640.0	-328 ~ 1184	

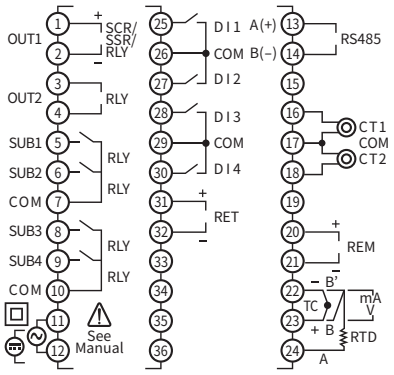
DC Current and Voltage

Classification	kind	Parameter Settings		Range	Error
		Display	Communication		
Current Input	4 ~ 20 mA (※)	1-5 V	30	-1999 ~ 9999	±0.2 % of FS ± 1 digit
	0 ~ 20 mA (※)	5 V	31		
VDC / ㎷DC	1 ~ 5 V	1-5 V	30		
	0 ~ 5 V	5 V	31		
	0 ~ 10 V	10 V	32		
	0 ~ 50 mV	0.05 V	33		
	0 ~ 100 mV	0.1 V	34		

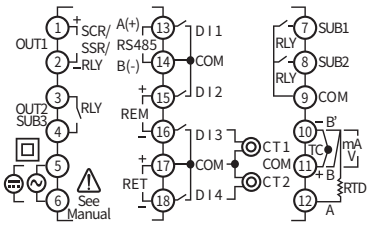
※ If direct current is used, it is recommended to use a 250 Ω (high precision of 0.1%) resistor connected in parallel to the outside of the terminal. The 250 Ω (1%) resistance enclosed in the product is not a precise resistance, so please be aware of the use.

Connection diagrams

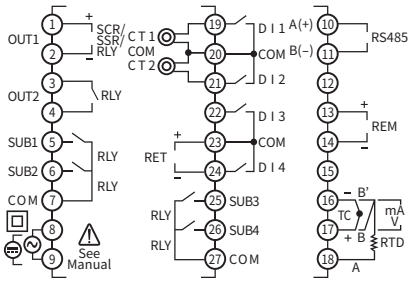
● VX2, VX3



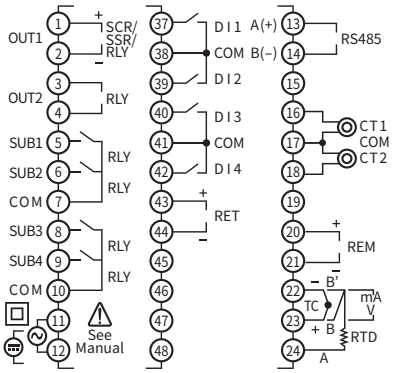
● VX4



● VX7

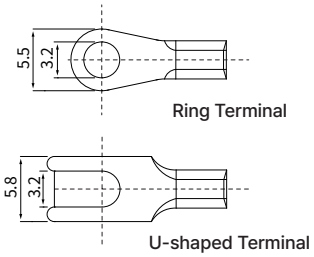


● VX9



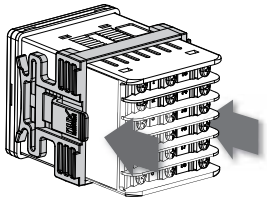
※ Use the following geometry for terminals.

[Unit : mm]

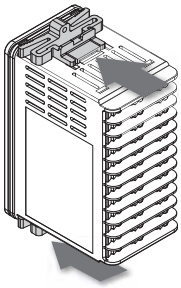


Bracket Assembly Diagram

● VX4



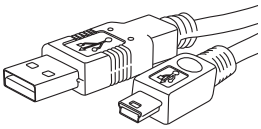
● VX2, VX3, VX7, VX9



Separate

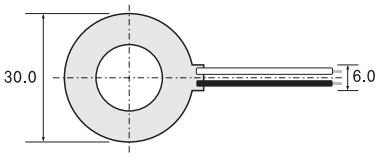
USB Loader Cable (NMC-UM210, ※Separate)

※ USB2.0 Mini 5PIN Cable



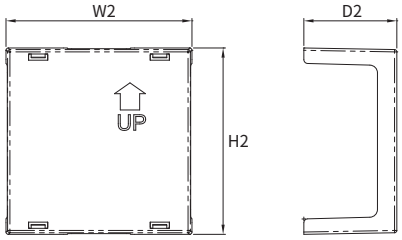
Current Detector (CT-70, ※Separate)

※ HBAEnable in Options
(Current ratio 1000 : 1, Current detection range 0.0 - 50.0 A)



[Unit : mm]

Protective Cover Dimensions (※Separately)

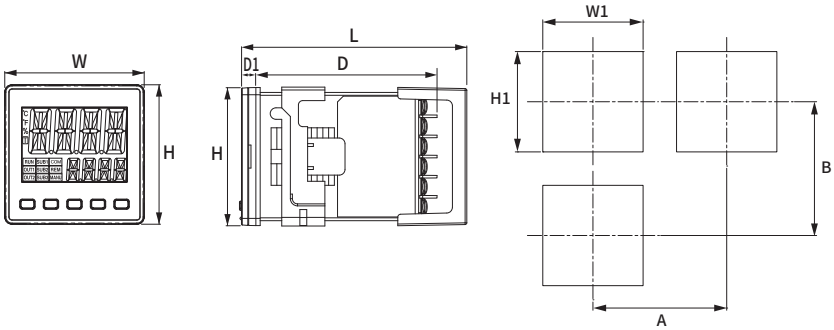


VX2	VX4	VX7	VX9
TC2A-COV	TC4A-COV	TC7A-COV	TC9A-COV

Appearance dimensions and panel processing dimensions

Product Appearance Dimensions

[Unit : mm]



Classification	Type	VX2	VX3	VX4	VX7	VX9
Product dimensions	W	48.0	96.0	48.0	72.0	96.0
	H	96.0	48.0	48.0	72.0	96.0
	D	62.5	62.5	63.0	62.5	62.5
	D1	5.5	5.5	5.0	5.5	5.5
	L	78.4	78.4	78.4	78.4	78.4
Panel cutout	W1 ∗1)	45.0	90.5	45.0	67.5	92.0
	H1 ∗1)	90.5	45.0	45.0	67.5	92.0
	A	70.0	122.0	60.0	83.0	117.0
	B ∗2)	122.0	70.0	60.0	100.0	117.0
Protective cover	W2	48.4	94.4	48.0	71.8	96.0
	H2	94.4	48.4	48.1	71.8	96.0
	D2	26.9	26.9	24.0	26.9	26.9

∗1) +0.5 mm Apply Tolerance
∗2) Apply 100.0 mm when using USB loader cable on VX4

AX series CE

Specifications

Model			AX9	AX2	AX7	AX3	AX4
Appearance							
W×H×D(㎜)			96.0×96.0×63.0	48.0×96.0×63.0	72.0×72.0×63.0	96.0×48.0×63.0	48.0×48.0×63.0
Input type			Multi input (Selection by internal parameters), (RTD :Pt 100 Ω, IEC 751)				
Sampling cycle			100 ㎳				
Input impedance			Max. 1 ㎆				
Allowable input voltage			10Vd.c. max				
Accuracy			±0.3 % of FS ±1 digit (in case of R type, ±1.0 % of FS ± 1 digit in the 0 ~ 600 ℃ range)				
Display			7 Segment LED (PV : Red, SV : green)				
Front size (㎜)	PV		22.5×11.2	14.5×7.0	14.5×7.0	15.9×7.6	13.0×6.5
	SV		18.7×9.3	10.8×5.2	9.4×4.7	12.0×6.0	9.2×5.2
Insulation Resistance			Min. 20 ㎆, 500 V d.c for 1 min (between 1st and 2nd terminal)				
Dielectric strength			2300 V a.c. 50/60 ㎐ for 1 min (between 1st and 2nd terminal)				
Control type			PID control (PID control by auto-tuning), ON/OFF control, P control				
Control output operation			Direct action / reverse action (selection by parameter setting)				
Control output type	Relay output (RLY 1)		1 A contact, 3 A 240 V a.c. 3 A 30 V d.c. (resisitive load) But the relay control output can be set as alarm output when not in use.				
	Voltage output (SSR)	Time-division proportional control (CYC)	12 - 15 V d.c. pulse voltage (load resistance min. 600 Ω)				
		Phase control (PHA)					
	Current output (SCR)		4 - 20 ㎃ d.c. (load resistance max. 600 Ω)				
Power voltage			100 - 240 V a.c. 50/60 ㎐ (10 % of power voltage)				
Voltage fluctuation rate			±10% of power voltage				
Power consumption			Max. 5.5 VA				
Ambient temperature & humidity			- 5 ~ 50 ℃, 35 ~ 85 % RH (Without condensation)				
Weight (g)			400	320	300	320	180

Suffix code

Model	Code			Content	
AX	□-	□	□	Multi Input Digital Temperature Controller	
Appearance	2			48(W) X 96(H) ㎜	
	3			96(W) X 48(H) ㎜	
	4			48(W) X 48(H) ㎜	
	7			72(W) X 72(H) ㎜	
	9			96(W) X 96(H) ㎜	
Option		1		Relay 1 + Relay 2+SSR	When using relay or SSR output (internal selection by parameter)
		2		Relay 1 + Relay 2 + Relay 3 + SSR	
		1B		SSR + Relay 1(form C) + Relay 2	Only AX2, 3, 7, 9
		2B		SSR + Relay 1(form C) + Relay 2 + Relay 3	
		3		4 - 20 ㎃ + Relay 2	When using current output
		4		4 - 20 ㎃ + Relay 2 + Relay 3	
Power			A	100-240 V a.c. 50/60 ㎐	

※ The relay output operates as control output, alarm output and LBA output depending on the internal parameter settings.

Range and Input Type

Sortation	Symbol	Input	Range	
			℃	℉
TC	K1	K	- 100 ~ 1200	-148 ~ 2192
	K2		-100.0 ~ 500.0	-148 ~ 932
	J	J	-100.0 ~ 500.0	-148 ~ 932
	r	R	0 ~ 1700	32 ~ 3092
	t	T	-100.0 ~ 400.0	-148 ~ 752
RTD	Pt	Pt100 Ω	-100.0 ~ 400.0	-148.0 ~ 752.0

NX series

Specifications

Model		NX9	NX2	NX7	NX3	NX4	NX1
Appearance							
W×H×D(mm)		96.0×96.0×100.0	48.0×96.0×100.0	72.0×72.0×100.0	96.0×48.0×100.0	48.0×48.0×100.0	48.0×24.0×100.0
Input	Thermocouple input	K, J, E, T, R, B, S, L, N, U, W, PL2					
	RTD input	Pt 100Ω, KPt 100Ω					
	DC voltage input	1-5 V d.c., -10-20 mV d.c, 0-100 mV d.c., 4-20 mA d.c. (Attach 250 Ω external resistor)					
	Input sampling cycle	250 ms					
	Input display resolution	Basically, below the measuring range decimal point					
	Input impedance	·Thermocouple and DC voltage input (mV): min. 1 MΩ, ·DC voltage input (V): approx. 1 MΩ					
	Allowable signal source resistance	·Thermocouple : max. 250 Ω ·DC voltage : max. 2 kΩ					
	Lead wire allowable resistance	RTD (max. 10 Ω. but the resistance among 3 lines should be same)					
	Allowable input voltage	Within ±10 V (thermocouple,RTD,DC voltage (mV)), within ±20 V (DC voltage (V))					
	Scaling	-1999 ~ 9999 (SL-L ~ SL-H Range)					
	Input correction	-100.0 % ~ 100.0 % of FS					
	Reference contact compensation error	±1.5 ℃ (15 ~ 35 ℃ Range), ±2.0 ℃ (0 ~ 50 ℃ Range)					
	Input disconnection detection	·Thermocouple: Select OFF, UP/DOWN Scale ·Side temperature resistance: UP Scale (Current detected during thermocouple and side temperature resistance BURN-OUT: about 50 nA)					
Performance	Display accuracy	±0.5 % of FS ±1 Digit, thermocouple (K, J, E, T, R, B, S, L, U, W, PL2)					
		±1.0 % of FS ±1 Digit, thermocouple (N)					
		±0.5 % of FS ±1 Digit, RTD (KPt100 Ω, Pt100 Ω), DC voltage					
	External power supply	12 V d.c., 20 mA max. (Cannot be used when using retransmission output)					
	Insulation Resistance	·1 Blocker to 2 Blocker: 500 V d.c. 20 MΩ or higher ·1 Blocker to GROUND: 500 V d.c. 20 MΩ or higher ·2 Blocker to GROUND: 500 V d.c. 20 MΩ or higher					
	Dielectric strength	·1 Blocker to 2 Blocker : 2,300 V a.c. 50/60Hz for a minute ·1 Blocker to GROUND : 2,300 V a.c. 50/60Hz for a minute ·2Blocker to F and G : 1,500 V a.c. 50/60Hz for a minute					
Communication (Optional)	Communication method	RS-422 (4-wire), RS-485 (2-wire)					
	Protocol	PC Link STB, PC Link with Checksum, MODBUS (RTU), MODBUS (ASCII)					
	Communication speed	2400, 4800, 9600, 14400, 19200 BPS					
	Max. number of connections	31 (Address setting 1 ~ 99)					
	Communication distance	Max. 1.2 km (total length)					
Control functions and output	Control method	PID auto-tuning					
	Control operation	a) reverse operation (heating) / forward operation (cooling) arbitrary selection (by parameter setting b) simultaneous heating / cooling control					
	Setting Range	Refer to range and input code					
	Contact input (DI)	Select among 3 preset temperatures with external contact					
	Auto-tuning 2 types	Select target value / low target value auto-tuning					
	Proportional band	0.1 ~ 999.9 % (Heating / Cooling type : 0.0 ~ 999.9 %)					
	Integral time	OFF, 1 ~ 6,000 sec					
	Differential time	OFF, 1 ~ 6,000 sec					
	ARW(Anti Reset Wind-up)	Auto, 50.0 ~ 200.0 % (Proportional band)					
	ON / OFF control	Select output type by parameter					
	PID selection	Zone PID / Group PID selection					
	Manual reset	Manual reset can be set when Integral time is OFF					
	Output amount at input disconnection (OUT1)	-5.0 ~ 105.0(Normal type), 0.0 ~ 105.0 %(Heating / cooling type)					
	Output amount at input disconnection (OUT2)	0.0 ~ 105.0 %					
Power voltage		100-240 V a.c. (±10% of power voltage) 24 V a.c. / Vd.c.					
Power consumption		Up to 6.0 W, 10 VA or less, 8 VA (NX1)					
Ambient temperature & humidity		0 ~ 50 ℃, 35 ~ 85 % RH (without condensation)					
Storage temperature		-25 ~ 70 ℃					
Weight(g)		472	342	344	340	342	94

Suffix code (NX2, 3, 4, 7, 9)

Model	Code	Content
NX	□-□□□	Multi Input/Output Temperature Controller
Appearance	2	48(W) X 96(H) ㎜
	3	96(W) X 48(H) ㎜
	4	48(W) X 48(H) ㎜
	7	72(W) X 72(H) ㎜
	9	96(W) X 96(H) ㎜
Control type	0	Normal type (heating control)
	1	Heating / cooling control (simultaneous)
	2	Heating / cooling control (NX4-20 only)
NX9 Option	0	-
	1	RS485, HBA
NX7 Option	0	-
	1	RS485, HBA
	2	SV2, SV3, HBA
NX2, 3 Option	0	SV2, SV3
	1	HBA
	2	RS485
NX4-0 Option	0	-
	1	HBA, AL2
	2	SV2, SV3
	3	RET, RS485
	4	RS485
	5	AL1, AL2
	6	AL1, AL2, SV2
	7	RS485, HBA
NX4-1 Option	0	-
	4	RS485
NX4-2 Option	0	AL1
Power voltage		100-240 V a.c. 50/60 Hz
	D	24 V d.c.

Note.
1: OUT1 (terminal ①-②-③) is applied as AL1
However, when selecting control output SSR/SCR6 :
OUT1 (terminal ⑥-⑦) applies as SV2
However, if relay control output

OUT2 (Terminal ⑪-⑫) applies as SSR/SCR

OUT2 (Terminal ⑪-⑫) applies as RLY

Suffix code (NX1)

(Note) NX1-1□ products can select control outputs 6, 9, 10, and 11 outputs.

Model	Code	Content			
NX1-	□□□	Multi Input/Output Temperature Controller 48(W) X 24(H) ㎜			
Control type	0	General type			
	1	Heating/cooling control (simultaneous)			
		Option	Terminal number ④, ⑤	Terminal number ⑥, ⑦	Output Selection Initial Value
General type Option	0	RET	RET	OUT1(RLY)	3
	1	-	OUT1(SSR/SCR)	-	1
	2	RS485/RET	RET	OUT1(RLY)	3
	3	RS485	OUT1(SSR/SCR)	-	1
	4	ALM	OUT1(SSR/SCR)	ALM	1
	5	RS485/ALM	OUT1(SSR/SCR)	ALM	1
Heating/Cooling Option	0	-	OUT2(SSR/SCR)	OUT1(RLY)	6
	1	-	OUT1(SSR/SCR)	OUT2(RLY)	10
	2	RS485	OUT2(SSR/SCR)	OUT1(RLY)	6
Power voltage		100-240 V a.c. 50/60 Hz			
	D	24 V d.c.			

※ OUT1 (Heated Output), OUT2 (Cooled Output), RLY (Relay Output), SSR (Voltage Pulse Output), SCR (Current Output, 4-20mAd.c.), RET (Transmission Output)

Range and Input Type

Model	Code	Input		Range (℃)	Degree
Thermocouple(TC)	1	K	*2	-200 ~ 1370	±0.5 % of FS ±1 digit
	2	K	*2	-199.9 ~ 999.9	
	3	J	*2	-199.9 ~ 999.9	
	4	E	*2	-199.9 ~ 999.9	
	5	T	*2	-199.9 ~ 400.0	
	6	R		0 ~ 1700	
	7	B	*1	0 ~ 1800	
	8	S		0 ~ 1700	
	9	L	*2	-199.9 ~ 900.0	
	10	N		-200 ~ 1300	±1.0 % of FS ±1 digit
	11	U	*2	-199.9 ~ 400.0	±0.5 % of FS ±1 digit
	12	W		0 ~ 2300	
	13	Platinel II		0 ~ 1390	
Temperature resistance (RTD)	20	KSPt100 Ω	*3	-199.9 ~ 500.0	±0.5 % of FS ±1 digit
	21	Pt100 Ω	*3	-199.9 ~ 640.0	
	22	Pt100 Ω	*3	-200 ~ 640	
DC Voltage (V d.c. / ㎷ d.c.)	30	1-5 V d.c.		-1999 ~ 9999 (Using scaling functions (SL-H/SL-L))	±0.5 % of FS ±1 digit
	31	0-10 V d.c.			
	32	-10-20 ㎷ d.c.			
	33	0-100 ㎷ d.c.			

⚠ Caution

● Measurement Input Wiring

- Be sure to disconnect the regulator body and external supply when wiring the measurement input lines. There is a risk of electric shock.
- Please connect carefully to the polarity of the input. If you connect it incorrectly, it causes the cause of the main body failure.
- Please use SHIELD processed wiring for the input. Also, please ground SHIELD with 1 point.
- Route the measurement input signal between the power circuit and the ground circuit if possible.
- The FS shall be measured from the minimum to the maximum of each range measurable range.
- Digit is the minimum display

*1) 0 ~ 400 ℃ Range: ±10 % of FS ±1 digit

*2) Below 0 ℃: ±1.0 % of FS ±1 digit

*3) 20 →KPt100 Ω (C1603) 21, 22 →Pt100 Ω(IEC751)

*4) When using current input, select code number "30" and attach a 250 Ohm 0.1% resistance to the input signal terminal.

DX series

Specifications

Model		DX9	DX2	DX7	DX3	DX4
Appearance						
W×H×D (mm)		96.0×96.0×100.0	48.0×96.0×100.0	72.0×72.0×100.0	96.0×48.0×100.0	48.0×48.0×100.0
Input	Thermocouple input	K, J, R				
	RTD input	Pt 100 Ω				
	DC voltage input	1-5 V d.c., 0-10 V d.c., 4-20 mA d.c.				
	Input sampling cycle	250 ms				
	Input display resolution	Basically 1 ℃ max. (0.1 ℃ max. on decimal point range)				
	Input impedance	Thermocouple and DC voltage input (mV) : min. 1 MΩ. DC voltage input (V) : approx. 1 MΩ				
	Allowable signal source resistance	Thermocouple max. 250 Ω, DC voltage max. 2 kΩ				
	Lead wire allowable resistance	RTD max. 10 Ω. (but the resistance among 3 lines should be same)				
	Allowable input voltage	±20 V d.c. for 1 min				
	Input correction	±100 % of FS				
	Input scaling	-1999 ~ 9999 (Within SL12 ~ SL13 range, with voltage/current input)				
	Reference contact compensation error	±3.5 ℃ (0 ~ 50 ℃ range)				
	Input disconnection detection	UP Scale				
Performance	Display accuracy	±0.5 % of FS but ± 1% of FS with voltage input				
	Retransm. output accuracy	±0.2mA d.c. (Load resistance max. 600 Ω, output range 3.2 ~ 20.8 mA d.c.)				
	Insulation voltage	Min. 20 MΩ (500 V d.c.) between input terminal and power terminal, between power terminal and protective earth terminal (enclosure)				
	Dielectric strength	2300 V a.c. 50/60 Hz for 1 min (between input terminal and power terminal, between power terminal and protective earth terminal)				
Control functions and output	Control type	PID Auto-tuning				
	Control operation	Reverse action (heating) or direct action (cooling), by internal setting (SL9)				
	Setting range	Same as input range chart				
	Proportional band	0 ~ 100 % of FS				
	Integral time	0 ~ 3,600 sec				
	Derivative time	0 ~ 3,600 sec				
	ARW(Anti Reset Wind-up)	Auto(A=0), 0 ~ 100 % of FS				
	ON/OFF control	Setting Proportional band to "0" turns ON/OFF control				
	During ON/OFF control hysteresis	0~10 % of FS				
	Control loop break alarm (LBA)	1 ~ 7,200 sec (Generally, 2 times the integral time)				
	Proportional period	1 ~ 100 sec.				
	Decimal point position	1 ~ 4 (“2” When setting 000.0)				
	Retransmission output	4-20 mA d.c. (Measured value)				
	Alarm type	High alarm(ALH), low alarm(ALL), high/low within range alarm (deviation setting, absolute setting)				
	Alarm setting range	0 ~ 100 % of FS				
	High alarm (ALH) hysteresis set	0 ~ 10 % of FS				
Output	Relay output	Contact capacity : 1c, 250 V a.c. 5 A (resisitive load)				
	Voltage output (SSR)	Approx. min. 12 V d.c. (load resistance min. 600 Ω)				
	Current	4 - 20 mA d.c. (load resistance max. 600 Ω). Accuracy: ±0.2 mA				
	Temperature alarm (Relay)	● DX4Alarm output (ALM): high, low alarm, LBA common, 1 a X 1 contact				
	LBA (Relay)	● High alarm (ALH) : 1 C X 1 contact (but DX7: 1 a X 1 contact) ● Low alarm (ALL) : 1 a X 1 contact 250 V a.c. 5A (resisitive load)				
	Current output	4 - 20 mA d.c. (load resistance max. 600 Ω), accuracy: ±0.2 mA.				
Power voltage		100-240 V a.c. 50/60 Hz, 24 V d.c. (Selection by Suffix code)				
Voltage fluctuation rate		±10 % of power voltage				
Power consumption		12 VA (100-240 V a.c., 24 V a.c.), 4.5 W (24 V d.c.)				
Ambient temperature & humidity		0 ~ 50 ℃, 35 ~ 85 % RH (Without condensation)				
Storage temperature		-25 ~ 65 ℃				
Vibration resistance		10-55 Hz, 0.76 mm, X, Y, Z each direction 2 hours				
Shock resistance		300 m/s² 6 directions each 3 times				
Weight (g)		472	342	344	340	342

Suffix code

Model	Code	Content
DX	□-□□□□□□□	Digital Temperature Controller
Appearance	2	48(W) x 96(H) ㎜
	3	96(W) x 48(H) ㎜
	4	48(W) x 48(H) ㎜
	7	72(W) x 72(H) ㎜
	9	96(W) x 96(H) ㎜
Input	K	K thermocouple
	J	J thermocouple
	R	R thermocouple
	P	RTD (Pt 100 Ω)
	V	1-5 V d.c.
	C	4-20 ㎃ d.c.
	F	0-10 V d.c.
Control output	M	Relay contact output
	C	Current output (4-20 ㎃ d.c.)
	S	SSR (Voltage pulse output, 12 V d.c.)
Alarm output	S	Alarm output 1 contact (Model : DX4)
	W	Alarm output 2 contacts (all models except DX4)
Option	A	Retransmission output (4-20㎃ d.c. measured value)
	N	None (DX4, DX7 No retransmission output)
Control operation ※ Selection by SL9 (initial value: R)	R	Reverse action (heating control)
	D	Direct action (except cooling)
Power voltage	•	No display (100-240 V a.c.)
	C	24 V a.c. 50/60 Hz or 24 V d.c.

Range and input code chart

Classification	Code	Input	Range (℃)		Accuracy
			1℃▤(SL2 : X1XX)	0.1℃▤(SL2 : X0XX)	
Thermocouple (TC)	0001	K	-50 ~ 1,300	-50.0 ~ 999.9	±0.5 % of FS
	0101	J	-50 ~ 600	-50.0 ~ 600.0	
	0100	R	0 ~ 1700	0.0 ~ 999.9	
RTD	0011	Pt100 Ω	-199 ~ 640	-199.0 ~ 640.0	
Voltage/Current	0000	1-5 V d.c.	-1999 ~ 9999	Decimal point by SL4	1 % of FS
	0000	4-20 ㎃ d.c.	-1999 ~ 9999		
	1111	0-10 V d.c.	-1999 ~ 9999		

KX series

Specifications

Model		KX9N	KX2N	KX7N	KX3N	KX4N	KX4S
외형							
W×H×D(㎜)		96.0×96.0×100.0	48.0×96.0×100.0	72.0×72.0×100.0	96.0×48.0×100.0	48.0×48.0×100.0	48.0×48.0×87.0
Input	Thermocouple input	K, J, E, T, R, B, S, L, N, U, W, PL2					
	RTD input	Pt 100 Ω, KPt 100 Ω					
	DC voltage input	1-5 V d.c. (4-20 ㎃ d.c.), 0-10 V d.c.					
	Input display resolution	Basically, below the range decimal point					
	Input sampling cycle	250 ㎳					
	Allowable signal source resistance	Max. 250 Ω (Thermocouple input), max. 2 ㎏ (DC voltage input)					
	Lead wire allowable resistance	RTD : max. 10 Ω/1 wire. The resistance between 3 lines should be same					
	Allowable input voltage	±20 V d.c. for 1 min					
	Scaling	0.0 % ~ 100.0 % of FS					
	Reference contact compensation error	±3.5 ℃ (0 ~ 50 ℃ range)					
	Input disconnection function	Up-scale and output OFF when input is disconnected					
Performance	Display accuracy	± 0.5 % of FS (but, 0 ~ 400 ℃ range of B thermocouple is out of guarantee range). Refer to "range and input code chart"					
	Insulation Resistance	Min. 20 ㎫, 500 V d.c., for 1 min (between 1st and 2nd terminal)					
	Dielectric strength	2300 V a.c. 50/60 ㎐ for 1 min (between 1st and 2nd terminal)					
Control functions and output	Setting range	Refer to "Range and input code chart"					
	Control type	PID control, ON/OFF control					
	Proportional band (P)	Within input range					
	Integral time	0 ~ 3600 sec.					
	Derivative time	0 ~ 3600 sec.					
	ARW (Anti Reset Wind-up)	Within input range					
	Control loop break alarm (LBA)	0 ~ 7200 sec.					
	Proportional period	0 ~ 100 sec.					
	Control output hysteresis	0 ~ 10 % of FS					
	ON/OFF control	Set the Proportional band to "0" (0.0)					
	Alarm type	Absolute alarm, deviation alarm (high alarm, low alarm, within range alarm)					
	Range over display	When exceed max. range "0000", when exceed min range "UUUU" flashing					
	Decimal point function	Decimal point position selection by parameter during DC voltage input					
	Decimal point position selection	Decimal point selection during current input and DC voltage (0~3 position)					
	Input correction value setting	-100.0 ~ 100.0 of FS					
	High or low alarm hysteresis	0 ~ 10 % of FS					
	High / Low range Limit	Within input range					
	Output operation	Direct / reverse action selectable by setting					
	Scale setting	-199 ~ 9999 (High and low scale setting during DC voltage input)					
Control output	Relay output	● NO : 5 A 250 V a.c., 5 A 30 V d.c. (Resisitive load) ● NC : 3 A 250 V a.c., 1 A 30 V d.c. (Resisitive load)					
	Voltage output (SSR)	Min. 12 V d.c., pulse voltage (load resistance min. 600 Ω)					
	Current output (SCR)	4-20 ㎃ d.c. (Load resistance min. 600 Ω), Accuracy : ±0.2 ㎃					
Alarm output	Relay output	250 V a.c. 3 A (load resistance) ※ refer to connection diagram(contact), but KX4N: 1A contact, 250 V a.c. 1 A (load resistance)					
Retransm. output	Current output	4-20 ㎃ d.c. (Load resistance max. 600 Ω), Accuracy: ±0.2 ㎃					
Power voltage		100-240 V a.c. 50/60 ㎐, 24 V d.c. (KX4S 제외)					
Voltage fluctuation rate		±10 % of power voltage					
Power consumption		11 VA max.				7 VA max.	
Ambient temperature & humidity		0 ~ 50 ℃, 35 ~ 85 % RH (Without condensation)					
Weight (packed)		400	320	300	320	180	

Suffix code

Model	Code					Content	
KX	□-	□	□	□	□	Digital Temperature Controller (Multi Input)	
Dimensions	2N					48(W) X 96(H) ㎜	
	3N					96(W) X 48(H) ㎜	
	4N					48(W) X 48(H) ㎜	
	7N					72(W) X 72(H) ㎜	
	9N					96(W) X 96(H) ㎜	
	4S					48(W) X 48(H) ㎜	For 11 pin sockets (2-stage step function by external contact)
Control output		M				Relay	
		S				SSR (Voltage pulse 12 V d.c.)	
		C				SCR (Current 4-20㎃ d.c.)	
Alarm output			C			※ KX4N, KX4S only	ALH, ALL, LBA (1a common output)
			E			※ KX4S Not selectable	
						KX2N, KX3N, KX9N	ALH(1c),ALL(1a)
						KX7N, KX4N (Optional)	ALH(1a),ALL(1a)
			K			※ KX4N, KX4S Not selectable	
						KX2N, KX3N, KX9N (Optional)	ALH(1c),ALL(1a),LBA(1a)
						KX7N (Optional)	ALH(1a),ALL(1a),LBA(1a)
Retransmission output (optional)				A		※ Selectable only in the following models KX4N-□C KX2N-□E, KX3N-□E, KX9N-□E KX2N-□K, KX3N-□K, KX9N-□K	Retransmission output (RET) 4-20 ㎃ d.c.
				N		None	
Power voltage					A	100-240 V a.c. 50/60 ㎐	
					D	24 V d.c. (But KX4S excluded)	

* When using 4 - 20 ㎃ input, please attach 250 Ω 0.1% resistor to 1 - 5 V d.c input terminal

Range and Input Type

Classification	Code(SL1)	Input type		Range (℃)	
				1 ℃ (SL2 : X1XX)	0.1 ℃ (SL2 : X0XX)
Thermocouple(TC)	0001	K		- 50 ~ 1300	- 50.0 ~ 999.9
	0101	J	∗2	- 50 ~ 600	- 50.0 ~ 600.0
	1100	E		- 199 ~ 999	- 199.9 ~ 999.9
	1101	T		- 50 ~ 400	- 50 ~ 400.0
	0100	R		0 ~ 1700	0.0 ~ 999.9
	0110	B	∗1	0 ~ 1800	0.0 ~ 999.9
	0111	S		0 ~ 1700	0.0 ~ 999.9
	1000	L	∗2	- 199 ~ 900	- 199.9 ~ 900.0
	1001	N	∗2	- 199 ~ 1300	- 199.9 ~ 999.9
	1010	U		- 199 ~ 400	- 199.9 ~ 400.0
	1011	W(Re5-Re25)		0 ~ 2300	0.0 ~ 999.9
	1110	PL2		0 ~ 1300	0.0 ~ 999.9
RTD	0010	KPt100 Ω(Old type)		- 199 ~ 500	- 199.9 ~ 500.0
	0011	Pt100 Ω(IEC)		- 199 ~ 640	- 199.9 ~ 640.0
DC Voltage(V d.c.)	0000	1-5 V d.c.	∗3	- 199 ~ 9999	Select Decimal Points by SL4
	1111	0-10 V d.c.	∗3		

※ K, J, E, T, R, B, S, N : IEC 584. L, U : DIN 43710, W(Re5-Re25) : Hoskins Mfg.Co.USA. Pt100 Ω : IEC 751, KS C1603. (Kpt100 Ω : Rt =139.16 Ω
※ Rt : Resistance value at 100℃).
※ 4 - 20 ㎃ When using a current input, attach 250 Ω 0.1% shunt resistance to both ends of the input terminals in 1-5 V d.c. input mode.
※ Degree : ± 0.5 % of FS
∗1) The 0 to 400℃ range is outside the warranty range
∗2) ±1% of FS in the range below 0℃
∗3) ± 1 % of FS

TD510 CE

Specifications

Model			TD510
Appearance			
W×H×D (㎜)			145.0×145.0×33.5
Power voltage			100-240 V a.c. 50/60 ㎐ (Voltage fluctuation rate: ±10 % of power voltage) 30 V A max
Dielectric strength			● Between 1st and 2nd terminals: Min. 1500 V a.c for 1 min ● between 1st and FG terminals: Min. 1500 V a.c for 1 min ● Between 2nd and FG terminals: Min. 1500 V a.c for 1 min
Input type			● 2 types of RTD (Pt-100, KPt-100) ±0.1 % of FS ±1 Digit ● 11 types of thermocouple (K, J, E, T, R, B, S, L, N, U, Wire 5 - 26) ±0.15 % of FS ±1 Digit ● 4 types of DC voltage (-10 - 20 ㎷, 0 - 100 ㎷, 1 - 5 V, 0 - 30 V) ±0.1 % of FS ±1 Digit
Sampling cycle			250 ㎳
Contact output (DO)	Up to 32 relay contacts	A contact	30 V d.c. 3 A max, 250 V a.c. 3 A
		B contact	NO : 30 V d.c. 5 A max, 250 V a.c. 5 A
Control output	SSR output		ON : 18 V d.c. Pulse voltage (Load resistance min. 800 Ω)
	SCR output		4-20 ㎃ d.c. (Load resistance max. 600 Ω)
Retransmission output	Current output		4-20 ㎃ d.c.
	Load resistance		Load resistance max. 600 Ω
	Output type		Present value PV), Set value (SV), output volume (MV), Random selection
	Refresh interval		250 ㎳
Functions	Input type	Input calibration (sensor bias)	Temperature 2 contacts : EUS(0 ~ 100 %)
		Scaling	DC voltage (VDC): Input scaling according to conversion range
		Input filter(LPF)	0 ~ 120 sec
	Control mode	Operation type	Constant-value / Program control
	Control output	Temperature control output	SSR or SCR (4 - 20 ㎃ d.c.) output selection
	Control operation	Pattern	100 patterns (1 pattern / 100 segments)
		Segment	2,000 segments
		PID group	4 groups
		Auto-tuning	Auto-tuning according to target set value
		Proportional band	0.00 ~ 100.00 % (ON / OFF control for 0.00%)
		Integral time	0 ~ 3,000 seconds (OFF state if 0 second is set)
		Derivative time	
		ON/OFF control	Set proportional band (PB) to 0
		Direct/reverse action	Depending on the direct/reverse action selection of the control output
		Hysteresis	EUS (0 ~ 100 %)
	Retransmission output	Temperature (Ch.1 and 2)	4 - 20 ㎃ d.c. Present value PV), Set value (SV), output volume (MV)
		Scaling	Auto scaling for defined upper/lower, limit range (4 - 20 mA d.c.)
	Alarm setting	Setting alarm	System alarm: 8 contacts. Assign 4 of 8 pattern alarms to a pattern
		Alarm type	High/Low absolute, High/Low deviation, Within/Out of range (alarm direction, hold)
		Absolute alarm setting range	EU (0 ~ 100 %)
		Deviation alarm setting range	EUS (-100 ~ 100 %)
		Hysteresis	EUS (0 ~ 100 %)
Display			TFT Color LCD (115.2 × 86.4 ㎜)
Resolution			640 × 480 pixel
Back light			LED Back light
Back light life			Approx. 40,000 h
Touch type			Resistive type (4 Wires)
Language			Korean/English/Chinese (Simplified)
Saving functions	Internal memory		Non-volatile memory : 80 MB
	External memory		SD Card (8 GB)
	Saving interval		1 ~ 360 sec
Memory information			Program information, set value save, recovery, temperature set / process / output value
Ambient temperature & humidity			0 ~ 50 ℃, 20 ~ 90 % RH (Without condensation)
Weight (g)			1,320

Suffix code

Model	Code				Content
TD51	□-	□	□	□	Programmable Temperature Controller
Channels	0				2 Channel
	1				1 Channel
Display part		1			5.7" TFT-LCD
		N			None
Input/output			1		8 input contacts · 6 output contacts (1 module)
			2		8 input contacts · 14 output contacts (2 modules)
			3		16 input contacts · 16 output contacts (3 modules)
			N		No input/output
Language				S	Korean, English and Chinese (simplified)
				T	Korean, English and Chinese (traditional)

※ This product consists of display part / power module / control module / input module / output module (digital input (DI) with up to 32 contacts, digital output (DO) with up to 32 contacts).

Components

Product	Model	Content
Display part	TD51□-1N□	Display part (5.7" TFT LCD)
Control module	TD510-MAIN	Temperature 2-channel control module
	TD511-MAIN	Temperature 1-channel control module
Power module	TM-PWR	Power module
Input module	TM-DI	Module with 16 input contacts
Output module	TM-DO	Module with 8 output contacts
Input/output module	TM-DIO	Module with 8 input and 6 output contacts

TD300 CE

Specifications

Model		TD300
Appearance		
W×H×D (㎜)		96.0×96.0×100.0
Power voltage		100-240Va.c. 50/60 ㎐ Max. 10 W (voltage fluctuation rate: ±10 % of power voltage)
Screen		3.5" TFT-LCD and touch panel interface
Program		Up to 100 patterns, individual pattern operation possible for each channel / Up to 2,400 segments (up to 100 segments per pattern
Input (2 channels)	Pt100 (IEC751)	-200.0 ~ 640.0 ℃, ± 0.1 % of FS
	TC_K	-200.0 ~ 1,370.0 ℃, ± 0.1 % of FS
	TC_J	-200.0 ~ 1,200.0 ℃, ± 0.1 % of FS
	TC_E	-200.0 ~ 1,000.0 ℃, ± 0.1 % of FS
	TC_T	-200.0 ~ 400.0 ℃, ± 0.1 % of FS
	TC_R	0 ~ 1,700.0 ℃, ± 0.1 % of FS
	TC_S	0 ~ 1,700.0 ℃, ± 0.1 % of FS
	mV	0 - 100 ㎷ or -10 - 20 ㎷ (-999.9 ~ 9999.9), ± 0.1 % of FS
	VDC	0 - 10 V (The signal range can be set, -999.9 ~ 9999.9), ± 0.1 % of FS
	4 - 20 ㎃	4 - 20 ㎃ : 250 Ω using the external resistor, V d.c. 1 ~ 5 V using after setting
Sampling cycle		500 ㎳
Output	Control output	2 contacts for each channel (heating/cooling)
	Voltage pulse output (SSR)	24 V d.c. Pulse (Load resistance min. 600 Ω), minimum pulse width : 10 ㎳
	Current output (SCR)	4-20 ㎃ d.c. (Load resistance max. 600 Ω)
	Relay output	NO → 250 V a.c. 5 A / 30 V d.c. 5 A
Communication	Protocol	PCLINK, Modbus-ASCII
	Specifications	● RS232C : 9600 ~ 38400 bps max. 10 m ● RS422/485 : 9600 ~ 38400 bps max. 1.2 ㎞ 256 Mode
Ambient temperature & humidity		0 ~ 50 ℃, 20 ~ 90 % RH (Without condensation)
Weight(g)		850

Suffix code

Model	Code			Content
TD300	□	□		2-Channel Programmable Temperature Controller
Communication	1			RS485/422
	2			RS232C
Language			1	Korean/English (standard type)
			2	English/Chinese (simplified)

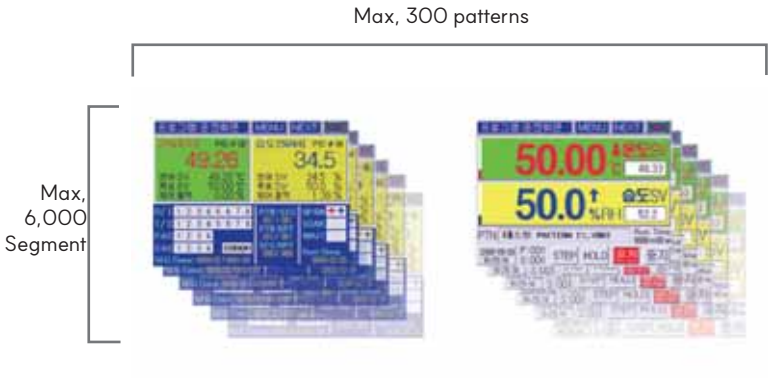
TH500A NEW

High visibility / Precise touch

TFT LCD 5.6" Color LCD screen with touch panel

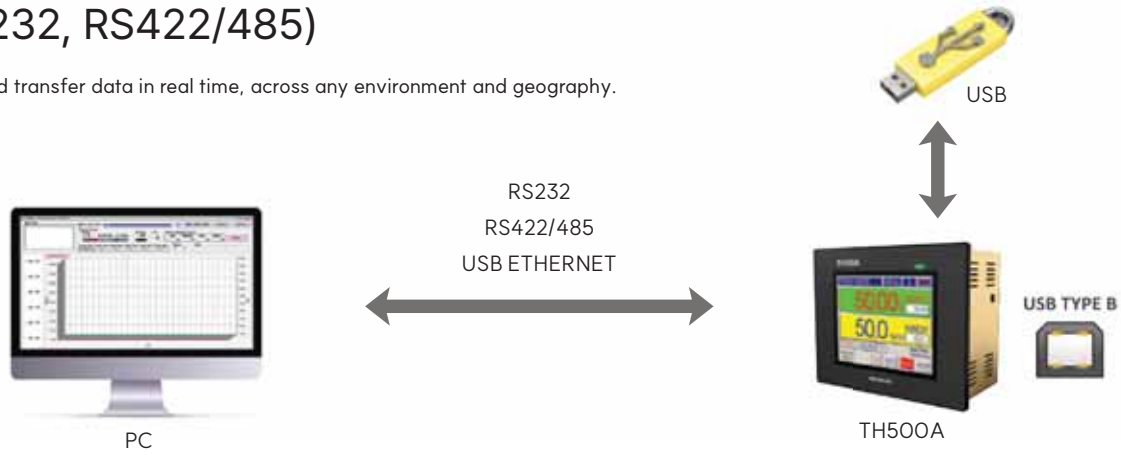
Using massive patterns/segments

The TH500A is a programmable thermostat that can store and use up to 300 patterns and up to 6,000 segments of temperature and humidity.



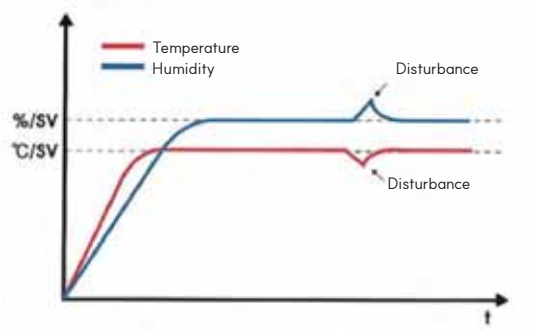
Various data communications (RS232, RS422/485)

Store and transfer data in real time, across any environment and geography.



High-precision control

Temperature 0.01℃ with 24 bit ADC
Relative humidity 0.1 R.H display resolution for precise control



Temperature/Humidity Independent PID Control

For precise temperature and humidity control
16 zones of temperature and 16 zones of humidity with independent PID groups.

Specifications

Input

Model		TH500A
Input	R.T.D	Resistance Temperature Detector (Pt100 Ω IEC751)
	VDC	0 - 5 V d.c. ※ In case of using Digital Temperature Sensor (Ex : EE99) please connect resistance 250 Ω in parallel on the exterior
	Sampling cycle	125 ms
Measurable range	Temperature	-100.0 ~ 200.0 °C
	Humidity	0.0 ~ 100.0 % R.H
Accuracy	Temperature	± 0.1 % of F.S
	Humidity	± 2 % of F.S
Contact Input (D/I)		8points (1a 8points, 2 COM)

Output

Model		TH500A
Control Output	S.S.R	ON : 24 V d.c., OFF : 0.1 V d.c. Less than Pulse voltage (More than load resistance 800 Ω)
		Cycle time : 1 rv 1000 sec
	Current Output(S.C.R)	4 - 20 mA d.c. (1 V - 5 V) (Load resistance Less than 600 Ω)
Retransmission Output	Temperature	4 - 20 mA d.c. (Load resistance Less than 600 Ω) PV /MV / SV (Internal selection)
	Humidity	
	Resolution	Around 8,000 (4 - 20 mA)
	Renewal Time	500 ms
Digital output (D.O)	Relay	12 points (1c 4 points, 1a 8 points)
		N.O : 30 V d.c, 5 A, 250 V a.c : 5 A N.C : 30 V d.c, 1 A, 250 V a.c : 2 A
	Transistor	8 points (2 COM)
		24 V d.c 300 mA Max. (Open collector)

Operation Environment

Model	TH500A
Usable surrounding temperature	0 ~ 50 °C
Usable surrounding humidity	20 ~ 90 % RH (No condensation)
Storage Temperature	-25 °C ~ 70 °C
Vibration	10-55 Hz, amplitude : 0.75 mm, 3 directions 4 times, 5 min/cycle
Shock	147 m/s², 3 directions 3 times
Dimension	183 (W) x 144 (H) x 94 (D)
Approval	CE KC
Weight	Approx. 2.35 Kg(Including packing materials)

Screen Specifications

Model	TH500A
Standard	TFT LCD 5.6″
Resolution	640 x RGB x 480
Life span of back light	LED Back light(Approx. 40,000 hrs)
Touch type	Resistive Operation (4 Wires)
Language	• Korean / English

Power supply

Model	TH500A
Power supply voltage	100 - 240 V a.c. Change rate of voltage ±10 %
Frequency	50 - 60 Hz
Power consumption	20 VA max
Insulation Resistance	More than 500 V d.c 20MΩ Power supply terminal - exterior case, Input terminal - exterior case
Dielectric Strength	2500 V a.c. 50-60 Hz : Power supply terminal - exterior case(F/G : Frame Ground), Input terminal - exterior case (F/G : Frame Ground), Input terminal - Input termina
External power supply	24 V d.c. 18 W max. (I/O board)

Communication

Model		TH500A
Applicable standard		EIA-RS232C, RS485/422, USB V2.0
Max connection	RS232C	1 : 1
	RS485/422	max 32 devices (master included) ※address : 1 ~ 999
Communication type	RS232C	Full duple
	RS485/422	2 wire type, 4 wire type : Half-duplex
Synchronizing system	RS232,485/422	asynchronous type
Communication distance	USB V1.1	approx. within 1 m
	RS232C	approx. within 10 m
	RS485/422	approx. within 1.2 km
Communication speed	USB V1.1	approx. 1 M bps
	RS232,485/422	9,600 / 19,200 / 38,400 / 57,600 / 115,200 bps
Data length	RS232,485/422	7/8 bits
Parity bit	RS232,485/422	NONE / EVEN / ODD
Stop bit	RS232,485/422	1/2 bit(s)
Protocol	USB V1.1	Bulk Mode
	RS232,485/422	PCLINK / PCLINK + CRC/MODBUS-RTU
Response delay tim	RS232,485/422	0 - 999 ms

Functions

Model		TH500A
Input	Bias(Deviation)	Temperature : -100.00 ~ 100.00 °C Humidity : -100.0 ~ 100.0 % R.H
	Dry· Wet sensor Bias	After removing gauze from wet sensor, correct the difference between dry and wet sensor
	Scaling	V d.c : Input scale in accordance with conversion range
	LPF	2 ~ 180 (sec)
	Detection of sensor disconnection	Up scale(In case of R.T.D input), Stop operation when it is over ±5 % of its range
Control mode	Operation method selection	Fix Control / Program Control
Control output	Temperature	SSR / SCR (4 - 20 mA d.c.)
	Humidity	SSR / SCR (4 - 20 mA d.c.)
Control Action	Pattern	100 patterns (1patterns / 100 segments)
	Segment	6,000 max segments
	P.I.D group	16 Groups (Temp 4 zones x Humidity 4 zones)
	Auto Tuning	Auto Tuning according to SV(Setting Value)
	Proportional Band	0.00 ~ 100.00 % 0.00 % = ON/OFF control
	Integral Time	0.0 ~ 6,000sec (0sec = OFF)
	Derivative Time	0.0 ~ 6,000sec (0sec = OFF)
	ON/OFF control	Set the Proportional Band as 0.0
	Direct/Reverse action	Select Direct or Reverse action in control output.
	ON/OFF Hysteresis	0.1 ~ 300 °C (In case of humidity, it is a web bulb temperature or converted value)
Retransmission Output	Temperature•Humidity	4 - 20 mA d.c, Select among PV,SV and MV(Manipulated Value)
	Scaling	Perform scaling of the High· Low deviation range 4 - 20 mA d.c automatically
Alarm Setting	System Alarm	System Alarm : 4 points Alarm per pattern : 4 points
	Aarm type	Including HighoLow /Low deviation alarm etc. 20 types of alarm are available.
	Process Alarm	Temperature : -100.0 ~ 200.0 °C
		Humidity : 0.0 ~ 100.0 % RH
	Deviation Alarm	Temperature : -300.0 ~ 300.0 °C
		Humidity : 0.0 ~ 100.0 % RH
	Hysteresis	Temperature : 0.0 ~ 300.0 °C
		Humidity : 0.0 ~ 100.0 % RH
Storage against Power failure	Memory	Internal Flash Memory and FRAM
	Memory function	Program Information and SV(Setting Value) backup and restoration. Storage of Temperature-Humidity setting value and PV

Suffix code

Model	Code			Content	
TH500A	□	□	□	Programmable temperature & humidity controller / 183(W)X144(H)x103(D)	
Type	1			Standard Type	※ No Input / Output boards ● Temperature & Humidity retransmission output ● Temperature & Humidity control output(SSR/SCR) ● Temperature & Humidity signal input ▪ Digital Input(D.I) : 8 points ● Digital Output(D.O) : Relay 12 points, open collector : 8 points ● Communication : RS232,RS485/422,USB
	2			Additional Type	※ Separate I/O Board from standard body ● Temperature & Humidity retransmission output ● Temperature & Humidity signal input ● Communication : RS232,RS485/422, USB
	N			No standard body (In case of purchasing separate I/O Board)	
Separate Input·Output Board (Additional Type Option)		1		● Input· Output board-1 (Relay output 12 points) ● Temperature & Humidity control output(SSR/SCR) ● DI : 8points ● DO : 12points relay output ● SMPS : 24V d.c 18 W	
		2		Output board-2 (Open collector 8 points external terminal board)	
		3		Output board-3 (Relay output 8 points output board)	
		4		Input·Output board-1 + Output board-2	
		5		Input·Output board-1 + Output board-3	
		N		No output board (In case of selecting standard body)	
Language			N	Korean / English (Standard)	

※ Example of Suffix Code (Standard type : TH500A-1NN / Additional type : TH500A-2NN)

Selection guide

● Integrated

Model	Separable board	Language	Model name
Standard type [1]	No output boards [N]	Korean / English (Standard) [N]	TH500AA-1NN

● Separable

Model	Separable board	Language	Model name
Additional type [2]	Input· Output board-1 (Relay output 12 points), Temperature & Humidity control output(SSR/SCR) DI : 8point, DO : 12point relat output, SMPS : 24 V d.c. 18 W [1]	Korean / English (Standard) [N]	TH500A-21N
	Output board-2 (Open collector 8 points external terminal board) [2]	Korean / English (Standard) [N]	TH500A-22N
	Output board-3 (Relay output 8 points output board) [3]	Korean / English (Standard) [N]	TH500A-23N
	Input·Output board-1 + Output board-2 [4]	Korean / English (Standard) [N]	TH500A-24N
	Input·Output board-1 + Output board-3 [5]	Korean / English (Standard) [N]	TH500A-25N
	No output board (In case of selecting standard body) [N]	Korean / English (Standard) [N]	TH500A-2NN

● No standard body

Model	Separable Board	Language	Model name
No standard body [N]	Input· Output board-1 (Relay output 12 points), Temperature & Humidity control output(SSR/SCR) DI : 8point, DO : 12point relat output, SMPS : 24 V d.c. 18 W [1]	Korean / English (Standard) [N]	TH500A-N1N
	Output board-2 (Open collector 8 points external terminal board) [2]	Korean / English (Standard) [N]	TH500A-N2N
	Output board-3 (Relay output 8 points output board) [3]	Korean / English (Standard) [N]	TH500A-N3N
	Input·Output board-1 + Output board-2 [4]	Korean / English (Standard) [N]	TH500A-N4N
	Input·Output board-1 + Output board-3 [5]	Korean / English (Standard) [N]	TH500A-N5N
	No Output Board (In case of selecting standard body) [N]	Korean / English (Standard) [N]	TH500A-NNN

TH510 CE

Specifications

Model				TH510
Appearance				
W×H×D (㎜)				145.0×145.0×33.5
Power voltage				100-240 V a.c. Voltage fluctuation rate ±10 %
Power frequency				50/60 ㎐
Power consumption				30 V A max
Dielectric strength				● Between 1st and 2nd terminals: Min. 1500 V a.c. for 1 min ● Between 1st and FG terminals: Min. 1500 V a.c. for 1 min ● Between 2nd and FG terminals: Min. 1500 V a.c. for 1 min
Input type				● 2 types of RTD (Pt-100, KPt-100) ±0.1 % of FS ±1 Digit ● 2 types of DC voltage (1 - 5 V, 0 - 30 V) ±0.1 % of FS ±1 Digit
Sampling cycle				250 ㎳
Contact outputs(DO)		Relay contact max. 32 contacts	A contact	30 V d.c. 3 A max, 250 V a.c. 3 A
			B contact	NO : 30 V d.c. 5 A max, 250 V a.c. 5 A
Control output		SSR output		ON : 18 V d.c. pulse voltage (load resistance min. 800 Ω)
		SCR output		4-20 ㎃ d.c. (Load resistance max. 600 Ω)
Retransmission output		Current output		4-20 ㎃ d.c.
		Load resistance		Load resistance max. 600 Ω
		Output type		Present value (PV), Set value (SV), output volume (MV), Random selection
		Refresh interval		250 ㎳
Functions	Input type	Input calibration (sensor bias)		Temperature 1 contact: EUS (0 ~ 100%) Humidity 1 contact: EUS (0 ~ 100%)
		Dry/wet bulb sensor compensation		Compensate the difference between the wet and dry bulb sensor after removing the wet bulb sensor gauze.
		Scaling		DC voltage (VDC): Input scaling according to conversion range
		Input filter (LPF)		0 ~ 120 sec
	Control mode	Operation type		Constant-value / Program control
	Control output	Temperature control output		Output (SSR) or current output (4 - 20 ㎃ d.c.) selection
		Humidity control output		
	Control operation	Pattern		100 patterns (1 pattern / 100 segments)
		Segment		2000 Segment
		PID group		16 groups (temperature 4 zones X humidity 4 zones)
		Auto-tuning		Auto-tuning according to target set value
		Proportional band		0.00 ~ 100.00 % (for 0.00 %, ON/OFF control)
		Integral time		0.0 ~ 3000 sec. (OFF status when 0 sec is set)
		Derivative time		
		ON/OFF control		Set 0.0 to proportional band (PB)
	Re-transmission output	Temperature, Humidity		Current output (4 - 20 ㎃ d.c.) Present value PV), Set value (SV), output volume (MV) selection
		Scaling		Automatic scaling of set high and low range (4 - 20 ㎃ d.c.)
	Alarm setting	Setting alarm		System alarm: 8 contacts Assign 4 of 8 pattern alarms to a pattern
		Alarm type		High/Low absolute, High/Low deviation, Within/Out of range (alarm direction,hold)
		Absolute alarm setting range		EU (0 ~ 100 %)
Display				TFT color LCD (115.2 × 86.4 ㎜)
Resolution				640 × 480 pixel
Back light				LED back light
Back light life				Approx. 40,000 h
Touch type				Resistive type (4 Wires)
Language				Korean/English/Chinese (simplified)
Saving functions		Internal memory		Non-volatile memory : 80 MB
		External memory		SD card (8 GB)
		Saving interval		1 ~ 360 sec
Memory information				Program information, set value, recovery, temperature set / process / output value
Ambient temperature & humidity				0 ~ 50 ℃, 20 ~ 90 % RH (without condensation)
Weight (g)				1,320

Suffix code

Model	Code							Content
TH	□	1	0	-	□	□	□	Programmable Temperature & Humidity Controller
Display part	5							5.7" TFT-LCD
Input/output					1			8 input contacts.6 output contacts (1 module)
					2			8 input contacts.14 output contacts (2 module)
					3			16 input contacts.16 output contacts (3 modules)
Language						S		Korean, English and Chinese (simplified)
						T		Korean, English and Chinese (traditional)
Communication								RS485
							E	RS485, Ethernet

※ Basic components (power module, Control module)
※ This product consists of power module/control module/Input module/output module 32 contacts, (digital input (DI) with up to 32 contacts, digital output (DO) with up to 32 contacts).

Components

Product	Model	Content
Display part	TH510-1N□	Display part (5.7" TFT LCD)
Control module	TH510-MAIN	Temperature & Humidity Control Module
Power module	TM-PWR	Power module
Input module	TM-DI	Module with 16 input contacts
Output module	TM-DO	Module with 8 output contacts
Input/output module	TM-DIO	Module with 8 input and 6 output contacts

TH300 CE KC

Specifications

Model		TH300
Appearance		
W×H×D (㎜)		96.0×96.0×100.0
Program		100 Pattern (100 segments / 1 pattern) max. 2000 segments
Screen		TFT LCD 70.08 × 52.56 ㎜ (3.5″)
Functions		Contact input (DI): 4 contacts, Contact output (DO): max. 12 contacts, RS232/485
Power voltage		100-240 V a.c. 50/60 ㎐ (voltage fluctuation rate: ±10 %)
Display accuracy		●Temperature (℃) : ±0.2 % of FS ●Humidity (%RH) : ±2 % of FS
Sampling cycle		500 ㎳
Input type		Pt100 Ω or 0-5 V d.c.
Output	Control output (OUT)	● ON : 24 V d.c. pulse voltage ● OFF : 0.1 V d.c. max. ● Pulse voltage (load resistance min. 800 Ω) ● Cycle time: 1 ~ 1000 sec
	Retransmission output (RET)	● Temperature / humidity : 4 - 20 ㎃ d.c. (load resistance max. 600 Ω) present value (PV), output volume (MV), set value (SV) ※by internal selection ● Resolution: approx. 7,000 ● Refresh interval : 500 ㎳
	Contact output (DO)	● Relay : 8 contacts (1a X 8 contacts), N.O : 30 V d.c. 5 A, 240 V a.c. 5 A ● Transistor: 4 contacts (open collector output). 24 V d.c. 300 ㎃ max
Control type		PID auto-tuning
Ambient temperature & humidity		0 ~ 50 ℃, 20 ~ 90 % RH (Without condensation)
Weight (g)		850

Suffix code

Model	Code		Content
TH300	□	□	Programmable Temperature & Humidity Controllers
Communication	1		RS232C communication
	2		RS485/422 communication
Language		1	Korean/English (standard type)
		2	English/Chinese (simplified)
		3	English/Chinese (traditional)

NP200

Specifications

Model		NP200
Appearance		
W×H×D(㎜)		96.0×96.0×100.0
Power voltage		100-240 V a.c. 50/60 ㎐ voltage fluctuation rate: : ±10 %
Power consumption		Max. 6.0 W / max. 10 VA
Input (Multi Input)	Thermocouple input	K, J, E, T, R, B, S, L, N, U, W, PLⅡ,
	RTD	Pt100 (KS/IEC 751), KPt100 (KS)
	DC voltage input	1-5 V d.c. 0 - 10 V, -10 - 20 ㎷, 0 - 100 ㎷
	DC Current input	4 - 20 ㎃ (Attach 250 Ω external resistor)
Control		● Relay output, voltage output (SSR), current output (SCR) ● Control behavior : PID control, ON/OFF control
Alarm type		High/Low, High/Low deviation
Communication method		RS485/422, 2-wire half-duplex or 4-wire half-duplex (by wiring method)
Setting		By front Shift up, Down keys
Display		PV : Digital LED, SV : Graphic LCD
Display accuracy		0.1 % of FS (Full Scale)
Setting accuracy		1 or 0.1 % (according to input range)
External control		4 alarm outputs (Run, Reset, Step, Hold)
Pattern		30 patterns, Up to 99 segments per pattern can be set
Segment		300 Segment
Set time unit of program		Hours, minutes or minutes, seconds
Sampling cycle		100 ㎳
Insulation Resistance		MIn. 500 V a.c. 20 ㏁
Dielectric strength		2300 V a.c. 50/60 ㎐ for 1 min (between 1st and 2nd terminals and between 1st terminal and ground)
Ambient temperature & humidity		0 ~ 50 ℃, 35 ~ 85 % RH (Without condensation)
Weight (g)		696

Suffix code

Model	Code		Content	
NP200	□	□	Programmable Temperature Controller (96 X 96 mm)	
Control type	0		Normal type (heating)	
	1		Heating/cooling type (synchronous control type)	
Option		0	None	※ Selection specification of DI 1 to 3 standard mounting (DI 4 to 7)
		1	RS422 / 485 (Communication function)	
		2	DI 4 contacts (DI 4~7)	
		3	RS422 / 485(Communication function), DI 4contacts	

Range and Input Type

Classification	Input		Input code	Range(℃)	Accuracy	Relative height
Thermocouple(TC)	K	*1	K1	-200.0 ~ 1370.0	±0.10 % of FS ±1digit	※ Display Range: -5% of the above range ~ +105 % *1: Below 0℃ : ±0.2 % of FS ±1digit *2 : 0 ~ 400 ℃ Range : ±5 % of FS ±2digit
	K	*1	K2	-200.0 ~ 1000.0		
	J	*1	J	-200.0 ~ 1200.0		
	E	*1	E	-200.0 ~ 1000.0		
	T	*1	T	-200.0 ~ 400.0		
	R		R	0 ~ 1700	±0.15 % of FS ±1digit	
	B	*2	B	0 ~ 1800		
	S		S	0 ~ 1700		
	L	*1	L	-200.0 ~ 900.0	±0.1 % of FS ±1digit	
	N		N	-200.0 ~ 1300.0	±0.2 % of FS ±1digit	
	U	*1	U	-200.0 ~ 400.0	±0.1 % of FS ±1digit	
	W		W	0 ~ 2300		
	Platinel Ⅱ		Platinel2	0.0 ~ 1300.0		
RTD	JPt100		JPT100	-200.0 ~ 500.0		
	Pt100		PT100	-200.0 ~ 640.0		
DC Voltage(V)	1 - 5 V		1/5 V	Scaling range SL-L ~ SL-H = -2000 ~ 14000 ※ If current input is used, attach a 250 Ω 0.1% resistance between terminals 19 and 20 to use it as a 4-20 mAd.c. input.		
	0 - 10 V		0/10 V			
DC Voltage(mV)	-10 - 20 mV		10/20 mV			
	0 - 100 mV		0/100 mV			
DC Current	4-20 mA d.c.		1/5 V※			

TS510 CE

Specifications

Model				TS510
Appearance				
W×H×D (㎜)				145.0×145.0×33.5
Power voltage				100 – 240 V a.c. Voltage fluctuation rate: ±10 % of power voltage ±10 %
Power frequency				50/60 ㎐
Power consumption				30 VA max
Dielectric strength				● Between 1st and 2nd terminals: min. 1500 V a.c. for 1 min ● Between 1st terminal and FG: min. 1500 V a.c. for 1 min ● Between 2nd terminal and FG: min. 1500 V a.c. for 1 min
Input type				● Thermocouple 11 types (K, J, E, T, R, B, S, L, N, U, Wre 5-26) ±0.15 % of FS ±1 digit ● RTD 2 types (Pt-100, KPt-100) ±0.1 % of FS ±1 Digit, ● Current voltage 4 types (-10 - 20 ㎷, 0 - 100 ㎷, 1 - 5 V, 0 - 30 V) ±0.1 % of FS ±1 Digit
Sampling cycle				250 ㎳
Contact outputs (DO)	Relay contact max. 32 contacts		A contact	30 V d.c. 3 A max, 250 V a.c. 3 A
			B contact	NO : 30 V d.c. 5 A max, 250 V a.c. 5 A
Control output	SSR output			ON : 18 V d.c. Pulse voltage (Load resistance min. 800 Ω)
	SCR output			4-20 ㎃ d.c. (Load resistance max. 600 Ω)
Retransmission output	SCR output			4-20 ㎃ d.c.
	Current output			Load resistance max. 600 Ω
	Load resistance			Laboratory PV, Laboratory SV, hot chamber PV, cold chamber PV
	Output type			250 ㎳
Functions	Input	Input correction		EUS(0 ~ 100 %)
		Input filter		0 ~ 120 sec
	Control output			Output (SSR) or current output (4 - 20 ㎃ d.c.) selection
	Control operation	Test pattern		Max. 100, test type (10 types) selection per each pattern
		PID group		Hot chamber/cold chamber each 4 groups, deviation PID
		Auto-tuning		Auto-tuning according to target set value
		Proportional band		0.00 ~ 100.00 % (for 0.00 %, ON/OFF control)
		Integral time/ Derivative time		0.0 ~ 3000 sec. (OFF status when 0 sec is set)
		ON/OFF control		Set 0.0 to proportional band (PB)
		Direct/reverse action		Depending on the direct/reverse action selection of the control output
		Direct/reverse action		ARW zone setting (50 ~ 1000 % of proportional band)
		A.T GAIN		0.0 ~ 10.0
	Alarm setting	Setting alarm		System alarm 8 contacts
		Alarm type		High/Low absolute, High/Low deviation, Within/Out of range (alarm direction, hold)
		Absolute alarm setrange		EU (0 ~ 100 %)
Display				TFT color LCD (115.2 × 86.4 ㎜)
Resolution				640 × 480 pixel
Back light				LED back light
Back light life				Approx. 40,000 h
Touch type				Resistive type (4 Wires)
Language				Korean/English/Chinese (simplified)
Saving functions	Internal memory			Non-volatile memory : 80 MB
	External memory			SD card (8 GB)
	Saving interval			1 ~ 360 sec
Memory information				Program information, set value, recovery, temperature set / process / output value
Ambient temperature & humidity				0 ~ 50 ℃, 20 ~ 90 % RH (Without condensation)
Weight(g)				Approx. 1.32 kg

Suffix code

Model	Code			Content
TS510-	□	□	□	Thermal Shock Test Controller
Display part	1			5.7" TFT-LCD
	N			None
Input/ output		1		16 input contacts · output 8 contacts (2 modules) + power module + control module
		2		16 input contacts · 16 output contacts (3 modules) + power module + control module
		3		16 input contacts · output 24 contacts (4 modules) + power module + control module
		N		No input/output
Language			S	Korean, English and Chinese (simplified)
			T	Korean, English and Chinese (traditional)

Components

Product	Model	Content
Display part	TS510-1N□	Display part (5.7" TFT LCD)
Control module	TS510-MAIN	Temperature 3-channel control module
Power module	TM-PWR	Power module
Input module	TM-DI	Module with 16 input contacts
Output module	TM-DO	Module with 8 output contacts
Input/output module	TM-DIO	Module with 8 input and 6 output contacts

※ This product basically consists of display and control parts (power, control, input, output modules). Digital input (DI) with up to 32 contacts, digital output (DO) with up to 32 contacts

ML CE

Specifications

Model		ML-D4		ML-D2H		ML-E
Appearance						
W×H×D(㎜)		30.0×100.0×96.9				
Power voltage		24 V d.c.				
Voltage fluctuation rate		±10 % of power voltage				
Power consumption		ML-D4S/C	ML-D4M	ML-D2HMS/SS	ML-D2H MM	ML-E
		Max.7W	Max.5W	Max.7W	Max.5W	Max.3W
Thermocouple		K, J, E, T, R, B, S, L, N, U, W, PL2				Each channel can be selected by INP parameter
RTD		Pt 100 Ω, KPt 100 Ω				
DC voltage		0 - 100 ㎷, 1 - 5 V, 0 - 10 V				
Sampling cycle		50 ㎳				
Input display resolution		Below minimum unit of input range				
Input impedance		Thermocouple and DC voltage input: min. 1 ㎆				
Allowable input		● Allowable input voltage : Within -2 - 5 V (thermocouple, RTD), within -5 to 12 V (DC voltage) ● Effect of allowable input resistance : approximately 0.2 uV/Ω ● Permissible input line resistance: not more than 10 Ω of side temperature resistance. However, the resistance between the three lines will be the same)				
Input correction		±100% of input range				
Reference junction compensation error		±1.5 ℃ (0 ~ 50 ℃)				
Input disconnection detection (Burn-out)		up scale				
Control Output	Relay	● 1a contact ● 250 V a.c. 3 A, 30 V d.c. 3 A				-
	Voltage output (SSR)	● Approx. 12 V min (Load resistance min. 600 Ω) with short-circuit, limit to about 25 mA ● Time resolution: bigger between control cycle 0.1 % or 10 ㎳				
	Current output (SCR)	● 4-20 ㎃ d.c. (Load resistance min. 600 Ω) ● Accuracy: ±0.1 % of FS (4 - 20 ㎃ range)				
RS232C communication		● Communication method : RS-232 standard ● Max. communication distance : 15 m ●Communication speed : 9600 bps ● Start bit : 1 bit ● Data length : 8 bit ● Parity bit : Even ● Stop bit : 1 bit ●Supported protocol : PC-Link				
RS485 communication		● Max. number of connections : 31 units ● Communication sequence : No sequence ● Response time : Reception handling time + (response time x 10 ㎳) ● Stop bit : 1, 2 bit [initial value: 1] ● Data length : 7, 8 bit [initial value: 8] ● Parity bit : None, odd, even [initial value: even] ●Start bit : 1 bit ● Max. communication distance : 1200 m ● Communication method : RS485 standard / 2-wire half-duplex ● Supported protocol : PC-Link, PC-Link with SUM, Modbus ASCII/RTU [[Initial value: PC-Link] ● Communication speed : 9600, 19200, 38400, 57600, 76800 bps [Initial value: 9600]				
Ambient temperature & humidity		0 ~ 50 ℃ / 35 ~ 85 % RH (Without condensation)				
Operating environment		No toxic gases, magnetic fields or dust generating areas				
Warming-up		At least 30 min				
Ambient temperature influence		Thermocouple, DC voltage: bigger between ±3 uV / ℃ or ±0.03 % of FS / ℃, RTD : ±0.1 ℃ / ℃ max				
Power supply change influence		Bigger between ±3 uV / 10 V or ±0.03 % of FS / 10 V				
Storage temperature & humidity		-25 ~ 65 ℃ / 5 ~ 95% RH (Without condensation)				
Weight (g)		220				

Suffix code

ML-D2H Modular Temperature Controllers

Model	Code			Content
ML-D	2	H	□	Modular Temperature Controller
Number of channels	2			2 Chanels
Input		H		Heating/cooling control (simultaneous), heater break alarm (HBA)
Control output			MM	OUT1 : Relay output / OUT2 : Relay output
			SM	OUT1 : SSR Output / OUT2 : Relay output
			SS	OUT1 : SSR Output / OUT2 : SSR Output
			CM	OUT1 : 4-20 ㎃ d.c. / OUT2 : Relay output
			CS	OUT1 : 4-20 ㎃ d.c. / OUT2 : SSR Output
			CC	OUT1 : 4-20 ㎃ d.c. / OUT2 : 4-20 ㎃ d.c.

ML-D4 Modular Temperature Controllers

Model	Code		Content
ML-D	4	□	Modular Temperature Controller
Number of channels	4		4 Chanels
Control output		M	Relay output
		S	SSR output (12 V d.c.)
		C	SCR output (4-20 ㎃ d.c.)

Ex: temperature controller 4 channel relay output : ML-D4M

ML-E Modular Event Outputs

Model	Content
ML-E	Modular Event Output Unit (8 contacts relay)

MT100

Specifications

Model		MT100
Appearance		
W×H×D(mm)		155.0×130.0×16.5
Input	Display screen	MONO LCD (128 X 64 ㎜)
	Temperature input (Multi Input)	4 contacts, thermocouple (K,J), RTD (Pt 100 Ω)
	Sampling cycle	1 Sec
	Measuring range	0 ~ 300 ℃
	Input correction	±100 % of FS
	Input impedance	Approx. 1 MΩ (thermocouple input)
	Reference contact compensation error	± 1.5 ℃ (0 ~ 50 ℃ range)
	Allowable input lead resistance	RTD (max. 10 Ω. but the resistance among 3 lines should be same)
	Input disconnection detection	UP SCALE(Reverse action), DOWN SCALE(Direct action)
	Pressure input	contact (4 - 20 ㎃ d.c. or contact input)
	Pressure sampling cycle	1sec.
	Pressure scale range	0.00 ~ 10.00 (Decimal point fixed)
	Contact input	Max. 8 contacts (ON / OFF resistance: 1 ~ 10 KΩ)
Performance	Display accuracy	Temperature: ±0.3 % of FS ±1 Digit, pressure: ±3 % of FS ±1 Digit
	Insulation Resistance	Min. 20 ㏁ (500 V d.c.) measuring terminal-power terminal
	Dielectric strength	2300 V a.c., 50/60 ㎐ for 1 min (between measuring terminal and power terminal, between power terminal and ground terminal)
Control functions and output	Digital input (DI)	8 contacts (① Option, ② Over pressure, ③ Overheating, ④ Over pump direct action, ⑤ Over pump reverse action, ⑥ Medium supplement termination, ⑦ Medium supplement start, ⑧ RUN/RESET
	Current detection input	3 phases (3 CT)
	Contact output (DO)	6 contacts (① Option, ② Temperature alarms , ③ Inhale, ④ Ramp direct action, ⑤ Ramp reverse action, ⑥ Medium supplement)
	Control output	Cooling control output (relay) 1 contact, heating control output (SSR) 1 contact
	Reverse phase detection	3-phase motor reverse rotation detection function
	Operation reservation	Reserve run time (time or weekly reservation)
	Forced cooling	When requiring sudden cooling, 100% cooling output after stopping heating output
	Preheating function	Control by preheating set value to prevent winter frost
	Abnormal history monitoring	Up to 20 errors can be memorized and displayed
	Control type	PID auto-tuning
	Proportional band	0(0.0) to the maximum value of range
	Integral time	1 ~ 3,600 sec
	Derivative time	1 ~ 3,600 sec
	ARW(Anti Reset Wind-up)	Auto, 0 ~ 100 %((Proportional band)
	ON/OFF control	Set the proportional band to "0"
	Alarm type	6 external alarms by contact input
	Communication function	RS485/422
Control output	Cooling (relay)	● Contact capacity: 1 a, 250 V a.c., 1 A, 30 V d.c. 1 A (resisitive load ● Proportional period: 1 ~ 1000 sec ●Time resolution: bigger between 0.1 % or 16.667 ㎳
	Heating (SSR)	● Voltage pulse: approx. min. 12 V d.c. (load resistance min. 600 Ω) ● Proportional period: 1 ~ 1000 sec, ● Time resolution: bigger between 0.1 % or 16.667 ㎳
	Contact output 6 contacts (DO)	1 a, 250 V a.c., 1 A. 30 V d.c. 1 A (Resisitive load)
Communication specifications		● Communication method : 2-wire half-duplex or 4-wire half-duplex ● Max. number of connections : 31 ●Communication distance : 1,200 m ● Communication sequence : No sequence ● Communication speed: 9,600 bps ● Start bit : 1 bit ● Stop bit : 1 bit ● Data length : 8 bit ● Parity bit : NONE ● Protocol : PC-Link with SUM
Power voltage		100-240 V a.c. 50/60 ㎐
Voltage fluctuation rate		±10 % of power voltage
Power consumption		8 VA
Ambient temperature & humidity		0 ~ 50 ℃, 35 ~ 85 % RH (Without condensation)
Storage temperature		-25 ~ 65 ℃
Weight (g)		850

Suffix code

Model	Code			Content
MT100	□	□	□	Multi Input Mold Temperature Controller
Communication	0			No communication
	1			RS485/422
Pressure inspection		0		No pressure inspection
		1		Pressure inspection by contact input
		2		Pressure inspection by 4 - 20 mA d.c.
Current inspection (HB)			0	HB None
			1	HB 3 contacts ※CT(CTL-6-S) sold separately

MC9 CE

Specifications

Model			MC9
Appearance			
W×H×D(㎜)			96.0×96.0×100.0
Input	Thermocouple		K, J, R, S, B, E, N, T, W, PL2, U, L
	RTD		Pt100 Ω, KPt100 Ω
	DC voltage		0-5 V, 1-5 V, 0-10 V, 4-20 ㎃ (Attach 250 Ω external resistor)
	Sampling cycle		1 sec
	Input display resolution		Basically, below the range decimal point
	Input impedance		Thermocouple and DC voltage input: min. 1 MΩ
	Allowable input resistance		Approx. 0.2 μV/Ω
	Allowable input lead resistance		RTD (Max. 10 Ω. but the resistance among 3 lines should be same)
	Allowable input voltage		Within -2 - 5 V (thermocouple,RTD), within -5 to 12 V (DC voltage)
	Scaling		0.0 % ~ 100.0 % of FS
	Input correction		±100 % of FS
	Reference contact compensation error		±1.5 ℃ (0 ~ 50 ℃ range)
	Input disconnection detection		UP SCALE(Reverse action), DOWN SCALE(Direct action)
Performance	Degree of indication	Thermocouple	Bigger between ±0.3 % of FS ±1 Digit or ±2 ℃
		RTD	Bigger between ±0.3 % of FS ±1 Digit or ±0.8 ℃
		DC voltage	±0.3 % of FS ±1 Digit
	Insulation Resistance		20 MΩ이상 (500 V d.c.), measuring terminal - power terminal
	Dielectric strength		2,300 V a.c. 50/60 ㎐, 1 min measuring terminal - power terminal
Control function and output	Control type		PID auto-tuning
	Simultaneous channel setting		4/8 channels simultaneous setting of the same value
	Control operation		a) Reverse action (heating) / direct action (cooling). by "suffix code" b) Heating/cooling simultaneous control (4 channels only)
	Setting range		Same as range and input code
	Digital input (DI)		RUN/STOP or control zone selection by contact input
	Auto-tuning		Auto-tuning by parameter selection
	Proportional band		0(0.0) to the maximum value of range
	Integral time		1 ~ 3,600 sec
	Derivative time		1 ~ 3,600 sec
	ARW(Anti Reset Wind-up)		Auto, 0 ~ 100 % (Proportional band)
	Gradient setting		0(0.0) to max. range/1 min (gradient setting for target value)
	Scan function		Displays the measured value and set value for each channel sequentially
	ON/OFF control		Set the proportional band to "0"
	Multi-memory zone		8 zone selection for each channel
	Heater break alarm (HBA)		0.0 - 100.0 A (ON/OFF control, can be used on time proportional control output)
	HBA dead band setting		0 ~ 100 sec
	Loop break alarm (LBA)		0.1 ~ 200.0 min (dead band : 0 ~ 100 sec.)
	Alarm output		Up to 3 contacts, parallel (OR) operation for all channels (by selected specifications)
	Alarm type		Selection by parameter
Control output	Relay output		● Contact capacity : 1 a, 250 V a.c. 3 A (resisitive load) ●Proportional period : 1 ~ 1000 sec ● Time resolution : Lower between 0.1 % or 10 ㎳
	Voltage output (SSR)		● Voltage pulse : approx. min. 12 V d.c. (load resistance min. 600 Ω) ● Proportional period : 1 ~ 1000 sec ● Time resolution : Lower between 0.1 % or 10 ㎳
	Current output (SCR)		● Current: 4 - 20 ㎃ d.c., 0 - 20 ㎃ (load resistance max. 600 Ω) ● Accuracy: ±1.0 % of FS (4 - 20 ㎃ range)
	Triac		200 V a.c. 0.5 A (Ambient temperature 40 ℃ max), Zero Crossing function
Alarm output (relay)	Temperature alarms (AL1,2,3)		1 a, 250 V a.c., 1 A, 30 V d.c. 1 A (resisitive load) / Output points: Max. 3 points (by selected specifications)
	Heater break alarm (HBA)		1 a 1 contact, 250 V a.c., 1 A, 30 V d.c. 1 A (resisitive load) ● Measuring current: 1 - 100 A a.c. (resolution: 0.5 A, ± 5 % of FS ± 1 Digit) ● CT for heater break detection: Model name JS81L (J&D Electronic.Co.Ltd) ● Accuracy: bigger between ±5 % of FS or ±2 A
	Loop break alarm (LBA)		1 a 1 contact, 250 V a.c., 1 A, 30 V d.c. 1 A (resisitive load) / Proportional period: 1 ~ 1000 sec
Power voltage			100-240 V a.c. 50/60 ㎐
Voltage fluctuation rate			±10 % of power voltage
Power consumption			12 VA
Ambient temperature & humidity			0 ~ 50 ℃, 35 ~ 85 % RH (Without condensation)
Storage temperature			-25 ~ 65 ℃
Vibration resistance			10 - 55 ㎐, single amplitude 0.75 ㎜, 3 axes each direction, 2 h
Shock resistance			300 ㎧², 3 axes each direction, 3 times
Weight (g)			700

Suffix code

MC9 (4 channels)

Model	Code	Content
MC9-4	□ □ □ □ □ □	4-Channel Digital Temperature Controllers
Control Type	D	For cooling control (Direct action)
	R	For heating control (Reverse action)
	W	Heating cooling simultaneous control
Input type	□	Refer to "Range and input code chart"
Heating output (output 1 ~ 4)	M	Relay contact output
	S	Output for SSR drive
	T	Output for Triac drive
	4	Current output (4-20 ㎃ d.c.)
	5	Current output (0-20 ㎃ d.c.)
Cooling output (output 5~8) * if control types are D and R then fix to N * if control type is W then select among M,S, t, 4 and 5	N	None (if control output operation is DR)
	M	Relay contact output
	S	Output for SSR drive
	T	Output for Triac drive
	4	Current output (4-20 ㎃ d.c.)
	5	Current output (0-20 ㎃ d.c.)
Option	N	None
	1	AL2, AL3
	2	AL2, AL3 + RS232 + contact input
	3	AL2, AL3 + RS485 / 422 + contact input
	4	AL2, AL3 + heater break
Power voltage	2	100-240 V a.c. 50/60 ㎐

MC9 (8 channels)

Model	Code	Content
MC9-8	□ □ □ □ □ □	8-Channel Digital Temperature Controllers
Control Type	D	For cooling control (Direct action)
	R	For heating control (Reverse action)
Input type	□	Refer to "Range and input code chart"
Heating output (output 1 ~ 4)	M	Relay contact output
	S	Output for SSR drive
	T	Output for Triac drive
	4	Current output (4-20 ㎃ d.c.)
	5	Current output (0-20 ㎃ d.c.)
Cooling output (output 5~8) * if control types are D and R then fix to N * if control type is W then select among M,S, t, 4 and 5	N	None (when selected, input channels 5 ~ 8 are for indication)
	M	Relay contact output
	S	Output for SSR drive
	T	Output for Triac drive
	4	Current output (4-20 ㎃ d.c.)
	5	Current output (0-20 ㎃ d.c.)
Option	N	None (alarm output AL1, 2, 3 built-in)
	2	RS232 + contact input
	3	RS485 / 422 + contact input
	4	heater break
Power voltage	2	100-240 V a.c. 50/60 ㎐

Range and input code chart

Classification	Code	Input type	Range (℃)	Accuracy
Thermocouple (TC)	K0	K	-200 ~ 1370	Bigger between ±0.3 % of FS ± 1 Digit or ±2 ℃
	K1	K	-199.9 ~ 999.9	
	J0	J	-200 ~ 1200	
	J1	J	-199.9 ~ 999.9	
	E0	E	-199.9 ~ 999.9	
	E1	E	-199.9 ~ 999.9	
	T0	T	-199.9 ~ 400.0	
	R0	R	0 ~ 1700	
	R1	R	0.0 ~ 999.9	
	B0	B	0 ~ 1800	
	B1	B	0.0 ~ 999.9	
	S0	S	0 ~ 1700	
	S1	S	0.0 ~ 999.9	
	L0	L	-199.9 ~ 900.0	
	N0	N	-200 ~ 1300	
	N1	N	-199.9 ~ 999.9	
	U0	U	-199.9 ~ 400.0	
	W0	W	0 ~ 2300	
	A0	PL2	0 ~ 1390	
RTD	P0	KPt100 Ω	-199.9 ~ 500.0	Bigger between ±0.3 % of FS ± 1 Digit or ±0.8 ℃
	D0	Pt100 Ω	-199.9 ~ 600.0	
DC voltage(mV)	V0	0-5 V d.c.	-199.9 ~ 999.9	±0.3 % of FS ± 1 Digit
	V1	1-5 V d.c.	-199.9 ~ 999.9	
	V2	0-10 V d.c.	-199.9 ~ 999.9	

※ When using current input, please attach 250 Ω 0.1% resistor to input signal terminal

SM100 CE

Specifications

Model		SM100-□□12	SM100-□□16	SM100-□□20
Appearance				
Number of channels		12 channels	16 channels	20 channels
Measurement input	Input type	● Thermocouple (K), range : -199.9 ℃ ~ 999.9 ℃ / RTD (Pt100 Ω) ● Range : -199.9 ℃ ~ 640.0 ℃		
	Display accuracy	±0.5 % of max. range (± 0.5 % of FS)		
	RJC compensation accuracy	Within display accuracy		
	Sampling cycle	1 sec.		
	Input correction	-1,200.0 ℃ ~ 1,200.0 ℃		
	Input filter	0.0 ~ 120.0 sec.		
	Burn-out operation	Thermocouple : Upscale RTD : Upscale		
Settings and display	Setting method	Setting by communication program		
	Number of settings	12 contacts	16 contacts	20 contacts
	Memory Storage	Storage by Semiconductor		
	Device address setting	Setting by built-in HEX BCD switch (1 to 15)		
	Display LED	Power indication, communication indication, control output indication		
Control output	Output Type	SSR driving voltage pulse output (driving voltage: 12 V d.c., load resistance min. 600 Ω)		
	Control operation	Time proportional PID or ON/OFF control		
	Number of PID groups	1 Group / Channel		
	Proportional cycle (output cycle)	1 sec. ~ 100 sec.		
	Proportional banD (P)	0 ~ 1200.0 ℃		
	Integral time (I)	1 ~ 3600 sec.		
	Derivative time (D)	1 ~ 3600 sec.		
	ARW (Anti Reset Wind-up)	0.1 ~ 100.0 % ※ "0" setting (Auto)		
	Manual reset	0.0 ~ 100.0 % (During ON/OFF control)		
	Hysteresis	0 ~ 120.0 ℃ (During ON/OFF control)		
	Control output operation	Cooling control (direct action) / heating control (reverse action) selection		
	Emergency output	0.0 ~ 100.0 %		
Contact input	Number of external contact inputs	1 contact (RUN/STOP by built-in dip switch)		
Communi-cation specifications	Communication standard	RS485/422(4-Wire type)		
	Communication method	Half duplex		
	Max. number of connections	15 ※ Address setting by HEX BCD switch		
	Communication sequence	No sequence		
	Start bit	1 Bit		
	Stop bit	1 Bit		
	Parity bit	Even		
	Data length	8 Bit		
	Transmission speed	19200 bps		
	Communication distance	1.2 ㎞ max		
	Communication protocol	PC Link with SUM		
	Response time	Reception handling time + (response setting time × 25 ㎳)		
Power voltage		100 - 240 V a.c. 50/60 ㎐ (±10% of rated power voltage)		
Power consumption		max.25 VA		
Insulation resistance		Min. 20 ㏁. between power terminal and grounD (500 V d.c. Mega)		
Dielectric strength		2000 V a.c. for 1 min (between power terminal and ground)		
Ambient temperature & humidity		0 ~ 50 ℃, 20 ~ 85 % RH (Without condensation)		
Storage temperature		-20 ℃ ~ 70 ℃		
Vibration resistance		10 - 55 ㎐ 19.6 ㎧² 3 axes 6 directions 2 h		
Shock resistance		196 ㎧² 3 axes 6 directions each 3 times		
Case material		Cold rolled steel plate (SPC)		
Weight (g)		1270		

Suffix code

Model	Code	Content
SM100-	□ □ □ □	Multi-channel Board Type Temperature Controller (basic specifications: alarm output 3 contacts, built-in run/stop SW 1 contact, RS485/422)
Input type	K	K(CA) thermocouple input (IEC 584-1)
	P	Pt100 Ω RTD input (IEC 751)
Output form	A	Control output (SSR driving voltage pulse output)
	N	No control output (Indication only)
Number of control contacts (Number of channels)	20	20 Channels (standard product)
	16	16 Channels
	12	12 Channels

BX8

Specifications

Model			BX8
Appearance			
Power voltage			100-240 V a.c. (Voltage fluctuation rate: ±10 %)
Input	Input		● Thermocouple : K, J, E, T, R, B, S, L, N, U, WRe 5-26, PL-Ⅱ(Refer to input signal and measuring range) ● RTD : Pt100 Ω, KPt100 Ω, ● DC voltage input : 1 - 5 V, -10 - 20 ㎷, 0 - 100 ㎷ (Freescale)
	Sampling cycle		250 ㎳
	Input impedance		Thermocouple and DC voltage input (㎷): min. 1 ㎆, DC voltage input (V): approx. 1 ㎆
	Allowable signal source resistance		Thermocouple: max. 250 Ω, voltage: max. 2 ㎏
	Lead wire allowable resistance		RTD : max. 10 Ω/1 wire (but the conductor resistance among 3 wires should be same)
	Allowable input voltage		Within ±10 V (thermocouple, RTD, voltage: ㎷ d.c.), within ±20 V (voltage: V d.c.)
	Noise removal rate		NMRR (normal mode): 40 dB min (50/60 ㎐ ±1 %), CMRR (common mode): 120 dB min (50/60 ㎐ ±1 %)
	Standard		Thermocouple/RTD (KS/IEC 751/DIN)
	Reference contact compensation error		±1.5 ℃ (15 ~ 35 ℃ interval), ±2.0 ℃ (0 ~ 50 ℃ interval)
	Input disconnection detection (BURN-OUT)		Thermocouple: OFF, UP/DOWN Scale selection, RTD : UP Scale (thermocouple and RTD BURN-OUT시 detection current: approx. 50 ㎁)
	Measuring accuracy		±0.5 % (FULL SCALE)
Output	Retransmission output		● Current output range : 4-20 ㎃ d.c. ● Load resistance : max. 600 Ω ● Resolution : approx. 3,000 ● Output refresh interval : 250 ㎳ ● Accuracy : ±0.5% of max. scale (4 - 20 ㎃ range) ● Output ripple : ±0.3% of max. scale (P-P) max. (150 ㎐)
	Alarm output (HBA)		● Contact capacity : 240 V a.c. 1 A, 30 V d.c. 1 A (Resisitive load) ● Contact configuration : 1 a ● Output points: Depending on model specifications (refer to connection diagram)
			● Number of contacts : 1 contact · Current measuring range : 1 - 50 A a.c. (resolution: 0.5 A, ±5 % of max. scale ±1 digit) ● Alarm output : selectable in alarm output ● Dead band : 0 ~ 100 % of max. range ● Other : available during ON/OFF control or time proportional output (but not during current output or cooling output) ● Break detection is not possible below 0.2 sec. during output on
	Control output	Relay contact output	● Contact capacity : 240 V a.c. 3 A, 30 V d.c. 3 A (Resisitive load) ● Contact configuration : 1 C ● Time resolution : smaller between 0.1 % or 10 ㎳ ·Proportional period: 1 ~ 1000 s ● Output operation : Time proportional, ON/OFF ● ON / OFF hysteresis: 0 ~ 100 % (Full Scale) ● Output limit : 0.0 ~ 100.0 % range high limit (OH), low limit(OL) selectable (Also during auto-tuning)
		SSR output (Voltage pulse output)	● ON voltage: min. approx. 24 V d.c. (load resistance min. 600 Ω, 30 mA current limit during short circuit) ● Proportional period : 1 ~ 1000 s ● OFF voltage : max. 0.1 V d.c. ● Output operation: time proportional ● Time resolution : smaller between 0.1 % or 10 ㎳ ● Output limit : 0.0~100.0 % range, high limit (OH) low limit(OL) selectable (also during AT)
		Current output (4 -20 ㎃)	● Current output range : 4 - 20 ㎃ d.c. ● Load resistance : max. 600 Ω ● Output refresh interval : 250 ㎳ ● Output operation : continuous PID ● Accuracy : ±0.5% of max. scale (4 - 20 ㎃ range) ● Resolution : approx. 3000 ● Output ripple : ±0.3% of max. scale (P-P) max. (150 ㎐) ● Output limit : -5.0 ~ 105.0 %range, high limit (OH) low limit(OL) selectable (also during AT)
Weight (g)			300

※ Control output : output can be selected from relay, current or SSR, heating / cooling type can be set individually.

Suffix code

Model	Code		Content
BX8-	□	□	Board Type Digital Temperature Controller
Control type	0		Normal
	1		Heating/cooling type
Option		0	SV2 / SV3 (Basic specifications: alarm output 2 contacts , (1 contact is determined by cooling output))
		1	HBA
		2	RS485
		3	HBA / RS485

HY-8000/8200/72/48

Specifications

Model		HY-48	HY-72	HY-8000	HY-8200
Appearance					
W×H×D(㎜)		96.0×96.0×125.0	96.0×96.0×125.0	72.0×72.0×110.0	48.0×48.0×100.0
Input	Thermocouple input	TC-K			
	Reference junction compensation accuracy	±1.5 °C (within -10 ~ 50 °C)			
	RTD input	Pt100 Ω			
	Allowable wiring resistance	10 Ω or less, but the resistance between 3 wires should be the same)			
	Input sampling cycle	500 ms			
Control output	Output type	Relay : 1C, 250 V a.c. 5A			
	Control type	ON/OFF control, Proportional control (Selective by Internal DIP switch)			
	Proportional band	1 ~ 10 °C			
	Manual reset (MR)	0 ~ 100 %			
	Control cycle	20 sec			
	Hysteresis	2 °C			
	Output acting	Reverse acting(heating)			
Alarm output	Alarm type	Model HY-8200 only. High limit alarm			
	Output type	Relay : 1C, 250 V a.c. 5A			
	Hysteresis	2 °C			
Power supply	Power supply voltage	100 - 240V a.c. 50 - 60Hz			
	Voltage fluctuation rate	± 10% of power supply voltage			
	Insulation Resistance	Min. 20 MΩ, 500 V d.c.			
	Dielectric strength	3,000 V a.c., 50/60 Hz for 1 minute (between 1st and 2nd terminal)			
	Power consumption	2.1VA	2.5VA	2.6VA	3.6VA
Display accuracy		±1% of FS ±1 Digit			
Ambient temperature/humidity		0 ~ 50 °C, 35 ~ 85 % RH (without condensation)			
Storage temperature		-25 ~ 65 °C			
Weight (g)		156	164	222	232

Suffix code

Model	Code							Description
HY-	□-	□	□	□	□	□	□	Digital temperature controller
Description	48							48(W) X 48(H) mm
	72							72(W) X 72(H) mm
	8000							96(W) X 96(H) mm
	8200							96(W) X 96(H) mm
Input		K						K thermocouple
		P						RTD, Pt 100 Ω (IEC)
Control output			M					Relay contact output
Alarm output				N				None
				O				High alarm (Only for HY-8200 model)
Control direction					R			Reverse action (Heating control)
Power supply voltage						A		100 - 240 V a.c. 50 - 60 Hz
Range code							□	Refer to the range and input code

Range and input code chart

Classification	Code	Input	Range (°C)			
			HY-48	HY-72	HY-8000	HY-8200
Thermocouple	04	TC-K	0 ~ 399			
	12		-	0 ~ 1199		
RTD	02	Pt100 Ω	0 ~ 199			
	04		0 ~ 399			

DF2

Specifications

Model		DF2
Appearance		
W×H×D(㎜)		48.0 x 96.0 x 62.5
Input	Thermocouple input	TC-K
	Reference junction compensation accuracy	±1.5°C (within -10 ~ 50 °C)
	RTD input	Pt100 Ω
	Allowable wiring resistance	10 Ω or less, but the resistance between 3 wires should be the same)
	Input sampling cycle	500 ms
Control output	Output type	Relay : 1C, 250 V a.c. 5A
	Control type	ON/OFF control, Proportional control (Selective by Internal DIP switch)
	Proportional band	1 ~ 10 °C
	Manual reset (MR)	0 ~ 100 %
	Control cycle	20 sec
	Hysteresis	2 °C
	Output acting	Reverse acting(heating)
Power supply	Power supply voltage	100 - 240 V a.c. 50 - 60 Hz
	Voltage fluctuation rate	± 10% of power supply voltage
	Insulation Resistance	Min. 20 MΩ, 500 V d.c.
	Dielectric strength	3,000 V a.c., 50/60 Hz for 1 minute (between 1st and 2nd terminal)
	Power consumption	2.4 VA
Display accuracy		±1% of FS ±1 Digit
Ambient temperature/humidity		0 ~ 50 °C, 35 ~ 85% RH (without condensation)
Storage temperature		-25 ~ 65 °C
Weight (g)		156

Suffix code

Model	Code	Description
DF	□-□□□□□□	Economical Digital Temperature Controller
Appearance	2	48(W) X 96(H) ㎜
Input	K	K thermocouple
	P	RTD Pt100 Ω (IEC)
Control output	M	Relay output
Alarm output	N	None
Control operation	R	Reverse action (heating control)
Power supply voltage	A	100 - 240 V a.c. 50-60 Hz
Range code	□	Refer to "Range and input code chart"

Range and input code chart

Classification	Code	Input	Range (°C)
Thermocouple	04	TC-K	0 ~ 399
	12		0 ~ 1199
RTD	02	Pt100 Ω	0 ~ 199
	04		0 ~ 399

HY-1000, HY-2000

Specifications

Model	HY-1000	HY-2000
Appearance		
W×H×D(㎜)	72.0×72.0×109.2	96.0×96.0×103.9
Power supply voltage	110 V a.c. / 220 V a.c. 60 Hz	
Voltage variation rate	Rated Voltage ± 10 %	
Power consumption	Approx. 3 VA max	
Input	Thermocouple, Resistive	
Control method	Proportional control	
Setting method	Analog Setting	
Display method	Non−Display	
Control output	Relay : 1 C, 277 V a.c. 6 A	
Setting accuracy	Within ± 2.0 % of Max. Range	
Proportional band	3 % of Max. Range (fixed)	
Proportional cycle	Relay Output : Approx. 20 sec	
External input resistance	• Thermocouple : Below 100 Ω • Resistive : Below 5 Ω Per 1 Wire (The resistance of each wire should be the same.)	
Dielectric strength	2000 V a.c. 60 Hz for 1 min	
Relay life expectancy	• Mechanical : Min.10 millions times. • Electrical : Min. 100 thousands times. (277 V a.c. 6 A Resistive load)	
Ambient temperature · humidity	0 ~ 50 °C, 35 ~ 85% R.H (Without condensation)	
Weight (g)	• HY−1000 : 210 • HY−2000 : 270 ※ Including brackets	

Suffix code

Model	Code						Description
HY−	□−	□	□	□	□	□	Analog temperature controller
Appearance	1000						72 mm x 72 mm
	2000						96 mm x 96 mm
input		K					TC K
		P					Pt 100
Control output			M				Relay contact output
Control operation				R			Reverse action (heating) control
Power					A		110 V a.c. / 220 V a.c.
Range code							See range code table

Range and input code chart

Division	Code	Range (°C)
Thermocouple	04	0 ~ 400
	12	0 ~ 1200
RTD	02	0 ~ 200
	04	0 ~ 400

ND4

Specifications

Model		ND4	ND4(For socket)
Appearance			
W×H×D(㎜)		48.0×48.0×79.5	48.0×48.0×78.0
Input	Thermocouple	K, J (J Type is for HY-2000 only)	
	RTD	Pt100 Ω(IEC751)	
	Allowable signal source resistance	Max. 100 Ω (thermocouple input)	
	Lead wire allowable resistance	RTD max. 10 Ω. (but the resistance among 3 lines should be same)	
Control functions and output	Control type	Proportional control, ON/OFF control (by suffix code)	
	Control operation	Reverse action or direct action (by suffix code)	
	Setting range	Same as input range chart	
	Proportional band	3 % of FS(Fixed)	
	Proportional period	Approx. 25 ~ 30 sec (Relay output), Approx. 2 ~ 4 sec (voltage output (SSR))	
	Hysteresis	Approx. 2 % of FS, fixed (ON/OFF control, 400 ℃ standard)	
	Input disconnection detection	Output OFF when range is over	
	Control output	Relay (1 c, 250 V a.c., 3 A resisitive load)	
Power voltage		110/220 V a.c. 60 ㎐ (But for ND4, 110 V a.c. or 220V a.c. are separated)	
Voltage fluctuation rate		±10 % of power voltage	
Power consumption		Max. 3 VA	
Dielectric strength		2000 V a.c. 50/60 ㎐ for 1 min (Between different live parts)	
Ambient temperature & humidity		0 ~ 50 ℃, 35 ~ 85 % RH (without condensation)	
Storage temperature		-25 ~ 65 ℃	
Weight (g)		200	

Suffix code

Model	Code	Content
ND4	□ □ □ □ □ □	Temperature Controller Without Indicator
Control type	F	ON/OFF control (2 position control)
	P	Proportional control
Input	K	K thermocouple
	P	RTD Pt100 Ω(IEC751)
Control output	M	Relay
Control operation	R	Reverse action (Heating control)
	D	Direct action (Cooling control)
Range code		Refer to "Range and input code chart"
Terminal structure	T	Terminal type

※ Specify the power voltage of ND4 separately (110 V a.c. or 220 V a.c.)

Range and input code chart

Code	ND4	
	Input	Range (℃)
1	Pt	-50 ~ 50
2	Pt	-100 ~ 100
3	Pt	0 ~ 100
5	Pt, K	0 ~ 200
6	Pt, K	0 ~ 300
7	Pt, K	0 ~ 400

BR6A

Specifications

Model		BR6A
Appearance		
W×H×D(㎜)		74.9×32.9×69.3
Power consumption		Max. 5 VA (220 V a.c. 60 ㎐)
Input sensor		Hanyoung Nux exclusive sensor (TH-570N) ※ Thermistor (-50.0 ~ 150.0 ℃)
Accuracy		±1 % of FS ±1 Digit
Control output (Main output)	Relay output	Contact configuration: 1c, 250 V a.c. 5A (resisitive load)
	SSR	10 V d.c. min (load resistance min. 500 Ω)
Alarm / Defrost	Relay	Contact configuration: 1c, 250 V a.c. 5A (resisitive load)
Control operation		Proportional operation (P control), ON/OFF operation
Setting method		Set, increase, decrease, digital method by shift key
Other features		Defrost timer, alarm function, heating/cooling dual usage
Ambient temperature & humidity		0 ~ 50 ℃, 35~85 % RH (Without condensation)
Line resistance		Max. 10 Ω for 1 wire
Weight		120

Suffix code

Model	Code					Content
BR6A -	□	□	□	□	-□	Digital Temperature Controller (Proportional control, ON/OFF control selectable by setting)
Input	N					Hanyoung Nux exclusive sensor (TH-570N) ※Thermistor
Control output		M				Relay Contact outputs
		S				SSR output (Voltage pulse 12 V d.c.)
Option			0			None (basic specifications: alarm output 1 contact)
			1			Communication (RS-485, MODBUS ASCII / RTU)
Power voltage				P4		100-240 V a.c. 50/60 ㎐
LED color					W	White LED
					R	Red LED

BR6 CE

Specifications

Model		BR6
Appearance		
W×H×D(㎜)		77.0×35.0×70.5
Power voltage		100-240 V a.c. 50/60 ㎐, 10-24 V a.c. 50/60 Hz or 10-24 V d.c.
Power consumption		Max. 5 VA (220 V a.c. 60 ㎐)
Input sensor		Hanyoung Nux exclusive sensor (TH-540N) ※ Thermistor (NTC) (-40.0 ~ 90.0 ℃)
Accuracy		±1 % of FS ±1 digit
Control output (Main Output)	Relay output	Contact configuration: SPDT, 250 V a.c, 5 A (resisitive load)
	SSR	Approx. 5 V d.c. (load resistance min. 500 Ω) max. approx. 50 ㎃
Control type		ON / OFF, Proportional control selectable by setting
Setting method		Set, increase, decrease, digital method by key
Other features		Defrost timer, alarm function, heating / cooling dual usage
Ambient temperature & humidity		0 ~ 50 ℃, 35 ~ 85 % RH (Without condensation)
Weight (g)		116

Suffix code

Model	Code					Content
BR6-	□	□	□	□		Digital Temperature Controller (basic specifications: alarm output 1 contact)
Control type	F					ON/OFF, Proportional control selectable by setting
Input		N				Hanyoung Nux exclusive sensor (TH-540N) ※ Thermistor
Control output			M			Relay
			S			SSR (Voltage pulse output 5 V d.c.)
Power voltage				P3		10-24 V a.c. 50/60 Hz or 10-24 V d.c.
				P4		100-240 V a.c. 50/60 ㎐

ED6 CE

Specifications

Model		ED6
Appearance		
W×H×D(㎜)		77.0×35.0×70.5
Power voltage		100-240 V a.c. 50/60 ㎐, 10-24 V a.c. 50/60Hz or 10-24 V d.c.
Power consumption		5.5 VA
Input sensor		K, Pt100 Ω, 4-20 ㎃ d.c., 1-5 V d.c.
Accuracy		± 0.5 % of FS ±1 Digit
Control output (Main Output)	Relay output	Contact configuration: 1 c, 250 V a.c. 5 A (resisitive load)
	SSR	Approx. 5 V d.c. (load resistance min. 500 Ω) max. approx. 50 ㎃
Control type		Proportional control, ON/OFF control selectable by setting
Setting method		Set, increase, decrease, digital method by key
Other features		Sub output (alarm, defrost timer), heating / cooling dual usage
Ambient temperature & humidity		0 - 50 ℃, 35 ~ 85 % RH (Without condensation)
Weight (g)		116

Suffix code

Model	Code					Content
ED6	□	□	□	□	□	Digital Temperature Controller
Control type	F					ON/OFF, Proportional control selectable by setting
Input		K				Thermocouple K
		P				RTD Pt100 Ω (IEC751)
		C				4-20 ㎃ d.c. (External resistance 250 Ω installation), 1-5 V d.c.
Control output			M			Relay output
			S			SSR (Voltage pulse output 5 V d.c.)
Power voltage				A		Alarm or defrost timer (Alarm or Defrost)
				N		None
Power voltage					P3	10-24 V a.c. 50/60Hz or 10-24 V d.c.
					P4	100-240 V a.c. 50/60 ㎐

HD6

Specifications

Model	HD6
Appearance	
W×H×D(㎜)	77.0×35.0×70.5
Power voltage	100-240 V a.c. 50/60 ㎐
Power consumption	Max. 2 VA
Input sensor	TH-540N (103ET: -40.0 ~ 90.0 ℃, 2 m ~ 20 m)
Accuracy	±1 % + 1 Digit of display value
Control output (relay contact)	OPEN OUT: 250 V a.c. 5 A, CLOSE OUT: 250 V a.c. 5 A
Control type	ON/OFF control (control by temperature and time)
Setting method	Digital method by FND and button
Other features	Green house operation / window closing motor control output
Ambient temperature & humidity	0 ~ 50 ℃, 35 ~ 85 % RH (Without condensation)
Weight(g)	116

Suffix code

Model	Code					Content
HD6	□	□	□	□		Cost-Effective Digital Temperature Controller
Control type	F					ON/OFF control
Input		N				Hanyoung Nux exclusive sensor (TH-540N) ※ Thermistor
Control output			M			Relay
Power voltage					P4	100-240 V a.c. 50/60 ㎐

BK3

Specifications

Model		BK3
Appearance		
W×H×D(㎜)		96.0×48.0×100.2
Input sensor	Thermocouple	K
	RTD	Pt100 Ω(IEC)
Input sampling time		500 ㎳
Input display resolution		Usually less than indication value 1 °C (0.1 °C)
Input impedance		1 MΩ (thermocouple)
Allowable signal source resistance		Thermocouple (100 Ω max)
Allowable wiring resistance		RTD (10 Ω max) but resistances among 3 wires should be same
Allowable input voltage		Within ±10 V d.c. (thermocouple, RTD)
Display accuracy		±0.5 % of FS ±1 Digit (but, if less than 599 °C with R input, warranty not applied)
Insulation resistance		20 MΩ min (500 V d.c.)
Dielectric strength		2,000 V a.c. 50/60 Hz, for 1 min, (between the different recharging part)
Power Supply Voltage		110/220 V a.c. 50/60 Hz (Dual usage)
Voltage fluctuation		±10 % of power supply voltage
Power consumption		4 VA max
Ambient temperature		0 ~ 50 °C
Storage temperature		-25 ~ 65 °C
Vibration resistance		10 - 50 Hz, Peak amplitude for 2 hrs each in X, Y and Z direction
Shock resistance		300 ㎧ each in X, Y and Z direction for 3 times
Weight		350 g

Suffix code

Model	Code	Content
BK3-	□	Digital Temperature Indicator
Input	K	K thermocouple (refer to the range and input code chart)
	K1	
	P1	Resistance Temperature Detector(RTD) Pt100 Ω (refer to the range and input code chart)
	P2	

Range and input code chart

Classification	Code	Input	Range (℃)
Thermocouple	K	K thermocouple	0 ~ 1,300 ℃
	K1		0.0 ~ 200.0
RTD	P1	Pt100 Ω	-199 ~ 600 ℃
	P2		-199.9 ~ 199.9 ℃

BK6-M

Specifications

Model			BK6-M
Appearance			
W×H×D(㎜)			72.0×36.0×87.5
Input	Input		Multi Input selectable by setting
	Thermocouple		K, J, E, T, R, B, S, L, N, U, W, PL2
	RTD		Pt 100 Ω(IEC 751), KPt 100 Ω
	Input sampling cycle		500 ㎳
	DC voltage		1-5 V d.c. (4-20 ㎷ d.c.), -10-20 ㎷ d.c., 0-100 ㎷ d.c.
	Input impedance		● Thermocouple and DC voltage input (㎷) : min. 1 ㏁ ● DC voltage input(V) : approx. 1 ㏁
	Allowable signal source resistance		Thermocouple (max. 100 Ω) DC voltage (max. 2 kΩ)
	Allowable wiring resistance		RTD max. 10 Ω (but the resistance among 3 lines should be same)
	Allowable input voltage		Within ±10 V (thermocouple, RTD, DC voltage (㎷)). within ±20 V (DC voltage (V))
	Input correction		Correction by internal parameter
	Reference contact compensation error		±2.0 ℃ (0 ~ 50 ℃)
Performance	Accuracy	Thermocouple	±0.5 % of FS ±1 Digit)
		RTD	±0.5 % of FS ±1 Digit)
		DC voltage / current	±0.5 % of FS ±1 Digit)
	Insulation resistance		Min. 20 ㏁ (500 V d.c.)
	Dielectric strength		2,000 V a.c. 50/60 ㎐ 1 minute (Between different live parts)
Power voltage			100-240 V a.c. 50/60 ㎐
Voltage fluctuation rate			±10 % of power voltage
Power consumption			Max. 4 VA
Ambient temperature & humidity			0 ~ 50 ℃, 35 ~ 85% RH (Without condensation)
Storage temperature			-25 ~ 65 ℃
Weight (g)			120

Suffix code

Model	Code	Content
BK6-M	□	Multi InputDigital Temperature Indicator
Option	0	None
	1	RET (Retransmission output 4 - 20 ㎃ d.c.)

Range and input code chart

Classification	Code	Input		Range (℃)	Accuracy	비고
Thermocouple(TC)	1	K	*2	-200 ~ 1370	±0.5 % of FS ±1 digit	*1) 0 to 400℃ range: ±10% of FS ±1 digit *2) Below 0℃: ±1.0 % of FS ±1 digit *3) -150.0 to 150.0℃ below: ±1.0% of FS ±1 digit *4) When using current input, select code number "30" and attach a 250 Ohm 0.1% resistance to the input signal terminal.
	2	K	*2	-199.9 ~ 999.9		
	3	J	*2	-199.9 ~ 999.9		
	4	E	*2	-199.9 ~ 999.9		
	5	T	*2	-199.9 ~ 400.0		
	6	R	*2	0 ~ 1700		
	7	B	*1	0 ~ 1800		
	8	S		0 ~ 1700		
	9	L	*2	-199.9 ~ 900.0		
	10	N		-200 ~ 1300	±1.0 % of FS ±1 digit	
	11	U	*2	-199.9 ~ 400.0	±0.5 % of FS ±1 digit	
	12	W		0 ~ 2300		
	13	Platinel Ⅱ		0 ~ 1390		
RTD (RTD)	20	KPt100 Ω	*3	-199.9 ~ 500.0	±0.5 % of FS ±1 digit	
	21	Pt100 Ω	*3	-199.9 ~ 640.0		
Voltage/Current (VDC / ㎷ DC)	30	5 V d.c.		1-5 V d.c.	±0.5 % of FS ±1 digit	
	32	20 ㎷ d.c.		10 - 20 ㎷ d.c.		
	33	100 ㎷ d.c.		0 - 100 ㎷ d.c.		
DC Current	30	20 ㎃ d.c.	*4	4-20 ㎃ d.c.		

GR200A

Specifications

Model		GR200A
Appearance		5.7"
W×H×D(㎜)		145.0×145.0×173.5
Power input	Power voltage	100 - 240 V a.c. Voltage fluctuation rate ±10 %
	Power frequency	50 - 60 ㎐
	Power consumption	25 VA max
	Maximum internal fuse ratings	250 V a.c.
	Insulation resistor	20 ㏁ between the power terminal and the FG terminal or 500 V d.c.
Sensor input	Number of channels	2, 4, 8, 12 (Refer to the type configuration)
	Input type	▪ 2 thermoresistors (Pt-100, KPt-100) ▪ 12 thermocouples (K, J, E, T, R, B, S, L, N, U, Wre 5-26, PL-Ⅱ) ▪ DC voltage 4 types (-10 - 20 mV, 0 - 100 mV, 1 - 5V, 0 - 30 V) ※ The current input (4 - 20 ㎃ d.c.) is available when you use resistance 250 Ω (0.5 W / 0.1 %) on input terminals.
	Sampling cycle	250 ㎳
	Current to measure the thermoresistor (RTD)	About 0.21 ㎃
	Input resistor	Thermocouple : More than 1 ㏁, VDC : More than 1 ㏁
	Allowable wiring resistor	▪ Thermocouple : Less than 200 Ω ▪ VDC : Less than 2 ㎏Ω ▪ Thermoresistor : Maximum 100 Ω/wire (The RTD is up to 10 Ω/wire for the range of -100.00 - .150.00)
	Impact of the wiring resistor	Thermoresistor : ±0.3 ℃/10 Ω (The 3 lines have the same wiring resistors)
	Allowable input voltage	▪ Thermocouple : Less than ±10 V d.c. ▪ VDC : Less than ±33 V d.c.
	Accuracy	±0.15 % of F.S, ±1 digit (Except the RJC temperature error) ※ Refer to the input table
	RJC temperature error	±1.5 ℃ (0 ~ 50 ℃)
	Sensor short detection (Burn-out)	UP-Scale during disconnection
Contact input	Maximum input	4
	Input method	No voltage contact input
	On/Off detection resistor	Consider on less than 1 kΩ minimum and off larger than 10 kΩ
	Minimum detection time	0.25 second
Alarm output	Maximum number of outputs	12
	Output type	Relay output
	Maximum ratings	5 A 250 V a.c., 5 A 30 V d.c.
	Recommended ratings	2 A 250 V a.c., 2 A 30 V d.c.
	Relay life	50,000 times at the maximum ratings, 100,000 times at the recommended ratings
Storage environment	Ambient temperature	-20 ~ 70 °C
	Temperature change	Less than 20 °C/h
	Ambient humidity	5 - 95 % RH (no condensation)
Ambient temperature		0 ~ 50 °C
Temperature change		10 °C/h or below
Ambient humidity		20 ~ 90 % RH (no condensation)
Magnetic field		400 A/m or less
Altitude		Less than 2,000 m above the sea level
Weight		About 1.32 kg

Suffix code

Model	Code			Content
GR200A -	□	□	□	Touch Screen Graphic Recorder
Input channel	2			2 channels
	4			4 channels
	8			8 channels
	12			12 channels
External contact input & output (DI / DO)		N		None
		1		DI 2 contacts + DO 6 contact
		2		DI 4 contacts + DO 12 contacts
Communication function			1	RS 422/485 + ETHERNET

RT9N

Specifications

Model	RT9N
Appearance	
W×H×D(㎜)	96.0×96.0×100.0
Power voltage	100-240 V a.c. (±10 %), 50/60 Hz
Power consumption	Max. 15 W, max. 20 VA
Sampling cycle	250 ㎳
Input	● Thermocouple : K, J, E, T, R, S, B, L, N, U, WRe 5 - 26, PL-Ⅱ ● RTD : Pt 100 Ω, KSPt 100 Ω ● DC voltage : 1-5 V d.c., 0-10Vd.c., -10-20 ㎷ d.c., 0-100 ㎷ d.c. (freescale type)
Input display resolution	Basically below the decimal point of the measuring range table
Input impedance	Thermocouple and DC voltage input (㎷): min. 1 ㎆. DC voltage input(V): approx. 1 ㎆
Alarm	Relay output (AL1,AL2)
Allowable signal source resistance	Thermocouple (max. 250 Ω). DC voltage (max. 2 ㎏)
Allowable wiring resistance	RTD max. 10 Ω. (but the resistance among 3 lines should be same)
Allowable input voltage	Within ±10 V (thermocouple,RTD,DC voltage (㎷)) Within ± 20 V (DC voltage (V)).
Noise removal rate	NMRR (normal mode): 40 dB min , CMRR (common mode): 120 dB min (50/60 ㎐ ±1 %)
Applicable standard	Thermocouple/RTD (KS/IEC 751/DIN)
Reference contact compensation error	±1.5 ℃ (15 ~ 35 ℃ 사이), ±2.0 ℃ (0 ~ 50 ℃ range)
Accuracy	Indication and record accuracy: ±0.5 % (Full Scale)
Record	● Recording paper check: If there is no recording paper, the P-END lamp on the front display window lights and recording stops ● Printing method: 203 dpi (8.0 dots/㎜) 384 dots per line ● Recording paper speed: (20, 30, 60, 120, 180, 300, 600, 900) ㎜/h ● Measurement point: 1 contact ● Response time: varies according to recording speed ● Recording method: Thermal line ● Recording paper: width 57.5 ㎜, length approx. 16 m

Suffix code

Model	Code			Content	
RT9N-	□	□	□	2-Channel Temperature Controller/Recorder	
Control type	0			Temperature recorder only	
	1			Temperature recorder and controller	
Number of channels		1		1 channel	
		2		2 channel	
Option			0	None (AL1 built-in)	
			1	AL2	1-Channel type only
			2	AL2, RS485 communication	
			3	RS485 communication	

Range and input code chart

Classification	NO.	Input type		Indication Symbols	Range (℃)	Accuracy
Thermocouple (TC)	1	K	*2	K1	-200 ~ 1370	±0.5% of FS ±1 digit
	2	K	*2	K2	-199.9 ~ 999.9	
	3	J	*2	J	-199.9 ~ 999.9	
	4	E	*2	E	-199.9 ~ 999.9	
	5	T	*2	t	-199.9 ~ 400.0	
	6	R	*2	r	0 ~ 1700	
	7	B	*1	b	0 ~ 1800	±0.5% of FS ±1 digit
	8	S		S	0 ~ 1700	
	9	L	*2	L	-199.9 ~ 900.0	±0.5% of FS ±1 digit
	10	N		n	-200 ~ 1300	±1.0% of FS ±1 digit
	11	U	*2	U	-199.9 ~ 400.0	±0.5% of FS ±1 digit
	12	W		W	0 ~ 2300	
	13	Platinel Ⅱ		PL11	0 ~ 1390	
RTD	20	KSPt100 Ω	*3	JPt	-199.9 ~ 500.0	
	21	Pt100 Ω	*3	Pt	-199.9 ~ 640.0	
Direct voltage (VDC/mV DC)	30	1-5 V d.c.		dCV	Scaling range SL-L : -1999 SL-H : 9999	
	31	0-10 V d.c.		dCV		
	32	-10 - 20 m V d.c.		dCmV		
	33	0-100 m V d.c.		dCmV		
Direct current	30	4-20 mA d.c.	*4	dCA	4-20 mA d.c.	

⚠ Caution

- Measurement Input Wiring
  - Disconnect the regulator body and external supply power when wiring the measurement input lines.
  - Pay attention to the polarity of the input and connect the input signal between the power circuit and the ground circuit.
  - Please use SHIELD-treated wiring for the input and ground SHIELD to 1 point.

- Digit is the minimum display

*1) 0 ~ 400 ℃ range : ±10 % of F.S ±1 digit
*2) Max. 0 ℃ : ±1.0 % of F.S ±1 digit
*3) -150.0 ~ 150.0 ℃ range : ±1.0 % of F.S ±1 digit
*4) When using current input, select code number "30" and attach a 250 Ohm 0.1% resistance to the input signal terminal.

- FS from the minimum to the maximum of each range measurable range.

- When selecting the input type, the selection number is set in the value display window (SV). However, do not set a number that does not have an input signal selection number.

LC series

Specifications

Model			LC6	LC4	LC3	LC7
Appearance						
W×H×D(㎜)			72.0×36.0×84.1	48.0×48.0×79.5	96.0×48.0×71.1	72.0×72.0×92.9
Power voltage			100-240 V a.c. 50/60 ㎐, 24-48 V a.c. 50/60 Hz or 24-48 V d.c. (Voltage fluctuation rate: ±10 %)			
Power consumption			• 2-stage setting: max. 12 VA. • 1-stage setting: max. 11 VA			
Character height			Counting unit (10.5 ㎜), Setting unit (6.7 ㎜)	6-digit: counting unit (10.8 ㎜), setting unit (8 ㎜) 4- digit: counting unit (14 ㎜), setting unit (8.5 ㎜)	Counting unit (14.5 ㎜), Setting unit (10 ㎜)	Counting unit (17.2 ㎜), Setting unit (12.5 ㎜)
Maximum counting speed			1 CPS / 30 CPS / 1 KCPS / 10 KCPS			
Power outage compensation			10 years (using non-volatile memory)			
Input			● Selection of input method by external switch (voltage input / non-voltage input) ● Counter : composed of CP1, CP2, RESET, BATCH-RESET ● Voltage input : HIGH level (5 - 30 V d.c.), LOW level (0 - 2 V d.c.), input resistance (about 4.5 ㎏) ● Timer : composed of START, INHIBIT, RESET ● Non-voltage input : impedance during short-circuit (max. 1 ㎏), residual voltage during short-circuit (max. 2 V d.c.)			
Minimum input signal time			1 ㎳ / 20 ㎳ (START, INHIBIT, RESET inputs)			
External power supply			Max. 12 V d.c. 100 ㎃			
ONE SHOT output			0.01 ~ 99.99 SEC			
Control output	Contect	1-Stage setting	OUT (SPST, 1a)	OUT (SPDT, 1c)		OUT (SPDT, 1c)
		2-Stage setting	OUT1 (SPST, 1a), OUT2 (SPDT, 1c) * OUT2 of LC6-P62C: SPST configuration			
		Capacity	• SPDT: NC (250 V a.c. 5A), NO (250 V a.c. 2A) • SPST: 250Va.c. 5A, resisitive load			
	Contectless	1-Stage setting	NPN circuits (OUT, BAT.O) * LC4-P61C/P41C models NPN 1 circuit configuration			
		2-Stage setting	-		NPN 2 circuits (OUT1, OUT2)	NPN 2 circuits (OUT1, OUT2)
		Capacity	Open collector, 30 V d.c. 100 ㎃ max			
Timer operation error			Power star t: max. ±0.01 % ±0.05 sec, Reset start : max. ±0.01 % ± 0.03 sec			
Communication			● Protocol : Modbus-RTU ● Communication type : RS485 (2-Wire half-duplex) ● Synchronization: Asynchronous ● Effective distance : Max. within 800 m ● Max. connections : 31 (Address:1 ~ 127) ● Response waiting time : 5 ~ 99 ㎳ ● Start bit : 1 bit (Fixed) ● Stop bit : 1 bit (Fixed) ● Data bit : 8 bit ● Parity bit : None / Odd / Even ● Communication speed : 2,400 / 4,800 / 9,600 / 19,200 / 38,400 bps			
Insulation Resistance			Min. 100 ㏁ (500 V d.c.) conductive terminal - unfilled metal			
Dielectric strength			2,000 V a.c. 60 Hz for 1 min (Different live part terminals)			
Noise immunity			Square-wave noise by noise simulator (1 ㎲ pulse every 16 ㎳), ±2000 V (pulse width 1 ㎲)			
Vibration resistance			10 - 55 ㎐, single amplitude 0.5 ㎜, 3-axis each direction, 2 h			
Relay life	Electrical		Min. 50,000 times			
	Mechanical		Min. 10 million times			
Degree of protection			IP66 (IEC 60529) (Product front)			
Storage temperature			-20 ~ 65 ℃			
Ambient temperature & humidity			-10 ~ 55 ℃, 35 ~ 85 % RH (Without condensation)			
Certified			CE KC			
Weight (g)			196	140	143	222

Suffix code

Model	Code	Content
LC	□ □ □ □ □ □	LCD Counter / Timer
Appearance	3	96(W) × 48(H) ㎜
	4	48(W) × 48(H) ㎜
	6	72(W) × 36(H) ㎜
	7	72(W) × 72(H) ㎜
Type	P	Preset Counter / Timer
Display digits	4	4 Digit display (9999) ※ LC4 only
	6	6 digit display (999999)
Setting stages	1	1 Stage setting
	2	2 Stage setting
Sub output	N	No sub output
	C	RS485 (MODBUS-RTU)
Power voltage	A	100-240 V a.c. 50/60 ㎐
	D	24-48 V a.c. 50/60 Hz or 24-48 V d.c.

GF series CE

Specifications

Model			GF7A	GF4A	GF4A-□□□S
Appearance					
W×H×D(㎜)			72.0×72.0×75.0	48.0×48.0×79.8	48.0×48.0×63.3
Power supply voltage			100 - 240 V a.c. 50/60 Hz (Voltage fluctuation rate : ± 10 %)		
Power Consumption			• P62 (7.6 VA), P61 (6.6 VA) • T6 (5.6 VA) • P42 (7.3 VA), P41 (6.6 VA)	• P41 (6.4 VA) • T4 (5.6 VA)	• P41S (5.9 VA) • T4S (5.4 VA)
Display method			White 7 segment LED		
Character size			• P62/P61/T6 (11.5 X 5.2 mm) • P42/P41 (13.6 X 7.8 mm)	8.5 X 5.0 mm	
Counting speed			1 / 30 / 1k / 5k cps	30 / 5k cps	
Blackout compensation			10 Years (nonvolatile memory used)		
Return time			500 ms or less		
Timer operation error			Power start : ± 0.01 % ± 0.05 seconds or less (ratio to setting value)		
Input			▪ Input method selection by external switch (voltage input / no-voltage input) ▪ Counter (composed of CP1, CP2, RESET), timer (composed of INHIBIT, RESET) ▪ Voltage input : HIGH level (5 V – 30 V d.c.), LOW level (0 V – 2 V d.c.), input resistance (about 4.7 kΩ) ▪ No-voltage input : Impedance in case of short circuit (1 kΩ or less), residual voltage in case of short-circuit (2 V d.c. or less)		
Min. input signal time			20 ms or more (RESET, INHIBIT input)		
One-shot output time		1st stage	0.5 seconds fixed	-	-
		2st stage	0.05 to 5.8 seconds		
External power supply			12 V d.c. 100 ㎃ max.		
Control output	Contact	1st stage	OUT (SPDT, 1c)		OUT2 (SPST, 1a)
		2st stage	OUT1 (SPDT, 1c), OUT2 (SPDT, 1c)	-	
		Capacity	SPDT : NC (250 V a.c. 2 A, 250 V a.c. 5 A), NO (250 V a.c. 5 A), Resistance load		250 V a.c. 5 A Resistance load
	Non-contact	1st stage	OUT (NPN Open collector)		-
		2st stage	OUT1, OUT2 (NPN 2 open collector circuits)	-	
		Capacity	30 V d.c. 100 ㎃ max.		
Relay life			Electrical (more than 50,000 times), Mechanical (more than 10 million times)		
Insulation Resistance			100 MΩ or more (based on 500 V d.c. mega)		
Dielectric strength			2,000 V a.c. 60 Hz 1 minute (between the conductive part terminal and the case)		
Noise resistance			Square wave noise by noise simulator ±2,000 V (Pulse width 1 μs)		
Vibration			• Durability : 10 - 55 Hz (1 minute cycle), Double amplitude 0.75 mm, X · Y · Z 2 hours each direction • Malfunction : 10 - 55 Hz (1 minute cycle), Double amplitude 0.5 mm, X · Y · Z 10 minutes each direction		
Ambient temperature and humidity			-10 ~ 55 ℃, 35 ~ 85 % R.H.		
Storage temperature			-20 ~ 65 ℃		
Weight (g)			• T6 : 150 g • P41 : 184 g • P42 : 190 g • P61 : 180 g • P62 : 198 g	• T4 : 100 g • P41 : 108 g	• T4S : 84 g • P41S : 92 g

Suffix code

Model	Code					Description
GF	□-	□	□	□	□	Digital counter/timer
Appearance	4A					48(W) X 48(H) mm
	7A					72(W) X 72(H) mm
Model		P				Preset counter/timer
		T				Total counter/timer
Display digits			6			6 Digit-display (999999) ※ GF7A model only
			4			4 Digit-display (9999)
Control output				2		2—Stage output ※ GF7A model only
				1		1—Stage output
				—		No output (Display only)
Terminal structure					S	8 Pin plug ※ GF4A model only
					—	Terminal

LC1 CE

Specifications

Model		LC1	LC1-F
Appearance			
W×H×D(㎜)		48.0×24.0×54.0	
Input type		Non voltage input (no indication)	Voltage input (24 - 240 V a.c., 6 - 240 V d.c.)
Power voltage		Lithium battery built-in	
Input operation		Up Count	
Counting speed		1/30/100/ 1K cps	20 cps
Input conditions		● Residual voltage when it breaks : 0.7 V ● Max. impedance when it breaks: max. 10 ㎏Ω ● Min impedance when it opens: min. 1 ㎆Ω	●HIGH : 24 - 240Va.c. / 6 - 240 V d.c. ●LOW : 0 - 2 V a.c./DC
Reset	Input type	Non-voltage input	
	Minimum signal width	Min. 20 ㎳	
Battery life		More than 7 years (approx. 25 ℃) ※ this is calculated value so it is not certified value (replacing cycle reference value)	
External setting switch		●SW1 : Internal battery ON/OFF, front reset key selectable ●SW2 : Count speed selectable	SW1 : Internal battery ON/OFF, front reset key selectable
External connection		Terminal Blocks (4P)	
Display method		7 Segment LCD (character height: 8.7 ㎜)	
Display digits		8 Digits	
Insulation resistance		Min. 100 ㎆Ω (500 V d.c), conductive terminal - unfilled metal	
Dielectric strength		2000 V a.c. 50/60 ㎐ for 1 min (conductive terminal - unfilled metal)	
Vibration resistance		10 - 55 ㎐, Double amplitude 0.75 ㎜, 3 axes each direction, 2h	
Shock resistance		300 ㎧², 3 Axes each direction each 3 times	
Ambient temperature & humidity		-10 ~ 55 ℃ / 35 ~ 85 % RH (Without condensation)	
Storage temperature		-25 ~ 65 ℃	
Degree of protection		IP66 (IEC 60529) (Front side)	
Weight (g)		58	

LT1 CE

Specifications

Model	LT1	LT1-F
Appearance		
W×H×D(㎜)	48.0×24.0×54.0	
Input type	Non-voltage input (no display)	Voltage input (24-240 V a.c. / 6-240 V d.c.)
Power voltage	Lithium battery built-in	
Operation type	UP Timer	
Time display	9999 h 59 m 59 s / 99999 h 59.9 m / 999999 h 59 m / 9999999.9 h	
Time accuracy	± 0.01 %	
Input conditions	● Residual voltage when breaks : 0.7 V ● Max. impedance when breaks: max. 10 ㎏Ω ● Min impedance when opens: min. 1 ㎆Ω	● HIGH : 24-240 V a.c./6-240 V d.c. ●L OW : 0-2 V a.c./0-2.4 V d.c.
Battery life	More than 10 years (approx. 25 ℃) ※ This is calculated value so it is not certified value (Replacing cycle reference value)	
External setting switch	●SW1 : Internal battery ON/OFF, front reset key selectable ●SW2 : Time range selection	
External connection	Terminal Blocks (4P)	
Display method	7 Segment LCD (Character height : 8.7 ㎜)	
Display digits	8 Digits	
Insulation resistance	Min. 100 ㎆Ω (500 V d.c). conductive terminal - unfilled metal	
Dielectric strength	2000 V a.c. 50/60 ㎐ for 1 min (Conductive terminal - unfilled metal)	
Vibration resistance	10 - 55 ㎐, double amplitude 0.75 ㎜, 3 axes each direction, 2h	
Shock resistance	300 ㎧², 3 axes each direction each 3 times	
Ambient temperature & humidity	-10 ~ 55 ℃ / 35 ~ 85 % RH (Without condensation)	
Storage temperature	-20 ~ 65 ℃	
Degree of protection	IP66 (IEC 60529) (Front side)	
Weight (g)	58	

LT4 series

Specifications

Model		LT4 (Socket type)	LT4S (Socket type)
Appearance			
W×H×D(㎜)		48.0×48.0×65.7	
Power voltage		24-240 V a.c. 50/60 Hz, 24-240 V d.c. Combined	
Allowable voltage fluctuation rate		±10% of power voltage	
Power consumption		Max. 4 VA (24 - 240 V a.c. 50/60 Hz) Max. 1.6 W (24 - 240 V d.c.)	Max. 4.5 VA (24 - 240 V a.c. 50/60 Hz) Max. 2 W (24 - 240 V d.c.)
Display method		Wide viewing angle negative LCD display	
Display mode		Up display and down display	
Display digits		4 Digits	
Character height		PV display : 14mm, SV display : 8.5mm	
Return time		Max. 100 ms	
External connection		Socket 8-pin	
Operating time range		0.01 sec ~ 9999 hour	
External input	Input signal	-	START, INHIBIT, RESET
	Input method	-	● Non-voltage input ● Impedance during short-circuit: max. 1 kΩ ● Voltage during short-circuit: max. 0.5 V ● Impedance during open: min. 100 kΩ
Minimum input time		-	START, INHIBIT, RESET minimum input signal width 1 ms / 20ms selection
Operating time error		Power START : max. ± 0.01 % ±0.05 sec., Signal START : max. ± 0.005 % ±0.03 sec.	
Control output	Operation mode	POND / PFKF / PFKN / PINT / TWON / TWOF / S-D	SOND / SFKF / SINT / SNFN / SNFF / SOFD / S.OND / S.FKN / S.INT / S.ODR
	Contact configuration	Time limit 2c, instantaneous 1c + time limit 1c	Time limit 1c
	Contact capacity	250 V a.c. 3A resistive load (NO : 5A, NC : 3A)	250 V a.c. 5A resistive load
Relay life		● Mechanical life: min. 10 million times ● Electrical life: min. 100,000 times (250 V a.c. 5A resisitive load)	
Insulation Resistance		Min. 100 MΩ (500 V d.c. Mega standard, conductive terminal - exposed unfilled metal part)	
Dielectric strength		2000 V a.c. 60 Hz for 1 min (Conductive terminal - exposed unfilled metal part)	
Noise immunity		± 2 kV (among operation power terminals, pulse width = 1 us, square wave noise by noise simulator)	
Vibration resistance		10 - 55 Hz (for 1 min) single amplitude 0.5 mm X, Y, Z each direction 2 hours	
Shock resistance		300 ㎧ (30G) X, Y, Z Each direction 3 times	
Degree of protection		IP66 (IEC 60529) (Product front)	
Ambient temperature & humidity		-10 ~ 55 ℃, 35 ~ 85 % RH (However, there will be no condensation.)	
Storage temperature		-25 ~ 65 ℃	
Certified		CE KC	
Weight (g)		86	84

Suffix code

Model	Code	Content
LT4	□	LCD Timer
Control output		Time limit 2c, time limit 1c + instantaneous 1c
	S	Time limit 1c

TT7H

Specifications

Model		TT7H
Appearance		
W×H×D(㎜)		72.0×72.0×63.0
Power voltage		220 V a.c. 60Hz
Allowable voltage fluctuation rate		±10% of power voltage
Power consumption		Approx. 9.6 VA (with 220 V a.c. 60 ㎐)
Display method		ON Time display window: Red FND 4 digits (Character height: 18.7 ㎜) OFF Time display window: Red FND 4 digits (Character height: 14.5 ㎜)
External connection method		Terminal
Minimum signal time		START: min. 1s
Control output	Contact configuration	Output: time limit SPDT (1c)
	Contact capacity	● NO : 250 V a.c. 5 A (Resisitive load) ● NC : 250 V a.c. 2 A (Resisitive load)
Relay life	Mechanical	Min. 10 million times
	Electrical	Min. 100,000 times (250 V a.c. 3A resisitive load)
Dielectric strength		2,000 V a.c. 50/60 ㎐ for 1 min
Noise immunity		±2 kV (Between operation power terminals), square wave noise by noise simulator (pulse width = 1㎲)
Insulation Resistance		Insulation Resistance
Vibration resistance		10 - 55 ㎐ (1 Minute cycle), peak amplitude 0.75 ㎜ X·Y·Z each direction 1 hour
Shock resistance		300 ㎧, X·Y·Z each direction 3 times
Ambient temperature & humidity		-10 ~ 55 ℃, 30 ~ 85 % RH (without condensation)
Storage temperature		-20 ~ 65 ℃
Weight (g)		300

Suffix code

TT7H

Model	Code	Content
TT7H-	□ □ □ □	Digital Twin Timer
Settings	P	Preset method
Display digits	4	4 Digit display (9999)
Control output	1	1-Stage output
External connection	A	9-Pin terminal type (external input)

TF4A

Specifications

Model	TF4A-A
Appearance	
Power voltage	100 - 240 V a.c. 50/60 Hz
Voltage fluctuation rate	Power voltage ±10 %
Power consumption	3.2 VA
Display	White 7 segments LED
Character size	Character height (8.5 mm), Character width (5.0 mm)
Timer operation	Power On Start
Return time	500 ms max.
Timer operation error	● Power start : ± 0.01 % ± 0.05 seconds or less ● Reset start : ± 0.01 % ± 0.03 seconds or less
Input	● Input method selection by external switch (Voltage input / No voltage input) ● RESET, INHIBIT Composed of input ● Voltage input : HIGH level (5 V - 30 V d.c.), LOW level (0 V - 2 V d.c.), Input resistance (Approx. 4.7 kΩ) ● No voltage input : Impedance in case of short circuit (1 kΩ below), Residual voltage in case of short circuit (2 V d.c. below)
Input signal time	20 ms below (RESET, INHIBIT input)
Control output	• Time limit 1c (SPDT) • SPDT : NC (250 V a.c. 2 A), NO (250 V a.c. 5 A), Resistance load
Relay life time	Electrical (more than 50,000 times), Mechanical (more than 10 million times)
External connection method	8-pin socket
Insulation resistance	100 MΩ or more (500 V d.c. Mega standard)
Dielectric strength	2,000 V a.c. 60 Hz 1 minute (Between the conductive part terminal and the case)
Noise immunity	Square wave noise by noise simulator ± 2,000 V (Pulse width 1 us)
Vibration	● Durability : 10 - 55 Hz (1 minute cycle), Double amplitude 0.75 mm, X · Y · Z 2 hours each direction ● Malfunction : 10 - 55 Hz (1 minute cycle), Double amplitude 0.5 mm, X · Y · Z 10 minutes each direction
Ambient temperature &humidity	-10 ~ 55 ℃, 35 ~ 85 % R.H.
Storage temperature	-20 ~ 65 ℃
Weight (g)	Approx. 92 g

Suffix code

Model	Code	Content
TF4A-	□-	Digital Timer, 48(W) X 48(H) mm
Time Specifications	A	100 — 240 V a.c. 50/60 Hz

T38A/T48A/TF62A CE NEW

Simple operation anyone can easily and conveniently

Dial-in control without complicated settings.
Make it easier and more comfortable to operate.

More features, faster

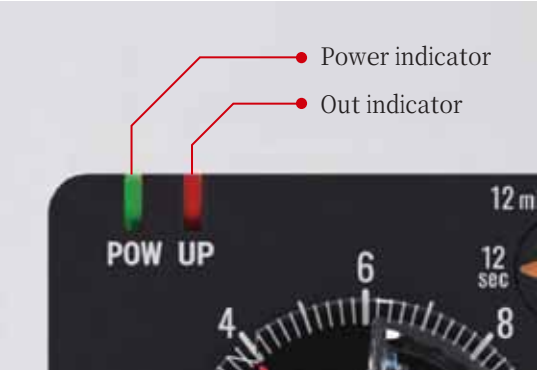
More slide-loads to customize the desired time range and behavior mode.
Provides a wide range of time settings from 0.1 seconds up to 60 hours per product.
Improved for wider use to suit your environment. Quickly access features

Compact size

Compared to the previous product, the rear length and product size have been miniaturized, resulting in a new compact size.
Convenient installation and more space.

Light up product behavior

You can check the operation status with the power indicator (green LED) and output indicator (red LED)
※T38A, T48A only.
※TF62A is the ON (green LED), OFF (red LED)



Customizable, easy-to-install brackets

We offer recessed brackets so you can install it any way you want, giving you a wide range of ways to use it.

※ T48A is the basic fixing brackets only
※ BRACKET-L : T57NP, TF62 recessed replaceable

Fixed Bracket

Model	T48A	T38A	TF62A
Compatible	●	●	●

BRACKET-S
(Purchase separately)

Model	T48A	T38A	TF62A
Compatible		●	●

BRACKET-M

Model	T48A	T38A	TF62A
Compatible		●	●

BRACKET-L
(Purchase separately)

※ T57NP, TF62 recessed replaceable

Model	T48A	T38A	TF62A
Compatible		●	●

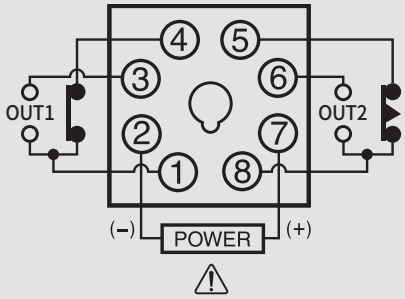
More choices with one product

Depending on the model, the time range can be from 0.1 seconds to 60 hours.
By integrating 14 models from the existing 108 models, we have improved the convenience and utilization of improving the convenience and utilization of product selection for users.

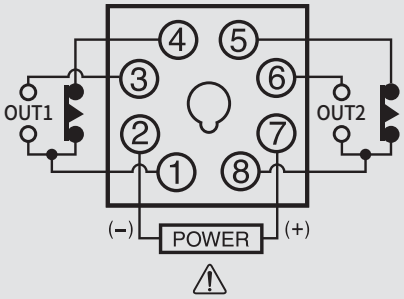
※ For details, please refer to the homepage.

Connection diagram

T48A

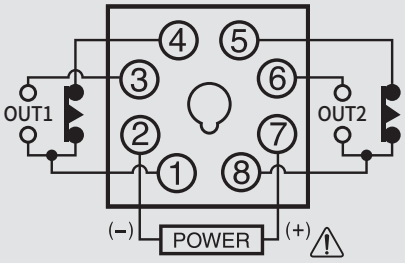


T48A-B
(instantaneous 1C + time-limit 1C)



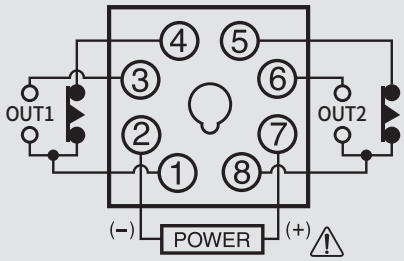
T48A-C
(time-limit 2C)

T38A



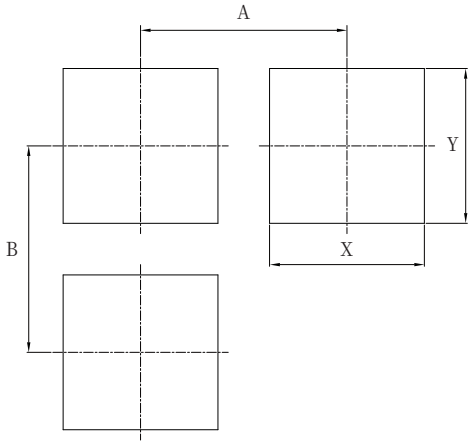
※ OUT1 output operates as instantaneous output in operation mode 'B/C/E/F'

TF62A



※ OUT1 output opreates as instantaneous output in operation mode 'B/E'

Panel cutout



Unit: mm

Distinguish	Notation	T48A	T38A / TF62A		
			BEACKET-L	BRACKET-M	BRACKET-S
Panel Machining Dimensions (tolerance : +0.5 / -0)	X	45.0	51.0	45.5	45.0
	Y	45.0	63.0	55.0	45.0
	A	60.0	60.0	70.5	60.0
	B	60.0	86.0	80.0	60.0

T38A CE NEW

Specifications

Model		T38A	
Appearance			
Timer type		Analog small timer	
Power supply voltage		24 – 240 V a.c. 50/60 Hz or 24 – 240 V d.c. dual usage	
Allowable voltage		±10 % of Power supply voltage	
Power consumption		• Max. 4.1 VA (24 – 240 V a.c. 50/60 Hz)	• Max. 2 W (24 – 240 V d.c.)
Operating time range		0.1 sec ~ 60 hour	
Operating time error		• Setting error: Max. ±5 % ±0.05 • Voltage error: Max. ±0.5 %	• Repetition error: Max. ±0.3 % • Temperature error: Max. ±2 %
Return time		Max. 100 ms	
External connection method		8-pin socket	
Control output	Operation mode	A/B/C/D/E/F (selected by front operating mode selector switch)	
	Contact composition	• instantaneous SPDT (1c) + time-limit SPDT (1c) • time-limit DPDT (2c) *Automatic change of contact composition according to operation mode	
	Contact capacity	• N.O. (250 V a.c. 3A Resistive load)	• N.C. (250 V a.c. 2A Resistive load)
Relay life		• Mechanical life: Min 10 million cycles	• Electrical life: Min. 20,000 cycles (250 V a.c. 2A resistive load)
Insulation resistance		Min. 100 MΩ (500 V d.c. mega, at conductive terminal and non-charged metal which is exposed)	
Dielectric strength		2000 V a.c. 60 Hz for 1 minute (conductive terminal and non-charged metal which is exposed)	
Noise immunity		±2kV (between the power terminals, pulse width = 1 us, square wave noise by noise simulator)	
Vibration resistance		10 - 55 Hz (for 1 minute) 0.75mm double amplitude 0.75mm in each X, Y, Z direction for 2 hours	
Shock resistance		300 m/s² (30G) in each X, Y, Z direction for 3 times	
Operating ambient temperature		-10 ~ 55 °C (without condensation)	
Accessories		• Fixing BRACKET	• BRACKET-M (48.0 X 59.0 mm) flush type bracket
Accessories (separately sold)		• BRACKET-S (48.0 X 48.0 mm) bracket for adjusting size (flush type)	• BRACKET-L (53.5 X 84.4 mm) bracket for adjusting size (flush type)
Weight (g)		Approx. 74 g (exposure type)	
Approval		CE	

Suffix code

Model	Code				Content	Product configuration
T38A	□-	□	□-	□	Analog small timer 38.4(W) x 42.4(H) x 59.0(D) mm	• T38A-1N-A • T38A-3N-A • T38A-6N-A
Time range		1			Maximum time : 1sec / 1min / 1hour / 10sec / 10min / 10hour	
		3			Maximum time : 3sec / 3min / 3hour / 30sec / 30min / 30hour	
		6			Maximum time : 6sec / 6min / 6hour / 60sec / 60min / 60hour	
Control output			N		No option	
Power supply voltage				A	24 – 240 V a.c. 50/60 Hz or 24 – 240 V d.c. dual usage	

T48A CE NEW

Specifications

Model		T48A	
Appearance			
Timer type		Analog timer	
Power voltage		24 – 240 V a.c. 50/60 Hz or 24 – 240 V d.c. dual usage	
Allowable voltage		±10 % of Power supply voltage	
Power consumption		• Max. 3.7 VA (24 – 240 V a.c. 50/60 Hz)	• Max. 1.5 W (24 – 240 V d.c.)
Operating time range		0.1 sec ~ 48 hour	
Operating time error		• Setting error: Max. ±5 % ±0.05 • Voltage error: Max. ±0.5 %	• Repetition error: Max. ±0.3 % • Temperature error: Max. ±2 %
Return time		Max. 100 ms	
External connection method		8-pin socket	
Control output	Operation mode	POWER ON DELAY (fixing)	
	Contact composition	• T48A-B : instantaneous SPDT (1c) + time-limit SPDT (1c)	• T48A-C : time-limit DPDT (2c)
	Contact capacity	• N.O. (250 V a.c. 3A Resistive load)	• N.C. (250 V a.c. 2A Resistive load)
Relay life		• Mechanical life: Min. 10 million cycles	• Electrical life: Min. 20,000 cycles (250 V a.c. 2A resistive load)
Insulation resistance		Min. 100 MΩ (500 V d.c. mega, at conductive terminal and non-charged metal which is exposed)	
Dielectric strength		2000 V a.c. 60 Hz for 1 minute (at conductive terminal and non-charged metal which is exposed)	
Noise immunity		±2kV (between the power terminals, pulse width = 1 us, square wave noise by noise simulator)	
Vibration resistance		10 – 55 Hz (for 1 minute) 0.75mm double amplitude 0.75 in each X, Y, Z direction for 2 hours	
Shock resistance		300 m/s^2 (30G) in each X, Y, Z direction for 3 times	
Operating ambient temperature		-10 ~ 55 °C (without condensation)	
Accessories		Fixing Bracket	
Weight (g)		Approx. 82 g	
Approval		CE	

Suffix code

Model	Code				Content	Product configuration
T48A	□-	□	□-	□	Analog timer 48.0(W) x 48.0(H) x 59.0(D) mm	• T48A-1B-A • T48A-3B-A • T48A-6B-A • T48A-12B-A • T48A-1C-A • T48A-3C-A • T48A-6C-A • T48A-12C-A
Time range		1			Maximum time : 1sec / 1min / 1hour / 10sec / 10min	
		3			Maximum time : 3sec / 3min / 3hour / 30sec / 30min	
		6			Maximum time : 6sec / 6min / 6hour / 60sec / 60min	
		12			Maximum time : 12sec / 12min / 12hour / 24hour / 48hour	
Control output			B		instantaneous SPDT (1C) + time-limit SPDT (1C)	
			C		time-limit DPDT (2C)	
Power supply voltage				A	24 – 240 V a.c. 50/60 Hz or 24 – 240 V d.c. dual usage	

TF62A CE NEW

Specifications

Model		TF62A	
Appearance			
Timer type		Analog twin timer	
Power voltage		24 – 240 V a.c. 50/60 Hz or 24 – 240 V d.c. dual usage	
Allowable voltage		±10 % of Power supply voltage	
Power consumption		• Max. 4.1 VA (24 – 240 V a.c. 50/60 Hz)	• Max. 2 W (24 – 240 V d.c.)
Operating time range		0.1 sec ~ 60 hour	
Operating time error		• Setting error: Max. ±5 % ±0.05 • Voltage error: Max. ±0.5 %	• Repetition error: Max. ±0.3 % • Temperature error: Max. ±2 %
Return time		Max. 100 ms	
External connection method		8-pin socket	
Control output	Operation mode	A/B/C/D/E/F (selected by front operating mode selector switch)	
	Contact composition	• instantaneous SPDT (1c) + Time limit SPDT (1c) • Time limit DPDT (2c) *Automatic change of contact composition according to operation mode	
	Contact capacity	• N.O. (250 V a.c. 3A Resistive load)	• N.C. (250 V a.c. 2A Resistive load)
Relay life		• Mechanical life: MIn. 10 million cycles	• Electrical life: Min. 20,000 cycles (250 V a.c. 2A resistive load)
Insulation resistance		Min. 100 MΩ (500 V d.c. mega, at conductive terminal and non-charged metal which is exposed)	
Dielectric strength		2000 V a.c. 60 Hz for 1 minute (at conductive terminal and non-charged metal which is exposed)	
Noise immunity		±2kV (between the power terminals, pulse width = 1 us, square wave noise by noise simulator)	
Vibration resistance (durability)		10 - 55 Hz (1 minute) 0.75mm double amplitude 0.75 in each X, Y, Z direction for 2 hours	
Shock resistance (durability)		300 m/s² (30G) in each X, Y, Z direction for 3 times	
Operating ambient temperature		-10 ~ 55 °C (without condensation)	
Accessories		• Fixing Bracket	• BRACKET-M (48.0 X 59.0 mm) flush type bracket
Accessories (separately sold)		• BRACKET-S (48.0 X 48.0 mm) bracket for adjusting size (flush type)	• BRACKET-L (53.5 X 84.4 mm) bracket for adjusting size (flush type)
Weight (g)		Approx. 79 g (Exposure type)	
Approval		CE	

Suffix code

Model	Code				Description	Product configuration
TF62A	□-	□	□-	□	Analog twin timer 38.4(W) X 42.4(H) X 59.0(D) mm	• TF62A-1N-A • TF62A-3N-A • TF62A-6N-A
Time range		1			Maximum time : 1sec / 1min / 1hour / 10sec / 10min / 10hour	
		3			Maximum time : 3sec / 3min / 3hour / 30sec / 30min / 30hour	
		6			Maximum time : 6sec / 6min / 6hour / 60sec / 60min / 60hour	
Control output			N		No option	
power voltage				A	24 – 240 V a.c. 50/60 Hz or 24 – 240 V d.c. dual usage	

T21

Specifications

Model	AC	T21 - 1 / 3 / 6 / 3H - 4A20
	DC	T21 - 1 / 3 / 6 / 3H - 4D24
Appearance		
Power voltage	AC	100-120 V a.c. 50/60 Hz, 200-230 V a.c. 50/60 Hz
	DC	24 V d.c.
Allowable voltage fluctuation rate		±10% of power voltage
Power consumption	AC	Max. 3.1 VA (230 V a.c. 60 Hz)
	DC	Max. 1.5 W (24 V d.c.)
Return time		Max. 100 ㎳
Time range	1	0.1 sec ~ 10 min
	3	0.3 sec ~ 30 min
	6	0.6 sec ~ 60 min
	3H	0.3 hrs ~ 24 hrs
Time error (Repetition error)		±1 % max. (ratio of maximum scale)
Time error (Setting error)		±10 % max. (ratio of maximum scale)
Control output	Operation mode	Power ON delay, interval, flicker OFF start, flicker ON start
	Contact configuration	4a4b
	Contact capacity	240 V a.c. 3A Resisitive load
Relay life		● Mechanical life : min. 10 million times, ● Electrical life : min. 100,000 times
Insulation resistance		Min. 100 MΩ (500 V d.c. standard, conductive terminal - exposed unfilled metal part)
Dielectric strength		2000 V a.c. 50/60 Hz for 1 min (conductive terminal - exposed unfilled metal part)
Noise immunity		±2 kV (among operation power terminals, Pulse width ±1 μs, square wave noise by noise simulator)
Vibration resistance		10 - 55 Hz (For 1 min) double amplitude 0.75 ㎜ X·Y· Z each direction 1 hour
Shock resistance		300 ㎧ X·Y· Z each direction 3 times
Ambient temperature & humidity		- 10 ~ 50 ℃, 35 ~ 85 % RH (Without condensation)
Storage temperature		- 25 ~ 65 ℃
Weight (g)		42

Suffix code

Model	Code			Content	
T21-	□	□	□	Timing Relay	
Time range	1			1 sec, 10 sec, 1 min, 10 min	Selection by side dip switch
	3			3 sec, 30 sec, 3 min, 30 min	
	6			6 sec, 60 sec, 6 min, 60 min	
	3H			3 hrs, 6 hrs, 12 hrs, 24 hrs	
Contact configuration		4		4a4b	
Power voltage			A20	200-230 V a.c.	
			D24	24 V d.c.	
			A10	100-120 V a.c.	

MA4N series CE

Specifications

Model		MA4N-A	MA4N-B	MA4N-C
Appearance				
W X H X D (㎜)		48.0×48.0×61.3		
Power voltage		24-240 V a.c. 50/60Hz or 24-240 V d.c.		
Voltage fluctuation rate		±10 % of power voltage		
Power consumption		5.3 VA (240 V a.c.), 2.5 W (240 V d.c.)		
Return time		Max. 0.1 sec		
Min signal width		START input, INHIBIT input, RESET input: min. 20 ㎳		-
Input		● Non-voltage input, ● Impedance during short circuit : max. 2 kΩ, ● Residual voltage during short circuit: max. 0.7 V d.c. , · ● Impedance during open: min. 100 kΩ		-
Output		Time limit 2c	Time limit 1c, instantaneous 1c	Time limit 2c, time limit 1c + instantaneous 1c
		● NO : 10 A 125 V a.c., 5 A 250 V a.c., 5 A 30 V d.c. ● NC : 3 A 125 V a.c., 2 A 250 V a.c., 1 A 30 V d.c.		
Repeating error		Max. ±0.3 %		
Setting error		Max. ±5 %. ±0.05 sec		
Temperature error		Max. ±2 %		
Insulation resistance		Min. 100 MΩ (500 V d.c. mega standard)		
Dielectric strength		2,000 V a.c. 50/60 Hz for 1 min		
Impulse voltage		Max. ±2000 V		
Vibration resistance		10 - 55 Hz Double amplitude 0.75 ㎜		
Shock resistance		300 ㎧ (approx. 30 G)		
Life	Mechanical	Min. 10 million times (switching frequency 180 times / min)		
	Electrical	More than 100 thousand times (250 V a.c. 3 A resisitive load)		
Terminal structure		Plug 11-pin		Plug 8-pin
Ambient temperature & humidity		-10 ~ 55 ℃, 35 ~ 85 % RH (단, 결로현상이 없을 것)		
Storage temperature		-20 ~ 65 ℃		
Weight (g)		Approx. 100 g (fixtures included)		

Suffix code

Model	Code	Content
MA4N-	□	Analog Multi Timer
Type	A	Time limit 2c ※ 11-pin type
	B	Time limit 1c + instantaneous 1c ※11-pin type
	C	Time limit 2c, time limit 1c + instantaneous 1c ※ by mode selection (8-pin type)
Power voltage		24-240 V a.c. 50/60 Hz or 24-240 V d.c.

MA4SD CE

Specifications

Model		MA4SD	MA4SDI
Appearance			
W X H X D (㎜)		48.0×48.0×61.3	
Power voltage		100-240 V a.c. 50/60Hz, 24-240 V d.c.	
Allowable voltage fluctuation rate		±10 % of power voltage	
Power consumption		Approx. 3.8 VA (100-240 V a.c. 60 Hz), Approx. 1.9 W (24-240 V d.c.)	
Return time		Max. 100 ㎳	
Operating time range		1 ~ 300 Sec	
⅄ Operating time error		● Repetition error : max. ±0.3 % ● Setting error : max. ±5 % ● Voltage error : max. ±0.5 % ● Temperature tolerance : max. ±2 % (ratio of maximum scale)	
△ Conversion time error		Max. ±25 %	
Control output	Operation mode	Power ON Start	
	Contact configuration	⅄ Contacts : 1a, △ Contacts : 1a	⅄ Contacts : 1a, △ contacts: 1a, instantaneous contacts: 1a
	Contact capacity	250 V a.c. 5 A resisitive load	
Relay life		● Mechanical: min. 5 million times ● Electrical: min. 100,000 times (250 V a.c. 5 A resisitive load)	
Insulation resistance		Min. 100 ㏁ (500 V d.c. Mega standard, conductive terminal - exposed unfilled metal part)	
Dielectric strength		2000 V a.c 50/60 ㎐ for 2 min (conductive terminal - exposed unfilled metal part)	
Noise immunity		±2 kV (among operation power terminals, pulse width ±1 ㎲, square wave noise by noise simulator)	
Vibration resistance		10 - 55 ㎐ (for 1 min), double amplitude 0.75 ㎜ X·Y·Z each direction 1 hour	
Shock resistance		300 ㎧ (30G) X·Y·Z each direction 3 times	
Ambient temperature & humidity		-10 ~ 55 ℃, 35 ~ 85 % RH (Without condensation)	
Storage temperature		-25 ~ 65 ℃	
Weight (g)		Approx. 95 g (fixtures included)	

Suffix code

Model	Code	Content
MA4	□	Analog Multi Timer (Star-Delta Timer), 48 (W) × 48 (H) ㎜
Control output	SD	⅄ (Star) output, △ (Delta) output
	SDI	Instantaneous output, ⅄ (Star) output, △(Delta) output

LP3/LP6 NEW

Specifications

Model		LP3	LP6
Appearance			
Power voltage		100 - 240 V a.c. 50/60 Hz	
Power consumption		• LP3-5ANN : 6 VA or less • LP3-5A3RN : 8 VA or less • LP3-5A5RN : 8 VA or less • LP3-5A5NC/5A5PC : 7 VA or less • LP3-5A5NT/5A5PT : 9 VA or less	• LP6-5ANN : 5 VA or less • LP6-5A5NN/5A5PN : 6 VA or less • LP6-5A3RN : 6 VA or less • LP6-5ANC : 5 VA or less • LP6-5ANT : 7 VA or less
Display		• Negative-LCD • 4 rows 2 columns •PV (white) • SV (green)	
Character size		• PV (14.5 mm) • SV (10.0 mm)	• PV (10.5 mm) •S V (6.7 mm)
Input frequency		• Non-contact (up to 50 KHz, ON/OFF pulse width of 10 us or more) • Contact (up to 30 Hz, ON/OFF pulse width of 16.6 ms or more)	
Input	Voltage	• [H] level (4.5 - 24 V d.c.) • [L] level (0 - 1 V d.c.) • Input impedance (4.5kΩ)	
	Non-voltage	• Short-circuit impedance (300 Ω or less) • Residual voltage (1 V d.c. or less) • Open-circuit impedance (100 kΩ or more)	
Measuring range		• F1, F2, F10, F11, F12, F13 : 0.0005Hz ~ 50KHz, • F3, F4, F5, F6 : 0.01s ~ 3200s, • F7, F8, F9 : 0 ~ 99999	
Measuring accuracy		• F1, F2, F10, F11, F12, F13 : F.S. ±0.05% rdg ±1digit, • F3, F4, F5, F6 : F.S. ±0.01% rdg ±1digit	
External power supply		12 V d.c. ±10 % 100 mA	
Display cycle		0.05 s / 0.5 s / 1 sec / 2 sec / 4 sec / 8 sec	
Display range		-99999 ~ 99999	
Power outage compensation		Approx. 10 years (applying non-volatile EEPROM)	
Control output	Step 3	• H, L – Closed contacts (SPDT) • GO – Closed contacts (SPST)	• H, GO, L – Closed contacts (SPST)
	Step 5	• HH, H, GO, L, LL – Closed contacts (SPST) or, Open contacts (NPN or PNP open collector) *Closed contacts (HH/H–COM OutputPublic, LL/L–COM OutputPublic)	• HH, H, GO, L, LL – Open contacts (NPN or PNP open collector)
	Capacity	• NO contacts (250 V a.c. 5A resistive load) • NC contacts (250 V a.c. 2A resistive load) • Open contacts (12 – 24 V d.c. 50mA or less)	• Contacts (250 V a.c. 5A resistive load) • Open contacts (12 – 24 V d.c. 50mA or less)
Relay Life	Electrical	Min. 100,000 times (250 V a.c. 2A)	Min. 100,000 times (250 V a.c. 5A)
	Mechanical	Min. 10,000,000 times	Min. 5,000,000 times
PV transmission Output		4 - 20 mA d.c. Load resistance 600 Ω or less (response time 800 ms or less)	
RS485 communication output		• Communication protocols - Modbus-RTU • Communication Methods - RS485 (2-wire half-duplex) • Communication Speed - 2400 / 4800 / 9600 / 19200 / 38400 bps	
Vibration durability		10 - 55Hz double amplitude 0.75 mm X, Y, Z each direction, 2 hr	
Insulation resistance		Min 100 MΩ (500 V d.c.), conductive part terminal - Non-conductive metal	
Withstand Voltage		2,000 V a.c. 60 Hz for 1 minute (between each conductive terminal)	
Noise immunity		±2,000 V (pulse width 1 μs, square wave noise applied to power terminals by noise simulator)	
Ambient temperature		-10 ~ 50 °C	
Shelf life		-20 ~ 60 °C	
Ambient humidity		35 ~ 85 % R.H.	
Protective Structure		• IP66 (Front panel) • Apply a protective cover to the terminal block	
Weight (excluding packaging)		150 g	108 g

Suffix code

형 명	코 드					내 용
LP	□-	□	□	□	□	LCD Multi pulse meter
Appearance	3					96(W) × 48(H) mm
	6					72(W) × 36(H)mm
Display digits		5				5-Digit display
Power voltage			A			100 - 240 V a.c. 50/60Hz
Output specifications		LP3		N	N	Directive only, No output, No options
				3R	N	3-Stage contact output, No options
				5R	N	5-Stage contact output, No options
				5N	C	5-Stage NPN open collector output + RS485 output (MODBUS-RTU)
				5N	T	5-Stage NPN open collector output + Transfer output (4-20 mA d.c.)
				5P	C	5-Stage PNP open collector output + RS485 output (MODBUS-RTU)
				5P	T	5-Stage PNP open collector output + Transfer output (4-20 mA d.c.)
		LP6		N	N	Directive only, No output, No options
				N	C	Directive only, No output, RS485 output (MODBUS-RTU)
				N	T	Directive only, No output, Transfer output (4 - 20 mA d.c.)
				3R	N	3-Stage contact output, No options
				5N	N	5-Stage NPN open collector output, No options
				5P	N	5-Stage PNP open collector output No options

LP1

Specifications

Model		LP1
Appearance		
WXHXD(㎜)		48.0×24.0×54.0
Power voltage		Non-power (battery built-in, changeable)
Display method		LCD display method, zero blanking
Battery life		More than approx. 3 years (approx. 25 ℃)
Character size		8.7 ㎜
Input type	Voltage input (INB)	● AC voltage input: 3 - 30 V a.c. ● DC voltage input: When High 4.5 - 30 V d.c. When Low 0 - 2 V d.c.
	Voltage input (INC)	30-240 V a.c.
	Non-voltage input (INA)	● Residual voltage during short circuit: max. 0.5 V, ● Max. impedance during short circuit: max. 10 ㎏Ω, ● Min impedance during open: min. 500 ㎏Ω
HOLD input method		Non-voltage input
Measuring range		● rpm (1 ~ 10000 rpm), ● 0.1 rpm (0.1 ~ 1000.0 rpm), ● rps (1 ~ 1000 rps), ● Hz (1 ~ 1000 Hz), ● 0.1 Hz (0.1 ~ 100.0 Hz)
External setting switch		SW1-1 : rps / rpm, SW1-2 : ×1 / ×0.1, SW2-1 : RESET, SW2-2 : (rps, rpm) / Hz
External connection		Terminal block (5 pins)
Measuring accuracy		±0.1% rdg ±1 digit
Vibration resistance		10 - 55 Hz (1 minute cycle) double amplitude 0.75 ㎜ X·Y· Z each direction 1 hour
Shock resistance		300 ㎧² X·Y·Z each direction 3 times
Insulation Resistance		Min. 100 ㎆Ω (500 V d.c. Mega standard, conductive terminal - exposed unfilled metal part)
Dielectric strength		2000 V a.c 50/60 ㎐ for 1 min (conductive terminal - exposed unfilled metal part)
Ambient temperature & humidity		-10 ~ 55 ℃, 35 ~ 85 % RH (Without condensation)
Storage temperature		-20 ~ 65 ℃
Weight (g)		46

(note 1) The battery life is calculated based on the above conditions, so please consider them while replacing it

HLP1

Specifications

Model		HLP1
Appearance		
W X H X D (㎜)		48.0×24.0×37.1
Input	Input specifications	4-20 ㎃ d.c.
	Max. display digits	4 Digits (-1999 ~ 9999)
	Sampling cycle	Selection by parameter (0.5, 1, 2, 3, 4, 5 sec)
	Input correction	±3 % of FS
Performance	Accuracy	±0.3 % of FS ±1 Digit
	Insulation resistance	100 ㎆Ω (500 V d.c.)
	Dielectric strength	2,300Va.c. 50/60 ㎐ for 1 min
Functions		● High limit scale setting ● Low limit scale setting ● Decimal point setting ● Display cycle setting ● Error display range setting ● High limit correction of display value ● Low limit correction of display value ●Measurement delay time setting ●Flashing function setting ●Parameter lock setting
Power voltage		Non-voltage type
Ambient temperature & humidity		-5 ~ 50 ℃, 20 ~ 90 % RH (Without condensation)
Storage temperature		-25 ~ 70 ℃
Vibration resistance		10 ~ 55 ㎐ single amplitude X·Y·Z each direction 2 hours
Shock resistance		300 ㎧², X·Y·Z each direction 3 times

LM series

Specifications

Model	LM3/6-DV	LM3/6-DA	LM3/6-AV	LM3/6-AA
Appearance				
Size	▪ LM3 : 96(W) X 48(H) X 68(D) mm ▪ LM6 : 72(W) X 36(H) X 81(D) mm			
Power	100 — 240 V a.c. 50/60 Hz			
Power Consumption	▪ LM3-N: 6 VA or less ▪ LM3-3R/3RC: 10 VA or less ▪ LM3-3RT: 11 VA or less ▪ LM3-3NC/3PC: 9 VA or less ▪ LM3-3NT/3PT: 10 VA or less ▪ LM6-N: 5 VA or less ▪ LM6-3R: 7 VA or less ▪ LM3-3N/3P: 5 VA or less ▪ LM3-RC: 6 VA or less ▪ LM3-RT: 7 VA or less			
Input signal	DC voltage	DC current	AC voltage / frequency	AC current / frequency
Input range	500 V / 100 V 50 V / 10 V 5 V / 1 V 200 mV / 50 mV	5 A / 2 A 500 mA / 200 mA 50 mA / 4 — 20 mA 5 mA / 2 mA	500 V / 250 V 110 V / 50 V 20 V / 10 V 2 V / 1 V	5 A / 2 A 500 mA / 200 mA 50 mA / 20 mA
AC measurement method	AVG / RMS selective measurement			
Input sampling cycle	50 ms			
Input sampling method	OVER sampling method using continuous approximation A / D converter			
Maximum allowable input	F.S. of each input range 110 %			
Frequency measurement range	0.2 ~ 9999 Hz (Frequency measurement range depends on the decimal point position)			
Display	▪ Negative-LCD ▪ 4 digit 2 rows ▪ PV (White) ▪ SV (Green)			
Character size	▪ LM3 : 17.6 X 10.6 mm ▪ LM6 : 7.0 X 11.5 mm			
Maximum display	—9999 ~ 9999			
Display degree	▪ [23 ℃ ± 5 ℃] - F.S. ± 0.1 % rdg ± 2 digit ▪ [23 ℃ ± 5 ℃, 5 A] - F.S. ± 0.3 % rdg ± 3 digit ▪ [50 ℃ ~ - 10 ℃] - F.S. ± 0.5 % rdg ±3 digit		▪ [23 ℃ ± 5 ℃] - F.S. ± 0.3 % rdg ±3 digit ▪ [23 ℃ ± 5 ℃, frequency] — F.S. ± 0.1 % rdg ± 2 digit ▪ [50 ℃ ~ - 10 ℃] - F.S. ± 0.5 % rdg ± 3 digit	
Control output	▪ Contact output : 3 stage, SPST (1a), 250 V a.c. 5 A 3 stage, ▪ Solid state output: 3-stage, NPN or PNP open collector, 12 - 24 V d.c. 50mA or less			
Relay life time	• ▪ Electrical (about 100,000 times, 250 V a.c. 5 A) • ▪ Mechanical (about 5 million times)			
Optional output	• ▪ Transmission output (4-20 mA) • ▪ RS-485 output			
External input	• ▪ HOLD/ZERO Optional input • ▪ Non-voltage input • ▪ Short circuit impedance: 300 Ω or less • ▪ Residual voltage: 1 V or less • ▪ Impedance when open: 100 kΩ or more			
Communication	▪ Communication protocol : Modbus-RTU ▪ Communication method : RS-485 (2-wire half duplex) ▪ Communication speed : 2400 / 4800 / 9600 / 19200 / 38400 bps			
Insulation Resistance	100 MΩ or more (500 V d.c. Mega standard, between conductive terminal and case)			
Withstand voltage	2000 V a.c. 60 Hz 1 minute (between conductive terminal and case)			
Noise	± 2 kV(Between operation power terminals, Pulse width = 1 us, Square wave noise by noise simulator)			
Vibration resistance	10 - 55 Hz, Single amplitude 0.5 ㎜, 3-axis angular, 2 hours			
Protection structure	• IP66 (front) • Terminal block protection cover applied			
Ambient temperature and humidity	- 10 ~ 50 ℃, 35 ~ 85 % RH			
Storage temperature	- 20 ~ 65 ℃			

Suffix code

Model	Code						Description
LM	□-	□	□-	□	□-	□	LCD Multi Panelmeter
Appearance	3						96(W) X 48(H) mm
	6						72(W) X 36(H) mm
Displayable Digit		4					4 Digit indication
Input Specification			DV				DC voltage
			DA				DC current
			AV				AC voltage
			AA				Alternating current
Output specifications				N			Non only (Indication option output)
				R			1-stage contact output *LM6 only (For LM6-RC/RT, 1-stage contact output fixed.)
				3R			3—stage contact output
				3N			3—stage NPN open collector output
				3P			3—stage PNP open collector output
Optional output					—		Non option output
					C		RS—485 output (MODBUS—RTU)
					T		Transmission output (4 — 20 mA d.c.)
Power supply voltage						A	100 - 240 V a.c. 50/60 Hz

WM3 CE

Specifications

Model	WM3
Appearance	
WXHXD(㎜)	96.0×48.0×102.0
Method of measurement	Periodic measurement method
Input Voltage	0 - 220 V a.c.
Display Cycle	0.1 ~ 2 sec
Power factor	80 ~ 100 %
Response speed	2 seconds (maximum range)
Number of displayed lines	4 Digit (-1999 ~ 9999)
Display	7 Segment LED
Accuracy	±0.5 % of FS, ±10 Digit
Insulation Resistance	100 ㏁ or more (500 V d.c.)
Voltage Resistance	2,000 V a.c. 1 minute (power terminal - input terminal)
Function	● Measurement item, ● Show Average Value, ● Scale Functions, ● Set Decimal Point, ● Hold, ● Show Maximum/Minimum, ● Communication Functions, ● Effective Value (RMS) measurement function, ● Decimal Point Location, ● Hold function, ● Lock function, ● Address, ● Communication speed, ● Show Maximum Value, ● Show Min Value, ● Upper limit setting, ● Lower limit setting, ● Select Output Behavior (PSOT), ● Hysteresis Settings,
Communication Output (RS485)	You can set the address from 00 to 99 times and select the modulation rate for serial transmissions (transmission rate: 1200, 2400, 4800, 9600, 19200 bps)
Current Output (Transfer)	4-20 ㎃ d.c. output for the current indicator (resolution: 12,000)
Transistor Output	PNP/NPN Open Collector Output (12-24V d.c. 50㎃ or less)
Relay Output	1 a X 3 Contact (HI, GO, LO), (220 V a.c. 5 A)
Power Voltage	100-240 V a.c. 50/60 ㎐ (Common)
Voltage Fluctuation Rate	-15 to 10% of the power voltage
Power Consumed	Approx. 5 VA
Ambient temperature & humidity	0 ~ 50 ℃ , 35 ~ 85 % RH (No condensation)
Storage temperature	-10 ~ 70 ℃
Vibration resistance	10-55 ㎐ single amplitude for 2 hours in each of X, Y, and Z directions
Shock resistance	300 ㎧ X·Y·Z 6 each direction 3 times
Weight (g)	300

Suffix code

Model	Code			Content
WM3-	□	□	□	Digital power meter
Constants and Wires	1			Single-phase 2-ray (0-220 V a.c.)
Input Specifications		01		Input Specification Reference (see code)
Output (optional)			N	Display Only
			0	Relay (HI, GO, LO), 4-20㎃ d.c.
			1	Relay (HI, GO, LO)
			2	NPN open Collector (HI, GO, LO), 4-20 ㎃ d.c.
			3	PNP open Collector (HI, GO, LO), 4-20 ㎃ d.c.
			4	NPN open Collector (HI, GO, LO), RS485
			5	PNP open Collector (HI, GO, LO), RS485

Input Specifications

Code	Content		
01	XXX : 5 A	Universal Translator	Set Transmission Ratio (CT sold separately)
02	XXX : 1 A		Set Transmission Ratio (CT sold separately)
03	0 - 2.5 A	Dedicated Translator (H-1W)	0 - 500.0 W max. (With CT)
04	0 - 5 A		0 - 1100.0 W max. (With CT)
05	0 - 10 A		0 - 2200.0 W max. (With CT)
06	0 - 15 A		0 - 3300.0 W max. (With CT)
07	0 - 30 A	Dedicated Translator (H-2W)	0 - 6600.0 W max. (With CT)
08	0 - 50 A		0 - 11.00 KW max. (With CT)
09	0 - 80 A	Dedicated Translator (H-4W)	0 - 17.60 KW max. (With CT)
10	0 - 100 A		0 - 22.00 KW max. (With CT)
11	0 - 150 A	Dedicated Translator (H-5W)	0 - 33.00 KW max. (With CT)
12	0 - 200 A		0 - 44.00 KW max. (With CT)

BS series

Specifications

Model		BS3	BS6	BS1
Appearance				
WXHXD(㎜)		96.0×48×102.0	72.0×36.0×100.0	48.0×24.0×100.0
Input	Input signal	Input voltage, current, instrument signal input (4 - 20 ㎃ d.c. or 1 - 5 V d.c.)		
	A/D converter	Double integration method		
	Sampling cycle	300 ㎳		400 ㎳
	Response speed	Approx. 2 sec (max. range)		Approx. 3 sec (max. range)
	External control	Present value hold function by contact input		
	Max. display digits	± 1999		
	Display	7 segment LED		
	Measurement and indication method	Effective value indicating method by full-wave rectification		
Performance	Accuracy	AC : ±0.5 % of FS ±1 Digit, DC : ±0.2 % of FS ±1 Digit		
	Insulation resistance	Min. 100 ㏁ (500 V d.c.)		
	Dielectric strength	1500 V a.c. for 1 min (between external terminal and case)		2000 V a.c. for 1 min (between external terminal and case)
Power voltage		110 V / 220 V a.c. 50/60 ㎐ common		100-240 V a.c. 50/60 ㎐ common
Voltage fluctuation rate		±10 % of power voltage		-15 ~ 10 % of power voltage
Power consumption		Max. 2 VA		Max. 4 VA
Ambient temperature & humidity		0 ~ 50 ℃, 35 ~ 85 % RH (without condensation)		-10 ~ 55 ℃, 35 ~ 85 % RH (without condensation)
Storage temperature		-10 ~ 70 ℃		-20 ~ 65 ℃
Vibration resistance		10 - 55 ㎐ single amplitude X·Y·Z each direction 2 hours		
Shock resistance		300 ㎧², X·Y·Z 6 directions each 3 times		
Weight (g)		350	250	150

Suffix code

※ Model name : BS6 and BS3 have different range codes

Model	Code					Content
BS	□-	□	□	□	□	Digital Voltmeter / Ammeter
Appearance	6					72 X 36 ㎜
	3					96 X 48 ㎜
	1					48 X 24 ㎜
Output		N				Display only
Input			A	10		AC voltmeter (AC)
				20		AC ammeter (AC)
			D	10		DC voltmeter (DC)
				20		DC ammeter (DC)
				11		DC voltmeter
				21		DC ammeter
Measuring range					1	Measuring range model example: BS3-NA101 (1.999 V)

● DC current (BS1)

Model	Measuring range	Resolution	Input impedance	Max. allowable input current
BS1-ND201	199.9 ㎂	0.1 ㎂	1 ㎏Ω	50 ㎃
BS1-ND202	1.999 ㎃	1 ㎂	100 Ω	150 ㎃
BS1-ND203	19.99 ㎃	10 ㎂	10 Ω	300 ㎃
BS1-ND204	199.9 ㎃	100 ㎂	1 Ω	3 A
BS1-ND205	1.999 A	1 ㎃	0.1 Ω	3 A
BS1-ND206	5.00 A	10 ㎃	0.01 Ω	5 A
BS1-ND207	19.99 A	10 ㎃	Shunt use (secondary voltage 50㎷)	
BS1-ND208	199.9 A	100 ㎃		
BS1-ND209	1999 A	1 A		

● DC current (BS3)

Model	Measuring range	Resolution	Input impedance	Max. allowable input current
BS3-ND201	1.999 ㎃	1 ㎂	100 Ω	50 ㎃
BS3-ND202	19.99 ㎃	10 ㎂	10 Ω	150 ㎃
BS3-ND203	199.9 ㎃	100 ㎂	1Ω	300 ㎃
BS3-ND204	1.999 A	1 ㎃	0.1Ω	3 A
BS3-ND205	5.00 A	10 ㎃	0.01Ω	5 A
BS3-ND206	19.99 A	10 ㎃	Shunt use (secondary voltage 50㎷)	
BS3-ND207	199.9 A	100 ㎃		
BS3-ND208	1999 A	1 A		

● DC current (BS6)

Model	Measuring range	Resolution	Input impedance	Max. allowable input current
BS6-ND201	199.9 ㎂	0.1 ㎂	100 Ω	1 ㎃
BS6-ND202	1.999 ㎃	1 ㎂	10 Ω	50 ㎃
BS6-ND203	19.99 ㎃	10 ㎂	1 Ω	150 ㎃
BS6-ND204	199.9 ㎃	100 ㎂	0.1 Ω	300 ㎃
BS6-ND205	5.00 A	10 ㎃	400 ㏁	5.1 A
BS6-ND206	19.99 A	10 ㎃	Shunt use (secondary voltage 50㎷)	
BS6-ND207	199.9 A	100 ㎃		
BS6-ND208	1999 A	1 A		

Measuring range

● AC current (BS3, BS6, BS1)

Model	Measuring range	Resolution	Input impedance	Max. allowable input current
BS□-NA201	19.99 ㎃	10 ㎂	10 Ω	50 ㎃
BS□-NA202	199.9 ㎃	100 ㎂	1 Ω	300 ㎃
BS□-NA203	1.999 A	1 ㎃	0.1 Ω	3 A
BS□-NA204	5.00 A	10 ㎃	40 ㏁	5.1 A
BS□-NA205	19.99 A	10 ㎃	Current transformer use (secondary current 5A)	
BS□-NA206	30.0 A	100 ㎃		
BS□-NA207	100.0 A	100 ㎃		
BS□-NA208	150.0 A	100 ㎃		
BS□-NA209	199.9 A	100 ㎃		
BS□-NA2010	300 A	1 A		
BS□-NA2011	1999 A	1 A		

● AC voltage (BS3)

Model	Measuring range	Resolution	Input impedance	Max. allowable input current
BS3-NA101	1.999 V	1 ㎷	100 ㎏Ω	10 V
BS3-NA102	19.99 V	10 ㎷	1 ㏁	50 V
BS3-NA103	199.9 V	100 ㎷	10 ㏁	300 V
BS3-NA104	400 V	1 V	10 ㏁	500 V
BS6-NA105	400 V	1 V	10 ㏁	500 V

● AC voltage (BS6, BS1)

※ Model name: BS1-NA105 (range: 500V)

Model	Measuring range	Resolution	Input impedance	Max. allowable input current
BS □-NA101	199.9 ㎷	0.1 ㎷	10 ㎏Ω	10 V
BS □-NA102	1.999 V	1 ㎷	100 ㎏Ω	10 V
BS □-NA103	19.99 V	10 ㎷	1 ㏁	50 V
BS □-NA104	199.9 V	100 ㎷	10 ㏁	300 V
BS6-NA105	400 V	1 V	10 ㏁	500 V
BS1-NA105	500 V			

● DC ammeter (BS3, BS6, BS1)

Model	Input	Display range	Input impedance	Max. allowable input current
BS □-ND211	4-20 ㎃ DC	50.0	25 Ω	150 ㎃
BS □-ND212		100.0	50 Ω	150 ㎃
BS □-ND213		199.9	100 Ω	150 ㎃

● DC voltmeter (BS3, BS6, BS1)

Model	Input	Display range	Input impedance	Max. allowable input current
BS □-ND111	1-5Vd.c.	50.0	500 ㎏Ω	100 V
BS □-ND112		100.0	500 ㎏Ω	100 V
BS □-ND113		199.9	500 ㎏Ω	100 V

InputMeasuring range 0 - 10 V d.c. (optional)

● DC voltage (BS3, BS6, BS1)

Model	Measuring range	Resolution	Input impedance	Max. allowable input voltage
BS□-ND101	199.9 ㎷	0.1 ㎷	10 ㎏Ω	70 V
BS□-ND102	1.999 V	1 ㎷	100 ㎏Ω	100 V
BS□-ND103	19.99 V	10 ㎷	1 ㏁	200 V
BS□-ND104	199.9 V	100 ㎷	10 ㏁	300 V
BS□-ND105	500 V	1 V	10 ㏁	600 V

BA1

Specifications

Model		BA1-D□□	BA1-D□□A
Appearance			
WXHXD(㎜)		48.0×24.0×60.0	
Input	Input signal	Input voltage, current, instrument signal input (4 - 20 ㎃ d.c. or 1 - 5 V d.c.)	
	A / D converter	Double integration method	
	Sampling cycle	300 ㎳	
	Response speed	Approx. 2 sec (max. range)	
	Max. display digits	±1999	
Performance	Accuracy	DC : ±0.2 % FS ±1 Digit	
	Insulation resistance	Min. 100 ㏁ (500 V d.c.)	
	Dielectric strength	1500 V a.c. for 1 min (between power terminals and input terminals)	
Functions	Decimal point display	10^{1}, 10^{2}, 10^{3} display by rear terminal connection	
	Polarity display	If the input signal is reversed, "-" is displayed automatically	
	Range over display	Displayed as "1 □□□"	
	Range below display	Displayed as "-1□□□"	
	Display	7 segment LED	
Power voltage		5 V d.c.	12-24 V d.c.
Voltage fluctuation rate		±10 % of power voltage	
Power consumption		Approx. 3 W	Approx. 5 W
Ambient temperature & humidity		0 ~ 50 ℃, 35 ~ 85 % RH (without condensation)	
Storage temperature		-10 ~ 70 ℃	
Vibration resistance		10 ~ 55 ㎐ 편진폭 X·Y·Z each direction 2 hours	
Shock resistance		300 ㎧², X·Y·Z each direction 3 times	

Suffix code

Model	Code				Content
BA1-	□	□	□	□	Digital Voltmeter / Ammeter
Input	D	10			DC voltage (DC)
		20			DC current (DC)
		11			DC voltmeter (1-5 V d.c.)
		21			DC ammeter (4-20 ㎃ d.c.)
Range code			□		Refer to measuring range
Power voltage					5 V d.c.
				A	12-24 V d.c.

Measuring range

DC voltage

Model	Measuring range	Resolution	Input impedance	Max. allowable input voltage
BA1-D101	199.9 ㎷	100 ㎶	100 ㎏Ω	70 V
BA1-D102	1.999 V	1 ㎷	1 ㏁	100 V
BA1-D103	19.99 V	10 ㎷	1 ㏁	250 V
BA1-D104	199.9 V	100 ㎷	10 ㏁	300 V
BA1-D111	1-5Vd.c.	50.0	100 ㎏Ω	100 V
BA1-D112		100.0	100 ㎏Ω	100 V
BA1-D113		199.9	100 ㎏Ω	100 V

※ Accuracy: ± 0.2% of present value ± 1 digit (23 ℃ ± 5 ℃)

DC current

Model	Measuring range	Resolution	Input impedance	Max. allowable input voltage
BA1-D201	199.9 ㎂	0.1 ㎂	1 ㎏Ω	1 ㎃
BA1-D202	1.999 ㎃	1 ㎂	100 Ω	50 ㎃
BA1-D203	19.99 ㎃	10 ㎂	10 Ω	150 ㎃
BA1-D204	199.9 ㎃	100 ㎂	1 Ω	300 ㎃
BA1-D205	1.999 A	1 ㎃	Shunt use (Secondary voltage 50 ㎷)	
BA1-D206	19.99 A	10 ㎃		
BA1-D207	199.9 A	100 ㎃		
BA1-D208	1999 A	1 A		
BA1-D211	4-20㎃ d.c.	50.0	25 Ω	150 ㎃
BA1-D212		100.0	50 Ω	150 ㎃
BA1-D213		199.9	100 Ω	150 ㎃

※ Accuracy: ± 0.2% of present value ± 1 digit (23 ℃ ± 5 ℃)

EM310

Specifications

Model	EM310
Appearance	
Power voltage	24 V d.c. 500 ㎃
Communication method	Asynchronous serial communication (RS232C)
Communication speed	38,400 bps
Communication distance	Max. 5 m
Setting method	Front switch operation method
Storage medium	USB memory stick
File system	FAT16, 32 support
Internal memory	32 Mbyte (Non-volatile)
Applicable products	TH500, TH300, TD500, TS500 (However, TD500 and TH300 only support RS232 products)

CV250

Specifications

Model	CV250
Appearance	
Power voltage	100 / 240 V a.c. 50/60 ㎐
Power consumption	Approx. 3 VA
Input signal	RTD : Pt100 Ω (IEC751), DRY / WET each 1 year
Measuring range	Temperature : 0 ~ 100 ℃, Humidity : 0 ~ 100 % RH
Accuracy	Temperature : ±0.5 %, Humidity : ±1 % RH
Output signal	Individual temperature/humidity output (Current by suffix code / output selection), 4 - 20 ㎃ d.c. (load resistance max. 600 Ω), 1 - 5 V d.c (load resistance 1 ㎏ min)
Output compensation	±5 % (Offset correction by variable resistor)
Insulation resistance	Min. 20 ㎆ (500 V d.c.)
Dielectric strength	2500 V a.c. (power terminal-signal input/output terminal)
Ambient temperature & humidity	0 ~ 50 ℃, 35 ~ 85 % RH (without condensation)
Storage temperature	-25 ~ 65 ℃
Weight (g)	300

Suffix code

Model	Code	Content
CV250-	□	Temperature / Humidity Converter
Output signal	C	4-20 ㎃ d.c.
	V	1-5 V d.c.

CV310/300

Specifications

Model	CV310	CV300
Appearance		
W×H×D(㎜)	49.3×33.0×17.8	52.0 x 90.0 x 20.0
Power voltage	9-30 V d.c.	9 V, 300 mA d.c. Adapter (1.3 Ø DC Jack)
Max. communication speed	460800 bps	2400 ~ 115200 bps
Communication distance	Max. 1.2 km , 256 node connectable	Max. 1.5 km , 256 node connectable
Safety	Built-in 2kV protection device for RS232 and RS485 / RS422	1/2nd circuit insulation, Surge Protection Device Built-in, Automatically generate ±15 KV ESD Protection Line Drive signals
Function setting	2-wire / 4-wire, built-in terminal resistor use/not use, full / half-duplex	Two-line/four-line, built-in termination resistance can be set, such as oil, zero, full/half duplex, etc.
Setting switch	4 Pin Dip Switch	6 Pin Piano Type Dip-Switch
Weight (g)	24	Body : 60, Adapter : 300

HMCE-103

Specifications

Model	HMCE-103
Appearance	
CPU	PIC32MX695F512L
Memory	SRAM : 128 Kbit, Flash : 512 Kbit
Input voltage	5 V d.c. (±10 %)
Max. Current	Max. under 250 mA
RS232 communication	● Data communication / serial console male DB9 serial port , ● Communication speed : 2400 ~ 115200 bps, ● Flow control : None, ● Signal : TX, RX, GND신호 : TX, RX, GND
RS485 communication	● 2-wire half-duplex method for data communication, ● Communication speed : 2400 ~ 115200 bps, ● Flow control: DE/RE, ● Signal : TX+, TX-
RS-422 communication	● 4-wire full-duplex method for data communication, ● Communication speed : 2400 ~ 115200 bps, ● Flow control: None, ● Signal : TX+, RX+, TX-, RX-
Ethernet communication	● 10/100 Base-T Ethernet (RJ-45 Connector), ● Fluid IP support, ● It is possible to access many clients (up to 3), ● ARP, IP/ICMP, TCP, Telnet, DHCP
Ambient setting	Telnet or serial console interface
LED	● Power input display, ● Activation status display
Ambient temperature	-10 ~ 60 ℃
Storage temperature	-30 ~ 80 ℃
Certification standard	KCC-REM-NUX-HMCE-103
Warranty period	1 Year
Weight (g)	74

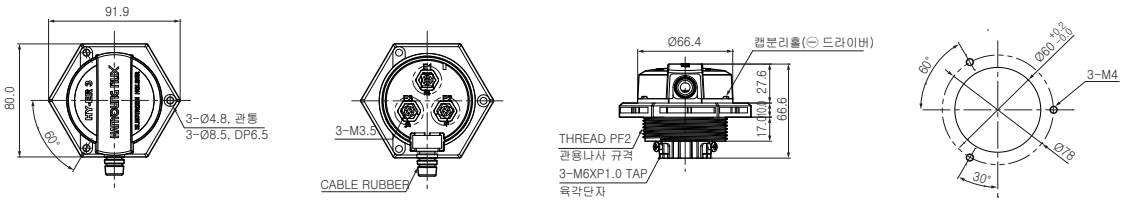
FS-3A

Specifications

Model	FS-3 A(High sensitivity)	FS-3 A(Low sensitivity)
Appearance		
Power voltage	110 V a.c. 50/60 ㎐ / 220 V a.c. 50/60 ㎐	
Allowable voltage fluctuation range	±10 % of power voltage	
Inter-electrode voltage (secondary voltage)	24 V a.c.	8 V a.c.
Power consumption	Approx. 3.2 VA	
Response time	80 ㎳ max. for operation, 160 ㎳ max. for return	
Inter-electrode operation resistance	0 - Approx. 27 KΩ	0 - Approx. 7 KΩ
Inter-electrode return resistance	Approx. 38 KΩ - ∞ Ω	Approx. 15 KΩ - ∞ Ω
Control output	Relay contact outputs: (1c): 250 V a.c 5 A (resistive load)	
Insulation resistance	Min. 100 ㏁ (500 V d.c Mega), conductive and exposed unfilled metal part	
Dielectric strength	2000 V a.c 50/60 ㎐ for 1 min (1st terminal - 2nd terminal)	
Vibration resistance	10 - 55 ㎐ (1 minute cycle) single amplitude: 0.76 ㎜ X, Y, Zeach direction 2 hours	
Shock resistance	300 ㎧	
Life	Mechanical : min. 5 million times (relay type), Electrical : 500,000 times min (resistive load)	
Ambient temperature & humidity	-10 ~ 50 ℃, 35 ~ 85 % RH (without condensation)	

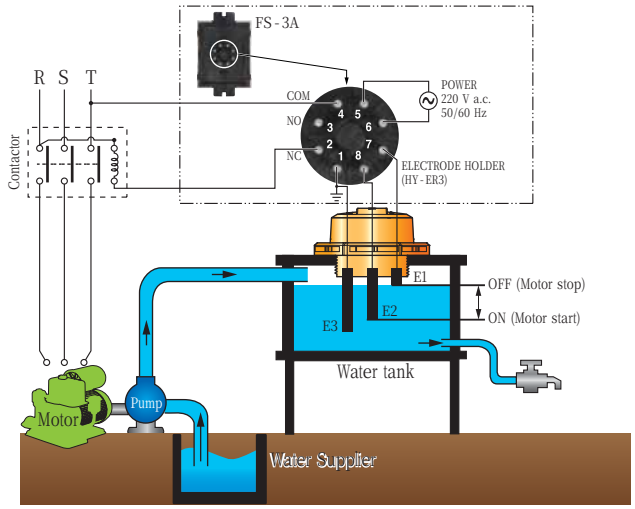
HY-ER3

Specifications

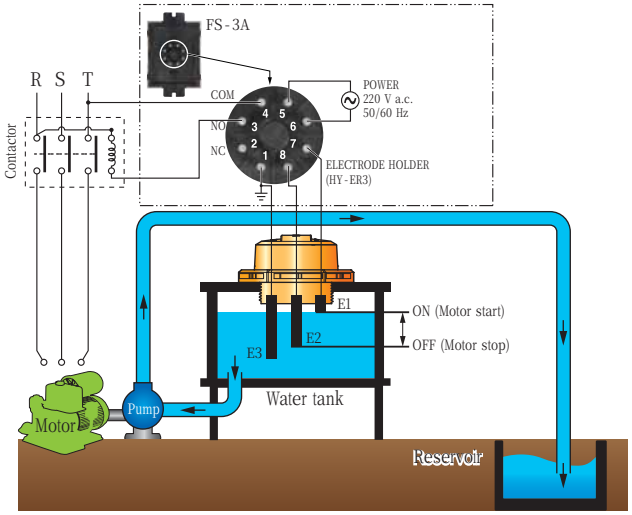
Appearance	Dimension
	

Usage example

- Example of Water Supply connection (with FS-3A)



- Example of Drain connection (with FS-3A)



UP series

Specifications

● Inductive DC 3 wire type CE

Model	NPN	UP8RM-1.5N□□	UP8RD-2N□□	UP12RM-2N□□	UP12RD-4N□□
	PNP	UP8RM-1.5P□□	UP8RD-2P□□	UP12RM-2P□□	UP12RD-4P□□
Appearance					
Shield		Shield	Non shield	Shield	Non shield
Standard sensing object (㎜)		Iron 8 X 8 X 1		Iron 12 X 12 X 1	
Sensing distance		1.5 ㎜	2 ㎜	2 ㎜	4 ㎜
Setting distance		0 ~ 1.2 ㎜	0 ~ 1.6 ㎜	0 ~ 1.6 ㎜	0 ~ 3.2 ㎜
Hysteresis		Less than 10% of sensing distance			
Response frequency		800 Hz		800 Hz	400 Hz
Power voltage		12-24 V d.c. (Usable voltage range 5 - 35 V d.c.)			
Control output		200 ㎃ max (Resistive load)			
Residual voltage		Max. 1.5 V			
Current consumption		Max. 6 ㎃			
Operation indication		Red LED			
Protection circuit		Power reversely connected protective circuit, surge protective circuit and over current protective circuit are built-in.			
Ambient temperature & humidity		-25 ~ 70 ℃ (Less than ±10 % of sensing distance at temperature 20 ℃), 35 ~ 85 % RH			
Insulation resistance		Min. 50 ㏁ (500 V d.c. mega standard)			
Dielectric strength		2000 V a.c. 50/60 ㎐ for 1 min (between the recharging part and case)			
Vibration resistance		10 - 55 ㎐ (1 min cycle, double amplitude : 1.5 ㎜ 2 hours for each of X, Y and Z directions)			
Shock resistance		500 ㎧ 3 times to each of X, Y and Z directions			
Degree of protection		IP67 (IEC 60529)			
Connection structure		● Cable type (standard cable length 2 m), ● Pin Connector type, ● Connector type			
Color		NPN : green, PNP : navy			
Material		● Case : stainless, ● Sensing surface : PBT, ● Cable holder : polyester elastomer		● Case : brass (chrome plating), ● Sensing surface: PBT, ● Cable holder : polyester elastomer	
Weight (g)	Cable	60	60	70	70
	Pin Connector	None	None	30	30
	Connector	None	None	30	30

● Inductive DC 3 wire type CE

Model	NPN	UP18RM-5N□□	UP18RD-8N□□	UP18RLM-5N□□	UP18RLD-8N□□
	PNP	UP18RM-5P□□	UP18RD-8P□□	UP18RLM-5P□□	UP18RLD-8P□□
Appearance					
Shield		Shield	Non shield	Shield	Non shield
Standard sensing object(㎜)		Iron 18×18×1	Iron 25×25×1	Iron 18×18×1	Iron 25×25×1
Sensing distance		5 ㎜	8 ㎜	5 ㎜	8 ㎜
Setting distance		0 ~ 4 ㎜	0 ~ 6.4 ㎜	0 ~ 4 ㎜	0 ~ 6.4 ㎜
Hysteresis		Less than 10% of sensing distance			
Response frequency		350 Hz	200 Hz	350 Hz	200 Hz
Power voltage		12-24 V d.c. (Usable voltage range 5 - 35 V d.c.)			
Control output		200 ㎃ max (Resistive load)			
Residual voltage		Max. 1.5 V			
Current consumption		Max. 6 ㎃			
Operation indication		Red LED			
Protection circuit		Power reversely connected protective circuit, surge protective circuit and over current protective circuit are built-in.			
Ambient temperature & humidity		-25 ~ 70 ℃ (Less than ±10 % of sensing distance at temperature 20 ℃), 35 ~ 85 % RH			
Insulation resistance		Min. 50 ㏁ (500 V d.c. mega standard)			
Dielectric strength		2,000 V a.c. 50/60 Hz for 1 min (Between the recharging part and case)			
Vibration resistance		10 - 55 ㎐ (1 min cycle, double amplitude : 1.5 ㎜ 2 hours for each of X, Y and Z directions)			
Shock resistance		500 ㎧ 3 times to each of X, Y and Z directions			
Degree of protection		IP67 (IEC 60529)			
Connection structure		● Cable type (standard cable length 2 m), ● Pin Connector type, ● Connector type			
Color		● NPN : green ● PNP : navy			
Material		● Case : brass (chrome plating), ● Sensing surface : PBT, ● Cable holder : polyester elastomer			
Weight (g)	Cable	120	120	140	140
	Pin Connector	80	80	100	100
	Connector	60	60	80	80

● Inductive DC 3 wire type CE

Model	NPN	UP30RM-10N□□	UP30RD-15N□□	UP30RLM-10N□□	UP30RLD-15N□□
	PNP	UP30RM-10P□□	UP30RD-15P□□	UP30RLM-10P□□	UP30RLD-15P□□
Appearance					
Shield		Shield	Non shield	Shield	Non shield
Standard sensing object (㎜)		Iron 30×30×1	Iron 45×45×1	Iron 30×30×1	Iron 45×45×1
Sensing distance		10 ㎜	15 ㎜	10 ㎜	15 ㎜
Setting distance		0 ~ 8 ㎜	0 ~ 12 ㎜	0 ~ 8 ㎜	0 ~ 12 ㎜
Hysteresis		Less than 10% of sensing distance			
Response frequency		250 Hz	100 Hz	250 Hz	100 Hz
Power voltage		12-24 V d.c. (Usable voltage range 5 - 35 V d.c.)			
Control output		200 ㎃ max (Resistive load)			
Residual voltage		Max. 1.5 V			
Current consumption		Max. 6 ㎃			
Operation indication		Red LED			
Protection circuit		● Power reverse connection protection circuit, ● Surge protection circuit, ● Over-current protection circuit built in			
Ambient temperature & humidity		-25 ~ 70 ℃ (Less than ±10 % of sensing distance at temperature 20 ℃), 35 ~ 85 %RH			
Insulation resistance		Min. 50 ㏁ (500 V d.c. mega standard)			
Dielectric strength		2000 V a.c. 50/60 ㎐ for 1 min (between the recharging part and case)			
Vibration resistance		10 - 55 ㎐ (1 min cycle, double amplitude : 1.5 ㎜ 2 hours for each of X, Y and Z directions)			
Shock resistance		500 ㎧ 3 times to each of X, Y and Z directions			
Degree of protection		IP67 (IEC 60529)			
Connection structure		● Cable type (standard cable length 2 m), ● Pin Connector type, ● Connector type			
Color		● NPN : green ● PNP : navy			
Material		● Case : brass (chrome plating) ● Sensing surface : PBT ● Cable holder : polyester elastomer			
Weight (g)	Cable	170	170	220	220
	Pin Connector	130	130	180	180
	Connector	150	150	200	200

● Inductive DC 2 wire type (Polarity / No polarity) CE

Model	Polar	UP8RM-1.5T□□	UP8RD-2T□□	UP12RM-2T□□	UP12RD-4T□□
	No polarity	-	-	UP12RM-2U□□	UP12RD-4U□□
Appearance					
Shield		Shield	Non shield	Shield	Non shield
Standard sensing object (㎜)		Iron 8×8×1	Iron 8×8×1	Iron 12×12×1	Iron 12×12×1
Sensing distance		1.5 ㎜	2 ㎜	2 ㎜	4 ㎜
Setting distance		0 ~ 1.2 ㎜	0 ~ 1.6 ㎜	0 ~ 1.6 ㎜	0 ~ 3.2 ㎜
Hysteresis		Less than 10% of sensing distance			
Response frequency		800 Hz	800 Hz	800 Hz	400 Hz
Power voltage		12-24 V d.c. (Usable voltage range 5 - 30 V d.c.)			
Control output		100 ㎃ max (Resistive load)			
Residual voltage		● T(Polarity) : max. 3.5 V ● U(No polarity) : max. 5 V			
Leakage current		Max. 1 ㎃			
Operation indication		Red LED			
Protection circuit		Surge protective circuit and over current protective circuit are built-in.			
Ambient temperature & humidity		-25 ~ 70 ℃ (Less than ±10 % of sensing distance at temperature 20 ℃), 35 ~ 85 % RH			
Insulation resistance		Min. 50 ㏁ (500 V d.c. mega standard)			
Dielectric strength		2,000 V a.c. 50/60 Hz for 1 min (between the recharging part and case)			
Vibration resistance		10 - 55 ㎐ (1 min cycle, double amplitude: 1.5 ㎜ 2 hours for each of X, Y and Z directions)			
Shock resistance		500 ㎧ 3 times to each of X, Y and Z directions			
Degree of protection		IP67 (IEC 60529)			
Connection structure		● Cable type (standard cable length 2 m), ● Pin Connector type, ● Connector type			
Color		● NO : green ● NC : navy			
Material		● Case: stainless ● Sensing surface: PBT ● Cable holder : polyester elastomer		● Case: brass (chrome plating) ● Sensing surface: PBT ● Cable holder : polyester elastomer	
Weight (g)	Cable	60		70	
	Pin Connector	None		30	
	Connector	None		30	

● Inductive DC 2 wire type (Polarity / No polarity) CE

Model	Polar	UP18RM-5T□□	UP18RD-8T□□	UP18RLM-5T□□	UP18RLD-8T□□
	No polarity	UP18RM-5U□□	UP18RD-8U□□	UP18RLM-5U□□	UP18RLD-8U□□
Appearance					
Shield		Shield	Non shield	Shield	Non shield
Standard sensing object (㎜)		Iron 18×18×1	Iron 25×25×1	Iron 18×18×1	Iron 25×25×1
Sensing distance		5 ㎜	8 ㎜	5 ㎜	8 ㎜
Setting distance		0 ~ 4 ㎜	0 ~ 6.4 ㎜	0 ~ 4 ㎜	0 ~ 6.4 ㎜
Hysteresis		Less than 10% of sensing distance			
Response frequency		350 Hz	200 Hz	350 Hz	200 Hz
Power voltage		12-24 V d.c. (Usable voltage range 5 - 30 V d.c.)			
Control output		100 ㎃ max (Resistive load)			
Residual voltage		● T (Polarity) : max. 3.5 V, ● U (no polarity): max. 5 V			
Leakage current		Max. 1 ㎃			
Operation indication		Red LED			
Protection circuit		Surge protective circuit and over current protective circuit are built-in.			
Ambient temperature & humidity		-25 ~ 70 ℃ (Less than ±10 % of sensing distance at temperature 20 ℃), 35 ~ 85 % RH			
Insulation resistance		Min. 50 ㏁ (500 V d.c. mega standard)			
Dielectric strength		2,000 V a.c. 50/60 Hz for 1 min (between the recharging part and case)			
Vibration resistance		10 - 55 ㎐ (1 min cycle, double amplitude : 1.5 ㎜ 2 hours for each of X, Y and Z directions)			
Shock resistance		500 ㎧ 3 times to each of X, Y and Z directions			
Degree of protection		IP67 (IEC 60529)			
Connection structure		● Cable type (standard cable length 2 m), ● Pin Connector type, ● Connector type			
Color		● NO : green ● NC : navy			
Material		● Case : brass (chrome plating) ● Sensing surface : PBT ● Cable holder : polyester elastomer			
Weight (g)	Cable	120	120	140	140
	Pin Connector	80	80	100	100
	Connector	60	60	80	80

● Inductive DC 2 wire type (Polarity / No polarity) CE

Model	Polar	UP30RM-10T□□	UP30RD-15T□□	UP30RLM-10T□□	UP30RLD-15T□□
	No polarity	UP30RM-10U□□	UP30RD-15U□□	UP30RLM-10U□□	UP30RLD-15U□□
Appearance					
Shield		Shield	Non shield	Shield	Non shield
Standard sensing object (㎜)		Iron 30×30×1	Iron 45×45×1	Iron 30×30×1	Iron 45×45×1
Sensing distance		10 ㎜	15 ㎜	10 ㎜	15 ㎜
Setting distance		0 ~ 8 ㎜	0 ~ 12 ㎜	0 ~ 8 ㎜	0 ~ 12 ㎜
Hysteresis		Less than 10% of sensing distance			
Response frequency		250 Hz	100 Hz	250 Hz	100 Hz
Power voltage		12-24 V d.c. (Usable voltage range 5 - 30 V d.c.)			
Control output		100 ㎃ max (Resistive load)			
Residual voltage		● T (polarity): max. 3.5 V, ● U (no polarity): max. 5 V			
Leakage current		Max. 1 ㎃			
Operation indication		Red LED			
Protection circuit		Surge protective circuit and over current protective circuit are built-in.			
Ambient temperature & humidity		-25 ~ 70 ℃ (Less than ±10 % of sensing distance at temperature 20 ℃), 35 ~ 85 % RH			
Insulation resistance		Min. 50 ㏁ (500 V d.c. mega standard)			
Dielectric strength		2,000 V a.c. 50/60 Hz for 1 min (between the recharging part and case)			
Vibration resistance		10 - 55 ㎐ (1 min cycle, double amplitude : 1.5 ㎜ 2 hours for each of X, Y and Z directions)			
Shock resistance		500 ㎧ 3 times to each of X, Y and Z directions			
Degree of protection		IP67 (IEC 60529)			
Connection structure		● Cable type (standard cable length 2 m), ● Pin Connector type, ● Connector type			
Color		● NO : green ● NC : navy			
Material		● Case : brass (chrome plating) ● Sensing surface : PBT ● Cable holder: polyester elastomer			
Weight (g)	Cable	170		220	
	Pin Connector	130		180	
	Connector	150		200	

● Inductive AC 2 wire type CE

Model		UP12RM-2A□□	UP12RD-4A□□
Appearance			
Shield		Shield	Non shield
Standard sensing object (㎜)		Iron 12×12×1	
Sensing distance		2 ㎜	4 ㎜
Setting distance		0 ~ 1.6 ㎜	0 ~ 3.2 ㎜
Hysteresis		Less than 10 % of sensing distance	
Response frequency		20 Hz	
Power voltage		100-240 V a.c. 50-60 Hz (Usable voltage range 90 - 250 V a.c. 50-60 Hz)	
Control output		200 ㎃ max (Resistive load)	
Residual voltage		Max. 10 V	
Leakage current		Max. 2.2 ㎃	
Operation indication		Red LED	
Protection circuit		Surge protective circuit built-in.	
Ambient temperature & humidity		-25 ~ 70 ℃ (less than ±10 % of sensing distance at temperature 20 ℃), 35 ~ 85 %RH	
Insulation resistance		Min. 50 ㏁ (500 V d.c. mega standard)	
Dielectric strength		2,000 V a.c. 50/60 Hz for 1 min (between the recharging part and case)	
Vibration resistance		10 - 55 ㎐ (1 min cycle, double amplitude: 1.5 ㎜ 2 hours for each of X, Y and Z directions)	
Shock resistance		500 ㎧ 3 times to each of X, Y and Z directions	
Degree of protection		IP67 (IEC 60529)	
Connection structure		● Cable type (standard cable length 2 m), ● Pin Connector type, ● Connector type	
Color		● NO : green ● NC : navy	
Material		● Case : brass (chrome plating) ● Sensing surface : PBT ● Cable holder : polyester elastomer	
Weight (g)	Cable	70	70
	Pin Connector	30	30
	Connector	30	30

● Inductive AC 2 wire type CE

Model		UP18RM-5A□□	UP18RD-8A□□	UP18RLM-5A□□	UP18RLD-8A□□
Appearance					
Shield		Shield	Non shield	Shield	Non shield
Standard sensing object (㎜)		Iron 18×18×1	Iron 25×25×1	Iron 18×18×1	Iron 25×25×1
Sensing distance		5 ㎜	8 ㎜	5 ㎜	8 ㎜
Setting distance		0 ~ 4 ㎜	0 ~ 6.4 ㎜	0 ~ 4 ㎜	0 ~ 6.4 ㎜
Hysteresis		Less than 10 % of sensing distance			
Response frequency		20 Hz			
Power voltage		100-240 V a.c. 50-60 Hz (Usable voltage range 90 - 250 V a.c. 50-60 Hz)			
Control output		Max. 200 ㎃ (resistive load)			
Residual voltage		Max. 10 V			
Leakage current		Max. 2.2 ㎃			
Operation indication		Red LED			
Protection circuit		Surge protective circuit built-in.			
Ambient temperature & humidity		-25 ~ 70 ℃ (less than ±10 % of sensing distance at temperature 20 ℃), 35 ~ 85 %RH			
Insulation resistance		Min. 50 ㏁ (500 V d.c. mega standard)			
Dielectric strength		2000 V a.c. 50/60 ㎐ for 1 min (between the recharging part and case)			
Vibration resistance		10 - 55 ㎐ (1 min cycle, double amplitude : 1.5 ㎜ 2 hours for each of X, Y and Z directions)			
Shock resistance		500 ㎧ 3 times to each of X, Y and Z directions			
Degree of protection		IP67 (IEC 60529)			
Connection structure		● Cable type (standard cable length 2 m), ● Pin Connector type, ● Connector type			
Color		● NO : green ● NC : navy			
Material		● Case : brass (chrome plating) ● Sensing surface : PBT ● Cable holder : polyester elastomer			
Weight (g)	Cable	120		140	
	Pin Connector	80		100	
	Connector	60		80	

● Inductive AC 2 wire type CE

Model		UP30RM-10A□□	UP30RD-15A□□	UP30RLM-10A□□	UP30RLD-15A□□
Appearance					
Shield		Shield	Non shield	Shield	Non shield
Standard sensing object (㎜)		Iron 30×30×1	Iron 45×45×1	Iron 30×30×1	Iron 45×45×1
Sensing distance		10 ㎜	15 ㎜	10 ㎜	15 ㎜
Setting distance		0 ~ 8 ㎜	0 ~ 12 ㎜	0 ~ 8 ㎜	0 ~ 12 ㎜
Hysteresis		Less than 10 % of sensing distance			
Response frequency		20 Hz			
Power voltage		100-240 V a.c. 50-60 Hz (Usable voltage range 90 - 250 V a.c. 50-60 Hz)			
Control output		Max. 200 ㎃ (Resistive load)			
Residual voltage		Max. 10 V			
Leakage current		Max. 2.2 ㎃			
Operation indication		Red LED			
Protection circuit		Surge protective circuit built-in.			
Ambient temperature & humidity		-25 ~ 70 ℃ (Less than ±10 % of sensing distance at temperature 20 ℃), 35 ~ 85 % RH			
Insulation resistance		Min. 50 ㏁ (500 V d.c. mega standard)			
Dielectric strength		2000 V a.c. 50/60 ㎐ for 1 min (between the recharging part and case)			
Vibration resistance		10 - 55 ㎐ (1 min cycle, double amplitude: 1.5 ㎜ 2 hours for each of X, Y and Z directions)			
Shock resistance		500 ㎧² 3 times to each of X, Y and Z directions			
Degree of protection		IP67 (IEC 60529)			
Connection structure		● Cable type (standard cable length 2 m), ● Pin Connector type, ● Connector type			
Color		● NO : green ● NC : navy			
Material		● Case : brass (chrome plating) ● Sensing surface : PBT ● Cable holde r: polyester elastomer			
Weight (g)	Cable	170	170	220	220
	Pin Connector	130	130	180	180
	Connector	150	150	200	200

Suffix code (Round type)

Model	Code	Content
UP	□ □ □ □ □ □	Inductive Type Proximity Sensor
Sensing area size	8	M8
	12	M12
	18	M18
	30	M30
Structure type	RM	Round type Shield
	RD	Round type Non Shield
	RLM	Long round type Shield (M8 and M12 are excluded)
	RLD	Long round type Non Shield (M8 and M12 are excluded)
Sensing distance	1.5	only with UP8-RM1.5
	2	only with UP8-RD2, UP12-RM2
	4	only with UP12-RD4
	5	only with UP18-RM5, UP18-RLM5
	8	only with UP18-RD8, UP18-RLD8
	10	only with UP30-RM10, UP30-RLM10
	15	only with UP30-RD15, UP30-RLD15
Power and output type	N	DC NPN output
	P	DC PNP output
	A	AC 2 wire type
	T	DC 2 wire type (polarity)
	U	DC 2 wire type (no polarity) ※ But M8 is excluded
Output state	A	Normal Open (N.O)
	C	Normal Close (N.C)
Connection structure		None (Cable type)
	CR	Pin Connector type
	C	Connector type

※ Note) M8(8)8) type is cable type only.

UP series

Specifications

● Inductive DC 3 wire type CE

Model				
	NPN	UP12S-4N □ □	UP18S-5N □ □	UP18S-8N □ □
	PNP	UP12S-4P □ □	UP18S-5P □ □	UP18S-8P □ □
Appearance				
Standard sensing object(㎜)		Iron 12X12X1	Iron 18X18X1	Iron 25X25X1
Sensing distance		4 ㎜	5 ㎜	8 ㎜
Setting distance		0 ~ 3.2 ㎜	0 ~ 4 ㎜	0 ~ 6.4 ㎜
Hysteresis		Less than 10 % of sensing distance		
Response frequency		800 ㎐	350 ㎐	250 ㎐
Power voltage		12-24 V d.c. (Usable voltage range 5 - 35 V d.c.)		
Control output	Open/Close capacitance	200 ㎃ max (Resistive load)		
	Residual voltage	Max. 1.5 V		
Current consumption		Max. 6 ㎃		
Operation indication		Red LED		
Protective circuit		● Power reversely connected protective circuit, ● Surge protective circuit and over current protective circuit are built-in.		
Degree of protection		IP67 (IEC 60529)		
Connection structure		● Cable type (standard cable length 2 m), ● Pin Connector type		
Ambient temperature & humidity		-25 ~ 70 ℃ (Less than ±10 % of sensing distance at temperature 20 ℃), 35 ~ 85 %RH		
Insulation resistance		Min. 50 ㏁ (500 V d.c. mega standard)		
Dielectric strength		2000 V a.c. 50/60 ㎐ for 1 min (between the recharging part and case)		
Vibration resistance		10 ~ 55 ㎐ (1 min cycle, double amplitude : 1.5 mm 2 hours for each of X, Y and Z directions)		
Shock resistance		500 ㎧² 3 times to each of X, Y and Z directions		
Material		● Case : PBT resin, ● Cable holder : polyester elastomer		
Weight(g)	Cable type	45	60	60
	Pin Connector type	15	20	20

● Inductive DC 3 wire type CE

Model							
	NPN	UP25S-5N □ □	UP25S-8N □ □	UP25S-12N □ □	UP30S-10N □ □	UP30S-15N □ □	UP40S-20N □ □
	PNP	UP25S-5P □ □	UP25S-8P □ □	UP25S-12P □ □	UP30S-10P □ □	UP30S-15P □ □	UP40S-20P □ □
Appearance							
Standard sensing object(㎜)		Iron 25 X 25 X 1	Iron 30 X 30 X 1	Iron 35 X 35 X 1	Iron 30 X 30 X 1	Iron 45 X 45 X 1	Iron 60 X 60 X 1
Sensing distance		5 ㎜	8 ㎜	12 ㎜	10 ㎜	15 ㎜	20 ㎜
Setting distance		0 ~ 4 ㎜	0 ~ 6.4 ㎜	0 ~ 9.6 ㎜	0 ~ 8 ㎜	0 ~ 12 ㎜	0 ~ 16 ㎜
Hysteresis		Less than 10% of sensing distance					
Response frequency		350 ㎐	250 ㎐	200 ㎐	250 ㎐	100 ㎐	100 ㎐
Power voltage		12-24 V d.c. (Usable voltage range 5 - 35 V d.c.)					
Control output	Open/Close capacitance	200 ㎃ max (Resistive load)					
	Residual voltage	Max. 1.5 V					
Current consumption		Max. 6 ㎃					
Operation indication		Red LED					
Protective circuit		● Power reversely connected protective circuit, ● Surge protective circuit and over current protective circuit are built-in.					
Degree of protection		IP67 (IEC 60529)					
Connection structure		● Cable type (standard cable length 2 m), ● Pin Connector type					
Ambient temperature & humidity		-25 ~ 70 ℃ (less than ±10 % of sensing distance at temperature 20 ℃), 35 ~ 85 % RH					
Insulation resistance		Min. 50 ㏁ (500 V d.c. mega standard)					
Dielectric strength		2,000Va.c. 50/60 Hz for 1 min (between the recharging part and case)					
Vibration resistance		10 ~ 55 ㎐ (1 min cycle, double amplitude : 1.5 mm 2 hours for each of X, Y and Z directions)					
Shock resistance		500 ㎧² 3 times to each of X, Y and Z directions					
Material		● Case : PBT resin, ● Cable holder : polyester elastomer					
Weight(g)	Cable type	80	80	80	90	90	110
	Pin Connector type	40	40	40	60	60	80

● Inductive DC 2 wire type CE

Model				
	NPN	UP12S-4T □ □	UP18S-5T □ □	UP18S-8T □ □
	PNP	UP12S-4U □ □	UP18S-5U □ □	UP18S-8U □ □
Appearance				
Standard sensing object(㎜)		Iron 12X12X1	Iron 18X18X1	Iron 25X25X1
Sensing distance		4 ㎜	5 ㎜	8 ㎜
Setting distance		0 ~ 3.2 ㎜	0 ~ 4 ㎜	0 ~ 6.4 ㎜
Hysteresis		Less than 10 % of sensing distance		
Response frequency		500 ㎐	350 ㎐	250 ㎐
Power voltage		12-24 V d.c. (Usable voltage range 5 - 30 V d.c.)		
Control output	Open/Close capacitance	Max. 100 ㎃ (resistive load)		
	Residual voltage	● T(Polarity) : max. 3.5 V ● U(No polarity) : max. 5 V		
Current consumption		1 ㎃ or less		
Operation indication		Red LED		
Protective circuit		● Power reversely connected protective circuit, ● Surge protective circuit and over current protective circuit are built-in.		
Degree of protection		IP67 (IEC 60529)		
Connection structure		● Cable type (standard cable length 2 m), ● Pin Connector type		
Ambient temperature & humidity		-25 ~ 70 ℃ (less than ±10 % of sensing distance at temperature 20 ℃), 35 ~ 85 %RH		
Insulation resistance		Min. 50 ㏁ (500 V d.c. mega standard)		
Dielectric strength		2000 V a.c. 50/60 ㎐ for 1 min (between the recharging part and case)		
Vibration resistance		10 ~ 55 ㎐ (1 min cycle, double amplitude: 1.5 mm 2 hours for each of X, Y and Z directions)		
Shock resistance		500 ㎧ 3 times to each of X, Y and Z directions		
Material		● Case : PBT resin, ● Cable holder : polyester elastomer		
Weight(g)	Cable type	45	60	60
	Pin Connector type	15	20	20

● Inductive DC 2 wire type CE

Model							
	NPN	UP25S-5T □ □	UP25S-8T □ □	UP25S-12T □ □	UP30S-10T □ □	UP30S-15T □ □	UP40S-20T □ □
	PNP	UP25S-5U □ □	UP25S-8U □ □	UP25S-12U □ □	UP30S-10U □ □	UP30S-15U □ □	UP40S-20U □ □
Appearance							
Standard sensing object(㎜)		Iron 25 X 25 X 1	Iron 30 X 30 X 1	Iron 35 X 35 X 1	Iron 30 X 30 X 1	Iron 45 X 45 X 1	Iron 60 X 60 X 1
Sensing distance		5 ㎜	8 ㎜	12 ㎜	10 ㎜	15 ㎜	20 ㎜
Setting distance		0 ~ 4 ㎜	0 ~ 6.4 ㎜	0 ~ 9.6 ㎜	0 ~ 8 ㎜	0 ~ 12 ㎜	0 ~ 16 ㎜
Hysteresis		Less than 10 % of sensing distance					
Response frequency		350 ㎐	250 ㎐	200 ㎐	250 ㎐	100 ㎐	100 ㎐
Power voltage		12-24 V d.c. (usable voltage range 5 - 30 V d.c.)					
Control output	Open/Close capacitance	Max. 100 ㎃ (resistive load)					
	Residual voltage	● T (polarity): max. 3.5 V ● U (Non polarity): max. 5 V					
Current consumption		Max. 1 ㎃					
Operation indication		Red LED					
Protective circuit		● Power reversely connected protective circuit, ● Surge protective circuit and over current protective circuit are built-in.					
Degree of protection		IP67 (IEC 60529)					
Connection structure		● Cable type (standard cable length 2 m), ● Pin Connector type					
Ambient temperature & humidity		-25 ~ 70 ℃ (less than ±10 % of sensing distance at temperature 20 ℃), 35 ~ 85 %RH					
Insulation resistance		Min. 50 ㏁ (500 V d.c. mega standard)					
Dielectric strength		2000 V a.c. 50/60 ㎐ for 1 min (between the recharging part and case)					
Vibration resistance		10 ~ 55 ㎐ (1 min cycle, double amplitude : 1.5 mm 2 hours for each of X, Y and Z directions)					
Shock resistance		500 ㎧ 3 times to each of X, Y and Z directions					
Material		● Case : PBT resin, ● Cable holder : polyester elastomer					
Weight(g)	Cable type	80	80	80	90	90	110
	Pin Connector type	40	40	40	60	60	80

● Inductive AC 2 wire type CE

Model	For AC	UP25S-5A □ □	UP25S-8A □ □	UP30S-10A □ □
Appearance				
Standard sensing object(㎜)		Iron 25 X 25 X 1		Iron 30 X 30 X 1
Sensing distance		5 ㎜	8 ㎜	10 ㎜
Setting distance		0 ~ 4 ㎜	0 ~ 6.4 ㎜	0 ~ 8 ㎜
Hysteresis		Less than 10% of sensing distance		
Response frequency		20 ㎐		
Power voltage		100-240 V a.c. 50-60 Hz (Usable voltage range 90 - 250 V a.c.50-60 Hz)		
Control output	Open/Close capacitance	Max. 200 ㎃ (resistive load)		
	Residual voltage	Max. 10 V a.c.		
Current consumption		Max. 2.2 ㎃		
Operation indication		Red LED		
Protective circuit		Surge protective circuit is built-in.		
Degree of protection		IP67 (IEC 60529)		
Connection structure		● Cable type (standard cable length 2 m), ● Pin Connector type		
Ambient temperature & humidity		-25 ~ 70 ℃ (less than ±10 % of sensing distance at temperature 20 ℃), 35 ~ 85 %RH		
Insulation resistance		Min. 50 ㏁ (500 V d.c. mega standard)		
Dielectric strength		2,000 V a.c. 50/60 Hz for 1 min (between the recharging part and case)		
Vibration resistance		10 ~ 55 ㎐ (1 min cycle, double amplitude : 1.5 mm 2 hours for each of X, Y and Z directions)		
Shock resistance		500 ㎧² X·Y·Z 3 times to each of X, Y and Z directions		
Material		● Case : PBT resin, ● Cable holder : polyester elastomer		
Weight(g)	Cable type	80	80	90
	Pin Connector type	40	40	80

● Inductive AC 2 wire type CE

Model	For AC	UP30S-15A □ □	UP40S-20A □ □
Appearance			
Standard sensing object(㎜)		Iron 45 X 45 X 1	Iron 60 X 60 X 1
Sensing distance		15 ㎜	20 ㎜
Setting distance		0 ~ 12 ㎜	0 ~ 16 ㎜
Hysteresis		Less than 10% of sensing distance	
Response frequency		20 ㎐	
Power voltage		100-240 V a.c. 50-60 Hz (Usable voltage range 90 - 250 V a.c.50-60 Hz)	
Control output	Open/Close capacitance	Max. 200 ㎃ (resistive load)	
	Residual voltage	Max. 10 V a.c.	
Current consumption		Max. 2.2 ㎃	
Operation indication		Red LED	
Protective circuit		Surge protective circuit is built-in.	
Degree of protection		IP67 (IEC 60529)	
Connection structure		● Cable type (standard cable length 2 m), ● Pin Connector type	
Ambient temperature & humidity		-25 ~ 70 ℃ (less than ±10 % of sensing distance at temperature 20 ℃), 35 ~ 85 %RH	
Insulation resistance		Min. 50 ㏁ (500 V d.c. mega standard)	
Dielectric strength		2,000 V a.c. 50/60 Hz for 1 min (between the recharging part and case)	
Vibration resistance		10 ~ 55 ㎐ (1 min cycle, double amplitude: 1.5 mm 2 hours for each of X, Y and Z directions)	
Shock resistance		500 ㎧² 3 times to each of X, Y and Z directions	
Material		● Case : PBT resin, ● Cable holder : polyester elastomer	
Weight(g)	Cable type	90	110
	Pin Connector type	60	80

Suffix code(Square type)

Model	Code							Content
UP	□	□	□	□	□	□	□	Inductive Type Proximity Sensor
Sensing area size	12							12(W) × 12(H) ㎜
	18							18(W) × 18(H) ㎜
	25							25(W) × 25(H) ㎜
	30							30(W) × 30(H) ㎜
	40							40(W) × 40(H) ㎜
Structure type		S						Square type
Sensing distance			2					2 ㎜ (only with UP8S-2)
			4					4 ㎜ (only with UP12S-4)
			5					5 ㎜ (only with UP18S-5, UP25S-5)
			8					8 ㎜ (only with UP18S-8, UP25S-8)
			10					10 ㎜ (only with UP30S-10)
			12					12 ㎜ (only with UP25S-12)
			15					15 ㎜ (only with UP30S-15)
			20					20 ㎜ (only with UP40S-20)
Power and output type				N				DC NPN output
				P				DC PNP output
				A				AC 2 wire type (but UP18S is excluded)
				T				DC 2 wire type (polarity)
				U				DC 2 wire type (no polarity)
Output state					A			Normal Open (NO)
					C			Normal Close (NC)
Sensing direction								Detect Front side
						U		Detect upper side (only available with the square type UP18S)
Connection structure								Cable type
							CR	Pin Connector type

UP series

Specifications

● Inductive DC 3 wire type / 2 wire type CE

Model		DC 3 wire type		DC 2 wire type	
		NPN	UP25F-8N□□	Polarity	UP25F-8T□□
		PNP	UP25F-8P□□	No polarity	UP25F-8U□□
Appearance					
Standard sensing object(㎜)		Iron 25 X 25 X 1			
Sensing distance		8 ㎜			
Setting distance		0 ~ 6.4 ㎜			
Hysteresis		Less than 10 % of sensing distance			
Response frequency		200 ㎐			
Power voltage		12-24 V d.c. (Usable voltage range 5 - 35 V d.c.)		12-24 V d.c. (Usable voltage range 5 - 30 V d.c.)	
Control output		200 ㎃ max (Resistive load)		100 ㎃ max (Resistive load)	
Residual voltage		Max. 1.5 V		● Polarity : max. 3.5 V, ● No polarity : max. 5 V	
Current consumption		Max. 6 mA		-	
Leakage current		-		Max. 1 mA	
Operation indication		Red LED			
Protection circuit		● Power reversely connected protective circuit, ● surge protective circuit and over current protective circuit are built-in.		● surge protective circuit and over current protective circuit are built-in.	
Ambient temperature & humidity		-25 ~ 70 ℃ (less than ±10 % of sensing distance at temperature 20 ℃), 35 ~ 85 %RH			
Insulation resistance		Min. 50 ㏁ (500 V d.c. mega standard)			
Dielectric strength		2,000 V a.c. 50/60 ㎐ for 1 min (between the recharging part and case)			
Vibration resistance		10 - 55 ㎐ (1 min cycle, double amplitude: 1.5 ㎜ 2 hours for each of X, Y and Z directions)			
Shock resistance		500 ㎧² X·Y·Z 3 times to each of X, Y and Z directions			
Degree of protection		IP67 (IEC 60529)			
Connection structure		● Cable type (standard cable length 2 m), ● Pin Connector type			
Color		● Polarity : green ● No polarity : navy			
Material		● Case : PBT resin ● Cable holder: polyester elastomer			
Weight(g)	Cable type	60		60	
	Pin Connector type	20		20	

● Inductive AC 2 wire type CE

Model		UP25F-8A□□
Appearance		
Standard sensing object(㎜)		Iron 25 X 25 X 1
Sensing distance		8 ㎜
Setting distance		0 ~ 6.4 ㎜
Hysteresis		Less than 10 % of sensing distance
Response frequency		20 ㎐
Power voltage		100-240 V a.c. 50-60 Hz (usable voltage range 90-250 V a.c. 50-60 Hz)
Control output		Max. 200 ㎃ (resistive load)
Residual voltage		Max. 10 V a.c.
Leakage current		Max. 2.2 ㎃
Operation indication		Red LED
Protection circuit		Surge protective circuit built-in.
Ambient temperature & humidity		-25 ~ 70 ℃ ((less than ±10 % of sensing distance at temperature 20 ℃), 35 ~ 85 % RH
Insulation resistance		Min. 50 ㏁ (500V d.c. mega standard)
Dielectric strength		2,000 V a.c. 50/60 ㎐ for 1 min (between the recharging part and case)
Vibration resistance		10 - 55 ㎐ (1 min cycle, double amplitude : 1.5 ㎜ 2 hours for each of X, Y and Z directions)
Shock resistance		500 ㎧ 3 times to each of X, Y and Z directions
Degree of protection		IP67 (IEC 60529)
Connection structure		● Cable type (standard cable length 2 m), ● Pin Connector type
Color		● NO : green, ● NC : navy
Material		● Case : PBT resin ● Cable holder : polyester elastomer
Weight(g)	Cable type	60
	Pin Connector type	20

Suffix code (Flat type)

Model	Code	Content
UP	□ □ □ □ □ □	Inductive Type Proximity Sensor
Sensing area size	25	Please refer to the dimension (25.7×49.0×10.5)
Structure type	F	Flat Type
Sensing distance	8	8 ㎜
Power and output type	N	DC NPN output
	P	DC PNP output
	A	AC 2 wire type
	T	DC 2 wire type (polarity)
	U	DC 2 wire type (no polarity)
Output state	A	Normal Open (NO)
	C	Normal Close (NC)
Connection structure		None (Cable type)
	CR	Pin Connector

CUP series CE

Specifications

● Capacitive DC 3 wire type

Model	NPN	CUP18R-8N□□	CUP18RP-8N□□	CUP30R-15N□□	CUP30RP-15N□□
	PNP	CUP18R-8P□□	CUP18RP-8P□□	CUP30R-15P□□	CUP30RP-15P□□
Appearance					
Shield		Non shield			
Standard sensing object (㎜)		Iron 50 X 50 X 1 (Grounded <earthed> state)			
Sensing distance		8 ㎜ (Volume variation)		15 ㎜ (Volume variation)	
Setting distance		0 ~ 6.4 ㎜		0 ~ 12 ㎜	
Hysteresis		Less than 20 % of sensing distance			
Response frequency		50Hz			
Power voltage		12-24 V d.c. (Usable voltage range 10 - 30 V d.c.)			
Control output		200 ㎃ max (Resistive load)			
Residual voltage		Max. 1.5 V			
Current consumption		Max. 10 ㎃			
Operation indication		Red LED			
Protection circuit		Power reversely connected protective circuit, surge protective circuit and over current protective circuit are built-in.			
Ambient temperature & humidity		-25 ~ 70 ℃ (less than ±10 % of sensing distance at temperature 20 ℃), 35 ~ 85 %RH			
Insulation resistance		Min. 50 ㏁ (500 V d.c. mega standard)			
Dielectric strength		2,000 V a.c. 50/60 Hz for 1 min (between the recharging part and case)			
Vibration resistance		10 - 55 ㎐ (1 min cycle, double amplitude : 1.5 ㎜ 2 hours for each of X, Y and Z directions)			
Shock resistance		500 ㎧ X·Y·Z 3 times to each of X, Y and Z directions			
Degree of protection		IP67 (IEC 60529)			
Connection structure		● Cable type (standard cable length 2 m), ● Pin Connector type, ● Connector type			
Color		● NPN : green ● PNP : navy			
Material		● CUP-18R/CUP-30R Case : brass (chrome plated) ● Detection surface : PBT ● CUP-18RP/CUP-30RP Integrated casing and detection surface: PBT			
Weight(g)	Cable type	70	70	120	120
	Pin Connector type	30	30	80	80

● Capacitive type, DC/AC dual usage 2 wire type

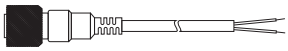
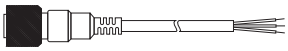
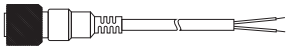
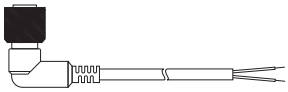
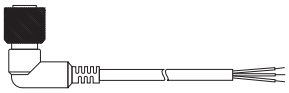
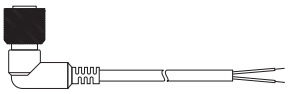
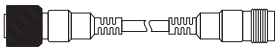
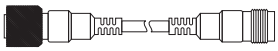
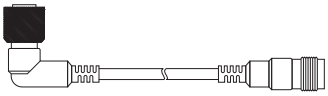
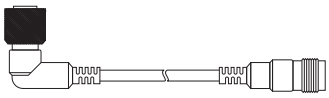
Model	CUP18R-8F□□	CUP18RP-8F□□	CUP30R-15F□□	CUP30RP-15F□□
Appearance				
Shield	Non shield			
Standard sensing object(㎜)	Iron 50 X 50 X 1 (Grounded <earthed> state)			
Sensing distance	8 ㎜ (Volume variation)		15 ㎜ (Volume variation)	
Setting distance	0 ~ 6.4 ㎜		0 ~ 12 ㎜	
Hysteresis	Less than 20% of sensing distance			
Response frequency	● DC : 40 ㎐ ● AC : 20 ㎐			
Power voltage	20-240 V a.c. 50-60 Hz/20-240 V d.c. (usable voltage range 18-250 V a.c. 50-50 Hz, 250 V d.c.)			
Control output	Switching capacity : 5-250 ㎃d.c. or less (resistive load), residual voltage : 7 V or less (AC/DC)			
Residual voltage	Max. 7 V (AC/DC)			
Leakage current	Max. 2 ㎃			
Operation indication	Red LED			
Protection circuit	Surge protective circuit built-in.			
Ambient temperature & humidity	-25 ~ 70 ℃ (less than ±10 % of sensing distance at temperature 20 ℃), 35 ~ 85 %RH			
Insulation resistance	Min. 50 ㏁ (500 V d.c. mega standard)			
Dielectric strength	2,000 V a.c. 50/60 Hz for 1 min (between the recharging part and case)			
Vibration resistance	10 - 55 ㎐ (1 min cycle, double amplitude : 1.5 ㎜ 2 hours for each of X, Y and Z directions)			
Shock resistance	500 ㎧ 3 times to each of X, Y and Z directions			
Degree of protection	IP67 (IEC 60529)			
Connection structure	● Cable type (standard cable length 2 m), ● Pin Connector type, ● Connector type			
Case	Brass (Chrome plating)	PTB resin	Brass (Chrome plating)	PTB resin
Color	● NO : green ● NC : navy	NO/NC: green	● NO: green ● NC : navy	NO/NC : green
Material	● CUP-18R/CUP-30R (Case: brass chrome plating, sensing surface: PBT resin) ● CUP-18RP/CUP-30RP (Case and sensing surface one body type: PBT resin)			
Weight(g) Cable type	70		120	
Weight(g) Pin Connector type	30		80	

Suffix code (Capacitive type)

Model	Code	Content
CUP -	□ □ □ □ □ □	Capacitive Type Proximity Sensor
Sensing area size	18	M18
	30	M30
Structure type	R	Round type (Brass chrome plating case)
	RP	Round type (Plastic case)
Sensing distance	8	8 ㎜ (only with CUP-18□-8)
	15	15 ㎜ (only with CUP-30□-15)
Power and output type	N	DC NPN output
	P	DC PNP output
	F	AC/DC 2 wire type (dual usage) (no polarity)
Output state	A	Normal Open (NO)
	C	Normal Close (NC)
Connection structure		None (Cable type)
	CR	Pin Connector type

Connector Cable

Specifications

Classification	Appearance	Model	Cable length	Usage power
Connector cable		AA2S-2M	2 m	AC 2 wire
		AA2S-5M	5 m	
		AD3S-2M	2 m	DC 3 wire
		AD3S-5M	5 m	
		AD2S-2M	2 m	DC 2 wire
		AD2S-5M	5 m	
		AA2A-2M	2 m	AC 2 wire
		AA2A-5M	5 m	
		AD3A-2M	2 m	DC 3 wire
		AD3A-5M	5 m	
		AD2A-2M	2 m	DC 2 wire
		AD2A-5M	5 m	
Relay cable		BA4S-2M	2 m	AC
		BA4S-5M	5 m	
		BD4S-2M	2 m	DC
		BD4S-5M	5 m	
		BA4A-2M	2 m	AC
		BA4A-5M	5 m	
		BD4A-2M	2 m	DC
		BD4A-5M	5 m	

Suffix code

Model	Code	Content
	□ □ □ □ □	Cable for Connecting proximity sensor
Cable	A	Connector cable
	B	Relay cable
Operating Voltage	A	AC
	D	DC
Number of wires	2	2 wires
	3	3 wires
	4	4 wires
Connector type	S	Straight type
	A	Angle type
Cable length	2M	2 m
	5M	5 m

PQ series RoHS2 NEW

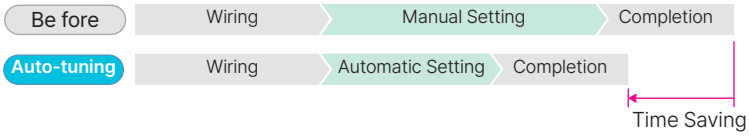
Easy-to-set sensitivity by Auto-tuning Function

Complicated initial setting is solved by the Auto-tuning function making users easy to set.
※Auto-tuning function works while the light enters

Auto-tuning starts by press B2 button for 3 seconds.

•AUTO-TUNING, THE SAVE TIME

In the previous models, users had to set the sensitivity by adjust volume.
PQ series has an automatic setting sensitivity function, allowing users to save time setting sensitivity.



•THROUGH BEAM / RETROREFLECTIVE

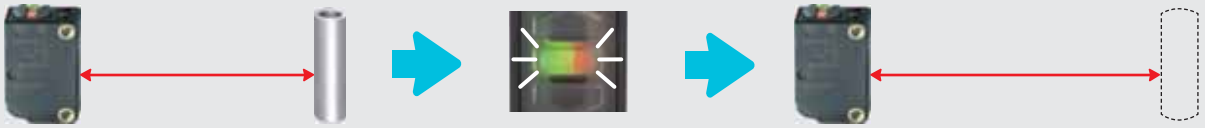
Holding B2 button for 3 seconds.

•DIFFUSE REFLECTIVE

Step 1
Holding B2 button for 3 seconds when there is a subject.

Step 2
Green, Red LED cross turn on check.

Step 3
Holding B2 button for 0.5 second when there is no subject.



Easy-to-set Button Type

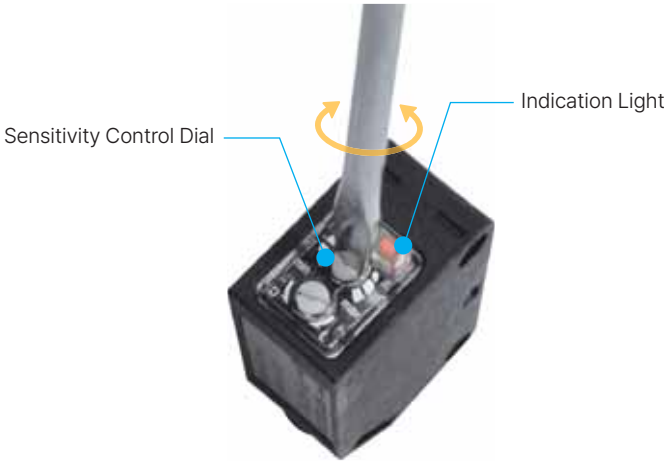
PQ series is button type which was improved from the previous dial type.

PQ series

- Improved Design for Comfortable Grip.
- Easy Operation.
- No Deviation in Sensitivity Control.
- Fine Tuning.

Dial Type

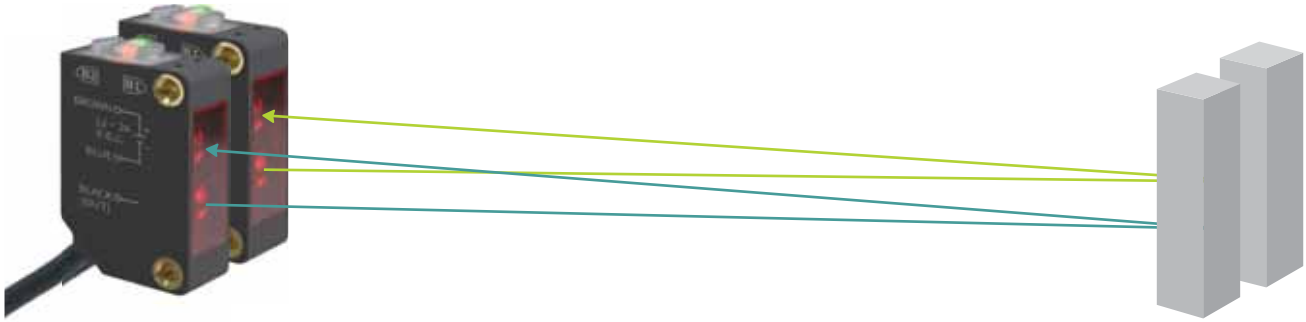
- Reguiring Tools for Sensitivity Control.
- Hard for Fine Tuning.
- Deviation might arise in Sensitivity Control.



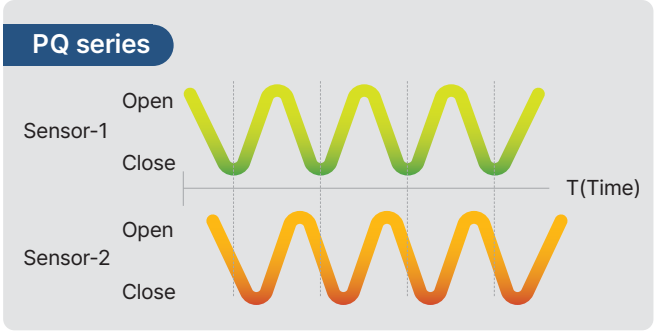
Mutual Interference Protection

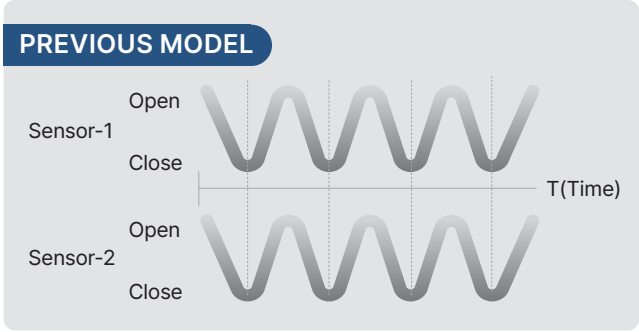
PQ series has mutual interference protection function so that each device is not affected by the others.

[Retroreflective, Diffuse Reflective]



•Floodlighting Cycle





Each device of PQ series(retroreflective type and diffuse reflective type) are not affected by the other devices, so it is possible to install closely.

Smartness that adjusts sensitivity by itself depending on the environment

AGC Function - Prevents production lines from stopping.

If unstable light reception continues for more than 20 seconds due to the optical axis being distorted or lens contaminated by external factors(water, dust, moisture, oil, etc.) the AGC function is turns on and stable light reception is achieved. This function provides convenience in maintenance.

Unstable Light Enterance

Stable Light Enterance

•AGC (Automatic Gain Control)

Unstable Light Entrance over 20 Seconds

▼

AGC Turned ON

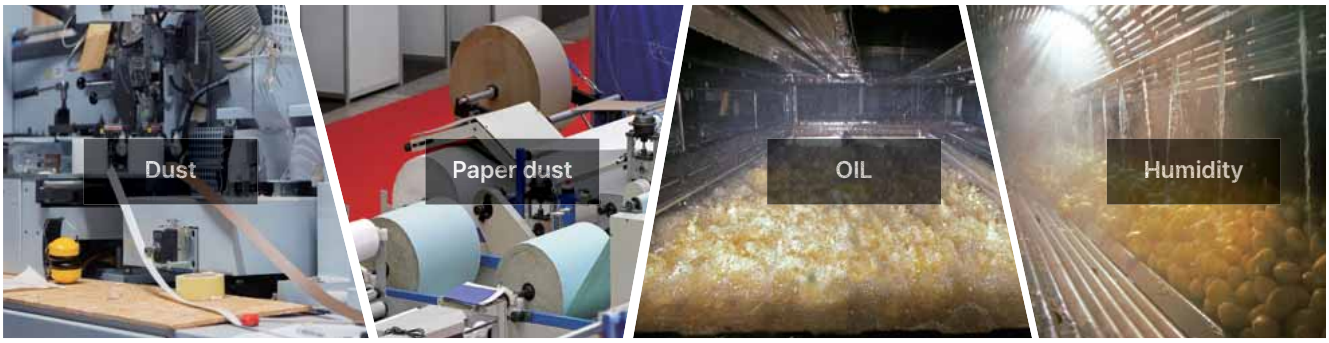
▼

Automatical Sensitivity Adjustment

▼

Stable Light Entrance

•Examples of environments that cause unstable light

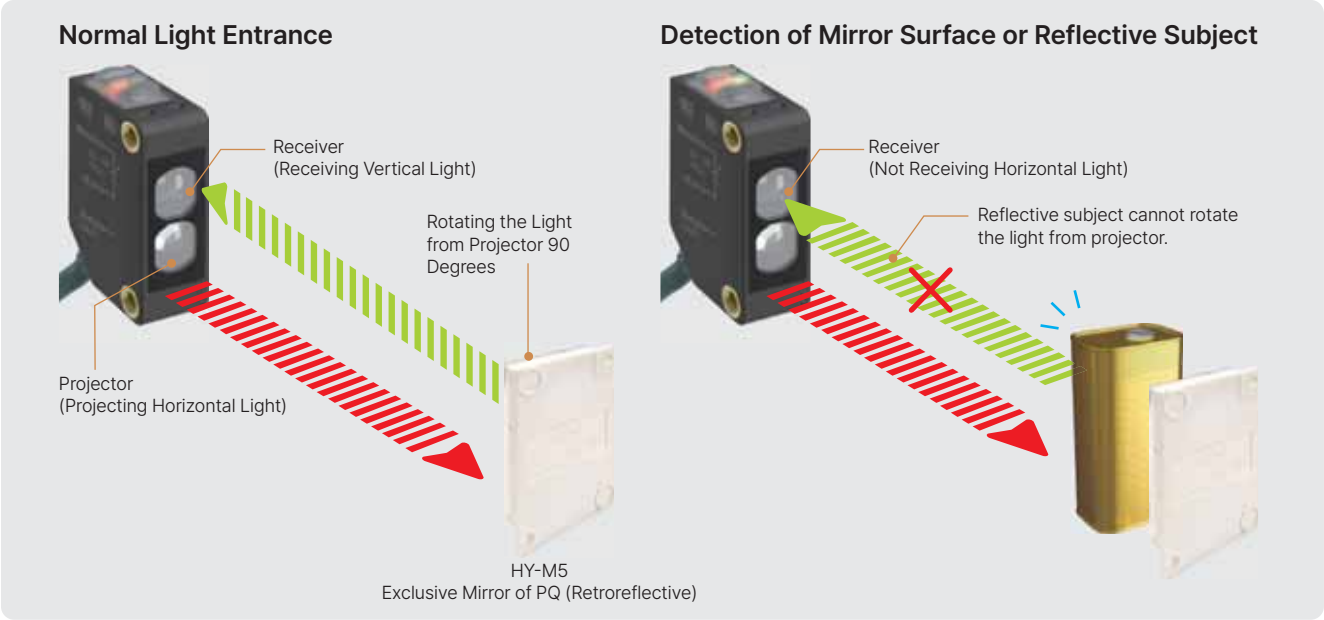


M.S.R Function for Precise Detection

MSR : **M**irror **S**urface **R**ejection

M.S.R(Mirror Surface Rejection) is a function of receiving reflected light from a exclusive mirror.
It enables mirror surface or reflective subject to be detected. Since it is not affected by the color and material of the subject, it allows stable detection.

•The Principle of M.S.R (Mirror Surface Rejection)



3 Types of Detection Method

PQ series has 3 types of detection method; through beam / retroreflective / diffuse reflective.

•Diffuse Reflective Type

•Retroreflective Type(MSR)

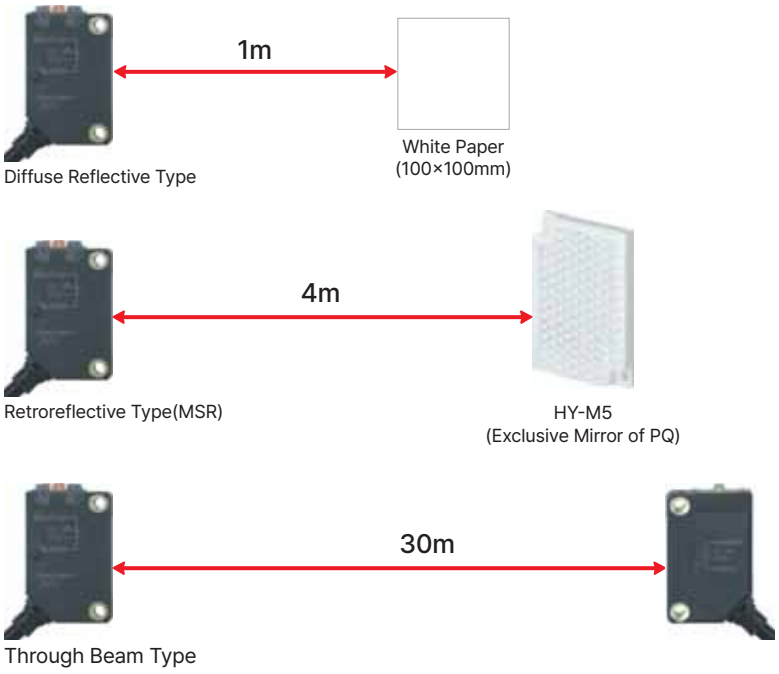
•Through Beam Type

Receiver

Projector

Maximum Sensing Distance

※Long-distance detection is possible by using a high-performance lens.

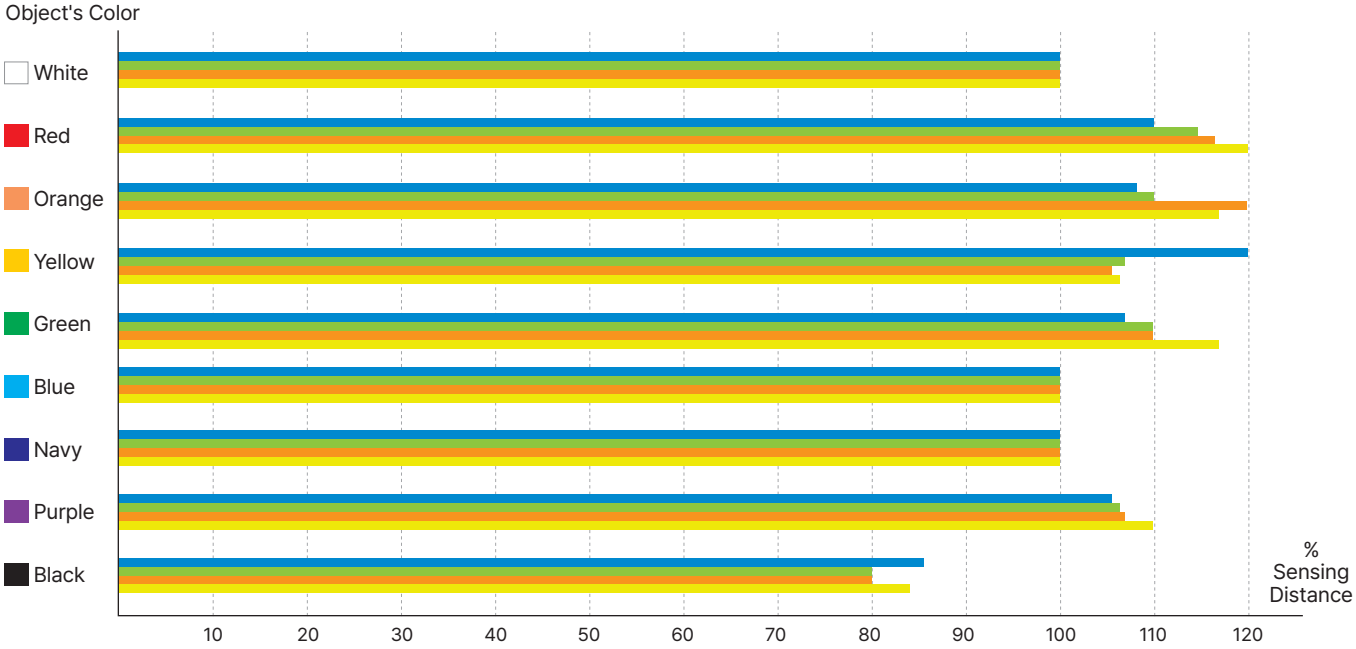


Reliable Detection regardless of Color

Photoelectric sensor cannot often detect subject properly depending on the subject's color.
PQ series is designed to detect subject regardless of its color.

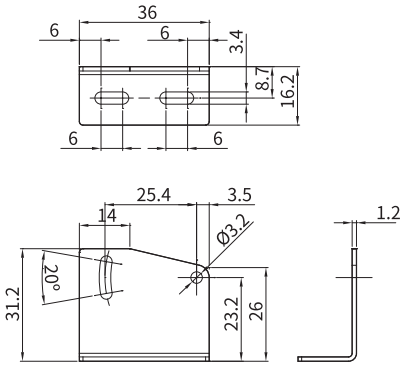
• **Maximum Sensing Distance Depending on Color** (Diffuse Reflective)

Standard :
White Paper(100×100mm)

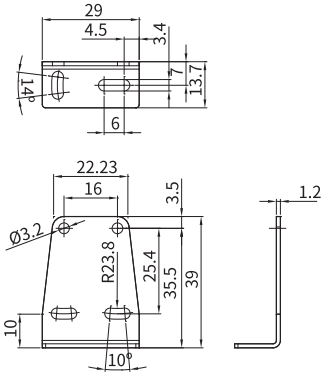


Accessory (Bracket)

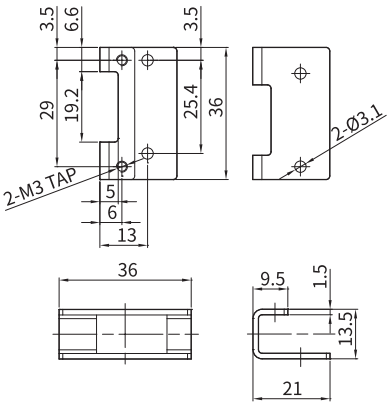
•**BRACKET A**



•**BRACKET B (SEPARATE)**

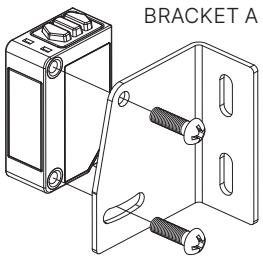


•**BRACKET C (SEPARATE)**



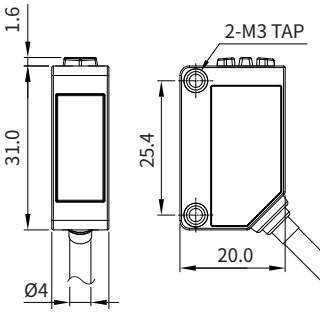
Installation Method / Diagram

•**Installation Method**



Screwing Torque of M3×12mm
should be less than 0.5Nm.

•**Diagram**



Specifications

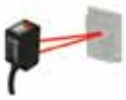
Sensing mode		Through-beam	Retroreflective (M.S.R.)	Diffuse-reflective
Cable type	NPN	PQ-T30NW	PQ-M4NW	PQ-R1NW
	PNP	PQ-T30PW	PQ-M4PW	PQ-R1PW
Appearance				
Connector type	NPN	PQ-T30NC	PQ-M4NC	PQ-R1NC
	PNP	PQ-T30PC	PQ-M4PC	PQ-R1PC
Appearance				
Sensing distance		30 m	0.1 ~ 4 m	1 m
Hysteresis distance		-		20% or less of detection distance
Detecting object		Ø12 mm or more (Opaque)	Ø75 mm more (Opaque)	White paper (100 x 100 mm)
Light source (wavelength)		Infrared LED (855 nm)	Red LED (660 nm)	Infrared LED (855 nm)
Current consumption		Emitter: max. 15 mA, Receiver: max. 20 mA	Max. 30 mA	
Power voltage		12 - 24 V d.c. Class 2 ±10 % (Ripple max. 10 %)		
Control output		• NPN or PNP open collector output		
		• Load current - max. 100 mA (26.4 V d.c. standard		
		• Residual voltage - NPN: max. 1.5 V, PNP: max. 1.5 V		
Operation mode		Light ON / Dark ON button switch type		
Indicator light		Control output indicator light : Red LED, Stability indicator light : Green LED (However, the red LED of the through-type emitter is a power indicator)		
Auto tuning		See How to set sensitivity and operation mode → Section ③.		
AGC		After 20 seconds of unstable light entering on button locked state to stable light entering state.		
Sensitivity adjustment		B1 increases the sensitivity and B2 decreases the sensitivity		
Protection circuit	Common	Power reverse connection protection, Output short-circuit over-current protection, Output reverse connection protection, Output short-circuit alarm		
	Individual	-	Mutual interference prevention function	
Response time		Max. 1 ms		
Insulation Resistance		More than 20 MΩ (500 V d.c. mega)		
Noise immunity		Square wave noise by noise simulator (pulse width 1μs) ±240 V		
Dielectric strength		1,000 V a.c. (50/60 Hz for 1 minute)		
Vibration resistance		10-55Hz, sweep: 1.5mm, X·Y·Z 2 in each direction for 2 hours		
Shock resistance		500 m/s2, X·Y·Z each direction 3 times		
Ambient illumination		Sunlight : max. 11,000 lx / Incandescent: max 3,000 lx		
Ambient temperature range		operating temperature : -20 ~ +55 °C During storage : -40 ~ +70°C (Without condensation or icing)		
Ambient humidity		35 ~ 85 % RH (Without condensation or icing)		
Pollution degree		3 rating		
Protection		IP67 (IEC standard)		
Certification		CE cULus RoHS2 (The connector type is currently undergoing CE and UL certification)		
Weight (Packing)	Cable type	100 g (160 g)	55 g (115 g)	55 g (100 g)
	Connector type	20 g (80 g)	10 g (70 g)	10 g (55 g)
Texture	Case	NYLON		
	Display	PC		
	Lens	PMMA		
Accessory	Common	Instructions manual, bracket A, bolt (M3 X 12 mm)		
	Individual	-	Mirror (HY-M5)	-
Connection method	Cable type	Number of wires - 3P, Outer diameter - 4 Ø, Length - 2 m (however, the emiiter of through-beam type has 2P)		
	Connector type	M8 Connector Wiring (M8 relay cable sold separately)		

Suffix code

Model	Code				Information
PQ-	□	□	□	□	Photoelectric Sensor
Sensing mode / Sensing distance (m)	T	30			Through beam
	M	4			Retroreflective
	R	1			Diffuse-reflective
Output			N		NPN open collector output
			P		PNP open collector output
Option				W	Cable type
				C	Connector type

PB series CE

Specifications

Model		PB-T7N	PB-T10RN	PB-T15N	PB-M3RN	PB-R01N	PB-R04RN	PB-R1N	PB-D04N
	PNP	PB-T7P	PB-T10RP	PB-T15P	PB-M3RP	PB-R01P	PB-R04RP	PB-R1P	PB-D04P
Appearance									
Sensing mode		Through-beam			Mirror reflection type	Diffuse - reflective			Distance-settable
Detecting object		Opaque object (over Ø12 ㎜)			Opaque object (over Ø75 ㎜)	White non-glossy paper (100 x 100 ㎜)			
Hysteresis		None				Max. 20% of sensing distance			
Operation mode		Light ON / Dark ON mode switching selection by VR							
Sensing distance		7 m	10 m	15 m	0.1 - 3 m (when using HY-M5) / 0.1 - 4 m (when using HY-M5S)	100 mm	400 mm	1 m	400 mm
Response time		Max. 1 ㎳							
Sensitivity adjustment		VR built-in							
Power voltage		12-24 V d.c. ±10% Ripple(p-p)10% or less							
Current consumption	Emitter	Max. 20 ㎃			Max. 30 ㎃				
	Receiver	Max. 15 ㎃							
Light source (wavelength)		Infrared LED (850 ㎚)	Red LED	Infrared LED (850 ㎚)	Red LED	Infrared LED (850 ㎚)	Red LED	Infrared LED (850 ㎚)	
Control output		● Load Current: max. 100mA (26.4 V d.c.) ● Residual voltage: max. 1 V							
Protection circuit		● Power reverse connection protection, ● Output reverse connection protection, ● Output short circuit protection, ● Putual interference protection (except transmissive), ● Output short circuit notification (except floodgators)							
LED Indicator		● Red LED : operation indicator, ● Green LED : stability indicator (However, the red LED of the emitter displays the power only)							
Insulation resistance		Min. 20 ㏁ (500 V d.c. mega standard)							
Dielectric strength		1,000 V a.c. (50/60 ㎐ for 1 min)							
Vibration resistance		10 - 55 ㎐, double amplitude : 1.5 ㎜, X·Y·Z each direction 2 hours							
Shock resistance		500 ㎧, X·Y·Z each direction 3 times							
Ambient illumination		● Sunlight : max. 11000 ㏓ ● Incandescent lamp : max. 3000 ㏓							
Ambient temperature & humidity		● During operation : -20 ~ 60 ℃ ● During storage : -25 ~ 70 ℃, 35 ~ 85 % RH (without condensation or icing)							
Noise immunity		Square wave noise by noise simulator (pulse width 1 ㎲) ±240 V							
Degree of protection		IP65 (IEC 60529)							
Accessories		● Bracket A, ● Bracket B(Order specification), ● Bracket C(Order specification)							
Certified		CE							
Weight (g)		90			60	50			

Suffix code

Model	Code				Content	
PB-	□	□	□	□	General Purpose Photo Sensor	
Sensing mode and distance	T	7			7 m	Through - beam
		10			10 m	
		15			15 m	
	M	3			3 m	Retro - reflective
	R	01			0.1 m	Diffuse - reflective)
		04			0.4 m	
		1			1 m	
	D	04			0.4 m	Distance-settable
Light source			-		Infrared LED	
			R		Red LED (Note1)	
Output				N	NPN open collector output	
				P	PNP open collector output	

(Note1) Red light (R): T10, M3, P3, R04, only

PY series CE

Specifications

Model		NPN	PNP
Model	NPN	PY-T3N	
	PNP	PY-T3P	
Appearance			
Sensing mode		Through - beam	
Detecting object		Opaque object (over Ø5 ㎜)	
Operation mode		Light ON / Dark ON mode switching selection by control wire (only receiver)	
Sensing distance		3 m	
Response time		Max. 1 ㎳	
Power voltage		12-24 V d.c. ± 10 %	
Current consumption	Emitter	Max. 10 ㎃	
	Receiver	Max. 15 ㎃	
Light source (wavelength)		Infrared LED (850 ㎚)	
Control output		● NPN or PNP open collector output, load current - max. 100 ㎃ (26.4 V d.c. standard), ● Residual voltage - NPN: max. 1V, PNP: max. 1V	
Protection circuit		● Power reverse protection circuit, output short circuit overcurrent protection circuit, ● Output short circuit notification circuit (Note 1), ● Output failure notification circuit (Note 2)	
LED Indicator		● Red LED : Control output, ● Green LED : stability indicator (however, the red LED of the emitter displays the power)	
Insulation resistance		Min. 20 ㏁ (500 V d.c. mega standard)	
Dielectric strength		1,000 V a.c. (50/60 ㎐ for 1 min)	
Vibration resistance		10 - 55 ㎐, Double amplitude : 1.5 ㎜, X·Y·Z each direction 2 hours	
Shock resistance		500 ㎧², X·Y·Z each direction 3 times	
Ambient illumination		● Sunlight: max. 11000 ㏓ ● Incandescent lamp: max. 3000 ㏓	
Ambient temperature & humidity		● During operation : -20 ~ 60 ℃ ● During storage : -25 ~ 70 ℃, 35 ~ 85 % RH (without condensation)	
Degree of protection		IP67 (IEC 60529)	
Materials		● Case : PC ● Lens : PC	
Connection		Cable extended type	
Weight (g)		66	

(Note 1) Repeats red LED OFF for 38.4 ms after red LED turns on for 192 ㎲ during light-on
(Note 2) Turns OFF after red LED turns ON for 49 ㎳ during light-on

Suffix code

Model	Code			Content
PY -	□	□	□	Flat Photo Sensor
Sensing mode	T			Through - beam
Sensing distance		3		3 m
Output			N	NPN open collector output
			P	PNP open collector output

PN series

Specifications

Model		PN-T3	PN-R02	PN-M1
Appearance				
Type		Through - beam	Diffuse - reflective	Retro - reflective
Sensing distance		3 m	200 ㎜	0.1-1 m
Detecting object		Opaque object (over Ø8 ㎜)	White non-glossy paper (200 x 200 ㎜)	Opaque object (over Ø48 ㎜)
Power voltage		12-24 V d.c. ±10 %		
Current consumption	Emitter	20 ㎃ d.c.	Max. 30 mA d.c.	
	Receiver	18 ㎃ d.c.		
Operating mode		Select Light On/Dark ON by Control Line (transmission type is only for the receiver).		
Control Output		● NPN voltage output : Load voltage max. 30 V d.c., ● Load current : max. 200 mA , residual voltage : max. 1 V		
Protection circuit		Reverse polarity protection, overcurrent protection		
Response time		Max. 3 ㎳		
Hysteresis		-	Not more than 20% of detection distance	-
Light source (wavelength)		Infrared LED (850 ㎚)		
Sensitivity control		By volume for sensitivity adjustment (except for transmissive floodlights)		
Material		Case and Lens : PC		
Connection		● Cable withdrawal formula ● All competitors: 4P ● External diameter : 44 mm ● Length : 1.5 m (However, the projector is 3P)		
Ambient light		● Sunlight : max. 11000 ㏓, ● Incandescent light : max. 3000 ㏓		
Ambient temperature & humidity		● When operating : -25 to 55℃ ● Storage : -40 to 70℃, 35 to 85% RH (but there will be no condensation).		
Degree of protection		IP54 (IEC 60529)		
Vibration resistance		10 - 55 ㎐, Double amplitude 1.5 ㎜, X·Y·Z each direction for 2 hours		
Dielectric strength		1,000 V a.c. for 1 min		
Insulation resistance		20 ㏁ or more (based on 500 V d.c. mega)		
Accessories		● Bracket for fixing, ● Bolt, ● Nut for fixing		
Weight (g)		250	150	100

※ The sensing distance can be varied depending on the size, surface condition, glossy, non-glossy of the sensing object
※ PN-TL3 is transmitter and PN-TR3 is receiver when it is Through-beam type

Suffix code

Model	Code		Content
PN -	□	□	Photo Sensor
Sensing mode and distance	T	3	Through - beam
	M	1	Retro - reflective
	R	02	Diffuse - reflective
Operation			12-24 V d.c. ±10 %

PR series CE

Specifications

Model							
Model	Metal	NPN	PRM-T7RN	PRM-T10N	PRM-M2N	PRM-R01N	PRM-R04N
		PNP	PRM-T7RP	PRM-T10P	PRM-M2P	PRM-R01P	PRM-R04P
	Plastic	NPN	PRP-T7RN	PRP-T10N	PRP-M2N	PRP-R01N	PRP-R04N
		PNP	PRP-T7RP	PRP-T10P	PRP-M2P	PRP-R01P	PRP-R04P
Appearance							
Detection method			Through - beam		Retro - reflective	Diffuse - reflective	
Detection distance			7 m	10 m	0.1 ~ 2 m (※Note1)	0.1 m	0.4 m
Hysteresis distance			-			20% or less of detection distance	
Detection object			Ø 10 mm or more opaque		Ø 25 mm or more opaque	White matte paper (100x100 mm)	
Light source			RED (640nm)	IR (860nm)	IR(860nm)		
Current consumption			● Emitter : 20 mA, ● Receiver : 20 mA		30 mA 이하		
Power supply voltage			12-24 V d.c. ±10% ripple (p-p) 10% or less				
Control output			NPN or PNP open collector output ● Load current : 100 mA or less (based on 26.4 V d.c.) ● Residual voltage-NPN : 1 V or less, PNP: 1 V or less				
Operation mode			Light ON / Dark ON (by white line)				
Protection circuit	Common		● Power reverse connection protection, ● Output reverse connection protection, ● Output short circuit overcurrent protection, ● Output terminal notification (※Note2)				
	Individual		-		Mutual interference prevention function		
Response time			1 ms or less				
Insulation Resistance			20 MΩ or more (based on 500 V d.c. mega)				
Noise resistance			Square wave noise by noise simulator (pulse width 1 μs) ±240 V				
Withstand voltage			1,000 V a.c. (50/60 Hz for 1 minute)				
Vibration resistance			10-55 Hz, dust amplitude: 1.5 mm, 2 hours each in X.Y.Z directions				
Shock resistance			500 ㎧, X·Y·Z each direction 3 times				
Ambient illuminance			● Sunlight : max. 11000 lx ● Incandescent lamp : max. 3000 lx (Light-receiving surface illuminance)				
Ambient temperature			● During operation : -20 ~ 60 ℃ ● During storage : -25 ~ 70 ℃, 35 ~ 85 % RH (without condensation or icing)				
Ambient Humidity			35 ~ 85 % RH (with no condensation)				
Protection structure			IP66 (IEC standard)				
Acquisition standard			CE				
Material	Case		● Metal: Gold plated, ● Plastic: Plastic				
	Display		PC				
	Lens		PC				
Accessories	common		● Metal: 2 fixing nuts, 1 washer, V/R adjustment driver ● Plastic: 2 fixing nuts, V/R adjustment screwdriver				
	Individual		-		Mirror (HY-M5)	-	
Weight			● Metal : Approx. 320 g, ● Plastic : Approx. 280 g		● Metal : Approx. 160 g, ● Plastic : Approx. 140 g		

(※ Note 1) Red light (R) : T7 only
(※ Note 2) Red LED blinks in case of overload (ON Time: 200 μs, OFF Time: 40 μs)

Suffix code

Model	Code					Content	
PR	□-	□	□	□	□	Round Photo Sensor	
Case material	M					Metal	
	P					Plastic	
Detection method and detection distance		T	7			7 m	Through - beam
			10			10 m	
		M	2			2 m	Retro - reflective
		R	01			0.1 m	Diffuse - reflective
			04			0.4 m	
Light source						Infrared LED	
				R		Red LED (※Note 1)	
Output					N	NPN open collector output	
					P	PNP open collector output	

(※ Note 1) Red light (R) : T7 only

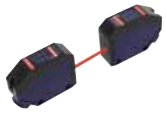
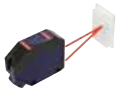
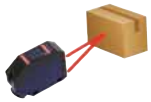
PU series CE

Specifications

Model		PU-30	PU-30S	PU-50	PU-50S
Appearance					
Sensing distance		30 ㎜		50 ㎜	
Detecting object		Opaque object (over Ø2 ㎜)	Opaque object (over Ø0.6 ㎜)	Opaque object (over Ø1.5 ㎜)	Opaque object (over Ø0.4 ㎜)
Power voltage		12-24 V d.c. ±10 %			
Current consumption		Max. 30 mA			
Operating mode		Selectable Light On/Dark On for reverse polarity			
Control Output		● NPN open collector output : Load voltage max. 300 V d.c., ● Load current : max. 180 mA, ● Residual voltage: max. 2 V			
Protection circuit		Output short circuit			
Response time		Max.1 ms			
Light source (wavelength)		Infrared LED (940 ㎚)			
Motion Indicator		● Output : Red LED, ● Power : Green LED			
Sensitivity adjustment		fix	By volume	fix	By volume
Material	Case	Zn			
	Lens	PC			
Connection type		● Cable pull-out type ● Number of wires : 3P ● Outer diameter : Ø4 ㎜ ● Length : 2m			
Ambient light		● Sunlight: max. 11000 lx, ● Incandescent light: max. 3000 lx			
Ambient temperature & humidity		● In operation : -20 ~ 60 ℃ ● Storage : -25~70 ℃, 35 ~ 85% RH (No condensation)			
Degree of protection		IP65 (IEC 60529)			
Vibration resistance		10 - 55Hz, Double amplitude 1.5 ㎜, X·Y·Z each direction for 2 hours			
Dielectric strength		1000 V a.c. for 1 min			
Insulation resistance		Min. 20 ㏁ (at 500 V d.c., between code and case, contact and power supply)			
Weight (g)		250			

PTX series

Specifications

Model	Type	Normal	Timer Built-in	Normal	Timer Built-in	Normal	Timer Built-in
	Built-in Power Supply	PTX-T15A	PTX-T15A-T	PTX-M7A	PTX-M7A-T	PTX-R1A	PTX-R1A-T
	Built-in Amplifier	PTX-T15B	PTX-T15B-T	PTX-M7B	PTX-M7B-T	PTX-R1B	PTX-R1B-T
Appearance							
Sensing Type		Through - beam		Retro - reflective		Diffuse - reflective	
Sensing distance		15 m		7 m		1 m	
Detecting object		Opaque object (over Ø20 ㎜)		Opaque object (over Ø60 ㎜)		White non-glossy paper (200x200 ㎜)	
Power voltage	Built-in Power Supply	24-240 V a.c. 50/60Hz or 24-240 V d.c. ±10 %					
	Built-in Amplifier	12-24 V d.c. ± 10 %					
Current Consumption	Emitter	Built-in power : 2 W or less / Built-in amplifier : 35 ㎃ or less		Built-in power : 2 W or less / Built-in amplifier: 45 ㎃ or less			
	Transmitter	Built-in power : 1 W or less / Built-in amplifier : 20 ㎃ or less					
Control Output	Built-in Power Supply	● Relay contact output (contact configuration 1a, 1b (COM)), rated load life 100,000 times or more ● Contact capacity : 30 V d.c. 5A / 250 V a.c. 5A resistive load					
	Built-in Amplifier	● NPN/PNP open collector simultaneous output ● Load current : 150 ㎃ d.c. Or less (resistive load) ● NPN current voltage : 1 V d.c. Below ● PNP current voltage : 2 V d.c. Below					
Operation mode		Light ON/Dark ON are selectable by the selector switch					
Response time	Built-in Power Supply	Max. 20 ms					
	Built-in Amplifier	Max. 1 ms					
Hysteresis	Built-in Power Supply	-		Less than 20 % of sensing distance			
	Built-in Amplifier	-					
LED Indicator	Built-in Power Supply	● Output indication: Red LED (Transmissive type emitter has 2 red LEDs for power indication) ● Stability indication : Green LED					
	Built-in Amplifier	● Output indication : Red LED ● Stability indication : Green LED					
Sensitivity adjustment		-		Sensitivity adjusting volume built-in			
Protection circuit	Built-in Power Supply	Surge protection					
	Built-in Amplifier	Reverse polarity protection and output-circuit protection					
Timer function built-in (only corresponds to timer built-in type)		Select OFF Delay, ON Delay or One Shot Delay by using the ON/OFF switch. Delay Time: 0.1~5 sec adjust by the volume.					
Ambient illumination		● Sunlight: max. 11000 lx ● Incandescent lamp: max. 3000 lx					
Ambient temperature & humidity		● Operation temperature: -20 ~ 60 ℃, ● Storage temperature: -25 ~ 70 ℃, 35 ~ 85 % RH (without icing or dew condensation)					
Degree of protection		IP66 (IEC 60529)					
Insulation resistance		Min 20㏁ (standard on 500 V d.c. mega)					
Dielectric strength		1,500 V a.c. (for 1 min)					
Vibration resistance		10 - 55 Hz Double amplitude: 1.5 mm, 2 hours to each of X, Y, Z directions					
Shock resistance		500 ㎧(approx. 50G), 3 times to each of X, Y, Z directions					
Connection method		Terminal					
Material		● Case: ABS ● Lens: PC					
Weight (g)		80					
Accessories	Individual	-		Reflector (HY-M5)		-	
	Common	● Driver, ● Bracket, ● bolt, ● Nut, ● Water-proof rubber, ● Wire holder					

※ The sensing distance may vary depending on the size, surface condition, glossy, non-glossy of the sensing object
※ The sensing distance of PTX-M7A (-T), PTX-M7B (-T) is the distance when using the reflector HY-M5

Suffix code

Model	Code				Content	
PTX -	□	□	□	□	Photo Sensor	
Sensing mode and distance	T	15			Through - beam	15 m
	M	7			Retro - reflective	7 m
	R	1			Diffuse - reflective	1 m
Power voltage			A		24-240 V a.c. 50/60 Hz or 24-240 V d.c. ±10 %	Built-in Power Supply
			B		12-24 V d.c. ±10 %	Built-in Amplifier
Timer					Normal type	
				-T	Timer Built-in type	

PLD series CE

Specifications

Model	PLD-R2N	PLD-R2P
Appearance		
Sensing Type	Diffuse - reflective	
Sensing distance	2 m	
Detecting object	White non-glossy paper (200x200 ㎜)	
Power voltage	12-24 V d.c. ±10%	
Power consumption	Max. 30 ㎃ d.c.	
Control output	● NPN open collector Max. 150 mA d.c. (resistance load) ● Residual voltage: 1 V d.c. Below	● PNP open collector Max. 150 mA d.c. (resistance load) ● Residual voltage: 1 V d.c. Below
Operation mode	Light On mode	
Response time	Max. 1 ms	
Hysteresis	Within 20 % of detectable distance	
Light source (wavelength)	Infrared LED (850 nm)	
LED Indicator	● Control output : Red LED ● Safety : green LED	
Sensitivity adjustment	'Built-in' sensitivity adjustment V/R (220。 degree spin V/R)	
Protection circuit	Reverse polarity protection, overcurrent protection	
Ambient intensity of illumination	● Sunlight: max. 11000 Lux, ● Incandescent lamp: max. 3000 Lux	
Ambient temperature & humidity	● When operating: -20 ~ 60 ℃ , ● when maintaining: -25 ~ 70 ℃, max. 35 ~ 85 % RH (without freezing)	
Degree of protection	IP64 (IEC 60529)	
Insulating resistance	20 ㏁ or more (based on 500Vd.c. mega)	
Dielectric strength	1000 V a.c. for 1 min	
Vibration resistance	10-55 ㎐ double amplitude 1.5mm, X,Y,Z each direction for 2 hours	
Shock resistance	500 ㎧² X·Y·Z each direction for 2 times	
Connection method	●Cable pull-out typed ● Number of wires: 3P ● Outer diameter: Ø3 ㎜ ● Length: 2 m	
Material	● Case: PET ● Lens cap: PC ● Lens : PMMA	
Cable	3P (26 AWG), length : 2 m	
Accessories	● Sensitivity adjusting driver, ● Fixing volt (3-M3 X 17L)	
Weight (g)	60	

Suffix code

Model	Code			Content
PLD -	□	□	□	Small size photo sensors
Sensing mode	R			Diffuse - reflective
Sensing distance		2		2 m
Output			N	NPN open collector output
			P	PNP open collector output

PL-D2B CE

Specifications

Model	PL-D2B
Appearance	
Sensing method	Distance - settable
Sensing distance	0.2 ~ 2 m
Detecting object	White non-glossy paper (200x200 ㎜)
Power voltage	12-24 V d.c. ±10 %
Current consumption	Max. 30 ㎃
Control output	● NPN / PNP open collector asynchronously, ● Load current : max. 150 ㎃ d.c. (resistive load) ● NPN residual voltage: max. 1 V d.c., ● PNP residual voltage: max. 2 V d.c.
Operation mode	Light ON / Dark ON ※ Selectable by the mode V/R
Response time	Max. 2 ㎳.
Hysteresis	Less than 10% of the sensing distance
Light source (wavelength)	Infrared LED (880 nm)
Receiving part	2 Photo diodes
LED Indicator	● Control out display : Red LED ● Stability display: Green LED
Distance setting	Near/Far : Optical distance adjusting volume 5 cycles.
Protection circuit	Reverse polarity protection and output short-circuit protection
Ambient illumination	● Sunlight: max. 11000 ㏓, ● Incandescent lamp: max. 3000 ㏓.
Ambient temperature & humidity	● Operation: -20 ~ 60 ℃ ● Storage: -25 ~ 70 ℃, 35 ~ 85 % RH (without condensation)
Degree of protection	IP65 (IEC 60529)
Insulation resistance	Min. 20 ㏁. (500 V d.c. Mega)
Dielectric strength	1,000 V a.c. (50/60 Hz for 1 min)
Vibration resistance	10 - 55 Hz, double amplitude:1.5mm for 2 hours each in X. Y and Z directions.
Shock resistance	500 ㎧ 3 times each in X. Y and Z directions.
Connection method	● Cable output type, ● Number of wires: 4P, ● Thickness: Ø 4mm ● Length 2m
Material	● Case : PC, ● Lens : PC
Accessory	Bracket, Adjustable driver, bolt, Nut.

Suffix code

Model	Code			Content
PL -	□	□	□	Distance-Settable Photo Sensor
Sensing mode	D			Distance-settable
Sensing distance		2		2 m
Power voltage			B	12-24 V d.c.

PEA series NEW

Easy-to-set sensitivity by Auto-tuning Function

Complicated initial setting is solved by the Auto-tuning function making users easy to set.
※Auto-tuning function works while the light enters

Auto-tuning starts by press B2 button for 3 seconds.

•AUTO-TUNING, THE SAVE TIME

In the previous models, users had to set the sensitivity by adjust volume.
PEA series has an automatic setting sensitivity function, allowing users to save time setting sensitivity.

Be fore	Wiring	Manual Setting	Completion
Auto-tuning	Wiring	Automatic Setting	Completion

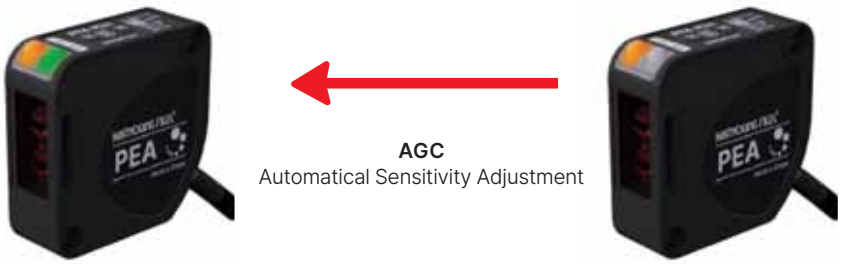
Time Saving

AGC Function - Prevents production lines from stopping.

If unstable light reception continues for more than 20 seconds due to the optical axis being distorted or lens contaminated by external factors(water, dust, moisture, oil, etc.) the AGC function is turns on and stable light reception is achieved. This function provides convenience in maintenance.

•AGC (Automatic Gain Control)

Unstable Light Entrance over 20 Seconds
▼
AGC Turned ON
▼
Automatical Sensitivity Adjustment
▼
Stable Light Entrance



Stable Light Enterance

AGC
Automatical Sensitivity Adjustment

Unstable Light Enterance

Specifications

Sensing mode		Through - beam	Retroreflective (M.S.R.)	Diffuse - reflective
Model	Relay output (AC/DC power)	PEA-T30A	PEA-M5A	PEA-R2A
	Open collector output (DC power)	PEA-T30D	PEA-M5D	PEA-R2D
Appearance				
Sensing distance		30 m	0.1 ~ 5 m	2 m
Hysteresis distance		-		20% or less of detection distance
Detecting object		Ø12 mm more (Opaque)	Ø75 mm more (Opaque)	White paper (100 x 100 mm)
Light source (wavelength)		Infrared light emitting diode (855 nm)	Red light emitting diode (660 nm)	Infrared light emitting diode (855 nm)
Power voltage	Relay output (AC/DC power)	24 - 240 V a.c. ±10 % or 24 - 240 V d.c. ±10% (Ripple max. 10 %)		
	Open collector output (DC power)	12 - 24 V d.c. Class 2 ± 10% (Ripple max. 10 %)		
Power consumption	Relay output (AC/DC power)	• Transmitter Max. 1 VA, • Receiver Max. 2VA	Max. 3 VA	
	Open collector output (DC power)	• Transmitter Max. 15 mA • Receiver Max. 20 mA	Max. 30 mA	
Control output	Relay output (AC/DC power)	• Relay contact output (Contact configuration 1a1b) • Contact Capacity: 30 V d.c. 5A / 250 V a.c. 5 A with resistive load	• Electrical life: Min. 100,000 cycles • Mechanical life : Min. 50 million cycles (Opening/closing frequency 180 times/min))	
	Open collector output (DC power)	• NPN or PNP open collector output is automatically detected • Load current - Max. 100 mA (26.4 V d.c. standard) • Residual voltage - Max. 1.5 V		
Operation mode		Light ON / Dark ON button switch type		
Indicator light		Control output indicator light : Orange LED, Stability indicator light : Green LED (However, the Green LED of the through-type emitter is a power indicator)		
Auto tuning		See How to set sensitivity and operation mode → Section ③.		
AGC		After 20 seconds of unstable light entering on button locked state to stable light entering state		
Sensitivity adjustment		B1 increases the sensitivity and B2 decreases the sensitivity		
Protection circuit	Common	-	Mutual interference prevention function	
	Open collector output (DC power)	Power reverse connection protection, Output short-circuit over-current protection, Output reverse connection protection, Output short-circuit alarm		
Response time	Relay output (AC/DC power)	Max. 20 ㎳		
	Open collector output(DC power)	Max. 1 ㎳		
Insulation Resistance		More than 20 MΩ (500 V d.c. mega)		
Dielectric strength		1,000 V a.c. (50/60 Hz for 1 minute)		
Vibration resistance		10-55Hz, sweep: 1.5mm, X·Y·Z 2 in each direction for 2 hours		
Shock resistance		500 m/s2, X·Y·Z each direction 3 times		
Ambient illumination		Sunlight : max. 11,000 lx / Incandescent: max 3,000 lx		
Ambient temperature range		Operating temperature : -20 +55 ℃ , During storage : -40 +70℃ (Without condensation or icing)		
Ambient humidity		35 85 % RH (Without condensation or icing)		
Protection		IP67 (IEC standard)		
Weight (Packing)	Relay output (AC/DC power)	265g (440g)	150g (280g)	145g (260g)
	Open collector output (DC power)	255g (430g)	140g (270g)	140g (255g)
Texture	Case	PC		
	Display	PC		
	Lens	PMMA		
Accessory	Common	Instructions manual, bracket, bolt (M3 X 12 ㎜)		
	Accessory	-	Mirror (HY-M5)	-
Connection method		Cable type		
Wiring specification	Relay output (AC/DC power)	Ø 6 mm, Through-beam type transmitter: 2-core, Through-beam type receiver, Mirror-reflection type, Diffuse-reflective type: 5-core, 2 m		
	Open collector output (DC power)	Ø 6 mm, Through-beam type transmitter: 2-core, Through-beam type receiver, Mirror-reflection type, Diffuse-reflective type: 5-core, 2 m		
Specifications of the small-sized cable		AWG20 (0.18 mm, 21 wire), Insulation outer diameter: 1.5 mm		

- Mutual interference prevention function
- Resistant to noise by adopting digital signal processing
- M.S.R. that receives only the light reflected from the mirror
- IP67 (IEC standard) protection structure with excellent water resistance
- Realization of long-distance detection by adopting high-performance lens

Suffix code

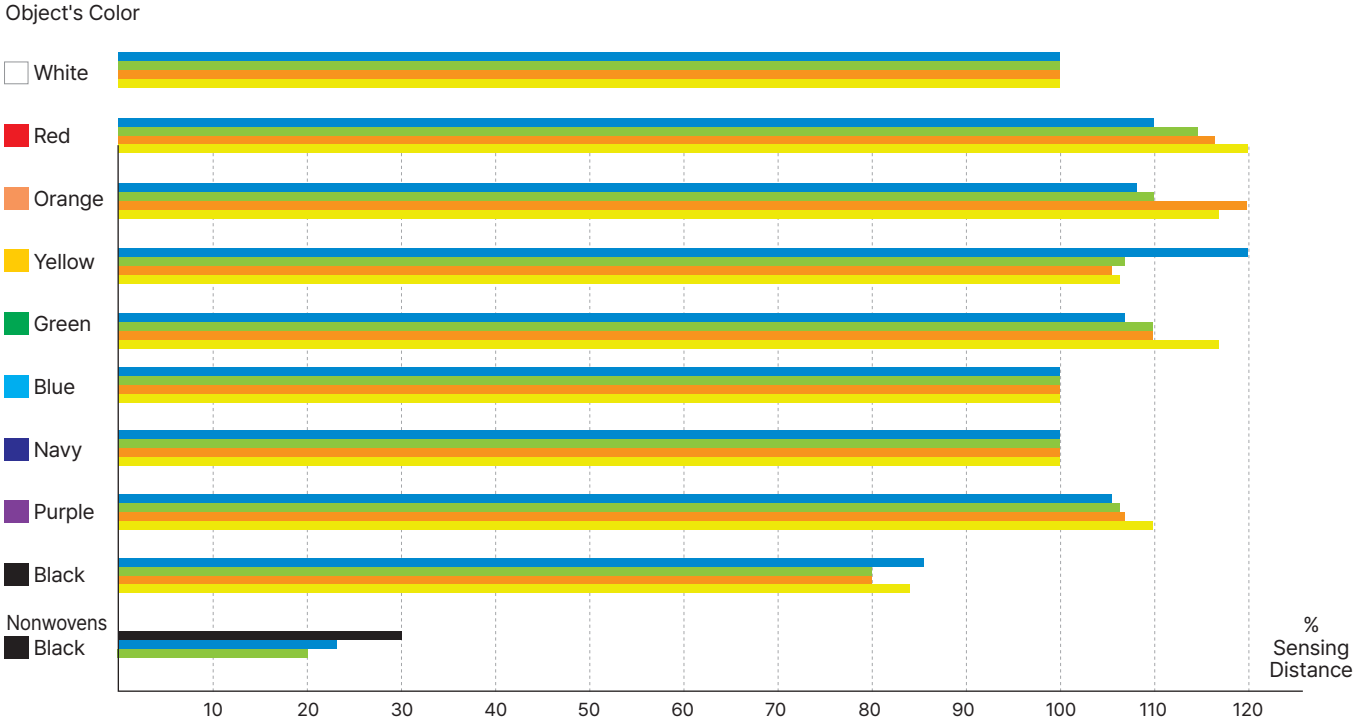
Model	Code			Content	
PEA-	□	□	□	PEA series	
Sensing mode	T			Through-beam	
	M			Retroreflective	
	R			Diffuse-reflective	
Sensing distance		30		30 m (Through-beam)	
		5		5 m (Retroreflective)	
		2		2 m (Diffuse-reflective)	
Control output			D	Open collector output	DC power
			A	Relay contact output	AC/DC power

Reliable Detection regardless of Color

Photoelectric sensor cannot often detect subject properly depending on the subject's color.
PEA series is designed to detect subject regardless of its color.

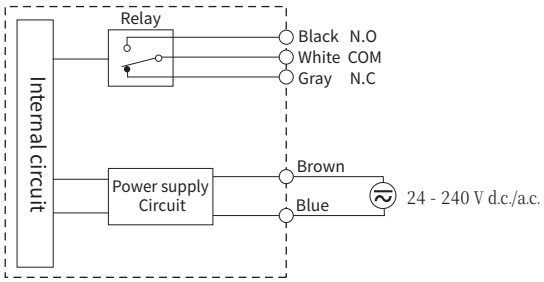
• **Maximum Sensing Distance Depending on Color** (Diffuse Reflective)

Standard :
White Paper(100×100mm)

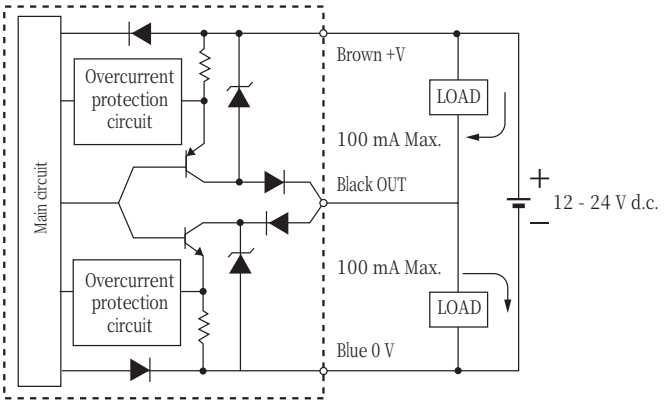


Connection diagram

■ Relay contact output



■ Open collector output (DC power)

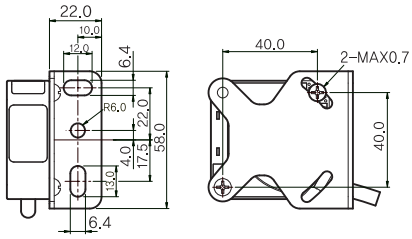


Internal circuit ⟷ External connection example

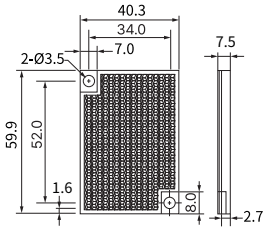
※ Depending on the load wiring, NPN or PNP open collector output is automatically detected

Accessories

■ Bracket

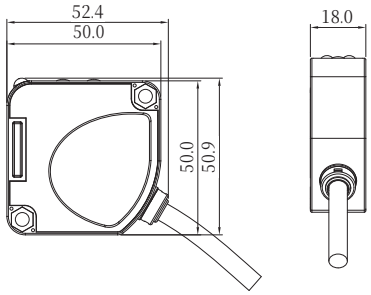


■ Reflector (HY-M5)



Dimension

[unit : mm]



PG series

Specifications

Model		NPN	PG-TRN	PG-TARN
		PNP	PG-TRP	PG-TARP
Appearance				
Function			Selection by switch (Normal/ON-Delay/OFF-Delay) 40 ms fixed	Selection by switch (Normal/ON-Delay/Off-Delay/One-Shot) 1 ㎳-5,000 ㎳ variable
Sensing method			Through-beam type, diffuse-reflective type (decision by combined with fiber unit)	
Sensing distance			Decision by combined with fiber unit	
Power voltage			12-24 V d.c. ±10 %	
Current consumption			Max. 35 ㎃	
Output	Control		● NPN/PNP Voltage output ● Load voltage: max. 200 ㎃ (30 V d.c.) ● Residual voltage : max. 1 V d.c.	
	Stability		-	● NPN/PNP Voltage output ● Load current : 50 ㎃ (30 V d.c.) or less, ● Residual voltage : max. 1 V d.c.
Operation mode			Light ON / Dark ON switch selection operating Normal or ON/OFF delay Switch selection operating	
Response time			Max. 1 ㎳	
Hysteresis			Max. 10 % of sensing distance (Reflection)	
Light source (wavelength)			Red LED (630 ㎚)	
LED Indicator			● Control out display : Red LED ● Stability display : Green LED	
Sensitivity adjustment			Sensitivity adjustment by brewing well volume (Coarse) and fine adjustment volume (Fine)	
Protection circuit			Reverse polarity protection, overcurrent protection (except for stable output of multi-function type)	
Ambient illumination			● Sunlight : max. 11000 ㏓, ● Incandescent lamp : max. 3000 ㏓	
Ambient temperature & humidity			● Operating : -20 ~ 60 ℃, ● Preserving : -25 ~ 70 ℃, 35 ~ 85 % RH (without condensation)	
Degree of protection			IP40 (IEC 60529)	
Insulating resistance			Min. 20 ㏁ (500 V d.c. Mega standard)	
Dielectric strength			1,000 V a.c. (50/60 Hz for 1 min)	
Vibration resistance			10 - 55 ㎐ double amplitude 1.5mm, X,Y,Z each direction for 2 hours	
Shock resistance			500㎧ X, Y, Z directions 3 times	
Connection method			Cable pull-out type (3 P, 2 m)	Cable pull-out type (4 P, 2 m)
Weight (g)			120	

Suffix code

Model	Code		Content
PG -	□	□	Fiber Optic Sensor
Sensing mode and distance	TR		Universal type
	TAR		Multifunctional (Built-in timer function and stable output)
Output		N	NPN open collector output
		P	PNP open collector output

PFD series CE

Specifications

Model	NPN	PFD-RGN	PFD-RMN
	PNP	PFD-RGP	PFD-RMP
Appearance			
Function	Mark detection	General type (mark detection)	Multi type (mark detection, rotation speed, counter)
	Counter	-	400 cps, Up/Down, 0 - 9999
	Tachometer	-	12 ~ 9999 rpm
Power supply voltage		12-24 V d.c. ±10 %	
Current consumption		Max. 50 ㎃	
Output	Control	● NPN/PNP Open collector output, ● Load current: 100 ㎃ (30 V d.c.) or less ● Residual voltage: 1V d.c. or less	
	Stability		
External input		Teaching	Teaching / Reset input
Operating mode		Selecting Light On / Dark On (selection by parameter)	
Timer function		ON-Delay, OFF-Delay, One-shot time output (Setting time: 1 ~ 9999 ㎳)	
On/Off Delay		0 ~ 9999 ㎳	
Light source (wavelength)		Red LED (660 ㎚)	
Protection circuit		Power reverse connection and output short protection circuit	
Response time		0.7 ms or less	1 ms or less
LED indicator		4 Digits FND	
Sensitivity control		Auto teaching/manual setting by setting button	
Additional function		● Brightness control 180 ˚ Turning indication, ● Display time set, ● Zero Reset, ● Initial reset, Lock function	
Ambient light		● Sunlight : max. 11000 ㏓, ● Incandescent lamp : max. 3000 ㏓	
Ambient temperature & humidity		● Operating : -20 ~ 60 ℃, ● Preserving : -25 ~ 70 ℃, 35 ~ 85 % RH (without condensation)	
Vibration resistance		10 - 55 ㎐ double amplitude 1.5mm, X,Y,Z each direction for 2 hours	
Shock resistance		500㎧² X, Y, Z directions 3 times	
Dielectric strength		1,000 V a.c. (50/60 Hz for 1 min)	
Insulating resistance		Min. 20 ㏁ (500 V d.c. Mega standard)	
Connection method		● Cable output type, ● Number of wires: 5P, ● Thickness : Ø 4mm, ● Length 2m, ● DIN rail mounting structure	
Weight (g)		150	

● MODEL : PFD-RMN only

Multi function	Counter	● UP / DOWN Mode, ● Prescale 1 ~ 999 distribution/dispensing setting, ● Indicating range: 0 ~ 9999, ● Counting speed : 400 cps (50 % duty), ● Output mode: 8 kinds selectable (N, F, C, R, K, P, Q, A), ● External reset: Min. Signal width 5 ㎳
	Tachometer	● Indicating range: 0 ~ 9999 rpm, ● Speed monitoring output function, ● Prescale: 1~1000 integers setting, ● Measurement cycle setting

Suffix code

Model	Code			Content
PFD -	□	□	□	Digital optical fiber sensor
Light source	R			Red LED
Function		G		General purpose (MARK)
		M		Multi type (MARK / RPM / Counter)
External output			N	NPN open collector
			P	PNP open collector

PFB series

Specifications

Model	NPN	PFB-RN
	PNP	PFB-RP
Appearance		
Detection method		Transmissive type, reflective type (by fiber cable)
Detection distance		By fiber cable
Power voltage		12-24 V d.c. ±10 % (Ripple 10 %이하)
Current consumption		Max. 20 ㎃
Control output		● NPN/PNP Open collector output, ● Load current: 100 ㎃ (30 V d.c.) or less ● Residual voltage: 1 V d.c. or less
Output operation		Selection by light-incident (Light On) and light-shielding (Dark On) switches
Timer function		NORMAL, ON-Delay, OFF-Delay (Delay time 40 ㎳ fixed)
Response time		1 ms or less
Hysteresis		Reflective type: 10% or less of the sensing distance
Light source (wavelength)		Red LED (660 ㎚)
Indicator light		Indication by Bar LED
Sensitivity control		Auto teaching / manual setting by setting button
Protection circuit		Mutual interference prevention, power reverse connection and output short protection circuit
Ambient light		● Sunlight : max. 11000 lx, ● Incandescent lamp : max. 3000 lx
Ambient temperature		-10 ~ 55 ℃ (Storage ambient temperature: -25 ~ 70 ℃)
Ambient Humidity		35 ~ 85% R.H. (No condensation or freezing)
Degree of protection		IP 40 (IEC)
Insulation resistance		More than 20 ㏁ (at 500 V d.c. between code and case, adjusting switch and case)
Dielectric strength		1000 V a.c., 50/60 ㎐ for 1 min
Vibration resistance		10 - 55 ㎐ double amplitude width 1.5 ㎜ , X·Y·Z, each direction for 2 hours
Insulation resistance		500 ㎧ X, Y, Z each direction 3 times
Connection method		● Cable output type, ● Number of wires: 5 P, ● Thickness : Ø 4 mm, ● Length 2 m, ● DIN rail mounting structure
Material		Case: Heatproof ABS
Weight (g)		Approx. 150 g (fixing bracket and packaging)

Suffix code

Model	Code		Content
PFB -	□	□	10 bit A / D Built-in bar display type
Light source	R		Red LED
External output		N	NPN open collector
		P	PNP open collector

PAS series CE

Specifications

Model						
	NPN	PAS-T4NL	PAS-T8NL	PAS-T12NL	PAS-T16NL	PAS-T20NL
		PAS-T4ND	PAS-T8ND	PAS-T12ND	PAS-T16ND	PAS-T20ND
	PNP	PAS-T4PL	PAS-T8PL	PAS-T12PL	PAS-T16PL	PAS-T20PL
		PAS-T4PD	PAS-T8PD	PAS-T12PD	PAS-T16PD	PAS-T20PD
Appearance						
Number of optical axis		4	8	12	16	20
Sensing range		60 ㎜	140 ㎜	220 ㎜	300 ㎜	380 ㎜
Detection distance		5 m				
Detection object		Opaque material of Ø 30 mm or more				
Optical axis pitch		20 ㎜				
Light source		IR (860 nm)				
Power voltage		12-24 V d.c. ±10% ripple (p-p) 10% or less				
Current Consumption		Max. 80 ㎃	Max. 90 ㎃	Max. 100 ㎃	Max. 110 ㎃	Max. 120 ㎃
Control output		NPN / PNP open collector output-Load current : max. 100 ㎃, ● Load current : 100 ㎃ (30 V d.c.) or less ● Residual voltage : 1 V d.c. Below				
Operating mode		Light ON or Dark ON				
LED Indicator		● Emitter : Power indicator (green LED), M/S indicator (red LED) ● Receiver : Incoming light stability indicator (green LED), output indicator (red LED), E1 indicator (red LED), E2 indicator (blue LED)				
Protection circuit		● Power reverse connection protection, ● Output short circuit overcurrent protection, ● Mutual interference prevention function				
Response time		7 ms or less				
Insulation Resistance		20 MΩ or more (based on 500 VDC mega)				
Noise resistance		Square wave noise by noise simulator (pulse width 1μs) ± 240 V				
Dielectric strength		1,000 V a.c. (50/60 ㎐ for 1 min)				
Vibration resistance		10 - 55 ㎐ double amplitude width 1.5 ㎜ , X·Y·Z, each direction for 2 hours				
Shock resistance		500 ㎧², X·Y·Z each direction 3 times				
Ambient light		● Sunlight : max. 11000 ㏓, ● Incandescent lamp : max. 3000 ㏓				
Ambient temperature		● Operating : -10 ~ +55 ℃, ● Preserving : -25 ~ +70 ℃ (However, no freezing or condensation)				
Ambient humidity		35 ~ 85 % RH (However, no condensation)				
Degree of protection		IP40 (IEC standard)				
Acquisition standard		CE				
Connection method		When taking out the cable (Number of wires : 5 P, Length : 3 m, Outer diameter : Ø 4 mm)				
Material	Case	ABS				
	Display	Acryl				
	Lens	Acryl				
Weight (g)		160	180	200	220	240

Suffix code

Model	Code	Content
PAS -	□ □ □ □ □	Area Sensor slim type
Optical axis spacing	20	20 mm
Sensing mode	T	Through - beam
Number of optical axis	4	4 optical axis
	8	8 optical axis
	12	12 optical axis
	16	16 optical axis
	20	20 optical axis
Control output	N	NPN open collector
	P	PNP open collector
Operation mode	L	Light ON
	D	Dark ON

PAN series CE

Specifications

Model	NPN	PAN20-T□N	PAN40-T□N
	PNP	PAN20-T□P	PAN40-T□P
Appearance			
Sensing type		Through - beam	
Sensing distance		7 m	
Detecting object		Opaque object (over Ø32 ㎜)	Opaque object (over Ø52 ㎜)
Optical axis pitch		20 ㎜	40 ㎜
Power voltage		12-24 V d.c. ±10% ripple (p-p) 10% or less	
Current Consumption		Max. 170 ㎃	Max. 100 ㎃
Control output		NPN or PNP open collector output, ● Load current : 100 ㎃ (26.4 VDC standard) or less ● Residual voltage : 1 V d.c. Below	
Operation mode		● Emitter : M/S mode switch switching type (Master / Slave) ● Receiver : D/L mode switch switching type (Dark ON, Light ON)	
Operation indicator		● Emitter : Power indicator (green LED), M/S indicator (red LED) ● Receiver : Incoming light stability indicator (green LED), output indicator (red LED), E1 indicator (red LED), E2 indicator (blue LED)	
Protection circuit		● Power reverse connection protection, ● Output short circuit overcurrent protection, ● Mutual interference prevention function	
Response time		Max. 15 ms	
Insulation Resistance		20 MΩ or more (based on 500 VDC mega)	
Noise resistance		Square wave noise by noise simulator (pulse width 1μs) ± 240 V	
Dielectric strength		1,000 V a.c. (50/60 ㎐ for 1 min)	
Vibration resistance		10 - 55 ㎐ double amplitude width 1.5 ㎜ , X·Y·Z, each direction for 2 hours	
Shock resistance		500 ㎧², X·Y·Z each direction 3 times	
Ambient light		● Sunlight : max. 11000 lx, ● Incandescent lamp : max. 3000 lx(receiving surface illuminance)	
Ambient temperature		● Operating : -10 ~ +55 ℃, ● Preserving : -25 ~ +70 ℃ (However, no freezing or condensation)	
Ambient humidity		35 ~ 85 % RH (However, no condensation)	
Degree of protection		IP65 (IEC standard)	
Acquisition standard		CE	
Connection method		When taking out the cable (Number of wires : 4 P, Length : 200 mm, Outer diameter : Ø 5.5 mm)	
Material	Case	Aluminum	
	Front cover	Acryl	
	Lens	Acryl	

Suffix code

Model	Code	Content
PAN	□ -□ □ □	Area Sensor
Optical axis pitch	20	20 ㎜ spacing
	40	40 ㎜ spacing
Sensing method	T	Through - beam
Number of optical axis	□	Number of optical axis (please refer to the dimension)
Output	N	NPN open collector
	P	PNP open collector

Suffix code

PAN 20	8, 12, 16, 20, 24, 28, 32, 36, 40, 44, 48
PAN 40	4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24

HPAN series CE

Specifications

Model		HPAN-C7	HPAN-CT7	HPAN-C7W
Appearance				
WXHXD(㎜)		38.5×82.1×80.8		
Function		Universal	High function	Two sensors connectable
How to attach		DIN Rail		
Power Voltage		110 - 220 V a.c., 50/60 ㎐, ±10 %		
Power consumption		Approx. 5 VA		
Power supply to sensor		12 V d.c. (±10 %), Load current: 200 ㎃ or less		
Input		● [L] Level 0-2 V d.c., Internal pull-up/pull-down resistance connection by NPN/PNP switch setting (4.7 ㎏Ω), ● [H] Level 4-30 V d.c., ● NORM/INV input signal inversion function		
Output	Contact point	● NO contact : 250 V a.c. 3 A resistance load ● NC contact : 250 V a.c. 2 A resistance load ● Relay rated load life : 100,000 times		
	Contactless	● NPN open collector output, load current : 100 ㎃ (30 V d.c.) or less ● Residual voltage : 1VDC or less, ISOLATION (insulation from internal circuit)		-
Response time		● Relay contact : approx. 10 ms, ● NPN open collector : max. 5 ㎲		
External synchronization		IN, ES period synchronization output function	IN, ES period synchronization and differential synchronization output function	-
Timer function		-	● 3 types of timer setting modes (ON DELAY, OFF DELAY,ONE SHOT DELAY) ● Timer time can be set (selected by dip switch) 40 ㎳~1 sec ↔ 0.4 s~10 sec	-
Ambient temperature & humidity		● Operating : -20 ~ 60 ℃, ● Preserving : -25 ~ 70 ℃, 35 ~ 85 % RH (without condensation)		
Noise immunity		Power line : 2000 VP, 0.5 ㎲ pulse width (by noise simulation)		
Dielectric strength		1,500 V a.c. 1 minute at 60 Hz		
Insulation resistance		20 ㎫Ω (based on 500Vd.c. mega)		
Vibration resistance		10-55 ㎐ (cycle 1 minute), double amplitude: 1.5 ㎜, 2 hours in each of X, Y, and Z directions (however, power is not turned on)		
Shock resistance		100㎧² X, Y, Z directions twice each (however, the power is not turned on)		
Weight (g)		160		

HPA-12

Specifications

Model	HPA-12
Appearance	
WXHXD(㎜)	49.0×61.0×90.0
Function	Multi-purpose
How to attach	Relay Socket 8PIN
Power Voltage	220 V a.c. ±10 % 60 ㎐
Power consumption	Approx. 4 VA
External output power	12 V d.c. ±10%, Load current: 50 ㎃ or less
Connectable sensor (Input)	NPN, PNP Transistor output sensor
Output	Relay contact : 1 c (250 V a.c. 3 A, resistive load, rated load life: 100,000 times)
Response time	Approx. 10 ㎳
Ambient temperature & humidity	● Operating : -20 ~ 60 ℃, ● Preserving : -25 ~ 70 ℃, 35 ~ 85 % RH (without condensation)
Noise immunity	● Power line: 1,500 Vp ● Pulse width: 0.5 ㎲ (noise simulator)
Dielectric strength	1500 V a.c. for 1 min (between supply and output)
Insulation resistance	20 ㎫Ω (based on 500Vd.c. mega)
Vibration resistance	10 - 55 ㎐ (for a minute), double amplitude width 1.5 ㎜, each X·Y·Z direction for 2 hour (in power off)
Shock resistance	100 ㎧² (Approx. 10 G), each X·Y·Z, 2 direction (in power off)
Weight (g)	260

HE30B,HE40B,HE50B series

Specifications

Model			HE30B	HE40B	HE50B
Appearance					
Electrical specifications	Output phase difference		Phase difference between the phase A and B : T/4 ± T/8 (1 cycle of A phase=T)		
	Response speed		Max. 200 kHz		
	Rated voltage	NPN voltage output	※ Depending on the model name composition 5-12 V d.c. ±5 % 12-24 V d.c. ±5 %		
		Open collector			
		Totem pole output			
		Line driver output	5 V d.c. ±5 %	5 V d.c. / 12 V d.c. / 24 V d.c. ±5 %	
	Current consumption		Max. 60 mA (no load)		
	Connection method		Cable extended type		
	Control output	NPN voltage output	● Load current : max. 30 mA ● Load current : 30 mA or less, ● Residual voltage : 0.4 V or less		
		NPN open collector			
		Totem pole output	LOW (load current : max. 30 mA, residual voltage : max. 0.4 V d.c.) HIGH (load current : max. 10 mA, output voltage : above rated voltage -2.5 V)		
		Line driver output	LOW (load current : max. 20 mA, residual voltage: max. 0.4 V) HIGH (load current : max. 20 mA, residual voltage: min. 2.5 V)		
	Response time	Voltage output	Max. 1 μs (wire length : 1.5 m, sinking current= max. 30 mA)		
		Open collector			
		Totem pole output	Max. 1 μs (wire length : 1.5 m, sinking current= max. 10 mA)		
		Line driver output	Max. 1 μs (wire length : 1.5 m, sinking current= max. 30 mA)		
Mechanical specifications	Starting torque		2×10^{-3} N·m	4×10^{-3} N·m	7×10-3 N·m
	Moment of inertia		Max 2×10^{-6} kg·m²	Max 4×10^{-6} kg·m²	Max 8×10^{-6} kg·m²
	Permissible shaft loading		● Radial : within 15 N ● Thrust : within 10 N	● Radial : within 30 N ● Thrust : within 20 N	● Radial : within 50 N ● Thrust : within 30 N
	Max. number of revolutions		5,000 r/min		
Ambient specifications	Insulation resistance		Min. 100 MΩ (between the terminal and case 500 V d.c. mega standard)		
	Dielectric strength		800 V a.c. 60 Hz for 1 min (between the terminal and case)		
	Vibration resistance		10 - 55 Hz (cycle for 1 min), double amplitude : 1.5 mm, for 2 hours each in X, Y and Z directions		
	Shock resistance		Max. 490 m/s²		Max. 735 m/s²
	Ambient temperature & humidity		-10 ~ 70 ℃, 35 ~ 85 % RH (without condensation), during storage: -25 ~ 85 ℃		
	Cable		● 5P, Ø5.0 mm, length : 1.5 m, shield cable (HE40B, HE50B specifications : 2m, 8m,10 m) ● Line driver type : 8P, Ø5.0 mm, length : 1.5 m, shield cable		
	Accessories		Ø 4.0 mm coupling	Ø 6.0 mm / Ø 8.0 mm coupling	Ø 8.0 mm coupling, bracket
	Weight (g)		120	170	200

Suffix code

Model	Code						Content
HE	□-	□	□	□	□	□	Shaft Rotary Encoder (incremental)
Dimension	30B	4					Outer diameter : Ø 30 mm axis : Ø 4 mm
	40B	6					Outer diameter : Ø 40 mm axis : Ø 6 mm
		8					Outer diameter : Ø 40 mm axis : Ø 8 mm Option : (Option)
	50B	8					Outer diameter : Ø 50 mm axis : Ø 8 mm
Number of pulses			*				Refer to "Number of pulses (resolution)"
Output signal				2			A, B phase output
				3			A, B, Z phase output
				3C			A, B, $\overline{Z}$ phase output
				4			A, $\overline{A}$, B, $\overline{B}$ phase output
				6			A, $\overline{A}$, B, $\overline{B}$, Z, $\overline{Z}$ phase output
Output circuit					N	12	NPN voltage output (5 - 12 V d.c.)
						24	NPN voltage output (12-24 V d.c.)
					O	12	NPN open collector output (5 - 12 V d.c.)
						24	NPN open collector output (12-24 V d.c.)
					T	12	Totem pole output (5 - 12 V d.c.)
						24	Totem pole output (12-24 V d.c.)
					L	5	Line driver Output (5 V d.c.)
						12	Line driver Output (12 V d.c.) ※ for HE40B, HE50B,
						24	Line driver Output (24 V d.c.)

(Note) (*) Is output only for A, B phase (line driver output: A, $\overline{A}$, B, $\overline{B}$ phase).
Pulses other than the ones in the chart are order-made

Number of pulses (resolution)

Model	Number of pulses per revolution
HE30B	100, 200, 360, 500, 1000, 1024
HE40B / HE50B	*1, *2, *5, 10, *12, 15, 20, 25, 30, 40, 45, 50, 60, 75, 100, 120, 125, 150, 192, 200, 240, 250, 256, 300, 360, 400, 500, 512, 600, 800, 1000, 1024

※ Please contact us if you have any request for pulse production

HE40H series CE

Specifications

Model			HE40H
Appearance			
Electrical specifications	Output phase difference		Phase difference between the phase A and B : T/4 ± T/8 (1 cycle of A phase=T)
	Response speed		200 KHz max.
	Rated voltage	NPN voltage output	※ Depending on the model name composition 5-12 V d.c. ±5 % 12-24 V d.c. ±5 %
		Open collector	
		Totem pole output	
		Line driver output	5 V d.c. ±5 %
	Current consumption		Max. 60 ㎃ (no load), line driver output max. 50 ㎃ (no load)
	Connectionmethod		Cable extended type
	Control output	NPN voltage output	● Load voltage : max. 30 V, ● Load current : max. 30 ㎃, ● Residual voltage : max. 0.4 V
		NPN open collector	
		Totem pole output	LOW (load current: max. 30 ㎃, residual voltage: max. 0.4 V) HIGH (load current : max. 10 ㎃, output voltage: above rated voltage - 2.5 V)
		Line driver output	LOW (load current: max. 20 ㎃, max. 0.4 V) HIGH (load current : max. 20 ㎃, residual voltage: min. 2.5V)
	Response time	Voltage output	Max. 1 μs (wire length: 1.5 m, sinking current= 30 ㎃)
		Open collector	
		Totem pole output	Max. 1 μs (wire length: 1.5 m, sinking current= max. 10 ㎃.)
		Line driver output	Max. 1 μs (wire length: 1.5 m, sinking current= max. 30 ㎃)
Mechanical specifications	Starting torque		4×10^{-3} N.m
	Moment of inertia		4×10^{-6} g·㎠ max
	Permissible shaft loading		● Radial : within 30 N ● Thrust : within 20 N
	Max. number of revolutions		5,000 r/min
Ambient specifications	Insulation resistance		Min. 100 MΩ (between the terminal and case 500 V d.c. mega standard)
	Dielectric strength		800 V a.c. 60 ㎐ for 1 min (between the terminal and case)
	Vibration resistance		10 - 55 ㎐ (cycle for 1 min), double amplitude : 1.5 ㎜, for 2 hours each in X, Y and Z directions
	Shock resistance		490 ㎧² max
	Ambient temperature & humidity		-10 ~ 70 ℃ (without icing), during storage: -25 ~ 85 ℃, 35 ~ 85 % RH
	Cable		● 5 P, Ø5.0 ㎜, length : 1.5 m, shield cable (HE40H cable length option : 2 m, 8 m, 10 m) ● Line drive type : 8P, Ø5.0 ㎜, length : 1.5 m, shield cable
	Weight (g)		170

Suffix code

Model	Code							Content
HE	□-	□	□	□	□	□	□	Hollow Shaft Rotary Encoder (incremental)
Dimension	40H	6						Outer diameter : Ø 40 ㎜ axis inner diameter : Ø 6 ㎜
		8						Outer diameter : Ø 40 ㎜ axis inner diameter : Ø 8 ㎜
		10						Outer diameter : Ø 40 ㎜ axis inner diameter : Ø 10 ㎜
		12						Outer diameter : Ø 40 ㎜ axis inner diameter : Ø 12 ㎜
Number of pulse			*					Refer to the pulse code chart (resolving power)
Output signal (output phase)				2				A, B phase output
				3				A, B, Z phase output
				3C				A, B, $\overline{Z}$ phase output
				4				A, $\overline{A}$, B, $\overline{B}$ phase output
				6				A, $\overline{A}$, B, $\overline{B}$, Z, $\overline{Z}$ phase output
Output circuit					N	12		NPN voltage output (5 - 12 V d.c.)
						24		NPN voltage output (12-24 V d.c.)
					O	12		NPN open collector output (5 - 12 V d.c.)
						24		NPN open collector output (12-24 V d.c.)
					T	12		Totem pole output (5 - 12 V d.c.)
						24		Totem pole output (12-24 V d.c.)
					L			Line driver output (5 V d.c.)

(Note) (*) Is output only for A, B phase (line driver output: A, $\overline{A}$, B, $\overline{B}$ phase).
Pulses other than the ones in the chart are order-made

Number of pulses (resolution)

Model	Number of pulses per revolution
HE40H	*1, *2, *5, 10, *12, 15, 20, 25, 30, 40, 45, 50, 60, 75, 100, 120, 125, 150, 192, 200, 240, 250, 256, 300, 360, 400, 500, 512, 600, 800, 1000, 1024,

※ Please contact us if you have any request for pulse production

HE40HB series CE

Specifications

Model			HE40HB
Appearance			
Electrical specifications	Output phase difference		Phase difference between the phase A and B : T/4 ± T/8 (1 cycle of A phase=T)
	Response speed		Max. 200 kHz
	Rated voltage	NPN voltage output	※ By suffix code 5-12 V d.c. ±5 % 12-24 V d.c. ±5 %
		Open collector	
		Totem pole output	
		Line driver output	5 / 12 / 24 V d.c. ±5 %
	Current consumption		Max. 60 mA, line driver output max. 30 mA (no load)
	Connection		Cable extended type
	Control output	NPN voltage output	● Load voltage : max. 30 V ● Load current: max. 30 mA ● Residual voltage : max. 0.4 V
		NPN open collector	
		Totem pole output	● LOW (load current: max. 30mA residual voltage: max. 0.4V) ● HIGH (load current: max. 10mA, output voltage: above rated voltage - 2.5 V d.c.)
		Line driver output	● LOW (load current: max. 20 mA, residual voltage: max. 0.4 V d.c.) ● HIGH (load current: max. 20 mA, residual voltage: min. 2.5V d.c.)
	Response time	Voltage output	Max. 1 μs (wire length: 1.5 m, sinking current= max. 30 mA)
		Open collector	
		Totem pole output	Max. 1 μs (wire length 1.5 m, sinking current= max. 10 mA.)
		Line driver output	Max. 1 μs (wire length: 1.5 m, sinking current= max. 30 mA)
Mechanical specifications	Starting torque		4×10^{-3} N.m
	Moment of inertia		4×10^{-6} Kg·m2 max
	Permissible shaft loading		● Radial : within 30 N ● Thrust : within 20 N
	Max. number of revolutions		5,000 r/min
Ambient specification	Insulation resistance		Min. 100 MΩ (between the terminal and case 500 V d.c. mega standard)
	Dielectric strength		800 V a.c. 60 Hzfor 1 min (between the terminal and case)
	Vibration resistance		10 - 55 Hz (cycle for 1 min), double amplitude : 1.5 mm, for 2 hours each in X, Y and Z directions
	Shock resistance		Max. 735 m/s²
	Ambient temperature & humidity		-10 ~ 70 ℃ (without condensation), during storage : -25 ~ 85 ℃, 35 ~ 85 % RH
	Cable		● 5 P, Ø 5 mm, length : 1.5 m, shield cable ● Line driver type : 8P, Ø 5 mm, length : 1.5 m, shield cable
	Accessories		Bracket

Suffix code

Model	Code						Content
HE	□-	□	□	□	□	□	Blind Shaft Type Rotary Encoder (Incremental)
Dimension	40HB	6					Outer diameter : Ø40 mm inner diameter : Ø6 mm
		8					Outer diameter : Ø40 mm inner diameter : Ø8 mm
		10					Outer diameter : Ø40 mm inner diameter : Ø10 mm
		12					Outer diameter : Ø40 mm inner diameter : Ø12 mm
Number of pulses			*				Refer to "Number of pulses (resolution)"
Output signal (Output phase)				2			A, B phase output
				3			A, B, Z phase output
				3C			A, B, $\overline{Z}$ phase output
				4			A, $\overline{A}$, B, $\overline{B}$ phase output
				6			A, $\overline{A}$, B, $\overline{B}$, Z, $\overline{Z}$ phase output
Output circuit					N	24	NPN voltage output (12-24 V d.c.)
						12	NPN voltage output (5 - 12 V d.c.)
					O	24	NPN open collector output (12-24 V d.c.)
						12	NPN open collector output (5 - 12 V d.c.)
					T	24	Totem pole output (12-24 V d.c.)
						12	Totem pole output (5 - 12 V d.c.)
					L	5	Line driver Output (5 V d.c.)
						12	Line driver Output (12 V d.c.)
						24	Line driver Output (24 V d.c.)

(Note) [*] Is output only for A, B phase (line driver output: A, $\overline{A}$, B, $\overline{B}$ phase).
Pulses other than the ones in the chart are order-made

Number of pulses (resolution)

Model	Number of pulses per revolution
HE40HB	*1, *2, *5, 10, *12,15, 20, 25, 30, 40, 45, 50, 60, 75, 100, 120, 125, 150, 192, 200, 240, 250, 256, 300,360, 400, 500, 512, 600, 800, 1000,1024

※ Please contact us if you have any request for pulse production

PSC series CE

Specifications

Model			PSC
Appearance			
Electrical specifications	Output phase difference		Phase difference between the phase A and B : T/4 ± T/8 (1 cycle of A phase=T)
	Response speed		Max. 100 KHz
	Rated voltage		5-12 V d.c. (±5 %), 12-24 V d.c. (±5 %)
	Current consumption		Max. 60 ㎃
	Connection		Cable extended type
	Control output	Voltage and open collector outputs	● Load voltage: max. 30 V, ● load current: max. 30 ㎃, ● Residual voltage: max. 0.4 V
		Totem pole output	● LOW (load current : max. 30 ㎃, residual voltage : max. 0.4 V) ● HIGH (load current : max. 10 ㎃, output voltage : above rated voltage - 1.5 V d.c.)
	Response time		Max. 1 μs (wire length: 1.5 m, sinking current= = 30 ㎃)
Mechanical specifications	Starting torque		Max. 200 gf·㎝ (19.600 u N·m)
	Moment of inertia		Max. 800 g·㎠ ($8X10^{-6}$ kg·m^2)
	Permissible shaft loading		● Radial : within 0.1 ㎜, ● Thrust : within 0.2 ㎜
	Max. number of revolutions		5,000 r/min
	Bearing life		1.2 X 10/ (r/min) : time
Ambient specification	Insulation resistance		Min. 500 MΩ (between the terminal and case)
	Dielectric strength		500 V a.c. 60 ㎐ for 1 min (between the terminal and case)
	Vibration resistance		10 - 55 ㎐ (cycle for 1 min), double amplitude : 1.5 ㎜, for 2 hours each in X, Y and Z directions
	Shock resistance		Max. 75 G
	Ambient temperature & humidity		-10 ~ 70 ℃ (without icing), during storage: -25 ~ 85 ℃, 35 ~ 85 % RH
	Cable		● Number of strips: 5 P, ● thickness: Ø 5.0 ㎜, ● Length: 1.5 m, ● Shield cable
	Weight (g)		625

Suffix code

Model	Code				Content
PSC-	□	□	□	□	Wheel Type Encoder
Min. length measurement	MA				1 m
	MB				1 ㎝
	MC				1 ㎜
	YA				1 YARD
	YB				0.1 YARD
	YC				0.01 YARD
Output signal		AB			A, B phase output (PSC-MA, YA), the others are A, B, Z Phase output
Output circuit			N		NPN voltage output
			O		NPN open collector
			T		Totem pole output
Power voltage				12	12 V d.c. (5-12 V d.c.)
				24	24 V d.c. (12-24 V d.c.)

※ The codes PSC-MA and PSC-YA are A, B phase output. The others are A, B, Z phase output

TPR-3

Specifications

Model		TPR-3P
Appearance		
Power voltage		220 V a.c. / 380 V a.c. / 440 V a.c.
Power frequency		50/60 Hz (common)
Rated current		200 A / 250 A / 320 A / 500 A
Protective circuit		● Fuse break alarm, ● Over current alarm, ● Overheating heat sink
Applying load		Resistive load / Inductive load
Control input	Current Input	4-20 mA d.c.
	Voltage Input	1-5 V d.c.
	Contact Input	ON/OFF
	External VR	External volume (10 kΩ)
Control type		● Phase control, ● ON/OFF control
Start type		Soft start / down
Output voltage		More than 95 % of the Power voltage (In case of maximum current input)
Cooling type		Forced cooling (200 A ~ 500 A), separate power supply for fan driving (320 A, 500 A)
Display method		Display by LED light
Insulation resistance		Min. 100 MΩ (Base on 500 V d.c. mega)
Output adjustable range		0 ~ 100 %
Dielectric strength		2,000 V a.c. 50/60 Hz for 1 min
Line noise		Noise by noise simulator (2 kV)
Ambient temperature & humidity		0 ~ 40 ℃, 35 ~ 85 % RH (without condensation)
Storage temperature		-25 ~ 70 ℃
Weight (g)		200/250 A: about 15 kg, 320 A: about 22 kg, 500 A: about 35 kg

Suffix code

Model	Code		Content
TPR-3P	□	□	3-Phase Power Regulator
Power voltage	220		220 V a.c.
	380/440		380 V a.c. / 440 V a.c.
Rated current		200	200 A
		250	250 A
		320	320 A
		500	500 A

TPR-2G

Specifications

Model					
	Low voltage	TPR-2G25L	TPR-2G35L	TPR-2G50L	TPR-2G70L
	High voltage	TPR-2G25H	TPR-2G35H	TPR-2G50H	TPR-2G70H
Appearance					
Power voltage	Low voltage	220 V a.c.			
	High voltage	380 V a.c.			
Power frequency		50 Hz / 60 Hz (common)			
Rated current (40 ℃ standard)		25 A	35 A	50 A	70 A
Applying load		Resisitive load			
Control Input	Current input	4-20 mA d.c. (impedance : 100Ω)			
	Voltage input	–		1-5 V d.c.	
	Contact input	ON / OFF		–	
	External VR	External volume (10 kΩ)			
Control method		● Phase control (shipment mode), ● Fixed cycle cycle control (optional), ● Variable cycle cycle control (optional)			
Movement type		SOFT START / SOFT DOWN (Time 0 to 50 seconds)			
Output voltage		More than 98 % of the Power voltage (In case of maximum current input)			
Cooling method		Natural cooling			Forced cooling
Display method		Display by LED			
Insulation resistance		500 V d.c. 100 MΩ			
Dielectric strength		2,500 V a.c. 50/60 Hz for 1 min			
Line noise		Noise by noise simulator (Pulse width 1 us: ± 2kV)			
Ambient temperature		0~50 ℃ (However, no condensation)			
Ambient Humidity		30 ~ 85 % RH			
Storage temperature		-25 ~ 70 ℃			
Weight(g)		740		1,730	1,750

Suffix code

Model	Code			Content
TPR-2G	□	□	-□	Single-phase power regulator
Rated current	25			25 A
	35			35 A
	50			50 A
	70			70 A
Used load voltage		L		220 V a.c. 50/60 Hz
		H		380 V a.c. 50/60 Hz
Control method			-	Phase Control (Default MODE)
			F	Fixed Cycle Control(Optional)
			V	Variable Cycle Control(Optional)

TPR-2M CE

Specifications

Model		Economical type	Advanced type	
		Low voltage	Low voltage	High voltage
		TPR-2ME25L	TPR-2MS25L	TPR-2MS25H
		TPR-2ME35L	TPR-2MS35L	TPR-2MS35H
Appearance				
WXHXD (㎜)		47.5×90.0×112.0		
Load Voltage		100-240 V a.c.		100 - 440 V a.c.
Circuit input power		100-240 V a.c. 3 W		24 V d.c. 1 W
Power frequency		50/60 ㎐ (common)		
Rated current		25 A / 35 A		
Control Input	Current input	4-20 ㎃ d.c. (impedance : 100 Ω) (Basic packages)	4-20 ㎃ d.c. (impedance : 100 Ω) (Option)	
	Voltage input	1-5 V d.c. (Basic packages)	1-5 V d.c. (Option)	
	Contact input	ON/OFF (Basic packages)	ON/OFF (Option)	
	External VR	External VR (10 ㎏) Simultaneous use of current and voltage input is not supported	-	
Applicable device		TRIAC	SCR	
Control method		● Phase control (Basic), ● Variable Cycle control (Option)		
Movement type		SOFT START (60 sec), SOFT UP/DOWN (15 sec) / Adjust start time by SOFT VR		
Output voltage		More than 98 % of the Power voltage (In case of maximum current input) / Output limitation control by Power VR		
Alarm function		-	● Relay contact output (overcurrent (CE), ● heat sink overheat (OT), ● power failure/heater break (PE), ● SCR short (PE)	
Display method (LED)	Check Output Volume	FIRE : Flicker speed directly proportional to output		
	Check power	POWER: ON POWER	-	
	Alarm verification	-	CE (CURRENT ERROR) : Load current greater than 45 A	
		-	OT (OVER TEMP) : Heat shield temperature above 85℃	
		PE (power ERROR): Power error, Heater break		
Cooling method		Natural cooling		
Weight (g)		322		

Suffix code

Model	Code				Content
TPR-2M	□	□	□	□	Single-Phase Mini Power Controller
Type	E				Economical type
	S				High function
Rated current		25			25 A
		35			35 A
Power voltage			L		100-240 V a.c.
			H		100 - 440 V a.c. (High function only)
Selection specification (High function only)				C	4-20 ㎃ d.c.
				V	1-5 V d.c.
				O	ON/OFF

Economic type: Basic specification
High function: Selection specification (optional 1)

※ The circuit input voltage shall be applied separately. (Low pressure : 100-240 V a.c. / High pressure: 24 V d.c.)

TPR-3M CE

Specifications

Model	TPR-3M25L	TPR-3M45L
Appearance		
WXHXD (㎜)	110.0×157.5×150.0	
Power Voltage	100-240 V a.c.	
Circuit input power	24 V d.c. 8 W	
Frequency of use	50/60 ㎐	
rated current	25 A	45 A
Applied Load	Resistance load	
Control Input	4-20 ㎃ d.c. (impedance: 100 Ω)	
Control method	Phase control (select variable cycle, fixed cycle control options)	
Output voltage	More than 98 % of the Power voltage (In case of maximum current input) / Output limitation control by Power VR	
Cooling method	Forced cooling (24 V d.c. FAN)	
Display method	4 LEDs display status and alarm conditions	
Insulation resistance	Above 100 ((based on 500 Vd.c. mega)	
Voltage withstand	2,500Va.c. 50/60 ㎐ For 1 min	
Line noise	Noise by noise simulator (2,000 V)	
Storage temperature	-30 ~ 90 ℃	
Ambient temperature & humidity	-20 ~ 80 ℃, 45 ~ 85% RH (No condensation)	
Weight (g)	1,756	

Suffix code

Model	Code			Content
TPR-3M	□	□	□	3-Phase mini power regulator
Rated current	25			25 A
	45			45 A
Power Voltage		L		100-240 V a.c. (For low voltage)
Option			IS	Power insulation type

※ Option -IS type is a product that can connect up to 5 in series with 1 temperature controller and power supply (SMPS).
The general type is 24 V d.c. The partial power circuit is non-insulated and requires 1:1 connection with the temperature controller.

TPR-2SL CE

Specifications

Model		TPR-2SL 040L	TPR-2SL 055L	TPR-2SL 070L	TPR-2SL 090L	TPR-2SL 110L	TPR-2SL 130L	TPR-2SL 160L	TPR-2SL 200L
	High voltage	TPR-2SL 040H	TPR-2SL 055H	TPR-2SL 070H	TPR-2SL 090H	TPR-2SL 110H	TPR-2SL 130H	TPR-2SL 160H	TPR-2SL 200H
Appearance									
WXHXD (㎜)		60.0×183.0×172.1		60.0×203.0 ×172.1	85.0×219.0 ×205.1	85.0×245.5×205.1			
Power voltage	Low voltage	100-240 V a.c.							
	High voltage	380-440 V a.c.							
Circuit input power		100-240 V a.c.							
		6 W		16 W	20 W				
Power frequency		50/60 ㎐ (Common)							
Rated current (40 ℃ standard)		40 A	55 A	70 A	90 A	110 A	130 A	160 A	200 A
Fuse installation		None (optional)			Built-in fast acting fuse				
Applying load		Resisitive load							
Control Input	Current input	4-20 ㎃ d.c. (impedance : 100 Ω)							
	Voltage input	1-5 V d.c. (option : 0-10 V d.c.)							
	Contact input	ON/OFF							
	External VR	External volume (10 kΩ)							
Control method		● Phase control, ● Fixed cycle control, ● Variable cycle control, ● ON/OFF control							
Movement type		SOFT START / SOFT UP, DOWN							
Output voltage		More than 98 % of the Power voltage (In case of maximum current input)							
Cooling method		Natural cooling		Forced cooling	Natural cooling	Forced cooling			
Display method		Display by LED							
Insulation resistance		Min. 100 MΩ (based on 500 V d.c. mega)							
Output control range		0 ~ 100 %							
Dielectric strength		3000 V a.c. 50/60 ㎐ for 1 min							
Line noise		Noise by noise simulator (3000 V)							
Ambient temperature & humidity		0 ~ 40 ℃, 30 ~ 85 % RH (without condensation)							
Storage temperature		-25 ~ 70 ℃							
Weight (g)		1,388		1,478	2,820	3,100			

Suffix code

Model	Code				Content	
TPR-2SL	□	□	□	□	Slim Type Single-Phase Thyristor Power Regulator	
	040				40 A	Fuse optional
	055				55 A	
	070				70 A	
	090				90 A	Fuse built-in
	110				110 A	
	130				130 A	
	160				160 A	
	200				200 A	
Power voltage		L			100-240 V a.c. (Low voltage)	
		H			380-440 V a.c. (High voltage)	
Option			C		RS485	
				F	Built-in fuse type (for 25/40/55/70 A models)	

※ The circuit need 100 - 240 V a.c. voltage power separately.

TPR-3SL-EP CE

Specifications

Model							
	Low voltage	TPR-3SL040L-EP	TPR-3SL055L-EP	TPR-3SL070L-EP	TPR-3SL090L-EP	TPR-3SL130L-EP	TPR-3SL160L-EP
	High voltage	TPR-3SL040H-EP	TPR-3SL055H-EP	TPR-3SL070H-EP	TPR-3SL090H-EP	TPR-3SL130H-EP	TPR-3SL160H-EP
Appearance							
Power voltage	Low voltage	100-240 V a.c.					
	High voltage	100-440 V a.c.					
Circuit input power		100-240 V a.c. 18 W					
Power frequency		50/60 Hz (Common)					
Rated current		40 A	55 A	70 A	90 A	130 A	160 A
Applying load		Resisitive load					
Current input		4-20 ㎃ d.c. (Impedance : 100 Ω)					
Control type		● Phase control, ● Fixed cycle control, ● Variable cycle control, ● ON/OFF control					
Movement type		SOFT START / SOFT UP, DOWN					
Output voltage		More than 98 % of the Power voltage (In case of maximum current input)					
Cooling method		Forced cooling					
Display method		Display by LED					
Insulation resistance		Min. 100 ㏁ (500 V d.c. Mega standard)					
Output control range		0 ~ 100 %					
Dielectric strength		3,000 V a.c. 50/60 Hz for 1 min					
Line noise		Noise by noise simulator (2500 V)					
Ambient temperature & humidity		0 ~ 40 ℃, 30 ~ 85 % RH (without condensation)					
Storage temperature		-25 ~ 70 ℃					
Weight (g)		4,324			9,194	9,288	

Suffix code

Model	Code			Content
TPR-3SL	□	□	-□	3-Channel Each Phase Control Thyristor Power Regulator
Rated current	040			40 A
	055			55 A
	070			70 A
	090			90 A
	130			130 A
	160			160 A
Power voltage		L		100-240 V a.c. (Low voltage)
		H		100-440 V a.c. (High voltage)
Option			EP	Each phase control (individual control of 3 devices)

※ Circuit and fan need 100 - 240 V a.c. voltage power separately.
※ For 130 A, 160 A products, the fan need 24 V d.c. voltage power.

TPR-3SL CE

Specifications

Model							
	Low voltage	TPR-3SL040L	TPR-3SL055L	TPR-3SL070L	TPR-3SL090L	TPR-3SL130L	TPR-3SL160L
	High voltage	TPR-3SL040H	TPR-3SL055H	TPR-3SL070H	TPR-3SL090H	TPR-3SL130H	TPR-3SL160H
Appearance							
WXHXD(㎜)		110.0×249.5×213.7		110.0×249.5×213.7	173.0×300.5×239.1		
Power voltage	Low voltage	100-240 V a.c.					
	High voltage	380-440 V a.c.					
Circuit input power		100-240 V a.c. 18 W			100-240 V a.c. 20 W		
Power frequency		50/60 ㎐ (Common)					
Rated current		40 A, 55 A, 70 A, 90 A, 130 A, 160 A					
Applying load		Resistive load					
Control Input	Current input	4-20㎃ d.c. (Impedance : 100 Ω)					
	Voltage input	1-5 V d.c.					
	Contact input	ON / OFF					
	External VR	External volume (10 KΩ)					
Control method		● Phase control, ● Fixed cycle cycle control, ● Variable cycle cycle control, ● ON/OFF control					
Movement type		SOFT START / SOFT UP, DOWN					
Output voltage		More than 98 % of the Power voltage (In case of maximum current input)					
Cooling method		Natural cooling (40 A, 55 A), Forced cooling (70 A, 90 A, 130 A, 160 A)					
Display method		Display by LED					
Insulation resistance		Min. 100 MΩ (Base on 500 V d.c. mega)					
Output control range		0 ~ 100 %					
Dielectric strength		3,000 V a.c. 50/60 Hz for 1 min					
Line noise		Noise by noise simulator (2500 V)					
Ambient temperature & humidity		0 ~ 40 ℃, 30 ~ 85 % RH (without condensation)					
Storage temperature		-25 ~ 70 ℃					
Weight (g)		4,044		4,324	9,100	9,194	

Suffix code

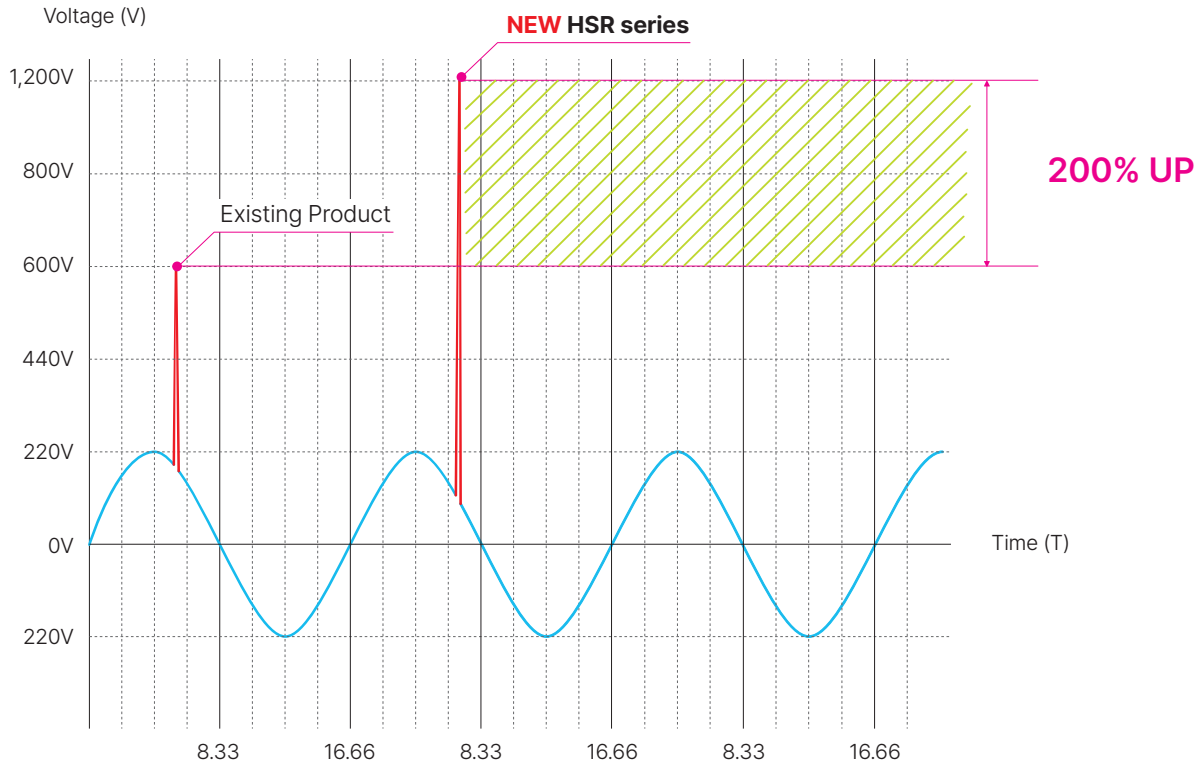
Model	Code			Content
TPR-3SL	□	□	-□	Slim Type 3-Phase Power Regulator
Rated current	040			40 A
	055			55 A
	070			70 A
	090			90 A
	130			130 A
	160			160 A
Power voltage		L		100-240 V a.c. (Low voltage)
		H		380-440 V a.c. (High voltage)
Option			-	Fuse built-in
			N	No fuse

※ Circuit and fan need 100 - 240 V a.c. voltage power separately.

HSR series RoHS2 NEW

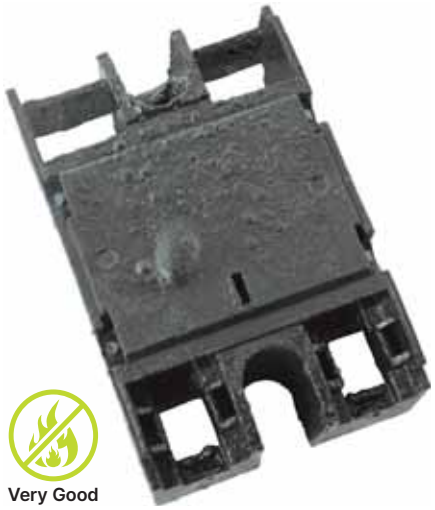
200% Improved Non-repetitive Peak Voltage

The new HSR series achieved 200% improvement of non-repetitive peak voltage compared to the previous HSR series, preventing damage to parts caused by peak voltage, thereby increasing durability.



Fire Prevention by Improved Flameproof Case

The case used in the new HSR series has improved flame-resistant performance, and is more safe from fire.
In addition, safe environment will be realized by blocking the cause of fire with the new HSR series adopting non-epoxy method.

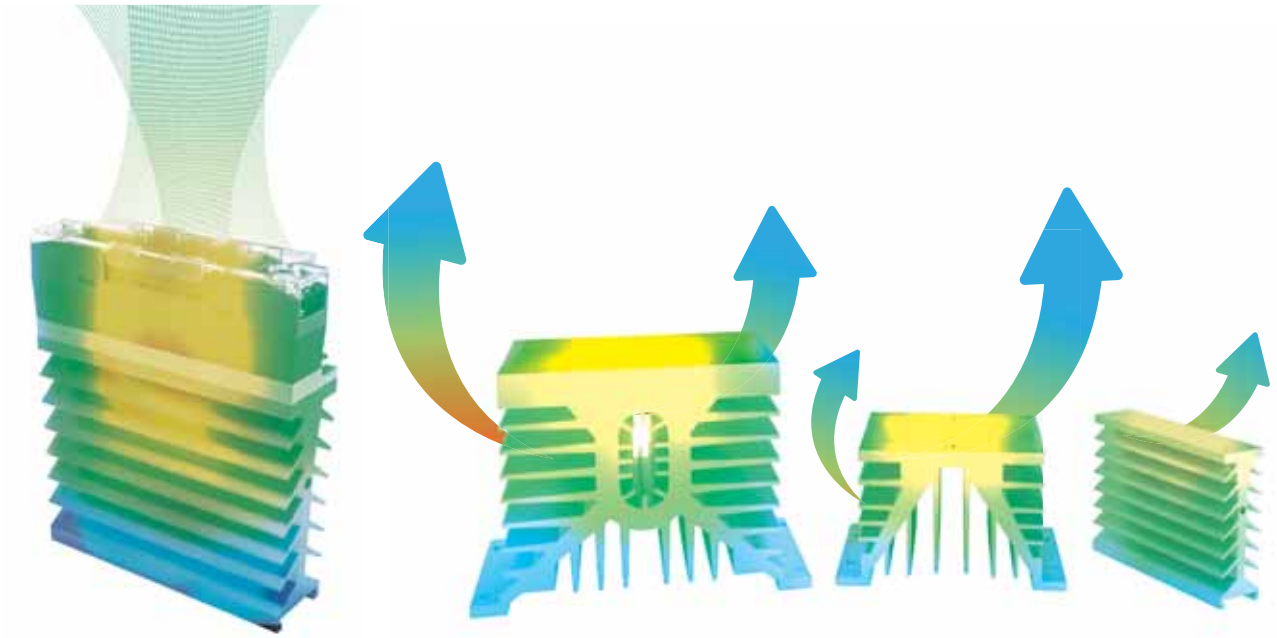


It meets strict conditions of certificates with great insulation performance in spite of its non-epoxy method.

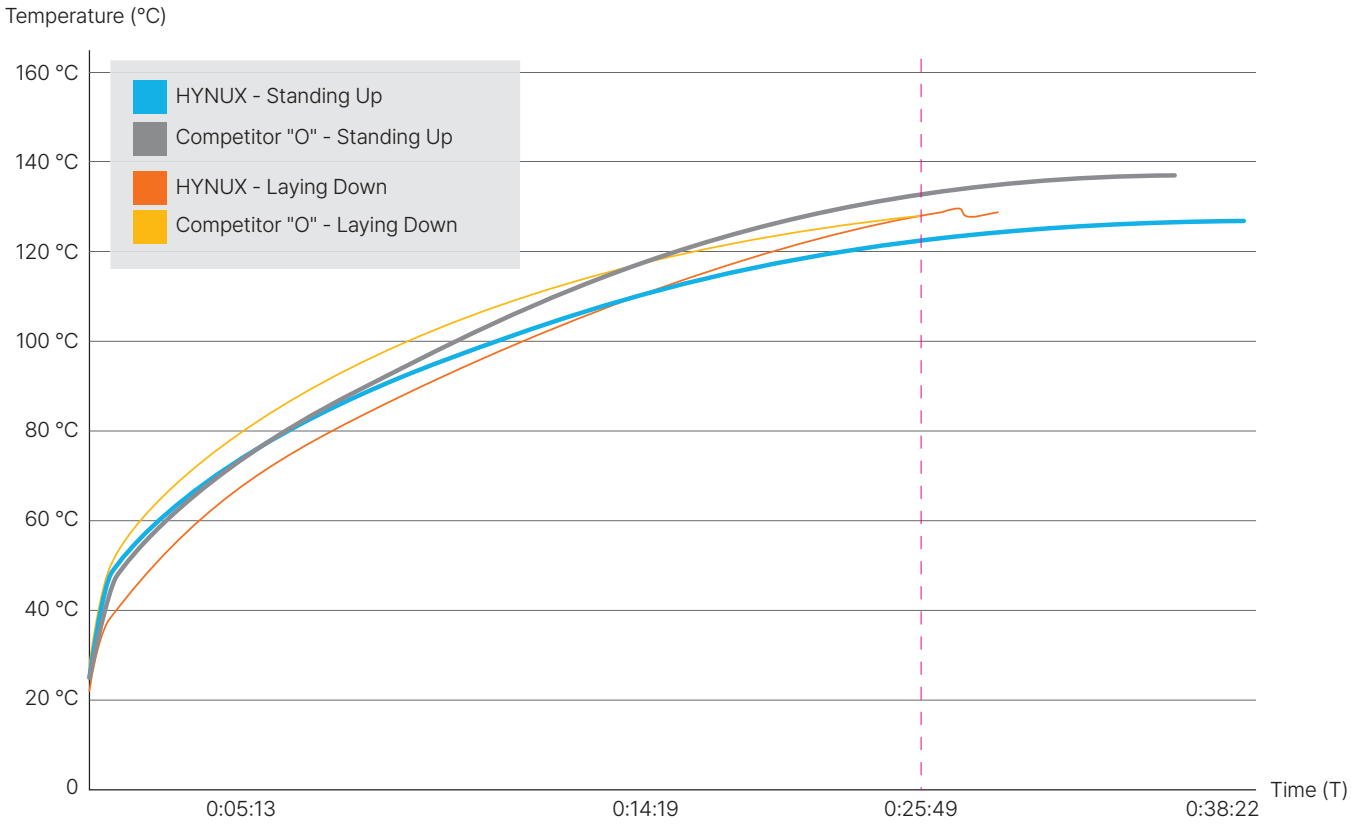
※This image has been created to aid understanding.

Upgraded Heatsink

It provides the best heat emission performance in any environment.



Heatsink(Triac) Temperature Comparison as per Installation Direction

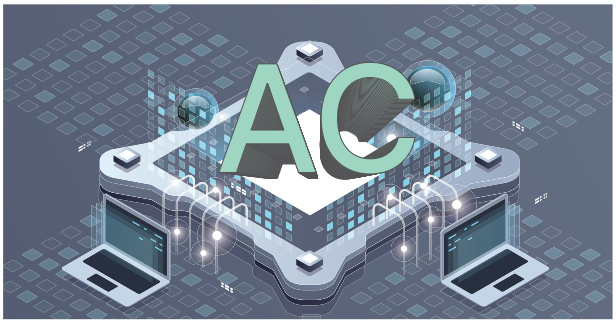


Item	Direction	Temperature	Ambient Temperature	Load Current	Time
Hanyoung Nux Heatsink Type C	Standing Up	122.3 °C	23~26 °C	39~40 A	0:25:49
	Laying Down	127.0 °C			
Competitor "O" Heatsink	Standing Up	132.1 °C			
	Laying Down	127.1 °C			

※Above is a comparative experiment data conducted by Hanyoung Nux on its own.

Newly Added AC Input in HSR-SL

AC input option is newly added.



2,500V Withstand Voltage

It is more safe by 2,500V of high voltage withstand capacity.

Heatsink Integral/Separate Selection

It is possible to choose the product with Heatsink or without Heatsink.
Installation holes are same sized, so it is convenient for replacement and maintenance.

HSR-SL

CE cULus RoHS2 NEW

Suffix code

● CE, UL certified products CE cULus

Model	Code						Content
HSR-SL	□	□	□	□	□	□	Slim-type single-phase Solid State Relay
Control input voltage	D						4 - 32 V d.c.
	A						90 - 240 V a.c.
Rated load current		15					15 A
		25					25 A
		40					40 A
Operating load voltage			L				24 - 240 V a.c. (Low voltage)
			H				24 - 480 V a.c. (High voltage)
Method of operation				Z			Zero-cross switching (standard product)
				R			Random switching
Heat sink & Option					S		Integrated heat sink (standard product)
					T		Heat sink + Bimetal mounted
					N		No heat sink ※CAUTION 1
point of contact						1C	1 Point of contact (Unmarked)
						2C	2 Point of contact (Unmarked) ※CAUTION 2 Only for 15 A

※ CAUTION 1 - In case of using a heatsink from other suppliers, it must be used in accordance with the thermal resistance table in the product manual.
※ CAUTION 2 - 2 contact : Only available for 15 A items. (HSR-SL□15LZS2C, HSR-SL□15HZS2C)

● S-MARK certified prod Ⓢ

Model	Code						Content
HSR-SL	□	□	□	□	□	-S	Slim-type single-phase Solid State Relayt
Control input voltage	D						4 - 32 V d.c.
Rated load current		15					15 A
		25					25 A
		40					40 A
Operating load voltage			L				24 - 240 V a.c. (Low voltage)
			H				24 - 480 V a.c. (High voltage)
Method of operation				Z			Zero-cross switching (standard product)
Heat sink & Option					S		Integrated heat sink (standard product)
					T		Heat sink + Bimetal mounted
					N		No heat sink ※CAUTION 1

※ CAUTION 1 - In case of using a heatsink from other suppliers, it must be used in accordance with the thermal resistance table in the product manual.

Specifications

Model								
		Low	HSR-SLD15LR□□	HSR-SLD25LR□□	HSR-SLD40LR□□	HSR-SLA15LR□□	HSR-SLA25LR□□	HSR-SLA40LR□□
			HSR-SLD15LZ□□	HSR-SLD25LZ□□	HSR-SLD40LZ□□	HSR-SLA15LZ□□	HSR-SLA25LZ□□	HSR-SLA40LZ□□
		High	HSR-SLD15HR□□	HSR-SLD25HR□□	HSR-SLD40HR□□	HSR-SLA15HR□□	HSR-SLA25HR□□	HSR-SLA40HR□□
			HSR-SLD15HZ□□	HSR-SLD25HZ□□	HSR-SLD40HZ□□	HSR-SLA15HZ□□	HSR-SLA25HZ□□	HSR-SLA40HZ□□
		S - Low	HSR-SLD15LZ□-S	HSR-SLD25LZ□-S	HSR-SLD40LZ□-S			
		S - High	HSR-SLD15HZ□-S	HSR-SLD25HZ□-S	HSR-SLD40HZ□-S			
LOAD	Rated Load Voltage	Low	24 - 240 V a.c. 50/60 Hz					
		High	24 - 480 V a.c. 50/60 Hz					
	Peak Voltage (Non-repetition)	Low	1,200 V					
		High						
	Rated load current		15 A	25 A	40 A	15 A	25 A	40 A
	Surge current 60 Hz (8.3 ms No repetition)	Low	170 A	260 A	420 A	170 A	260 A	420 A
		High	170 A	250 A	370 A	170 A	250 A	370 A
	Surge current 50 Hz (10 ms No repetition)	Low	160 A	250 A	400 A	160 A	250 A	400 A
		High	160 A	230 A	350 A	160 A	230 A	350 A
	Leakage current		Less than 20 mA					
	Output ON voltage dropping		Less than 1.6 V (R.M.S)					
INPUT	Rated Voltage		5 - 24 V d.c.			100 - 240 V a.c. 50/60 Hz		
	Operating Voltage Range (ON Voltage)		4 - 32 V d.c.			90 - 264 V a.c. 50/60 Hz		
	return voltage (OFF Voltage)		Less than 3 V			Less than 50 V		
	Impedance		Less than 4 kΩ			Less than 40 kΩ		
	Current consumption		Constant current method : Less than 14 mA			Less than 14 mA		
Response Time			1/2 Cycle + 1 ms max. (“R” type below 1 ms)					
Insulating Resistance			500 V d.c., 100 MΩ (Between the input / output and case)					
Dielectric strength			2,500 V a.c. (For 1min at 60 Hz)					
Rated impulse withstand voltage (Uimp)			2,500 V					
Vibration resistance			10 - 55 Hz, Constant current method : 1.5 mm,X·Y·Z each axis direction for 2 hour					
Shock resistance			1,000 m/s², X·Y·Z each axis 3 times					
Storage Temperature			-30 ~ 90 °C					
Ambient Temperature			-30 ~ 80 °C (no condensation)					
Ambient Humidity			45 ~ 85 % RH					
Pollution level grade			2 Level					
Bolt tightening torque			Input terminal: 0.05 Nm / Output terminal: 0.25 Nm					
Usage			Resistive load					
Certification			CE EN 60947-4-3 cULus Ⓢ RoHS2					
Weight Integrated heat sink (with box)			Approx. 226 g		Approx. 266 g	Approx.226 g		Approx. 266 g
Weight Heating plate removal (with box)			Approx. 94 g					

HSR-2 CE cULus RoHS2 NEW

Specifications

Model														
		Low	HSR-2D 10LZ□	HSR-2D 20LZ□	HSR-2D 30LZ□	HSR-2D 40LZ□	HSR-2D 50LZ□	HSR-2D 70LZ□	HSR-2A 10LZ□	HSR-2A 20LZ□	HSR-2A 30LZ□	HSR-2A 40LZ□	HSR-2A 50LZ□	HSR-2A 70LZ□
			HSR-2D 10LR□	HSR-2D 20LR□	HSR-2D 30LR□	HSR-2D 40LR□	HSR-2D 50LR□	HSR-2D 70LR□	HSR-2A 10LR□	HSR-2A 20LR□	HSR-2A 30LR□	HSR-2A 40LR□	HSR-2A 50LR□	HSR-2A 70LR□
		High	HSR-2D 10HZ□	HSR-2D 20HZ□	HSR-2D 30HZ□	HSR-2D 40HZ□	HSR-2D 50HZ□	HSR-2D 70HZ□	HSR-2A 10HZ□	HSR-2A 20HZ□	HSR-2A 30HZ□	HSR-2A 40HZ□	HSR-2A 50HZ□	HSR-2A 70HZ□
			HSR-2D 10HR□	HSR-2D 20HR□	HSR-2D 30HR□	HSR-2D 40HR□	HSR-2D 50HR□	HSR-2D 70HR□	HSR-2A 10HR□	HSR-2A 20HR□	HSR-2A 30HR□	HSR-2A 40HR□	HSR-2A 50HR□	HSR-2A 70HR□
LOAD	Rated Load Voltage	Low	24 - 240 V a.c. 50/60 Hz											
		High	24 - 480 V a.c. 50/60 Hz											
	Peak Voltage (Non-repetition)	Low / High	1,200V											
	Rated load current		10A	20A	30A	40A	50A	70A	10A	20A	30A	40A	50A	70A
	Surge current 60Hz (8.3ms No repetition)	Low	170A	260A	420A		525A		170A	260A	420A		525A	
		High	170A	250A	370A		525A		170A	250A	370A		525A	
	Surge current 50Hz (10ms No repetition)	Low	160A	250A	400A		500A		160A	250A	400A		500A	
		High	160A	240A	340A		500A		160A	250A	340A		500A	
	Leakage current		Less than 20 m											
	Output ON voltage dropping		Less than 1.6 V (R.M.S)											
INPUT	Rated Voltage		5 - 24 V d.c.						100 - 240 V a.c. 50/60 Hz (public)					
	Operating Voltage Range (ON Voltage)		4 - 32 V d.c.						90 - 264 V a.c. 50/60 Hz (public)					
	return voltage (OFF Voltage)		Less than 3 V						Less than 50 V					
	Impedance		Less than 4 kΩ						Less than 40 kΩ					
	Current consumption		Constant current method : 14 mA or less						Less than 14 mA					
Response Time			1/2 Cycle + 1 ms max. ("R" type below 1ms)											
Insulating Resistance			500 V d.c., 100 MΩ (Between input and output and case)											
Dielectric strength			2,500 V a.c. (For 1min at 60 Hz)											
Vibration resistance			10 - 55 Hz, Double amplitude : 1.5 mm, X-Y-Z each axis direction for 2 hour											
Shock resistance			1,000 m/s², X·Y·Z each axis 3 time											
Storage Temperature			-30 ~ 90 °C											
Ambient Temperature & Humidity			-30 ~ 80 °C (No Condensation), 45 ~ 85 % RH											
Pollution level grad			2 level											
Bolt tightening torque			Input terminal : 0.05 Nm / Output terminal : 0.25 Nm											
Usage			Resistive load											
Accepted standard			CE EN 60947-4-3 cULus RoHS2											
Weight Heating plate removal (with box)			Approx 110 g				Approx 120 g		Approx 110 g				Approx 120 g	
Weight Integrated heat sink (with box)			Approx 462g	Approx 668g	Approx 868g		Approx 1,266g	Approx 1,832g	Approx 462g	Approx 668g	Approx 868g		Approx 1,266g	Approx 1,832g

Suffix code

Model	Code					Information
HSR-2	□	□	□	□	□	Single-Phase Solid State Relay
Control Input Voltage	D					4 - 32 V d.c.
	A					90 - 240 V a.c.
Rated load current		10				10A
		20				20A
		30				30A
		40				40A
		50				50A
		70				70A
Rated load voltage			L			24 - 240 V a.c. (Low voltage)
			H			24 - 480 V a.c. (High voltage)
Operation method (Switching Mode)				Z		Zero Cross Switching (Standard product)
				R		Random Switching
Heatsink option					T	Heat sink + Bimetal mounting (50 A, 70 A only)
					N	No Heat sink ※CAUTION 1

HSR-3 CE cULus RoHS2 NEW

Specifications

Model														
		Low	HSR-3D 10LZ□	HSR-3D 20LZ□	HSR-3D 30LZ□	HSR-3D 40LZ□	HSR-3D 50LZ□	HSR-3D 70LZ□	HSR-3A 10LZ□	HSR-3A 20LZ□	HSR-3A 30LZ□	HSR-3A 40LZ□	HSR-3A 50LZ□	HSR-3A 70LZ□
			HSR-3D 10LR□	HSR-3D 20LR□	HSR-3D 30LR□	HSR-3D 40LR□	HSR-3D 50LR□	HSR-3D 70LR□	HSR-3A 10LR□	HSR-3A 20LR□	HSR-3A 30LR□	HSR-3A 40LR□	HSR-3A 50LR□	HSR-3A 70LR□
		High	HSR-3D 10HZ□	HSR-3D 20HZ□	HSR-3D 30HZ□	HSR-3D 40HZ□	HSR-3D 50HZ□	HSR-3D 70HZ□	HSR-3A 10HZ□	HSR-3A 20HZ□	HSR-3A 30HZ□	HSR-3A 40HZ□	HSR-3A 50HZ□	HSR-3A 70HZ□
			HSR-3D 10HR□	HSR-3D 20HR□	HSR-3D 30HR□	HSR-3D 40HR□	HSR-3D 50HR□	HSR-3D 70HR□	HSR-3A 10HR□	HSR-3A 20HR□	HSR-3A 30HR□	HSR-3A 40HR□	HSR-3A 50HR□	HSR-3A 70HR□
LOAD	Rated Load Voltage	Low	24 - 240 V a.c. 50/60 Hz											
		High	24 - 480 V a.c. 50/60 Hz											
	Peak Voltage (Non-repetition)	Low / High	1,200 V											
	Rated load current		10A	20A	30A	40A	50A	70A	10A	20A	30A	40A	50A	70A
	Surge current 60Hz (8.3ms No repetition)	Low	170A	260A	420A		525A		170A	260A	420A		525A	
		High	170A	250A	370A		525A		170A	250A	370A		525A	
	Surge current 50Hz (10ms No repetition)	Low	160A	250A	400A		500A		160A	250A	400A		500A	
		High	160A	240A	350A		500A		160A	250A	350A		500A	
	Leakage current		Less than 20 mA											
	Output ON voltage dropping		Less than 1.6 V (R.M.S)											
INPUT	Rated Voltage		5 - 24 V d.c.						100 - 240 V a.c. 50/60Hz					
	Operating Voltage Range (ON Voltage)		4 - 32 V d.c.						90 - 264 V a.c. 50/60Hz					
	return voltage (OFF Voltage)		Less than 3 V						Less than 50 V					
	Impedance		Less than 4 kΩ						Less than 40 kΩ					
	Current consumption		Constant current method : Less than 25mA						Less than 14 mA					
Response Time			1/2 Cycle + 1 ms max. (“R” type below 1ms)											
Insulating Resistance			500 V d.c., 100 MΩ (Between input and output and case)											
Dielectric strength			2,500 V a.c. (For 1min at 60 Hz)											
Vibration resistance			10 - 55 Hz, Double amplitude : 1.5 mm, X-Y-Z each axis direction for 2 hour											
Shock resistance			1,000 m/s², X·Y·Z each axis 3 time											
Storage Temperature			-30 ~ 90 °C											
Ambient Temperature & Humidity			-30 ~ 80 °C (No Condensation), 45 ~ 85 % RH											
Pollution level grad			2 leve											
Bolt tightening torque			Input terminal : 0.05 Nm / Output terminal : 0.25 Nm											
Usage			Resistive load											
Accepted standard			CE EN 60947-4-3 cULus RoHS2											
Weight Heating plate removal (with box)			Approx 227g				Approx 322g		Approx 227g				Approx 322g	
Weight Integrated heat sink (with box)			Approx 995g	Approx 1,257g	Approx 1,511g		Approx 1,796g	Approx 2,374g	Approx 995g	Approx 1,257g	Approx 1,511g		Approx 1,796g	Approx 2,374g

Suffix code

Model	Code					Information
HSR-3	□	□	□	□	□	Three Phase Solid State Relay
Control Input Voltage	D					4 - 32 V d.c.
	A					90 - 240 V a.c.
Rated load current		10				10 A
		20				20 A
		30				30 A
		40				40 A
		50				50 A
		70				70 A
Rated load voltage			L			24 - 240 V a.c. (Low voltage)
			H			24 - 480 V a.c. (High voltage)
Operation method (Switching Mode)				Z		Zero Cross Switching (Standard product)
				R		Random Switching
Heatsink option					T	Heat sink + Bimetal mounting (50 A, 70 A only)
					N	No Heat sink ※CAUTION 1

HSR-2SLD series

Specifications

Model		Low voltage	HSR-2SLD252Z	HSR-2SLD402Z
		High voltage	HSR-2SLD254Z	HSR-2SLD404Z
Appearance				
WXHXD(㎜)		Low voltage	79.0×96.6×131.3	95.0×96.6×156.7
		High voltage		110.0×133.0×140.1
Load	Usage Load Voltage	Low voltage	90-264 V a.c.	
		High voltage	90-480 V a.c.	
	Peak voltage (Non-repeating)	Low voltage	600 V	
		High voltage	1,200 V	
	Rated load current		25 A	40 A
	Frequency		50/60 Hz (Common)	
	Input current (8.3 ms non-repeating)	Low voltage	260 A	420 A
		High voltage	250 A	370 A
	Leakage current		10 ㎃ or less	
	Output ON voltage drop		1.8 V (RMS) or less	
Rated impulse withstand voltage		Low voltage	4 ㎸	
		High voltage	6 ㎸	
Input	Rated voltage		5-24 V d.c.	
	Operating voltage range		4-32 V d.c.	
	Impedance		4 ㎏Ω or less	
	Operating voltage		3 V d.c. More than	
	Return voltage		1.5 V d.c. or less	
	Current input		Constant current method : 10 ㎃ (±3)	
Detection unit	Rated voltage		24 V d.c.	
	Operating voltage range		20-26 V d.c.	
	Power Consumption		25 ㎃ or less, 40 ㎃ or less in case of alarm output (based on 24 V d.c.)	
	Collector internal pressure		30 V d.c. or less	
	Current through current		50 ㎃ or less	
	Collector power consumption		500 ㎽	
	Output form		Transistor open collector (High when abnormality is detected)	
Response time			1/2 Cycle + 1 ㎳ max. (“R” type 1 ms or less)	
Insulation Resistance			500 V d.c., 100 ㎫Ω (between input and output and case)	
Withstand voltage			2,500 V a.c. (1 minute at 60 Hz)	
Vibration resistance			10-55 ㎐, double amplitude : 1.5 ㎜, 2 hours in each of X, Y, and Z directions	
Shock resistance			1,000 ㎧², 3 times in each of X, Y, and Z directions	
Storage temperature			-30 ~ 90 ℃	
Ambient temperature and humidity			-20 ~ 80 ℃, 45 ~ 85 % RH (without condensation)	
Pollution degree			Level 2	
Protection structure			IP20 (IEC 60529)	
Purpose of use			Resistive load / inductive load	
Applied standard			IEC 62314	
Weight (g)			1,000	1,300

Suffix code

Model	Code			Content
HSR-2SLD	□	□	□	2-wire cut-off alarm output solid-state relay (alarm open collector output)
Rated load current	25			25 A
	40			40 A
Used load voltage		2		90-264 V a.c. (Low voltage)
		4		90-480 V a.c. (High voltage)
The mode of operationally			Z	Zero cross switching (standard product)
			R	Random switching

HSR-3SL series CE

Specification

Model		Low voltage	HSR-3SLD152Z	HSR-3SLD252Z	HSR-3SLD402Z
		High voltage	HSR-3SLD154Z	HSR-3SLD254Z	HSR-3SLD404Z
Appearance					
WXHXD(㎜)			79.0×96.6×120.0		95.0×96.6×146.0
Load	Usage Load Voltage	Low voltage	90-264 V a.c.		
		High voltage	90-480 V a.c.		
	Peak voltage (Non-repeating)	Low voltage	600 V		
		High voltage	800 V	1,200 V	
	Rated load current		15 A (40 ℃)	25 A (25 ℃)	40 A (25 ℃)
	Frequency		50/60 Hz (Common)		
	Input current (8.3 ms non-repeating)	Low voltage	170 A	260 A	420 A
		High voltage	170 A	250 A	370 A
	Leakage current		20 ㎃ or less		
	Output ON voltage drop		1.6 V (RMS) or less		
Input	Rated voltage		5-24 V d.c.		
	Operating voltage range		4-32 V d.c.		
	Impedance		4 ㎏Ω or less		
	Operating voltage		3 V d.c. More than		
	Return voltage		1.5 V d.c. or less		
	Current input		Constant current method : 10 ㎃ (±3)		
Response time			1/2 Cycle + 1 ㎳ max. (“R” type 1 ㎳ or less)		
Insulation Resistance			500 V d.c., 100 ㎫Ω (between input and output and case)		
Withstand voltage			3,000 V a.c. (1 minute at 60 Hz)		
Vibration resistance			10-55 ㎐, double amplitude : 1.5 ㎜, 2 hours in each of X, Y, and Z directions		
Shock resistance			1,000 ㎧², 3 times in each of X, Y, and Z directions		
Storage temperature			-30 ~ 90 ℃		
Ambient temperature and humidity			-20 ~ 80 ℃, 45 ~ 85 % RH (without condensation)		
Weight (g)			1,000		1,300

Suffix code

Model	Code	Content
HSR-3SL	□ □ □ □	Slim type 3-phase solid-state relay
Input voltage	D	4-32 V d.c.
Rated load current	15	15 A
	25	25 A
	40	40 A
Used load voltage	2	90-264 V a.c. (Low voltage)
	4	90-480 V a.c. (High voltage)
The mode of operationally	Z	Zero cross switching (standard product)
	R	Random switching

SSR-2C

Specifications

Model		SSR-2C252Z	SSR-2C402Z
Appearance			
Load	Load voltage	90-264 V a.c.	
	Peak voltage (non-repetitive)	600 V	
	Rated load current	25 A	40 A
	Frequency	50/60 Hz(Common)	
	Closing current (8.3 ms non-repetitive)	260 A	420 A
	Leakage current	10 mA or less	
	Output ON Voltage drop	1.8 V (RMS) or less	
Input	Voltage range	4-32 V d.c.	
	Impedance	4 kΩ or less	
	Operating voltage	3 V d.c. More than	
	Return voltage	1.5 V d.c. Below	
Response speed		1/2 Cycle + 1 ms max	
Insulation Resistance		500 V d.c. 100 MΩ (Between input and output and case)	
Withstand voltage		2,500 V a.c. (1 minute at 60 Hz)	
Vibration resistance		10 -55 Hz, double amplitude: 1.5 mm, 2 hours in each of X, Y and Z directions	
Shock resistance		1,000 m/s², X、Y、Z 3 times each direction	
Storage temperature		-30 ~ 90 ℃	
Ambient temperature		-20 ~ 80 ℃ (However, no condensation)	
Ambient Humidity		45 ~ 85 % RH	
Applied standard		IEC 62314	
Subordinate category		LC A	
Protection class		IP20	
Pollution level		Level 2	
Weight(g)		670	900

Suffix code

Model	Code	Content
SSR-	□ □ □ □ □	Solid State Relay
phase	2	phase
Contact	C	2 Contact
Rated load current	25	25 A
	40	40 A
Used load voltage	2	90-264 V a.c.
How to operate	Z	Zero cross switching

HSP/HSM/HSN series

HSP series / HSM series

Model	HSP-10	HSP-20	HSP-40	HSM-70	HSM-110	HSM-150	HSM-200	HSM-250
	HSR-2□10□□	HSR-2□20□□	HSR-2□30□□	HSR-2□10□□	HSR-2□20□□	HSR-2□40□□	HSR-3□20□□	HSR-3□40□□
	-	-	HSR-2□40□□	-	HSR-2□30□□	HSR-3□10□□	HSR-3□30□□	-
Appearance								
Capacity	10 A	20 A	30 A	10 A	20 A	40 A	20 A	40 A
	-	-	40 A	-	30 A	10 A	30 A	-
Length (㎜)	48	80	109	70	110	150	200	250

HSN series

Model	HSN-80	HSN-120	HSN-80-F	HSN-120-F
	HSR-2□50□□	HSR-2□70□□	HSR-3□50□□	HSR-3□40□□
With or without fan	Without	Without	With	With
Appearance				
Capacity	50 A	70 A	50 A	70 A
	-	-	-	-
Length (㎜)	80	120	92X92X25T	92X92X25T

HSR-PD series

Specifications

Model		HSR-PD032Z	HSR-PD052Z	HSR-PD082Z
Appearance				
WXHXD(㎜)		35.0×19.0×8.0	37.5×23.2×10.6	35.0×36.7×20.0
Load	Rated load voltage	100-220 V a.c.		
	Used load voltage	90-240 V a.c.		
	Peak voltage (non-repeating)	600 V		
	Rated load current	3 A	5 A	8 A
	Frequency	50/60 ㎐		
	Input current	30 A	60 A	120 A
	Leakage current	10 ㎃ or less		
	Output ON voltage drop	1.6 V (rms) or less		
Input	Rated voltage	5-24 V d.c.		
	Operating voltage range	4-32 V d.c.		
	Impedance	4 ㎏Ω or less		
	Operating voltage	3 V d.c. More than		
	Return voltage	1.5 V d.c. or less		
	Current input	Constant current method : 10 ㎃ (±3)		
Response time		1/2 cycle + 1 ㎳ max		
Insulation Resistance		500 V d.c., 100 ㎫Ω (between input and output and case)		
Voltage withstand		2500 V a.c. (1 minute at 60 Hz)		
Vibration resistance		10-55 ㎐, double amplitude : 1.5 ㎜, 2 hours in each of X, Y, and Z directions		
Shock resistance		100 ㎧², 3 times each in X, Y, Z directions		
Storage temperature		-30 ~ 90 ℃		
Ambient temperature and humidity		-20 ~ 80 ℃, 45 ~ 85 % RH (without condensation)		
Weight (g)		10	22	27

Suffix code

Model	Code	Content
HSR-P	□ □ □ □	Single-phase solid-state relay for printed circuit boards
Input voltage	D	4-32 V d.c.
Rated load current	03	3 A
	05	5 A
	08	8 A
Used load voltage	2	90-240 V a.c. (Low voltage)
The mode of operationally	Z	Zero cross switching
	R	Random switching

TPS series CE

Specifications

Model	TPS-15S	TPS-30S	TPS-50S	TPS-75S	TPS-100S
Appearance					
W×H×D (mm)	64.1×97.6×32.0	79.0×98.0×37.0	83.0×125.0×38.8	96.0×135.0×40.2	93.0×199.0×50.0
Power output	15 W	30 W	50 W	75 W	100 W
Input voltage	Free voltage 100-240 V a.c. (50/60 Hz)				Manual-select input 100-120 V a.c. 50/60 Hz/ 200-240 V a.c. 50/60 Hz
Output voltage	5 V, 12 V, 15 V, 24 V d.c.			5 V, 12 V, 15 V, 24 V d.c.	
Voltage fluctuation range	±5 ~ ±10 % (Varies due to the internal VR)				
Protective circuit	● Overcurrent, ● Overvoltage, ● Overheating, ● Output short-circuit protection				
Dielectric strength	● 2,700 V a.c. 1 minute, detection current = 10 mA, (input-output) ● 1,500 V a.c. 1 minute, detection current = 10 mA, (input-FG) ● 500 V a.c. 1 minute, detection current = 10 mA, (output-FG)				
Insulation resistance	100 MΩ min, 500Vd.c. (Input - Output)				

Model	TPS-150S	TPS-220S	TPS-350S	TPS-450S
Appearance				
W×H×D (mm)	93.0×209.0×65.0	93.0×209.0×65.0	115.0×230.0×50.0	115.0×230.0×50.0
Power output	150 W	220 W	350 W	450 W
Input voltage	Manual-select input 100-120 V a.c. 50/60 Hz / 200-240 V a.c. 50/60 Hz			Free voltage 100-240 V a.c. 50/60 Hz
Output voltage	5 V,12 V,15 V,24 V d.c.	12 V, 15 V, 24 V d.c.	12 V, 24 V, 48 V d.c.	
Voltage fluctuation range	±5 ~ ±10 % (Depends on internal VR)			
Protective circuit	● Overcurrent, ● Overvoltage, ● Overheating, ● Output short-circuit protection			
Dielectric strength	● 2,700 V a.c. 1 minute, detection current = 10 mA, (input-output) ● 1,500 V a.c. 1 minute, detection current = 10 mA, (input-FG) ● 500 V a.c. 1 minute, detection current = 10 mA, (output-FG)			
Insulation resistance	100 MΩ min, 500 V d.c. (Input-output)			

Suffix code

Model	Code			Content
TPS-	□	□-	□	Enclosed Type
Power output	15			15 W
	30			30 W
	50			50 W
	75			75 W
	100			100 W
	150			150 W
	220			220 W
	350			350 W
	450			450 W
Number of output voltage		S		1 Output
Output voltage classification			05	5 V d.c. (220 W, 350 W, 450 W Exclude)
			12	12 V d.c.
			15	15 V d.c. (350 W, 450 W Exclude)
			24	24 V d.c.
			48	48 V d.c. (15 W, 30 W, 50 W, 75 W, 100 W, 150 W, 220 W Exclude)

DPS series CE

Specifications

Model	DPS-15S	DPS-30S	DPS-50S	DPS-75S
Appearance				
W×H×D (mm)	25.0×90.0×103.0	40.0×90.0×103.0	40.0×90.0×103.0	56.0×124.0×97.8
Power output	15 W	30 W	50 W	75 W
Input voltage	100-240 V a.c. (Free power)			
Output voltage	5 V, 12 V, 15 V, 24 V d.c.			12 V, 24 V, 48 V d.c.
Voltage fluctuation range	±5 ~ 10 % (Varies due to the internal VR)			
Protective circuit	● Overcurrent, ● Overvoltage, overheat, ● Output short-circuit protection, ● DC OK display function			
Dielectric strength	● 2,700 V a.c. 1 minute, detection current =10 mA, (input-output) ● 1,500 V a.c. 1 minute, detection current = 10 mA, (input-FG) ● 500 V a.c. 1 minute, detection current = 10 mA, (output-FG) ● 500 V a.c. 1 minute, detection current = 10 mA, (output-DC OK)			
Insulation resistance	50 MΩ or more. (Input-Output, FG), (Output-FG, DC OK)			

Model	DPS-100S	DPS-120S	DPS-180S	DPS-240S
Appearance				
W×H×D (mm)	56.0×124.0×97.8	66.0×124.0×97.8	66.0×124.0×97.8	125.5×124.0×97.8
Power output	100 W	120 W	180 W	240 W (※ However, DPS-240S-12 is 216W)
Input voltage	100-240 V a.c. 50/60 Hz (Free power)	100-120 V a.c. 50/60 Hz/ 200-240 V a.c. 50/60 Hz(Automatic input selection)		
Output voltage	12 V, 24 V, 48 V d.c.		24 V, 48 V d.c.	12 V, 24 V, 48 V d.c.
Voltage fluctuation range	±5 ~ 10 % (Depends on internal VR)			
Protective circuit	● Overcurrent, ● Overvoltage, Overheat, ● Output short-circuit protection, ● DC OK display, ● DC OK output function			
Dielectric strength	● 2,700 V a.c. 1 minute, detection current =10 mA, (input-output) ● 1,500 V a.c. 1 minute, detection current = 10 mA, (input-FG) ● 500 V a.c. 1 minute, detection current = 10 mA, (output-FG) ● 500 V a.c. 1 minute, detection current = 10 mA, (output-DC OK)			
Insulation resistance	50MΩ or more (input-output, FG), (output-FG, DC OK)			

Suffix code

Model	Code			Content
DPS-	□	□	□	DPS Power Supply (DIN Rail Type)
Power output	15			15 W
	30			30 W
	50			50 W
	75			75 W
	100			100 W
	120			120 W
	180			180 W
	240			240 W (※ only DPS-240S-12 : 216 W)
Number of output voltage		S		1 Output (single output)
Output voltage classification			05	5 V d.c. (DPS-75S, DPS-100S, DPS-120S, DPS-180S, DPS-240S excluded)
			12	12 V d.c. (DPS-180S excluded)
			15	15 V d.c. (DPS-75S, DPS-100S, DPS-120S, DPS-180S, DPS-240S excluded)
			24	24 V d.c.
			48	48 V d.c. (DPS-15S, DPS-30S, DPS-50S excluded)

HNPS series CE

Specifications

Model	HNPS-03S	HNPS-07S
Appearance		
W×H×D (㎜)	36.0×80.0×65.0	
Power output	3 W	7.5W
Input voltage	100-240 V a.c. 50/60 Hz ±10% of power supply voltage	
Output voltage	5 V, 12 V, 15 V, 24 V	
Voltage fluctuation range	±5 ~ 10 % (varies due to the internal VR)	
Protective circuit	Over voltage, Over current, Over heat, Short circuit	
Dielectric strength	● 3 kVAC (between input and output), 1.5 kVAC (between input and FG), ● 500 V a.c. (Between output and FG), (detection current: 10 mA, for 1 min)	
Insulation Resistance	100 MΩ or more (between input and output, at 500 V d.c.)	
Weight (g)	120	

Suffix code

Model	Code				Content
HNPS-	□	□	□	□	DPS Power Supply (DIN Rail Type)
Power output	03				3 W
	07				7.5 W
Number of output voltage		S			1 Output (Single output)
Output voltage classification			05		5 V d.c.
			12		12 V d.c.
			15		15 V d.c.
			24		24 V d.c.
Structure				D	Rail structure (DIN)

DR series

(Except DRP Series)

Product composition

Model	Push button switch					
	Chrome plated guard type		Plastic guard type		Plastic guard type	
	Flat Ø22	Protrusion Ø16	Flat Ø22	Protrusion Ø16	Square Ø16	Rectangular Ø16
Appearance						
Actuator code	DRF-A	DRF-R	DRF-K	DRF-T	DRF-S	DRF-O

Model	Illuminated pushbutton switch					
	Chrome plated guard type		Plastic guard type		Plastic guard type	
	Flat Ø22	Protrusion Ø16	Flat Ø22	Protrusion Ø16	Square Ø16	Rectangular Ø16
Appearance						
Actuator code	DRX-A	DRX-R	DRX-K	DRX-T	DRX-S	DRX-O

Model	Indicator light					
	Chrome plated guard type		Plastic guard type		Plastic guard type	
	Flat Ø22	Protrusion Ø16	Flat Ø22	Protrusion Ø16	Square Ø16	Rectangular Ø16
Appearance						
Actuator code	DRP-A	DRP-R	DRP-K	DRP-T	DRP-S	DRP-O

Model	Selector switch					
	Chrome plated guard type		Plastic guard type		Plastic guard type	
	Flat Ø22	Protrusion Ø16	Flat Ø22	Protrusion Ø16	Square Ø16	Rectangular Ø16
Appearance						
Actuator code	DRS-A	DRS-R	DRS-K	DRS-T	DRS-S	DRS-O

Model	Illuminated selector switch					
	Chrome plated guard type		Plastic guard type		Plastic guard type	
	Flat Ø22	Protrusion Ø16	Flat Ø22	Protrusion Ø16	Square Ø16	Rectangular Ø16
Appearance						
Actuator code	DRT-A	DRT-R	DRT-K	DRT-T	DRT-S	DRT-O

Model	KEY selector switch					
	Chrome plated guard type		Plastic guard type		Plastic guard type	
	Flat Ø22	Protrusion Ø16	Flat Ø22	Protrusion Ø16	Square Ø16	Rectangular Ø16
Appearance						
Actuator code	DRK-A	DRK-R	DRK-K	DRK-T	DRK-S	DRK-O

Model	Emergency stop switch			
	Chrome plated guard type		Plastic guard type	
	Flat Ø22	Protrusion Ø16	Flat Ø22	Protrusion Ø16
Appearance				
Actuator code	DRE-AM	DRE-RM	DRE-KM	DRE-TM
Appearance				
Actuator code	DRE-AA	DRE-RA	DRE-KA	DRE-TA
Appearance				
Actuator code	DRE-AR	DRE-RR	DRE-KR	DRE-TR

Model	Illuminated emergency stop switch			
	Chrome plated guard type		Plastic guard type	
	Flat Ø22	Protrusion Ø16	Flat Ø22	Protrusion Ø16
Appearance				
Actuator code	DRA-AM	DRA-RM	DRA-KM	DRA-TM
Appearance				
Actuator code	DRA-AA	DRA-RA	DRA-KA	DRA-TA
Appearance				
Actuator code	DRA-AR	DRA-RR	DRA-KR	DRA-TR

Accessories

Model	Emergency protection cover	Front protective cover			Anti-rotation ring
	HEG-16 (Protrusion)	HSC-16P (Protrusion)	HSC-16PS (Protruding square)	HSC-22F (Flat)	DR Ø16 Anti-rotation ring
Application Model	DRE-R, DRE-T, DRA-R, DRA-T	DRF-R, DRF-T, DRX-R, DRX-T	DRF-S, DRF-O, DRX-S, DRX-O	DRF-A, DRS-K, DRX-A, DRX-K	Ø16 Common
Appearance					

Suffix Code

Model	Code	Content	
DRF -	□	Push button switch	
DRX -	□	Illuminated pushbutton switch	
DRP -	□	Indicator light	
DRS -	□	Selector switch	
DRT -	□	Illuminated selector switch	
DRK -	□	Key selector switch	
DRE -	□	Emergency stop switch	
DRA -	□	Illuminated emergency stop switch	
Control part shape	A	Ø22 Flat	Chrome plated guard
	R	Ø16 Protrusion	
	K	Ø22 Flat	Plastic guard
	T	Ø16 Protrusion	
	S	Ø16 Square	
	O	Ø16 Rectangular	

Specification

Rating		250 V a.c. 3 A
Insulation Resistance		100MΩ or more
Withstand voltage		1500 V a.c. 1 minute at 50/60 Hz
Contact contact resistance		50 MΩ or less
Vibration resistance		10-55 Hz double amplitude 3 mm
Shock resistance		Approx. 50 G (500 m/s²)
Ambient temperature		-10 ~ 50 ℃
Ambient humidity		45 ~ 85 % RH
Opening and closing frequency		Up to 30 times/min
life	Electrical	200,000 times or more / 1,800 h
	Mechanical	1 million times or more / 1,800 h
Certification		KC

CR series

(Except CRB Series)

Product composition

Model	Push button switch			
	Flat Ø30	Flat Ø25	Protrusion Ø30	Protrusion Ø25
Appearance				
Actuator code	CRF-F30	CRF-F25	CRF-P30	CRF-P25

Model	Illuminated pushbutton switch					
	Flat Ø30	Protrusion Ø30	Protective guard Ø30	Flat Ø25	Protrusion Ø25	Protective guard Ø25
Appearance						
Actuator code	CRX-F30	CRX-P30	CRX-G30	CRX-F25	CRX-P25	CRX-G25

Model	Indicator light	
	Flat Ø30	Flat Ø25
Appearance		
Actuator code	CRP-30	CRP-25

Model	Selector switch			
	Short lever		Long lever	
	Flat Ø30	Flat Ø25	Flat Ø30	Flat Ø25
Appearance				
Actuator code	CRS-30	CRS-25	CRSL-30	CRSL-25

Model	Illuminated selector switch			
	Flat Ø30	Flat Ø25	Flat Ø30	Flat Ø25
외 형				
Actuator code	CRT-30	CRT-25	CRTL-30	CRTL-25

Model	KEY selector switch	
	Flat Ø30	Flat Ø25
Appearance		
Actuator code	CRK-30	CRK-25

Model	Emergency stop switch	
	Flat Ø30	Flat Ø25
Appearance		
Actuator code	CRE-30M	CRE-25M
Appearance		
Actuator code	CRE-30R	CRE-25R
Model	Illuminated emergency stop switch	
	Flat Ø30	Flat Ø25
Appearance		
Actuator code	CRA-30M	CRA-25M
Appearance		
Actuator code	CRA-30R	CRA-25R
Model	Buzzer	
	Flat Ø30	Flat Ø25
Appearance		
Actuator code	CRB-30	CRB-25

Accessories

Model	Emergency protection cover		Front protective cover		Silicone cover		Tightening tool		
	HEG-25 (Protrusion)	HEG-30 (Protrusion)	HSC-25P (Protrusion)	HSC-30P (Protrusion)	CR-25WPC	CR-30WPC	FIX HEAD-CR25	FIX HEAD-CR30	FIX HANDLE
Application Model	CRE-25, CRA-25	CRE-30, CRA-30	CRF-F25, CRX-F25	CRF-F30, CRX-F30	Ø25	Ø30	Ø25	Ø30	Handle
Appearance									

Suffix Code

Model	Code	Content
CRF -	□	Push button switch
CRX -	□	Illuminated pushbutton switch
CRP -	□	Indicator light
CRS -	□	Selector short lever switch
CRSL -	□	Selector long lever switch
CRT -	□	Illuminated selector switch
CRTL -	□	Illuminated long lever switch
CRK -	□	Key selector switch
CRE -	□	Emergency stop switch
CRA -	□	Illuminated emergency stop switch
CRB-	□	Buzzer
Control part shape	F30	Ø30 Flat
	P30	Ø30 Protrusion
	G30	Ø30 Protective guard
	F25	Ø25 Flat
	P25	Ø25 Protrusion
	G25	Ø25 Protective guard

Specification

Contact configuration		1a1b
Contact operation		Slow-make
Installation panel thickness		1 ~ 6 mm (excluding accessories)
Rated voltage / power consumption		100-240 V a.c. / 4.4 VA or less
		380 V a.c. / 2.7 VA or less
		12-24 V d.c. / 18 mA or less
Allowable operating frequency	Mechanical	30 times/min or less
	Electrical	30 times/min or less
Insulation Resistance		100MΩ or more
Withstand voltage		1500 V a.c. 50/60 Hz 1 minute
Vibration resistance	Malfunction	10-55 Hz double amplitude width 3 mm
Shock resistance	Mechanical	500 m/s² or more
	Malfunction	100 m/s² or more
life	Mechanical	10,000 times or more
	Electrical	100,000 times or more
Ambient temperature and humidity		-25 ~ 40 ℃, 45 ~ 85 % RH
Storage temperature		-40 ~ 60℃
Certification		KC

MR series

CE KC (Excludes KC certified MRP and MRB series)

Model	Push button switch				
	Aluminum guard			Plastic guard	
	Flat Ø30	Flat Ø25	Protrusion Ø22	Flat Ø25	Protrusion Ø22
Appearance					
Actuator code	MRF-A(Ø30)	MRF-N(Ø25)	MRF-R(Ø22)	MRF-K(Ø25)	MRF-T(Ø22)

Model	Illuminated pushbutton switch					
	Aluminum guard			Plastic guard		
	Flat Ø30	Flat Ø25	Protrusion Ø22	Flat Ø25	Protrusion Ø22	ON / OFF
Appearance						
Actuator code	MRX-A(Ø30)	MRX-N(Ø25)	MRX-R(Ø22)	MRX-K(Ø25)	MRX-T(Ø22)	MRX-WM2

Model	Indicator light				
	Aluminum guard			Plastic guard	
	Flat Ø30	Flat Ø25	Protrusion Ø22	Flat Ø25	Protrusion Ø22
Appearance					
Actuator code	MRP-A(Ø30)	MRP-N(Ø25)	MRP-R(Ø22)	MRP-K(Ø25)	MRP-T(Ø22)

Model	Selector switch				
	Aluminum guard			Plastic guard	
	Flat Ø30	Flat Ø25	Protrusion Ø22	Flat Ø25	Protrusion Ø22
Appearance					
Actuator code	MRS-A(Ø30)	MRS-N(Ø25)	MRS-R(Ø22)	MRS-K(Ø25)	MRS-T(Ø22)

Model	Illuminated selector switch				
	Aluminum guard			Plastic guard	
	Flat Ø30	Flat Ø25	Protrusion Ø22	Flat Ø25	Protrusion Ø22
Appearance					
Actuator code	MRT-A(Ø30)	MRT-N(Ø25)	MRT-R(Ø22)	MRT-K(Ø25)	MRT-T(Ø22)
Appearance					
Actuator code	MRT-A3(Ø30)	MRT-N3(Ø25)	MRT-R3(Ø22)	MRT-K3(Ø25)	MRT-T3(Ø22)

Model	Key selector switch		
	Aluminum guard		
	Flat Ø30	Flat Ø25	Protrusion Ø22
Appearance			
Actuator code	MRK-A(Ø30)	MRK-N(Ø25)	MRK-R(Ø22)

Model	Emergency stop switch				
	Aluminum guard			Plastic guard	
	Flat Ø30	Flat Ø25	Protrusion Ø22	Flat Ø25	Protrusion Ø22
Appearance					
Actuator code	MRE-AM(Ø30)	MRE-NM(Ø25)	MRE-RM(Ø22)	MRE-KM(Ø25)	MRE-TM(Ø22)
Appearance					
Actuator code	MRE-AR(Ø30)	MRE-NR(Ø25)	MRE-RR(Ø22)	MRE-KR(Ø25)	MRE-TR(Ø22)

Model	Illuminated emergency stop switch				
	Aluminum guard			Plastic guard	
	Flat Ø30	Flat Ø25	Protrusion Ø22	Flat Ø25	Protrusion Ø22
Appearance					
Actuator code	MRA-AM(Ø30)	MRA-NM(Ø25)	MRA-RM(Ø22)	MRA-KM(Ø25)	MRA-TM(Ø22)
Appearance					
Actuator code	MRA-AR(Ø30)	MRA-NR(Ø25)	MRA-RR(Ø22)	MRA-KR(Ø25)	MRA-TR(Ø22)

Model	Buzzer				
	Aluminum guard			Plastic guard	
	Flat Ø30	Flat Ø25	Protrusion Ø22	Flat Ø25	Protrusion Ø22
Appearance					
Actuator code	MRB-A(Ø30)	MRB-N(Ø25)	MRB-R(Ø22)	MRB-K(Ø25)	MRB-T(Ø22)

Accessories

Model	Emergency sign nameplate		Emergency protection cover			Front protective cover			Tightening tool	
	EN-36	EN-26	HEG-22 (Protrusion)	HEG-25F (Flat)	HEG-30F (Flat)	HSC-22P (Protrusion)	HSC-25F (Flat)	HSC-30F (Flat)	FIX HEAD-MR	FIX HANDLE
Application Model	MRE-A MRA-A	MRE-R, MRE-T MRA-R, MRA-T	MRE-R, MRE- T, MRA-R, MRA-T	MRE-N, MRE-K, MRA-N, MRA-K	MRE-A, MRA-A	MRF-R, MRF-T, MRX-R, MRX-T	MRF-N, MRF-K, MRX-N, MRX-K	MRF-A, MRX-A	Ø22, Ø25, Ø30	Handle
Appearance										

Suffix Code

Model	Code	Content	
MRF -	□	Push button switch	
MRX -	□	Illuminated pushbutton switch	
MRP -	□	Indicator light	
MRS -	□	Selector switch	
MRT -	□	Illuminated selector switch	
MRK -	□	Key selector switch	
MRE -	□	Emergency stop switch	
MRA -	□	Illuminated emergency stop switch	
MRB-	□	Buzzer	
Control part shape	A	Ø30 flat	Aluminum guard
	N	Ø25 flat	
	R	Ø22 protrusion	
	K	Ø25 flat	Plastic guard
	T	Ø22 protrusion	

Specification

Contact unit		MR-CB
Contact configuration		1a1b
Contact operation		Snap-action
Installation panel thickness		7.0 mm (excluding accessories)
Mechanical	Tightening torque	Mounting nut : 1.96 N·m max, Terminal bolt : 0.78 N·m max
	Operating distance	5 ㎜ ±0.2
	Recoil time	3 ms or less
	Operating part operation life	Button : more than 500,000 times, Selector : more than 200,000 times
Electrical	Withstand voltage	2,000 V a.c. 50/60 ㎐ 1 minute
	Contact contact resistance	50 ㎧ or less (at the time of shipment)
	Insulation Resistance	100 ㎧ or more 500 V d.c.
	Rated current	6 A 250 V a.c.
	Minimum load current	5 ㎃ 24 V d.c., 10 ㎃ 11 V d.c.
	Electrical life	More than 200,000 times
Light source	Power supply voltage	100-240 V a.c. (LED capacitor voltage drop type)
		380 V a.c. (LED capacitor voltage drop type)
		12-24 V a.c. 50/60Hz or 12-24 V d.c. (LED capacitor voltage drop type)
Environmental conditions	Ambient temperature and humidity	-20 ~ 55 ℃, 35 ~ 85 % RH (Without condention)
	Storage temperature	-40 ~ 85 ℃
	Shock resistance	300 pulse period 11 ms
	Vibration resistance	100, 10 ㎐-55 ㎐, amplitude 0.75 ㎜ (within 1 ㎳)

AR series

Product composition

Model	Push button switch		Illuminated pushbutton switch		Indicator light	
	Columnar	Columnar	Columnar	ON / OFF	AC	DC
Appearance						
Actuator code	ARF-F,B,P,G,H	ARF-S	ARX-P,G,H	ARX-S	ARP-A0	ARP-D0

Model	Selector switch	Illuminated selector switch	Key selector switch	Emergency stop switch	
	Lever	Lever			
Appearance					
Actuator code	ARS-S,L	ART-2,2R,3	ARK-2,2R,3,3L,3R,3LR	ARE-3,4	ARE-4XR

Suffix code

Model	Code	Content
ARF -	□	Push button switch
ARX -	□	Illuminated pushbutton switch
ARP -	□	Indicator light
ARS -	□	Selector switch
ART -	□	Illuminated selector switch
ARK -	□	Key selector switch
ARE -	□	Emergency stop switch
ARE -	□	Illuminated emergency stop switch
ARB-	□	Buzzer

Specification

Allowable operating frequency	Mechanical	30 times/minute
	Electrical	30 times/minute
Insulation Resistance		100 MΩ or more
Withstand voltage		2,000 V a.c. 1 minute (between the same pole terminals)
Vibration resistance	Malfunction	10-55 Hz double amplitude 3 mm (within 1 ms)
Shock resistance	Mechanical	500 ms^2 or more
	Malfunction	100 ms^2 or more
Life	Mechanical	1,000,000 times or more
	Electrical	100,000 times or more
Light source	Power supply voltage	100-240 V a.c. (LED capacitor voltage drop expression)
		12-24 V a.c./d.c. (LED capacitor voltage drop expression)
Ambient temperature & humidity		-25 ~ 40 ℃, 45 ~ 85 % RH (Without condention)
Storage temperature		-40 ~ 70℃

Accessories

Model	Emergency sign nameplate	Emergency Protection Cover	Tightening tool	
	EN-26	HEG-22(Extended)	FIX HEAD-AR	FIX HANDLE
Applied model	ARE	ARE	All models	Handle
Appearance				

CDN series CE

Specification

Model	CDN		
Appearance			
Power Voltage	24 V a.c. 50/60 Hz or 24 V d.c.	110 V a.c.	220 V a.c.
LED Indication Color	Red, green, yellow, white, orange, blue		
Insulation resistance	100 MΩ or more		
Voltage withstand	2,000 V a.c. 1 minute		
Power consumption	20 mA 0.4 VA	0.4 W	0.5 W
LED Rated Voltage	24 V d.c.		
Life	50,000 hours (24 V d.c., 25 ℃)		
Ambient temperature and humidity	-20 ℃ ~ 40 ℃, 45 ~ 85 % RH (Without condention)		
Storage temperature	-25 ~ 55 ℃		

(Note) CDN-S□ (30 X 30 ㎜) / CDN-R□ (30 X 40 ㎜)

Suffix code

Model	Code					Content
CDN-	□	□	-□□	□□	-□□□□□□	Set Indicator
Basic model name	S					Square (30×30 ㎜)
	R					Rectangle(30×40 ㎜)
Power Voltage		D2				24 V a.c. 50/60 Hz or 24 V d.c.
		A1				110 V a.c.
		A2				220 V a.c.
Collective Face Configuration Group			01			1st to 10th
Collective Face Configuration Column				01		Rows 1 to 20
Lamp color					C	C : COLOR color combination R (Red), G (Green), Y (Yellow), O (Orange), A (Blue), W (White)

CR40 series

Specifications

Model	CR40		
Appearance			
Power Voltage	100-240 V a.c.	380 V a.c.	12-24 V a.c./d.c.
Power consumption/current	4.4 VA or less	2.7 VA or less	18 ㎃ or less
Display color	Red, green, yellow, blue, white		
Light source life	100,000 h		

Suffix code

Model	Code		Content	
CR40	□	□	LED light source rectangular indicator	
Power Voltage	A0		100-240 V a.c.	LED (Condenser voltage drop type)
	A3		380 V a.c.	
	D0		12-24 V a.c./d.c.	LED (Resistance voltage drop type)
Display color		R	Red, green, yellow, blue, white	

HY-500 series

Product composition

Model		Rated capacity	Use
Exposed	HY-510	3P 250 V a.c. 15A	Electromotor 3 phase power supply ON, OFF
Recessed	HY-512, HY-512S (Switch part for the lamp)	2P 250 V a.c. 15A	1 Phase Electromotor ON, OFF
	HY-513, HY-513S (Switch part for the lamp)	3P 250 V a.c. 15A	Electromotor for 3 phase power supply ON, OFF
	HY-514	3P 250 V a.c. 15A	Electromotor for 3 phase power supply ON, OFF
Exposed	HY-516	3P 250 V a.c. 15A	Electromotor for 3 phase power supply Direct/reverse revolution for stop 1 phase, 3 phase, right/left for revolution
Exposed	HY-517	3P 250 V a.c. 15A	Electromotor 1 phase, 3 phase ON, OFF

BE series

Steel case (BE)

Model		Rated capacity	Contact terminal	Marker	Case material
Steel case exposed	BE 230	3P 440 V a.c. 30A	M5	ON (Black) OFF (Red)	Cold workable steel plate

Waterproof type (BEW, BEWT)

Model		Rated capacity	Contact terminal	Marker	Case material
Waterproof	BEW 215	3P 440 V a.c. 15A	M4	ON (Black) OFF (Red)	Flame retardant ABS resin
	BEW 230	3P 440 V a.c. 30A	M5		
Advanced waterproof type	BEWT 215	3P 440 V a.c. 15A	M4		
Advanced waterproof type	BEWT 315	3P 440 V a.c. 15A	M4	FOR. (Black) STOP (Red) REV. (Black)	

MAS series CE

Specifications

Appearance	Suffix code	Rated insulation voltage	Rated conduction current
	MAS-025-A/B	690 V a.c.	25 A
	MAS-063-A/B		63 A
	MAS-125-A/B		125 A

Suffix code

Model	Code		Content
MAS-	□	□	Main switch
Rated current	025		For AC25 A
	063		For AC63 A
	125		For AC125 A
Color classification		A	For emergency stop (yellow guard, red handle)
		B	Basic type (white guard, black handle)

SQ4 series

Specifications

Model		SQ4
Appearance		
Rated insulation voltage (Ui)		690 V a.c.
Impulse withstand voltage (Uimp)		2,500 V a.c.
Rated conduction current (Ith)		16 A
Rated conduction current (Ie)		16A-24 V a.c. / 8A-48 V a.c. / 5A-110 V a.c. / 3A-220 V a.c. / 1.8A-380 V a.c.
Rated operating voltage (Ue)		480 V a.c.
Mechanical life		300,000 Times
Electrical life		AC: 200,000 Times, DC: 100,000 Times
Ambient temperature & humidity		-25 ~ 55 ℃, less than 90% RH (however, there should be no condensation)
Altitude		2,000 m or less
Material for each part	Body	NY66 GF15 % flame retardant grade
	Cam	ACETAL
	Contact	AgNi
	Terminal	BRASS
	Bolt	Iron (galvanized)
	Spring	Stainless (STS)
	Handle	PC flame retardant grade

Suffix code

Model	Code							Content
SQ4-	□	□	□-	□	□	□	□	Cam switch
install	F							4-Hole panel mounting
Nameplate frame		S						Square nameplate frame (48 X 48 ㎜)
Handle			H					H-type handle (general industrial)
			R					R-type handle (voltmeter, ammeter switch)
Selected number of stages				2				2nd stage selection
				3				3nd stage selection
				4				4nd stage selection
				5				5nd stage selection
				6				6nd stage selection
				7				7nd stage selection
Number of contact units stacked					1			1 Rows
					2			2 Rows
					3			3 Rows
					4			4 Rows
					5			5 Rows
					6			6 Rows
Standard circuit diagram serial number						0	1	01 ~ 99

※ For standard products, refer to the individual model code. (Voltmeter, ammeter switch, etc.)

HY-SQ5/255/305/MRK series

Specifications

Model			Square type	Round type	Handle locking type	Bottom (C) type	Square key type
Appearance							
Contact rating	Rated insulation voltage		600 V				
	Rated current		10 A, 20 A				
	Contact structure		2 Cut-off slow-make 1- stage 2 contacts, max. 6 positions (max. 3 positions for the momentary version)				
	Operation method		Each position fixed, spring return type				
	Selection angle		30°, 45°,60°,90°				
	Positions		2 positions ~ 12 positions , 2 positions ~ 4 positions				
	Insulation resistance		100 MΩ (500 V d.c.)				
	Dielectric strength		2,500 V a.c. for 1 min				
	Life	Mechanical	Min. 500 thousand operations				
		Electrical	● Min. 100 thousand operations, ● MRK : Min. 200 thousand operations				
	Ambient temperature		-20 ~ 50 ℃				
	Degree of protection		● 305, 255 (Round type) : IP65 (IEC 60529), ● SQ5 (Square type) : IP40 (IEC 60529)				
Part materials	Body		Heat-resistant Polycarbonate (PC)				
	Cam		Acetal				
	Contacts		Ag + Ni				
	Terminals		Brass				
	Bolt		Swrm				
	Springs		Stainless Steel				
	Handle		Phenol Resin				

Suffix code

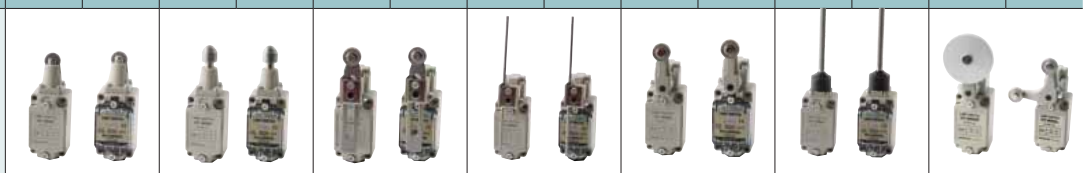
Model		Code					Content
Appearance	□	□	□	□	□	□	Cam switch
	HY-SQ5						Square type cam switch
	HY-255						Ø25 type cam switch
	HY-305						Ø30type cam switch
Contact type		S					Square type (standard type)
		C					Round type (for HY-SQ5)
Handle type			H				Standard type (standard industrial machine)
			R				Switch board type (A/S, V/S)
			P				Control switch type (C/S)
Position selection				2			2 positions
				3			3 positions
				4			4 positions
				5			5 positions
				6			6 positions
Number of contact unit (Number of rows)					1		1 rows
					2		2 rows
					3		3 rows
					4		4 rows
					5		5 rows
					6		6 rows
Standard circuit diagram serial number						0 1	01 ~ 99

※ A/S : ammeter converting switch, V/S: voltmeter converting switch
※ Possible to manufacture 20 A, 250 V product only within the square type contact structure

Suffix code

Model	Code				Content
HY-MRK	4	2	0	2	Key cam switch
Contact formation					Labeled the serial number (refer to the standard circuit diagram)

HY-M900/LM900 series

Model		Roller plunger		Top ball plunger		Variable roller		Variable rod wire		Roller lever		Coil spring		Ø50 roller lever	Fork roller Lever
		HY-M902	HY-LM902	HY-M903	HY-LM903	HY-M904	HY-LM904	HY-M907	HY-LM907	HY-M908	HY-LM908	HY-M909	HY-LM909	HY-M908R	HY-M908L
Appearance															
Operation speed		0.1 - 1 m/s													
Opening and closing frequency	Mechanical	120 times/minute													
	Electrical	20 times/minute													
Insulation resistance		100 MΩ or more (500 V d.c.)													
Dielectric strength		● 1000 V a.c. 50/60 Hz for 1 min (between charging part), ● 1500 V a.c. 50/60 Hz for 1 min (between discharging part)													
Contact resistance		Max. 100 MΩ (initial)													
Vibration	Malfunction	10 - 55 Hz double amplitude width 1.5 mm													
Shock	Mechanical	1,000 m/s² or more (100G or more)													
	Malfunction	300m/s² or more (30G or more)													
Life	Mechanical	More than 1 million times													
	Electrical	More than 300,000 times													

● Rating

Rated voltage(V)		Non-inductive load (A)				Inductive load (A)			
		Resistive load		Lamp		Inductive load		Electric motor load	
		NC	NO	NC	NO	NC	NO	NC	NO
AC	125	15		3	1.5	10		3	1.5
	250	10		2	1	6		2	1
	480	3		1.5	0.8	2		1.5	0.75
DC	8	15		6	3	10		-	
	14	15		6	3	10		-	
	30	6		4	3	5		-	
	125	0.4		0.2	0.2	0.05		-	
	250	0.2		0.1	0.1	0.03		-	

HY-L800 series

Model		Roller Plunger [horizontal]	Cross roller Plunger type [vertical]	Top Plunger	Roller Adjustable Lever	Rubber Roller Adjustable Lever	Adjustable Rod Lever	Roller Lever	Coil spring
		HY-L802	HY-L802C	HY-L803	HY-L804	HY-L804RE	HY-L807	HY-L808	HY-L809
Appearance									
Frenqucy	Mechanical	120 times/minute							
	Electrical	30 times/minute							
Insulation resistance		100 MΩ 이상 (500 V d.c.)							
Dielectric strength		● Between terminals: 1,500 V a.c. 50/60 Hz 1 minute, ● Between non-charging metal parts: 2,000 V a.c. 50/60 Hz 1 minute							
Contact resistance		25 MΩ or less (initial value), 100 MΩ or less (after test)							
Vibration	Malfunction	10-55 Hz or more, double amplitude 1.5 mm							
Shock	Mechanical	300m/s² or more (30G or more)							
	Malfunction	100m/s² or more (10G or more)							
Life	Mechanical	Over 1 million times (open/close frequency 120 times/min)							
	Electrical	100,000 times or more (opening and closing frequency 20 times/min at rated load)							
Ambient temperature & humidity		-10 ~ 70 ℃, 95% RH or less (20 ℃) (No condensation)							

● Rating

LOAD / Rated voltage	Resistive load (cosϕ 1)	Inductive load (cosϕ 0.4)
125 V a.c.	5 A	3 A
250 V a.c.	5 A	2 A
125 V d.c.	0.4 A	0.1 A

HY-LS800 series

Model		Roller Plunger	Push Plunger	Roller Arm	Rubber Roller Lever	Roller Adjustable Lever	Adjustable Rod Lever	Roller Lever
		HY-LS802N	HY-LS803N	HY-LS803RN	HY-LS804RE	HY-LS804N	HY-LS807N	HY-LS808N
Appearance								
Frequency	Mechanical	120 times/minute						
	Electrical	30 times/minute						
Insulation resistance		100 MΩ or more (500 V d.c.)						
Contact resistance		25 MΩ or less (initial value)						
Dielectric resistance		● 1,000 V a.c. 50/60 Hz for 1 minute, ● 2,000 V a.c. 50/60 Hz 1 minute						
Vibration	Malfunction	10-55 Hz double amplitude 1.5 mm						
Shock	Mechanical	1000 m/s² or more (100 G or more)						
	Malfunction	300 m/s² or more (30 G or more)						
LIfe	Mechanical	More than 1 million times						
	Electrical	100,000 times or more						
Ambient temperature and humidity		-10 ~ 70 ℃, 95 % RH or less (20 ℃) (No condensation)						

● Ratings

Rated voltage (V)		Non-inductive load (A)		Inductive load (A)			
		Resistive load	Lamp	Inductive load		Electric motor load	
		NO	NC	NO	NC	NO	NC
AC	125	6	2	6		3	
	250	6	1.5	6		1.5	
DC	8	6	4	6		4	
	14	6	4	6		4	
	30	4	2.5	4		2.5	
	125	0.4	0.1	0.4		0.1	
	250	0.2	0.05	0.2		0.05	

ZCN-500 series

Model		Plunger	Hinge roller short lever	Hinge roller long lever	Hinge short lever	Hinge lever	Hinge long lever	Vertical roller plunger	Horizontal roller plunger	Resin road spring
		ZCN-P501O	ZCN-R504A	ZCN-R504C	ZCN-L507A	ZCN-L507C	ZCN-L507D	ZCN-PR508V	ZCN-PR508H	ZCN-L509
Appearance										
Operation speed		0.1 mm - 0.5 m/s								
Frequency	Mechanical	120 times/minute								
	Electrical	20 times/minute								
Insulation resistance		100 MΩ or more (500 V d.c.)								
Contact resistance		25 MΩ or less (initial value), 100 MΩ or less								
Dielectric strength		● Between charging part : 1000 V a.c. 50/60 Hz for 1 min, ● between discharging part : 1500 V a.c. 50/60 Hz for 1 min								
Vibration	Malfunction	10-55 Hz double amplitude 1.5 mm								
Shock	Mechanical	1000 m/s² or more (100 G or more)								
	Malfunction	300 m/s² or more (30 G or more)								
LIfe	Mechanical	More than 1 million times								
	Electrical	More than 300,000 times								
Ambient temperature and humidity		-10 ~ 80 ℃ 25 ~ 95 % RH (No condensation)								

● Ratings

Rated voltage(V)		Non-inductive load(A)		Inductive load ((A)			
		Resistive load		Inductive load		Electric motor load	
		NC	NO	NC	NO	NC	NO
AC	125	15		10		3	1.5
	250	10		6		2	1
	600	3		2		1.5	0.75
DC	8	15		10		-	-
	14	15		10		-	-
	30	6		5		-	-
	125	0.4		0.05		-	-
	250	0.2		0.03		-	-

HY-700 series

Specifications

Model	Panel mounting	Spring single push button	Pin push button	Spring stander push button	Hinge roller single lever
	HY-P701A (Z4G1P05B)	HY-P701B (Z4G1P09B)	HY-P701C (Z4G1P01B)	HY-P701D (Z4G1P03B)	HY-R704A (Z4G1L07B)
Appearance					

Model	Hinge roller middle lever	Hinge roller lever	2 positions roller lever	Single position lever	Middle lever type
	HY-R704B	HY-R704C (Z4G1L03B)	HY-R704-2W	HY-L707A	HY-L707B
Appearance					

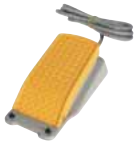
Model	Hinge lever	Special lever	Hinge special lever	Roller panel mounting (Vertical)	Roller panel mounting (horizontal)
	HY-L707C (Z4G1L01B)	HY-L707D	HY-L707S	HY-PR708A	HY-PR708B (Z4G1P07B)
Appearance					

Operation speed		0.1 mm - 1 m/s
Allowable operating frequency	Mechanical	50 - 300 times/minute
	Electrical	20 times/minute
Insulation resistance		100 MΩ or more (500 V d.c.)
Contact resistance		● Max. 50 MΩ (initial), ● max. 2 Ω (after testing)
Vibration resistance		10 - 55 Hz double amplitude 0.75mm
Shock resistance	Mechanical	1,000 m/s² or more (100G or more)
	Malfunction	300m/s² or more (30G or more)
Dielectric strength		2,000 V a.c. 50/60 Hz 1 minute (each terminal and non-charging metal part)
Life	Mechanical	Over 1 million times (open/close frequency 120 times/min)
	Electrical	300,000 times or more (opening and closing frequency 20 times/min at rated load)
Net weight(g)		31.5 ~ 59.5 g
Rated current (Ie)		10 A 250 V a.c. (Resistive load)

HY-100 series

Specifications

Model	HY-101	HY-102N
Appearance		
Rated voltage	250 V a.c., 10 A	250 V a.c., 10 A
Internal switch	SMV-61A-07H	SMV-61A-07H
Material of case	Plastic	Aluminum

Model	HY-103N	HY-104N	HY-105N
Appearance			
Rated voltage	250 V a.c., 10 A		
Internal switch	HY-P701B	HY-P701D	HY-P701B
Material of case	Aluminum	Aluminum green (Hammer) stamp	

Suffix code

Model	Code	Content
HY-10	□	Foot Switch
Appearance	1	Plastic foot switch
	2N	Aluminum foot switch
	3N	Middle size aluminum foot switch
	4	Large size aluminum foot switch
	5	Large size aluminum foot switch

LEL/LES series

Specifications

Model	LEL (Long lever)	LES (Short lever)
Appearance		
Rated insulation voltage	600 V	
Rated current	3 A 250 V a.c.	
Contact structure	2 Cut-off slow-make 1- stage 2 contacts, max. 4 positions	
Insulation resistance	100 MΩ (500 V d.c.)	
Dielectric strength	2,500 V a.c., for 1 min (between charging part and discharging part)	
Contact resistance	20 MΩ or less (at the time of shipment)	
Life	● Mechanical : Min. 500 thousand operations, ● Electrical : Min. 100 thousand operations	
Ambient temperature & humidity	-20 ~ 50 ℃, 45 ~ 85 % RH (without condensation)	

Suffix code

Model	Code	Content
LE	□ □ □	Mono Lever Switch
Lever selection	L	Long lever
	S	Short lever
Stage selection	01	1 st step selection
	02	2 st step selection
	03	3 st step selection
	04	4 st step selection
Returning type	1	Auto returning
	2	Manual returning

※ In the case of the combination return type, it is an order product, so please enter the return operation for each direction. The basic contact configuration for each direction of the product is 1a.

HY-P series

Specifications

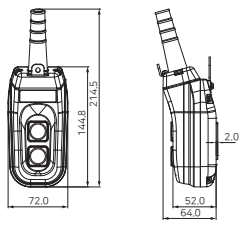
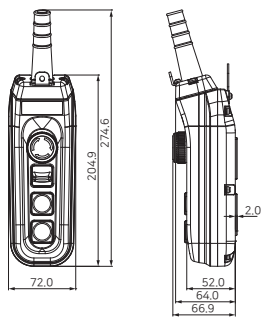
Model		HY-P1022B	HY-P1024BB HY-P1022SB	HY-P1026BBB HY-P1024SBB	HY-P1026SBBB	HY-P1028BBBB HY-P1028SBBBB	HY-P1029SBBB
		2 button	4 button/2 button +Push lock turn reset	6 button/4 button +Push lock turn reset	6 button/push lock turn reset +1 (switch)	8 button/push lock turn reset +1 (switch)	6 button/push lock turn reset + 3 (switch)
Degree of protection		IP65 (IEC 60529)					
Materials · Colors	Case	High impact ABS resin					
	Contacts	AgSnO2					
Insulation resistance		100 MΩ (500 V d.c.)					
Dielectric strength		2,000 V a.c. 1 minute (between charging and non-charging parts)					
Ambient temperature & humidity		-10 ~ 45 ℃, 45 ~ 85 % RH (without condensation)					

Suffix code

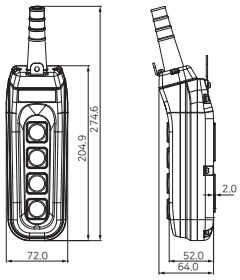
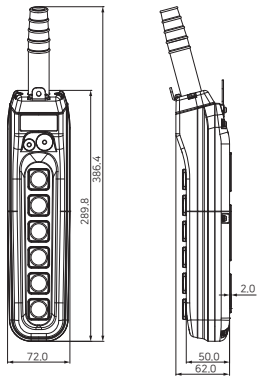
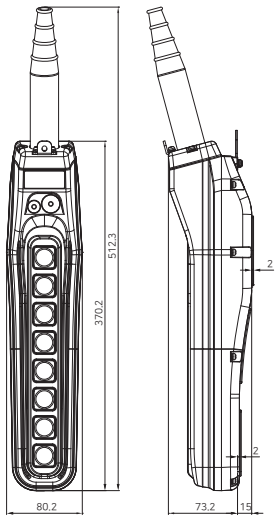
Model	Code										Content	
HY-		□	□	□	□	□	□	□	□	□	Hoist switch	
Number of buttons	P1022			X	X	X		X	X	X	2 buttons	
	P1024			X	X	X			X	X	4 buttons	
	P1026				X	X				X	6 buttons	
	P1028				X	X					8 buttons	
	P1029									X	9 buttons	
Emergency switch											None	
		S									1b Basic specifications	
		S1									1a1b Contacts on-demand	
Contacts and control switches											None	
			P	P	P						MRP-RA0	MR control switches * Arrangement order and type may vary according to order specifications. * There are 6 types of nameplates when selecting a control switch. (POWER, MAIN-AUX, OFF ON, HORN, LIGHT, A A+B B) * If you do not select it, it will be shipped without a nameplate.
			H	H	H						MRF-RM1	
			M	M	M						MRS-R2A1	
			Y	Y	Y						MRS-R3A2	
			K	K	K						MRK-R2A1	
						A	A	A	A		HY-PA	1a Default
						B	B	B	B		HY-PB	1a-1a
						C	C	C	C		HY-PC	1a-1a
						D	D	D	D		HY-PD	2a-2a
						E	E	E	E		HY-PE	2a-2a
						A1	A1	A1	A1		HY-PA1	1a1b Order made
						B1	B1	B1	B1		HY-PB1	1a1b-1a1b
						C1	C1	C1	C1		HY-PC1	1a1b-1a1b
						E1	E1	E1	E1		HY-PE1	2a2b-2a2b
						F	F	F	F		HY-PF	2a
						F1	F1	F1	F1		HY-PF1	2a2b
Other		Toggle switch and volume required by consumers, etc. Separate order available for mounting other options										Toggle switch (2rd 3rd) Volume 1K,2K,3K,Etc Ø 8~16 controller switches

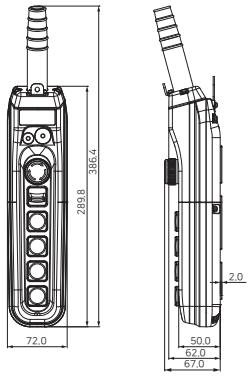
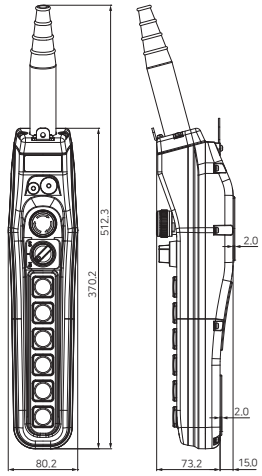
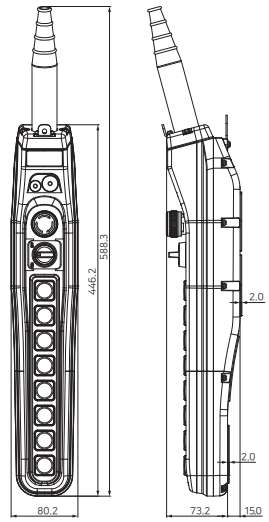
※ Except where X is indicated in the model configuration

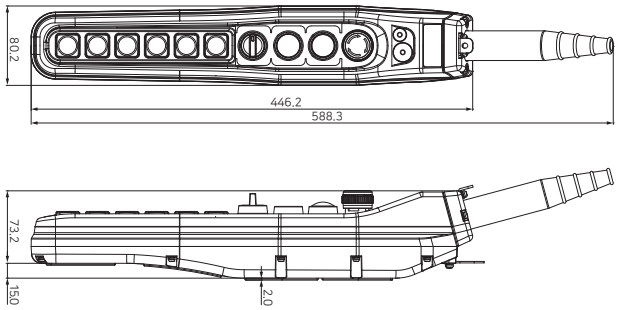
External dimensions

Model	Appearance	External dimensions	Model	Appearance	External dimensions
HY-P1022 2 button			HY-P1022S 2 button +Push lock turn reset		

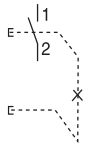
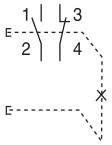
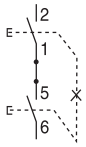
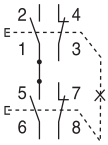
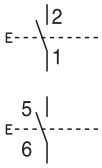
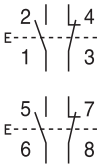
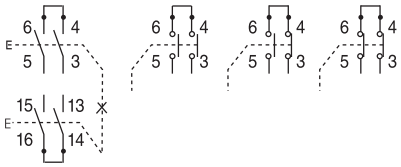
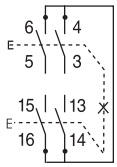
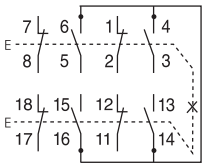
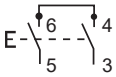
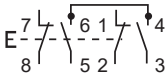
External dimensions

Model	Appearance	External dimensions
HY-P1024 4 button		
HY-1026 6 button		
HY-P1028 8 button		

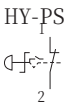
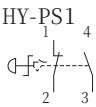
Model	Appearance	External dimensions
HY-P1024S 4 button +Push lock turn reset		
HY-1026S 6 button + 1 switch +Push lock turn reset		
HY-P1028S 8 button + 1 switch +Push lock turn reset		

Model	Appearance	External dimensions
HY-P1029S 6 button+ 3 switch +Push lock turn reset		

Contact units

Model	Appearance	Contact configuration	Information
HY-PA		HY-PA(1a)  HY-PA1(1a1b) 	For on/off operation power, etc. To close and hold, press the top button (ON) . To open, press the bottom button (OFF).
HY-PB		HY-PB(1a-1a)  HY-PB1(1a1b-1a1b) 	For general circuits (up/down/east/west, etc.) It does not support the simultaneous operation of the 2 buttons with the seesaw-type mechanical interlock.
HY-PC		HY-PC(1a-1a)  HY-PC1(1a1b-1a1b) 	For general circuits. It supports the simultaneous operation of the 2 buttons because there is no mechanical interlock.
HY-PD		HY-PD(2a-2a) 	For speed control and 2-circuit control The contacts are divided into two stages. It does not support the simultaneous operation of the 2 buttons with the seesaw-type mechanical interlock.
HY-PE		HY-PE(2a-2a)  HY-PE1(2a2b-2a2b) 	For general circuits. 2a-2a / 2a2b-2a2b contacts. It does not support the simultaneous operation of the 2 buttons with the seesaw-type mechanical interlock.
HY-PF		HY-PF(2a)  HY-PF1(2a2b) 	For general circuits. You can freely assemble and configure it according to the independent 1 contact switch. Up to 2a2b contacts (1a, 1b, 1a1b, 2a1b, 2a2b)

Contact units (Push lock turn reset switch)

Model	Appearance	Contact configuration	Explanation
HY-PS		HY-PS  HY-PS1 	When the button is pressed, the pressed state is maintained. Return turns in the direction of the printed arrow. (Moving part + contact)

Accessories

Model	Appearance	Explanation
PS-3R(HOIST)		Switch on operation part (excluding contact)

STS series

Specifications

Model	STS 040	STS 060	STS 080
Appearance			
Circumference size	Ø 40	Ø 60	Ø 80
Bracket selection	● Plastic round bracket ● L type bracket ● Elbow bracket (option)	● Plastic round bracket ● L type bracket ● Elbow bracket (option)	● Plastic round bracket ● L type bracket ● Elbow bracket (option)
Rated voltage	24 V a.c. 50/60 Hz or 24 V d.c. (Order specification when the power supply voltage is 12 V)		
Number of stacked layers	1, 2, 3, 4, 5 stacks		
Color	Red, Yellow, Green, Blue, White		
Power Consumption	Max. approx. 6 W for 5 stacks (0.9 W per each stack)		
Body material	Heat resistant ABS		

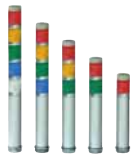
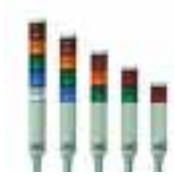
Suffix code

Model	Code	Content
STS	□ -□ □ □	Sign Tower With Continuous Light
Diameter size	040	Ø 40 cylinder type
	060	Ø 60 cylinder type
	080	Ø 80 cylinder type
Power voltage	C51	24 V a.c. 50/60 Hz or 24 V d.c.(dual usage)
	D41	12 V a.c. 50/60 Hz or 12 V d.c.(dual usage)
Number of stacked layers	1	1 stack (red)
	2	2 stack (red, green)
	3	3 stack (red, yellow, green)
	4	4 stack (red, yellow, green, blue)
	5	5 stack (red, yellow, green, blue, white)
Bracket selection	M	PIPE connection type plastic base (MP-40, MP-60, MP-80)
	L	L-shaped bracket
Optional		Plastic elbowbracket (EPM-18, EPM-25)

※ The power supply voltage is 12 V a.c. 50/60 Hz or 12 V d.c. If it is, the order specification

STL series

Specifications

Model	STL 025	STL 040	STL 060	STL 080
Appearance				
Circumference size	Ø 25	Ø 40	Ø 60	Ø 80
Function	Continuous light only	● A : Continuous light, ● F : Continuous light, Flashing light, Buzzer		
Rated voltage	24 V d.c.	24 V a.c. 50/60 Hz or 24 V d.c., 100-240 V a.c. 50/60 Hz		
Number of stacked layers	1, 2, 3, 4, 5 stacks			
Bracket selection	● L-shaped pedestal (ST-AG: sold separately)	● Direct installation (bolt fixed installation) ● Plastic round pedestal ● L-shaped bracket, ● STM-84 (option) ● STM-105 (option) ● Elbow type bracket (EPM) (option)		
Color	Red, Yellow, Green, Blue, White			
Power Consumption	About 4 W or less (Based on 5 stages, 0.6 W for each stage)	Max. approx. 8 W for 5 stacks (1.2 W per each lamp)		
Buzzer size	-	75 dB (1 m)	85 dB (1 m)	

Suffix code (STL025)

Model	Code				Content
STL	□	-□	□	□	Sign tower (LED light source)
Diameter size	025				Ø25 cylinder type
Power voltage		D51			24 V d.c. (LED light source)
Module colors			1		1 stack (red)
			2		2 stack (red, green)
			3		3 stack (red, yellow, green)
			4		4 stack (red, yellow, green, blue)
			5		5 stack (red, yellow, green, blue, white)
polarity				N	NPN (Common Anode)
				P	PNP (Common Cathode)

※ Color of modules can be changed at customer's request

※ L type bracket sold separately

Suffix code (STL040, 060, 080)

Model	Code					Content
STL	□-	□	□	□	□	Sign tower (LED light source)
Diameter size	040					Ø 40 cylinder type
	060					Ø 60 cylinder type
	080					Ø 80 cylinder type
Function		A				Continuous light only
		F				Continuous light, flashing light and buzzer (selected by the external signal)
Power voltage			C51			24 V a.c. 50/60 Hz or 24 V d.c. (dual usage)
			A11			100-240 V a.c. 50/60 Hz
Module colors				1		1 stack (red)
				2		2 stack (red, green)
				3		3 stack (red, yellow, green)
				4		4 stack (red, yellow green, blue)
				5		5 stack (red, yellow, green, blue, white)
Bracket selection					D	Direct installation (bolt fixing installation)
					L	L type bracket (standard)
					M	PIPE Attachable plastic bracket (MP-40, MP-60, MP-80)
Optional						Optional bracket (STM)
						Plastic elbow support (EPM-18, EPM-25)

※ Composition of stacking modules: Upper side (1st stack) to the lower side.

HY-TN series CE

Specifications

Stage	Model	Voltage	Consumption power	Bulb
1	HY-TN-24-1 HY-TN-220-1	24 V d.c. 220 V a.c.	0.21 A 0.04 A	5 W
2	HY-TN-24-2 HY-TN-220-2	24 V d.c. 220 V a.c.	0.42 A 0.08 A	5 W
3	HY-TN-24-3 HY-TN-220-3	24 V d.c. 220 V a.c.	0.63 A 0.11 A	5 W
4	HY-TN-24-4 HY-TN-220-4	24 V d.c. 220 V a.c.	0.84 A 0.14 A	5 W
5	HY-TN-24-5 HY-TN-220-5	24 V d.c. 220 V a.c.	1.05 A 0.17 A	5 W

Stage	Model	Voltage	Consumption power	Bulb	Flashing
1	HY-TWBN-24-1 HY-TWBN-220-1	24 V d.c. 220 V a.c.	0.21 A 0.04 A	5 W	60 times/ 1 minute
2	HY-TWBN-24-2 HY-TWBN-220-2	24 V d.c. 220 V a.c.	0.42 A 0.08 A	5 W	
3	HY-TWBN-24-3 HY-TWBN-220-3	24 V d.c. 220 V a.c.	0.63 A 0.11 A	5 W	
4	HY-TWBN-24-4 HY-TWBN-220-4	24 V d.c. 220 V a.c.	0.84 A 0.14 A	5 W	
5	HY-TWBN-24-5 HY-TWBN-220-5	24 V d.c. 220 V a.c.	1.05 A 0.17 A	5 W	

Suffix code

Model	Code				Content	
HY-	□	□	□	□	HY-TN Series Sign Tower	
Function	TN				Continuous light only	Bulb type
	TWBN				Continuous light, flashing light, buzzer	
Power voltage		24			24 V d.c.	
		220			220 V a.c.	
Stacking modules			1		1 stack (red)	
			2		2 stack (red, green)	
			3		3 stack (red, yellow, green)	
			4		4 stack (red, yellow, green, blue)	
			5		5 stack (red, yellow, green, blue, white)	
Supporter selection					No indication (L type bracket standard)	
Accessories					ST-011 (Plastic bracket installation)	
					MP-60 (Plastic bracket installation (Bar type))	
					EPM (Plastic elbow type bracket)	

STE060 series

Specifications

Base unit specifications

Model	STE060-BAD51	STE060-BFD51	STE060-BAA11	STE060-BFA11	Dimension
Power voltage	24 V d.c.		100-240 V a.c. 50/60 Hz		DC Type AC Type
Function	Lighting only	Lighting, Flickering, Buzzer (External signal)	Lighting only	Lighting, Flickering, Buzzer (External signal)	
Flickering time	-	60 times / minute	-	60 times / minute	
Buzzer sound types	-	A single melody / beeping	-	A single melody / beeping	
Size of buzzer sound	-	85 dB (1 m)	-	85 dB (1 m)	
Power Consumption	-	1.2 W	-	1.2 W	
Ambient temperature & humidity	-5 ℃ ~ 50 ℃, 35 ~ 85 % RH (without condensation)				
Weight (g)	76 g	96 g	160 g	178 g	

LED unit specifications

Model	STE060-LR	STE060-LY	STE060-LG	STE060-LB	STE060-LW
Dimension					
Power voltage	24 V d.c.				
Power Consumption	1.2 W				
Light source	LED				
Emission angle	360°				
Ambient temperature & humidity	-5 ℃ ~ 50 ℃, 35 ~ 85 % RH (without condensation)				
Weight (g)	43 g				

Suffix code

Model	Code				Content
STE060 -	□	□	□	□	Ø60 LED Light Sign Tower
Function	A				Lighting only
	F				Lighting, Flickering, Buzzer (External signal)
Power voltage		D51			24 V d.c.
		A11			100-240 V a.c. 50/60 Hz
Stacking modules			1		1 stack (red)
			2		2 stacks (red, Green)
			3		3 stacks (red, Yellow, Green)
			4		4 stacks (red, Yellow, Green, Blue)
			5		5 stacks (red, Yellow, Green, Blue, White)
Supporter selection				L	L type bracket (Standard type)
				E	Elbow type supporter (EPM-18)
				M	Plastic supporter (MP-60)
				S	Plastic supporter (ST-011)

※ The color was arranged from top to bottom in following order, red, Yellow, Green, Blue, and White. There are two types of functions which are lightening only / Lightening, Flickering & Buzzer.

Base unit suffix code

Model	Code			Content
STE060 -	□	□	□	STE060 Sign Tower Base Unit
Classification	B			Base unit
Function		A		Lighting only
		F		Lighting, Flickering, Buzzer (external signal)
Power voltage			D51	24 V d.c.
			A11	100-240 V a.c. 50/60 Hz

LED unit suffix code

Model	Code		Content
STE060 -	□	□	STE060 Sign Tower LED Unit
Classification	L		LED unit
Unit		R	Red unit
		Y	Yellow unit
		G	Green unit
		B	Blue unit
		W	White unit

STE025 series CE

Specifications

Functions	Continuous light
Power voltage	24 V d.c.
Body material / color	ABS / Chrome plated & ivory
Lens colors	Red, green, yellow
Diameter	Ø 25
Max. number of stacks	3 Stacks

Suffix code

Model	Code	Content
STE025 -	□ □	Ø 25 LED Modular Sign Tower
Power voltage	D51	24 V d.c.
Number of stacks	1	1 stack (red)
	2	2 stacks (red, green)
	3	3 stacks (red, yellow, green)
Body color	S	Chrome plated
	N	Ivory

※ L type bracket sold separately

HL series CE KC

Specifications

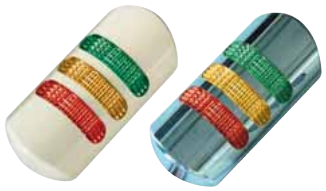
Model		HL-100	HL-200	HL-300
Appearance				
Optical characteristic specification				
Lens color		Transparency	Transparency	Transparency
Lighting color (default)		Daylight		
Color temperature (default)		6,000 ~ 7,000 K		
Total luminous flux	AC	509 lm	1044 lm	1063 lm
	DC	-		
Illuminance (at 1m)	AC	205 lux	318 lux	368 lux
	DC	-		
Light efficiency		102 lm / W	109 lm/W	110 lm/W
General specification				
Model		HL-100	HL-200	HL-300
LED model used		LG Innotek G3 series (LEMWS59R80FZ) LM80 certification		
Features of the LED chip used		Zener diode is built into the internal circuit of the LED chip. ESD durability is strong through the protection circuit.		
Product life (based on LED)		More than 50,000 hours		
Rated voltage	AC	110-220 V a.c.		
	DC	12-24 V d.c.		
Frequency		50/60 Hz		
Operating voltage range		100-240 V a.c.		
Current consumption (A)		-		
		0.023	0.046	0.046
Power Consumption		-		
		5 W	10 W	10 W
Withstand voltage		AC : 3,000 V a.c., 60 Hz, 1 minute		
Color rendering		88	87	88
Responsibility				
Test Items		Exam conditions		Result
Withstand voltage		AC : 3,000 V a.c., 60 Hz, 1 minute		Clear
Operating temperature		-20 ℃ ~ +60 ℃		Clear
ON/OFF repeated test		Turns off and repeats 1,000 times every 3 seconds		Clear
Aging Test		Operates over 96 hours with rated input		Clear
Acquisition standard		CE KC		
Weight (g)		10.6	13	15

Suffix code

Model	Code	Content
HL	□ □ □ -□	Universal panel lamp
Size and output	1 0 0	5 W
	2 0 0	10 W
	3 0 0	10 W
Input power method	A	110-220 V a.c.
	D	12-24 V d.c.

WME series CE

Specifications

Model	WME
Appearance	
Function	● A : Lit indication, ● F : Lit, blinking, buzzer (selected by external signal)
Color (body)	● B : Beige body ● C : Chrome plated body
Rated voltage	24 V a.c. 50/60Hz or 24 V d.c. (Order specification when the power supply voltage is 12 V)
Number of stacked layers	3-stage
Power Consumption	2.1 W or less
Buzzer	2 Types of tones (single/intermittent), approx. 80 dB (1 m)

Suffix code

Model	Code			Content
WME-	□	□	□	Wall Mounted Light
Appearance	B			Beige color body
	C			Chrome gold plating body
Function		A		Continuous light indication
		F		Continuous light indication, flashing light indication, buzzer (selected by the external signal)
Power voltage			C51	24 V a.c. 50/60 Hz or 24 V d.c.
			C41	12 V a.c. 50/60 Hz or 12 V d.c. C41 ※ order-made

WMS series CE

Specifications

Model	WMS
Appearance	
Function	● A : Continuous light, ● F : Continuous light, Flashing light, Buzzer
Lens color	Red, Yellow, Green, Blue, White
Rated voltage	24 V a.c. 50/60 Hz or 24 V d.c. Common (Standard specification) (Order specification when the power supply voltage is 12 V)
Number of tiers	1, 2, 3, 4, 5 tiers
Power Consumption	0.5 W (lamp/1 stage), 3.2 W or less (including 5-stage buzzer)
Buzzer	2 types of tones (single/intermittent), 70 dB (1 m)

Suffix code

Model	Code			Content
WMS-	□	□	□	Wall Mounted Light
Appearance	A			Only for continuous light
	F			Continuous light, flashing light, buzzer (selected by the external signal)
Function		C51		24 V a.c. 50/60Hz or 24 V d.c.
		C41		12 V a .c. 50/60 Hz or 12 V d.c. Common ※ "C41" is an order specification
Power voltage			1	1 stack (red)
			2	2 stack (red, Green)
			3	3 stack (red, Yellow, Green)
			4	4 stack (red, Yellow, Green, Blue)
			5	5 stack (red, Yellow, Green, Blue, White)

T series

Specifications

Model	T060 / T084	T060 / T084	T060 / T084 T100 / T150	T060 / T084 / T100	T060 / T084 T100 / T150	T060 / T084 / T100
Appearance	 T060		T084		T100	T150
Appearance	Round cap supporter installation	Square cap supporter installation	Square cap direct installation	Round cap direct installation	Square cap direct installation	Round cap direct installation
Functions	Rotating continuous light				Rotating continuous light, buzzers	
Power voltage	● 12 V d.c. : 0.08 A, ● 24 V d.c. : 0.06 A, ● 110 - 220 V a.c. : 0.03 A				● 12 V d.c. : 0.09 A, ● 24 V d.c. : 0.07 A, ● 110 - 220 V a.c. : 0.04 A	
Rotating cycle	180 ± 15% times / 1 minute					
Buzzer volume	-				Approx. 80 dB	
Cap materials	Polycarbonate (PC) resin					
Body	ABS resin					
Cap colors	Red, yellow, green, blue					
Degree of protection	IP54					

Suffix code

Model	Code						Content
T	□-	□	□	□	□-	□	Revolving Warning Light
Appearance	060						Ø 60
	084						Ø 84
	100						Ø 100
	150						Ø 150
Cap appearance		P					Round cap ※ except ø150 model
		F					Square cap attachment type
Functions			A				Rotating lights
			F				Rotating light · Buzzer
Power voltage				D12			12 V d.c.
				D24			24 V d.c.
				A11			110 - 220 V a.c.
Cap colors					R		Red
					Y		Yellow
					G		Green
					A		Blue (only with Ø 84 model)
Pedestal						D	Direct installation type (basic type)
						M	Supporter installation type ※ only with Ø60/ Ø84 models with rotating continuous light

RLA-WX/WXB CE

Specifications

Model	RLA-WX□□	RLA-WXB□□
Appearance		
Function	Rotating continuous light	Rotating continuous light, buzzer
Dimension	Ø118 Square cap (direct installation, magnetic mounting bracket, magnetic mounting bracket and cigar jack)	
Power voltage	12 V d.c., 24 V d.c., 110 V a.c. 50/60 Hz, 220 V a.c. 50/60 Hz	
Power consumption	● 7.2 W (Power voltage : at 24 V d.c.), ● 12 W (Power voltage : at 220 V a.c.)	
Flash speed	About 60 times / 1 minute	
Light source	Xenon tube strobe light	
Buzzer	-	Built-in buzzer (approx. 90 dB 1m apart)
Material	● Cap : Acrylic resin, ● Body : ABS resin	
Cap color	Red, blue, white	
Protection structure	IP54 (IEC 60529)	

Suffix code

Model	Code			Content	
RLA-	□	□	□	Turn Light (Ø118)	
Function	WX			Strobe light	
	WXB			Rotating continuous light and buzzer built-in	
Power voltage		01		12 V d.c.	※ Direct installation type
		02		24 V d.c.	
		10		110 V a.c.	
		20		220 V a.c.	
		10M		110 V a.c.	※ Permanent magnet stand
		20M		220 V a.c.	
		01A		12 V d.c.	※ Permanent magnet stand with cigar jack for automobile
		02A		24 V d.c.	
Cap color			R	Red	
			B	Blue	

LT series CE

Specifications

Appearance	Suffix code	Power voltage	Power consumption	Number of leds	Rotating cycle	Flickering
	LT-R-12	12-48 V d.c., 12-24 V a.c. 50/60 Hz	Max. 2.9 W (power voltage: 12 - 48 V d.c)	24	Approx. 90 times / min	Approx. 50 times / min
	LT-R-012	110/220 V a.c. 50/60 Hz	Max. 5 W	24		
	LT-P-12	12-48 V d.c., 12-24 V a.c. 50/60 Hz	Max. 2.9 W (power voltage: 12 - 48 V d.c)	24		
	LT-P-012	110/220 V a.c. 50/60 Hz	Max. 5 W	24		
	LT-PB-12	12-48 V d.c., 12-24 V a.c. 50/60 Hz	Max. 2.9 W (power voltage: 12 - 48 V d.c)	24		
	LT-PB-012	110/220 V a.c. 50/60 Hz	Max. 5 W	24		

Suffix code

Model	Code			Content	
LT-	□	□	□	Signal Light (Ø84 Cap)	
Installation type (Function)	R			Supporter mounting (rotating, flashing)	
	P			Direct mounting (rotating, flashing)	※ Optional supporter (STM-105)
	PB			Direct mounting (rotating, flashing, buzzer built-in)	
Power voltage		12		12-48 V d.c., 12-24 V a.c. 50/60 Hz	
		012		110/220 V a.c. 50/60 Hz	
Cap color			R	Red	
			Y	Yellow	
			G	Green	

SLB series CE

Specifications

Model	SLB 060
Appearance	
Dimensions (cap size)	Ø 70 Cap
Shape and function	● P : Direct installation of round cap , ● R : Installation with round cap base, ● F : Direct installation of square cap, ● X : Installation with square cap base
Function	● A : Lighting only ● F : Lit, blinking, buzzer (selected by external input signal)
Rated voltage	24 V a.c. 50/60 Hz or 24 V d.c., 110 - 240 V a.c. 50/60 Hz (Order specification when the power supply voltage is 12 V)
Color	Red, Yellow, Green
Light	LED (Light-emitting diode)
Power consumption	Max. 2 W (24 V a.c. / d.c.), max. 3.5 W (110 - 240 V a.c.)
Buzzer	● 2 types of buzzer melodies (single melody, beeping), ● volume : 80 dB (1 m distance)

Suffix code

Model	Code				Content	
SLB	□	-□	□	□	Turn Light	
Dimension	060				Ø 70 Cap	
Design and function		RA			Round type cap supporter mounting installation	Continuous light only
		XA			Rectangular type cap supporter mounting installation	
		PA			Round type cap direct installation	
		FA			Rectangular type cap direct installation	
		PF			Round type cap direct installation	Continuous light, flashing light and buzzer selected by the external signal
		FF			Rectangular type cap direct installation	
Power voltage			C51		24 V a.c. 50/60 Hz or 24 V d.c.	
			C41		12 V a.c. 50/60 Hz or 12 V d.c. (※ order-made)	
			A11		110 - 240 V a.c. 50/60 Hz	
Cap color				R	Red	
				Y	Yellow	
				G	Green	

HY-256/306/606/606N

Specifications

Model	HY-256	HY-306	HY-606	HY-606N
Appearance				
Voltage used	110 V a.c., 220 V a.c. 12 V d.c., 24 V d.c.			
Power consumption	Approx. 4 VA : HY-256-1,HY-256-2,HY-306-1,HY-306-2 30 mA Max.: HY-256-12,HY-256-24,HY-306-12,HY-306-24		Approx. 8 VA : HY-606-1,HY-606N-1,HY-606-2,HY-606N-2 30 mA Max.: HY-606-12,HY-606N-12,HY-606-24,HY-606N-24	
Power frequency	50/60 Hz (for 110 V a.c., 220 V a.c.)			
Volume	85 dB (1 m) * HY-606-12, HY-606N-12, HY-606-24, HY-606N-24: 80 dB (1 m)			
External diameter	For Ø25	For Ø30	Rectangular panel flush (for Ø66)	Rectangular panel extended (□80)

Suffix code

Model	Code		Content
HY-	□	□	Power Buzzer
Dimension	256		For Ø 25
	306		For Ø 30
	606		Rectangular panel flush (for Ø 66)
	606N		Rectangular panel extended (□80)
Power supply voltage		1	110 V a.c. 50/60 Hz
		2	220 V a.c., 50/60 Hz
		12	12 V d.c.
		24	24 V d.c.

HY-606MD/606MA

Specifications

Model	HY-606MD	HY-606MA
Dimension		
Power supply voltage	12 / 24 V d.c.	110 / 240 V a.c.
Power consumption	Approx. 2.5 W	
Power frequency	-	50/60 Hz (Common)
Volume	98 dB max (1 m)	
External diameter	Ø 66 panel cutout dimensions	

Suffix code

Model	Code	Content
HY-606	□	4-Tone melody buzzer
Power supply voltage	MD	12 / 24 V d.c.
	MA	110 / 220 V a.c.

HY-226M/256

Specifications

Model	HY-226MD/MA	HY-256MD/MA
Dimension		
Power supply voltage	100-240 V a.c. 50/60 Hz / 12 V d.c., 24 V d.c.	100-240 V a.c. 50/60 Hz / 12 V d.c., 24 V d.c.
Power consumption	0.6 W / 13.5 W	0.6 W / 13.5 W
Power frequency	50/60 Hz	50/60 Hz
Volume	80 dB	80 dB
External diameter	Ø22 / Ø25	Ø25

Suffix code

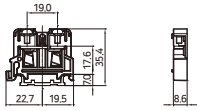
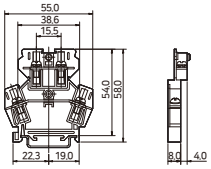
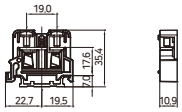
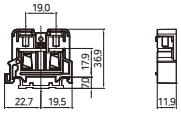
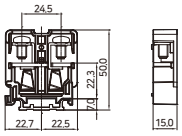
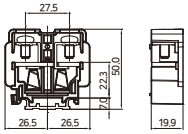
Model	Code		Content
HY-	□	□	3-Tones Electronic Buzzer
Dimension	226		Ø 22 / Ø 25 dual usage (Front side: rectangular type)
	256		Ø 25 (front side: round type)
Power supply voltage		MD	12-24 V d.c.
		MA	100-240 V a.c. 50/60 Hz

HYBT/HYTM series

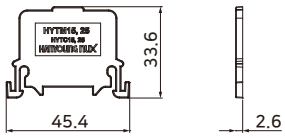
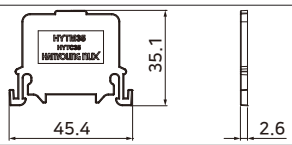
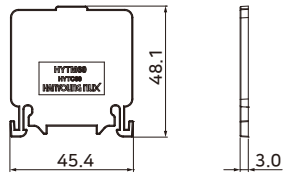
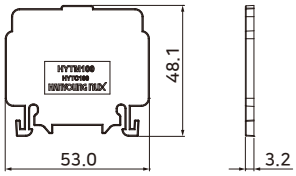
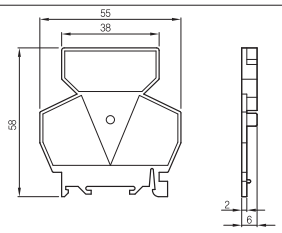
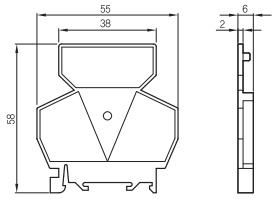
Specifications

Model	HYTM-15A	HYBT-15A2	HYTM-25A	HYTM-35A	HYTM-60A	HYTM-100A
Appearance						
Rated insulating voltage	600 V					
Rated current	15A	15A	25A	35A	60A	100A
Insulation resistance	Min. 100 MΩ (between each live part and between each live part and mounting metal plate)					
Dielectric strength	2500 V a.c. for 1 min (between live part and unfilled part)					
Terminal bolt	M3.5	M3.5	M4	M4	M6	M6
Ambient temperature & humidity	-20 ~ 55 ℃, 45 ~ 85 % RH					

External dimensions

Model	Appearance	External dimensions
HYTM-15A		
HYBT-15A2		
HYTM-25A		
HYTM-35A		
HYTM-60A		
HYTM-100A		

Separator

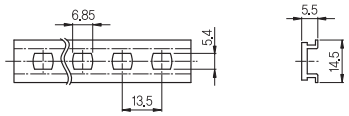
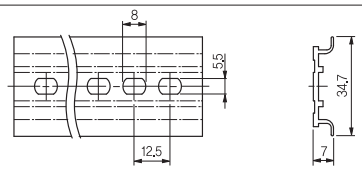
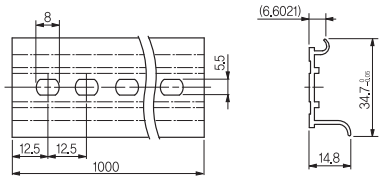
Model	Appearance	External dimensions
HYTM-02 (15A, 25A)		
HYTM-04 (35A)		
HYTM-05 (60A)		
HYTM-06 (100A)		
HYBT-12 (HYBT-15A2-A)		
HYBT-12 (HYBT-15A2-B)		

Accessories

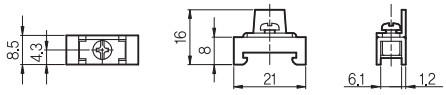
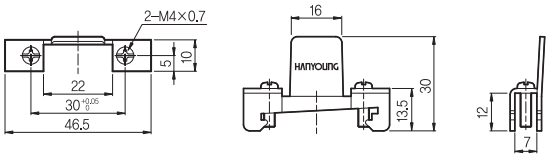
Applying Accessory Classification

Model	HYTM-15A	HYBT-15A2	HYTM-25A	HYTM-35A	HYTM-60A	HYTM-100A
Rail	HYBT-01					
Separator	HYTM-02	HYBT-12	HYTM-02	HYTM-04	HYTM-05	HYTM-06
Stopper	HYBT-07					
Terminal number plate	HYTM-08	HYBT-08	HYTM-08			
Terminal number plate cover	HYTM-07	HYBT-10	HYTM-07			
Short terminal	HYBT-13	HYBT-13	-	-	-	-

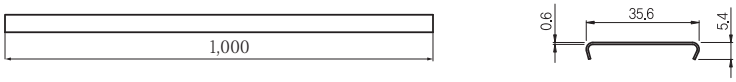
Aluminum Rail (DIN rail)

Appearance	External dimensions
HYBT-CH10 (For 10A)	
HYBT-01 (For 15A ~ 100A)	
HYBT-01A (For warp 15 A ~ 100 A)	

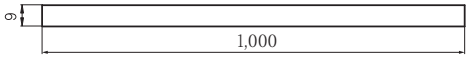
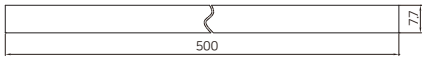
Stopper

Model	Appearance	External dimensions
HYBT-ST10		
HYBT-07		

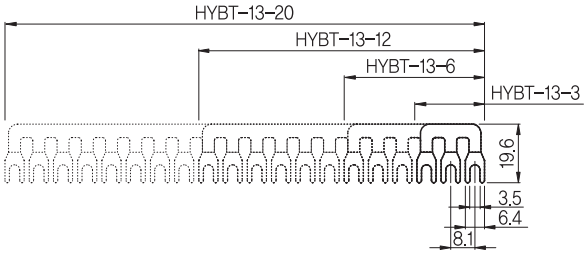
Terminal number plate cover

Model	Appearance	External dimensions
HYBT-08 ※ For HYBT-15A2		
HYTM-08		

Seal

Model	Appearance	External dimensions
HYBT-10 (9 ㎜ Width) ※ For HYBT-15A2		
HYTM-07 (7.7 ㎜Width)		

Short Bar

Appearance	External dimensions
HYBT-13-3	
HYBT-13-6	
HYBT-13-12	
HYBT-13-20	

※ Short bar HYBT-13-3~13-20 are only for the HYBT-15A

HYT series

● For rated current 10 A

Model	Appearance	Rating	Horizontal	Width	Height	Fixed dimensions
HYT-1010		10A 10P	112	24	17	102.5

● For rated current 20 A

Model	Appearance	Rating	Horizontal	Width	Height	Fixed dimensions
HYT-203		20A 3P	56	30	20	44
HYT-204		20A 4P	68	30	20	56
HYT-206		20A 6P	89	30	20	78
HYT-2010		20A 10P	137	30	20	126
HYT-2012		20A 12P	163	30	20	150.5
HYT-2015		20A 15P	199	30	20	187
HYT-2020		20A 20P	257	30	20	245

● For rated current 30 A

Model	Appearance	Rating	Horizontal	Width	Height	Fixed dimensions
HYT-303		30A 3P	67	5	24	54.5
HYT-304		30A 4P	83	35	24	70
HYT-306		30A 6P	113	35	24	100.5
HYT-3010		30A 10P	153	35	24	143

● For rated current 60 A

Model	Appearance	Rating	Horizontal	Width	Height	Fixed dimensions
HYT-603		60A 3P	84.5	40	31	28
HYT-604		60A 4P	113.5	40	31	57

● For rated current 100 A

Model	Appearance	Rating	Horizontal	Width	Height	Fixed dimensions
HYT-1003		100A 3P	104.5	55.5	36.5	35
HYT-1004		100A 4P	140	55.5	36.5	70

● For rated current 150 A

Model	Appearance	Rating	Horizontal	Width	Height	Fixed dimensions
HYT-1503		150A 3P	115.5	67.5	41	39
HYT-1504		150A 4P	153	67.5	41	77

● For rated current 200 A

Model	Appearance	Rating	Horizontal	Width	Height	Fixed dimensions
HYT-2003		200A 3P	134	72.5	44.5	45
HYT-2004		200A 4P	180	72.5	44.5	90

● For rated current 300 A

Model	Appearance	Rating	Horizontal	Width	Height	Fixed dimensions
HYT-3003		300A 3P	155.5	83.5	49.5	51.8
HYT-3004		300A 4P	207.5	83.5	49.5	103.6

● For rated current 400 A

Model	Appearance	Rating	Horizontal	Width	Height	Fixed dimensions
HYT-4003		400A 3P	155.5	83.5	49.5	51.8
HYT-4004		400A 4P	207.5	83.5	49.5	103.6

● For rated current 500 A

Model	Appearance	Rating	Horizontal	Width	Height	Fixed dimensions
HYT-5003		500A 3P	204	94	59.5	68
HYT-5004		500A 4P	270	93	59.5	136

HY-F15/F30 series

Specifications

Model	F15-1A	F15-1D	F15-2A	F15-2D	F15-3A	F15-3D	F30
Appearance							
Rated current	250 V a.c. 15 A	24 V d.c. 10 A	250 V a.c. 15 A	24 V d.c. 10 A	250 V a.c. 15 A	24 V d.c. 10 A	30 A 600 V a.c.
Remarks	AC 110-220 V a.c. DC 12-24 V d.c. ※ For Ø 6 X 30 ㎜ ceramic fuses						110-600 V a.c. ※ For Ø 12 X 50 ㎜ ceramic fuses

HY-25/30 series

Specifications

Appearance	Model	Materials	Remarks
	HY-2501	Rolled iron	Ø 25
	HY-2502		
	HY-2503		
	HY-2504		
	HY-2505		
	HY-2506		
	HY-3001	Rolled iron	Ø 30
	HY-3002		
	HY-3003		
	HY-3004		
	HY-3005		
	HY-3006		

Suffix code

Model	Code		Content
HY-	□	□	Rolled Iron Control Boxes
Installation hole	25		Ø 25 installation hole
	30		Ø 30 installation hole
Number of holes		01	1 Hole
		02	2 Hole (03 : 3 Hole, 04 : 4 Hole, 05 : 5 Hole, 06 : 6 Hole)

HYC-M1/M2

Suffix code

Appearance	Model	Material	Remarks
	HYC-M1	Polycarbonate (PC)	Ø8
	HYC-M2	Polycarbonate (PC)	Ø11

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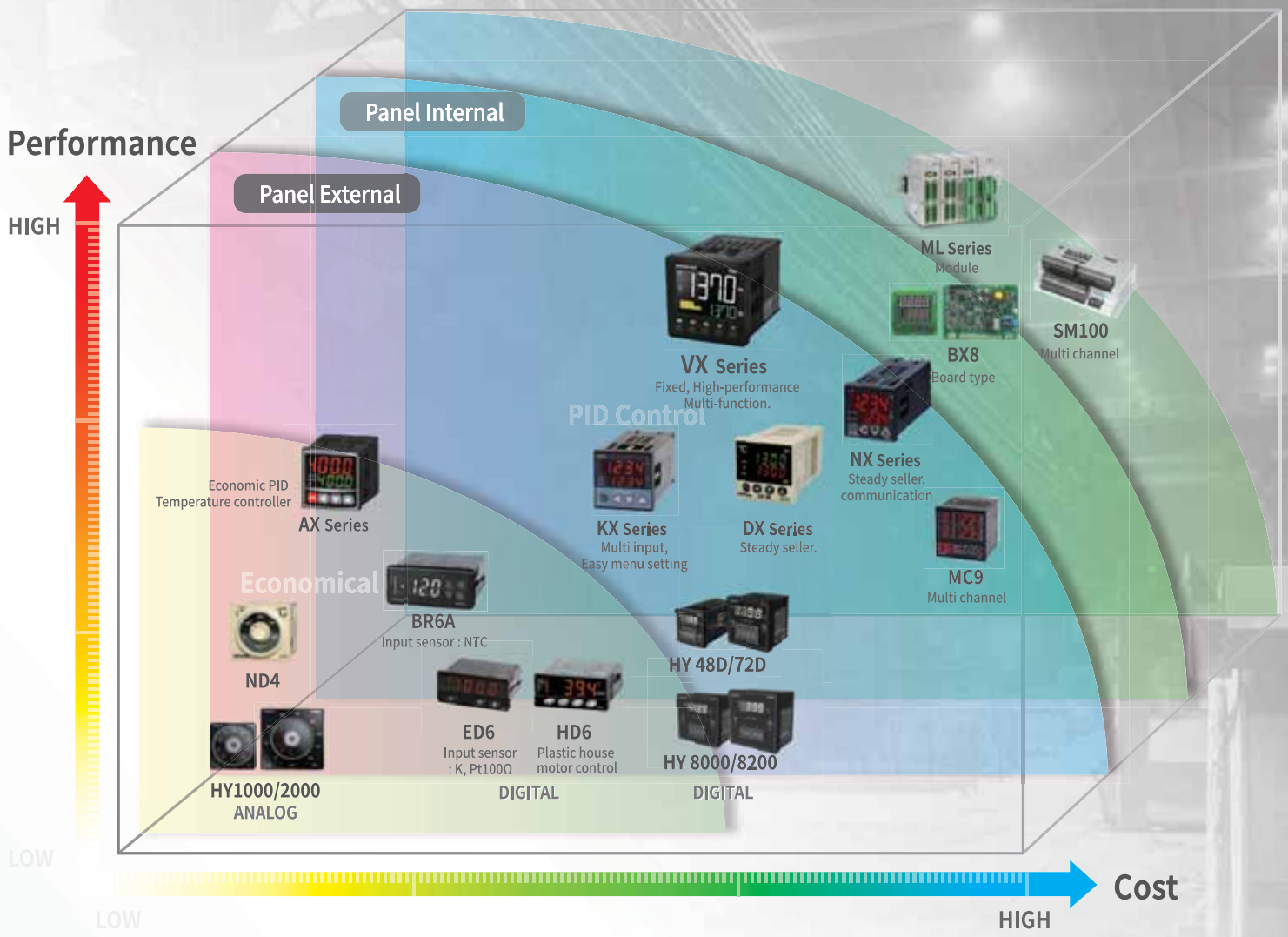
Temperatrue controller selection guide



thermo-hygrostat

TH510/TH500A
Programmable temperature & Humidity controller

TD510/300
Programmable temperature controller

TS510
Thermal shock test controller

Programmable

NP200
Programmable temperature controller

mold temperature

MT100
Multi-input mold temperature controller

Recorder

RT9N
mini recorder

GR200A
Graphic recorder (touch panel)

input device

EE99
High-precision temperature/humidity sensor

output device

HSR
solid state relay

TPR
power regulator

indicator

BK3
Digital Temperature Indicators

BK6-M
Multi Input Temperature Indicators

Power supply

TPS
Power supply

DPS
DIN rail power supply

Other device

FS3A
water level regulator

HYER3
Electrode holder

CV250
Temperature/ humidity converter

HMCE103
Ethernet Converter

CV310
converter for communication

TCS
Integrated program

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MAIN PRODUCTS

Temperature controllers / Recorders / Counters / Timers / Panelmeters / Multi pulse meters / Proximity sensors / Photo sensors / Rotary encoders
Thyristor power regulators / Solid state relays / Power supplies / Control switches / Combination display lights / Power switches / Main switches
Cam switches / Limit switches / Micro switches / Pendant switches / Foot switches / Mono lever switches / Sign towers / Turn lights / Buzzers
Terminal blocks / Fuse holders / Control boxes / Connector cables