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PRODUCT GUIDE

version S9.0

WORLD LEADER IN CONTROL & MEASUREMENT

HANYOUNG NUX

Since 1972

World Leader in control & measurement

KS A 9001
ISO 9001

국가교정기관

LISTED LR 114761

1972. Establishment of HANYOUNG ELECTRONIC CO.
1990. Incorporated to HANYOUNG ELECTRONIC CO.,Ltd.
Organization of plastic injection/molding section
Designation of calibration laboratory (Temperature controller)
1991. Designation of quality control leading company
1992. Designation of leading technology company
1993. Establishment of Kimpo factory (Plastic injection / molding)
Acquisition of N.T (New Technology)
Mark for multi-input Temperature controller and Counter/Timer
I.S.O.9001 Certified (TUV Rheinland Germany)
1994. Awarded as the 100 companies competitive in Quality. (National Quality Award)
1995. Awarded as the 100 companies competitive in Quality. (National Quality Award)
1996. CE Certified for 10 Items (From TUV Rheinland)
1997. Awarded as the 100 companies competitive in Quality. (National Quality Award)
1999. Selection of Superior Quality Enterprise Top 50
2000. Top Quality Enterprise Award
Awarded as the 50 companies competitive in Quality. (National Quality Award)
2001. Win the Prize for National Quality Management
Awarded as the 50 companies competitive in Quality. (National Quality Award)
2002. Establishment of HANYOUNG NUX CO.,LTD.
Selection of Superior Quality Enterprise Top 50
2003. ISO 9001 : 2000 Re-Certified
Establishment of SHANGHAI HANYOUNG ELECTRIC CO.,LTD in CHINA.
2004. Designation of Venture Enterprise.
Establishment of PT. HANYOUNG in INDONESIA
2006. Certification of New Excellent Product (NEP)
- Ministry of Commerce, Industry & Energy
2007. Special Company for Materials & Components
Certification of INNO-BIZ

HANYOUNG NUX "One-Stop Process System" - We provide **BEST QUALITY, LOW COST & ON-TIME DELIVERY** to our customers.

HANYOUNG NUX "One-Stop Process System"-
Based upon QCD policy, we provide **HIGH QUALITY, LOW COST, AND ON-TIME DELIVERY** to our customers.
To meet quality of global standard, we are continuously performing process innovation and quality activities.
As the realization of one-stop factory, our network system provides real-time management of R&D, Manufacturing, Sales and Customer service.
We are performing perfect job on deliverying products to our customers on time by applying HIAP(HANYOUNG INNOVATION ACTION PLAN) system.

- **R**ecorder **T**emperature Controller
- **D**igital Counter / Timer
- **A**nalog Timer
- **P**anel meter
- **M**ulti-Pulse meter
- **S**ensor **R**otary Encoder
- **T**PR **S**SR
- **C**ontrol Switch
- **M**icro Switch
- **L**imit Switch
- **C**am Switch **M**ono Lever Switch
- **H**oist Switch **F**oot Switch **M**ain Switch
- **L**ED Sign Tower **T**urn Light **S**ignal Light
- **T**erminal Block **F**use Holder **C**ontrol Box

TOUCH PANEL TYPE
TEMPERATURE & HUMIDITY CONTROLLER

TD500
TWO CHANNELS PROGRAMMABLE TEMPERATURE CONTROLLER

- TOUCH PANEL 256 COLOR LCD INTERFACE
- HIGH ACCURACY CONTROLLER (1/100°…, 1/10 % RH DISPLAY & CONTROL)
- BUILT-IN LARGE STORAGE CAPACITY (300 PATTERNS / 6,000 SEGMENTS)
- GRAPHIC DISPLAY FOR SV & PV EACH CHANNEL (FOR MAX.360 DAYS)
- RS232, RS485 AND USB COMMUNICATION SUPPORT

TH500
PROGRAMMABLE TEMPERATURE & HUMIDITY CONTROLLER

- UNIVERSAL INPUT (RTD / TC / V d.c)
- UNIVERSAL OUTPUT (RELAY / SSR / SCR)
- TOUCH SCREEN & COLOR LCD INTERFACE
- RS232, RS485 AND USB COMMUNICATION SUPPORT

HYBRID & GRAPHIC RECORDER

- HIGH ACCURACY / HIGH QUALITY
- MULTI CHANNEL RECORDER
- MULTI-INPUT SIGNALS
- CONVENIENT INTERFACE
- POWER SAVING DESIGN
- WIDE APPLICATION FOR CONTROL SYSTEM

DIGITAL TEMPERATURE CONTROLLER

KX series

- AUTO TUNING FUNCTION
- UNIVERSAL INPUT
- CONVERTIBLE CONTROL ACTION (DIRECT OR REVERSE)
- RETRANSMISSION OUTPUT
- VARIOUS OPTIONS AVAILABLE

KX4S (Socket type)

DIGITAL COUNTER / TIMER

GE series

- BATCH COUNTER OUTPUT
- EXTERNAL OUTPUT POWER 12 V 200 mA
- PNP / NPN INPUT SELECTABLE
- ONE SHOT TIME OUTPUT (0.01S ~ 99.99S)

ANALOG & DIGITAL TIMER

T38N/T48N/T57N/TF62N/TF62D
ANALOG TIMER

- APPLY CONVENIENT TIME SET-UP MODE
- VARIOUS TIME RANGES (01, 03, 06, 10, 30, 60, 12)
- HOUR(H) / MINUTE(M) / SECOND(S) ARE PARTICULARLY INTEGRATED

MA4N
ANALOG TIMER

- APPLY CONVENIENT TIME SET-UP MODE
- VARIOUS TIME RANGES (TOTAL 16 TIME RANGES)
- VARIOUS OPERATION CHARTS (TOTAL 6 OPERATION CHARTS)

TT4-P42A/P42B
DIGITAL DUAL TIMER

- PLUG-IN TYPE (8 PINS AND 11 PINS)
- VARIOUS TIME RANGES (0.01 sec ~ 9999 hour)
- AVAILABLE INDIVIDUAL ON-DELAY SETTING FOR 2 OUTPUTS

DIGITAL MULTI PULSE METER / PANEL METER

RP series

DIGITAL MULTI PULSE METER

- AUTO ZERO TIME SETTING FUNCTION
- COMPARATIVE OUTPUT FUNCTION (HH, H, GO, L, LL)
- STARTING COMPENSATION TIMER FUNCTION
- DISPLAY CYCLE SETTING FUNCTION

MP series

DIGITAL MULTI PANEL METER

- MEASURING RMS
- MULTI INPUT RANGE
- WIDE DISPLAY RANGE
- 4 DIGITS (-1999 ~ 9999), 5 DIGITS (19999 ~ 99999)

RP series

MP series

PHOTO SENSOR

PEN series

- BUILT IN POWER (RELAY OUTPUT)
- ATTACHED MOTION DISPLAY LIGHT
- ATTACHED SENSITIVITY ADJUSTMENT VOLUME
- POWER VOLTAGE 24 - 240 V a.c/d.c

PFB series

- INTENSITY CONTROL BY AUTO TEACHING
- 7 SEGMENTS, 4 DIGIT LED
- EASY TO INSTALL
- TIMER SETTING (40ms, 100ms, 500ms, 1s)

PFD series

- ALARM OUTPUT 2 POINTS
- TIME SIGNAL 2 POINTS

PW series

- ADJUSTABLE RANGE SETTING SENSOR
- IP67 STRUCTURE

PS series

- SMALL AND LONGEST DISTANCE DETECTION (THROUGH BEAM TYPE 1m, 7m, 10m)

PROXIMITY SENSOR / ROTARY ENCODER

HYP/HCP series

- FAST AND RELIABLE DETECTION
- SURGE PROTECTION CIRCUIT
- REVERSE POLARITY PROTECTION
- SUITABLE FOR VARIOUS USES

HE series

- INCREMENTAL TYPE
- WIDE POWER VOLTAGE (5V d.c / 5-12 V d.c / 12-24V d.c)
- SIMPLE INSTALLATION STRUCTURE
- VARIOUS OUTPUT SPECIFICATIONS
- EASY TO INSTALL

THYRISTOR POWER REGULATOR

TPR series

- SIMPLE DESIGN
- SEMIPERMANENT LIFE EXPECTANCY
- CONTROL MODE SELECTION
- MOVEMENT BY SOFT START

CONTROL SWITCH

QR series

- ALUMINUM GUARD TYPE (FLUSH TYPE/EXTENDED TYPE : 2 KINDS)
- PLASTIC GUARD (HANDLING PARTS 30 KINDS)
- HANDLING PART AND CONTACT UNIT ARE DETACHABLE
- SNAP OPERATION CONTACT BLOCK (1a1b STACKING TYPE)
- HIGH RELIABILITY CONTACT UNIT
- IP65 PROTECTION
- USE ILLUMINATED LED

LIMIT SWITCH

- STRONG DIE CASTING CASE
- LOW PRICE AND SAFETY LIMIT SWITCH
- ELEGANT APPEARANCE AND SOFT OPERATION

SIGNAL LIGHT

TLB series
TURN LIGHT

- TURN LIGHT (ABOUT 150 RPM)
- BUZZER (75 dB ~ 85 dB)

STL series
LED SIGN TOWER

- VARIOUS SIZES (Ø25, Ø40, Ø60, Ø80)
- 2 KINDS OF BUZZERS (75dB ~ 85dB)

SLB060
SIGNAL LIGHT

- BRILLIANT LIGHT AND LONG LIFE LED LAMP
- 2 KINDS OF BUZZERS (75dB ~ 85dB)

WME/WMS
WALL MOUNTED LIGHT

- ULTRA-SLIM WALL-MOUNT TYPE
- BEIGE AND CHROME METAL COLOR CASE
- 2 KINDS OF BUZZERS (75dB ~ 85dB)

GLOBAL NETWORK

● HEAD OFFICE & SUBSIDIARY ● DISTRIBUTOR (55 DISTRIBUTORS IN THE WORLD)

HEAD OFFICE
1381-3, JUAN-DONG, NAM-GU, INCHEON, KOREA
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ALITQAN FACTORY EQUIPMENT TRADING L.L.C

U.S.A
HANYOUNG U.S.A

VIETNAM
HAN MY VEIT AUTOMATION CO.,LTD.

contents

TEMPERATURE CONTROLLER

GRAPHIC RECORDER

Model	GR100
Appearance	
W ×H ×D (㎜)	14 ×145 ×181
Function	Multi-input, Horizontal/Vertical scroll, Text, Bar, History(Magnification/Scale-down)Reading mode, 6 or 12 channels, 6 or 12 contact output, 4 alarm for each channel, Various computing, RS232, RS422/485, USB, ETHERNET communication
MMI	5.6 inch color / Touch panel
Input	Sampling cycle : 1 sec / channel Accuracy : ± 0.1 % of F.S
	Permissible signal source resistance : Max. 250 Ω, V d.c : Max. 2KΩ Permissible wiring resistance : RTD: Below 10 Ω wire(But the resistance of the 3wires should be the same) RTD : Min. 10 ㏁, Thermocouple : V d.c : Min. 1㏁
Computing function	Computing, Function, Conversion : +, -, X, ÷, ABS( ), SQRT( ), SIN( ), COS( ), TAN(), LOG10( ), %R.H. Conversion, ℉ Conversion
Contact input	Contact Specification : 6 points Capacity : Max. 24 V d.c 10 ㎃ Contact operation : RECORD / STOP, ALARM
Contact output	Contact Specification : GR100-1X : 6 points, GR100-2X : 12 points Capacity : Normal Open (Max. 30 V d.c / 5 A, 250 V a.c / 5 A) Contact type : ALARM, BURNOUT, D/I
Communication	Protocol : GR100-x1 : MODBUS-RTU, GR100-x2 : MODBUS-RTU, MODBUS on TCP Type ; GR100-x1 : RS232C,RS422/485, USB V1.1, GR100-x2 : RS232C,RS422/485, USB V1.1, ETHERNET TCP/IP
Memory	Internal memory : SD-RAM(Volatile) : Max. 12 hours(interval 1 sec), FLASH(non-volatile): operation setting storage External memory : SD CARD(non-volatile) : Possible storage for 1 year when you use 1GB (interval 2 sec.) Recording contents : Measuring or computing value for each channel, Burn-out, D/I, Alarm, Relay out
Power supply	Power voltage / Frequency : 100 - 240 V a.c Voltage variable ratio : ±10 % / 50 - 60 Hz
Operation environment	Temperature : 0 ~ 50 ℃ Humidity : 20 ~ 80 % R.H. (5 ~ 40 ℃) No condensation
Storage environment	Temperature : -25 ~ 70 ℃ Humidity : 5 ~ 95 % R.H. No condensation

RECORDER/TEMPERATURE CONTROLLER

Model	RT9
Appearance	
W ×H ×D (㎜)	96 ×96 ×100
Function	• ZOOM • PID-Auto Tuning • Free scale • Multi Input/Output • Alarms • Recorder/Temp.controller • RS485
Power voltage	100 - 240 V a.c (±10 %), 50/60 Hz
Current consumption	Max. 6.0 W, Max. 10 VA
Sampling cycle	250 ms
Input	T.C: K, J, E, T, R, S, B, L, N, U, WRe 5 - 26, PL- II R.T.D: Pt 100 Ω, KPt 100 Ω Direct voltage: 1 - 5 V, 0 - 10 V, -10 - 20 mV, 0 - 100 mV(Free scale type)
Input display resolution	Below decimal point of input signal and measaring range
Input impedance	T.C and mV input: Min. 1 ㏁, d.c volt : 1 ㏁
Alarm	Relay output(AL1,AL2)
Source tolerable resistance	T.C : Max . 250 Ω , Voltage : Max . 2 ㏀
Lead wire tolerable resistance	R.T.D : Max . 10 Ω / Wire (Notice:Identical conductor resistance between 3wires)
Input tolerable voltage	±10 V (T.C, R.T.D, voltage :mV d.c), ±20 V (voltage:V d.c)
Noise removal rate	NMRR(Normal mode): Min. 40dB , CMRR(Common mode):Min. 120 dB (50/60 Hz ±1 %)
Standard	T.C / R.T.D (KS/IEC/DIN)
Standard junction temp . compensation tolerance	±1.5 ℃ (15 ~ 35 ℃), ±2.0 ℃(0 ~ 50 ℃)
Accuracy	±0.3 % (Full Scale)
Record	Measuring point : 1 point Response time : Variable by recording time Record method : Thermal line Printing : 203 dpi (8.0 dot/㎜) 384 dots/line Record speed : 24 ㎜/h ~ 900 ㎜/h Record paper : Width 57.5 ㎜ , Length 16 m Runout of paper : P-END lamp on,Record is stopped

HYBRID RECORDER

Model	NR100
Appearance	
W ×H ×D (㎜)	143 ×143 ×226.6
Function	6 channels multi input, zoom scale function, prescale function, 6 point relay output, 2 point event input, communication function (RS-485)
Power voltage	100 - 240 V a.c, 47 - 65 Hz (Voltage Fluctuation Rate ±10 %)
Power consumption	Max. 50 VA
Sampling Cycle	Below max. 500 ㎳ (Depend on the number of channel)
Input	Thermocouple (B, R, S, K, E, J, T), RTD (JPT100, PT100) d.c voltage input: ±100 mV, ±20 V DC current input: 0 - 24 ㎃ connected with external resistor 250 Ω
Input Display Resolution	Display up to 3rd decimal position
Alarm Output	6 points relay contact output
Input impedance	T.C and mV input : Min. 2 ㏁, d.c volt : 400 kΩ
Permissible Wiring Resistance	RTD: Below 10 Ω/1 wire (But the resistance of the 3 wires should be the same)
Applied Standard	Thermocouple / RTD (KS/IEC/DIN)
Accuracy	Indicator: 0.25 % (Full Scale), Record: 0.5 % (Full Scale)
Related to Record	Measuring point : 6 points Response time : depend on the record speed Record method : 6 dot dotting-method Record speed : 20 ~ 360 ㎜ Availability of Record paper : on the front panel window, the lamp of P-END' is ON and the record stops if there is no paper Record paper : width 100 ㎜, length : 7.8 m

TEMPERATURE & HUMIDITY CONTROLLER

Model	TH500(One body)		TH500(Separation type)
Appearance	CE 		CE  
W ×H ×D (㎜)	190 × 155 × 84		190 × 155 × 84
Program	Max. 100 pattern (Max. 6,000 segment)		
Screen	5.7 inch STN color LCD screen (Touch screen type)		
Function	Pattern repetition : Max. 999 times, Partial repetition : Max. 255 times / Pattern link and editing		
Power voltage	100 - 240 V a.c, 50 - 60 Hz (Voltage variation rate : ±10 %)		
Input	Pt 100 Ω or 4 - 20 ㎃ d.c (0 - 5 V d.c)		
Input cycle	500 ㎳		
Measuring accuracy	Temperature	Pt 100 Ω 4 - 20 ㎃ d.c (0 - 5 V d.c)	–100.0 ~ 200.0 ℃ (–100 ~ 200.0 ℃ ※Scale variable)
	Humidity	Pt 100 Ω 4 - 20 ㎃ d.c (0 - 5 V d.c)	0.0 ~ 100.0 ℃(0.0 ~ 100.0 % R.H) (0.0 ~ 100.0 % R.H. ※Scale variable)
Indicating accuracy	Temperature : ±0.1 % of F.S, Humidity : ±1 % of F.S		
Output	S.S.R output	Min. 24 V d.c (Minimum pulse width : 0.2ms)	
	Current output	4 - 20 ㎃ d.c	
Retransmission output	Temperature : 1 point, Humidity : 1 point (PV, SV, MV selection)		
	4 - 20 ㎃ Resistive Load Max. 600 Ω		
Contact input	DI : 8 points		
ON/OFF output	Max. 20 points (Relay : 12 points, Open collector : 8 points)		
Contact output type	Inner signal : 8 points, Alarm signal : 4 points each channel, Run/Stop signal : 1 point, 1st Ref. signal : 1 point, 2nd Ref. signal : 1 point		
	Temp. / Humi. Up/Down, Soak signal : 6 points, Temp./Humi. Control signal : 2 points, Time signal : 8 points / 1 segment		
	Error signal : 1 point, Sensor disconnection signal : 1 point, Wait signal : 1 point, Hold signal : 1 point, PT End signal : 1 point		
Communication output	RS485-Max. communication distance 1.2 ㎞, Max. 32 connections available, Communication speed : Max. 115,200 bps		
	RS 232 C, USB V 1.1		
Storage / Capacity	Internal FLASH memory, Temp./Humi. Each 86,400 points		
Storage function	Program information & Setting value back-up and recovery, Temp. / humi. Setting, Indicating value storage		
Ambient Temp. / Humidity	0 ~ 50 ℃, 10 ~ 90 % R.H.(No condensation)		

TEMPERATURE CONTROLLER

2 CHANNELS PROGRAMMABLE TEMPERATURE CONTROLLER

Model		TD500		
Appearance				
W × H × D (㎜)		190 × 155 × 84		
Power supply		100 - 240 V a.c (±10 %), 50 - 60 Hz Max. 16 W		
Screen	LCD	5.7 inch color / Touch panel type		
Program	Pattern / Segment	100 patterns / 2400 segments, Pattern repetition : Max. 999 times, Partial repetition : Max. 255		
Input	Measuring range	Sensor type	Accuracy	Measuring range
		Pt.100	±0.1 % of F.S	- 200.0 ~ 640.0 ℃
		T.C	±0.1 % of F.S	- 200.0 ~ 1700.0 ℃
	Sampling	V d.c	±0.1 % of F.S	0.0 ~ 10.0 V (Range setting)
	cycle	500 ㎳		
Output	Control output	2 points for each channel (Heating / Cooling)		
	Specification	Voltage pulse (SSR) : 24 V d.c. minimum pulse width 10 ㎳ Current (SCR) : 4 - 20 ㎃ d.c(Below 600 Ω) Relay output : N/O 250 V a.c 5 A/ 30 V d.c 5 A, N/C : 250 V a.c 2 A/ 30 V d.c, TR output (O/C) : Max. 24 V 100 ㎃ Sink		
Communication	Protocol	PC - Link(Check Sum), Modbus - ASC II		
	Communication Type	RS232C : 2400 ~ 115200 bps Max. 10 m, RS422/485 : 2400 ~ 115,200 bps, Max.1.5 ㎞ 256 Mode		

TEMPERATURE CONTROLLER (Programmable Temperature controller)

Model	NP200	NP100
Appearance		
W × H × D (㎜)	96 × 96 × 100	96 × 96 × 100
Function	• Retransmission output • Input correction • Auto/Manual output • Heating/Cooling Control • Constant-value control • 5 Inner signals • Zone PID • 5 Time signals	• 2 Alarm output (Relay) • 2 Time signals (Transistor)
Power voltage	100 - 240 V a.c (50/60 Hz)	
Power consumption	Max. 10 VA (except communication)	
Input	Multi input (T.C: 13 kinds, R.T.D: 2 kinds, Voltage: 5 kinds)	
Control output	Universal-output: Relay, SSR, Current	
Control action	P.I.D or ON/OFF	
Alarm	4 Alarm output	2 Alarm output
Communication	RS 485/422 (Optional)	
Setting	By Up/Down key on the front	
Display	PV : Digital LED, SV : LCD Back light	PV/ SV : Digital LED
Setting and display accuracy	0.1 % of F.S (Full Scale)	
Setting resolution	1 or 0.1 % (According to input range)	
Memory protection	Semipermanent	
External control	4 Alarm output (Run, Reset, Step, Hold)	3 Alarm output (Run, Reset, Hold)
Number of pattern	30	2
Number of segment	300	20
Number of pattern contact	30	
Operation	1 ~ 99 times or limitless	
Program inclination	Hour, Minute	
Sampling cycle	250 ㎳	
Insulation resistance	500 V a.c 20 ㏁ min.	
Dielectric strength	2300 V a.c 50/60 Hz for 1 minute (Between primary and secondary terminal & between primary and ground)	
Ambient temperature & humidity	0 ~ 50 ℃(Between primary and ground), 35 ~ 85 % R.H.	

TEMPERATURE CONTROLLER (Programmable Temperature controller)

Model	PX 9	PX 7	PX 2	PX 3
Appearance				
W ×H ×D (㎜)	96 ×96 ×100	72 ×72 ×100	48 ×96 ×100	96 ×48 ×100
Function	• Fuzzy • Zone PID • Group PID • Auto tuning • 3 Alarm outputs • Universal-input/output • External contact input • Ramp & Soak • Output limitation • Heating/Cooling control • Interface (RS 485/422) • Protection:IP 65 (Front) • Input filter: OFF, 1~120 sec. • Retransmission output (PV, SV, MV) • Heating/Cooling hysteresis			
Input	Thermocouple: K, J, E, T, R, S, B, L, N, U, WRe 5-26, PL- ‖ R.T.D: Pt 100 Ω, KPt 100 Ω Direct voltage: 1 - 5 V, 0 - 10 V, -10 ~ 20mV, 0 ~ 100 mV(Free scale type)			
Sampling cycle	250 ㎳, (Remote option: 500 ㎳)			
Input display resolution	Below decimal point of Input signal and Measuring range			
Input impedance	T.C and mV input: Min, 1 ㏁ d.c V: 1 ㏁			
Source tolerable resistance	Thermocouple: Max. 250 Ω, Voltage: Max. 2 kΩ			
Lead wire tolerable resistance	R.T.D: Max. 10 Ω/wire (notice: Identical conductor resistance between 3 wires)			
Input tolerable voltage	±10 V (T.C, R.T.D, Voltage: mV d.c), ±20 V (Voltage: V d.c)			
Noise removal rate	NMRR (Normal mode): 40dB min. CMRR(Common mode): 120 dB min.(50/60 Hz ±1 %)			
Standard	T.C, R.T.D: KS, IEC, DIN			
Scaling	According to setting max. value(SH), min. value(SL) of measuring range, scaling is available (-1999 ~ 9999)			
Standard junction temp. compensation tolerance	±1.5 ℃(15 ~ 35 ℃), ±2.0 ℃(0 ~ 50 ℃)			
Burn-out	T.C: OFF, Up/Down selectable R.T.D: OFF, UP selectable (Detection current: 50 ㎂)			
Accuracy	±0.1 % (Full scale)			
Power supply for sensor	24 V d.c (Internal resistance: 1.2 kΩ) Max. 50 ㎃ 15 V d.c (Internal resistance: 600 Ω)			

TEMPERATURE CONTROLLER (P.I.D Auto-tuning)

Model	NX9	NX7	NX2	NX3	NX4	NX1
Appearance						
W ×H ×D (㎜)	96 ×96 ×100	72 ×72 ×100	48 ×96 ×100	96 ×48 ×100	48 ×48 ×100	48 ×24 ×100
Function	• Fuzzy • Zone PID • Group PID • Auto tuning • 2 Alarm outputs • Universal-input/output • External contact input • Output limitation • Heating/Cooling control • Heater Break Alarm (HBA1) • Interface (RS 485/422) • Protection :IP 65 (Front) • Input filter : OFF, 1~120 sec. • Retransmission output (PV, SV, MV) • Heating/Cooling hysteresis					
Input	Thermocouple: K, J, E, T, R, S, B, L, N, U, WRe 5 - 26, PL- ‖ R.T.D: Pt 100 Ω, KPt 100 Ω Direct voltage: 1 - 5 V, 0 - 10 V, -10 - 20 mV, 0 - 100 mV (Free scale type)					
Sampling cycle	250 ㎳					
Input display resolution	Below decimal point of Input signal and Measuring range					
Input impedance	T.C and mV input : Min, 1 ㏁d.c V : 1 ㏁					
Source tolerable resistance	Thermocouple: Max. 250 Ω, Voltage: Max. 2 kΩ					
Lead wire tolerable resistance	R.T.D: Max. 150 Ω /wire (notice: Identical conductor resistance between 3 wires)					
Input tolerable voltage	±10 V (T.C, R.T.D, Voltage: mV d.c), ±20 V (Voltage: V d.c)					
Noise removal rate	NMRR (Normal mode): 40 dB min. CMRR(Common mode): 120 dB min.(50/60 Hz ±1 %)					
Standard	T.C, R.T.D: KS, IEC, DIN					
Standard junction temp. compensation tolerance	±1.5 ℃(15 ~ 35 ℃), ±2.0 ℃(0 ~ 50 ℃)					
Burn-out	T.C: OFF, Up/Down selectable R.T.D: OFF, UP selectable (Detection current: 50 nA)					
Accuracy	±0.5 % (Full scale)					
Power supply for sensor	12 V d.c (Internal resistance: 600 Ω) Max. 50 ㎃ 15 V d.c (Internal resistance: 600 Ω)					

TEMPERATURE CONTROLLER

Model	UX100
Appearance	
W×H×D (㎜)	48×24×100
Function	• Fuzzy • Input correction • Interface (RS 485) • Heating/Cooling control • Output limitation • Auto tuning • ARW • Input filter: OFF, 1 ~ 120sec. • Universal-input • Heating/Cooling hysteresis • Alarm output
Input	Thermocouple: K, J, E, T, R, S, B, L, N, U, WRe 5-26, PL-Ⅱ R.T.D: Pt 100 Ω , KPt 100 Ω Direct voltage: 1 - 5 V, -10 ~ 20 mV, 0 ~ 100 mV (Free scale type)
Sampling cycle	250 ㎳
Input display resolution	Below decimal point of Input signal and Measuring range
Input impedance	T.C and mV input: Min, 1 ㏁ d.c V: 1 ㏁
Source tolerable resistance	Thermocouple: Max. 250 Ω , Voltage: Max. 2 ㏀
Lead wire tolerable resistance	R.T.D: Max. 150 Ω/wire
Input tolerable voltage	±10 V (T.C, R.T.D, Voltage: mV d.c), ±20 V (Voltage: V d.c)
Noise removal rate	NMRR (Normal mode): Min. 40 dB CMRR(Common mode): Min. 120 dB (50/60 Hz ±1 %)
Standard	T.C, R.T.D: KS, IEC, DIN
Scaling	According to setting Max. value(SH), Min. value(SL) of measuring range, scaling is available (-1999 ~ 9999)
Standard junction temp. compensation tolerance	±1.5 ℃(15 ~ 35 ℃), ±2.0 ℃(0 ~ 50 ℃)
Burn-out	T.C: Up/Down scale selectable R.T.D: Up scale selectable (Detection current: 50 ㎂)
Accuracy	±0.5 % (Full scale)

TEMPERATURE CONTROLLER (P.I.D Auto-tuning)

Model		MX9-F	MX7-F	MX2-F	MX3-F	MX4-F
Appearance						
W×H×D (㎜)		96×96×100	72×72×100	48×96×100	96×48×100	48×48×100
Function		• Auto tuning • Multi input. 11 kinds of input • Ramp		• Direct/Reverse action • PV/SV Retransmission		• Input correction • Manual output
Power voltage		100 - 240 V a.c (50/60 ㎐)				
Power consumption		Max.15 VA				Max. 12 VA
Input		Multi Input, Thermocouple(K,J,R), R.T.D.(DIN/JJS Pt100Ω),mV & mA				
Control output		Current output : 4 - 20 mA d.c (Load resistance Max.600 Ω Relay contact output : 250 V a.c 3 A (Resistive load) , SSR driving : 12 V d.c (Constant voltage pulse) [Load resistance : Min. 800 Ω]				
Control action		P.I.D(Auto-tuning function), ON/OFF, P . PI . PD				
Alarm output		Relay contact output : 250 V a.c 3 A (Resistive lood)				
Heater/ Loop Break Alarm		LBA,HBA [Relay contact output : 250 V a.c 3A (Resistive Load)]				
Setting		By Up/Down key on the front				
Display		L.E.D Display (PV: Green, SV:Red)				
		PV : 14 ㎜, SV : 10.5 ㎜	PV : 11 ㎜, SV : 8 ㎜	PV : 10 ㎜ SV : 8 ㎜	PV : 14 ㎜ SV : 8 ㎜	PV : 8 ㎜, SV : 8 ㎜
Setting and display accuracy		· T/C : Within ±(0.3 % of SV ±1 digit) or ±2 ℃(Whichever is larger) · R.S : ±4 ℃ + 1 digit · R.T.D : Within ±(0.3 % of SV ±1 digit) or ±0.8 ℃ (Whichever is larger)				
Memory protection		Semipermanent				
Sampling cycle		500 ㎳				
Dielectric strength		2,000 V a.c 50/60 ㎐ for 1 minte				
Vibration	Malfunction	2 - 55 ㎐ X · Y · Z each positions for 10 minutes				
	Durability	10 - 55 ㎐ 0.76 ㎜ X · Y · Z each positions for 2 hours				
shock	Malfunction	100 ㎨ 6 position, Each 3 times				
	Durability	300 ㎨ 6 position, Each 3 times				
Life	Mechanical	Min. 10 million times (Relay type)				
	Electrical	Min. 0.3 million times (Relay type)				
Ambient temperature and humidity		0 ~ 50 ℃(32 ~ 122 ℉) · 35 ~ 85 %R.H. (Without condensation)				

HEATING/COOLING TEMPERATURE CONTROLLER (P.I.D Auto-tuning)

Model		MX9-V	MX2-V
Appearance			
W ×H ×D (㎜)		96 ×96 ×100	48 ×96 ×100
Function		Multi input, Heating/Cooling PID control, HBA(Heater Break Alarm), Remote function, Manual output function, Remote/Local input selectable ℃/ ℉, Reverse/Direct action selectable.Ramp	
Power voltage		100 - 240 V a.c (50/60 ㎐)	
Power consumption		Max. 15VA	
Input		Multi Input, (Thermocouple : K/J/T/E/R/S/B, RTD : KS Pt100 Ω / DIN Pt 100 Ω, Voltage/Current)	
Control output		Relay contact : 250 V a.c 5 A (Resistive load), SSR: 12 V d.c (constant voltage pulse) [Load resistance Min. 800Ω], Current: 4 - 20mA d.c (Load resistance Max 600 Ω)	
Control action		PID (Auto-tuning function) or ON/ OFF	
Alarm output		Relay contact output : 250 V a.c 3 A (AL-2), 3 A(AL-1) Resistive load	
Heater/Loop Break Alarm		LBA, HBA [Relay contact output : 250 V a.c 3 A (Resistive load)]	
Setting		By Up/Down key on the front	
Display		L.E.D Display	
Setting and display accuracy		· T/C : Within ±(0.3 % of SV ±1 digit) or ±2℃(Whichever is larger) · R.S : ±4 ℃ + 1 digit · R.T.D : Within ±(0.3 % of SV ±1 digit) or ±0.8 ℃ (Whichever is larger)	
Protection Memory		Semipermanent	
Sampling cycle		500 ㎳	
Heating cycle		1 ~ 100 sec	
Cooling cycle		1 ~ 100 sec	
Cooling gain		Display of 10 times to proportional band	
Cooling deadband		-20.0 ~ 20.0 ℃(℉)	
Input correction range		SLU ~ SLF	
Insulation resistance		Min 20 ㏁ (500 V d.c Mega)	
Dielectric strength		2000 V a.c 50/60 ㎐ for 1 minute (Between terminal and earth)	
Vibration	Malfunction	2 - 55 ㎐, X, Y, Z each position for 10 minute	
	Durability	10 - 55 ㎐, 0.76 ㎜, X, Y, Z each position for 2 hours	
shock	Malfunction	100 ㎨ 6 positions each 3 times	
	Durability	300 ㎨ 6 positions each 3 times	
Life	Mechanical	Min 10 millions times (Relay type)	
	Electrical	Min 0.3 million times (Relay type)	
Ambient temperature and humidity		0 ~ 50 ℃(32 ~ 122 ℉) · 35 ~ 85 % R.H. (Without condensation)	

TEMPERATURE CONTROLLER (P.I.D Auto-tuning)

Model		KX9N	KX7N	KX4N	KX3N	KX2N
Appearance						
W ×H ×D (㎜)		96(W) ×96(H) ×100(D)	72(W) ×72(H) ×100(D)	48(W) ×48(H) ×100(D)	96(W) ×48(H) ×100(D)	48(W) ×96(H) ×100(D)
Function		· Built-in PID auto tuning function · Direct/Reverse operation selection function · Alarm (ALH, ALL, LBA) · Upper/Lower limit setting limitation function		· Setting data lock function · Input compensation function · Decimal point display function		
Power Voltage		100 - 240 V a.c, 50 - 60 Hz (voltage fluctuation rate: ±10 %)				
Power Consumption		Below approx. 11 VA				
Input		· Thermocouple: K, J, E,T, R, B, S, L, N, U, W · RTD: D(Kpt), P(Dpt) · d.c Voltage Current input: 1 ~ 5 V d.c, 0 ~ 10 V d.c				
Control Output		· Relay: 250 V a.c 3 A (resistive load) · SSR: 12V d.c pulse voltage(above resistive load 800 Ω) · Current Output: 4 - 20 mA d.c (Below Resistive load 600 Ω)				
Adjusting Operation		· PID operation · ON/OFF operation				
Alarm Output		Relay output: ALH, ALL (250 V a.c 3 A)				
Loop Break Alarm		Relay output: LBA (250 V a.c 3 A)				
Setting Method		Digital Setting by Up/Down Keys				
Indicator Method		Digital display (PV: red, SV: red)				
Accuracy		±0.5 % of F.S (But thermocouple Btype 0 ~ 400 ℃ out of guarantee range)				
Power failure back up		Semipermanent				
Dielectric Strength		2000 V a.c, 50/60 ㎐ for 1 minute (between the terminals of the two-polar current carry part)				
Vibration	Malfunction	2 - 55 ㎐ each X · Y · Z direction for 10 minutes				
	Durability	10 - 55 ㎐, 0. 76 ㎜, each X · Y · Z direction for 2 hours				
Shock	Malfunction	100 ㎨ 3 times at each 6 direction (approx. 10 G)				
	Durability	300 ㎨ 3 times at each 6 direction (approx. 30 G)				
Life	Mechanical	Above 10 million times (Relay type)				
	Electrical	Above 300 thousand times (Relay type)				
Operating Ambient Temperature/Humidity		0 ~ 50 ℃ / 35 ~ 85 %R.H. (without condensation)				

TEMPERATURE CONTROLLER

TEMPERATURE CONTROLLER (P.I.D Auto-tuning)

Model		DX9	DX7	DX2	DX3	DX4
Appearance						
W×H×D (㎜)		96×96×100	72×72×100	48×96×100	96×48×100	48×48×100
Power supply		100 - 240 V a.c (± 10 %), 50 - 60 Hz				
Power consumption		Max. 12 VA				
Input	Type	Refer to "input type chart"				
	Cycle	250 ms				
	Accuracy	± 0.5 % of F.S (DCV Input : ±1 % of F.S)				
	Tolerable voltage	20 V d.c for 1 minute				
	Standard junction temp. compensation tolerance	±3.5 ℃ (Within 0 ~ 50 ℃)				
	Input disconnection	Up Scale				
Output	Relay output	NO : 5 A 250 V a.c, 5 A 30 V d.c (Resistive load), NC : 3 A 250 V a.c, 1 A 30 V d.c (Resistive load), Switching Life : 1,000,000 times (No-load)				
	Voltage output	ON voltage : 12 V d.c Min, OFF voltage : 0.1 V d.c Max, Resistive load 600 Ω Min.				
	Current output	Range : 3.2 - 20.8 mA, Accuracy : ± 0.2 mA, Resistive load 600 Ω Max.				
Transmission output		Range : 3.2 - 20.8 mA, Accuracy : ± 0.2 mA, Resistive load 600 Ω Max.				
Alarm		5 A 250 V a.c, 5 A 30 V d.c (Resistive load), Switching Life : 1,000,000 times (No-load)				
Control	Type	ON/OFF, PID control				
	Operation	Reverse, Direct				
	Over-integral protection	Auto(A=0), 0.1 ~ 100.0 %				
Insulation resistance		More than 20 ㏁ between 1st terminal and 2nd terminal				
Dielectric strength		2,300 V a.c, for 1 minute between 1st terminal and 2nd terminal				
Operating environment	Temp. & Humidity	0 ~ 50 ℃, 35 ~ 85 %RH (No condensation)				
	Environment	Refer to "safety information"				

TEMPERATURE CONTROLLER

Model	HY-8000S	HY-8200S (Alarm output)	HY-72D	HY-48D
Appearance				
W×H×D (㎜)	96×96×125	96×96×125	72×72×110	48×48×100
Power voltage	110 / 220 V a.c (50 / 60 Hz)			
Power consumption	3 VA			
Input	Thermocouple (K,J), R.T.D (DIN/JIS pt 100 Ω) Voltage/Current			
Control output	Relay contact : 250 V a.c 3 A (Resistive road), SSR: 12 V d.c (Constant voltage pulse) [Load resistance Min. 800 Ω], Current: 4 - 20 mA d.c [Load resistance Min. 600 Ω]			
Control action	Proportional or ON/OFF control			
Alarm output	—	Relay contact : 250 V a.c 3 A	—	
Setting	By B.C.D S/W			
Permissible input resistance	Thermocouple : Max.250 Ω, R.T.D : Max. 10 Ω			
Indication range	Setting temperature range			
Display	L.E.D Display			
Setting and display accuracy	Set Value : ±1.0 % of F.S, Display : ±0.5 % of F.S			
Control sensitivity	Approx 0.2 % F.S (Fixed)			
Proportional cycle	Relay contact : 25 ~ 30 sec SSR : 2 ~ 4 sec			
Reset range	Max. ±1.5 % of Range			
Dielectric strength	2,000 V a.c 50/60 ㎐ for 1 minute (Between + and - charging terminals)			
Vibration — Malfunction	2 - 55 ㎐, X · Y · Z each position for 10 minutes			
Vibration — Durability	10 - 55 ㎐, 0.76 ㎜, X · Y · Z each positions for 2 hours			
Shock — Malfunction	100 ㎨ 6 positions, each 3 times			
Shock — Durability	300 ㎨ 6 positions, each 3 times			
Life — Mechanical	Min.10 million times (Relay type)			
Life — Electrical	Min. 0.3 million times (Relay type)			
Ambient temperature and humidity	0 ~ 50 ℃(32 ~122 ℉) · 35 ~ 85 %R.H. (Without freeze)			

TEMPERATURE CONTROLLER

Model		KF9	KF9 (built-in alarm)	KF7	KF7 (built-in alarm)
Appearance					
W ×H ×D (㎜)		96 ×96 ×100	96 ×96 ×100	72 ×72 ×100	72 ×72 ×100
Power Voltage		100 - 240 V a.c 50 - 60 ㎐ (voltage fluctuation rate: ±10 %)			
Power Consumption		Approx. 3 VA			
Input		Thermocouple, RTD, voltage/current			
Control Output		Relay: 250 V a.c 3 A (resistive load), SSR: 12 V d.c Voltage Pulse(load resistor: Above 800 Ω), Current: 4 - 20 ㎃ d.c(Road resistor: Below 600 Ω)			
Control Method		Proportional Control or ON/OFF			
Alarm Output		—	Relay : 250 V a.c 3 A	—	Relay: 250 V a.c 3 A
Setting Method		Setting by the digital switch			
Permissible Input Resistor		Thermocouple: Below 100 Ω, R.T.D: Below 10 Ω /each wire			
Indicated Range		Setting temperature range			
Indicated Method		Digital indicator			
Setting and indicator accuracy		Below ±0.5 % of F.S, Below ±1.0 % of setting range			
Hysteresis		1 ~ 20 ℃ (ON/OFF control, proportional band control volum)			
Proportional Cycle		Relay : 25 ~ 30 sec, SSR : 2 ~ 4 sec			
Reset Range		Above ±1.5 % of Max. range (variable)			
Dielectric Strength		2000 V a.c 50/60 ㎐, for 1 minute (between the terminals of the two-polar current carry part)			
Vibration	Malfunction	2 - 55 ㎐ each X · Y · Z direction for 10 minutes			
	Durability	10 - 55 ㎐, 0.76 ㎜, each X · Y · Z direction for 2 hours			
Shock	Malfunction	100 ㎨ 3 times at each 6 direction (approx. 10G)			
	Durability	300 ㎨ 3 times at each 6 direction (approx. 30G)			
Life	Mechanical	Above 10 million times (Relay type)			
	Electrical	Above 300 thousand times (Relay type)			
Operating Ambient Temperature/Humidity		0 ~ 50 ℃ / 35 ~ 85 % R.H. (without condensation)			

TEMPERATURE CONTROLLER

Model		KF2	KF2 (built-in alarm)	KF4
Appearance				
W × H × D(㎜)		48 ×96 ×100	48 ×96 ×100	48 ×48 ×100
Power Voltage		100 - 240 V a.c 50 - 60 ㎐ (voltage fluctuation rate : ±10 %)		
Power Consumption		Approx. 3 VA		
Input		Thermocouple, RTD, voltage/current		
Control Output		Relay : 250 V a.c 3 A (Resistive load), SSR : 12 V d.c Voltage Pulse (load resistor : Above 800 Ω), Current : 4 - 20 ㎃ d.c (load resistor : Below 600 Ω)		
Control Method		Proportional Control or ON/OFF		
Alarm Output		—	Relay : 250 V a.c 3 A	—
Setting Method		Setting by the digital switch		
Permissible Input Resistor		Thermocouple: Below 100 Ω, RTD : Below 10 Ω / each wire		
Indicated Range		Setting temperature range		
Indicated Method		Digital indicator		
Setting and indicator accuracy		Below ±0.5 % of F.S, Below ±1.0 % of setting range		
Hysteresis		1 ~ 20 ℃ (ON/OFF control, proportional band control volum)		
Proportional Cycle		Relay : 25 ~ 30 sec, SSR : 2 ~ 4 sec		
Reset Range		Above ±1.5 % of max range (variable)		
Dielectric Strength		2000 V a.c, 50/60 ㎐, for 1 minute (between the terminals of the two-polar current carry part)		
Vibration	Malfunction	2 - 55 ㎐ each X · Y · Z direction for 10 minutes		
	Durability	10 - 55 ㎐, 0. 76 ㎜, each X · Y · Z direction for 2 hours		
Shock	Malfunction	100 ㎨ 3 times at each 6 direction (approx. 10G)		
	Durability	300 ㎨ 3 times at each 6 direction (approx. 30G)		
Life	Mechanical	Above 10 million times (Relay type)		
	Electrical	Above 300 thousand times (Relay type)		
Operating Ambient Temperature/Humidity		0 ℃ ~50 ℃ / 35 ~ 8 5% R.H. (without condensation)		

TEMPERATURE CONTROLLER

Model		DF2 DF2	(SUB)	DF4
Appearance				
W ×H ×D (㎜)		48 ×96 ×100	48 ×96 ×100	48 ×48 ×100
Power voltage		110 / 220 V a.c (50/60 Hz)		
Power consumption		3 VA	4 VA	3 VA
Input		Thermocouple (k.J) R.T.D (DIN/JIS Pt 100 Ω). Voltage/Current		
Control output		Relay contact : 250 V a.c 3 A(Resistive load), SSR : 12 V d.c (constant voltage pulse)(load resistance Min. 800 Ω), Current: 4 - 20 mA d.c (load resistance Max. 600 Ω)		
Control action		Proportional or ON/OFF control		
Alarm		—	Relay contact : 250 V a.c 3 A	—
Setting		By B.C.D S/W		
Permissible input resistance		Thermocouple : Max. 250 Ω, R.T.D : Max. 10 Ω		
Display range		Setting value		
Display		Digital indicator		
Setting and display accuracy		Display ±0.5 % of F.s Range, Max. Set value ±1.0 % of F.S		
Hysteresis		0.2 % F.S (fixing), ON/OFF control.		
Proportional cycle		Relay contact : 25 ~ 30 sec SSR : 2 ~ 4 sec		
Reset range		±1.5 % of Max. Range		
Dielectric strength		2,000 V a.c 50/60 ㎐ for 1 minute (Between + and - charging terminals)		
Vibration	Malfunction	2 - 55 ㎐, X, Y, Z each position for 10 minutes		
	Durability	10 - 55 ㎐, 0.76 ㎜, X, Y, Z each position for 2 hours		
shock	Malfunction	100 ㎨ 6 positions, Each 3 times		
	Durability	300 ㎨ 6 positions, Each 3 times		
Life	Mechanical	More than 10 million times		
	Electrical	More than 0.3 million times		
Ambient temperature and humidity		0 ~ 50 ℃(32 ~ 122 ℉) · 35 ~ 85 % R.H. (Without condensation)		

MULTI CHANNEL TEMPERATURE CONTROLLER (8CH / 4CH)

Model	MC9
Appearance	CE 
W ×H ×D (㎜)	96 ×96 ×100
Function	• Multi channels PID control device • Various alarm functions (15 types) • multi memory function (max 8 x 8 units) • 8/4 channels control device • DI contact input function • Heating/cooling function (4 channels are possible only)
Power Voltage	110 - 220 V a.c (50 - 60 ㎐)
Power consumption	100 V a.c (below 14 VA)/ 240V a.c (below 20 VA)
Input	4 or 8 channels (Sampling Time: 1s) Type (TC, RTD, d.c V) / Input impedance (Approx. 1 ㏁)
Output	Type (Relay Output, Voltage Pulse Output, Triac Output, 4 - 20 ㎃ Output, 0 - 20 ㎃ Output)
Alarm	1a Contact Type/ 250 V a.c, 1 A (for resistive load) /Life time: above 300,000 times ON/OFF
Communication	EIA RS485 / RS232C, Max. connecting units: 31 units (for RS485, Address can be set from 1 to 99) Communication method: 4-wire half duplex/ 2-wire half duplex,Communication Protocol: PC-LINK
Contact input	From Below 2 ㏀, ON, From Above 15 ㏀, OFF
Operating Environment	Temperature: 0 ~ 50 ℃ (32 ~ 122 ℉), Humidity: 45 ~ 85 % R.H. (but, without condensation) Magnetic field: Below 400 AT/m Without poisonous gas and without full of dust

TEMPERATURE CONTROLLER FOR FREEZER CONTROL

Model	BR6	ED6
Appearance		
W×H×D (㎜)	77×35×77	77×35×77
Power Voltage	10 - 24 V a.c / d.c,110/ 220 V a.c, 50/60 ㎐ (±10 %)	10 - 24 V a.c / d.c,110/220 V a.c, 50/60 ㎐ (±10 %)
Power Consumption	Max. 5 VA	Max. 5 VA
Input Sensor	Diode, NTC	Pt100Ω, CA, 4 - 20 ㎃ d.c, 1 - 5 V d.c
Display accuracy	Max. range: 1% +1Digit	Max. range: 1 % +1 Digit
Control output (Relay contact)	Main output : 250 V a.c 5 A(Resistive load) Auxiliary output : 250 V a.c 5 A(Resistive load)	Main output : 250 V a.c 5 A(Resistive load) Auxiliary output : 250 V a.c 5 A(Resistive load)
Control mode	ON / OFF, Proportion	ON / OFF or Proportional
Setting method	Digital method by up and Down key	Digital method by up and Down key
Other function	Defrosting Timer, Alarm function, Heating / cooling control	Defrosting Timer, Alarm function, Heating / cooling control
Ambient temperature	0 ~ 50 ℃	0 - 50 ℃
Ambient humidity	Max. 85 % R.H.	Max. 85 % R.H.

ANALOG TEMPERATURE CONTROLLER

Model		HY-4500	HY-4700	HY-5000
Appearance				
W×H×D (㎜)		96×96×125	96×96×125	72×72×110
Power voltage		100 / 220 V a.c (50/60 ㎐)		
Power Consumption		3 VA	5 VA	5 VA
Input		T.C , R.T.D , Voltage/current		
Control output		Relay contact : 250 V a.c 3 A (Resistive load), SSR: 12 V d.c (Constant voltage pulse) (Load resistance Min. 800 Ω), current output: 4 - 20 mA d.c (Load resistance Min. 600 Ω)		
Control action		Proportional or ON/OFF contact		
Alarm output		Relay contact: 250 V a.c 3 A(Resistive load)		
Control sensitivity		±0.2 % of F.S		
Permissible input resistance		Thermocouple : Max. 100 Ω , R.T.D: Max. 10 Ω/wire		
Setting		Analog setting		
Display		Analog indication		
Setting and display accuracy		The same as SV, ±2.0 % of F.S		
Alarm setting range		—	Within 1~10% of Max. range for operation point of SV	—
Proportional cycle		Relay contact : 25 ~ 30 sec , SSR : 2 ~ 4sec		
Reset range		±1.5 % of F.S		
Dielectric strength		2,000 V a.c for 1 minute		
Vibration	Malfunction	2 - 55 ㎐, X · Y · Z, each position for 10 minutes		
	Durability	10 - 55 ㎐, 0.76 ㎜, X · Y · Z, each position for 2 hours		
Shock	Malfunction	100 ㎨ 6 positions, Each 3 times		
	Durability	300 ㎨ 6 positions, Each 3 times		
Life	Mechanical	More than 10 million times		
	Electrical	More than 0.3 million times		
Ambient temperature and humidity		0 ~ 50 ℃(32~122 ℉) · 35 ~ 85 %R.H. (Without condensation)		

TEMPERATURE CONTROLLER

ANALOG TEMPERATURE CONTROLLER

Model		HY-2000	HY-1000	ND4	ND4 (for socket)
Appearance					
W ×H ×D (㎜)		96×96×104	72×72×110	48×48×80	48×48×78
Power voltage		110/220 V a.c (50/60 ㎐)			
Power consumption		2 VA			
Input		Thermocouple, R.T.D (DIN, JIS Pt100 Ω)			
Control Output		Relay contact : 250 V a.c (Resistive load)			
Control action		Proportional or ON/OFF control			
Permissible input resistance		Thermocouple : Max. 100 Ω, R.T.D: Max. 10 Ω / wire			
Setting		Analog setting			
Setting and display accuracy		±1.0 % of F.S			
Proportional band		1 ~ 10 % of F.S (HY-4500) (Model HY-4700, HY-5000 fixing to 3% of F.S)			
Proportional cycle		Relay contact : 25 ~ 30 sec.			
Dielectric strength		2,000 V a.c 50/60 ㎐ per 1 minute (Between + and - charging terminals)			
Vibration	Malfunction	2 - 55 ㎐, X · Y · Z each position for 10 minutes			
	Durability	10 - 55 ㎐, 0.76 ㎜, X · Y · Z each position for 2 hours			
Shock	Malfunction	100 ㎨ 6 positions, each 3 times (Approx. 10 G)			
	Durability	300 ㎨ 6 positions, each 3 times (Approx.30 G)			
Life	Mechanical	Min. 10 million times (Relay type)			
	Electrical	Min. 0.3 million times (Relay type)			
Ambient temperature and humidity		0 ~ 50 ℃(32 ~ 122 ℉) · 35 ~ 85 % R.H. (without condensation)			

ANALOG TEMPERATURE CONTROLLER

Model		HY-3000	AF1	AF1 (Built-in alarm output)
Appearance				
W ×H ×D (㎜)		96×96×104	48×96×100	48×96×100
Power voltage		110/220 V a.c (50/60 ㎐)		
power consumption		3 VA		
Input		Temperature, R.T.D		
Control output		Relay contact : 250 V a.c 5 A (Resistive load), SSR : 12 V d.c (Constant voltage pulse) (Load resistance more than 800 Ω)		
Control action		Proportional or ON/OFF control		
Alarm output				Relay contact : 250 V a.c 5 A
Alarm setting				Variation setting for SV
Setting		Analog setting	by B.C.D switch	
Permissible input resistance		Thermocouple : Max. 100 Ω, R.T.D: Max. 10 Ω/wire		
Display range		Setting value		
Display		Analog		
Setting and display accurary		Setting temperature: within ±2 % of F.S, Display accuracy : Within ±2.5 % of F.S		
Proportional band		3 % of F.S (Fixing)		
Proportional cycle		Relay contact : 25 ~ 30 sec SSR : 2 ~ 4 sec		
Reset range		±1.5 % of F.S (Between + and - charging terminals)		
Dielectric strength		2,000 V a.c 50/60 ㎐ for 1 minute		
Vibration	Malfunction	2 - 55 ㎐, X . Y . Z each position for 10 minutes		
	Durability	10 - 55 ㎐, 0.76 ㎜, X · Y · Z each position for 2 hours		
Shock	Malfunction	100 ㎨ 6 positions, each 3 times		
	Durability	300 ㎨ 6 positions, each 3 times		
Life	Mechanical	Max. 10 million times (Relay type)		
	Electrical	Max. 0.3 million times (Relay type)		
Ambient temperature and humidity		0 ~ 50 ℃ (32~122 ℉) · 35 ~ 85 %R.H. (without condensation)		

5 CHANNELS TEMPERATURE INDICATOR

Model	TP3
Appearance	
W ×H ×D (㎜)	96 ×48 ×100
Power supply	100 - 240 V a.c(±10 %), 50 - 60 ㎐
Power consumption	Max. 5 VA
Input	Thermocouple : K, J, R
	RTD : DIN Pt 100 Ω
Display accuracy	Thermocouple : ±0.5 % of display value + 1 digit or ±3 ℃ RTD : ±0.5 % of display value +1 digit or ±2 ℃
Control operation	Indicator only (5 channels)
Setting method	Digital method by setting key
Function	• 1 to 5 channel display by automatic or fixed 1 channel
	• Offset correction for each channel
Ambient Temp. / Humidity	Max. 0 ℃~ 50 ℃ / 35 ~ 85 % R.H.

TEMPERATURE INDICATOR

Model	HN100
Appearance	
W ×H ×D (㎜)	270 ×166 ×34
Use	Sauna facility, bathroom, fitness center, hospital, greenhouse, etc temperature display in spacious places
FND size	24 x 34
Case	Complete waterproof to IP57
Input type	Pt100(-100 ~ 400 ℃, -19.9 ~ -99.9 ℃)
Input display accurity	Full span of ±0.5 % reg ±1 Digit
Sensor appearance	Waterproof SUS TUBE
Sensor cable length	1.5 m
Power cable length	1.8 m
Power Voltage	12 V d.c

TEMPERATURE INDICATOR

Model		AT3	AT6
Appearance			
W ×H ×D (㎜)		96 ×48 ×100	72 ×36 ×95
Power voltage		110/220 V a.c (50/60 Hz)	100 - 240 V a.c (50 - 60 Hz)
Power consumption		3 VA	
Input		R.T.D. , Thermocouple, Voltage/Current	
Permissible input resistance		T.C : 100 Ω Min. , R.T.D : 10 Ω Min.	
Display accuracy		Max. 0.5 % of Max. range	
Display		Digital indicator	
Dielectric strength		2,000 V a.c 50/60 Hz for 1 minute(Between + and - charging terminals)	
Vibration	Malfunction	2 - 55 Hz, X · Y · Z each position for 10 minutes	
	Durability	10 - 55 Hz, 0.76 ㎜, X . Y . Z each position for 2 hours	
Shock	Malfunction	100 ㎨ 6 positions , Each 3 time (Approx. 10 G)	
	Durability	300 ㎨ 6 positions , Each 3 time (Approx. 30 G)	
Ambient temperature and humidity		0 ~ 50 ℃ · 35 ~ 85 %R.H. (without condensation)	

TEMPERATURE CONTROLLER

TEMPERATURE INDICATOR

Model		DF40(Socket)	HY-800S	HY-48I	HY-72I
Appearance					
W ×H ×D (㎜)		48 ×48 ×100	96 ×96 ×125	48 ×48 ×110	72 ×72 ×110
Power voltage		110/220 V a.c (50/60 ㎐)			
Function		Display exclusive use			
Power consumption		3 VA			
Input		R.T.D, Thermocouple, voltage / current			
Permissible input resistance		T.C :Max. 100 Ω , R.T.D: Max. 10 Ω			
Display accuracy		Max. 0.5% of F.S			
Display		Digital indicator			
Dielectric strength		2,000 V a.c 50/60 ㎐ for 1 minute			
Vibration	Malfunction	2 - 55 ㎐ , X,Y,Z, each position for 10 minutes			
	Durability	10 - 55 ㎐ , 0.76 ㎜ ,X,Y,Z,each position for 3 hours			
Shock	Malfunction	100 ㎨ 6 positions, Each 3 times			
	Durability	300 ㎨ 6 positions, Each 3 times			
Ambient temperature and humidity		0 ~ 50 ℃(32 ~ 122 ℉) , 35 ~ 85 %R.H.(without condensation)			

TEMPERATURE INDICATOR

Model	BK3	BK6	BK6-M
Appearance			
W ×H ×D (㎜)	96 ×48 ×100	72 ×36 ×98	72 ×36 ×100
Power voltage	110 / 220 V a.c 50 / 60 Hz		100 - 240 V a.c 50 / 60 Hz
Function	Display exclusive use		
Power consumption	4 VA max.		
Input	T.C : K, K1, J, R, R.T.D : Pt100 Ω , voltage		Universal input
Display accuracy	max. 0.5 % of F.S		
Display	Digital indicator		Digital indicator / Retrans mission
Dielectric strength	2,000 V a.c 50/60 Hz for 1 minute		
Vibration	10 - 55 Hz, X, Y, Z each position for 2 hours		
Shock	300 ㎨, X,Y, Z each position 3 times		

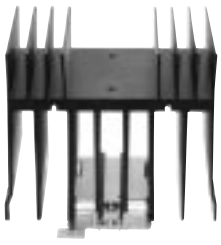
DIGITAL PORTABLE THERMOMETER

Model	D55
Appearance	
W ×H ×D (㎜)	71 ×158 ×32
Power voltage	9 V d.c
Input	K, J
Display method	LCD digital
Display accuracy	±0.5 % of F.S
Measuring range	-200.0 ~ 1370.0 ℃
Ambient temperature and humidity	0 ~ 50 ℃(32 ~122 ℉) · 35 ~ 85 %R.H. (without condensation)

TPR (Thyristor power regulator)

Model	Single phase			Three phase	
	TPR-2N	TPR-2N	TPRF-2N	TPR-3N	TPRF-3N
Appearance					
W ×H ×D (㎜)	92 ×100 ×131	115.2 ×194.7 ×131	115.2 ×194.7 ×131	190X266X150	169 ×361 ×213
Input voltage	110 V a.c 220 V a.c, 380 V a.c, 440 V a.c				
Operating Frequency	50 - 60 Hz				
Rated current	25 A, 35 A	50 A, 70 A		35 A, 50 A, 60 A	70 A, 100 A
Ambient temperature	0 - 50 ℃ (Ambient humidity : Max. 90% R.H.)				
Applied load	Resistance load / L load			Resistance load / L load	
Control Input	Current input : 4 - 20 mA d.c, Voltage input : 1 - 5 V d.c, Contact input : ON - OFF				
Output voltage	Min. 97 % against input voltage				
Protection circuit	Fuse, Over current protection, short detection				
Starting Method	Soft Start, Soft Down type				
Cooling type	Auto cooling (70 A : Forced cooling by FAN)			Forced cooling by the FAN	
Alarm output	Short alarm (FUSE), over current(Relay contact 1a, 250 V, 1 A)				
Insulation resistance	Min. 20 ㏁ (500 V Mega)				
Option	-	Communication RS232C / 485		-	Communication RS232C / 485
Communication	-	RS485		-	RS485
Control Method	· Phase control · Cycle control · ON / OFF			· Phase control · ON / OFF	
Function	· Output Limit	· Soft start · Load Break Alarm (L.L) · Over Current Alarm (O.C)		· Output Limit	· Fuse Break Alarm · Load Break Alarm (L.L) · Over Current Alarm (O.C)

HEATSINK (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 ㎜

SINGLE PHASE SSR (Solid State Relay)- Low Voltage (100 - 240 V a.c)

Model		HSR-2D102 □	HSR-2D202 □	HSR-2D302 □	HSR-2D402 □	HSR-2D502 □	HSR-2D702 □
Appearance		CE					
W × H × D (㎜)		44 × 64 × 29					
Input	Rated voltage	5 - 24 V d.c					
	Voltage use range	4 - 32 V d.c					
	Impedance	Less than 4 kΩ					
	Operating voltage	More than 3 V d.c					
	Release voltage	Less than 1.5 V					
Output	Rated load voltage	100 - 240 V a.c					
	Load voltage range	90 - 264 V a.c					
	Rated load current	10 A	20 A	30 A	40 A	50 A	70 A
	Input current	170 A	250 A	315 A		580 A	
Output voltage drop		1.3 V	1.6 V	1.8 V			
Leakage current		10 mA	15 mA				
Insulation resistance		500 V d.c 100 ㏁(Between I/O and case)					
Dielectric strength		2,500 V a.c (1minute at 60 ㎐)					
Vibration		10 - 55 ㎐ Double amplitude width 1.5 ㎜/ X.Y.Z each direction for 2 hours					
Shock		1,000 ㎳ (Approx100G) X.Y.Z each axis 3 times					
Storage temperature		-30 ℃ ~ 90 ℃					
Ambient temperature		-20 ℃ ~ 80 ℃					
Ambient humidity		45 ~ 85 %R.H.					
Net weight		Approx 150 g(Including packing box)					

SINGLE PHASE SSR (Solid State Relay)- Low Voltage (100 - 240 V a.c)

Model		HSR-2A102 □	HSR-2A202 □	HSR-2A302 □	HSR-2A402 □	HSR-2A502 □	HSR-2A702 □
Appearance		CE					
W × H × D (㎜)		44 × 64 × 29					
Input	Rated voltage	100 - 240 V a.c					
	Voltage use range	90 - 264 V a.c					
	Impedance	Less than 40 kΩ					
	Operating voltage	More than 72 V d.c					
	Release voltage	Less than 40 V a.c					
Output	Rated load voltage	100 - 240 V a.c					
	Load voltage range	90 - 264 V a.c					
	Rated load current	10 A	20 A	30 A	40 A	50 A	70 A
	Input current	170 A	250 A	315 A		580 A	
Output voltage drop		1.3 V	1.6 V	1.8 V			
Leakage current		15 mA					
Insulation resistance		500 V d.c 100 ㏁(Between I/O and case)					
Dielectric strength		2,500 V a.c (1 minute at 60㎐)					
Vibration		10 - 55 ㎐ Double amplitude width:1.5 ㎜/ X.Y.Z each direction for 2 hours					
Shock		1,000 ㎳ (Approx100G) X.Y.Z each axis 3 times					
Storage temperature		-30 ℃ ~ 90 ℃					
Ambient temperature		-20 ℃ ~ 80 ℃					
Ambient humidity		45 ~ 85 %R.H.					
Net weight		Approx 150 g(Including packing box)					

THREE PHASE SSR (Solid State Relay) - Low Voltage (100 - 240 V a.c)

Model		HSR-3D102 □	HSR-3D202 □	HSR-3D302 □	HSR-3D402 □	HSR-3D502 □	HSR-3D702 □
Appearance		CE 					
W ×H ×D (㎜)		109 ×75 ×36					
Input	Rated voltage	5 - 24 V d.c					
	Voltage use range	4 - 32 V d.c					
	Impedance	Less than 4 kΩ					
	Operating voltage	More than 3 V d.c					
	Release voltage	Less than 1.4 V					
Output	Rated load voltage	100 - 240 V a.c					
	Load voltage range	90 - 264 V a.c					
	Rated load current	10 A	20 A	30 A	40 A	50 A	70 A
	Input current	125 A	260 A	315 A		580 A	
Output voltage drop		1.5 V	1.8 V				
Leakage current		10 mA	15 mA				
Insulation resistance		500 V d.c 100 ㏁(Between I/O and case)					
Dielectric strength		2,500 V a.c (1minute at 60㎐)					
Vibration		10 - 55 ㎐ Double amplitude width 1.5 ㎜/ X.Y.Z each direction for 2 hours					
Shock		1,000 ㎳ (Approx100G) X.Y.Z each axis 3 times					
Storage temperature		-30 ℃ ~ 90 ℃					
Ambient temperature		-20 ℃ ~ 80 ℃					
Ambient humidity		45 ~ 85 %R.H.					
Net weight		Approx 400 g(Including packing box)					

THREE PHASE SSR (Solid State Relay)- Low Voltage (100 - 240 V a.c)

Model		HSR-3A102 □	HSR-3A202 □	HSR-3A302 □	HSR-3A402 □	HSR-3A502 □	HSR-3A702 □
Appearance		CE 					
W ×H ×D (㎜)		109 ×75 ×36					
Input	Rated voltage	100 - 240 V d.c					
	Voltage use range	90 - 264 V d.c					
	Impedance	Less than 40 kΩ					
	Operating voltage	More than 72 V d.c					
	Release voltage	Less than 40 V a.c					
Output	Rated load voltage	100 - 240 V a.c					
	Load voltage range	90 - 264 V a.c					
	Rated load current	10 A	20 A	30 A	40 A	50 A	70 A
	Input current	125 A	260 A	315 A		580 A	
Output voltage drop		1.3 V	1.6 V	1.8 V			
Leakage current		20 mA				15 mA	
Insulation resistance		500 V d.c 100 ㏁(Between I/O and case)					
Dielectric strength		2,500 V a.c (1minute at 60㎐)					
Vibration		10 - 55 ㎐ Double amplitude width:1.5 ㎜/ X.Y.Z each direction for 2 hours					
Shock		1,000 ㎳ (Approx100G) X.Y.Z each axis 3 times					
Storage temperature		-30 ℃ ~ 90 ℃					
Ambient temperature		-20 ℃ ~ 80 ℃					
Ambient humidity		45 ~ 85 %R.H.					
Net weight		Approx 400 g(Including packing box)					

SINGLE PHASE SSR (Solid State Relay)- High Voltage (100 - 440 V a.c)

Model		HSR-2D104 □	HSR-2D204 □	HSR-2D304 □	HSR-2D404 □	HSR-2D504 □	HSR-2D704 □
Appearance		CE 					
W×H×D (㎜)		44×64×29					
Input	Rated votage	5 - 24 V d.c					
	Voltage use range	4 - 32 V d.c					
	Impedance	Less than 4 kΩ					
	Operating voltage	More than 3 V d.c					
	Release voltage	Less than 1.4 V					
Output	Rated load voltage	100 - 440 V a.c					
	Load voltage range	90 - 480 V a.c					
	Rated load current	10 A	20 A	30 A	40 A	50 A	70 A
	Input current	170 A	250 A	350 A	370 A	580 A	
Output voltage drop		1.3 V	1.6 V	1.8 V			
Leakage current		20 mA					
Insulation resistance		500 V d.c 100 ㏁(Between I/O and case)					
Dielectric strength		2,500 V a.c (1minute at 60㎐)					
Vibration		10 - 55 ㎐ Double amplitude width 1.5 ㎜					
Shock		1,000 ㎨ (Approx 100G)					
Storage temperature		-30 ℃ ~ 90 ℃					
Ambient temperature		-20 ℃ ~ 80 ℃					
Ambient humidity		45 ~ 85 %R.H.					
Net weight		Approx 150 g(Including packing box)					

SINGLE PHASE SSR (Solid State Relay)- High Voltage (100 - 440 V a.c)

Model		HSR-2A104 □	HSR-2A204 □	HSR-2A304 □	HSR-2A404 □	HSR-2A504 □	HSR-2A704 □
Appearance		CE 					
W×H×D (㎜)		44×64×29					
Input	Rated votage	100 - 240 V a.c					
	Voltage use range	90 - 264 V a.c					
	Impedance	Less than 40 kΩ					
	Operating voltage	More than 75 V d.c					
	Release voltage	Less than 40 V a.c					
Output	Rated load voltage	100 - 440 V a.c					
	Load voltage range	90 - 480 V a.c					
	Rated load current	10 A	20 A	30 A	40 A	50 A	70 A
	Input current	170 A	250 A	350 A	370 A	580 A	
Output voltage drop		1.3 V	1.6 V	1.8 V			
Leakage current		15 mA				20 mA	
Insulation resistance		500 V d.c 100 ㏁(Between I/O and case)					
Dielectric strength		2,500 V a.c (1 minute at 60㎐)					
Vibration		10 - 55 ㎐ Double amplitude width:1.5 ㎜					
Shock		1,000 ㎨ (Approx 100G)					
Storage temperature		-30 ℃ ~ 90 ℃					
Ambient temperature		-20 ℃ ~ 80 ℃					
Ambient humidity		45 ~ 85 %R.H.					
Net weight		Approx 150 g(Including packing box)					

THREE PHASE SSR (Solid State Relay)- High Voltage (100 - 440 V a.c)

Model		HSR-3D104 □	HSR-3D204 □	HSR-3D304 □	HSR-3D404 □	HSR-3D504 □	HSR-3D704 □
Appearance		CE 					
W ×H ×D (㎜)		109 ×75 ×36					
Input	Rated votage	5 - 24 V d.c					
	Voltage use range	4 - 32 V d.c					
	Impedance	Less than 4 kΩ					
	Operating voltage	More than 3 V d.c					
	Release voltage	Less than 1.4 V					
Output	Rated load voltage	100 - 440 V a.c					
	Load voltage range	90 - 480 V a.c					
	Rated load current	10 A	20 A	30 A	40 A	50 A	70 A
	Input current	170 A	250 A	350 A	370 A	580 A	
Output voltage drop		1.3 V	1.8 V				
Leakage current		20 mA					
Insulation resistance		500 V d.c 100 ㏁(Between I/O and case)					
Dielectric strength		2,500 V a.c (1minute at 60㎐)					
Vibration		10 - 55 ㎐ Double amplitude width 1.5 ㎜					
Shock		1,000 ㎨ (Approx 100G)					
Storage temperature		-30 ℃ ~ 90 ℃					
Ambient temperature		-20 ℃ ~ 80 ℃					
Ambient humidity		45 ~ 85 %R.H.					
Net weight		Approx 400 g(Including packing box)					

THREE PHASE SSR (Solid State Relay)- High Voltage (100 - 440 V a.c)

Model		HSR-3A104 □	HSR-3A204 □	HSR-3A304 □	HSR-3A404 □	HSR-3A504 □	HSR-3A704 □
Appearance		CE 					
W ×H ×D (㎜)		109 ×75 ×36					
Input	Rated votage	100 - 240 V d.c					
	Voltage use range	90 - 264 V d.c					
	Impedance	Less than 72 kΩ					
	Operating voltage	More than 75 V d.c					
	Release voltage	Less than 40 V a.c					
Output	Rated load voltage	100 - 440 V a.c					
	Load voltage range	90 - 480 V a.c					
	Rated load current	10 A	20 A	30 A	40 A	50 A	70 A
	Input current	170 A	260 A	350 A	370 A	580 A	
Output voltage drop		1.95 V	1.8 V				
Leakage current		20 mA					
Insulation resistance		500 V d.c 100 ㏁(Between I/O and case)					
Dielectric strength		2,500 V a.c (1minute at 60㎐)					
Vibration		10 - 55 ㎐ Double amplitude width:1.5 ㎜					
Shock		1,000 ㎨ (Approx 100G)					
Storage temperature		-30 ℃ ~ 90 ℃					
Ambient temperature		-20 ℃ ~ 80 ℃					
Ambient humidity		45 ~ 85 %R.H.					
Net weight		Approx 400 g(Including packing box)					

DIGITAL COUNTER / TIMER (Built-in Batch counter)

Model		GE6-P4	GE6-P6	GE6-T6	GE4-P4	GE4-P6	GE4-T6
Appearance							
W×H×D (㎜)		72×36×86			48×48×85		
Type		Preset		Display	Preset		Display
Display digit		4Digits 2Stages	6Digits 2Stages	6Digits 1Stage	4Digits 2Stages	6Digits 2Stages	6Digits 1Stage
FND Hight		PV : 11 mm SV : 8 mm			PV : 11 mm SV : 8 mm		
Function		Out-counter setting & Indication(Exception: Indication)			Out-counter output & constant output		
		PNP / NPN Input selection, built-in switch			Twin timer(On/Off Time separate setting)		
		Dual counter function (CP1+CP2)			Flicker MODE 99.99 sec setting		
		Prescale function			Key Lock function		
		OFFSET setting function(Standard value when reset)			P.V storage function when power off		
Counting speed & Input		1 / 30 / 1 K / 10 Kcps, Contact. Non-contact					
Reset		External reset signal width 0.1 ㎳ / 1 ㎳ / 20 m sec selectable					
Input type		CP1, CP2, RST, RST.B (TOTAL is exception) 4 Input					
		[H]Level 4 - 30 V d.c [L]Level 0 - 2 V d.c NPN / Internal full-up by PNP setting / full-down resistance connection(4.7 kΩ)					
Power voltage		1. 100 V - 240 V d.c / a.c 50 - 60 Hz(±10%)					
		2. 24 V - 60 V d.c / a.c 50 - 60 Hz(±10%)					
Consumption power		About 13 VA(220 V a.c 60 Hz)					
Power supply to sensor		+12 V d.c (Voltage fluctuation rate : Max. ±5%) 200 mA Max.					
Control output	RELAY1	1a (250 V a.c 3 A)		-	1c (250 V a.c 3 A)		
	RELAY2	1c (250 V a.c 3 A)			1c (250 V a.c 3 A)		-
	TR1/TR2	NPN open collector 30 V d.c 100 mA Max. (Refer to terminal structure)					
Dielectric strength		-					
Ambient temperature & humidity		-10 -50 ℃ 30 - 85 % R.H.(Without condensation)					
Protection structure		IP65(Front)					

DIGITAL COUNTER / TIMER (Built-in Batch counter)

Model		GE3-P6	GE3-T6	GE7-P6	GE7-T6
Appearance					
W×H×D (㎜)		96×48×100		72×72×87	
Type		Preset	Display	Preset	Display
Display digit		6Digits 2Stages	6Digits 1Stage	6Digits 2Stages	6Digits 1Stage
FND Hight		PV : 13 mm SV : 10 mm		PV : 13 mm SV : 10 mm	
Function		Out-counter setting & Indication(Exception: Indication)		Out-counter output & constant output	
		PNP / NPN Input selection, built-in switch		Twin timer(On/Off Time separate setting)	
		Dual counter function (CP1+CP2)		Flicker MODE 99.99 sec setting	
		Prescale function		Key Lock function	
		OFFSET setting function(Standard value when reset)		P.V storage function when power off	
Counting speed & input		1 / 30 / 1 K / 10 Kcps, Contact. Non-contact			
Reset		External reset signal width 0.1 ㎳ / 1 ㎳ / 20 m sec selectable			
Input type		CP1, CP2, RST, RST.B (TOTAL is exception) 4 Input			
		[H]Level 4 - 30 V d.c [L]Level 0 - 2 V d.c NPN / Internal full-up by PNP setting / full-down resistance connection(4.7 kΩ)			
Power voltage		1. 100 V - 240 V d.c / a.c 50 - 60 Hz(±10%)			
		2. 24 V - 60 V d.c / a.c 50 - 60 Hz(±10%)			
Consumption power		About 13 V A(220 V a.c 60 Hz)			
Power supply to sensor		+12 V d.c (Voltage fluctuation rate : Max. ±5%) 200 mA Max.			
Control output	RELAY1	1a (250 V a.c 3 A)	-	1a (250 V a.c 3 A)	-
	RELAY2	1c (250 V a.c 3 A)		1c (250 V a.c 3 A)	
	TR1/TR2	NPN open collector 30 V d.c 100 mA Max. (Refer to terminal structure)			
Dielectric strength		-			
Ambient temperature & humidity		-10 - 50 ℃ 30 - 85 % R.H.(Without condensation)			
Protection structure		IP65(Front)			

DIGITAL COUNTER / TIMER

Model		GF7-P62 / GF7-P42	GF7-P61 / GF7-P41	GF7-T60
Appearance				
W ×H ×D (㎜)		72 ×72 ×127.5	72 ×72 ×127.5	72 ×72 ×127.5
Control method		Up, Down , Up/Down		
Display method		7 Segment LED LED Height :10 ㎜, 11 ㎜		
Stage of freeset		1stage, 2stages	1stage	—
Display digit		4 digits, 6 digits		6 digits
Max. Counting speed		30 / 1 K / 3 K/ 5 Kcps		
Counting input		Contact, Non-contact		
Reset		External reset: Min.input signal width 0.02 sec (Contact, Non-contact input) Power reset: Min. power opening time 0.5 sec		
Inhibit input		Voltage input(d.c input) 「H」level 5-30 Vd.c, 「L」level 0-2 Vd.c (input resistance Approx. 4.7 kΩ)		
Memory protection		Semipermanent		
Power voltage		100 - 240 V a.c (50/60 Hz)		
Power consumption		GF7-P62 : Approx. 8.7 VA, GF7-P61 : Approx. 7.6 VA, GF7-T60 : Approx. 6.4 VA (220 V a.c 60 Hz)		
Power supply to sensor		12 V d.c (Voltage fluctuation rate : Max. ±10 %) 100 ㎃ Max.		
Control output		Contact output : 1c (250 V a.c 3 A) Non-contact output : 30 V d.c, 100 ㎃ Max.		—
Insulation resistance		Min.100 ㏁ (At 500 V d.c) Part of conduction terminal and exposured non-elecrifying metal part		
Dielectric strength		2000 V a.c 50/60 ㎐ for 1minute		
Vibration	Malfunction	10 - 55 ㎐, X · Y · Z each position for 10 minutes		
	Durability	10 - 55 ㎐, 0.76 ㎜, X · Y · Z each position for 2 hours		
Shock	malfunction	100 ㎨ 6, each direction 3 times		
	Durability	300 ㎨ 6, each direction 3 times		
Life	Mechanical	10 million operations Min. (Relay type)		
	Electrical	10,000 million operation Min. (Relay type)		
Ambient temperature & humidity		0 ~ 50 ℃ · 30 ~ 85 %R.H.		

DIGITAL COUNTER / TIMER

Model		GF4-P41	GF4-P41S (SOCKET)	GF4-T40
Appearance				
W ×H ×D (㎜)		48 ×48 ×112	48 ×48 ×112	48 ×48 ×112
Control method		Up, Down , Up/Down		
Display method		7 Segment LED LED Height :8 ㎜		
Stage of freeset		1stage	1stage	—
Display digit		4 digits		
Max. Counting speed		30 / 5 Kcps		
Counting input		Contact, Non-contact		
Reset		External reset: Min.input signal width 0.02 sec (Contact, Non-contact input) Power reset: Min. power opening time 0.5 sec		
Inhibit input		Voltage input(d.c input) 「H」level 5-30 Vd.c, 「L」level 0-2 Vd.c (input resistance Approx. 4.7 kΩ)		
Memory protection		Semipermanent		
Power voltage		100 - 240 V a.c (50/60 Hz)		
Power consumption		GF4-T40 : 4.8 VA, GF4-P41/ P41S : 6.2 VA (240 V a.c 60 ㎐)		
Power supply to sensor		12 V d.c (Voltage fluctuation rate : Max. ±10 %) 100 ㎃ Max.		
Control output		Contact output : 1c (250 V a.c 3 A) Non-contact output : 30 V d.c, 100 ㎃ Max.		—
Insulation resistance		Min.100 ㏁ (At 500 V d.c) Part of conduction terminal and exposured non-elecrifying metal part		
Dielectric strength		2000 V a.c 50/60 ㎐ for 1minute		
Vibration	Malfunction	10 - 55 ㎐, X · Y · Z each position for 10 minutes		
	Durability	10 - 55 ㎐, 0.76 ㎜, X · Y · Z each position for 2 hours		
Shock	malfunction	100 ㎨ 6, each direction 3 times		
	Durability	300 ㎨ 6, each direction 3 times		
Life	Mechanical	10 million operations Min. (Relay type)		
	Electrical	10,000 million operation Min. (Relay type)		
Ambient temperature & humidity		0 ~ 50 ℃ · 30 ~ 85 %R.H.		

DIGITAL COUNTER · TIMER

DIGITAL TIMER

Model		LF4N-A	LF4N-B	LF4N-C	LF4N-D	TF4-A	TF4-B	TF4-C	TF2
Appearance									
W×H×D (㎜)		48×48×75.5				48×48×95.6			48×96×112
Terminal type		8 pin Plug			11 pin Plug	8 pin Plug			plug-in
Control method		Up, Down				Up, Down			Up
Display method		LCD				LED Height 7 Segment LED : 8 mm			
Display digit		3 digits				4 digits			3 digits
Time setting range		0.01 s ~ 9990 h				999.9 sec/ 9999 sec	9 m 59.9 sec/ 59 m 59 sec	59 hours 59 minute	99.9 sec/ 999 sec
Counting input		Reset, start, inhibit				Reset, INHIBIT			
Input signal		• Non voltage input • Impedance in a short circuit : Max. 2 ㏀ • Residual voltage in a short circuit : Max. 0.7 V d.c • Impedance in open : Min. 100 ㏀				External reset, inhibit: Min. input signal width 0.02 sec. Power reset: Min. power opening time 0.5 sec.			
Power voltage		24 - 240 V a.c/d.c (50 / 60 Hz)				100 - 240 V a.c (50/60 Hz)			
Power consumption						Approx. 4.8 VA (220 V a.c 60 Hz)			Approx. 4.8 VA (220 V a.c 60 Hz)
Control output		Contact output : 1c 250 V a.c 3A (resistance load)				Contact output : 1c 250 V a.c 3 A (resistance load) Non-Contact output: 30 V d.c 100 mA Max.			Contact output : 1 c 250 V a.c 3 A (resistance load) Non-Contact output : 30 V d.c 100 mA Max.
Insulation resistance		Min.100 ㏁ (At 500 V d.c) Part of conduction terminal and exposured non-electrifying metal part							
Dielectric strength		2,000 V a.c 50/60 Hz for 1 minute (Between terminal)							
Vibration	Malfunction	10 - 55 Hz, X · Y · Z each position for 10 minutes							
	Durability	10 - 55 Hz, 0.76㎜, X . Y . Z each position for 2 hours							
Shock	Malfunction	100 ㎨ 6 positions, each 3 times							
	Durability	300 ㎨ 6 positions, each 3 times							
Life	Mechanical	Min. 10 million operations (Relay type)							
	Electrical	Min. 100,000 million operation (Relay type)							
Ambient temperature & humidity		0 ~ 50 ℃ · 30 ~ 85 %R.H.							

DIGITAL DUAL TIMER

Model		TT4-P42A	TT4-P42B	TT7
Appearance				
W×H×D (㎜)		48×48×100	48×48×100	72×72×87
Power supply		100 - 240 V a.c 50 - 60 Hz		
Voltage Regulation		±10 % of Power supply voltage		
Power Consumption		Below 9.1 VA (at 220 V a.c 60Hz)		
Display method		PV : 11 ㎜, SV : 8 ㎜		PV: 13.5 ㎜, SV : 13.5 ㎜
Tereminal type		Plug 11 Pin	Plug 8 Pin	Terminal
Min. signal amplitude	START	Max. 20 ㎳	—	Max. 100 ㎳
	RST/INH			
Control	Contact	OUT A : Specified time SPDT (1c), OUTB : Specified time SPDT(1c)		Time limit 1c
	Construction capacity	250 V a.c 5 A (Resistance load)		
Life	Mechanical	10 million times		50 million times
	Electrical	more than100,000 times		
Dielectric strength		2,000 V a.c 50 / 60 Hz for 1 minute		
Noise		±2 ㎸		
Insulation resistance		Min. 100 ㏁ (500 V d.c mega standard)		
Vibration (Durability)		10 - 55 ㎐ (cycle 1 minute), Double amplitude 0.5 for 2h		
Shock	Durability	300 (30 G) X · Y · Z each direction 3 times		
	Malfunction	100 (10 G) X · Y · Z each direction 3 times		
Ambient temperature		-10 ~ 55 ℃ Without freeze		
Storage temperature		-20 ~ 65 ℃ Without freeze		
Ambient humidity		30 ~ 85 %R.H.		

MULTI-ANALOG TIMER

MODEL		MA4N-A	MA4N-B	MA4N-C
Appearance		CE 		
W×H×D (㎜)		48×48×94		
Function		Multi operation, Multi time		POWER ON DELAY, Multi time
Power voltage		24 - 240 V a.c/d.c 50 - 60 ㎐		
Operating voltage		±10 % of power voltage		
Power consumption		a.c : Approx. 5.3 VA Max., d.c : 2.5 W		
Time setting range		0.12 sec ~ 300 hours		
Min. signal amplitude		START input, INHIBIT input, RESET input: Min. 20 ㎳		—
Input		• Non voltage Input • Impedance in a short circui t: Max. 2 ㏀ • Residual voltage in a short circuit: Max. 0.7 V d.c • Impedance in open: Min. 100 ㏀		—
Control output	Contact	Specified time DPDT (2c)		Specified time SPDT (1c), Instantaneous time SPDT (1c)
	Contact capacity	250 V a.c 5 A (Resistance load)		
Variation of operation time		Max. ±0.3 % (Rate against full scale)		
Setting error		Max. ± 5 % ±0.05 sec		
Voltage error		Max. ±0.5 %		
Temperature error		Max. ±2 %		
Dielectric strength		2,000 V a.c 50/60 ㎐ for 1minute		
Vibration	Malfunction	10 - 55 ㎐ double amplitude 0.75 ㎜		
	Durability	10 - 55 ㎐ double amplitude 0.5 ㎜		
Shock	Malfunction	100 ㎨ (Approx. 10 G)		
	Durability	300 ㎨ (Approx. 30 G)		
Life	Mechanical	Over 10 million operations (Open & Short frequency : 180 / min)		
	Electrical	Over 100,000 (250V a.c 3 A load resistance)		
Ambient temperature & humidity		0 ~ 50 ℃ · 30 ~ 85 %R.H.		

ANALOG TIMER

Model		T38N	T48N	T57NE / T57NP	TF62NE / TF62NP	TF62DE / TF62DP
Model	Exposure type	T38N	T48N	T57NE	TF62NE	TF62DE
	Panel type			T57NP	TF62NP	TF62DP
Appearance		 Exposure type	 Exposure type	 Panel type Exposure type	 Panel type Exposure type	 Panel type Exposure type
W×H×D (㎜)		40.5×50.5	48.0×48.0(H)	50.0×62.0 57.5×84.5	50.0×62.0 57.5×84.5	50.0×62.0 57.5×84.5
Function		POWER ON DELAY TIMER			TWIN TIMER	DUAL TIMER
Power supply		24 - 240 V a.c 50/60 Hz, 24 - 240 V d.c				
Allowable voltage variation		±10 % of Power supply Voltage				
Power consumption		Less than 4.5 VA (at 240 V a.c 60 ㎐), Less than 1.5 W (at 24 V d.c)				
Return time		Less than 100 ㎳				
maximum time	01	0.01 ~ 1 s / 0.01 ~ 1 m / 0.01 ~ 1 h				
	03	0.01 ~ 3 s / 0.01 ~ 3 m / 0.01 ~ 3 h				
	06	0.01 ~ 6 s / 0.01 ~ 6 m / 0.01 ~ 6 h				
	10	0.01 ~ 10 s / 0.01 ~ 10 m / 0.01 ~ 10 h				
	30	0.01 ~ 30 s / 0.01 ~ 30 m / 0.01 ~ 30 h				
	60	0.01 ~ 60 s / 0.01 ~ 60 m / 0.01 ~ 60 h				
	12H	0.01 ~ 12 h / 0.01 ~ 24 h / 0.01~ 48 h ('24h' and '48h' time setting '12h' : '×2' and '×4')			'12' model is not availale	
Time error	Repeat error	Less than ±0.3 % (ratio against Max. scale)				
	Setting error	Less than ±5 % (ratio against Max. scale)				
Control output	Output mode	POWER ON DELAY			FLICKER (ON Start)	FLICKER (ON-A Start)
	Contact	A type (Time - limit 1c + Instantaneous 1a) / B type (Time - limit 1c + Instantaneous 1c) / C type(Time - limit 2c)			D type (Time - limit 1c)	F type (Time - limit 2c)
	Contact capacity	250 V a.c 3 A (Resistive load)				
Life span of relay		Mechanical : More than 10 million times / Electrical : More than 100,000 times				
Dielectric strength		2000 V a.c 50/60 ㎐ for 1 minute				
Noise		±2 kV				
Insulation resistance		More than 100 ㏁ (Based on 500 V d.c mega standard)				
Vibration (Durability)		10 - 55 ㎐ (cycle :1 minute), Double amplitude 0.5 ㎜ X · Y · Z each direction for 2h.				
Shock (Durability)		300 ㎪ (30 G) X · Y · Z each direction 3 times				
Ambient temperature		-10 ~ 55 ℃ Without freeze				
Storage temperature		-25 ~ 65 ℃ Without freeze				
Ambient humidity		30 ~ 85 % R.H.				

MULTI PULSE METER

Model		BP6
Appearance		
W ×H ×D (㎜)		72 ×36 ×100
Function		Auto Zero time setting function, Time unit selection function (Individual input for each bank/ batch input selection function), Parameter lock function, Electricity failure compensation function (applicable only to F9), Remote/local conversion function(applicable only to communication output type), Comparative output function (HH, H, GO, L, LL), 4 steps bank setting function, Current output range selection function, Max, Min, Peak value 10 steps memory function (Max: 4 steps save, average value save, Min: 4 steps save, average save), Start compensation timer function, Display cycle setting function
Power Supply		100 - 240 V a.c, 50 - 60 Hz
		24 - 60 V (d.c/a.c), 50 - 60 Hz
Power Consumption		Below 10 VA (240 V a.c)
		Below 6 W (24 V d.c)
Voltage output for Sensor		12 V d.c ±10 % 120 ㎃ (voltage fluctuation rate: ±10 %)
Measuring Accuracy		FS ± 0.01 % rdg ± 1 dig
Measurement Range		0.0005 Hz ~ 50 ㎑, 0.001 s ~ 3.200 s, 0 ~ 4 x 10 ^{9}Count
Max. Display Digits		5 digits (-19999 ~ 99999)
Display method		7 Segment
Input Signal		Non-Contact Input: Max. 50㎑ (ON/OFF width for each above 10 ㎲)(ON voltage: 4.5 V - 24 V, OFF voltage: 0 - 1.0 V) Contact Input: Max. 30 ㎐ (ON/OFF width for each above 33 ㎳)(12 V d.c, able to switch the current of 2 ㎃ sufficiently)
Output type		Relay Output (H, GO, L)
Operation Mode		· F1: revolution/ frequency/ speed · F2: moving speed · F3: cycle · F4: passing time · F5: time difference · F6: time width · F7: pulse width · F8: pulse interval · F9: Addition counter · F10: absolute ratio · F11: error ratio · F12: density · F13: error
Noise Immunity		By noise simulator, square-shaped wave noise (pulse width 1㎲) ±2000V
Vibration Resistance	Durability	10 - 55 ㎐ double amplitude width 0.75 mm in each X · Y · Z direction for 2 hours
	Malfunction	10 - 55 ㎐ double amplitude width 0. 5 mm in each X · Y · Z direction for 10 minutes
Shock Resistance	Durability	300 ㎰ (approx. 30G) in each X · Y · Z direction for 3 times
	Malfunction	100 ㎰ (approx. 10G) in each X · Y · Z direction for 3 times
Operating Ambient Environment		Temperature: -10 ~ 50 ℃ (without condensation) Humidity: 35 ~ 85 % R.H.

MULTI PULSE METER

Model		RP1 RP3		RP4	RP6	RP7
Appearance						
W ×H ×D (㎜)		48 ×24 ×100	96 ×48 ×105	48 ×48 ×85	72 ×36 ×105	72 ×72 ×92
Function		· Auto Zero time setting function · Time unit selection function · Parameter lock function · Electricity failure compensation function(applicable only to F9) · Remote/local conversion function (applicable only to communication output type) · Comparative output function (HH, H, GO, L, LL) · Current output range selection function · Max, Min, Peak value 10 steps memory function (Max : 4 steps save, average value save, Min: 4 steps save, average save) · Starting compensation timer function · Display cycle setting function				
Power Supply		100 - 240 V a.c, 50 - 60 Hz				
		-	24 - 60 V d.c / a.c 50 - 60 Hz			
Power Consumption		Below 10 VA (240 V a.c)	Below 9.5 VA (240 V a.c)	Below 12 VA (240 V a.c)		Below 9.5 VA (240 V a.c)
		-	Below 5 W (24 V d.c)	Below 6 W (24 V d.c)	Below 5 W (24 V d.c)	
Voltage output for Sensor		12 V d.c ±10 % 120 ㎃ (voltage fluctuation rate ±10 %)				
Measuring Accuracy		±0.02 % rdg ±1 digit				
Measurement Range		0.0003 Hz ~ 10 k㎐, 0.001 s ~ 3.200 s, 0 ~ 4 x 10^{9}Count				
Max. Display Digits		4 Digits (0 ~ 9999)	5 Digits (0 ~ 99999)			
Display Method		7 Segment				
Input Signal		Non-Contact Input: Max. 10 k㎐ (ON/OFF width for each above 50 ㎲)(ON voltage: 4.5 V - 24 V, OFF voltage : 0 - 1.0 V) Contact Input: Max. 30 ㎐ (ON/OFF width for each above 33 ㎳)(12 V d.c, able to switch the current of 2 ㎃ sufficiently)				
Output type		Relay Output (H)	Relay Output (H, GO, L) (HH, H,GO, L, LL)	Relay Output (H)	Relay Output (H, GO, L)	Relay Output (H, GO, L) (HH, H, GO, L, LL)
Operation Mode		· F1: Revolution/ Frequency/ Speed · F2: Moving speed · F3: Cycle · F4: Passing Time · F5: Time Difference · F6: Time Width · F7: Pulse Width · F8: Pulse Interval · F9: Additon Counter				
Noise Immunity		By noise simulator, square-shaped wave noise (pulse width 1㎲) ±2000 V				
Vibration Resistance	Durability	10 - 55 ㎐ double amplitude width 0.75 ㎜ in each X · Y · Z direction for 2 hours				
	Malfunction	10 - 55 ㎐ double amplitude width 0. 5 ㎜ in each X · Y · Z direction for 10 minutes				
Shock Resistance	Durability	300 ㎰ (approx. 30G) in each X · Y · Z direction for 3 times				
	Malfunction	100 ㎰ (approx. 10G) in each X · Y · Z direction for 3 times				
Operating Ambient Environment		Temperature: -10 ~ 50 ℃ (without condensation) Humidity: 35 ~ 85 % R.H.				

PANEL METER

DIGITAL MULTI PANEL METER

Model	MP3	MP6
Appearance		
W×H×D (㎜)	96×48×112	72×36×100
Power Supply	100 - 240 V a.c (50 - 60 ㎐) voltage fluctuation rate ±10 %	
Power Consumption	5 VA	Approx. 4 VA
Display	7 Segment LED Display	
Insulation Resistance	100 ㏁ minimum (at 500 V d.c) between external terminal and case	
Dielectric Strength	2000 V a.c minimum for 1 minute between external terminal and case	
Noise Immunity	By noise simulator, square-shaped wave noise, pulse width 1㎲, ±3000 V	
Vibration Resistance	Malfunction: 10 - 55 ㎐ Single amplitude 0.5 ㎜ X · Y · Z each direction for 1 hour Durability: 10 - 55 ㎐ Single amplitude 0.75 ㎜ X · Y · Z each direction for 2 hours	
Shock Resistance	Malfunction: 100 ㎪ for 3 times each in X · Y · Z direction Durability: 300 ㎪ for 3 times each in X · Y · Z direction	
Operating Ambient temperature	-10 ~ 55 ℃(without freeze)	
Operating Ambient Humidity	Relative Humidity 35 ~ 85 % R.H.	
Operating Circumstance	With no corrosive gas	
Storage Ambient Temperature	-20 ~ 65 ℃(without freeze)	
Relay Life Expectancy	Mechanical: More than 20,000,000 times Electrical: More than 100,000 times	

DIGITAL PANEL METER (VOLTAGE METER • CURRENT METER)

Model		BS1	BS3	BS6
Appearance				
W×H×D (㎜)		48×24×100	96×48×100	72×36×100
Function		Indicator		
Power supply		100 - 220 V a.c 50 - 60 ㎐(voltage variation rate ±10 %)		
Display unit		V, ㎷, A, ㎃, ㎂		
Max. display range		1999 (3 ½ Digit)		
Input signal		a.c voltage, a.c current, d.c voltage, d.c current, Instrumentation signal		
A/D converter		2 dual integration		
Sampling cycle		300 ㎳		
Response speed		Approx. 2 sec. (Max. range)		
Insulation resistance		Min. 100 ㏁ at 500 V d.c between terminals		
Dielectric strength		1500 V a.c for 1 minute between power and external terminals		
Vibration	Mechanical	10 - 55 ㎐ each direction for 1 hour		
	Electrical	10 - 55 ㎐ each direction for 10 minutes		
Shock	Mechanical	300 ㎪ X · Y · Z each direction 3 times (Approx. 30G)		
	Electrical	100 ㎪ X · Y · Z each direction 3 times (Approx. 10G)		
Ambient Temp. & Humidity		0 ~ 50 ℃ / 35 ~ 85 % R.H.		

DIGITAL PANEL METER

Model		BA1 DP3-N	DP1		DP6
Appearance					
W×H×D (㎜)		48×24×53	48×24×53	96×48×113	72×36×100
Function		Display		Display	Display
Power supply		5 V d.c 12 - 24 V d.c		110/220 V a.c (50/60 Hz)	100/240 V a.c (50/60 Hz) 12 - 48 V d.c
Display unit		-		V · mV · A · mA · ㎂A · Hz	V · mV · A · mA · ㎂A
Max. range		±1999 (3 ½ Digit)		±1999 (3 ½ Digit)	±1999 (3 ½ Digit)
Input signal		d.c voltage, d.c current, Instrumentation signal		a.c voltage, a.c current, d.c voltage, d.c current, Instrumentation signal	
A/D converter		2 dual integration			
Sampling cycle		2.5 times / sec.			
Response speed		Approx. 2.5sec.			
Insulation resistance		Min. 100 ㏁ at 500 V d.c mega between external terminal and case			
Dielectric strength		1500 V a.c for 1 minute between power and external terminals			
VIbration	Malfunction	10 - 55 ㎐ 0.76 ㎜ X · Y · Z each direction for 2 hours			
	Durability	2 - 55 ㎐ X · Y · Z each direction for 10 minutes			
Shock	Malfunction	100 ㎨ each direction 3 times (Approx. 10G)			
	Durability	300 ㎨ each direction 3 times (Approx. 30G)			
Ambient temp. & Humidity		0 ~ 50 ℃/ 35 ~ 85 % R.H. (No condensation)			

DC SWITCHING INDUCTIVE SENSOR (Square Type)

Model	HYP-18S5N□ HYP-18S5P□	HYP-25S5N□ HYP-25S5P□	HYP-30S10N□ HYP-30S10P□	HYP-40S20N□ HYP-40S20P□
	HYP-18S8N□ HYP-18S8P□	HYP-25S8N□ HYP-25S8P□ HYP-25S12N□ HYP-25S12P□	HYP-30S15N□ HYP-30S15P□	
Appearance				
W×H×D (㎜)	18×18×37.5	25×25×40.8	30×30×54.8	40×40×55.0
Object	Steel 18×18×1㎜	Steel 25×25×1㎜ Steel 30×30×1㎜ Steel 35×35×1㎜	Steel 30×30×1㎜	Steel 50×50×1㎜
	Steel 25×25×1㎜		Steel 45×45×1㎜	
Sensing distance	5㎜	5㎜ 8㎜ 12㎜	10㎜	20㎜
	8㎜		15㎜	
Mounting distance	0 ~ 4.0㎜	0~4.0㎜ 0~6.4㎜ 0~9.6㎜	0~8.0㎜	0~16.0㎜
	0 ~ 6.4㎜		0~12.0㎜	
Frequency	500 ㎐	350 ㎐ 250 ㎐ 200 ㎐	250 ㎐	250 ㎐
	300 ㎐		100 ㎐	
hysteresis	Max. 10 % of sensing distance			
Current voltage	12 - 24 V d.c (±10 %)			
Control output	Resistive load : Max. 200 ㎃ Inductive load : Max. 100 ㎃			
Power consumption	Max. 10 ㎃ (At 12 V d.c)			
Residual voltage	Max. 1 V (At 24 V d.c, 200 ㎃)			
Leakage current	Max. 0.5 ㎃ (At 12 V d.c)			
Ambient temperature	-25 ℃ ~ +70 ℃ (At ±10 % at +20 ℃ for sensing distance)			
Insulation resistance	Max. 50 ㏁ (At 500 V d.c)			
Dielectric strength	2,000 V a.c for 1 minute (At 50/60 ㎐)			
Vibration	10 - 55 ㎐, Double amplitude 1.5 mm, X · Y · Z each position for 2 hours			
Shock	500 ㎨ (Approx. 50 G), X · Y · Z each position for 3 times			
Display	Red LED			
Protection circuit	Surge protection/ reverse polarity protection			
Protection	IP67(IEC)			
Material	Case: PBT resin			

DC SWITCHING INDUCTIVE SENSOR (Round Type)

Model	HYP-8R1.5N□ HYP-8R1.5P□	HYP-8R2N□ HYP-8R2P□	HYP-12R2N□ HYP-12R2P□	HYP-12R4N□ HYP-12R4P□	HYP-18R5N□ HYP-18R5P□	HYP-18R8N□ HYP-18R8P□
Appearance						
Ø/ L (㎜)	8/30	8/30	12/43	12/43	18/47	18/47
Object	Steel 8 × 8 × 1 ㎜		Steel 12 × 12 × 1 ㎜		Steel18 ×18 ×1 ㎜	Steel25 ×25 ×1 ㎜
Sensing distance	1.5 ㎜	2 ㎜	2 ㎜	4 ㎜	5 ㎜	8 ㎜
Mounting distance	0 ~ 1.2 ㎜	0 ~ 1.6 ㎜	0 ~ 1.6 ㎜	0 ~ 3.2 ㎜	0 ~ 4.0 ㎜	0 ~ 6.4 ㎜
Frequency	800 ㎐		800 ㎐	400 ㎐	350 ㎐	200 ㎐
Hysteresis	Max. 10 % of sensing distance					
Current voltage	12 - 24 V d.c (±10 %)					
Control output	Resistive load : Max. 200 ㎃ Inductive load: Max. 100 ㎃					
Current consumption	Max. 10 ㎃ (At 12 V d.c)					
Residual voltage	Max. 1.5 V		Max. 1 V (At 24 V d.c, 200 ㎃)			
Leakage voltage	Max. 0.5 ㎃ (At 12 V d.c)					
Ambient voltage	-25 ℃~ +70 ℃(Max. ±10 % at +20 ℃ for sensing distance)					
Insulation resistance	Min. 50 ㏁ (At 500 V d.c)					
Dielectric strength	2,000 V a.c for 1 minute (At 50/60 Hz)					
Vibration	10 - 55 ㎐, Double amplitude 1.5 ㎜, X · Y · Z each position for 2 hours					
Shock	500 ㎨ (Approx.50G), X · Y · Z each position for 3 times					
Display	Red LED					
Protection circuit	Surge protection/Reverse polarity protection					
Protection	IP67(IEC)					
Material	Case: stainless Face: PBT resin		Case: stainless Face: PBT resin Holder : PC		Case : Brass(Chrome plating) Face : PBT resin Holder : PC	

DC SWITCHING INDUCTIVE SENSOR (Round Type)

Model	HYP-18RL5N□ HYP-18RL5P□	HYP-18RL8N□ HYP-18RL8P□	HYP-30R10N□ HYP-30R10P□	HYP-30R15N□ HYP-30R15P□	HYP-30RL10N□ HYP-30RL10P□	HYP-30RL15N□ HYP-30RL15P□
Appearance						
Ø/ L (㎜)	18/80	18/80	30/57	30/57	30/80	30/80
Object	Steel 18 ×18 ×1 ㎜	Steel 25 ×25 ×1 ㎜	Steel 30 ×30 ×1 ㎜	Steel 45 ×45 ×1 ㎜	Steel 30 ×30 ×1 ㎜	Steel 45 ×45 ×1 ㎜
Sensing distance	5 ㎜	8 ㎜	10 ㎜	15 ㎜	10 ㎜	15 ㎜
Mounting distance	0 ~ 4.0 ㎜	0 ~ 6.4 ㎜	0 ~ 8.0 ㎜	0 ~ 12.0 ㎜	0 ~ 8 ㎜	0 ~ 12 ㎜
Frequency	350 ㎐	200 ㎐	250 ㎐	100 ㎐	250 ㎐	100 ㎐
Hysteresis	Max. 10% of sensing distance					
Current voltage	12 - 24 V d.c (±10 %)					
Control output	Resistive load : Max. 200 ㎃ Inductive load : Max. 100 ㎃					
Power consumption	Max. 10 ㎃ (At 12 V d.c)					
Residual voltage	Max. 1V (At 24 V d.c, 200 ㎃)					
Leakage voltage	Max. 0.5 ㎃ (At 12 V d.c)					
Ambient voltage	-25 ℃~ +70 ℃(Max. ±10 % at +20 ℃ for sensing distance)					
Insulation resistance	Min. 50 ㏁ (At 500 V d.c)					
Dielectric strength	2,000 V a.c for 1 minute (At 50/60 ㎐)					
Vibration	10 - 55 ㎐, Double amplitude 1.5 ㎜, X · Y · Z each position for 2 hours					
Shock	500 ㎨ (Approx.50G), X · Y · Z each position for 3 times					
Display	Red LED					
Protection circuit	Surge protection/Reverse polarity protection					
Protection	IP67(IEC)					
Material	Case : Brass(Chrome plating) Fase : PBT resin Holder : PC					

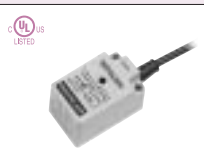
AC SWITCHING INDUCTIVE SENSOR (Square Type)

Model	HYP-25S5A□ HYP-25S8A□	HYP-30S10A□ HYP-30S15A□	HYP-40S20A□
Appearance			
W×H×D (㎜)	25(W) ×25(H) ×51.8(D)	30(W) ×30(H)×54.8(D)	40(W) ×40(H)×55.0(D)
Object	Steel 25 ×25 ×1 ㎜ Steel 30 ×30 ×1 ㎜	Steel 40 ×40×1 ㎜ Steel 50×50 ×1 ㎜	Steel 60 ×60×1 ㎜
Sensing distance	5 ㎜ 8 ㎜	10 ㎜ 15 ㎜	20 ㎜
Mounting distance	0 ~ 4.0 ㎜ 0 ~ 6.4 ㎜	0 ~ 8.0 ㎜ 0 ~ 12.0 ㎜	0~16.0 ㎜
Frequency	20 ㎐		
Hysteresis	Max. 10 % of sensing distance		
Power voltage	100 - 240 V a.c (±10 %)		
Control output	Max. 200 ㎃ (At 220 V a.c)		
Residual voltage	Max. 2.2 ㎃ (At 220 V a.c, 200 ㎃)		
Leakage voltage	Max. 10 V a.c (At 220 V a.c, 200 ㎃)		
Ambient temperature	-25 ℃ ~ +70 ℃(Max. ±10 % at 20 ℃ of sensing distance)		
Insulation resistance	Min.50 ㏁ (At 500 V a.c)		
Dielectric strength	2,000 V a.c for 1 minute (At 50/60 ㎐)		
Vibration	10 ~ 55 ㎐, Double amplitude 1.5 ㎜, X · Y · Z each position for 2 hours		
Shock	500 ㎨ (Approx. 50G), X · Y · Z each position for 3 times		
Display	Red LED		
Protection circuit	Surge protection		
Protection	IP67 (IEC)		
Material	Case: PBT resin		

AC SWITCHING INDUCTIVE SENSOR (Round Type)

Model	HYP-12R2A □	HYP-12R4A □	HYP-18R5A □	HYP-18R8A □	HYP-18RL5A □	HYP-18RL8A □	HYP-30R10A □	HYP-30R15A □	HYP-30RL10A □	HYP-30RL15A □
Appearance										
Ø/ L (㎜)	12/43	12/60	18/53	18/53	18/80	18/80	30/57	30/57	30/80	30/80
Object	Steel12 ×12 ×1㎜	Steel12 ×12 ×1㎜	Steel18 ×18×1㎜	Steel25 ×25 ×1㎜	Steel18 ×18 ×1㎜	Steel25 ×25 ×1㎜	Steel30 ×30 ×1㎜	Steel45×45×1㎜	Steel30 ×30 ×1㎜	Steel45×45×1㎜
Sensing distance	2 ㎜	4 ㎜	5 ㎜	8 ㎜	5㎜	8㎜	10㎜	15㎜	10㎜	15㎜
Mounting distance	0 ~ 1.6㎜	0 ~ 3.2㎜	0~4.0㎜	0 ~ 6.4㎜	0~4.0㎜	0 ~ 6.4㎜	0 ~ 8.0㎜	0 ~ 12.0 ㎜	0 ~ 8.0㎜	0 ~ 12.0㎜
Frequency	20 ㎐									
Hysteresis	Max. 10% of sensing distance									
Power voltage	100 - 240 V a.c (±10 %)									
Control output	Max. 200 ㎃ (At 220 V a.c)									
Residual voltage	Max. 10 V a.c (At 220 V a.c, 200 ㎃)									
Leakage current	Max. 2.2 ㎃ (At 220 V a.c, 200 ㎃)									
Ambient temperature	-25 ℃ ~ +70 ℃(Max. ±10 % at 20 ℃ of sensing distance)									
Insulation resistance	Min. 50 ㏁ (At 500 V a.c)									
Dielectric strength	2,000 V a.c for 1 minute (At 50/60 ㎐)									
Vibration	10 - 55 ㎐, Double amplitude 1.5 ㎜, X · Y · Z each position for 2 hours									
Shock	500 ㎨ (Approx. 50G), X · Y · Z each position for 3 times									
Display	Red LED									
Protection circuit	Surge protection									
Protection	IP67 (IEC)									
Material	Case:Stainless Face:PBT resin Holder : PC		Case:Brass(Chrome plating) Face:PBT resin Holder : PC							

DC 2WIRE SWITCHING INDUCTIVE SENSOR (Square Type)

Model	HYP-18S5T□ HYP-18S8T□	HYP-25S5T□ HYP-25S8T□ HYP-25S12T□	HYP-30S10T□ HYP-30S15T□	HYP-40S20T□
Appearance				
W ×H ×D (㎜)	18 ×18 ×37.5	25 ×25 ×40.8	30 ×30 ×54.8	40 ×40 ×55.0
Object	Steel 18 ×18 ×1 ㎜ Steel 25 ×25 ×1 ㎜	Steel 25 ×25 ×1 ㎜ Steel 25 ×30 ×1 ㎜ Steel 35 ×35 ×1 ㎜	Steel 30 ×30 ×1 ㎜ Steel 45 ×45 ×1 ㎜	Steel 50 ×50 ×1 ㎜
Sensing distance (㎜)	5 ㎜ 8 ㎜	5 ㎜ 8 ㎜ 12 ㎜	10 ㎜ 15 ㎜	20 ㎜
Mounting distance	0 ~ 4.0 ㎜ 0 ~ 6.4 ㎜	0 ~ 4.0 ㎜ 0 ~ 6.4 ㎜ 0~9.6 ㎜	0 ~ 8.0 ㎜ 0 ~ 12.0 ㎜	0 ~ 16.0 ㎜
Frequency	500 ㎐ 300 Hz	350 Hz 250 Hz 200 Hz	250 Hz 100 Hz	100 Hz
hysteresis	Max. 10% of sensing distance			
Power voltage	12 - 24 V d.c (±10 %)			
Control output	Resistive load : Max. 200 ㎃ Inductive load : Max. 100 ㎃			
Residual voltage	Max. 7 V			
Leakage current	Max. 1 ㎃			
Ambient temperature	-25 ℃ ~ +70 ℃(At ±10 % at+20 ℃ for sensing distance)			
Insulation resistance	Min. 50 ㏁ (At 500 V d.c)			
Dielectric strength	2,000 V a.c for 1 minute (At 50/60 ㎐)			
Vibration	10 - 55 ㎐, Double amplitude width 1.5 ㎜, X · Y · Z each position for 2 hours			
Shock	500 ㎨ (Approx. 50G), X · Y · Z each position for 3 times			
Display	Red LED			
Protection circuit	Surge protection/ reverse polarity protection			
Protection	IP67(IEC)			
Material	Case: PBT resin			

DC 2WIRE SWITCHING INDUCTIVE SENSOR (Round Type)

MODEL	HYP-8R1.5T□	HYP-8R2T□	HYP-12R2T□	HYP-12R4T□	HYP-18R5T□	HYP-18R8T□
Appearance						
Ø/ L (㎜)	8 ×30	8 ×30	12 ×43	12 ×43	18 ×47	18 ×47
Object	Steel8 ×8 ×1 ㎜		Steel12 ×12 ×1 ㎜		Steel18 ×18 ×1 ㎜	Steel25 ×25 ×1 ㎜
Sensing distance	1.5 ㎜	2 ㎜	2 ㎜	4 ㎜	5 ㎜	8 ㎜
Mounting distance	0 ~ 1.2 ㎜	0 ~ 1.6 ㎜	0 ~ 1.6 ㎜	0 ~ 3.2 ㎜	0 ~ 4.0 ㎜	0 ~ 6.4 ㎜
Frequency	800Hz		800Hz	400Hz	350Hz	200Hz
Hysteresis	Max. 10 % of sensing distance					
Power voltage	24 V d.c (±10 %)					
Control output	Resistive load : Max. 200 ㎃ Inductive load: Max. 100 ㎃					
Residual voltage	Max. 7 V					
Leakage voltage	Max. 1 ㎃					
Ambient voltage	-25 ℃~ +70 ℃(Max. ±10 % at +20 ℃ for sensing distance)					
Insulation resistance	Min. 50 ㏁(At 500 V d.c)					
Dielectric strength	2,000 V a.c for 1 minute (At 50/60 Hz)					
Vibration	10 - 55 Hz, Double amplitude 1.5 mm, X · Y · Z each position for 2 hours					
Shock	500 ㎨ (Approx.50G), X · Y · Z each position for 3 times					
Display	Red LED					
Protection circuit	Surge protection/Reverse polarity protection(Exception : HYP-8RT Series)					
Protection	IP67(IEC)					
Material	Case: stainless Face: PBT resin Holder : PC		Case : Stainless Face : PBT resin Holder : PC		Case : Brass (Chrome plating) Face : PBT resin Holder : PC	

DC 2WIRE SWITCHING INDUCTIVE SENSOR (Round Type)

MODEL	HYP-18RL5T□	HYP-18RL8T□	HYP-30R10T□	HYP-30R15T□	HYP-30RL10T□	HYP-30RL15T□
Appearance						
Ø/ L (㎜)	18/80	18/80	30/57	30/57	30/80	30/80
Object	Steel 18 ×18 ×1 ㎜	Steel 25 ×25 ×1 ㎜	Steel 30 ×30 ×1 ㎜	Steel 45 ×45 ×1 ㎜	Steel 30 ×30 ×1 ㎜	Steel 45 ×45 ×1 ㎜
Sensing distance	5 ㎜	8 ㎜	10 ㎜	15 ㎜	10 ㎜	15 ㎜
Mounting distance	0 ~ 4.0 ㎜	0 ~ 6.4 ㎜	0 ~ 8.0 ㎜	0 ~ 12.0 ㎜	0 ~ 8 ㎜	0~12 ㎜
Frequency	350Hz	200Hz	250Hz	100Hz	250Hz	100Hz
Hysteresis	Max. 10 % of sensing distance					
Power voltage	24 V d.c (±10 %)					
Control output	Resistive load : Max. 200 ㎃ Inductive load: Max. 100 ㎃					
Residual voltage	Max. 7 V					
Leakage voltage	Max. 1 ㎃					
Ambient voltage	-25 ℃~ +70 ℃(Max. ±10 % at +20 ℃ for sensing distance)					
Insulation resistance	Min. 50 ㏁(At 500 V d.c)					
Dielectric strength	2,000 V a.c for 1 minute (At 50/60 Hz)					
Vibration	10 - 55 Hz, Double amplitude 1.5 mm, X · Y · Z each position for 2 hours					
Shock	500 ㎨ (Approx.50G), X · Y · Z each position for 3 times					
Display	Red LED					
Protection circuit	Surge protection/Reverse polarity protection					
Protection	IP67(IEC)					
Material	Case : Brass(Chrome plating) Face : PBT resin Holder : PC					

DC SWITCHING INDUCTIVE SENSOR (Relay Connector , Round Type)

Model	HYP-12R2N□-CR 12R2P□-CR	HYP-12R4N□-CR 12R4P□-CR	HYP-18R5N□-CR 18R5P□-CR	HYP-18R8N□-CR 18R8P□-CR	HYP-18RL5N□-CR 18RL5P□-CR	HYP-18RL8N□-CR 18RL8P□-CR	HYP-30R10N□-CR 30R10P□-CR	HYP-30R15N□-CR 30R15P□-CR	HYP-30RL10N□-CR 30RL10P□-CR	HYP-30RL15N□-CR 30RL15P□-CR
Appearance										
Ø/ L (㎜)	12×43	12×43	18×47	18×47	18×80	18×80	30×57	30×57	30×80	30×80
Object	Steel12×12×1 ㎜		Steel18×18×1 ㎜	Steel25×25×1 ㎜	Steel18×18×1 ㎜	Steel25×25×1 ㎜	Steel30×30×1 ㎜	Steel45×45×1 ㎜	Steel30×30×1 ㎜	Steel45×45×1 ㎜
Sensing distance	2 ㎜	4 ㎜	5 ㎜	8 ㎜	5 ㎜	8 ㎜	10 ㎜	15 ㎜	10 ㎜	15 ㎜
Mounting distance	0 ~ 1.6 ㎜	0 ~ 3.2 ㎜	0 ~ 4.0 ㎜	0 ~ 6.4 ㎜	0 ~ 4.0 ㎜	0 ~ 6.4 ㎜	0 ~ 8.0 ㎜	0 ~ 12.0 ㎜	0 ~ 8.0 ㎜	0 ~ 12.0 ㎜
Frequency	800Hz	400Hz	350Hz	200Hz	350Hz	200Hz	250Hz	100Hz	250Hz	100Hz
Hysteresis	Max. 10 % of sensing distance									
Current voltage	12 - 24 V d.c (±10 %)									
Control output	Resistive load : Max. 200 ㎃ Inductive load : Max. 100 ㎃									
Current consumption	Max. 10 ㎃ (At 12 V d.c)									
Residual voltage	Max. 1 V (At 24 V d.c, 200 ㎃)									
Leakage current	Max. 0.5 ㎃ (At 12 V d.c)									
Ambient temperature	-25 ℃~ +70 ℃(Max. ±10 %, at +20 ℃ for sensing distance)									
Insulation resistance	Min. 50 ㏁ (At 500 V d.c)									
Dielectric strength	2,000 V a.c for 1 minute (At 50/60 ㎐)									
Vibration	10 - 55 ㎐, Double amplitude width 1.5 ㎜, X · Y · Z each position for 2 hours									
Shock	500 ㎨ (Approx. 50G), X · Y · Z each position for 3 times									
Display	Red LED									
Protection circuit	Surge protection/ Reverse polarity protection									
Protection	IP67(IEC)									
Material	Case:stainless, Face:PBT resin		Case : Brass(Chrome plating), Face : PBT resin							
	Holder : PC		Holder : PC							

AC SWITCHING INDUCTIVE SENSOR (Relay Connector, Round Type)

Model	HYP-12R2A□-CR	HYP-12R4A□-CR	HYP-18R5A□-CR	HYP-18R8A□-CR	HYP-18RL5A□-CR	HYP-18RL8A□-CR	HYP-30R10A□-CR	HYP-30R15A□-CR	HYP-30RL10A□-CR	HYP-30RL15A□-CR
Appearance										
Ø/ L (㎜)	12/60	12/60	18/53	18/53	18/80	18/80	30/57	30/57	30/80	30/80
Object	Steel12×12×1㎜	Steel12×12×1㎜	Steel18×18×1㎜	Steel25×25×1㎜	Steel18×18×1㎜	Steel25×25×1㎜	Steel30×30×1㎜	Steel45×45×1㎜	Steel30×30×1㎜	Steel45×45×1㎜
Sensing distance	2㎜	4㎜	5㎜	8㎜	5㎜	8㎜	10㎜	15㎜	10㎜	15㎜
Mounting distance	0~1.6㎜	0~3.2㎜	0~4㎜	0~6.4㎜	0~4.0㎜	0~6.4㎜	0~8.0㎜	0~12.0㎜	0~8.0㎜	0~12.0㎜
Frequency	20㎐									
Hysteresis	Max. 10 % of sensing distance									
Power voltage	100 - 240 V a.c (±10 %)									
Control output	Max. 200㎃ (At 220 V a.c)									
Leakage current	Max. 2.2㎃ (At 220 V a.c, 200㎃)									
Residual voltage	Max. 10 V a.c (At 220 V a.c, 200㎃)									
Ambient temperature	-25℃~+70℃ (+Max. ±10 % at 20℃ of sensing distance)									
Insulation resistance	Min. 50㏁ (At 500 V d.c)									
Dielectric strength	2,000 V a.c for 1minute (At 50/60㎐)									
Vibration	10 - 55㎐, Double amplitude 1.5㎜, X · Y · Z each position for 2 hours									
Shock	500㎨ (Approx. 50G), X · Y · Z each position for 3 times									
Display	Red LED									
Protection circuit	Surge protection									
Protection	IP67 (IEC)									
Material	Case:Stainless, Face:PBT resin		Case:Brass(Chrome plating), Face:PBT resin							

DC 2WIRE SWITCHING INDUCTIVE SENSOR (Relay Connector,Round Type)

Model	HYP-12R2T□-C	HYP-12R4T□-C	HYP-18R5T□-C	HYP-18R8T□-C	HYP-18RL5T□-C	HYP-18RL8T□-C	HYP-30R10T□-C	HYP-30R15T□-C	HYP-30RL10T□-C	HYP-30RL15T□-C
Appearance										
Ø/ L (㎜)	12/43	12/43	18/47	18/47	18/80	18/80	30/57	30/57	30/80	30/80
Object	Steel12×12×1㎜		Steel18×18×1㎜	Steel25×25×1㎜	Steel18×18×1㎜	Steel25×25×1㎜	Steel30×30×1㎜	Steel45×45×1㎜	Steel30×30×1㎜	Steel45×45×1㎜
Sensing distance	2㎜	4㎜	5㎜	8㎜	5㎜	8㎜	10㎜	15㎜	10㎜	15㎜
Mounting distance	0~1.6㎜	0~3.2㎜	0~4.0㎜	0~6.4㎜	0~4.0㎜	0~6.4㎜	0~8.0㎜	0~12.0㎜	0~8.0㎜	0~12.0㎜
Frequency	800㎐	400㎐	350㎐	200㎐	350㎐	200㎐	250㎐	100㎐	250㎐	100㎐
Hysteresis	Max. 10 % of sensing distance									
Power voltage	24 V d.c (±10 %)									
Control output	Resistive load: Max. 50㎃ Inductive load: Max. 25㎃									
Residual voltage	Max. 7 V									
Leakage current	Max. 1㎃									
Ambient temperature	-25℃~+70℃ (Max. ±10 %, at +20℃ for sensing distance)									
Insulation resistance	Min. 50㎁ (At 500 V d.c)									
Dielectric strength	2,000 V a.c for 1 minute (At 50/60㎐)									
Vibration	10 - 55㎐ Double amplitude width 1.5mm, X · Y · Z each position for 2 hours									
Shock	500㎨ (Approx. 50G), X · Y · Z each position for 3 times									
Display	Red LED									
Protection circuit	Surge protection									
Protection	IP67(IEC)									
Material	Case:Stainless, Face:PBT resin		Case : Brass (Chrome plating), Face : PBT resin							
	Holder : PC		Holder : PC							

DC SWITCHING INDUCTIVE SENSOR (Connector, Round Type)

Model	HYP- 12R2N□-C 12R2P□-C	HYP- 12R4N□-C 12R4P□-C	HYP- 18R5N□-C 18R5P□-C	HYP- 18R8N□-C 18R8P□-C	HYP- 18RL5N□-C 18RL5P□-C	HYP- 18RL8N□-C 18RL8P□-C	HYP- 30R10N□-C 30R10P□-C	HYP- 30R15N□-C 30R15P□-C	HYP- 30RL10N□-C 30RL10P□-C	HYP- 30RL15N□-C 30RL15P□-C
Appearance										
Ø/ L (㎜)	12/57	12/57	18/55	18/55	18/88	18/88	30/63	30/63	30/85	30/85
Object	Steel12×12×1 ㎜		Steel18×18×1 ㎜	Steel25×25×1 ㎜	Steel18×18×1 ㎜	Steel25×25×1 ㎜	Steel30×30×1 ㎜	Steel45×45×1 ㎜	Steel30×30×1 ㎜	Steel45×45×1 ㎜
Sensing distance	2 ㎜	4 ㎜	5 ㎜	8 ㎜	5 ㎜	8 ㎜	10 ㎜	15 ㎜	10 ㎜	15 ㎜
Mounting distance	0~1.6 ㎜	0~3.2 ㎜	0~4.0 ㎜	0~6.4 ㎜	0~4.0 ㎜	0~6.4 ㎜	0~8.0 ㎜	0~12.0 ㎜	0~8.0 ㎜	0~12.0 ㎜
Frequency	800 ㎐	400 ㎐	350 ㎐	200 ㎐	350 ㎐	200 ㎐	250 ㎐	100 ㎐	250 ㎐	100 ㎐
Hysteresis	Max. 10 % of sensing distance									
Power voltage	12 - 24 V d.c (±10 %)									
Control output	Resistive load : Max. 200 ㎃ Inductive load : Max. 100 ㎃									
Current consumption	Max. 10 ㎃ (At 12 V d.c)									
Residual voltage	Max. 1V (At 24 V d.,c, 200 ㎃)									
Leakage current	Max. 0.5 ㎃ (At 12 V d.c)									
Ambient temperature	-25 ℃~+70 ℃ (Max. ±10 %, at +20 ℃ for sensing distance)									
Insulation resistance	Min. 50 ㏁ (At 500 V d.c)									
Dielectric strength	2,000 V a.c for 1 minute (At 50/60 ㎐)									
Vibration	10 - 55 ㎐, Double amplitude width 1.5 ㎜, X · Y · Z each position for 2 hours									
Shock	500 ㎨ (Approx. 50G), X · Y · Z each position for 3 times									
Display	Red LED									
Protection circuit	Surge protection/ Reverse polarity protection									
Protection	IP67(IEC)									
Material	Case : Stainless, Face : PBT resin		Case : Brass(Chrome plating), Face : PBT resin							
	Holder : PC		Holder : PC							

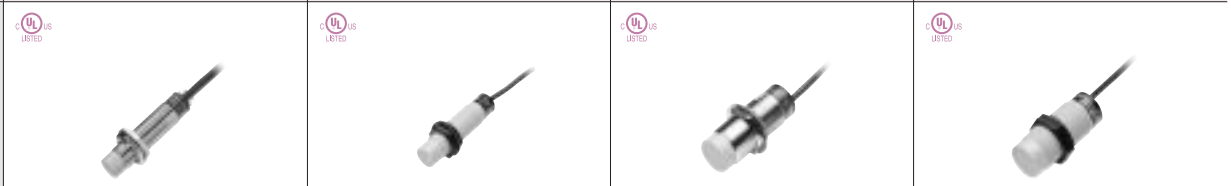
DC 2WIRE SWITCHING INDUCTIVE SENSOR (Connector,Round Type)

Model	HYP- 12R2T□-C	HYP- 12R4T□-C	HYP- 18R5T□-C	HYP- 18R8T□-C	HYP- 18RL5T□-C	HYP- 18RL8T□-C	HYP- 30R10T□-C	HYP- 30R15T□-C	HYP- 30RL10T□-C	HYP- 30RL15T□-C
Appearance										
Ø/ L (㎜)	12/43	12/43	18/47	18/47	18/80	18/80	30/57	30/57	30/80	30/80
Object	Steel12×12×1 ㎜		Steel18×18×1 ㎜	Steel25×25×1 ㎜	Steel18×18×1 ㎜	Steel25×25×1 ㎜	Steel30×30×1 ㎜	Steel45×45×1 ㎜	Steel30×30×1 ㎜	Steel45×45×1 ㎜
Sensing distance	2 ㎜	4 ㎜	5 ㎜	8 ㎜	5 ㎜	8 ㎜	10 ㎜	15 ㎜	10 ㎜	15 ㎜
Mounting distance	0~1.6 ㎜	0~3.2 ㎜	0~4.0 ㎜	0~6.4 ㎜	0~4.0 ㎜	0~6.4 ㎜	0~8.0 ㎜	0~12.0 ㎜	0~8.0 ㎜	0~12.0 ㎜
Frequency	800 ㎐	400 ㎐	350 ㎐	200 ㎐	350 ㎐	200 ㎐	250 ㎐	100 ㎐	250 ㎐	100 ㎐
Hysteresis	Max. 10 % of sensing distance									
Power voltage	24 V d.c (±10 %)									
Control output	Resistive load:Max. 50 ㎃, Inductive load:Max. 25 ㎃									
Residual voltage	Max. 7 V									
Leakage current	Max. 1 ㎃									
Ambient temperature	-25 ℃~+70 ℃ (+Max. ±10 % at 20 ℃ of sensing distance)									
Insulation resistance	Min. 50 ㎃ (At 500 V d.c mega)									
Dielectric strength	2,000 V a.c for 1 minute (At 50/60 ㎐)									
Vibration	10 - 55 ㎐, Double amplitude 1.5 ㎜, X · Y · Z each position for 2 hours									
Shock	500 ㎨ (Approx. 50G), X · Y · Z each position for 3 times									
Display	Red LED									
Protection circuit	Surge protection									
Protection	IP67 (IEC)									
Material	Case:Stainless, Face:PBT resin		Case:Brass(Chrome plating), Face:PBT resin							
	Holder : PC		Holder : PC							

AC SWITCHING INDUCTIVE SENSOR (Connector,Round Type)

Model	HYP-12R2A□-C	HYP-12R4A□-C	HYP-18R5A□-C	HYP-18R8A□-C	HYP-18RL5A□-C	HYP-18RL8A□-C	HYP-30R10A□-C	HYP-30R15A□-C	HYP-30RL10A□-C	HYP-30RL15A□-C
Appearance										
Ø/ L (㎜)	12/57	12/74	18/55	18/62	18/71	18/88	30/63	30/63	30/85	30/85
Object	Steel12 ×12× 1 ㎜	Steel12 ×12× 1 ㎜	Steel18 ×18 × 1 ㎜	Steel25 ×25 × 1 ㎜	Steel18 ×18 × 1 ㎜	Steel25 ×25× 1 ㎜	Steel30 ×30 × 1 ㎜	Steel45 ×45 × 1 ㎜	Steel30 ×30 × 1 ㎜	Steel45 ×45 × 1 ㎜
Sensing distance	2 ㎜	4 ㎜	5 ㎜	8 ㎜	5 ㎜	8 ㎜	10 ㎜	15 ㎜	10 ㎜	15 ㎜
Mounting distance	0 ~ 1.6 ㎜	0 ~ 3.2 ㎜	0 ~ 4.0 ㎜	0 ~ 6.4 ㎜	0 ~ 4.0 ㎜	0 ~ 6.4 ㎜	0 ~ 8.0 ㎜	0 ~ 12.0 ㎜	0 ~ 8.0 ㎜	0 ~ 12.0 ㎜
Frequency	20 ㎐									
Hysteresis	Max. 10 % of sensing distance									
Power voltage	100 - 240 V a.c (±10 %)									
Control output	Max. 200 ㎃ (At 220 V a.c)									
Residual voltage	Max. 10 V a.c (At 220 V a.c, 200 ㎃)									
Leakage current	Max. 2.2 ㎃ (At 220 V a.c, 200 ㎃)									
Ambient temperature	-25 ℃ ~ +70 ℃ (Max. ±10 % at 20 ℃ of sensing distance)									
Insulation resistance	Min. 50 ㏁ (At 500 V d.c)									
Dielectric strength	2,000 V a.c for 1 minute (At 50/60 ㎐)									
Vibration	10 - 55 ㎐, Double amplitude 1.5 ㎜, X · Y · Z each position for 2 hours									
Shock	500 ㎨ (Approx. 50G), X · Y · Z each position for 3 times									
Display	Red LED									
Protection circuit	Surge protection									
Protection	IP67 (IEC)									
Material	Case : Stainless, Face : PBT resin		Case : Brass(Chrome plating), Face : PBT resin							
	Holder : PC		Holder : PC							

DC CAPACITIVE PROXIMITY SENSOR (Round Type)

Model	HCP-18R8N□ / HCP-18R8P□	HCP-18RP8N□ / HCP-18RP8P□	HCP-30R15N□ / HCP-30R15P□	HCP-30RP15N□ / HCP-30RP15P□
Appearance				
Ø/ L (㎜)	18/75	18×75	30×73.5	30×73.5
Object	Steel 50 X 50 X 1 ㎜			
Sensing distance	8 ㎜ (variable)	8 ㎜ (variable)	15 ㎜ (variable)	15 ㎜(variable)
Mounting distance	0 ~ 6.4 ㎜	0 ~ 6.4 ㎜	0 ~ 12.0 ㎜	0 ~ 12.0 ㎜
Frequency	50 ㎐			
Hysterisis	Max. 20 % of sensing distance			
Power voltage	12 - 24 V d.c (±10 %)			
Control Output	Resistive load : Max. 200 mA Inductive load : Max. 100 mA			
Residual voltage	Max.1.5V (At 24 V d.c, 200 mA)			
Leakage current	Max. 15 mA (At 12 V d.c)			
Ambient temperature	-25 ℃ ~ +70 ℃ (Max. ±10 % at 20 ℃ of sensing distance)			
Insulation resistance	Min 50 ㏁			
Dielectric strength	2,000 V a.c for 1 minute (At 50/60 ㎐)			
Vibration	10 - 55 ㎐, Double amplitude 1.5 ㎜, X · Y · Z each position for 2 hours			
Shock	500 ㎨ (Approx. 50 G), X · Y · Z each position for 3 times			
Display	Red LED			
Protection circuit	Surge protection, Reverse polarity protection			
Protection	IP67 (IEC)			
Material	HCP-18R, 30R TYPE	Case : Brass(Chrome plating)	Face : PBT resin	Holder : PC
	HCP-18RP, 30RP TYPE	Case : PBT resin	Face : PBT resin	Holder : PC

AC CAPACITIVE PROXIMITY SENSOR (Round Type)

Model	HYP-18R8A□	HCP-18RP8A□	HCP-30R15A□	HCP-30RP15A□
Appearance				
Ø/ L (㎜)	18/75	18/75	30/73.5	30/73.5
Object	Steel 50 X 50 X 1 ㎜			
Sensing distance	8 ㎜ (variable)	8 ㎜ (variable)	15 ㎜ (variable)	15 ㎜ (variable)
Mounting distance	0 ~ 6.4 ㎜	0 ~ 6.4 ㎜	0 ~ 12.0 ㎜	0 ~ 12.0 ㎜
Frequency	20 ㎐			
Hysterisis	Max. 20 % of sensing distance			
Power voltage	100 - 240 V a.c (±10 %)			
Control Output	Max. 200 ㎃ (At 240 V a.c)			
Residual voltage	Max. 20 V a.c			
Leakage current	Max. 2.2 ㎃			
Ambient temperature	-25 ℃ ~ +70 ℃(Max. ±20 % At 20 ℃ of sensing distance)			
Insulation resistance	Min. 50 Ω			
Dielectric strength	2,000 V a.c for 1 minute (At 50/60 ㎐)			
Vibration	10 - 55 ㎐, Double amplitude 1.5 ㎜, X · Y · Z each position for 2 hours			
Shock	500 ㎨ (Approx. 50 G), X · Y · Z each position for 3 times			
Display	Red LED			
Protection circuit	Surge protection			
Protection	IP67 (IEC)			
Material	HCP-18 R, 30 R TYPE	Case : Brass(Chrome plating)	Face : PBT resin	Holder : PC
	HCP-18 RP, 30 RP TYPE	Case : PBT resin	Face : PBT resin	Holder : PC

DC CAPACITIVE PROXIMITY SENSOR (Relay Connector, Round Type)

Model	HCP-18R8N □-CR HCP-18R8P □-CR	HCP-18RP8N □-CR HCP-18RP8P □-CR	HCP-30R15N □-CR HCP-30R15P □-CR	HCP-30RP15N □-CR HCP-30RP15P □-CR
Appearance				
Ø/ L (㎜)	18/75	18/75	30/73.5	30/73.5
Object	Steel 50X50X1 ㎜			
Sensing distance	8 ㎜ (Variable)	8 ㎜ (Variable)	15 ㎜ (Variable)	15 ㎜ (Variable)
Mounting distance	0 ~ 6.4 ㎜	0 ~ 6.4 ㎜	0 ~ 12.0 ㎜	0 ~ 12.0 ㎜
Frequency	50 ㎐			
Hysterisis	Max. 20 % of sensing distance			
Power voltage	12 - 24 V d.c (±10 %)			
Control output	Resistive load : Max. 200 ㎃ Inductive load : Max. 100 ㎃			
Residual voltage	Max. 1.5 V (At 24 V d.c , 200 ㎃)			
Leakage current	Max. 0.5 ㎃ (At 12 V d.c)			
Ambient temperature	-25 ℃ ~ +70 ℃(Max. +20 % at ±20 ℃ for sensing distance)			
Insulation resistance	Min. 50 ㏁ (At 500 V d.c)			
Dielectric strenght	2,000 V a.c for 1minute (At 50 / 60 ㎐)			
Vibration	10 - 55 ㎐, Double amplitude, 1.5 ㎜, X · Y · Z each position for 2 hours			
Shock	500 ㎨ (Approx, 50 G) X · Y · Z each position for 3 time			
LED indicators	Red L.E.D			
Protection circuit	Surge protection , Reverse polarity protection			
Protection	IP67(IEC)			
Material	HCP-18R, 30R TYPE Case : Brass(Chrome plating) Face : PBT resin Holder : PC			
	HCP-18RP, 30RP TYPE Case : PBT resin Face : PBT resin Holder : PC			

AC CAPACITIVE PROXIMITY SENSOR (Relay Connector, Round Type)

Model	HCP-18R8A □-CR	HCP-18RP8A □-CR	HCP-30R15A □-CR	HCP-30RP15A □-CR
Appearance				
Ø/ L (㎜)	18/75	18/75	30/73.5	30/73.5
Object	Steel 50X50X1 ㎜			
Sensing distance	8 ㎜ (Variable)	8 ㎜ (Variable)	15 ㎜ (Variable)	15 ㎜(Variable)
Mounting distance	0 ~ 6.4 ㎜	0 ~ 6.4 ㎜	0 ~ 12.0 ㎜	0 ~ 12.0 ㎜
Frequency	20 ㎐			
Hysterisis	Max. 20 % of sensing distance			
Power voltage	100 - 240 V a.c (±10 %)			
Control output	Max. 200 ㎃(At 240 V a.c)			
Residual voltage	Max. 20 V a.c			
Leakage current	Max. 2.2 ㎃			
Ambient temperature	-25 ℃ ~ +70 ℃(Max. ±10 % at +20 ℃ for sensing distance)			
Insulation resistance	Min. 50 ㏁ (At 500 V d.c)			
Dielectric strenght	2,000 V a.c for 1minute (At 50/60 ㎐)			
Vibration	10 - 55 ㎐, Double amplitude width, 1.5mm, X · Y · Z each position for 2hours			
Shock	500 ㎨ (Approx, 50 G) X · Y · Z each position for 3 time			
LED indicators	Red L.E.D			
Protection circuit	Surge protection			
Protection	IP67(IEC)			
Material	HCP-18R, 30R TYPE Case : Brass(Chrome plating) Face : PBT resin Holder : PC			
	HCP-18RP, 30RP TYPE Case : PBT resin Face : PBT resin Holder : PC			

PEN SERIES

Model	Built in Power Supply	PEN-T10A	PEN-M5A	PEN-R700A
	Built in Amplifier	PEN-T10B	PEN-M5B	PEN-R700B
Appearance				
Type		Through beam	Retro reflection	Diffuse reflection
Sensing distance		10 m	0.1 ~ 5 m	700 ㎜
Detection object		More than Ø16 ㎜ (Opaque object)	More than Ø60 ㎜ (Opaque object)	200 x 200 ㎜ (White no glossy paper)
Power voltage	Built in Power Supply	24 - 240 V a.c/d.c ±10 % 50/60 ㎐		
	Built in Amplifier	12 - 24 V a.c/d.c ±10 %		
Current Consumption	Trns	Less than 30 mA	Less than 40 mA	
	Rcvr	Less than 20 mA		
Control Output	Built in Power Supply	Relay output 1c 250 V a.c 2 A(Resistive load)		
	Built in Amplifier	NPN/PNP Open Collector, 200 mA d.c (Resistive load)		
Operation mode		Light ON / Dark ON		
Response time		Less than 20 ms		
		Less than 1 ㎳	Less than 0.5 ㎳	
Hysteresis		-	-	Within 15% of detecting distance
Light source		Infrared LED		
Protection circuit		Reverse polarity protection circuit, Over current protection circuit		
Connection		Length of code : 1.5 M 5P Ø6 ㎜, Trns : 2P (Built in power supply : 4P Ø4 ㎜, Trns : 2P)		
Ambient light		Sun light: less than 11,000 lx, Incandescent lamp: less than 3,000 lx		
Ambient temperature		Operation : -20 ~ 65 ℃ (Storage : -25 ~ 70 ℃)		
Protection		IP65(IEC)		
Vibration		10 - 55 ㎐, Double amplitude width 1.5 ㎜ , X · Y · Z, each direction for 2 hours		
Dielectric strength		1,000 V a.c (1 minute)		
Insulation resistance		500 ㎨, X.Y.Z each direction 3 times		
Material		Case : Heatproof ABS, Lens : PC		
Insulation resistance		More than 20 ㏁ (At 500V d.c between code and case, adjusting switch and case)		
Weight		150 g (Built in Power Supply), 100 g(Built in Amplifier)		

PE SERIES

MODEL		PE-T5D	PE-R05D	PE-M3D
Appearance				
Type		Through beam	Diffuse reflection	Retro reflection
Sensing distance		5 m	500 ㎜	3 m
Detection object		Substance(over 20 ㎜)	White no-glossy paper (500x500 ㎜)	Substance(over ϕ60 ㎜)
Power voltage		24 - 240 V a.c (50/60 ㎐) / 24 - 240 V d.c		
Current Consumption		Trns : Max. 0.7 W Rcvr : Max. 1.2 W	Max. 2 W	Max. 1.6 W
Operation mode		Dark : ON	Light : ON	Dark : ON
Control Output		Relay output 1c 250 V a.c 2 A(Resistive load)		
Response time		Max. 25 ms		
Hysteresis		—	Max. 20 %	—
Light source		Infrared LED(Modulated)		
LED Indicators		Red LED		
Sensitivity control		—	By sensitivity control volume	
Material	Case	Polycarbonate		
	Lens	Polycarbonate		
Connection		Cable		
Ambient light		Max. 20,000 lx (Max.)		
Ambient temperature and humidity		Max. -10 ℃ ~ 55 ℃, 85 %R.H. (Max.)		
Case protection		IP54(IEC)		
Vibration		10 - 55 ㎐, Double amplitude width 1.5 ㎜, X · Y · Z, each direction for 2 hours		
Dielectric strength		1,500 V a.c for 1 minute		
Insulation resistance		Min. 20 ㏁ (At 500 V d.c, Between code and case, contact and power supply)		
Accessories		Bracket for fixing, Bolt Nut for fixing		

PHOTO SENSOR (PN SERIES)

Model		PN-T3	PN-R02	PN-M1
Appearance				
Type		Through beam	Diffuse reflection	Retro reflection
Sensing distance		3 m	200 ㎜	1 m
Detection object		Substance(over ϕ8 ㎜)	White no-glossy(200 x 200 ㎜)	Substance (over ϕ60 ㎜)
Power voltage		12 - 24 V d.c ±10 %		
Current consumption		Max. 45 mA	Max. 40 mA	
Operating mode		Dark : ON	Light : ON	Dark : ON
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, Over current protection		
Response time		Max. 3 ㎳		
Hysteresis		—	Max. 20 %	—
Light source		Infrared LED(Modulated)		
LED Indicators		Rcvr :Red LED Trns: Green LED	Red LED	
Sensitivity control		—	By sensitivity control volume	—
Material	Case	Polycarbonate		
	Lens	Polycarbonate		
Connection		Cable		
Ambient light		Sun light : Max. 11,000 lx, Incandescent light : Max. 3,000 lx		
Ambient temperature and humidity		-10 ℃ ~ 60 ℃, 85 %R.H. (Max.)		
Case protection		IP54(IEC)		
Vibration		10 - 55 ㎐, Double amplitude 1.5 ㎜, X · Y · Z each direction for 2 hours		
Dielectric strength		500 V a.c for 1 minute		
Insulation resistance		Min. 20 ㏁ (At 500 V d.c, Between code and case, contact and power supply)		
Accessories		Bracket for fixing, Bolt, Nut for fixing		

PHOTO SENSOR (PU SERIES)

Model		PU-30	PU-30S	PU-50	PU-50S
Appearance					
Sensing distance		30 ㎜		50 ㎜	
Detection object		Over ϕ2 ㎜(Substance)	Over ϕ0.4 ㎜ (Substance)	Over ϕ1.5 ㎜ (Substance)	Over ϕ0.6 ㎜ (substance)
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		Reverse polarity protection , Over current protection			
Response time		Max.1 ms			
Light source		Infrared LED(Modulated)			
LED Indicators		Output : Red LED, Power : Green LED			
Sensitive control		—	control volume	—	control volume
Material	Case	Zn			
	Lens	Polycarbonate			
Connection		Cable			
Ambient light		Sun light : Max, 1,100 lx, Incandescence light : Max 3,000 lx			
Ambient temperature and humidity		-25 ℃ ~ +55 ℃, 35 ~ 85 % R.H.			
Case protection		IP65(IEC)			
Vibration		10 - 55Hz, Double amplitude 1.5 ㎜, X · Y · Z each direction for 2 hours			
Dielectric strength		1,500 V a.c for 1minute			
Insulation resistance		Min. 20 ㏁ (At 500 V d.c, Between code and case, contact and power supply)			

PHOTO SENSOR (PR SERIES)

Model		PR-T10NP. PR-T10NC	PR-R300NP. PR-R300NC	PR-M1NP. PR-M1NC
Appearance				
Type		Through beam	Diffuse reflection	Retro reflection
Sensing distance		10 m	300 ㎜	1 m
Detection object		Substance (over ϕ10 ㎜)	White no-glossy paper (200 x 200 ㎜)	Substance(over ϕ25 ㎜)
Power voltage		12 - 24 V d.c ±10 %		
Current consumption		Tcvr : Max. 20 mA Rcvr : Max. 15 mA	Max. 35 mA	
Operating mode		Light ON / Dark ON Selectable		
Control Output		NPN open collector output : Load voltage Max. 30 V d.c, Load current : Max. 200 mA, Residual voltage : Max. 1 V		
Protection circuit		Reverse polarity protection, Over current protection		
Response time		Max. 1.5 ms		
Hysteresis		—	Max. 20 %	—
Light source		Infrared LED (Modulated)		
LED Indicators		Tcvr : Green LED, Rcvr : Red LED	Red LED	
Sensitive control		By sensitive control volume		
Material	Case	Brass, Plastic		
	Lens	Polycarbonate		
Connection		Out going cable		
Ambient light		sun light : Max. 11,000 lx , Incandescence light : Max. 3,000 lx		
Ambient temperature and humidity		-25 ℃ ~ 55 ℃, Max. 35 ~ 85 %RH		
Case protection		IP66 (IEC)		
Vibration		10 - 55 ㎐, Double amplitude 1.5 ㎜, X · Y · Z each direction for 2 hours		
Dielectric strength		500 V a.c for 1 minute		
Insulation resistance		Min. 20 ㏁ (At 500 V d.c, Between code and case, contact and power supply)		
Accessories		Bolt, Nut for fixing		

PHOTO SENSOR (PS Series)

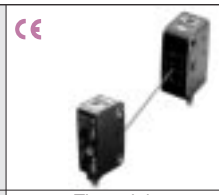
Appearance												
Type		Through beam			Retro reflection	Diffuse reflection			Convergent beam		Distance convergent beam		
Model	NPN type	PS-T1N	PS-T7N	PS-T10RN	PS-M2RN	PS-R7N	PS-R30N	PS-R40RN	PS-Z4N	PS-Z3RN	PS-D3RN	PS-D4RN	PS-D5RN
	PNP type	PS-T1P	PS-T7P	PS-T10RP	PS-M2RP	PS-R7P	PS-R30P	PS-R40RP	PS-Z4P	PS-Z3RP	PS-D3RP	PS-D4RP	PS-D5RP
Sensing distance		1 m	7 m	10 m	0.1 - 2 m	70 ㎜	300 ㎜	400 ㎜	1-40 ㎜	3-30 ㎜	10-30 ㎜	10-40 ㎜	10-50 ㎜
Detection object		Ø6 ㎜			Ø20 ㎜	white no-glossy paper 100 ×100 ㎜	white no-glossy paper 200 ×200 ㎜		white no-glossy paper 100 ×100 ㎜		White no-glossy paper 50×50 ㎜		
Power voltage		+12 - +24 V d.c ±10 % (Ripple ±10 %)											
Current consumption	Trns	Max. 23 ㎃	Max. 20 ㎃	Max. 23 ㎃	Max. 23 ㎃	Max. 28 ㎃	Max. 23 ㎃	Max. 25 ㎃		Max. 23 ㎃		Max. 30 ㎃	
	Rcvr	Max. 20 ㎃	Max. 20 ㎃	Max. 20 ㎃									
Output	Control output	NPN / PNP open collector output, load voltage : Max. 30 V d.c, Resistive load : 100 ㎃, Inductive load : Max. 50 ㎃, Residual voltage : Max.1 V											
	Stability output	NPN open collector output, load voltage : Max. 30 V d.c, Resistive load : Max. 50 ㎃, Residual voltage : Max.1 V											
Operating mode		Light On / Dark On selection by switch Volume built-in type											
Response time		Max. 0.7 ㎳											
Hysteresis		-				Within 20 % of operating distance					Within 10 % of operating distance		
Light source		Infrared emitting diode		Red emitting diode		Infrared emitting diode	Red emitting diode	Infraed emitting diode		Red emitting diode			
Operating indicator		Control output indicator : Red LED, stability output indicator : Green LED(Infrared LED of emitting part for through beam type is power indicator											
Ambient light		Sunlight : Max. 5000 lx											
Ambient temperature		When operating : -25 ~ + 55℃, When preserving : 35 ~ 85 % R.H.(No condensation)											
Ambient humidity		When operating : 35 ~ 85 % R.H., When preserving : 35 ~ 85 % R.H.(No condensation)											
Case protection		IP67(IEC)											
Vibration		10 - 55 ㎐ (Cycle for 1 min.), Double amplitude : 1.5 ㎜, each X · Y · Z direction for 2 hr.											
Shock		500 ㎳ (approx. 50 G), each X · Y · Z direction for 3 time											
Connection		Flying lead NPN 4P(Trns. 2P) / PNP 3P(Trns 2P), Ø3 ㎜, length 2 m			Flying lead NPN 4P / PNP 3P, Ø3 ㎜, length 2 m								
Material		CASE : PC, Lens Cover : PC											
Weight		Trns · Rcvr:each 50 g(Net weight)			Approx. 50 g (Net weight)								

PHOTO SENSOR (PZ1 Series)

Appearance												
Type		Through beam			Retro reflection		Diffuse reflection			Convergent beam	Time convergent beam	
Model	NPN type	PZ1-T1N	PZ1-T5N	PZ1-T7N	PZ1-M1N	PZ1-M2N	PZ1-R10N	PZ1-R30N	PZ1-R40N	PZ1-Z3N	PZ1-Z4N	PZ1-ZT3N	PZ1-ZT4N
	PNP type	PZ1-T1P	PZ1-T5P	PZ1-T7P	PZ1-M1P	PZ1-M2P	PZ1-R10P	PZ1-R30P	PZ1-R40P	PZ1-Z3P	PZ1-Z4P	PZ1-ZT3P	PZ1-ZT4P
Sensing distance		1 m	5 m	7 m	0.1-1 m	0.1-2 m	100 ㎜	30-300 ㎜	40-400 ㎜	10-30 ㎜	10-40 ㎜	10-30 ㎜	10-40 ㎜
Detection object		Opaque object of Min. Ø6 ㎜			Opaque object of Min. Ø48 ㎜		White no-glossy paper 200 ×200 ㎜			White no-glossy paper 50×50 ㎜		
Power voltage		12 - 24 V d.c (±10 %)										
Current consumption	Trns	Max. 20 ㎃ d.c			Max. 30 ㎃ d.c							
	Rcvr	Max. 18 ㎃ d.c										
Operating mode		LIGHT ON(L.ON) / DARK ON(D.ON) Selectable S/W build in type.									Timer settlement V/R built in type	
Control Output		NPN/PNP OPEN collector output , Load current : Max.100 ㎃ d.c (Resistive load), Residual voltage : Max.1 V d.c										
Response time		Max. 1 ㎳									Operating : Max. 3 ㎳ Momentary : Max. 100 ㎳ (At Min. Timer V/R)	
Hysteresis		–					Within 25 % of Operating distance	Within 10 % of Operating distance	Within 10 % of Operating distance			
Light source		Infrared emitting diode										
Material		CASE : PC(EXRL) Lense : PC										
Protection circuit		Reverse polarity protection circuit, over current protection circuit										
Connection		3P (Trsn. 2P), Ø 3.8 ㎜, length : 2 m										
Ambient light		Sunlight : Max. 11,000 lx, Incandescent lamp : Max.3,000 lx										
Ambient temperature		Operating : -25 ~ 55 ℃, Preserving : - 25 ~ 70 ℃(Without condensation)										
Ambient humidity		Max. 35 ~ 85 % R.H.										
Protection structure		IP 65(IEC) (IP67 is an option)										
Vibration		10 - 55 ㎐ (for a minute), double amplitude width : 1.5 ㎜, each X.Y.Z direction for 2hr.										
Dielectric strength		1000 V a.c (50-60 ㎐ for a minute)										
Shock		500 ㎳ (Approx 50 G), each X.Y.Z direction for 3times										
Insulation resistance		20 ㏁ Min.(At 500 V d.c between code and case, adjusting switch and case)										
Weight		Trns., Rcvr. : each approx. 55g			Approx. 60g							

PHOTO SENSOR (PW SERIES)

		PW SERIES			
Appearance					
Type		Distance Convergent Beam			
Model	NPN type	PW-D10RN	PW-D10N	PW-D15N	PW-D20N
	PNP type	PW-D10RP	PW-D10P	PW-D15P	PW-D20P
Sensing distance		10 - 100 ㎜	10 - 100 ㎜	10 - 150 ㎜	10 - 200 ㎜
Detection object		White no-glossy paper 100 ×100 ㎜			
Power voltage		+12 - +24 V d.c ±10 % (Ripple ±10 % (Max.))			
Current consumption		Max. 30 mA			
Output	Control output	NPN open collector output(NPN TYPE)/PNP open collector output(PNP TYPE), Load Current:Max. 100 ㎃, Load voltage:Max. 30 V d.c, NPN open			
	Stabilize output	collector output Load Current:Max. 50 ㎃, Load voltage:Max. 30 V d.c			
Operating mode		Light ON / Dark ON Selectable			
Response time		Max. 0.7 ㎳			
Hysteresis		10 % of operating distance			
Light source		Red LED	Infrared emitting diode		
Operating Indicator		Control outuput indicate : Red LED, Stabilized output indicate : Green LED			
Ambient light		Sunlight : Max. 5000 lx			
Ambient temperature		-25 ~ +55 ℃			
Ambient humidity		35 ~ 85 % R.H.			
Case Protection		IP67(IEC)			
Vibration		10 - 55 ㎐ for 1 minute, Double amplitude width : 1.5 ㎜, X · Y · Z each direction for 2 hours			
Shock		500 ㎨ (About 50 G), X · Y · Z each direction for 10 times			
Connection		NPN type : Ø4/4C(Length : 2 m) PNP type : Ø4/3C(Length : 2 m)			
Material		CASE : Heatproof ABS, Lens Cover : PC(Translucent red)			
Weight		Approx. 80 g			

PHOTO SENSOR (PY SERIES)

		PY series			
Appearance					
Type		Through beam			
Model		PY-T3N		PY-T3P	
		PY-T3N-D	PY-T3N-L	PY-T3P-D	PY-T3P-L
		PY-TL3(Trns.), PY-TR3N-D(Rcvr.)	PY-TL3(Trns.), PY-TR3N-L(Rcvr.)	PY-TL3(Trns.), PY-TR3P-D(Rcvr.)	PY-TL3(Trns.), PY-TR3P-L(Rcvr.)
Detection object		Opaque object of over (Min. Ø5 ㎜)			
Operating mode		Dark ON	Light ON	Dark ON	Light ON
Sensing distance		3 m			
Response time		Max. 1 ㎳			
Power voltage		+12 - + 24 V d.c ±10 % (Ripple Max. ±10 %)			
Current consumption		In case of rating Voltage 24 V d.c, Trns : 23 mA, Rcvr : Max. 18 ㎃			
Light source		Infrared emitting diode			
Control Output		• Load voltage : Max. 30 V d.c • Stability output current : Max. 50 ㎃ • Residual voltage : Max.1 V • NPN open collector output • load current : Max. 100 ㎃		• PNP open collector output • Load current : Max. 100 ㎃ • Residual voltage: Min.(Power voltage -2.0 V)	
Protection circuit		Reverse polarity protection, over current protection			
LED Indicator		Trns. : Power indicate(Red LED), Rcvr. : Operating indicate(Red LED), Stability indicate(Green LED)			
Insulation resistance		Min. 20 ㏁ (At 500 V d.c)			
Dielectric strength		1000 V a.c (for a minute in 50/60 ㎐ mega)			
Vibration		10 - 55 ㎐ (cycle for 1 minute) double amplitude width : 1.5 ㎜, each X · Y · Z direction 2 hrs			
Shock		500 ㎨ (Approx. 50 G) each X · Y · Z direction 2 time			
Ambient light		Sunlight : Max. 11000 lx, Incandescent : Max. 3000 lx			
Ambient temperature		-25 ℃ ~ +65 ℃ (Without freeze)			
Ambient humidity		Operating : 35 - 85 % R.H., preserving : -35 - 90 % R.H.			
Case Protection		IP 67 (IEC)			
Material		Lens, case : PC			
Connection		Trns. : Ø3 ㎜, 2P, Rcvr. : Ø3 ㎜, 3P(NPN:4P), Cable length : 2 m			
Weight		Approx. 66 g			

PHOTO SENSOR (PLD SERIES)

	PLD SERIES	
Appearance		
Type	Diffuse Reflection	
Model	PLD –R2N	PLD-R2P
Detectable distance	2 m (200X200 mm White No reflectible object)	
Detection object	Over Ø6 mm opacity objection	
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)	PNP open collector Max 150 mA d.c (resistance load)
Operation mode	Light On mode	
Response time	Max 1 ms	
Hysteresis	Within 20% of detectable distance	
Light source	Infrared LED (850 ㎚)	
Operation display	Control output : Red LED, Safety : Green LED	
Sensitivity adjustment	Built in sensitivity adjustment V/R (220°degree spin V/R)	
Protection circuit	Power connection protecting circuit, output terminal (over current) protecting circuit	
Ambient intensity of illumination	Light of the sun: Max 11000 Lux Incandescent lamp: Max 3000 Lux	
Ambient temperature	When operating : -20 ~ 55 , when maintaining : -25 ~ 70	
Ambient humidity	Max. 35 ~ 85 % R.H (Freezing not allowed)	
Protectable structure	IP64 (IEC standard)	
Insulating resistance	Min 20 Ω (using 500 V d.c between code and case)	
Dielectric strength	1,000 V a.c, for 1 minute	
Max. vibration	10-55 Hz double amplitude 1.5mm, X,Y,Z each direction for 2 hours	
Max. Shock	500 ㎨ X,Y,Z each direction for 2 times	
Connection method	Number of cable 3P,Thickness : Ø3 mm, length : 2 m.(But, Emitter 2P)	
Material	Case : PET, Lens cap: PC, Lens : PMMA	
Cable	3P (26 AWG), Length : 2 m	
Accessories	Sensitivity adjust driver, Fixing volt (3-M3 X 17L)	
Weight	Approx. 60 g	

PHOTO SENSOR (PF SERIES)

		Digital Multi Control Type		Bar Indication Type
Appearance				
Type		Mediocrity	Multi function	Mediocrity
Model	NPN type	PFD-RGN	PFD-RMN	PFB-RN
	PNP type	PFD-RGP	PFD-RMP	PFB-RP
Power voltage		+12 - 24 V d.c ±10 % (Ripple Max. 10 %)		
Current consumption		Max. 30 ㎃		Max. 45 ㎃
Output	Control	Open collector output, 100 ㎃ (Supplied voltage Max. 30 V, Residual voltage Max. 0.5 V)		
	Stability	Open collector output, 100 ㎃ (Supplied voltage Max. 30 V, Residual voltage Max 0.5 V)		
External input		Teaching / Auto teaching	Teaching / Auto teaching / Reset input	Auto teaching
Operating mode		Light On / Dark On output		-
		Normal output, ON DELAY, OFF DELAY, ON/OFF DELAY output		Normal output, ON DELAY, OFF DELAY output
On/Off Delay		0 ~ 9999 ㎳		10, 40 ㎳
Light source		Red emitting diode / 660 ㎚		
Protection circuit		Reverse polarity protection, Over current protection		
Response time		Max. 700 ㎲	Max. 1 ㎳	Max. 500 ㎲
LED indicator		7 points status LED, 4 Digits FND		6 Points bar
Sensitivity control		Auto-teaching, Manual		Auto-teaching
Additional function		Brightness control 180° Turning indication Display time set, Zero Reset, Initial reset, Lock function		-
Ambient light		Incandescent Light : Max. 10,000 ㏓		
Ambient temperature		-10 ℃ ~ +60 ℃ (without freeze)		
Ambient humidity		35 ~ 85 % R.H.		
Vibration		10 - 55 ㎐ for 1 minute, Double amplitude : 1.5 ㎜, X · Y · Z each direction for 2 hours		
Shock		500 ㎨ (About 50 G), X · Y · Z each direction for 3 times		
Dielectric strength		1500 V a.c (50/60 ㎐) for 1 minute		
Insulation Resistance		Min. 20 ㏁ (at 500 V d.c)		
Connection		For DIN Rail attachment Flying lead 1.5 m		
		5 P		

• MODEL : PFD-RMN only

Multi function	Counter	• UP / DOWN Mode, Free scale 1~1000 integers setting • Indicating range : 0 ~ 9999 • Counting speed : 400 cps • Output mode : 8 kinds selectable(N, F, C, R, K, P, Q, A) • External reset : Min. Signal width 5 ㎳
	RPM	• Indicating range : 0 ~ 9999 rpm • Speed monitoring output function • Free scale : 1~1000 integers setting • Measurement cycle setting
Option	Communication	RS485 or RS232 (TTL Level), No external output when using communication

FIBER OPTIC SENSOR (PG SERIES)

		Universal type	
Appearance			
Model		PG - TR	
Light Source		Red LED (Modulated)	
Type		Decision by combined with Fiber unit.(Diffuse Reflection, Through beam)	
Hysteresis		Max. 10 % of sensing distance (Reflection)	
Response time		Max. 1 ㎳	
Power voltage		12 - 24 V d.c (±10 %)	
Power consumption		Max. 35 ㎃ (Sensitivity control by COARSE and FINE)	
Sensitive control		Built-in sensitivity control volume (COARSE & sensitivity control by FINE)	
Output	Control	NPN Voltage Output, Load voltage: Max. 30 V d.c, Load current: Max. 200 mA, Residual voltage: Max. 1 V	
	Stability	–	
Operating mode		LIGHT-ON / DARK-ON Switch selection operating NORMAL or ON/OFF DELAY Switch Selection operating (40 ms fixed)	
LED Indicator		Operating indicator(Red LED) Stability operating indicator (Green LED)	
Protection circuit		Reverse polarity protection, Over current protection(stability output of multi-function type an exception)	
Ambient light		Sunlight Max : 11000 lx, Incandescent lamp : 3500 lx	
Ambient temperature		Operating : -10 - 55 ℃, preserving : -25 - 70 ℃ (Without condensation)	
Ambient humidity		35 - 85 % R.H.	
Vibration		10 - 55 ㎐ (Cycle for a minute), double amplitude width: 1.5 ㎜ each X · Y · Z direction 2 hrs.	
Shock		500 ㎨ (Approx 50 G), each X · Y · Z direction 3 times.	
Dielectric strength		500 V a.c(For a minute in 50/60 ㎐)	
Insulation resistance		Max. 20 ㏁ (At 500 V d.c mega)	
Connection		Flying lead 2 m (3P)	Flying lead 2 m (4P)

FIBER OPTIC CABLE

Internal diameter : I. External diameter : E.

Model			APPEARANCE	SPECIFICATIONS	Ambient temperature	Length of cable
Through Beam TYPE	Standard TYPE	GT-4310-2		• Hood: M4 ×0.7(P) • Core: Ø1 • E.: Ø2.2 • Permitted radius of flexural: 30R	-30 - 70 ℃	2 m
	Standard TYPE (Round type)	GTR-2910-2		• Hood: Ø2.9 • Core: Ø1 • E.: Ø2.2 • Permitted radius of flexural: 30R		
	Standard TYPE	GT-4M10-2		• Hood: M4 ×M2.6 • Core: Ø1 • E.: Ø2.2 • Permitted radius of flexural: 30R		
	Standard TYPE (Small)	GT-3005-2		• Hood: M3 ×0.5(P) • Core: Ø0.5 • E.: Ø1 • Permitted radius of flexural: 1R		
	Standard TYPE (Small Round type)	GTR-1505-2		• Hood: Ø1.5 • Core: Ø0.5 • E.: Ø1.25 • Permitted radius of flexural: 15R		
	SUS TUBE TYPE	GTS3-4005-2		• Hood: M4 ×0.7(P) • Core: Ø0.5 • E.: Ø2.2 • SUS Tube Length: Ø1 ×70 ㎜ • Permitted radius of flexural: 30R		
	Standard TYPE	GT-3075-2		• Hood:M3 ×0.5(P) • Core: Ø0.75 • E.: Ø1.25 • Permitted radius of flexural: 20R		
Reflection TYPE	Standard TYPE	GR-6210-2		• Hood: M6 ×0.75(P) • Core: Ø1 • E.: Ø2.2 • Permitted radius of flexural: 30R	-30 - 70 ℃	2 m
	Standard TYPE	GR-6410-2		• Hood: M6 ×1(P) • Core: Ø1 • E.: Ø2.2 • Permitted radius of flexural: 30R		
	Standard TYPE	GR-4205-2		• Hood: M4 × Ø2.5 • Core: Ø0.5 • E.: Ø1.25 • Permitted radius of flexural: 15R		
	Standard TYPE (Small)	GR-3005-2		• Hood: M3 ×0.5(P) • Core: Ø0.5 • E.: Ø1.25 • Permitted radius of flexural: 15R		
	Standard TYPE (Round type)	GRR-3005-2		• Hood: Ø3 • Core: Ø0.5 • E.: Ø1.25 • Permitted radius of flexural: 15R		
	SUS TUBE TYPE	GRS3-4005-2		• Hood:M6 ×1(P) • Core: Ø0.5 • E.: Ø2.2 • Permitted radius of flexural: Fiber:10R, SUS:10R • SUS Tube Length: Ø1.5 ×70 ㎜		
	SUS TUBE TYPE	GRS2-6005-2		• Hood:M6 ×1(P) • Core: Ø0.5 • E.: Ø2.2 • Permitted radius of flexural: Fiber:15R, SUS:10R • SUS Tube Length: Ø1.5 ×35 ㎜		
	Co-axial TYPE	GR-62X5-2		• Hood:M6 ×0.75(P) • Emitter Fiber Core: Ø1 ×1 • Permitted radius of flexural:30R • Receiver Fiber Core: Ø0.265×16 • E.: Ø2.2		
Surface detection TYPE	Liquid TYPE	GL-635-05		• Skin: Ø6.35(PFA Tube) • E.: Ø1.25 • PFA Tube Length: 500 ㎜ • Permitted radius of flexural: 30R	-40 - 80 ℃	2 m
	Liquid TYPE	GL-635-1		• Skin: Ø6.35(PFA Tube) • E.: Ø1.25 • PFA Tube Length: 1000 ㎜ • Permitted radius of flexural: 30R		1.5 m

DIMENSIONS

GT-4310-2
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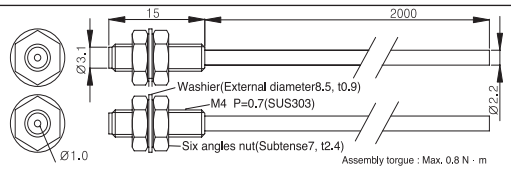

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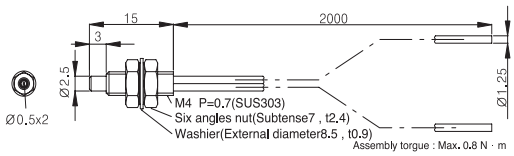

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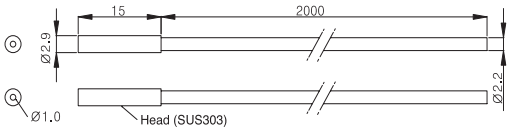

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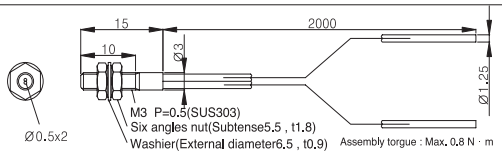

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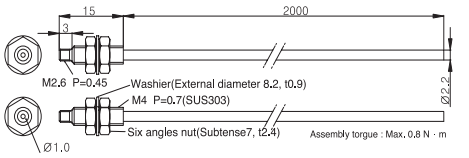

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GT-3005-2
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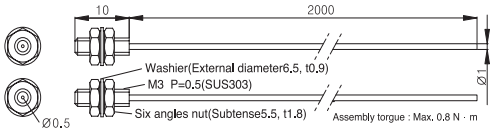

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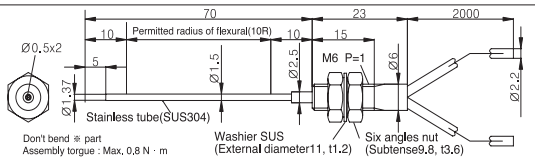

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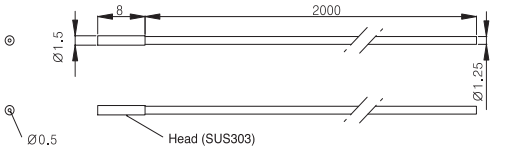

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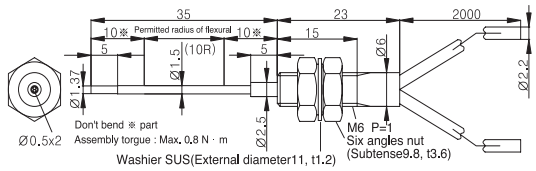

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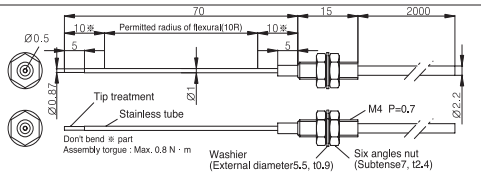

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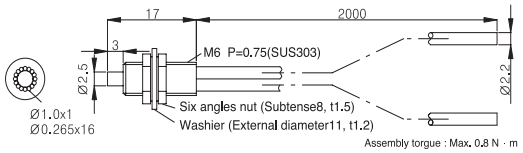

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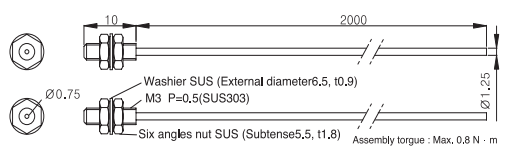

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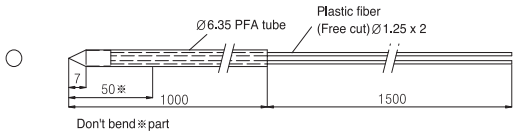

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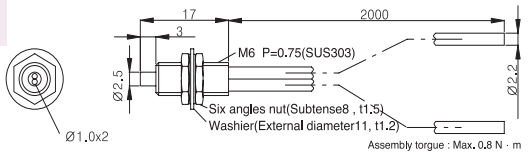

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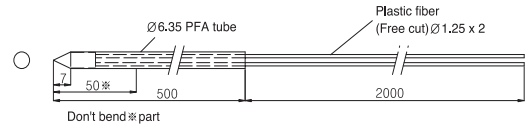

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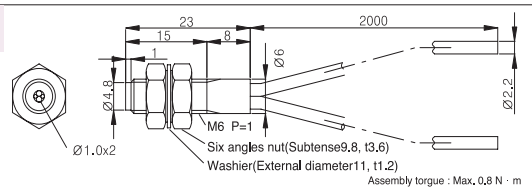


AREA SENSOR (PAN Series)

Series	Model	Type	Sensing Disance	Number of optical axis	Sensing range	Detection object
PAN10	PAN10-T16	Through beam	2 m	16 EA	150 ㎜	Opaque object of over Ø17 ㎜
	PAN10-T24			24 EA	230 ㎜	
	PAN10-T32 PAN10-T40			32 EA 40 EA	310 ㎜ 390 ㎜	
	PAN10-T48 PAN10-T56			48 EA 56 EA	470 ㎜ 550 ㎜	
	PAN10-T64 PAN10-T72			64 EA 72 EA	710 ㎜ 780 ㎜	
	PAN10-T80 PAN10-T88			80 EA 88 EA	870 ㎜	
	PAN10-T96			96 EA	950 ㎜	
PAN20	PAN20-T08		7 m	8 EA	140 ㎜	Opaque object of over Ø32 ㎜
	PAN20-T12			12 EA	220 ㎜	
	PAN20-T16			16 EA	300 ㎜	
	PAN20-T20			20 EA	380 ㎜	
	PAN20-T24 PAN20-T28			24 EA 28 EA	460 ㎜ 540 ㎜	
	PAN20-T32 PAN20-T36			32 EA 36 EA	620 ㎜ 700 ㎜	
	PAN20-T40 PAN20-T44			40 EA 44 EA	780 ㎜ 860 ㎜	
CE	PAN20-T48			48 EA	940 ㎜	
PAN40	PAN40-T04			4 EA	120 ㎜	Opaque object of over Ø57 ㎜
	PAN40-T06			6 EA	200 ㎜	
	PAN40-T08			8 EA	280 ㎜	
	PAN40-T10			10 EA	360 ㎜	
	PAN40-T12 PAN40-T14			12 EA 14 EA	440 ㎜ 520 ㎜	
	PAN40-T16 PAN40-T18			16 EA 18 EA	600 ㎜ 680 ㎜	
	PAN40-T20 PAN40-T22			20 EA 22 EA	760 ㎜ 840 ㎜	
CE	PAN40-T24			24 EA	920 ㎜	

Model	PAN10-T □ □N PAN10-T □ □P	PAN20-T □ □N PAN20-T □ □P	PAN40-T □ □N PAN40-T □ □P
Appearance			
Type	Through beam		
Sensing distance	2 m	7 m	
Detection object	Opaque object of over Ø17 ㎜	Opaque object of over Ø32 ㎜	Opaque object of over Ø52 ㎜
Optical axis pitch	10 ㎜	20 ㎜	40 ㎜
Power voltage	12 - 24 V d.c ±10 % (Ripple P-P ± 10 %)		
Current Consumption	Max. 220 ㎃	Max. 170 ㎃	Max. 100 ㎃
Output Control	Light ON		
Operating mode	Trns.M/S display:Red LED, Power display : Green L(+) Rcvr. E1 display : Red LED, E2 display : Blue LED stability display : Green LED, Operation display : Red LED		
Response time	Max. 30 ms	Max. 15 ms	Max. 7 ms
Light source	Infrared emitting diode (Wave length 860 ㎚)	Infrared emitting diode (Wave length 950 ㎚)	
Operating indicator	Trns.:M/S display:Red LED, Power display : LED, Operation Display : Red Rcvr.: E1 display : Green LED, E2 display : Red, Light on stability display : Green LED, Operation display : Red LED		
Operating S/W	ALL/ONE S/W Operation (only for Rcvr.), Max.ter/Slave S/W Operation (only for Trns.)		
Ambient light	Sun light : Max. 10,000 lx		
Ambient temperature	-10 ~ +55 ℃ (No freezing)		
Ambient humidity	Max. 35 ~ 85 % RH		
Vibration	10 - 55 ㎐(Cycle for 1 min.) Double amplitude width 1.5 ㎜, each X · Y · Z direction for 2 hr.		
Case protection	IP66(IEC)		
Dielectric strength	1000 V a.c for 1 min. between current part and case		
Material	Case: Aluminum, Window : acryl, Lens : acryl		
Connection	Connector flying lead 4P Ø5.5		
Protection circuit	Preventing mutual interference function when installing in parallel(MS/MODE), Over current protection		

AREA SENSOR (PAS Series)

Model	NPN	PAS-T4N	PAS-T8N	PAS-T12N	PAS-T16N	PAS-T20N
	PNP	PAS-T4P	PAS-T8P	PAS-T12P	PAS-T16P	PAS-T20P
Type		Through beam				
Sensing distance		5 m				
Detection object		Opaque object of over Ø30 ㎜				
Optical axis pitch		20 ㎜				
Number of optical axis		4	8	12	16	20
Sensing range		80 ㎜	90 ㎜	100 ㎜	110 ㎜	120 ㎜
Power voltage		12 - 24 V d.c (Ripple Max. ±10 %)				
Current Consumption		Max. 80 ㎃	Max. 90 ㎃	Max. 100 ㎃	Max. 110 ㎃	Max. 120 ㎃
Output range		Appearance	NPN open collector output-Load current : Max. 100 ㎃, Load voltage : Max. 30 V d.c, Residual voltage : Max. 1 V PNP open collector output-Load current : Max. 100 ㎃, Output voltage : (Power voltage-over 2.5 V)			
Operating mode		CE 	Light ON			
Response time			Below 7 ㎳			
Light source			Infrared emitting diode(Wave length 850 ㎚)			
Point angle			Within ±5° (At over 2 m sensing distance)			
Operating indicator			Trns.:M/S display:Red LED, Power display : Green LED, Operation Display : Red LED Rcvr.E1 display : Red LED, E2 display : Blue, Red, LIght on stability display : Green LED, Operation display : Red LED			
Ambient light			Sun light : 10,000 lx			
Ambient temperature			-10 ~ +55 ℃ (No freezing)			
Ambient humidity			35 ~ 85 % R.H.			
Vibration			0 - 55 ㎐ (Cycle for 1 min.) Double amplitude width 1.5 ㎜, each X · Y · Z direction for 2 hr.			
Case protection			IP40(IEC)			
Dielectric strength			1000 V a.c for 1 min. between current part and case			
Material			Case : ABS, Window : Acryl			
Connection			Flying lead 5P, Ø4.3 length 3 m			
Weight		Each Max.160 g	Each Max.180 g	Each Max.200 g	Each Max.220 g	Each Max.240 g
Protection circuit		Auto compensation sensitivity function, Preventing mutual interference function when installing in parallel, Over current protection				

ROTARY ENCODER (HE/ HE Ø40HB, Ø40H SERIES)

HE SERIES (HE shaft type)

Appearance

Ø40	Ø50
40(W)	50(W)
40(H)	50(H)
50(D)	57(D)

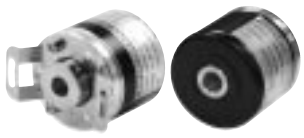
HE40B — 6 — 600 — 3 — T — 24 — (Wire Specification)

Mode	Shaft external diameter	Pulse number per revolution	Phase type	Output type	Power voltage	Wire Specification
HE40B Ø40 mm Shaft type	6 : Ø6 mm 8 : Ø8 mm (Option)	*1, 2, 5, 10, 12, 15, 20, 25, 30, 40, 45, 50, 60, 75, 100, 120, 125, 150, 200, 240, 250, 300, 360, 400, 500, 512, 600, 800, 1000, 1024, 1200, 1500, 1800, 2000, 2048, 2500, 3000	2 : A,B 3 : A, B, Z 3C : A, B, $\overline{Z}$ 4 : A, $\overline{A}$, B, $\overline{B}$ 6 : A, $\overline{A}$, B, $\overline{B}$, Z, $\overline{Z}$ (Standard : A, B, Z)	O : NPN Open collector N : NPN Voltage T : Totem-pole L : Line driver (Line Drive: 5V d.c)	5 : 5 V d.c 12 : 12 V d.c (5-12 V d.c) 24 : 24 V d.c (12-24 V d.c)	No mark: Standard type C : Connector
HE50B Ø50 mm Shaft type	8 : Ø8 mm	*1, 2, 5, 10, 12, 15, 20, 25, 30, 40, 45, 50, 60, 75, 100, 120, 125, 150, 200, 240, 250, 300, 360, 400, 500, 512, 600, 800, 1000, 1024, 1200, 1500, 1800, 2000, 2048, 2500, 3000				

	Model	HE □□B- □- □- □-N- □	HE □□B- □- □- □-O- □	HE □□B- □- □- □-T- □	HE □□B- □- □- □-L- □
	Output type	NPN Voltage output	NPN Open collector output	Totem Pole Output	Line Driver Output
Electrical Specification	Output type	A, B, Z phase			$A,B,Z,\overline{A},\overline{B},\overline{Z}$ phase
	Phase difference on Output	Phase difference between A. B phase : T/4 ± T/8 (Cycle of A phase = T)			
	Max Response Frequency	300 kHz			
	Power voltage	5 - 12 V d.c / 12 - 24 V d.c ± 5 %			5 V d.c ± 5 %
	Current Consumption	70 ㎃ Max. (No-load) Line Drive output below 30 ㎃ (No-load)			
	Connection method	WIRE			
	Control output	Load voltage : 30 V Max. Load Current : 30 mA Max. Residual Voltage : 0.4 V Max.		For Low Load Current: 30 mA Max. Residual Voltage: 0.4 V Max. For High Load Current: 10 mA Max. Residual Voltage: Above -2.5V of rated voltage	For Low Load Current: 20 Max. Residual Voltage : 0.4 V Max. For High Load Current : 20 mA Max. Residual Voltage : 2.5 V Max.
	Response Time	1 ㎲ Max. (Cable length 2.0 m / sink=30 mA)		1 ㎲ Max. (Cable length 1.5 m / sink=10 mA)	1 ㎲ Max. (Cable length 1.5 m / sink = 30 mA)
Mechanical Specification	Starting Torque	Ø40 : 40 gf · ㎝(0.004 N · m Max.) Ø50 : 80 gf · ㎝(0.008 N · m Max.)			
	Moment of inertia	Ø40 : 40 g · ㎠ Max., Ø50 : 80 g · ㎠ Max.			
	Permissible Shaft Loading	Ø40 : Radial : Within 2 kgf, Thrust : Within 1 kgf Ø50 : Radial : Within 2.5 kgf, Thrust : Within 1.2 kgf			
	Max. Permissible Revolution	5000 rpm			
	Bearing Life	1.2×10^8 /rpm : hour			
	Insulation Resistance	Over 100 ㏁ (Based on 500 V d.c mega between terminal and case)			
	Dielectric strength	800 V a.c (Between terminal and case at 60Hz for 1 minute)			
	Vibration Resistance	10 - 55Hz (Cycle for 1 minute), Double amplitude width : 1.5 mm, Each X · Y · Z direction for 2 hours			
	Shock Resistance	Ø40 : 50 G Max., Ø50 : 75 G Max.			
	Operating Ambient Temperature	-10 ~ 60 ℃(Without condensation), Storage Temperature: -25 ~ 85 ℃			
	Operating Ambient Humidity	35 ~ 85 % R.H.			
	Protection	IP 50 (IEC Standard)			
	Wire Specification	5 P, Ø5.0 mm, Length : 2.0 m, Shield cable (Line Driver Type : 8P, Ø5.0 mm, Length : 2.0 m, Shield cable)			
	Weight	Ø40 : 170 g, Ø50 : 200 g			
	Accessories	Ø8.0 mm Coupling, Bracket (Ø40mm Bracket – Separate sales)			

HE 40HB/ HE 40H SERIES (Hollow / Hollow Built- in Shaft)

Appearance



HE40HB / HE40B — 6 — 600 — 3 — T — 24 — [ ]

Mode	Shaft external diameter	Pulse number per revolution	Phase type	Output type	Power voltage	Wire Specification
HE40HB Ø40 ㎜ Hollow Buit- in Shaft	6 : Ø6 ㎜ 8 : Ø8 ㎜ 12 : Ø12 ㎜ (Option)	*1, 2, 5, 10, 12, 15, 20, 25, 30, 40, 45, 50, 60, 75, 100, 120, 125, 150, 200, 240, 250, 300, 360, 400, 500, 512, 600, 800, 1000, 1024, 1200, 1500, 1800, 2000, 2048, 2500, 3000	2 : A, B 3 : A, B, Z 3C : A, B, $\overline{Z}$ 4 : A, $\overline{A}$, B, $\overline{B}$ 6 : A, $\overline{A}$, B, $\overline{B}$, Z, $\overline{Z}$ (Standard : A, B, Z)	O : NPN Open collector N : NPN Voltage T : Totem-pole L : Line driver (Line Drive: 5V d.c)	5 : 5 V d.c 12 : 12 V d.c (5-12 V d.c) 24 : 24 V d.c (12-24 V d.c)	No mark : Standard type C : Connector
HE40H Ø40 ㎜ Hollow Shaft	6 : Ø6 ㎜ 8 : Ø8 ㎜ 12 : Ø12 ㎜ (Option)	*1, 2, 5, 10, 12, 15, 20, 25, 30, 40, 45, 50, 60, 75, 100, 120, 125, 150, 200, 240, 250, 300, 360, 400, 500, 512, 600, 800, 1000, 1024, 1200, 1500, 1800, 2000, 2048, 2500, 3000				

	Model	HE40HB-□-□-□-N-□ HE40H-□-□-□-N-□	HE40HB-□-□-□-O-□ HE40B-□-□-□-O-□	HE40HB-□-□-□-T-□ HE40B-□-□-□-T-□	HE40HB-□-□-□-L-□ HE40B-□-□-□-L-□
	Output type	NPN Voltage output	NPN Open collector output	Totem Pole Output	Line Driver Output
Electrical Specification	Output type	A, B, Z phase			A,B,Z,$\overline{A}$,$\overline{B}$,$\overline{Z}$ phase
	Phase difference on Output	Phase difference between A. B phase : T/4 ± T/8(Cycle of A phase = T)			
	Max Response Frequency	300 kHz			
	Power voltage	5 - 12 V d.c / 12 - 24 V d.c ± 5 %			5 V d.c ± 5 %
	Current Consumption	70 ㎃ Max. (No-load) Line Drive output below 30 ㎃ (No-load)			
	Connection method	WIRE			
	Control output	Load voltage : 30 V Max. Load Current : 30 mA Max. Residual Voltage : 0.4 V Max.		For Low Load Current: 30 mA Max. Residual Voltage: 0.4 V Max. For High Load Current: 10 mA Max. Residual Voltage: Above -2.5V of rated voltage	For Low Load Current: 20 Max. Residual Voltage: 0.4 V Max. For High Load Current: 20 mA Max. Residual Voltage: 2.5 V Max.
	Response Time	1 ㎲ Max. (Cable length 2.0 m / sink=30 mA)		1 ㎲ Max. (Cable length 1.5 m / sink=10 mA)	1 ㎲ Max. (Cable length 1.5 m / sink = 30 mA)
Mechanical Specification	Starting Torque	50 gf · ㎝ (0.005 N · m Max.)			
	Moment of inertia	40 g · ㎠ Max.			
	Permissible Shaft Loading	Radial : Within 2 kgf, Thrust : Within 1 kgf			
	Max. Permissible Revolution	5000 rpm			
	Bearing Life	1.2 x 10^8 /rpm : hour			
	Insulation Resistance	Over 100 ㏁ (Base on 500 V d.c mega between terminal and case)			
	Dielectric strength	800 V a.c (Between terminal and case at 60Hz for 1 minute)			
	Vibration Resistance	10 - 55Hz (Cycle for 1 minute), Double amplitude width : 1.5 ㎜, Each X · Y · Z direction for 2 hours			
	Shock Resistance	Ø40 : 50 G Max., Ø50 : 75 G Max.			
	Operating Ambient Temperature	-10 ~ 60 ℃ (Without condensation), Storage Temperatur : -25 ~ 85 ℃			
	Operating Ambient Humidity	35 ~ 85 % R.H.			
	Protection	Protection IP 50 (IEC Standard)			
	Wire Specification	5 P, Ø 5.0 mm, Length : 1.5 m, Shield cable (Line Driver Type : 8P, Ø 5.0 mm, Length : 1.5 m, Shield cable)			
	Weight	Ø 40 : 170 g			
	Accessory	Spring Bracket			

ROTARY ENCODER (PSC SERIES)

PSC SERIES	
Appearance	

PSC — MA — AB — T

Mode	Min.measuring Unit	Output Phase	Output type
INCREMENTAL TYPE	• MA: 1 m • MB: 1 ㎝ • MC: 1 ㎜ • YA: 1 YARD • YB: 0.1 YARD • YC: 0.01 YARD	• AB : A, B phase	• N : NPN Voltage output • O : NPN Open collector output • T : Totem Pole Output

Model		PSC-MA-AB-N PSC-MB-AB-N PSC-MC-AB-N PSC-YA-AB-N PSC-YB-AB-N PSC-YC-AB-N	PSC-MA-AB-O PSC-MB-AB-O PSC-MC-AB-O PSC-YA-AB-O PSC-YB-AB-O PSC-YC-AB-O	PSC-MA-AB-T PSC-MB-AB-T PSC-MC-AB-T PSC-YA-AB-T PSC-YB-AB-T PSC-YC-AB-T
Output type		NPN Voltage output	NPN Open collector output	Totem Pole Output
Electrical Specification	Output type	A, B, Z phase (∗PSC-MB-□□-□, PSC-MC-□□-□, PSC-YC-□□-□)		
	Phase difference on Output	Phase difference between A, B phase : T/4 ±T/8(Cycle of A phase = T)		
	Max. Response Frequency	180 kHz		
	Power voltage	5 - 12 V d.c / 12 - 24 V d.c ± 5 %		
	Current Consumption	60 ㎃ Max.		
	Connection method	WIRE		
	Control output	Load voltage : 30 V Max. Load Current : 30 mA Max. Residual Voltage : 0.4 V Max.		For LowLoad Current: 30 mA Max. Residual Voltage: 0.4 V Max. For HighLoad Current : 10 mA Max. Residual Voltage : -1.5V of rated voltage Max.
	Response Time	1㎲ Max. (Cable length 2.0 m / sink=30 mA)		
MechanicalSpecificatin	Starting Torque	200 gf · ㎝ (19600 uN.m · m Max.)		
	Moment of inertia	800 g.cm² (8 × 10⁻⁶ kg.m²) Max.		
	Permissible Shaft Loading	Radial : Within 2 kgf, Thrust : Within 1 kgf		
	Max. Permissible Revolution	5000 rpm		
	Bearing Life	1.2 x 10⁸ /rpm : hour		
Insulation Resistance		Over 500 ㏁ (Between terminal and case)		
Dielectric strength		500 V a.c (Between terminal and case at 60 Hz for 1 minute)		
Vibration Resistance		10 - 55 ㎐ (Cycle for 1 minute), Double amplitude width: 1.5 ㎜, Each X · Y · Z direction for 2 hours		
Shock Resistance		75G Max.		
Operating Ambient Temperature		-10 ~ 60 ℃(Without condensation), Storage Temperature : -25 ~ 85 ℃		
Operating Ambient Humidity		35 ~ 85 % R.H.		
Wire Specification		5 P, Ø 6.0 mm, Length : 1.5 m, Shield cable		
Weight		About 170 g		

FLOATLESS LEVEL SWITCH (FS-3)

MODEL		FS-3
Appearence		 49(W)×62(H)×91(D)
Power supply		220 V a.c (50/60 Hz), 110 V a.c(50/60 Hz)
Operating voltage		±10 % of power supply
Secondary voltage		24 V a.c (high sensitive)
Power Consumption		Approx. 3.2 VA
Response time	Working	Max. 80 ms
	Reset	Max. 160 ms
Operating resistance of electrodes		0 ~ about 27 kΩ
Reversion resistance of electrodes		about 38 kΩ ~ ∞ Ω
Control output		Contact output : (1c) 250 V a.c 5 A(resistive load)
Insulation resistance		Min. 100 MΩ (500 V d.c)
		Conductive part and non-charging metal part
Dielectric strength		2,000 V a.c 50/60 Hz for 1 minute (between ⊕ and ⊖)
Vibration	Malfunction	2 - 55 Hz, X, Y, Z each direction for 10 minute
	Durability	10 - 55 Hz, 0.76 mm, X, Y, Z each direction for 2 hours
Shock	Malfunction	100 m/s² 6 direction each 3 times
	Durability	300 m/s² 6 direction each 3 times
Life	Mechanical	More than 5 million times (Relay type)
	Electrical	More than 0.5 million times (Resistive load)
Ambient temperature and humidity		-10 ~ 55 ℃ (32 ~ 122 ℉) · 35 ~ 85 % R.H. (Without condensation)

CONTROL UNIT

MODEL	HPAN-C7	HPAN-CT7	HPAN-C7W	HPA-12
Appearance (mm)	 8.5(W)×82.1(H)×80.8(D)			 49(W)×62(H)×91(D)
Function	Multi-purpose	Timer function	Two sensors connectable	Multi-purpose
How to attach	DIN Rail			Relay Socket 8PIN
Power Voltage	85 - 264 V a.c, 50/60 Hz			220 V a.c ±10 % 60 Hz
Power consumption	Approx. 5 VA			Approx. 4 VA
Power supply to sensor	+12 V d.c (±10 %), Max. 200 mA			12 V d.c±10 % 50 mA
Connectable sensor	NPN / PNP transistor output or relay output sensor			NPN, PNP transistor output
Output	· Relay contact : 1c (250 V a.c 3A,Resistive load) Rated electrical life : over 100,000 operation · NPN Transistor output (open collector) Max. sink current : 100 mA, Applied voltage : 30 V d.c Max.		· Relay contact:1c (2outs separately) (250 V a.c 3A resistive load) Rated electrical life: over 100,000 operations (in power off)	· Relay contact: 1c (250 V a.c 3 A, resistive load) Rated electrical life:over 100,000 operations (in power off)
Response time	Relay contact : Approx. 10 mA, Open collector : 5 μs Max.		Approx. 10 ms	Approx. 10 ms
External synchronization	Gate synchronization	Frequency and differential synchronization	—	—
Timer	—	· Selectable from on-delay, off-delay and one shot-delay · Time range 40 ms~1 S ↔0.4~10 S (selectable by dip switch)	—	—
Ambient temperature and humidity	-10 ~ 50℃, 35 - 85 % R.H. (No freezing)			-10 ~ 50 ℃, 35 ~ 85 % R.H. (No freezing or No condensation)
Noise immunity	Power line: 1,500 VP, 0.5 μs pulse width (by noise simulation)			
Dielectric strength	1,500 V a.c for 1 minute (Between supply and output)			
Insulation resistance	10 MΩ (At 500 V d.c, Between supply and output)			
Vibration	10 - 55 Hz(For a minute), double amplitude width 0.75 mm, each X · Y · Z direction for 2 hour(in power off)			
Shock	100 m/s² (Approx. 10G), 0.75 mm, each X · Y · Z, 2 direction (in power off)			
Net · Weight	Approx. 150 g	Approx. 160 g	Approx. 165 g	Approx. 260 g

QR Series (ALUMINUM GUARD TYPE) CE

Model	PUSH-BUTTON SWITCH		ILLUMINATED PUSH BUTTON SWITCH		PILOT LAMP	
	Flush Ø30	Extended Ø22	Flush Ø30	Extended Ø22	Flush Ø30	Extended Ø22
Appearance						
Suffix code	QRF-A □□ □	QRF-R □□ □	QRX-A □□ □□	QRX-R □□ □□	QRP-A □□	QRP-R □□
Model	SELECTOR SWITCH		ILLUMINATED SELECTOR SWITCH		KEY SELECTOR SWITCH	
	Flush Ø30	Extended Ø22	Flush Ø30	Extended Ø22	Flush Ø30	Extended Ø22
Appearance						
Suffix code	QRS-A □□	QRS-R □□	QRT-A □□ □	QRT-R □□ □	QRK-A □□ □	QRK-R □□ □
Model	EMERGENCY STOP BUTTON SWITCH					
	Flush Ø30		Extended Ø22			
Appearance						
Suffix code	QRE-A M□	QRE-A R□	QRE-R M□	QRE-R R□		
Model	ILLUMINATED EMERGENCY STOP BUTTON SWITCH					
	Flush Ø30		Extended Ø22			
Appearance						
Suffix code	QRA-A M□□	QRA-A R□□	QRA-R M□□	QRA-R R□□		

Operation of contact		Snap-action switching
Material	Contact	AgNi(Gold Plated)
	Contact case	Polycarbonate (PC)
Mechanical characteristics	Tightening torque	Screws : 25 Ncm Max, Terminal Screw : 50 Ncm Max
	Actuating force	(Operation+1a1b) 6.47N
	Actuating travel	5 ㎜ +0.5
	Rebound time	≤3 ㎳
	Mechanical lifetime	BUTTON : more than 1.0 million times, SELECTOR SWITCH : more than 0.5 million times
Electrical characteristics	Rated Insulation Voltage	2000 V a.c for 1 min.
	Contact resistance	Max. 50 ㏁ (Initial setting)
	Isolation resistance	≤10 ㏁ 500 V d.c.
	Switch rating	AC : 6 A 250 V a.c DC : 10 A 24 V d.c
	Minimum load current	15 mA 24V d.c, 10 mA 110 V d.c
Environmental conditions	Ambient Temperature	-25 ~ 55 ℃
	Ambient Humidity	35 ~ 85 % R.H.
	Storage Temperature	-40 ~ 85 ℃
	Shock resistance	300 ㎨. pulse width 11 ㎳
	Vibration resistance	100 ㎨ at 10 ㎐ - 500 ㎐, amplitude 0.75 ㎜

TRANSFORMER RATINGS

Light Source	Rated Voltage	Remark
	100 - 240 V a.c	L.E.D(Without voltage reduction)
	12 - 24 V d.c / a.c	※Plastic Guide applied

QR Series (PLASTIC GUARD TYPE) CE

Model	PUSH-BUTTON SWITCH			
	Flush Ø22	Extended Ø22	Full Guide Ø22	Half Guide Ø22
Appearance				
Suffix code	QRF-F M□□	QRF-P M□□	QRF-G M□□	QRF-H M□□
Model	PUSH-BUTTON SWITCH			
	Square Flush Ø22	Square Extended Ø22	Square Mushroom Ø22	Square Double Buttons Ø22
Appearance				
Suffix code	QRF-C M□□	QRF-D M□□	QRF-M M□□	QRF-W M□□
Model	ILLUMINATED PUSH-BUTTON SWITCH					
	Flush Ø22	Full Guide Ø22	Half Guide Ø22	Square Flush Ø22	Square Extended Ø22	Square Mushroom Ø22
Appearance						
Suffix code	QRX-P M□□ □	QRX-G M□□ □	QRX-H M□□ □	QRX-C M□□ □	QRX-D M□□ □	QRX-M M□□ □
Model	PILOT LAMP			ILLUMINATED SELECTOR SWITCH		
	Flush Ø22	Roulette Ø22	Square Flush Ø22	Short Lever Ø22	Long Lever Ø22	Short Lever Ø22
Appearance						
Suffix code	QRP-F □□	QRP-B □□	QRP-S □□	QRS-S □□	QRS-L □□	QRT-S □□

Operation of contact		Snap-action switching
Material	Contact	AgNi(Gold Plated)
	Contact case	Polycarbonate (PC)
Mechanical characteristics	Tightening torque	Screws : 25 Ncm Max, Terminal Screw : 50 Ncm Max
	Actuating force	(Operation+1a1b) 6.47N
	Actuating travel	5 ㎜ +0.5
	Rebound time	≤3 ㎳
	Mechanical lifetime	BUTTON : more than 1.0 million times, SELECTOR SWITCH : more than 0.5 million times
Electrical characteristics	Rated Insulation Voltage	2000 V a.c for 1 min.
	Contact resistance	Max. 50 ㏁ (Initial setting)
	Isolation resistance	≤10 ㏁ 500 V d.c.
	Switch rating	AC : 6 A 250 V a.c DC : 10 A 24 V d.c
	Minimum load current	15 mA 24V d.c, 10 mA 110 V d.c
Environmental conditions	Ambient Temperature	-25 ~ 55 ℃
	Ambient Humidity	35 ~ 85 % R.H.
	Storage Temperature	-40 ~ 85 ℃
	Shock resistance	300 ㎨ pulse width 11 ㎳
	Vibration resistance	100 ㎨ at 10 ㎐ - 500 ㎐ amplitude 0.75 ㎜

TRANSFORMER RATINGS

Light Source	Rated Voltage	Remark
	100 - 240 V a.c	L.E.D(Without voltage reduction) ※Plastic Guide applied
	12 - 24 V d.c / a.c	

QR Series (PLASTIC GUARD TYPE) CE

Model	EMERGENCY STOP BUTTON SWITCH						KEY SELECTOR SWITCH
	Mushroom Ø30	Mushroom Ø40	Mushroom Ø40	Mushroom Ø40	Mushroom Ø47	Mushroom Ø75	Projection Key Ø22
Appearance							
Suffix code	QRE-3R□	QRE-4 M□	QRE-4 P □	QRE-4 R□	QRE-5 M□	QRE-7 M□	QRK-P □□ □
Model	ILLUMINATED EMERGENCY STOP BUTTON SWITCH						
	Mushroom Ø30	Mushroom Ø40	Mushroom Ø40	Mushroom Ø40	Mushroom Ø47	Mushroom Ø75	
Appearance							
Suffix code	QRA-3 R□ □	QRA-4 M□ □	QRA-4 P □ □	QRA-4 R□ □	QRA-5 M□ □	QRA-7 M□ □	

Operation of contact		Snap-action switching
Material	Contact	AgNi(Gold Plated)
	Contact case	Polycarbonate (PC)
Mechanical characteristics	Tightening torque	Screws : 25 Ncm Max, Terminal Screw : 50 Ncm Max
	Actuating force	(Operation+1a1b) 6.47N
	Actuating travel	5 ㎜ +0.5
	Rebound time	≤3 ㎳
	Mechanical lifetime	BUTTON : more than 1.0 million times, SELECTOR SWITCH : more than 0.5 million times
Electrical characteristics	Rated Insulation Voltage	2000 V a.c for 1 min.
	Contact resistance	Max. 50 ㏁ (Initial setting)
	Isolation resistance	≤10 ㏁ 500 V d.c.
	Switch rating	AC : 6 A 250 V a.c DC : 10 A 24 V d.c
	Minimum load current	15 mA 24V d.c, 10 mA 110 V d.c
Environmental conditions	Ambient Temperature	-25 ~ 55 ℃
	Ambient Humidity	35 ~ 85 % R.H.
	Storage Temperature	-40 ~ 85 ℃
	Shock resistance	300 ㎨. pulse width 11 ㎳
	Vibration resistance	100 ㎨ at 10 ㎐ - 500 ㎐, amplitude 0.75 ㎜

TRANSFORMER RATINGS

Light Source	Rated Voltage	Remark
	100 - 240 V a.c	L.E.D(Without voltage reduction) ※Plastic Guide applied
	12 - 24 V d.c / a.c	

AR Series

Model	PUSH-BUTTON SWITCH					
	Round	Direction	Square	Square projection	Wholly	Wholly-momentary
Appearance						
Suffix code	ARF-F, B, P, G, H	ARC-I	ARC-S, C	ARC-P	ARF-DF	ARF-DP

Model	ILLUMINATED PUSH-BUTTON SWITCH				PILOT LAMP	
	Round	Direction	Square	ON / OFF	a.c	d.c
Appearance						
Suffix code	ARX-P, G, H	ARC-XI	ARC-XS	ARX-S	ARP-A1, A2	ARP-B12, B24

Model	PILOT WHOLLY TYPE	SELECTOR SWITCH		ILLUMINATED SELECTOR SWITCH
	Applied power directly	Lever	Handle	Lever
Appearance				
Suffix code	ARP-DF, DR	ARS-S, L	ARS-H	ART

Model	KEY SELECTOR SWITCH	EMERGENCY PUSH-BUTTON SWITCH			
Appearance					
Suffix code	ARK	ARE-B, P, R, K	ARE-4XR	ARE-5XB,7XB	ARE-5B, 7B

Operation	Mechanical	Max. 30 Operations /minute
	Electrical	Max. 30 Operations /minute
Insulation resistance		Min.100 MΩ (AT d.c 500 V)
Dielectric strength		1500 V a.c 50/60 Hz for minute
Vibration	Malfunction	10 - 55 Hz double amplitude width 3 mm
Shock	Durability	Min.500 m/s²
	Malfunction	Min.100 m/s²
Life	Mechanical	Min. 0.5 millions operations, 1,000hour (PILOT LAMP)
	Electrical	Min. 0.1 millions operations, 1,000hour (PILOT LAMP)
Ambient temperature		-25 ℃ ~ +40 ℃
Ambient humidity		45 ~ 85%R.H.
Storage temperature		-40 ℃ ~ + 70 ℃

LAMP RATINGS

Rated voltage		Rated current		Consumption power	
Incandescent light lamp	LED LAMP	Incandescent light lamp	LED LAMP	Incandescent light lamp	LED LAMP
6.3 V	6 V	150 mA	72 mA	1 W	0.4 W
12 V	12 V	80 mA	36 mA	1 W	0.4 W
24 V	24 V	40 mA	18 mA	1 W	0.4 W

TRANSFORMER RATINGS

Rated voltage	Voltage use	Lamp
110 V a.c	110 V a.c	150 mA, 6.3 V a.c LAMP
220 V a.c	220 V a.c	

※ LED lamp switch using transformer is on order made product.
Contact block rated is 6 A 250 V a.c

CONTROL SWITCH (CR Series)

Suffix code		Power voltage	Input voltage	Power consumption	Diameter	Remarks
 Push Button Lamp Switch	CR-254	24 V a.c / d.c 110 V, 220 V a.c 380 V, 440 V a.c Contact 5 A, 250 V a.c	24 V a.c / d.c 6.3V a.c	1 W	ϕ25	Red, Green, Blue, Yellow, White ∗ L : LED type ex)CR-254-2L
	CR-304				ϕ30	
 Push Button Switch	CR-251	5 A, 250 V a.c			ϕ25	Red, Green, Blue, Yellow, Black
	CR-301				ϕ30	
 Pilot Lamp	CR-252	110 V a.c 220 V a.c 380 V a.c 440 V a.c	6.3 V a.c	1 W	ϕ25	Red, Green, Blue, Yellow, White ∗ L : LED type ex)CR-252-2L
	CR-302				ϕ30	
 Pilot Lamp	CR-2510	24 V d.c	24 V d.c	1W	ϕ25	Red, Green, Blue, Yellow, White ∗ L : LED type ex)CR-251-0L
	CR-3010				ϕ30	
 Selector Switch	CR-253	5 A, 250 V a.c			ϕ25	
	CR-303				ϕ30	
 Emergency Stop Button Switch	CR-257	5 A, 250 V a.c			ϕ25	Red, Green, Yellow
	CR-307				ϕ30	
 Emergency Stop Button Switch (Push lock turn reset)	CR-257R	5 A, 250 V a.c			ϕ25	Red, Green
	CR-307R				ϕ30	
 Selector Push Button Switch	CR-308	5 A, 250 V a.c			ϕ30	Contact 1a1b
 Key Switch	CR-2511	5 A, 250 V a.c			ϕ25	
	CR-3011				ϕ30	

Ø16 SMALL CONTROL SWITCH (SR Series)

Model		SRF PUSH-BUTTON	SRX ILLUMINATED PUSH-BUTTON	SRP PILOT-LAMP	SRS SELECTOR	SRK KEY-SELECTOR	SRE EMERGENCY RESET
Appearance							
Ratings		6 A, 250 V a.c					
Display color		Red, Yellow, Green, Blue, White					
Contact		AgNi					
Insulation resistance		Min.100 ㏁					
Dielectric strength		1500 V a.c (50/60 ㎐ for 1min.)					
Vibration	Malfunction	10 - 55 ㎐, Double amplitude 0.75 ㎜					
Operation	Mechaical	Min. 500,000 times		Min. 100,000 times			
	Electrical	Min. 70,000 times					
Ambient temperature		-20 ℃ ~ 50 ℃					
Ambient humidity		45 ~ 88 % R.H.					
Storage temperature		-40 ℃ ~ 70 ℃					

INCANDIDATE LAMP RATINGS

Power voltage	Power consumption
6.3 V a.c / d.c	60 mA
12 V a.c / d.c	40 mA
24 V a.c / d.c	20 mA

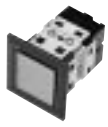
LED RATINGS

Power voltage	Power consumption
12 V a.c / d.c	20 mA
24 V a.c / d.c	15 mA

RECTANGULAR LAMP

Model	CR-401(a.c SUPPLY)				CR-402(d.c SUPPLY)	
Appearance						
Voltage	110 V	220 V	380 V	440 V	12 V	24 V
Secondary voltage	6.3 V	6.3 V	6.3 V	6.3 V	transless voltage	
Cap color	Red, Yellow, Green, Blue, White					
Insulation resistance	Min. 100 ㏁ (Within current carrying part & non current carriyng part)					
Dielectric strength	1,500 V a.c For minute					
Bulb's life	5,000 Hours above					
Ambient temperature	-20 ℃ ~ +40 ℃					
Ambient humidity	45 ~ 85 %R.H.					
Storage temperature	-25 ℃ ~ +55 ℃					

COMBINATION DISPLAY LIGHTS

Model	VOLTAGE TYPE		TRANSFORMER TYPE		RESISTANCE TYPE	
	CD-SA	CD-RA	CD-SC,SD	CD-RC,RD	CD-SB	CD-RB
Appearance						
Voltage	24 V d.c		110 / 220 V a.c		110 / 125 V d.c	
Cap color	Red, Yellow, Green, White, Orange					
Insulation resistance	Min. 100 ㏁ (At 500 V d.c)					
Dielectric strength	1,500 V a.c For 1minute					
Consumption power	0.68 W(24 V d.c, 28 mA)					
LED	24 V d.c					
Life	50,000 hours (24 V d.c, 25 ℃)					
Ambient temperature	-20 ℃ ~ +40 ℃					
Ambient humidity	45 ~ 85 %R.H.					
Storage temperature	-25 ℃ ~ +55 ℃					

※Note : CD-S □(30x30mm) and CD-R □(30x40mm)

MICRO SWITCH

Model		PUSH BUTTON	ROLLER LEVER	LEVER	ROLLER PUSH BUTTON
		P701-A, B, C, D	R704-A, B, C, 2W	L707-A, B, C, D	PR708-A, B
Appearance					
Operation speed		0.1 ㎜ - 1 ㎝			
Frequency	Mechanical	50 - 300 / minute			
	Electrical	20 / minute			
Insulation resistance		Min. 100 ㏁ (AT d.c 500 V)			
Contact resistance		Max. 50 ㏁ (initial), Max. 2 Ω (after testing)			
Vibration		10 - 55 ㎐ double amplitude 0.75㎜			
Shock	Durability	Min. 1000 ㎨ (Min. 100G)			
	Malfunction	Min. 300 ㎨ (Min. 30G)			
Dielectric strength		1,000 V a.c 50/60 ㎐ for 1 minute (between charging part) 1,500 V a.c 50/60 ㎐ for 1 minute (between discharging part)			
Life	Mechanical	Min. 1 Millions Operations (Switching frequency 120 / minute)			
	Electrical	Min. 0.3 Millions Operations (Switching frequency 20 / minute, at rated load)			
Net weight		31.5 ~ 59.5 g			
Rated current		10 A 250 V a.c (Resistive load)			

MICRO SWITCH

Model		ROLLER LEVER (WATERPROOF)
		HY-R404B
Appearance		
Operation speed		0.1 - 0.1 ㎜/sec
Frequency	Mechanical	50 - 300 /minute
	Electrical	20 /minute
Insulation resistance		Min. 100 ㏁ (At 500 V d.c)
Contact resistance		Max. 15 ㏁ (initial)
Dielectric Strength	Charging part	1,000 V a.c 1 minute (50 - 60 ㎐)
	Discharging part	1,500 V a.c 1 minute (50 - 60 ㎐)
Vibration/Malfunction		10 - 55 ㎐ double amplitude width 1.5 ㎜
Shock	Durability	Min. 1,000 ㎨ (Min. 100G)
	Malfunction	Min. 300 ㎨ (Min. 30G) pin push button type about Min. 30G
Life	Mechanical	Min. 0.5 millions operations (Switching frequency 60 /minute)
	Electrical	Min. 0.1 millions operations (Switching frequency 20 /minute, at rated load)
Net weight		6.2 g ~ 10.2 g
Rated current		10 A 250 V a.c (Resistive load)

LIMIT SWITCH

Model		ROLLER PLUNGER		TOP BALL PLUNGER		VARIABLE ROLLER LEVER		VARIABLE ROD		ROLLER LEVER		SPRING WIRE		FORK ROLLER LEVER
		M902	LM902	M903	LM903	M904	LM904	M907	LM907	M908	LM908	M909	LM909	M908L
Appearance														
Operation speed		0.1 - 1 ㎐												
Frequency	Mechanical	120 /minute												
	Electrical	20 /minute												
Insulation resistance		Min. 100 ㏁ (At 500 V d.c)												
Dielectric strength		1,000 V a.c 50/60 ㎐ 1 minute (between charging part) 1,500 V a.c 50/60 ㎐ 1 minute (between discharging part)												
Contact resistance		Max. 100 ㏁ (initial)												
Vibration	Malfunction	10 - 55 ㎐ Double amplitude width 1.5 ㎜												
Shock	Durability	Min. 1,000 ㎨ (Min. 100G)												
	Malfunction	Min. 300 ㎨ (Min. 30G)												
Life	Mechanical	Min. 1 Millions operations												
	Electrical	Min. 0.3 Million operation												

RATINGS

RATED VOLTAGE (V)		NON-INDUCTIVE LOAD(A)				INDUCTIVE LOAD(A)			
		Resistive LOAD		RAMP		INDUCTIVE LOAD		MOTOR LOAD	
		N,C	N,O	N,C	N,O	N,C	N,O	N,C	N,O
a.c	125	10		3	1.5	8		5	2.5
	250	6		2	1	4		3	1.5
	480	2		1.5	0.8	2		1.5	0.8
d.c	8	10		6	3	6		6	
	14	10		6	3	6		6	
	30	6		4	3	4		4	
	125	0.4		0.2	0.2	0.05		0.2	
	250	0.2		0.1	0.1	0.02		0.1	

MINI LIMIT SWITCH

Model		VARIABLE ROLLER LEVER(L804)	VARIABLE ROD(L807)	ROLLER LEVER(L808)	SPRING WIRE(L809)
Appearance					
Frequency	Mechanical	120 /minute			
	Electronical	30 /minute			
Insulation resistance		Min. 100 ㏁ (At 500 V d.c)			
Dielectric strength		Between noncontinuous terminal : 1500 V a.c 50/60 ㎐ 1minute Between terminal & non-current carring metal part : 2000 V a.c 50/60 ㎐ 1 minute			
Contact resistance		Max. 25 ㏁ (initial), Max. 100 ㏁ (after testing)			
Vibration	Malfunction	Min. 10 - 55 ㎐ double amplitude width 1.5 ㎜			
Shock	Durability	Min. 300㎨ (30G above)			
	Malfunction	Min. 100㎨ (10G above)			
Life	Mechanical	Min. 1 million operation (Switching frequency 120 /minute)			
	Electrical	Min. 0.1 millions operations (Switching frequency 20 /minute, at rated load)			
Ambient temperature and humidity		-10 ℃ ~ +70 ℃ 95 %R.H. below (20 ℃)			

RATINGS

RATED VOLTAGE \ LOAD	Resistive LOAD(cos ϕ ≒1)	INDUCTIVE(cos ϕ ≒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

LIMIT SWITCH

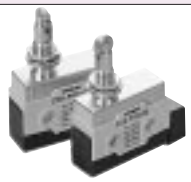
N TYPE LIMIT SWITCH

Model		ROLLER PLUNGER	PUSH PLUNGER	ROLLER ARM	VARIABLE ROLLER LEVER	VARIABLE ROD	ROLLER LEVER
		LS-802N	LS-803N	LS-803RN	LS-804N	LS-807N	LS-808N
Appearance							
Frequency	Mechanical	120 /minute					
	Electrical	30 /minute					
Insulation resistance		Min. 100 MΩ (AT 500 V d.c)					
Contact resistance		Max. 25 MΩ (initial)					
Dielectric resistance		1,000 V a.c 50/60 Hz for 1 minute 2,000 V a.c 50/60 Hz for 1 minute					
Vibration	Malfunction	10 - 55 Hz double amplitude width 1.5 mm					
Shock	Durability	Min. 1000 m/s² (Min. 100G)					
	Malfunction	Min. 300 m/s² (Min. 30G)					
Life	Mechanical	Min. 1 million operation					
	Electrical	Min. 0.1 million operation					
Ambient temperature		-10 ℃~+70 ℃					
Ambient humidity		Max. 95 %R.H. (20 ℃)					

RATINGS

RATED VOLTAGE (V)		NON-INDUCTIVE Load(A)		INDUCTIVE LOAD(A)			
		Resistive LOAD	RAMP LOAD	INDUCTIVE LOAD		MOTOR LOAD	
		N.O	N.C	N.O	N.C	N.O	N.C
a.c	125	6	2	6		3	
	250	6	1.5	6		1.5	
d.c	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 TYPE LIMIT SWITCH

Model		PUSH BUTTON	ROLLER LEVER	LEVER	ROLLER PUSH BUTTON	SPRING WIRE
		P501O	R504A,C	L507A,C	PR508A,H	L509
Appearance						
Operation speed		0.1 mm - 0.5 m/s				
Frequency	Mechanical	120 /minute				
	Electrical	20 /minute				
Insulation resistance		Min. 100 MΩ (AT 500 V d.c)				
Contact resistance		Max. 25 MΩ (initial), Max. 100 MΩ				
Dielectric strength		Between charging part :1,000 V a.c 50/60 Hz for 1 minute Between discharging part : 1,500 V a.c 50/60 Hz for 1 minute				
Vibration	Malfunction	10 - 55 Hz double amplitude width 1.5 mm				
Shock	Durability	Min. 1,000 m/s² (Min. 100G)				
	Malfunction	Min. 300 m/s² (Min. 30G)				
Life	Mechanical	Min. 1 million operation				
	Electrical	Min. 0.3 million operation				
Ambient temperature and humidity		-10 ℃ ~ +80 ℃ Max. 25 ~ 95 %R.H.				

RATINGS

RATED VOLTAGE (V)		NON-INDUCTIVE LOAD(A)		INDUCTIVE LOAD(A)			
		Resistive LOAD		INDUCTIVE LOAD		MOTOR LOAD	
		N.C	N.O	N,C	N.O	N.C	N.O
a.c	125	15		10		3	1.5
	250	10		6		2	1
	600	3		2		1.5	0.75
d.c	8	15		10		—	—
	14	15		10		—	—
	30	6		5		—	—
	125	0.4		0.05		—	—
	250	0.2		0.03		—	—

POWER PUSH BUTTON SWITCH

Model		RATINGS	USE
 EXPOSURE	HY-510	3 P 250 V 15 A	Electromotor 3phase power supply ON, OFF
 BUILT-IN	HY-512	2 P 250 V 15 A	1phase Electromotor ON, OFF
	HY-513	3 P 250 V 15 A	Electromotor for 3phase power supply ON, OFF
	HY-514	3 P 250 V 15 A	Electromotor for 3phase power supply ON, OFF
 EXPOSURE	HY-516	3 P 250 V 15 A	Electromotor for 3phase power supply Direct/reverse revolution for stop 1phase, 3phase, right/left for revolution
 EXPOSURE	HY-517	3 P 250 V 15 A	Electromotor 1phase, 3phase ON, OFF

POWER PUSH BUTTON SWITCH (BE Series)

STEEL CASE BE

Model		RATINGS	ELECTROMOTOR CAPACITY(KW)		CONTACT TERMINAL	LITERAL DISPLAY	MATERIAL OF CASE
			1 ϕ 100/110 V	3 ϕ 200/220 V			
 STEEL CASE EXPOSURE	BE 215	3 P 15 A	0.4	2.2	M4	ON(black) OFF(red)	cold workable steel plate
	BE 230	3 P 30 A		3.7	M5		

WATER PROOF (BEW, BEWT)

Model		RATINGS	ELECTROMOTOR CAPACITY(KW)		CONTACT TERMINAL	LITERAL DISPLAY	MATERIAL OF CASE
			1 ϕ 100/110 V	3 ϕ 200/220 V			
 WATER PROOF	BEW 215	3 P 15 A	0.4	2.2	M4	ON(black) OFF(red)	burning resist ABS
	BEW 230	3 P 30 A		3.7	M5		
 ADVANCED WATER PROOF	BEWT 215	3 P 15 A	0.4	2.2	M4		
 ADVANCED WATER PROOF	BEWT 315	3 P 15 A	0.4	2.2	M4	FOR(black) STOP(red) REV(black)	

CAM / MONO LEVER SWITCH

CAM SWITCH

Model				SQUARE TYPE	255,305 TYPE	HANDLE CONTROL TYPE	CIRCLE TYPE	SQUARE KEY TYPE
Appearance								
Contact part	a.c		Voltage	110 / 250 / 440 V				
			Rated current	10 / 7 / 3 A				
			Momentary current	closed momentary current=rated current ×10				
	d.c		Voltage	24 / 110 / 250 V				
		Resis -tance	Rated current	10 / 2 / 1 A				
			Momentary current	closed momentary current=rated current ×1.1				
		Indec -tion	Rated current	5 / 1 / 0.4 A				
			Momentary current	closed momentary current=rated current ×1.1				
	Rated electric current			10 A				
Life	Mechanical			Min. 0.5 millions operations				
	Electrical			Min. 0.1 millions operations				
Insulation resistance				Min. 100 MΩ				
Contact resistance				Max. 15 MΩ (Initial)				
Dielectric strength				1,500 V a.c 1minute				
Vibration				10 - 55 Hz double amplitude width 1.5 mm				
Shock				Min. 30G				
Operation power				560 g				
Ambient temperature				-20 ℃ ~ +50 ℃				

MONO LEVER SWITCH

Model				LONG LEVER	SHORT LEVER
Appearance					
Contact part	a.c		Rated voltage	150 V / 250 V / 600 V	
			Rated current	5 A / 3 A / 1 A	
			Cut-off current	Open circuit & Cut-off current=Rated current ×10	
	d.c		Rated voltage	125 V / 250 V	
		resis -tance	Rated current	2.2 A / 1.1 A	
			Cut-off current	Rated current ×1.1	
		Induc -tion	Rated current	1.2 A / 0.45 A	
			Cut-off current	Rated current ×1.1	
	Rated electric current			10 A	
Insulation resistance				Min. 100 Ω	
Dielectric strength				a.c 2,500 V / 1 minute between charging part & between discharging part	
Contact resistance				Max. 20 MΩ below	
Life				mechanical, Min. 0.5 millions operations , electronical: Min. 0.1millions operations	
Ambient temperature				-20 ℃~+50 ℃	

HOIST SWITCH

Model		HY-1022 (2 BUTTON)	HY-1024 (4 BUTTON)	HY-1026 (6 BUTTON)	HY-1028 (8 BUTTON)
Appearance					
Protection construction		IP-65 (IEC)			
Material · Color	Case	ABS			
	Screw	Stainless screw			
	Button packing	Special rubber (black)			
	Cable bracket	Special rubber (black)			
Insulation resistance		Min. 100 MΩ (At d.c 500 V)			
Dielectric strength		1500 V a.c for 1 minute			
Ambient temperature		-15 ℃ ~ 45 ℃			
Ambient humidity		45 ~ 85 %R.H.			

FOOT SWITCH

Model	HY-101	HY-102
Appearance		
Reted voltage	250 V a.c, 6 A	250 V a.c, 6 A
Internal switch	HY-P601 A	HY-P601 A
Material of case	ABS resin	AL Diecasting

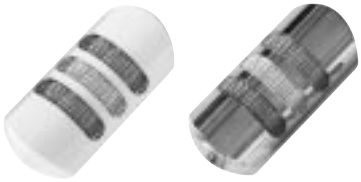
Model	HY-103	HY-104	HY-105
Appearance			
Reted voltage	250 V a.c, 10 A		
Internal switch	HY-P701D		HY-P701B
Material of case	AL Diecasting		

MAIN SWITCH

Appearance	Suffix code	Rated insulation voltage	Rated current	Material
	MAS-025-A · B	690 V a.c	25 A	Anti-flammable
	MAS-063-A · B		63 A	
	MAS-125-A · B		125 A	

SIGNAL LIGHT

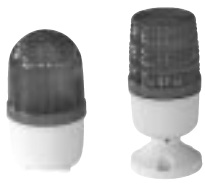
WALL MOUNTED LIGNT CE

Model	WME	WMS
Appearance		
Function	A : Continuous light F : Continuous light, Flashing light, Buzzer	A : Continuous light F : Continuous light, Flashing light, Buzzer
Body (Color)	B : Beige C : Chrome plating	Red, Yellow, Green, Blue, White
Rated voltage	24 VDC, 24 VAC (12 V is a custom-made)	
Number of stacks	3 stacks basics	1, 2, 3, 4, 5 stacks
Power consumption	0.5 W per each lamp, max. 2.1 W	0.5 W per each lamp, max. 3.2 W for 5 stacks F type
Buzzer	75 ~ 85 dB (1m)	75 ~ 85 dB (1m)
Drive	NPN, PNP Transistor Open Collector Drive 24 V d.c , 24 V a.c	

TURN LIGHT (TLB Series)

Model	TLB 060	TLB 100	TLB 150
Appearance			
Size	Ø 60	Ø 100	Ø 150
Shape	P: Round shape lens, Direct mount (Buzzer) R : Round shape lens, Prop mount F : Square shape lens, Direct mount (Buzzer) X : Square shape lens, Prop mount	P: Round shape lens, Direct mount (Buzzer) F : Square shape lens, Direct mount (Buzzer)	F : Square shape lens, Direct mount (Buzzer)
Function	A : Revolution and continuous light F : Revolution and continuous light, Buzzer (Except stainless material)	A : Revolution and continuous light F : Revolution and continuous light, Buzzer (Except stainless material)	A : Revolution and continuous light F : Revolution and continuous light, Buzzer (Except stainless material)
Rated voltage	24 V d.c, 24 V a.c (12 V is a custom-made)		
Color	Red, Yellow, Green		
Bulb	5 W	10 W	20 W
Buzzer	75 ~ 85 dB (1m)	75 ~ 85 dB (1m)	90 dB (1m)
Power consumption	max. 6 W	max. 11 W	max. 21 W
Revolutions	120 ~ 160 revolutions per minute		
Drive	Relay, NPN, PNP Transistor Open Collector Drive		
Material	ABS		ABS, Stainless

SIGNAL LIGHT (SLB Series) CE

Model	SLB 060
Appearance	
Size	Ø 60
Shape	P: Round shape lens, Direct mount (Buzzer) R : Round shape lense, Prop mount F : Square shape lens, Direct mount (Buzzer) X : Square shape lens, Prop mount
Function	A : Continuous light F : Continuous light, Flashing light, Buzzer
Rated voltage	24 VDC, 24 VAC (12 V is a custom-made)
Color	Red, Yellow, Green
Light	LED
Drive	NPN, PNP Transistor Open Collector 24 V a.c / V d.c
Power consumption	max. 1 W
Buzzer	75 ~ 85 dB (1m)

TURN LIGHT

Model		VOLTAGE	CONSUMPTION POWER	BULB	REVOLUTION
	TR-12	12 V d.c	0.9 A	12 V 5 W	130 /minute
	TR- 24	24 V d.c	0.5 A	24 V 5 W	
	TR-012	110 V a.c	0.1 A	12 V 5 W	
		220 V a.c	0.05 A		
	TX- 12	12 V d.c	0.9 A		
	TX- 24	24 V d.c	0.5 A	24 V 5 W	
	TX-012	110 Va.c	0.1 A	12 V 5 W	
		220 V a.c	0.05 A		
	TF- 12	12 V d.c	0.9 A		
	TF- 24	24 V d.c	0.5 A	24 V 5 W	
	TF-012	110 V a.c	0.1 A	12 V 5 W	
		220 V a.c	0.05 A		
	TP- 12	12 V d.c	0.9 A		
	TP- 24	24 V d.c	0.5 A	24 V 5 W	
	TP-012	110 V a.c	0.1 A	12 V 5 W	
		220 V a.c	0.05 A		

REVOLVING LIGHT

SPECIFICATION

Model		VOLTAGE	BULB	REVOLUTION	COLOR	REMARK
	HY-RLA-KB-01	12 V d.c	12 V,10 W	160 /minute	Red	General use
	HY-RLA-KB-01A					Car use. (magnet method)
	HY-RLA-KBB-10	110 V a.c	12 V,10 W		Red	Absorption buzzer method
	HY-RLA-KBB-20	220 V a.c	12 V,10 W		Red	

LED TURN LIGHT

Appearance	Suffix code	Power voltage	Power consumption	Chips	Revolution	Flickering
	LTR-12	12-24 V a.c/d.c	0.07 A, 1.7 W	24	approx. 190 times for a minutes	approx. 50 times for a minutes
	LTR-012	110 - 220 V a.c	0.01 A, 2.2 W	24		
	LTP- 12	12-24 V a.c/d.c	0.07 A, 1.7 W	24		
	LTP- 012	110 - 220 V a.c	0.01 A, 2.2 W	24		
	LTPB- 12	12-24 V a.c/d.c	0.07 A, 1.7 W	24		
	LTPB-012	110 - 220 V a.c	0.01 A, 2.2 W	24		

SIGNAL LIGHT

SIGNAL LIGHT (XENON Lamp Flashing) CE

SPECIFICATION

Model		Rated Volt	BULB	Consumption power	Flashing	Remark
	RLA-WX-01	12 V d.c	XENON LAMP	4 W	60 /MIN	• Buzzer built-in type is optional. • It is available to use cigar jack with car. • Flashing number is selectable (1~3 times).
	RLA-WX-02	24 V d.c				
	RLA-WX-10	110 V a.c		4.5 W		
	RLA-WX-20	220 V a.c				

CUBE TOWER

Model		VOLTAGE	CONSUMPTION POWER	BULB	COLOR	REVOLUTION
 □82 REVOLVING CUBE LIGHT	HY-CTB-KBB-021	24 V d.c	12 W	24 V, 10 W	Red	160 /minute
	HY-CTB-KBB-022	24 V d.c	24 W	24 V, 10 W	Red,Green	
	HY-CTB-KBB-023	24 V d.c	35 W	24 V, 10 W	Red,Yellow,Green	
	HY-CTB-KBB-201	220 V a.c	8 W	12 V, 5 W	Red	
	HY-CTB-KBB-202	220 V a.c	16 W	12 V, 5 W	Red,Green	
	HY-CTB-KBB-203	220 V a.c	23 W	12 V, 5 W	Red,Yellow,Green	
 □116 REVOLVING CUBE LIGHT	HY-CTC-KBM-021	24 V d.c	18 W	24 V, 10 W	Red	130 /minute
	HY-CTC-KBM-022	24 V d.c	28 W	24 V, 10 W	Red,Green	
	HY-CTC-KBM-023	24 V d.c	38 W	24 V, 10 W	Red,Yellow,Green	
	HY-CTC-KBM-201	220 V a.c	13 W	12 V, 5 W	Red	
	HY-CTC-KBM-202	220 V a.c	18 W	12 V, 5 W	Red,Green	
	HY-CTC-KBM-203	220 V a.c	23 W	12 V, 5 W	Red,Yellow,Green	

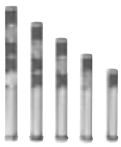
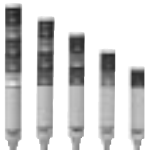
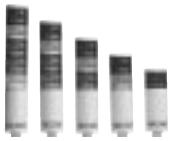
CUBE LIGHT

Model		VOLTAGE	CONSUMPTION POWER	BULB	COLOR
 □82 CUBE LIGHT	HY-CTB-TB-021	24 V d.c	0.42 A	24 V, 10 W	Red (Option)
	HY-CTB-TB-022		0.63 A		Red, Blue
	HY-CTB-TB-101	110 V a.c	0.14 A	110 V, 10 W	Red (Option)
	HY-CTB-TB-102		0.20 A		Red, Blue
	HY-CTB-TB-201	220 V a.c	0.08 A	220 V, 10 W	Red (Option)
	HY-CTB-TB-202		0.11 A		Red, Blue

LED SIGN TOWER (STS Series) CE

Model	STS 040	STS 060	STS 080
Appearance			
Size	Ø 40	Ø 60	Ø 80
Mount	Mounting Bracket Pipe Bracket L type Bracket	Mounting Bracket Pipe Bracket L type Bracket	Mounting Bracket Pipe Bracket L type Bracket
Rated voltage	24 VDC, 24 VAC (12 V is a custom-made)		
Number of stacks	1, 2, 3, 4, 5 stacks		
Color	Red, Yellow, Green, Blue, White		
Power consumption	1.1 W per each lamp, max. 7 W for 5 stacks F type		
Drive	Relay, NPN, PNP Transistor Open Collector Drive		
Material	ABS		

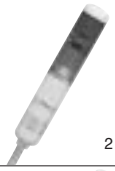
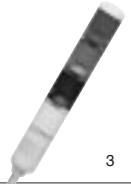
LED SIGN TOWER (STL Series) CE

Model	STL 025	STL 040	STL 060	STL 080
Appearance				
Size	Ø 25	Ø 40	Ø 60	Ø 80
Function	A : Continuous light F : Continuous light, Flashing light, Buzzer	A : Continuous light F : Continuous light, Flashing light, Buzzer	A : Continuous light F : Continuous light, Flashing light, Buzzer	A : Continuous light F : Continuous light, Flashing light, Buzzer
Rated voltage	24 VDC / VAC	24 VDC, 24 VAC (12 V is a custom-made)		
Number of stacks	1, 2, 3, 4, 5 stacks			
Drive	Relay, NPN, PNP Transistor Open Collector Drive 24 VDC / 24 VAC	Relay, NPN, PNP Transistor Open Collector Drive 24 VAC / VDC, 100 ~ 240 VAC		
Mount	Direct	Direct Mounting Bracket Pipe Bracket L type Bracket	Direct Mounting Bracket Pipe Bracket L type Bracket	Direct Mounting Bracket Pipe Bracket L type Bracket
Color	Red, Yellow, Green, Blue, White			
Power consumption	1.1 W per each lamp, max. 7 W for 5 stacks F type			
Buzzer	75 ~ 85 dB (1m)	65 ~ 75 dB (1m)	75 ~ 85 dB (1m)	75 ~ 85 dB (1m)

SIGNAL LIGHT

SIGN TOWER CE (HY-T, HY-TB)

STAGE	Model	VOLTAGE	CONSUMPTION POWER	BULB	FLASHING
 1	HY-T(TW)-12-1 HY-T(TW)-24-1 HY-T(TW)-110-1 HY-T(TW)-220-1	12 V a.c/d.c 24 V a.c/d.c 110 V a.c 220 V a.c	0.42 A 0.21 A 0.07 A 0.04 A	12 V 5 W 24 V 5 W 110 V 5 W 220 V 5 W	60 /minute (HY-TW)
 2	HY-T(TW)-12-2 HY-T(TW)-24-2 HY-T(TW)-110-2 HY-T(TW)-220-2	12 V a.c/d.c 24 V a.c/d.c 110 V a.c 220 V a.c	0.84 A 0.42 A 0.14 A 0.08 A	12 V 5 W 24 V 5 W 110 V 5 W 220 V 5 W	
 3	HY-T(TW)-12-3 HY-T(TW)-24-3 HY-T(TW)-110-3 HY-T(TW)-220-3	12 V a.c/d.c 24 V a.c/d.c 110 V a.c 220 V a.c	1.26 A 0.63 A 0.20 A 0.11 A	12 V 5 W 24 V 5 W 110 V 5 W 220 V 5 W	
 4	HY-T(TW)-12-4 HY-T(TW)-24-4 HY-T(TW)-110-4 HY-T(TW)-220-4	12 V a.c/d.c 24 V a.c/d.c 110 V a.c 220 V a.c	1.68 A 0.84 A 0.27 A 0.14 A	12 V 5 W 24 V 5 W 110 V 5 W 220 V 5 W	
 5	HY-T(TW)-12-5 HY-T(TW)-24-5 HY-T(TW)-110-5 HY-T(TW)-220-5	12 V a.c/d.c 24 V a.c/d.c 110 V a.c 220 V a.c	2.10 A 1.05 A 0.33 A 0.17 A	12 V 5 W 24 V 5 W 110 V 5 W 220 V 5 W	

STAGE	Model	VOLTAGE	CONSUMPTION POWER	BULB	FLASHING
 1	HY-TB(TWB)-12-1 HY-TB(TWB)-24-1 HY-TB(TWB)-110-1 HY-TB(TWB)-220-1	12 Vd.c 24 V d.c 110 V a.c 220 V a.c	0.42 A 0.21 A 0.07 A 0.04 A	12 V 5 W 24 V 5 W 110 V 5 W 220 V 5 W	60 /minute (HY-TWB)
 2	HY-TB(TWB)-12-2 HY-TB(TWB)-24-2 HY-TB(TWB)-110-2 HY-TB(TWB)-220-2	12 Vd.c 24 V d.c 110 V a.c 220 V a.c	0.84 A 0.42 A 0.14 A 0.08 A	12 V 5 W 24 V 5 W 110 V 5 W 220 V 5 W	
 3	HY-TB(TWB))-12-3 HY-TB(TWB)-24-3 HY-TB(TWB)-110-3 HY-TB(TWB)-220-3	12 Vd.c 24 V d.c 110 V a.c 220 V a.c	1.26 A 0.63 A 0.20 A 0.11 A	12 V 5 W 24 V 5 W 110 V 5 W 220 V 5 W	
 4	HY-TB(TWB)-12-4 HY-TB(TWB)-24-4 HY-TB(TWB)-110-4 HY-TB(TWB)-220-4	12 Vd.c 24 V d.c 110 V a.c 220 V a.c	1.68 A 0.84 A 0.27 A 0.14 A	12 V 5 W 24 V 5 W 110 V 5 W 220 V 5 W	
 5	HY-TB(TWB)-12-4 HY-TB(TWB)-24-4 HY-TB(TWB)-110-4 HY-TB(TWB)-220-4	12 Vd.c 24 V d.c 110 V a.c 220 V a.c	2.10 A 1.05 A 0.33 A 0.17 A	12 V 5 W 24 V 5 W 110 V 5 W 220 V 5 W	

TOWER LIGHT

Model	VOLTAGE	BULB	COLOR
HY-STA-TB-012	12 V a.c / d.c	12 V, 3 W	Red,Green
HY-STA-TB-013	12 V a.c / d.c	12 V, 3 W	Red,Yellow,Green
HY-STA-TB-014	12 V a.c / d.c	12 V, 3 W	Red,Yellow,Green,Blue
HY-STA-TB-022	12 V a.c / d.c	24 V, 3 W	Red,Green
HY-STA-TB-023	12 V a.c / d.c	24 V, 3 W	Red,Yellow,Green
HY-STA-TB-024	12 V a.c / d.c	24 V, 3 W	Red,Yellow,Green,Blue
HY-STA-TB-102	110 V a.c	110 V, 3 W	Red,Green
HY-STA-TB-103	110 V a.c	110 V, 3 W	Red,Yellow,Green
HY-STA-TB-104	110 V a.c	110 V, 3 W	Red,Yellow,Green,Blue
HY-STA-TB-202	220 V a.c	220 V, 3 W	Red,Green
HY-STA-TB-203	220 V a.c	220 V, 3 W	Red,Yellow,Green
HY-STA-TB-204	220 V a.c	220 V, 3 W	Red,Yellow,Green,Blue

ASSEMBLY TERMINAL BLOCK

SPECIFICATION

Model / Classification	HYBT-15	HYBT-25	HYBT-35	HYBT-60	HYBT-100	HYBT-15-2
						
Rated Insulating voltage	Max. 600 V					
Rated current	15 A	25 A	35 A	60 A	100 A	15 A, 2 stack
Insulation resistance	Min. 100 MΩ					
Dielectric stength	2,500 V a.c for 1minute between non-current carrying parts					
Terminal bolt	M3.5	M4	M4	M6	M6	M3.5
Ambient temperature	-20 ~ 55 ℃					
Ambient humidity	45 - 85 % R.H					

TERMINAL BLOCK

SPECIFICATION

Model / Classification	TB-10	TB-20	TB-30	TB-60	TB-100
					
Rated insulating voltage	Max. 600 V				
Rated current	10 A	20 A	30 A	60 A	100 A
Insulation resistance	Min. 100 MΩ				
Dielectric strength	2, 500 V a.c for 1minute between non- current carrying parts				
Ambient temperature	-20 ~ 55 ℃				
Ambient humidity	45 - 85 % R.H				

SPECIFICATION

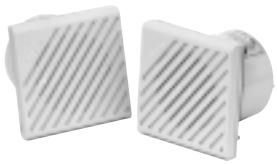
Model / Classification	TB-150	TB-200	TB-300	TB-400	TB-500
					
Rated insulating voltage	Max. 600 V				
Rated current	150 A	200 A	300 A	400 A	500 A
Insulation resistance	Min. 100 MΩ				
Dielectric strength	2,500 V a.c for 1 minute between non-current carrying parts				
Ambient temperature	-20 ~ 55 ℃				
Ambient humidity	45 - 85 % R.H				

POWER BUZZER

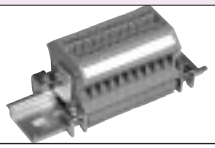
Model	HY-256	HY-306	HY-606	HY-606N
Appearance				
Voltage	110 V, 220 V a.c / d.c 12 V, 24 V d.c			
Power consumption	4 VA		8 VA	
Cycle	50 / 60 Hz			
Volume(distance 1m)	85Phon	85Phon	85Phon	
External diameter	ϕ25	ϕ30	ϕ65	Exposure type

3 TIMBRE ELECTRIC BUZZER

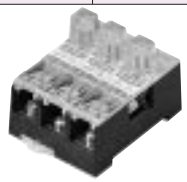
MELODY BUZZER

Model	HY-226 MD, MA	HY-256 MD, MA	HY-606 MD, MA
Appearance			
Voltage	110, 220 V a.c / 12, 24 V d.c	110, 220 V a.c / 12, 24 V d.c	110, 220 V a.c / 12, 24 V d.c
Power consumption	0.6 W / 13.5 W	0.6 W / 13.5 W	2.5 W
Frequency	50/60 Hz	50/60 Hz	50/60 Hz
Volume(distance 1m)	80 phon	80 phon	98 phon
Diameter	ϕ 22	ϕ 25	ϕ 66

N-TYPE ASSEMBLY TERMINAL BLOCK

Appearance	Model	HY-NBT-15
	Rated insulating voltage	600 V
	Rated current	15 A
	Insulation resistance	100 MΩ
	Dielectric strength	2,500 V a.c for 1 minute

FUSE HOLDER

Model	F15-1A	F15-1D	F15-2A	F15-2D	F15-3A	F15-3D	F30
Appearance							
Rating	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	600 V a.c 30 A
Remark	For a.c : Common to 110 V - 220 V For d.c : Common to 12 V - 24 V ※Use a ceramic fuse						110 V - 600 V a.c ※Ceramic Fuse

CONTROL BOX AND CONNECTOR

Appearance	Model	Material	Remark
	HY-2501	Thermostable ABS resin	ϕ25
	HY-2502		
	HY-2503		
	HY-2504		
	HY-2505		
	HY-2506		
	HY-3001	Thermostable ABS resin	ϕ30
	HY-3002		
	HY-3003		
	HY-3004		
	HY-3005		
	HY-3006		
	CB25	Thermostable ABS resin	ϕ25
	CB30	Thermostable ABS resin	ϕ30
	HYC-M1	PC (resin)	ϕ8
	HYC-M2	PC (resin)	ϕ11

TEMPERATURE CONTROLLER

SOLID STATE RELAY

FOOT SWITCH

POWER PUSH BUTTON SWITCH

CAM / MONO LEVER SWITCH

REVOLVING LIGHT
LED TURN LIGHT
SIGNAL LIGHT
CUBE TOWER LIGHT

LEADING HIGH-TECH CORPORATION IN CONTROL & MEASUREMENT

MAIN QUALITY COMPETITION

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- UL / CE CERTIFIED
- ERP (ENTERPRISE RESOURCES PLANNING)
- SELECTED AS SUPERIOR QUALITY ENTERPRISE TOP 50
- TOP QUALITY ENTERPRISE AWARD
- WIN THE PRIZE FOR NATIONAL QUALITY MANAGEMENT

MAIN PRODUCTS & TECHNOLOGY

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- AUTOMATIC CORRECTION FACILITY TO ENSURE PRECISION OF PRODUCTS.
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HANYOUNG NUX CO.,LTD
1381-3, Juan-Dong, Nam-Gu Incheon, Korea
TEL : +82-32-876-4697 FAX : +82-32-876-4696
Http : //www.hynux.net E-mail : overseas@hynux.com

Temperature Controller/Recorder/Digital Counter.Timer/Analog Timer/Panel Meter/Multi Pulse Meter/Sensor
Rotary Encoder/TPR/SSR/Control Switch/Micro Switch/Limit Switch/Cam Switch/Mono Lever Switch/Hoist Switch
Main Switch/LED Sign Tower/Turn Light/Signal Light/Terminal Block/Fuse Holder/Control Box

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HANYOUNG NUX CO.,LTD.
1381-3, Juan-Dong, Nam-Gu, Incheon, Korea
TEL: +82-32-876-4697 FAX: +82-32-876-4696
http://www.hynux.net E-mail: overseas@hynux.com

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