QMS
ISO 9001:2000
登録番号 JSAQ 097
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JAB
QMS Accreditation
認定番号R001

TOHO


TRM-006A

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DIGITAL INDICATOR

TRM-006A

Most Superior Indicator with Advanced Multiple Functions!
Low Price, Easy Operation & Selectable Input!!

TRM-006A

TOHO ELECTRONICS INC.

DIGITAL INDICATOR TRM-006A

Sized in conformity with DIN48 × 96

■Features

●Suitable for diversified inputs

Accepts temperatures from thermocouples and resistance thermometers, as well as currents or voltages

●Remote monitoring, using communication function

In conformity with RS-485, optionally sets the communication function, which is applicable for managing data in fields with computers connected

●Peak/bottom hold function

Holds maximum measurement (peak value) and minimum measurement (bottom value) during operation for reading them anytime

●Up to 2 events of outputs (1-event output as the standard feature)

Allows up to 2 events of outputs as an option, where the setting changeable through front keys depending on conditions of generated contact outputs or operations

●Power supply for sensors

Equips the power source for external supply of 12 VDC, which is usable as power source for sensors and such

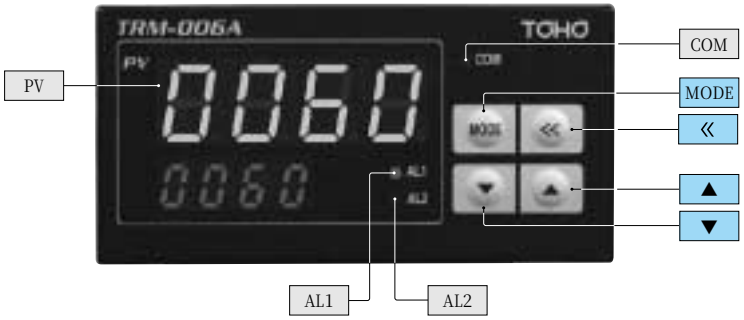
●Digital PV filter

Mounts the primary delay filter, which is applicable for removing high-frequency noises and such, as a standard feature for inputting measured data

●Standardization of Conformity

UL/cUL/CE is under approval

■Names of components



PV	Indicates measured values and characters
AL1	Lights up when the event output 1 is turned on
AL2	Lights up when the event output 2 is turned on
COM	Lights up when the communication function (option) is effective (Blinks during communication)
MODE	Used when screens are to be switched (Set parameters saved)
«	Used when figures are to be moved at setting
▲	Used for increasing the set value
▼	Used for decreasing the set values

■Standard specifications

Types of inputs	Thermocouple	K, J, R, T, N, S or B (External resistance within 0.5 μ V/1 Ω)	Key switching available
	RTD	Pt100 or JPt100 (External resistance 10 Ω or less per line)	
	Current/voltage	0 to 5VDC/1 to 5VDC (Input resistance of 500k Ω or more), 4 to 20mA (Input resistance of 250 Ω)	Key switching available
		0 to 1VDC (Input resistance of 500k Ω or more), 0 to 10mVDC/0 to 10VDC (Input resistance of 1M Ω or more)	Model designation
Indication	Indication of set value/character	4 figures, green, 14mm	
	Setting indication	4 figures, red, 8mm	
	Function indication	Red LED (AL1 and AL2), green LED (COM)	
Sampling interval		250mS	
Display precision	Thermocouple	Either ±(0.3% +1digit) or ±2°C of the reference value, whichever larger (ambient temperature of 23 ±10°C) Note: ±3°C for -100 to 0°C, ±4°C for -200 to -100°C, and no specification for 400°C or lower with thermocouple B	
	RTD	Either ±(0.3% +1digit) or ±0.9°C of the reference value, whichever larger (ambient temperature of 23 ±10°C) Either ±(0.3% +1digit) or 1.5°C, whichever larger (ambient temperature of 0 to 50°C)	
	Current/voltage	Full span ±(0.3% + 1digit) (ambient temperature of 23 ±10°C), where full span = setting range	
Memory element		EEPROM	
Input power source		100 to 240VAC, 50/60Hz, and 24VAC/VDC ±10%, 50/60Hz	
Weight		300g or less	
Power consumption		10VA (240VAC), 6VA (24VAC), and 4W (24VDC)	
Accessory		Instruction manual and fixing bracket	
Ranges of ambient temperature and humidity for service		0 to 50°C, 20 to 90% RH (no dew allowed)	
Ranges of ambient temperature and humidity for storage		-25 to 70°C (no freeze or dew allowed), 5 to 95% (no dew allowed)	
Function	PV compensation, zero point setting	Thermocouple/RTD: -199 to 999 or -199.9 to 999.9°C, Current/voltage: -1999 to 9999 digit (decimal point in designated location)	
	PV compensation, gain setting	Multiplied by 0.50 to 2.00	
	Digital PV filter	0 to 99 sec (Filter OFF at "0")	
	PV hold	Hold of the measured value 1) No hold, 2) Peak hold (PV MAX value saved), 3) Bottom hold (PV MIN value saved), 4) Peak/bottom hold (PV MAX/MIN value saved)	
	Instant power-off	No effect on operation by power-off within 1cycle	
	Insulation resistance	Between measurement terminal and casing: 20M Ω at 500VDC, and between power supply terminal and casing: 20M Ω at 500VDC	
	Withstand voltage	Between measurement terminal and casing: 1min at 1000VAC, and between power supply terminal and casing: 1min at 1500VAC	
	Blind function	Available with no display of arbitrary parameter screen	
	Burnout (cut wire)	Thermocouple/RTD: Overscale 0 to 5 /0 to 1 /0 to 10VDC: Equivalent to 0 input 1 to 5VDC/4 to 20mA: Underscale 0 to 10mVDC: Overscale	
	Setting of decimal point	Indication of figures after the decimal point, with/without	
	Priority screen	Available with indication of arbitrary parameter screens in the operation mode (9pcs)	
	Lock function	4-mode selection (lock OFF, ALL, lock of the operation mode and lock other than the operation mode)	

■Option specifications

Event output	Rated output Contact: 1a Contact capacity: 250VAC, 2.4A (resistance load) Min. load: 5VDC, 10mA Mechanical life: 5million times or more Electrical life: 0.2million times or more Contact output operation 1) No function 2) Upper/lower limit of absolute value (added function: hold and stand-by sequence) 3) Upper limit of absolute value (added function: hold and stand-by sequence) 4) Lower limit of absolute value (added function: hold and stand-by sequence) 5) Upper/lower limit range of absolute value (added function: hold and stand-by sequence) Output polarity setting 1) Normal open 2) Normal close Other functions 1) Setting of upper/lower limit of output 2) Setting of sensitivity of output 3) Setting of delay timer of output					
Transmission output (PV transmission)	Type		Load resistance	Output response time	Output precision	Output resolution
	Voltage	0 to 10mVDC	500kΩ or more	600ms or shorter	±0.3% (23°C±10°C)	Equivalent to the indication resolution or higher
		0 to 1VDC				
		0 to 5VDC	1kΩ or more			
		1 to 5VDC				
		0 to 10VDC				
	Current	4 to 20mADC	600kΩ or more			
Communication	Communication standards	Conformity with RS-485				
	Communication method	Protocol	Proprietary to TOHO Electronics/MODBUS (RTU or ASCII)			
		Information direction	Half duplex			
		Sync system	Asynchronous			
		Transmission code	ASCII (except BCC)			
		Interface	Two-wire type			
		Communication speed	1200／2400／4800／9600／19200BPS			
		Character	Proprietary to TOHO Electronics	Start bit	1bit fixed	
				Stop bit	1/2bits	
				Data length	7/8bits	
				Parity	None/odd No./even No.	
				BCC check	With/without	
				Address	1 to 99 stations	
			MODBUS (RTU)	Start bit	1bit fixed	
				Stop bit	1/2bits	
				Data length	8bits	
				Parity	None/odd No./even No.	
				Address	1 to 247 stations	
			MODBUS (ASCII)	Start bit	1bit fixed	
				Stop bit	1/2bits	
				Data length	7bits	
				Parity	None/odd No.	
				Address	1 to 247 stations	
		Response delay time	0 to 250mS			
Power supply for driving sensor	Output voltage: 12VDC Allowable current: Max. 20mA (load resistance of 600Ω or more) Output precision: ±1V (0 to 50°C)					

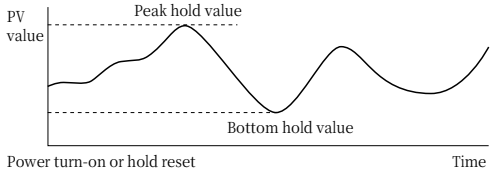
■Indication ranges

		Indication range		Setting range	
		Without decimal point	With decimal point	Without decimal point	With decimal point
Thermocouple	K	−210 to 1382	−199.9 to 999.9		
	J	−210 to 860	−199.9 to 860.0		
	R	−10 to 1710			
	T	−210 to 410	−199.9 to 410.0		
	N	−210 to 1310	−199.9 to 999.9		
	S	−10 to 1710			
	B	−20 to 1802			
RTD	Pt100	−199 to 530	−199.9 to 530.0		
	JPt100	−199 to 520	−199.9 to 520.0		
Current/ voltage	0 to 5VDC	Approx. -2% of setting of the lower limit of scaling (SLL) to approx. +12% of setting of the upper limit of scaling (SLH), within the setting range		−1999 to 9999	−199.9 to 999.9 −19.99 to 99.99 −1.999 to 9.999
	0 to1VDC				
	0 to 10mVDC				
	0 to 10VDC				
	1 to 5VDC	Approx. -12% of setting of the lower limit of scaling (SLL) to approx. +12% of setting of the upper limit of scaling (SLH), within the setting range			
	4 to 20mADC				

■Superior function

Bottom hold/peak hold

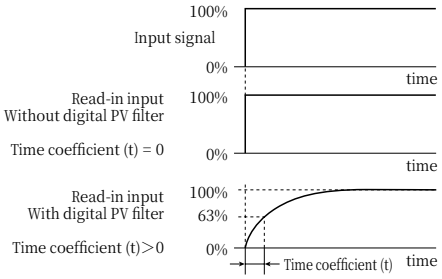
Maximum and minimum values (peak and bottom) of measurements (PV) can be saved for reference after power is turned on. Either peak or bottom value alone can be saved and indicated by setting.
During indicating the peak/bottom value, holding the UP key pushed for approx. 2sec or longer leads to resetting the indication.



Digital PV filter

Digital PV filter is a function to provide the CR filtering effect using software by calculating the primary delay with respect to a measurement (PV). The filtering effect can be set using the time coefficient (t). (Time coefficient is defined as a time for the PV value to reach approx. 63% when inputs change in a stepping manner.)

Application of digital PV filter
1) Removal of high-frequency noise; effect of noise is mitigated when electric noise is applied on inputs.
2) Response to a drastic input change can be delayed.

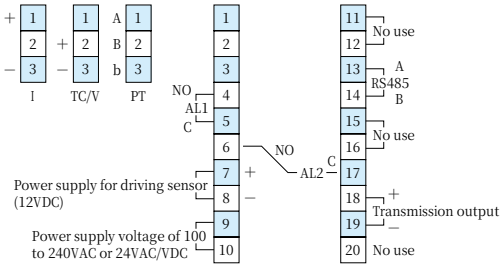


■Isolation

Power supply circuit		
PV input	CPU circuit	Voltage of 12VDC for driving sensor
		Transmission output
		Event output 1
		Event output 2
Communication RS-485		

Solid line: Insulated, dotted line: Not insulated

■Terminal allocation



■Terminal description

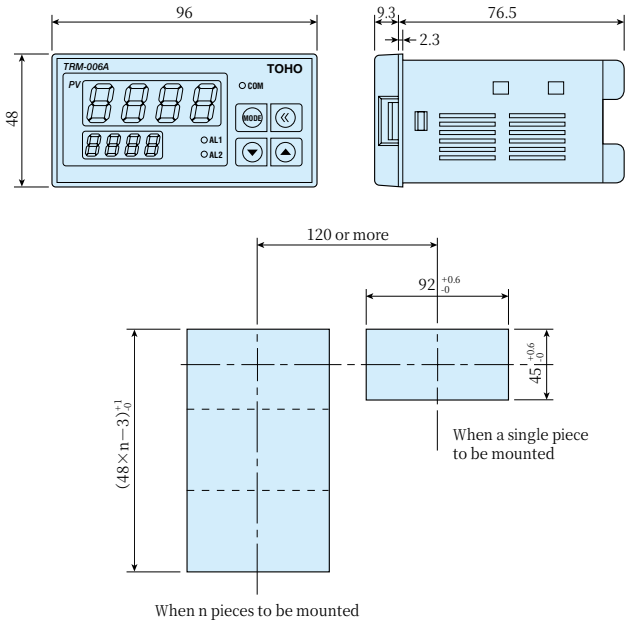
Communication	Connect terminal A/B of RS-485 with care. (Use a converter in case of other than RS-485.)
Transmission	Connect with care on polarity.
EV1 and EV2 (AL1 and AL2)	Available with polarity switching of normal open/normal close
Input of RTD	Connect terminal A/B/b with care.
Input of thermocouple, current or voltage	Connect with care on polarity.
Power supply for driving sensor	Connect with care on polarity.
In case of specification with 24VDC	Wire the "+" side with No. 10 side.

■Table for selecting model

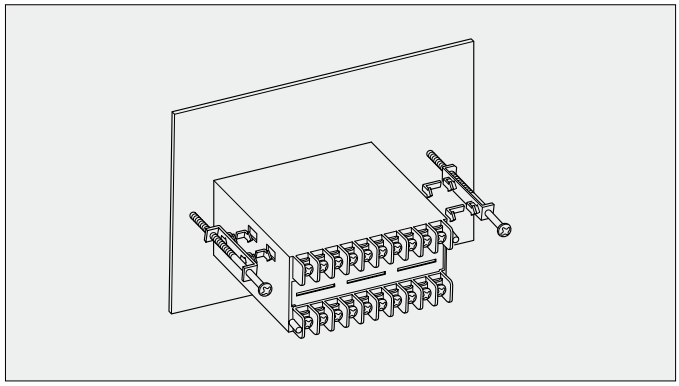
TRM-006A- [Input] -A [Event output 1] [Option] - [Power supply]

Input	0	Thermocouple (K, J, R, T, N, S or B)/RTD (Pt100 or JPt100)	Input switching
	2	0 to 5VDC／1 to 5VDC／4 to 20mADC	Input switching
	4	0 to 1VDC	
	5	0 to 10VDC	
	6	0 to 10mVDC	
Option	B	Event output 2 (AL2: relay contact output)	
	F	Transmission output 1 to 5VDC	
	G	Transmission output 0 to 10VDC	
	H	Transmission output 0 to 10mVDC	
	I	Transmission output 4 to 20mADC	
	K	Transmission output 0 to 1VDC	
	J	Transmission output 0 to 5VDC	
	M	Communication RS-485 (TOHO-exclusive protocol, MODBUS)	
	Q	Power supply voltage for driving sensor (12VDC)	
Power supply/voltage		100 to 240VAC	
	24	24VAC/DC	

■Panel cutting and outside dimension



■Panel mounting



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