Independent Single Display PID Temperature Controllers

TR1D Series

INSTRUCTION MANUAL

TCD220018AE

Autonics

Thank you for choosing our Autonics product.

Read and understand the instruction manual and manual thoroughly before using the product.

For your safety, read and follow the below safety considerations before using.

For your safety, read and follow the considerations written in the instruction manual, other manuals and Autonics website.

Keep this instruction manual in a place where you can find easily.

The specifications, dimensions, etc are subject to change without notice for product improvement Some models may be discontinued without notice.

Follow Autonics website for the latest information.

Safety Considerations

- Observe all 'Safety Considerations' for safe and proper operation to avoid hazards.
- ⚠ symbol indicates caution due to special circumstances in which hazards may occur.

⚠ Warning Failure to follow instructions may result in serious injury or death

01. **Fail-safe device must be installed when using the unit with machinery that may cause serious injury or substantial economic loss.(e.g. nuclear power control, medical equipment, ships, vehicles, railways, aircraft, combustion apparatus, safety equipment, crime/disaster prevention devices, etc.)**
Failure to follow this instruction may result in personal injury, economic loss or fire.
02. **Do not use the unit in the place where flammable/explosive/corrosive gas, high humidity, direct sunlight, radiant heat, vibration, impact or salinity may be present.**
Failure to follow this instruction may result in explosion or fire.
03. **Install the unit on DIN rail to use.**
Failure to follow this instruction may result in electric shock.
04. **Do not connect, repair, or inspect the unit while connected to a power source.**
Failure to follow this instruction may result in fire or electric shock.
05. **Check 'Connections' before wiring.**
Failure to follow this instruction may result in fire.
06. **Do not disassemble or modify the unit.**
Failure to follow this instruction may result in fire or electric shock.

⚠ Caution Failure to follow instructions may result in injury or product damage

01. **When connecting the power input and relay output, use AWG 20 (0.50 mm^2) cable or over, and tighten the terminal screw with a tightening torque of 0.74 to 0.90 N m.**
When connecting the sensor input and communication cable without dedicated cable, use AWG 28 to 16 cable and tighten the terminal screw with a tightening torque of 0.74 to 0.90 N m.
Failure to follow this instruction may result in fire or malfunction due to contact failure.
02. **Use the unit within the rated specifications.**
Failure to follow this instruction may result in fire or product damage
03. **Use a dry cloth to clean the unit, and do not use water or organic solvent.**
Failure to follow this instruction may result in fire or electric shock.
04. **Keep the product away from metal chip, dust, and wire residue which flow into the unit.**
Failure to follow this instruction may result in fire or product damage.

Cautions during Use

- Follow instructions in 'Cautions during Use'. Otherwise, it may cause unexpected accidents.
- Check the polarity of the terminals before wiring the temperature sensor.
For RTD temperature sensor, wire it as 3-wire type, using cables in same thickness and length. For thermocouple (CT) temperature sensor, use the designated compensation wire for extending wire.
- Keep away from high voltage lines or power lines to prevent inductive noise .
In case of installing power line and input signal line closely, use line filter or varistor at power line and shielded wire at input signal line.
Do not use near the equipment which generates strong magnetic force or high frequency noise.
- Do not apply excessive power when connecting or disconnecting the connectors of the product.
- Install a power switch or circuit breaker in the easily accessible place for supplying or disconnecting the power.
- Do not use the unit for other purpose (e.g. voltmeter, ammeter), but temperature controller.
- When changing the input sensor, turn off the power first before changing.
After changing the input sensor, modify the value of the corresponding parameter.
- Do not overlapping communication line and power line. Use twisted pair wire for communication line and connect ferrite bead at each end of line to reduce the effect of external noise.
- Make a required space around the unit for radiation of heat. For accurate temperature measurement, warm up the unit over 20 min after turning on the power.
- Make sure that power supply voltage reaches to the rated voltage within 2 sec after supplying power.
- Do not wire to terminals which are not used.
- This unit may be used in the following environments.
  - Indoors (in the environment condition rated in 'Specifications')
  - Altitude Max. 2,000 m
  - Pollution degree 2
  - Installation category II

Ordering Information

This is only for reference, the actual product does not support all combinations.
For selecting the specified model, follow the Autonics website .

T R 1 D - ❶ ❷ ❸ ❹

❶ Option output
1: Alarm output 1
R: Alarm output 1, Transmission output 1
T: Alarm output 1, RS485 communication

❷ Power supply
4: 100-240 VAC 50/60Hz

❸ Control output1
R: Relay
C: Current/SSR

❹ Control output2

PN	Control output2	Additional function
N	None	-
R	Relay ↔ Alarm output 2	CT input
C	Current/SSR ↔ Transmission output 2	CT input

Product Components

- Product (+ bracket)
- Instruction manual

Manual

For proper use of the product, refer to the manuals and be sure to follow the safety considerations in the manuals.
Download the manuals from the Autonics website.

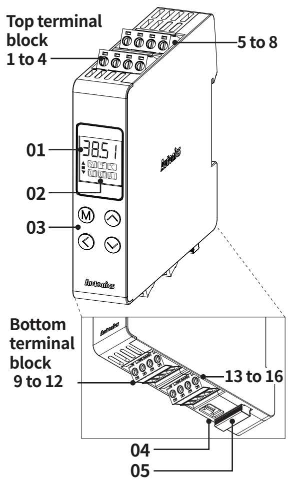
Software

Download the installation file and the manuals from the Autonics website.

■ DAQMaster

DAQMaster is comprehensive device management program. It is available for parameter setting, monitoring.

Unit Descriptions



01. **PV / SV display part (Red)**
RUN mode: Displays PV (Present value) and SV (Setting value).
Parameter: Displays name and setting value of parameters.
02. **Indicator**

Indicator	ON contition
SV	SV display
OUT☐	Control output☐ ON
AL1	AL1 alarm output ON
▲ ■ ▼	Displays PV deviation based on SV (Setting value) by LED. ▲: when deviation is over +2 °C ■: when deviation is within ±2 °C ▼: when deviation is under −2 °C Flashes during auto tuning every 1 sec
°C / °F	'2-2 Temperature unit' parameter setting

03. **Control key**
[M]: MODE key
[◀] / [▲] / [▼]: Setting value control key
04. **PC loader port**
Communication converter (SCM-USP, Sold separately) connection
05. **Bracket handle**
Use to mount and detach the DIN rail.

Specifications

Series		TR1D Series
Power supply		100 - 240 VAC∼ 50/60 Hz
Permissible voltage range		90 to 110% of rated voltage
Power consumption		≤ 8 VA
Sampling period		50, 100, 250 ms
Input specification		Refer to 'Input Type and Using Range'.
Option input	CT input	• 0.0-50.0 A (primary current measurement range) • CT ratio: 1/1,000, • Measurement accuracy: ±5% F.S. ±1digit
Control output	Relay	250 VAC∼ 3 A 1a
	SSR	12 VDC⎓ ±3 V, ≤ 20 mA
	Current	DC 4-20 mA or DC 0-20 mA (parameter), Load: ≤ 500 Ω
Option output	Alarm	AL1, AL2: 250 VAC∼ 3 A 1a
	Transmission	DC4-20 mA (Load resistance: ≤ 500 Ω, Output accuracy: ±0.3% F.S.)
	RS485 comm.	Modbus RTU / ASCII

Display type		7 segment (red), 4-digit
Control type		ON/OFF, P, PI, PD, PID Control
Hysteresis		Control output: 1 to 100 °C/°F (0.1 to 100.0 °C/°F) Alarm output: 1 to 100 °C/°F (0.1 to 50.0 °C/°F)
Proportional band (P)		0.1 to 999.9 °C
Integral time (I)		0 to 9,999 sec
Derivative time (D)		0 to 9,999 sec
Control cycle (T)		Relay output: 0.5 to 120.0 sec, SSR drive output: 0.5 to 120.0 sec
Manual reset		0.0 to 100.0%
Dielectric strength		Between the charging part and the case : 3,000 VAC∼ 50/60 Hz for 1 min
Vibration		0.75 mm amplitude at frequency of 5 to 55Hz in each X, Y, Z direction for 2 hours
Relay life cycle	Mechanical	OUT1/2, AL1/2: ≥ 5,000,000 operations
	Electrical	OUT1/2, AL1/2: ≥ 100,000 operations (resistance load: 250 VAC∼ 5 A)
Insulation resistance		≥ 100 MΩ (500 VDC⎓ megger)
Insulation type		Double insulation or reinforced insulation (dielectric strength between the charging part and the case: 3 kV)
Noise immunity		Square shaped noise (pulse width: 1 µs) by noise simulator ±2 kV R-phase, S-phase
Memory retention		≈ 10 years (non-volatile semiconductor memory type)
Ambient temperature		-10 to 50 °C, storage: -20 to 60 °C (no freezing or condensation)
Ambient humidity		35 to 85%RH, storage: 35 to 85%RH (no freezing or condensation)
Certification		CE EHE EAC
Unit weight (packaged)		≈ 123.5 g (≈ 194.5 g)

Communication Interface

■ RS485

Communication protocol	Modbus RTU / ASCII
Application standard	EIA RS485 compliance with
Maximum connection	31 units (address: 01 to 127)
Synchronous method	Asynchronous
Communication method	Two-wire half duplex
Communication effective range	≤ 800 m
Communication speed	4,800 - 9,600 (default) - 19,200 - 38,400 - 57,600 - 115,200 bps (parameter)
Response time	5 to 99 ms (default: 20 ms)
Start bit	1 bit (fixed)
Data bit	8 bit (fixed)
Parity bit	None (default), Odd, Even
Stop bit	1 bit, 2 bit (default)
EEPROM life cycle	≈ 1,000,000 operations (Erase / Write)

- It is recommended to use Autonics communication converter. Please use twisted pair wire, which is suitable for RS485 communication.

Input Type and Using Range

- The setting range of some parameters is limited when using the decimal point display.

Input type		Decimal point	Display Method	Using range(°C)	Using range(°F)
Thermo-couple	K (CA)	1	KCA.H	-50 to 1,200	-58 to 2,192
		0.1	KCA.L	-50.0 to 999.9	-58.0 to 999.9
	J (IC)	1	JIC.H	-30 to 800	-22 to 1,472
		0.1	JIC.L	-30.0 to 800.0	-22.0 to 999.9
	L (IC)	1	LIC.H	-40 to 800	-40 to 1,472
		0.1	LIC.L	-40.0 to 800.0	-40.0 to 999.9
	T (CC)	1	TCC.H	-50 to 400	-58 to 752
		0.1	TCC.L	-50.0 to 400.0	-58.0 to 752.0
	R (PR)	1	rPr	0 to 1,700	32 to 3,092
	S (PR)	1	SPr	0 to 1,700	32 to 3,092
RTD	DPt100 Ω	1	dPt.H	-100 to 400	-148 to 752
		0.1	dPt.L	-100.0 to 400.0	-148.0 to 752.0
	CU50 Ω	1	CU5.H	-50 to 200	-58 to 392
		0.1	CU5.L	-50.0 to 200.0	-58.0 to 392.0
	Nickel120 Ω	1	nI12	-80 to 260	-112 to 500

■ Display accuracy

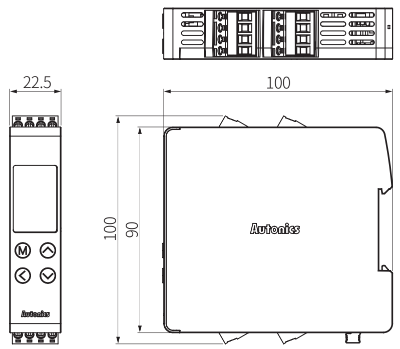
- The setting range of some parameters is limited when using the decimal point display.

Input type	Using temperature	Measurement accuracy
Thermocouple RTD	At room temperature (23°C±5 °C)	(PV ±0.3% or ±1 °C higher one) ±1-digit • Thermocouple R (PR), S (PR) below 200 °C: (PV ±0.5% or ±3 °C higher one) ±1-digit, Over 200 °C: (PV ±0.5% or ±2 °C higher one) ±1-digit, • Thermocouple L (IC), RTD Cu50 Ω: (PV ±0.5% or ±2 °C higher one) ±1-digit
	Out of room temperature range	(PV ±0.5% or ±2 °C higher one) ±1-digit • Thermocouple R (PR) , S (PR): (±1.0% or ±5 °C higher one) ±1-digit • Thermocouple L (IC), RTD Cu50 Ω: (PV ±0.5% or ±3 °C higher one) ± 1-digit

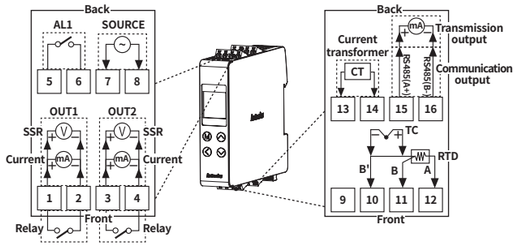
- When multiple products (or more) are mounted without separation, ±1°C is added to all accuracy.

Dimensions

- Unit: mm, For the detailed drawings, follow the Autonics website.



Connections



■ Terminal support by model

Terminal No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Function / Model	Control output 1		Control output 2		Alarm output		Power		-	Temperature sensor input			CT input		Option output	
TR1D-14RN	Relay		-		Relay		○		-	TC	-		-	-	-	-
										RTD						
TR1D-14RR	Relay		Relay		Relay		○		-	TC	-		○		-	-
										RTD						
TR1D-R4RR	Relay		Relay		Relay		○		-	TC	-		○		Trans-mission	
										RTD						
TR1D-T4RR	Relay		Relay		Relay		○		-	TC	-		○		Communi-cation	
										RTD						
TR1D-14CN	Current		-		Relay		○		-	TC	-		-	-	-	-
	SSR									RTD						
TR1D-14CC	Current		Current		Relay		○		-	TC	-		○		-	-
	SSR		SSR							RTD						
TR1D-R4CC	Current		Current		Relay		○		-	TC	-		○		Trans-mission	
	SSR		SSR							RTD						
TR1D-T4CC	Current		Current		Relay		○		-	TC	-		○		Communi-cation	
	SSR		SSR							RTD						

Initial Display When Power is ON

When power is supplied, after all display will flash for a while, series and model name are displayed sequentially. After input sensor type will flash twice, enter into RUN mode.

All display	Series	Model	Input specification	Run mode
8.8.8.8.	tr 1d	t4rr	YCA.H	26.6
▲ SV °F °C ■ OUT1 OUT2 AL1 ▼	°C	°C	°C	°C OUT1 OUT2 AL1

Errors

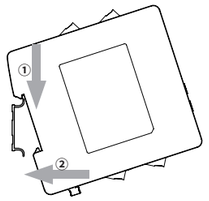
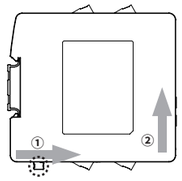
Display	Description	Troubleshooting
oPEn	Flashes if input sensor is disconnected or sensor is not connected.	Check input sensor status.
HHHH	Flashes when PV is higher than input range.[01]	When input is within the rated temperature range, this display disappears.
LLLL	Flashes when PV is lower than input range.[01]	

01) Be careful that when HHHH / LLLL error occurs, the control output may occur by recognizing the maximum or minimum input depending on the control type.

Installation Method

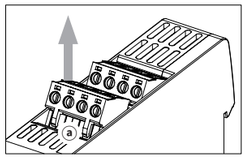
■ Mounting on DIN rail

- Mount the metal part with a spanner so that a large force is not applied to the body.

Install	Uninstall
	
1. Hang the top of backside holder to 35 mm width DIN rail. 2. Press the unit in the direction of the arrow until there is clicking sound.	1. Pull the bracket handle on the bottom of the unit in the direction of the arrow. 2. Lift the unit up while pulling the handle bracket to remove.

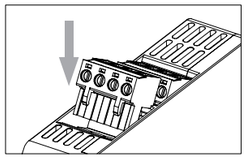
Attaching and Dettaching a Terminal Unit

■ Detaching



Lift the lower part of the terminal unit ⓐ upwards by using a tool (e.g. flat-head driver).

■ Attaching



Press the terminal unit downwards to insert.

- When disconnecting terminal unit and wiring, refer to 'Connections' to attach to right position. Failure to follow this instruction may result in fire product damage or malfunction.

Mode Setting

RUN	[▲] key over 2 sec	→	Display part switching	Auto	→ RUN
	No key input over screen protection time	→	Screen protection	[M], [◀], [▲], [▼] key	→
	[▼] + [▲] key over 3 sec	→	Digital input key	Auto	→
	[M], [◀], [▲] or [▼] key	→	SV setting	[M] key or no key input over 3 sec	→
	[M] key over 2 sec	→	Parameter group	[M] key over 2 sec	→
	[◀] + [▲] + [▼] key over 3 sec	→	Parameter reset	Refer to 'Parameter Reset'	→

Parameter Reset

01. Press the [◀] + [▲] + [▼] keys for over 5 sec. in run mode, INIT turns ON.
02. Change the setting value as YES by pressing the [▲] , [▼] keys.
03. Press the [M] key to reset all parameter values as default and to return to run mode.

Parameter Setting

- Some parameters are activated/deactivated depending on the model or setting of other parameters. Refer to the descriptions of each item.
- Select group by [▲], [▼] key and press [M] key to parameter setting mode in parameter group setting mode.
- [M] key: Move to next item after saving / Return to upper level with save (≥ 2 sec)
  [◀] key: Move digits / Return to the upper level without saving (≥ 2 sec) / Return to RUN mode without saving (≥ 3 sec)
  [▲], [▼] key: Select parameter / Change setting value
- Return to the upper level without saving when there is no key input for more than 30 seconds.
- The range in parentheses '( )' is the setting range when the set value of the 'input specification' parameter is used with one decimal point.
- Recommended parameter setting sequence: Parameter 2 group → Parameter 1 group → SV setting mode

■ Parameter 1 group

Parameter		Display	Default	Setting range	Condition
1-1	Lock	LoCK	oFF	OFF LOC1: Lock parameter 2 group LOC2: Lock parameter 1, 2 group LOC3: Lock parameter 1, 2 group + SV setting lock • It is possible to check the value only in lock mode.	-
1-2	Heater current monitoring	Ct-A	-	[CT input model] 0.0 to 50.0 A	2-10/11 Control output 1/2: SSR
1-3	Auto tuning	At	oFF	OFF, ON: Execution	2-9 Control type: PID
1-4	AL1 alarm temperature	AL1	1250	Deviation alarm: -F.S. to F.S. °C/°F Absolute value alarm: Within input specification • Changing the '2-16/19 AL1/2 alarm operation' and '2-17/20 AL1/2 alarm option' will automatically reset the value to the maximum or minimum that will not be output.	2-16/19 AL1/2 alarm operation: AM1 to AM6, HBA
1-5	AL2 alarm temperature	AL2	1250		
1-6	Heating proportional band	H-P	10	0.1 to 999.9 °C/°F	-
1-7	Heating integral time	H-I	240	0 (OFF) to 9999 sec	-
1-8	Heating derivative time	H-d	49	0 (OFF) to 9999 sec	-
1-9	Cooling proportional band	C-P	10	0.1 to 9999 °C/°F	-
1-10	Cooling integral time	C-I	240	0 (OFF) to 9999 sec	-
1-11	Cooling derivative time	C-d	49	0 (OFF) to 9999 sec	-
1-12	Dead band[01]	db	0	-Proportional band to +Proportional band °C/°F	2-9 Control type: P.P, P.ON, ON.P
				-999 to 999 (-199.9 to 999.9) °C/°F	2-9 Control type: ON.ON
1-13	Manual reset	rESt	50	0.0 to 100.0%	1-7/10 Heating/ Cooling integral time: 0
1-14	Heating hysteresis	HHYS	2	1 to 100 (0.1 to 100.0) °C/°F	2-9 Control type: ONOF & 2-8 Control output mode[02]
1-15	Heating OFF offset	HoSt	0	0 to 100 (0.0 to 100.0) °C/°F	
1-16	Cooling hysteresis	CHYS	2	1 to 100 (0.1 to 100.0) °C/°F	
1-17	Cooling OFF offset	CoSt	0	0 to 100 (0.0 to 100.0) °C/°F	

01) When set to the + value, the dead band is formed based on SV and does not control any control.
When set to the - value, the overlap band is formed based on SV, perform the heating and cooling control at the same time.

02) Parameter display following to the setting value of '2-8 Control output mode'
HEAT: '1-14 & 15 Heating hysteresis & OFF offset'
COOL: '1-16 & 17 Cooling hysteresis & OFF offset'
H-C: '1-14 & 15 Heating hysteresis & OFF offset', '1-16 & 17 Cooling hysteresis & OFF offset'

■ Parameter 2 group

Parameter		Display	Default	Setting range	Condition
2-1	Input specification	In-t	YCAH	Refer to 'Input Type and Using Range'	-
2-2	Temperature unit	Unit	°C	°C, °F	-
2-3	Sampling period	SPLt	50	50, 100, 250 ms	-
2-4	Input correction	In-b	0	-999 to 999 (-199.9 to 999.9) °C/°F	-
2-5	Input digital filter	ñAvF	0.1	0.1 to 120.0 sec	-
2-6	SV low limit value	L-SU	-50	Within 2-1 Input specification L-SV ≤ H-SV - 1-digit °C/°F H-SV ≥ L-SV + 1-digit °C/°F	-
2-7	SV high limit value	H-SU	1200		-
2-8	Control output mode	o-Ft	H-C	HEAT: Heating[03], COOL: Cooling[03], H-C: Heating (OUT1) & Cooling (OUT2)[02]	-
2-9	Control type	C-ñd	P.P	PID, ONOF: ON/OFF, P.P: PID-PID*, ON.ON: ON/OFF-ON/OFF*, P.ON: PID-ON/OFF*, ON.P: ON/OFF-PID*	* 2-8 Control output mode: H-C

Parameter		Display	Default	Setting range	Condition
2-10	Control output 1	oUt1	CUrr	[Current/SSR output model] SSR, CURR: Current	-
2-11	Control output 1 range	o1ñA	4-20	4-20, 0-20 mA	2-10/12 Control output 1/2: CURR
2-12	Control output 2	oUt2	CUrr	[Current/SSR output model] SSR, CURR: Current	-
2-13	Control output 2 range	o2ñA	4-20	4-20, 0-20 mA	2-10/12 Control output 1/2: CURR
2-14	Heating control cycle	H-t	20.0	[Relay output model] 0.5 to 120.0 sec	-
			2.0	[Current/SSR output model] 0.5 to 120.0 sec	2-10/12 Control output 1/2: SSR
2-15	Cooling control cycle	C-t	20.0	[Relay output model] 0.5 to 120.0 sec	-
			2.0	[Current/SSR output model] 0.5 to 120.0 sec	2-10/12 Control output 1/2: SSR
2-16	AL1 alarm operation	AL-1	ñ□□ LA □□□■	□□□ AM0: OFF AM1: Deviation high limit alarm AM2: Deviation low limit alarm AM3: Deviation high, low limit alarm AM4: Deviation high, low limit reserve alarm AM5: Absolute value high limit alarm AM6: Absolute value low limit alarm SBA: Sensor break alarm LBA: Loop break alarm[03] HBA: Heater break alarm	-
2-17	AL1 alarm option			■ A: Standard alarm, B: Alarm latch, C: Standby sequence 1, D: Alarm latch and sequence 1, E: Standby sequence 2, F: Alarm latch and sequence 2 • Enter to option setting: Press [◀] key in 2-16 AL-1 alarm operation.	-
2-18	AL1 Hysteresis	A1HY	1	1 to 100 (0.1 to 50.0) °C/°F	2-16/17 AL1/2 Alarm operation: AM1 to AM6 or HBA
2-19	AL2 alarm operation	AL-2	ñ□□A	[Alarm output 2 model] Same as '2-16/17 AL1 alarm operation/ option'	2-8 Control output mode: HEAT or COOL
2-20	AL2 alarm option				
2-21	AL2 hysteresis	A2HY	1	[Alarm output 2 model] 1 to 100 (0.1 to 50.0) °C/°F	2-16/17 AL1/2 Alarm operation: AM1 to AM6 or HBA
2-22	LBA time[04]	LbAt	0	0 to 9999 sec or auto setting[05]	2-16/17 AL1/2 alarm operation: LBA
2-23	LBA band	LbAb	2	0 to 999 (0.0 to 999.9) °C/°F or Auto setting[06]	
2-24	Transmission output1 mode	Aou1	Pv	[Transmission output model] PV, SV, H-MV: Heating MV, C-MV: Cooling MV	-
2-25	Transmission output1 low limit	FS1L	-50	[Transmission output model] Refer to 'Input Type and Using Range'	
2-26	Transmission output1 high limit	FS1H	1200		
2-27	Transmission output2 mode	Aou2	Pv	[Transmission output 2 model] PV, SV, H-MV: Heating MV, C-MV: Cooling MV	2-8 Control output mode: HEAT or COOL
2-28	Transmission output2 low limit	FS2L	-50	[Transmission output 2 model] Refer to 'Input Type and Using Range'	
2-29	Transmission output2 high limit	FS2H	1200		
2-30	Digital input key	di-F	StoP	STOP: Stop control output, ALRE: Alarm reset, AT: Auto tuning execution, OFF	-
2-31	Sensor error, MV	Er.ñv	0	0.0 (OFF) to 100.0 (ON)	2-8 Control output mode: HEAT or COOL
				-100 (Cooling ON) to 0.0 (OFF) to 100 (Heating ON)	2-8 Control output mode: H-C
2-32	Screen protection	dSP	oFF	OFF, 1, 30, 60 min	-
2-33	Comm. protocol	PrCL	rtU	RTU: Modbus RTU, ASCI: Modbus ASCII	-
2-34	Comm. address	AdrS	1	1 to 99	-
2-35	Comm. speed	bPS	96	48, 96, 192, 384, 576, 1152 (×100) bps	-
2-36	Comm. parity bit	PrtY	nonE	None, Even, Odd	-
2-37	Comm. stop bit	StP	2	1, 2 bit	-
2-38	Response time	rSUt	20	5 to 99 ms	-
2-39	Comm. write	CoñY	EnA	EN.A: Enable, DIS.A: Disable	-
2-40	Parameter reset	Init	no	YES, NO	-

01) [Alarm output2 model] 'Control output 2 terminal' operates as 'alarm output 2'.
[Transmission output2 model] 'Control output 2 terminal' operates as 'transmission output 2'.

02) [Control output 2 terminal not support model] 'Alarm output 1 terminal' operates as 'control output 2'.

03) Operates based on 'Control output 1'

04) - Initialization condition of LBA time (alarm output status)
Alarm reset, change '2-8 Control output mode' (standard alarm: OFF, alarm latch: OFF),
Change '2-4 Input correction' or SV (Standard alarm: latch, alarm latch: latch),
Error status: OPEN, HHHH, LLLL (Standard alarm: Immediately ON, alarm latch: Immediately ON)
- Stop condition of LBA operation (Alarm output status)
Set '2-22/23 LBA time/band: 0' (standard alarm: OFF, alarm latch: latch)
Stop control output, execute auto tuning (standard alarm: OFF, alarm latch: latch),
If '2-1 Input specification' is changed, the settings are initialized.

05) After auto tuning, the range is set as twice of the integral time automatically. If the previous setting value is outside of the range automatically set, it is set to the nearest Max. or Min. value of the range.

06) After auto tuning, the range is set as 10% of the proportion band automatically. If the previous setting value is outside of the range automatically set, it is set to the nearest Max. or Min. value of the range.

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