Isolated Converters

CN-6000 Series

PRODUCT MANUAL

For your safety, read and follow the considerations written in the instruction manual, other manuals and Autonics website.
The specifications, dimensions, etc. are subject to change without notice for product improvement. Some models may be discontinued without notice.

Features

- Multi-input
  - CN-610□-□ : Thermocouple 12 types, RTD 5 types, Analog (mV, V, mA) 6 types
  - CN-640□-□ : 0 to 50.00kHz
- Improved visibility with negative LCD
  : 12 segment, 3 colors (selectable red, green, yellow)
- Displays input type and unit on display part
- Various outputs
  - Alarm output: 1 EA / 2 EA / 4 EA
  - 0 - 20 mA transmission output (adjustable insulation, output range), 0 - 10 VDC⎓ voltage output (adjustable insulation, output range)
- Various functions
  - High / Low peak input monitoring
  - Alarm output (upper / lower, sensor break)
  - Transmission output / display scale
  - Digital input key (DI), etc.
- Built-in power supply for sensor / transmitter (24 VDC⎓)

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 on a device panel to use.
Failure to follow this instruction may result in fire or 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 electric shock.

05. Do not disassemble or modify the unit.
Failure to follow this instruction may result in fire or electric shock.

06. Check 'Connections' before wiring.
Failure to follow this instruction may result in fire.

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

01. Use the unit within the rated specifications.
Failure to follow this instruction may result in fire or product damage.

02. 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.

03. 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.

Cautions during Use

- Follow instructions in 'Cautions during Use'.
  Otherwise, It may cause unexpected accidents.
- Power supply should be insulated and limited voltage / current or Class 2, SELV power supply device.
- Install a power switch or circuit breaker in the easily accessible place for supplying or disconnecting the power.
- Keep away from high voltage lines or power lines to prevent inductive noise.
  In case installing power line and input signal line closely, use line filter or varistor at power line and shielded wire at input signal line.
- This unit may be used in the following environments.
  - Indoors / Outdoors
  - 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.

CN - 6 ❶ ❷ - ❸

❶ Input
10: Universal input
40: Pulse input

❷ Power supply
0: 100 - 240 VAC ± 10 % 50 / 60 Hz
1: 24 VDC ± 10 %

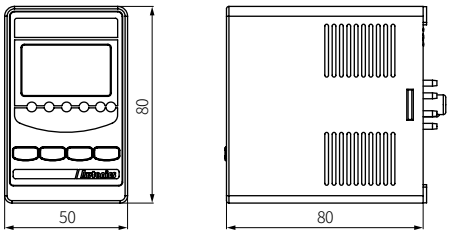
❸ Output
C1: Transmission (DC 0 - 20 mA) output × 1
C2: Transmission (DC 0 - 20 mA) output × 2
V1: Transmission (0 - 10 VDC) output × 1
V2: Transmission (0 - 10 VDC) output × 2
R1: Alarm output × 1
R2: Alarm output × 2
R4: Alarm output × 4

Product Components

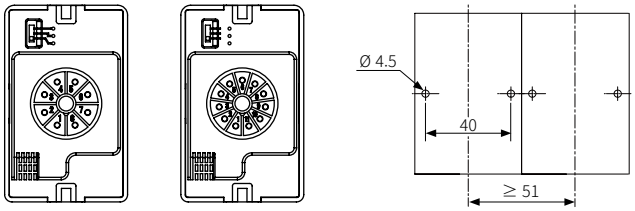
- Product
- 8-pin socket (output: C1, V1, R1 model)
- Instruction manual
- 11-pin socket (output: C2, V2, R2, R4 model)

Dimensions

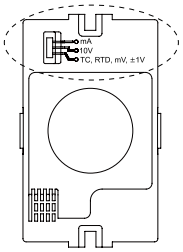
- Unit: mm, For the detailed drawings, follow the Autonics website.



■ 8-pin socket ■ 11-pin socket ■ Panel cut-out



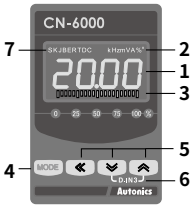
Input Type Selection Switch



- Select the input type of the universal input model.
  The pulse input model does not have this input type selection switch.
- After selecting the input type with the switch, set the same input specification in the input type parameter of the program mode.

Switch	Input
mA (default)	0 (4) to 20 mA
10V	-1 to 10 VDC⎓
TC, RTD, mV, ±1V	Thermocouple, RTD, mV, ± 1 VDC⎓

Unit Descriptions



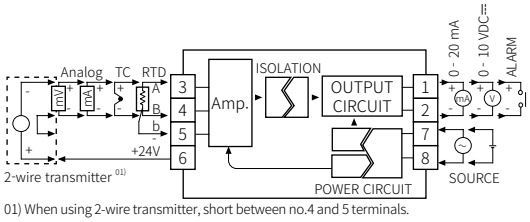
No.	Part name	Name plate	Function
1	Display part (red, green, yellow)	-	Run mode: Displays current measured value. Set mode: Displays parameters. • Color selectable
2	Unit display part (red)	-	-
3	Output scale bar		[Transmission output model] Displays output as % by scale bars.
	Alarm output indicator		[Alarm output model] Turns ON when the alarm output is on.
4	MODE key	[MODE]	Used to enter monitoring mode and program mode , move to parameters, save SV and return to RUN mode.
5	Setting key	[◀], [▼], [▲]	Used to change parameter SV.
6	Digital input	D.IN3	Press the [▼] + [▲] keys for 3 sec, it operates the set function at digital input key parameter.
7	Input type display part 01)	-	[Universal input model] Turns ON when checking or changing the setting value.

01) In case of thermocouple type, L, N, U, P types are not displayed.
In case of RTD type, RTD is displayed.

Connections

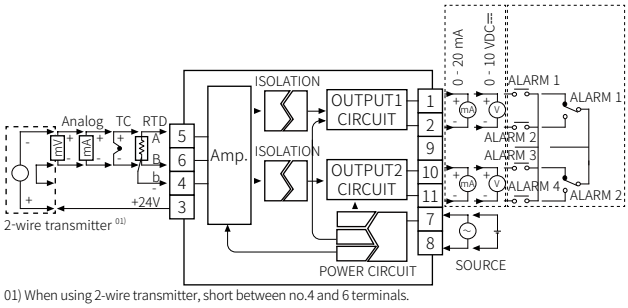
- SOURCE: 100 - 240 VAC~ 50 / 60 Hz 8 VA
  24 VDC⎓ 3 W

■ **Universal input (8-pin)**



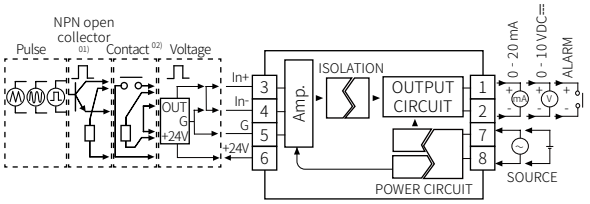
01) When using 2-wire transmitter, short between no.4 and 5 terminals.

■ **Universal input (11-pin)**



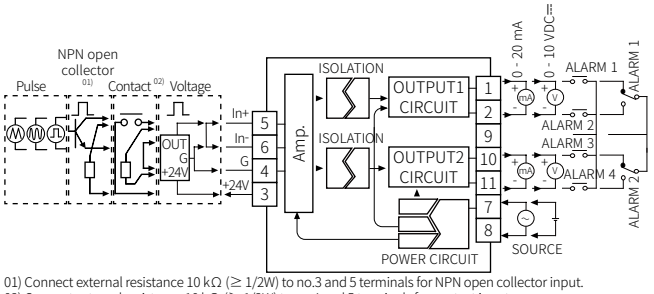
01) When using 2-wire transmitter, short between no.4 and 6 terminals.

■ **Pulse input (8-pin)**



01) Connect external resistance 10 kΩ (≥ 1/2W) to no.3 and 6 terminals for NPN open collector input.
02) Connect external resistance 10 kΩ (≥ 1/2W) to no.3 and 5 terminals for contact input.

■ **Pulse input (11-pin)**



01) Connect external resistance 10 kΩ (≥ 1/2W) to no.3 and 5 terminals for NPN open collector input.
02) Connect external resistance 10 kΩ (≥ 1/2W) to no.4 and 5 terminals for contact input.

Specifications

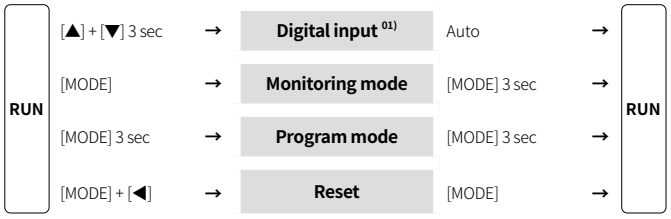
Model	CN-610□-□	CN-640□-□
Input type[01]	Universal - Temperature sensor : RTD, thermocouple - Analog: voltage, current	Pulse
Display method	12-segment (selectable red, green, yellow) LCD (character size: 6.4 × 11.0 mm), Graphic bar and input type / unit display part (red) LCD (character size: 1.4 × 2.75 mm)	
Display accuracy[02]	Dependent on the ambient temperature	
25 ± 5°C	± 0.2 % F.S. ± 1 digit	
-10 to 20°C, 30 to 50°C	± 0.3 % F.S. ± 1 digit	
Display cycle[03]	-	Same with pulse input cycle
Sampling cycle	Temperature sensor input: 250 ms Analog input: 100 ms	-
Unit weight (packaged)	≈ 160 g (≈ 301 g)	≈ 200 g (≈ 340 g)
Certification	CE UK CA	

01) For details, refer to the input type and range.
02) Thermocouple, below -100 °C: ± 0.4 % F.S. ± 1 digit
Thermocouple T, U: min. ± 2.0 °C
03) When pulse input cycle is over 10 sec, it is updated by every 10 sec.

Output	Transmission (DC 0 - 20 mA)	Transmission (0 - 10 VDC⎓)	Alarm
Load resistance	≤ 600Ω	≥ 10 kΩ	-
Accuracy	± 0.3 F.S.		-
Resolution	8,000		-
Contact capacity	-		250 VAC~
Contact composition	-		5 A, 1a: 1 / 3 A, 1c: 2 / 5 A, 1a: 4 model

Power supply	100 - 240 VAC~ 50 / 60 Hz	24 VDC⎓
Permissible voltage range	90 to 110 % of rated voltage	
Power consumption	≤ 8 VA	≤ 3 W
Insulation resistance	≥ 100 MΩ (500 VDC⎓ megger)	
Dielectric strength	Between input terminal and power terminal: 2,000 VAC~ 50 / 60 Hz for 1 min	
Vibration	0.75 mm double amplitude at frequency of 5 to 55 Hz in each X, Y, Z direction for 2 hours	
Noise immunity	± 2 kV the square wave noise (pulse width: 1 μs) by the noise simulator	
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)	

Mode Setting



01) P1-34, P2-30 Digital input key (HOLD: hold display value or ZERO: remote zero)

Monitoring Mode

- Some parameters are activated / deactivated depending on the model or setting of other parameters. Refer to the description of each parameter.
- If any key is not entered for 30 sec in each parameter, it returns to RUN mode.
- [MODE] key: Saves current setting value and moves to the next parameter.
- [◀] key: Changes setting digits.
- [▲], [▼] key: Changes setting values.

Parameter		Display	Defaults	Setting range	Display condition
M1-1	1 CH output value	oUt.1	- - - -	[Transmission output model] • Displays output value by each channel.	-
M1-2	2 CH output value	oUt.2	- - - -		
M1-3	Alarm 1 value	AL 1	100.0	[Alarm output model] Temperature sensor input : within temperature range Analog input : low-limit to high-limit scale • Depending on the number of alarm outputs, whether to display alarm 3 / 4 is different.	P1-20 to 27, P2-19 to 26 Alarm operation / option: AT1.A, AT2.A
M1-4	Alarm 2 value	AL2	000.0		
M1-5	Alarm 3 value	AL3	100.0		
M1-6	Alarm 4 value	AL4	000.0		
M1-7	Display max. peak value[01]	H.PEK	- - - -	Max. peak value in run mode	-
M1-8	Display min. peak value[01]	L.PEK	- - - -	Min. peak value in run mode	-

01) Initial max. / min. peak value is saved after 2 sec from supplying the power.
Reset: Press the [▼] + [▲] keys for at least 1 sec

Program Mode

- Some parameters are activated / deactivated depending on the model or setting of other parameters. Refer to the description of each parameter.
- If any key is not entered for 30 sec in each parameter, it returns to RUN mode.
- [MODE] key: Saves current setting value and moves to the next parameter.
- [◀] key: Changes setting digits.
- [▲], [▼] key: Changes setting values.

■ Universal input

Parameter		Display	Defaults	Setting range	Display condition
P1-1	Input type	IN-P	AMA2	• Refer to Input Type and Range	-
P1-2	Temperature unit[01]	UNIt	°C	°C, °F	P1-1 Input type: Temp. sensor
P1-3	Display unit	d.UNt	%, OFF, mV, V, mA, A, °C, °F		P1-1 Input type: Analog
P1-4	Low-limit input value	L-AG	04.00	Within input type range • Low-limit input value + 20 % F.S. < High-limit input value	
P1-5	High-limit input value	H-AG	20.00		
P1-6	Decimal point position	d.P	0.0	0.0, 0.00, 0.000, 0 • Set the decimal point position of the high / low-limit scale.	
P1-7	Low-limit scale	L-SC	000.0	-1999 to 9999	
P1-8	High-limit scale	H-SC	100.0		
P1-9	Input correction	IN-b	000	-999 to 999	-
P1-10	Low-limit value of transmission output 1	L.oR1	04.00	[Transmission (DC 0 - 20 mA) output model] DC 0 - 20 mA	-
		00.00	[Transmission (0 - 10 VDC⎓) output model] 0 - 10 VDC⎓		
P1-11	High-limit value of transmission output 1	H.oR1	20.00	[Transmission (DC 0 - 20 mA) output model] DC 0 - 20 mA	-
		10.00	[Transmission (0 - 10 VDC⎓) output model] 0 - 10 VDC⎓		
P1-12	Low-limit value of transmission output 2	L.oR2	04.00	[Transmission (DC 0 - 20 mA) output model] DC 0 - 20 mA	-
		00.00	[Transmission (0 - 10 VDC⎓) output model] 0 - 10 VDC⎓		
P1-13	High-limit value of transmission output 2	H.oR2	20.00	[Transmission (DC 0 - 20 mA) output model] DC 0 - 20 mA	-
		10.00	[Transmission (0 - 10 VDC⎓) output model] 0 - 10 VDC⎓		
P1-14	Bar display CH	bAR	oUt 1	[Transmission output model] OUT1, OUT2	P1-37 User level: HIGH
P1-15	Low-limit scale value of transmission output 1	L.oU1	000.0	[Transmission output model] Temperature sensor input : within temperature range Analog input : low-limit to high-limit scale	-
P1-16	High-limit scale value of transmission output 1	H.oU1	100.0		
P1-17	Low-limit scale value of transmission output 2	L.oU2	000.0		
P1-18	High-limit scale value of transmission output 2	H.oU2	100.0		
P1-19	Input and transmission output extension[02]	Ex.1o	5P	[Transmission output model] 5P: output DC 3.2 - 20.8 mA, 0 - 10.5 VDC⎓ out of 5 % of analog input range 10P: output DC 2.4 - 21.6 mA, 0 - 11 VDC⎓ out of 10 % of analog input range 0P: output DC 4 - 20 mA, 0 - 10 VDC⎓ in the analog input range	P1-1 Input type: Analog & P1-37 User level: HIGH
P1-20	Alarm 1 operation	AL-1	AtiA □□□.■	[Alarm output model] □□□ AT1: Absolute high limit alarm, AT2: Absolute low limit alarm, SBA: sensor break alarm, AT0: no alarm output	-
P1-21	Alarm 1 option			[Alarm output model] ■ A: standard alarm, B: alarm latch, C: standby sequence, D: alarm latch and standby sequence • Enter alarm option setting mode : Operate in 'Alarm 1 operation' mode select AT1 or AT2 and input [◀] key	-
P1-22	Alarm 2 operation	AL-2	At2A □□□.■	[Alarm output model] Same as 'P1-20 / 21 Alarm 1 operation / option' • Depending on the number of alarm outputs, whether to display alarm 3 / 4 is different.	-
P1-23	Alarm 2 option				
P1-24	Alarm 3 operation	AL-3	AtiA □□□.■		
P1-25	Alarm 3 option				
P1-26	Alarm 4 operation	AL-4	At2A □□□.■		
P1-27	Alarm 4 option				
P1-28	Alarm output hysteresis	A-HY	001	[Alarm output model] 001 to 999	P1-20 to 27 Alarm operation / option: AT1.A, AT2.A

01) When changing the setting value, input type, high / low-limit scale, high / low-limit scale value of transmission output 1 / 2, and AL1 to 4 are reset.
02) 0 mA, 0 VDC⎓ or less cannot be expanded. 1 VDC⎓, 10 VDC⎓ input are available to extend only 5 %.

Parameter		Display	Defaults	Setting range	Display condition
P1-29	Input special function	I N.SF	L I N	LIN: output the input value, ROOT: output the square root of the input value, SQAR: output the square of the input value, TUF: Two Unit Function [01]	P1-1 Input type: Analog
P1-30	Atmospheric pressure	0.PSI	08.00	Low-limit to high-limit input value	P1-1 Input type: Analog & P1-29 Input special function: TUF
P1-31	Span correction	SPAN	1.000	0.900 to 1.100	P1-1 Input type: Analog & P1-37 User level: HIGH
P1-32	Normal average digital filter	AV.F	0 1	01 (OFF) to 16	P1-37 User level: HIGH
P1-33	Moving average digital filter	MAV.F	04		
P1-34	Digital input key	di -K	HoLd	HOLD: hold display value, ZERO: remote zero, AL.RE: alarm reset [02] • Press the [◀] + [▲] keys for 3 sec to operates with the set function.	-
P1-35	Display part color [03]	CoLR	GRN	GRN: green / green, YELO: yellow / yellow, RED: red / red, R--G: red / green, G--R: green / red • Display: normal / error occur	-
P1-36	Sensor disconnection alarm output	bURN	oN	ON, OFF • Refer to the error.	P1-1 Input type: Temp. sensor
P1-37	User level	USER	StNd	STND, HIGH	-
P1-38	Lock	LoCK	oFF	OFF: program / monitoring mode - enable to check and setting LOC1 : program mode - enable to check, monitoring mode - enable to check and setting LOC2 : program mode - disable to check and setting, monitoring mode - enable to check	-

01) Pressure of pressure sensor < atmospheric pressure: display of vacuum degree in mmHg unit
Pressure of pressure sensor > atmospheric pressure: display of positive pressure in kg/cm²

02) In the alarm output model, AL.RE displayed when the setting value of P1-21, 23, 25, 27 Alarm1 ~ 4 options are alarm latch or alarm latch and standby sequence.

03) The color of the display part in monitoring mode and program mode is red.

■ Pulse input

Parameter		Display	Defaults	Setting range	Display condition
P2-1	Input type	I N-P	50KH	• Refer to Input Type and Range	-
P2-2	Display unit	d.UNt	KHZ	kHz, Hz, %, OFF	-
P2-3	Low-limit input value	L-RG	00.00	Within input type range • Low-limit input value + 20 % F.S. < High-limit input value	-
P2-4	High-limit input value	H-RG	50.00		
P2-5	Decimal point position	dP	0.00	0.0, 0.00, 0.000, 0 • Set the decimal point position of the high / low-limit scale.	-
P2-6	Low-limit scale	L-SC	00.00	-1999 to 9999	-
P2-7	High-limit scale	H-SC	50.00		
P2-8	Input correction	I N-b	000	-999 to 999	-
P2-9	Low-limit value of transmission output 1	LoR1	04.00	[Transmission (DC 0 - 20 mA) output model] DC 0 - 20 mA	-
			00.00	[Transmission (0 - 10 VDC⎓) output model] 0 - 10 VDC⎓	
P2-10	High-limit value of transmission output 1	HoR1	20.00	[Transmission (DC 0 - 20 mA) output model] DC 0 - 20 mA	-
			10.00	[Transmission (0 - 10 VDC⎓) output model] 0 - 10 VDC⎓	
P2-11	Low-limit value of transmission output 2	LoR2	04.00	[Transmission (DC 0 - 20 mA) output model] DC 0 - 20 mA	-
			00.00	[Transmission (0 - 10 VDC⎓) output model] 0 - 10 VDC⎓	
P2-12	High-limit value of transmission output 2	HoR2	20.00	[Transmission (DC 0 - 20 mA) output model] DC 0 - 20 mA	-
			10.00	[Transmission (0 - 10 VDC⎓) output model] 0 - 10 VDC⎓	
P2-13	Bar display CH	bAR	oUt 1	[Transmission output model] OUT1, OUT2	P2-32 User level: HIGH
P2-14	Low-limit scale value of transmission output 1	LoU 1	00.00	[Transmission output model] Low-limit to high-limit scale	-
P2-15	High-limit scale value of transmission output 1	HoU 1	50.00		
P2-16	Low-limit scale value of transmission output 2	LoU2	00.00		
P2-17	High-limit scale value of transmission output 2	HoU2	50.00		
P2-18	Input and transmission output extension	Ex.I o	SP	[Transmission output model] 5P: output DC 3.2 - 20.8 mA, 0 - 10.5 VDC⎓ out of 5 % of analog input range 10P: output DC 2.4 - 21.6 mA, 0 - 11 VDC⎓ out of 10 % of analog input range 0P: output DC 4 - 20 mA, 0 - 10 VDC⎓ in the analog input range	P2-32 User level: HIGH
P2-19	Alarm 1 operation	AL-1	AtLA □□□■	[Alarm output model] □□□ AT1: Absolute high limit alarm, AT2: Absolute low limit alarm, SBA: sensor break alarm, AT0: no alarm output	-
P2-20	Alarm 1 option			[Alarm output model] ■ A: standard alarm, B: alarm latch, C: standby sequence, D: alarm latch and standby sequence • Enter alarm option setting mode : Operate in 'Alarm 1 operation' mode select AT1 or AT2 and input [◀] key	-
P2-21	Alarm 2 operation	AL-2	At2A □□□■	[Alarm output model] Same as 'P2-19 / 20 Alarm 1 operation / option' • Depending on the number of alarm outputs, whether to display alarm 3 / 4 is different.	-
P2-22	Alarm 2 option				
P2-23	Alarm 3 operation	AL-3	AtLA □□□■		
P2-24	Alarm 3 option				
P2-25	Alarm 4 operation	AL-4	At2A □□□■		
P2-26	Alarm 4 option				
P2-27	Alarm output hysteresis	A-HY	001	[Alarm output model] 001 to 999	P2-19 to 26 Alarm operation / option: AT1.A, AT2.A
P2-28	Span correction	SPAN	1.000	0.900 to 1.100	P2-32 User level: HIGH
P2-29	Moving average digital filter	MAV.F	04	01 (OFF) to 16	
P2-30	Digital input key	di -K	HoLd	HOLD: hold display value, ZERO: remote zero, AL.RE: alarm reset [01] • Press the [◀] + [▲] keys for 3 sec to operates with the set function.	-
P2-31	Display part color	CoLR	GRN	GRN: green / green, YELO: yellow / yellow, RED: red / red, R--G: red / green, G--R: green / red • Display: normal / error occur	-
P2-32	User level	USER	StNd	STND, HIGH	-
P2-33	Lock	LoCK	oFF	OFF: program / monitoring mode - enable to check and setting LOC1 : program mode - enable to check, monitoring mode - enable to check and setting LOC2 : program mode - disable to check and setting, monitoring mode - enable to check	-

01) It can be applied when the setting value of the alarm option is alarm latch or alarm latch and standby sequence.

Input Type and Using Range

■ Universal input

Input type		Display	Using range (°C)	Using range (°F)
RTD	Cu50 Ω	C U.50	-199.9 to 200.0	-199.9 to 392.0
	Cu100 Ω	C U.10	-199.9 to 200.0	-199.9 to 392.0
	JPt100 Ω	JPt.1	-199.9 to 600.0	-328 to 1112
	DPt50 Ω	dPt.5	-199.9 to 600.0	-328 to 1112
	DPt100 Ω	dPt.1	-199.9 to 850.0	-328 to 1530
Thermocouple	K (CA)	tC.K1	-200 to 1350	-328 to 2462
		tC.K2	-199.9 to 999.9	-328 to 1832
	J (IC)	tC-J	-199.9 to 800.0	-328 to 1472
	E (CR)	tC-E	-199.9 to 800.0	-328 to 1472
	T (CC)	tC-t	-199.9 to 400.0	-199.9 to 752.0
	B (PR)	tC-b	400 to 1800	752 to 3272
	R (PR)	tC-R	0 to 1750	32 to 3182
	S (PR)	tC-S	0 to 1750	32 to 3182
	N (NN)	tC-N	-200 to 1300	-328 to 2372
	C (W5)	tC-C	0 to 2300	32 to 4172
	L (IC)	tC-L	-199.9 to 900.0	-328 to 1652
	U (CC)	tC-U	-199.9 to 400.0	-199.9 to 752.0
	Platinel II	tC-P	0 to 1390	32 to 2534
Analog	0.00 - 20.00 mA	A.mA1	-1999 to 9999 • The using range varies depending on the decimal point position.	
	4.00 - 20.00 mA	A.mA2		
	-50.0 - 50.0 mVDC⎓	A.mV1		
	-199.9 - 200.0 mVDC⎓	A.mV2		
	-1.000 - 1.000 VDC⎓	A-V1		
	-1.00 - 10.00 VDC⎓	A-V2		

■ Pulse input

- Non-contact: 0 to 50 kHz / contact: 0 to 45 kHz
  Displays 0 for below 0.1 Hz
- Input Low Level: 0 - 1 VDC⎓ / Input High Level: 5 - 24 VDC⎓
- Duty ratio: 30 to 70 %
- Since the response speed is slower in the low-speed pulse, 0 Hz is displayed if no pulse is input for more than 2 sec to prevent the slow response speed at 0 Hz.

Input type		Measuring cycle	Display	Using range
Pulse	0 to 9.999 Hz	≤ 10 sec	10H	-1999 to 9999 • The using range varies depending on the decimal point position.
	0 to 99.99 Hz	≤ 10 sec	100H	
	0 to 999.9 Hz	≤ 10 sec	1kH	
	0 to 9.999 kHz	≤ 1 sec	10kH	
	0 to 50.00 kHz	≤ 0.1 sec	50kH	

Reset

01. Press the [MODE] + [◀] keys in run mode, parameter INIT is displayed.
02. Displays the setting value as NO by pressing the [MODE] key.
03. Change the setting value as YES by pressing the [▲] or [▼] keys.
04. Press the [MODE] key to reset all parameter values as default and to return to run mode.

- Reset is possible when the lock parameter of the program mode is set to OFF.

Error

Display	Description	Troubleshooting
LLLL	Flashes when measurement input is lower than the using range	Error display is released automatically when it is in the measured and using range.
HHHH	Flashes when measurement input is higher than the using range	
bURN 01) 02)	Flashes when the temperature sensor is disconnected	Check the input sensor status.
ERR	Flashes when setting value error	Resetting after checking the setting conditions.
ERR2 01)	Flashes when the parameter setting of the input type and the selection switch setting do not match.	Check the input type.

01) Applicable to universal input model only.
02) Transmission output and alarm output according to P1-36 sensor disconnection alarm output parameter setting.

Sensor disconnection alarm output	Transmission output (DC 4 - 20 mA)	Alarm output	
		Absolute High-limit alarm	Absolute Low-limit alarm
ON	20 mA	ON	OFF
OFF	4 mA	OFF	ON

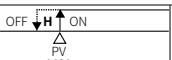
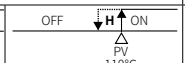
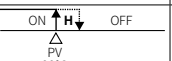
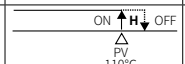
Alarm Output

888.8
Alarm operation **Alarm option**

The alarm output is set by combining the alarm operations and alarm options.
Each alarm output operates independently, and the alarm is automatically canceled when the current temperature exceeds the alarm operating range.

■ Operation

• **H**: alarm output hysteresis

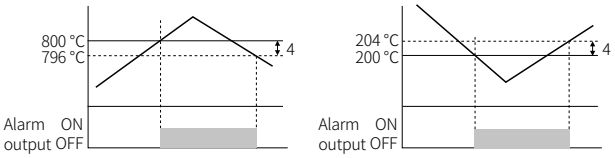
Name	SV	Alarm operation		Alarm output ON
No alarm output	AT0	-		-
Absolute high-limit alarm	AT1			PV ≥ absolute value
		Absolute value: Set as 90°C	Absolute value: Set as 110°C	
Absolute low-limit alarm	AT2			PV ≤ absolute value
		Absolute value: Set as 90°C	Absolute value: Set as 110°C	
Sensor break alarm	SBA	-		When sensor disconnection is detected

■ Option

Name	SV	Description
Standard alarm	A	If it is an alarm condition, alarm output is ON. Unless an alarm condition, alarm output is OFF.
Alarm latch	B	If it is an alarm condition, alarm output is ON. Before clearing the alarm, an ON condition is latched. (holding the alarm output)
Standby sequence	C	First alarm condition is ignored. From the second alarm condition, standard alarm operates. • When power is ON and it is an alarm condition, it is ignored. From the second alarm condition, standard alarm operates.
Alarm latch and standby sequence	D	If it is an alarm condition, it operates both alarm latch and standby sequence. • When power is ON and it is an alarm condition, it is ignored. From the second alarm condition, alarm latch operates.

■ Alarm output hysteresis

The set hysteresis is applied to AL1 to AL4 and it is as below.
• E.g.: high-limit input value: 800 °C, low-limit input value: 200 °C, hysteresis: 4

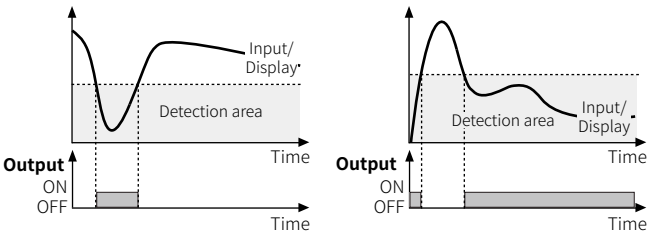


Hold

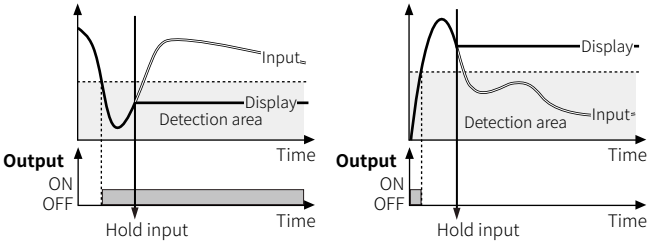
Holds current display value and control output when external input signal is applied.

Input: ═══ Display: ———

■ When not using hold function



■ When using hold function

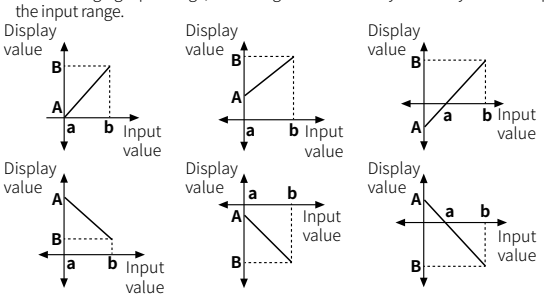


Function Description

■ High / Low-limit scale value

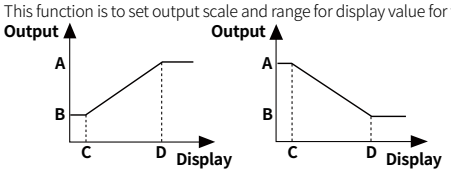
This function is to display setting of particular high / low-limit value in order to display high / low-limit value of measured input.
If measured inputs are a and b and particular values are A and B, it will display a = A, b = B as below graphs.

- When changing input range, it is changed automatically as factory default display range of the input range.



■ High / low-limit value of transmission output and High / low-limit scale value of transmission output

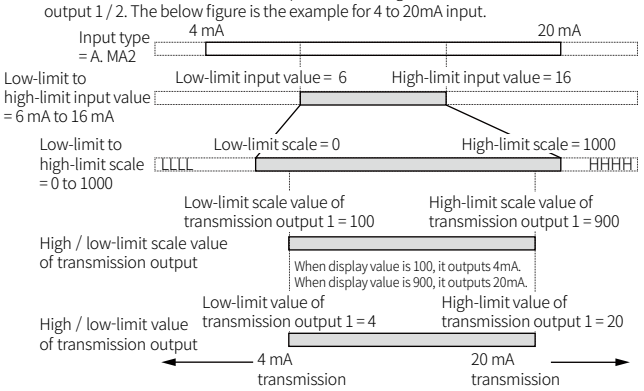
This function is to set output scale and range for display value for transmission output.



A: High-limit value of transmission output 1 / 2
B: Low-limit value of transmission output 1 / 2
C: Low-limit scale value of transmission output 1 / 2
D: High-limit scale value of transmission output 1 / 2

When the input value set at low-limit scale value of transmission output 1 / 2 is displayed, the output value set at low-limit value of transmission output 1 / 2 is transmitted.
When the input value set at high-limit scale value of transmission output 1 / 2 is displayed, the output value set at high-limit value of transmission output 1 / 2 is transnitted.

- E.g: Relation among input type, high / low-limit input value, high / low-limit scale, high / low-limit scale value of transmission output 1 / 2, and high / low-limit value of transmission output 1 / 2. The below figure is the example for 4 to 20mA input.



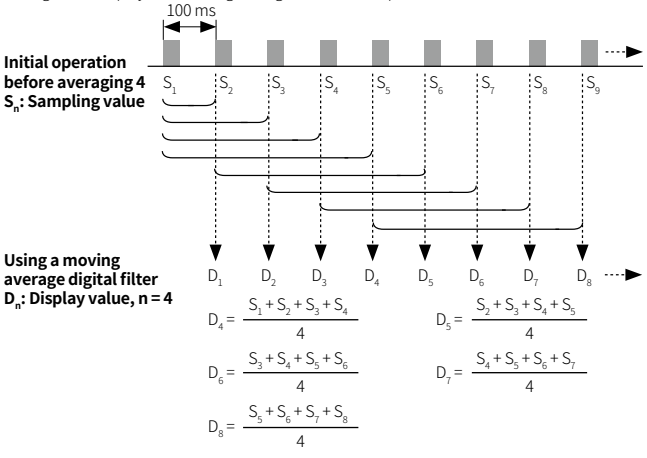
■ Input correction

This function is to correct the error occurring from a thermocouple, a RTD or analog input out of allowable error range of this unit.
This is also available to correct error when a sensor cannot contact the subject position by calculating the error temperature.
When executing input correction function, you should measure the error from a sensor accurately. If the measured error is not correct, error may be greater.

- E.g.: When measured temperature is 4 °C and actual temperature is 0 °C. Set IN-B as -4, and and display value is 0 °C.

■ Normal / moving average digital filter

Digital filter is able to stably display and output the noise from input line and irregular signals.
Normal average filter displays the averaged n times of input values periodically. Moving average filter displays the moving averaged n times of input values in real time.



■ Input special function

When selecting analog input, this function is to display the calculated actual value by square, root (√), or two unit function (TUF) as display value.

SV	Functions	Graph	Applications
LIN	Outputs as input value	Display, Y = AX + B, Input	Standard characteristics
ROOT 01)	Outputs the rooted (√) input value	Display, Y = A(√X) + B (X ≥ 0), Y = 0 (X < 0), Input	Used for measuring flows by pressure signal.
SQAR 02)	Outputs the squared input value	Y = A(X)² + B (X > 0), Display, Input, Y = -A(X)² + B (X < 0)	Used for outputting differential pressure by flow signal.
TUF	• Refer to Atmospheric pressure (0) setting for Two Unit Function		

01) Display value and mA output value for ROOT

$$\text{Output} = \left(\sqrt{\frac{\text{Input - Low-limit input}}{\text{High-limit input - Low-limit input}}}\right) \times \text{(High-limit scale - Low-limit scale)} + \text{Low-limit scale}$$

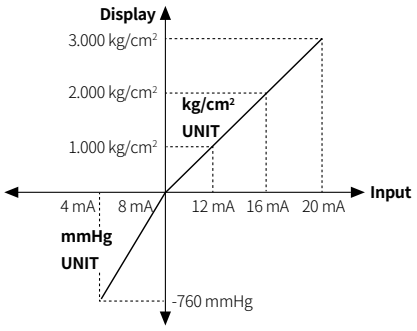
02) Display value and mA output value for SQAR

$$\text{Output} = \left(\frac{\text{Input - Low-limit input}}{\text{High-limit input - Low-limit input}}\right)^2 \times \text{(High-limit scale - Low-limit scale)} + \text{Low-limit scale}$$

■ Atmospheric pressure (0) setting for Two Unit Function

When connecting a pressure sensor, compound pressure which is below atmospheric pressure (0) is for vacuum as mmHg and which is atmospheric pressure or over it is for positive pressure as kg/cm². Atmospheric pressure is 0 kg/cm². When this unit does not display 0 kg/cm², you can correct zero-point adjustment function.
When using two unit function, low-limit scale is fixed as -760. low-limit scale parameter is displayed but you cannot set this. You can set high-limit scale within 0 to 9999 range.

- E.g: When pressure range is -760.0 mmHg to 3.000 kg/cm², and pressure transmitter outputs DC 4 - 20 mA and it outputs 8.00 mA for atmospheric pressure (0), set input special function = TUF, high-limit scale = 3000, decimal point position = 0.000, atmospheric pressure = 08.00. This unit displays for 4 mA input as -760, for 8 mA input as 0.000 and 20 mA input as 3.000.



Segment Table

The segments displayed on the product indicate the following meanings. It may differ depending on the product.

7 segment				11 segment				12 segment				16 segment			
0	0	I	I	0	0	I	I	0	0	I	I	0	0	I	I
I	1	J	J	I	1	J	J	I	1	J	J	I	1	J	J
2	2	K	K	2	2	K	K	2	2	K	K	2	2	K	K
3	3	L	L	3	3	L	L	3	3	L	L	3	3	L	L
4	4	M	M	4	4	M	M	4	4	M	M	4	4	M	M
5	5	N	N	5	5	N	N	5	5	N	N	5	5	N	N
6	6	O	O	6	6	O	O	6	6	O	O	6	6	O	O
7	7	P	P	7	7	P	P	7	7	P	P	7	7	P	P
8	8	Q	Q	8	8	Q	Q	8	8	Q	Q	8	8	Q	Q
9	9	R	R	9	9	R	R	9	9	R	R	9	9	R	R
A	A	S	S	A	A	S	S	A	A	S	S	A	A	S	S
b	B	T	T	b	B	T	T	b	B	T	T	b	B	T	T
C	C	U	U	C	C	U	U	C	C	U	U	C	C	U	U
d	D	V	V	d	D	V	V	d	D	V	V	d	D	V	V
E	E	W	W	E	E	W	W	E	E	W	W	E	E	W	W
F	F	X	X	F	F	X	X	F	F	X	X	F	F	X	X
G	G	Y	Y	G	G	Y	Y	G	G	Y	Y	G	G	Y	Y
H	H	Z	Z	H	H	Z	Z	H	H	Z	Z	H	H	Z	Z

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