Autonics

Isolated Converter
CN-6000 SERIES

RusAutomation

M A N U A L

Thank you very much for selecting Autonics products.
For your safety, please read the following before using.

▣ Caution for your safety

※Please keep these instructions and review them before using this unit.

※Please observe the cautions that follow;

⚠**Warning** Serious injury may result if instructions are not followed.

⚠**Caution** Product may be damaged, or injury may result if instructions are not followed.

※The following is an explanation of the symbols used in the operation manual.

⚠**Caution:** Injury or danger may occur under special conditions.

⚠Warning

1. **In case of using this unit with machinery(Ex: nuclear power control, medical equipment, ship, vehicle, train, airplane, combustion apparatus, safety device, crime/disaster prevention equipment, etc) which may cause damages to human life or property, it is required to install fail-safe device.**
   It may cause a fire, human injury or damage to property.
2. **Install this unit on a panel.**
   It may cause electric shock.
3. **Do not connect, repair, or inspect this unit when power is ON.**
   It may cause electric shock.
4. **Do not disassemble the case. Please contact us if it is required.**
   It may cause electric shock or a fire.
5. **Wire properly after checking terminal numbers.**
   It may cause a fire.

⚠Caution

1. **This unit shall not be used outdoors.**
   It might shorten the life cycle of the product or cause electric shock.
2. **Please observe the rated specifications.**
   It might shorten the life cycle of the product or cause a fire.
3. **In cleaning this unit, do not use water or organic solvent. And use dry cloth.**
   It may cause electric shock or a fire.
4. **Do not use this unit where there are flammable or explosive gas, humidity, direct ray of the sun, radiant heat, vibration and impact etc.**
   It may cause a fire or explosion.
5. **Do not inflow dust or wire dregs into the unit.**
   It may cause a fire or malfunction.
6. **Wire it properly after checking terminal numbers when connecting power cable and measuring input.**
   It may cause a fire or explosion.

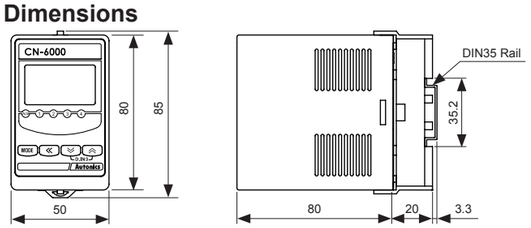
▣ Ordering information

CN – 6 10 0 – C1

Output	C1	Transmission output (0-20 mA) 1EA
	C2	Transmission output (0-2 0mA) 2EA
	V1	Transmission output (0-10 V) 1EA
	V2	Transmission output (0-10 V) 2EA
	R1	Alarm output 1EA
	R2	Alarm output 2EA
	R4	Alarm output 4EA
Supply power	0	100-240 VAC 50 to 60 Hz
	1	24 VDC
Input	10	Universal input
	40	Pulse input (※option)
Item	CN-6	Isolated Converter

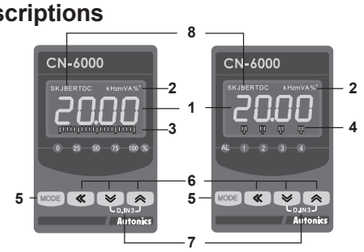
▣ Dimensions

(unit: mm)



※ **The above specifications are subject to change without notice.**

▣ Part descriptions



[Transmission output model] [Alarm output model]

① Display part (selectable red, green, yellow)
- Run mode: Displays current measured value.
- Parameter set mode: Displays parameters and SV.

② Unit display part (red)

③ Output scale Bar : For transmission output mode, displays output as % by scale bars.

④ Alarm output indicator: Turns ON when the alarm output is on.

⑤ MODE key
: Used to enter parameter set mode, move to parameters, save SV and return to RUN mode.

⑥ ≪, ≫, ∧ key: Used to change parameter SV.

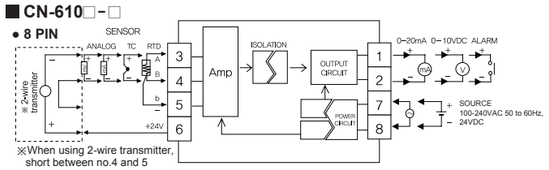
⑦ D.IN3
: Press the ≫ and ∧ keys for 3 sec. at the same time, it operates the set function (alarm clear, display hold, zero-point adjustment) at [dI-K].

⑧ Input type (only for CN-610□-□)
: Turns ON the selected temperature sensor type at [INP] parameter. (In case of thermocouple type, L, N, U, P types are not displayed. In case of RTD type, RTD is displayed.)
(In case of thermocouple type, L, N, U, P types are not displayed.In case of RTD type, RTD is displayed.)

▣ Connections

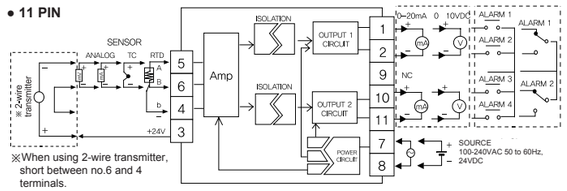
■ CN-610□-□

● 8 PIN



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

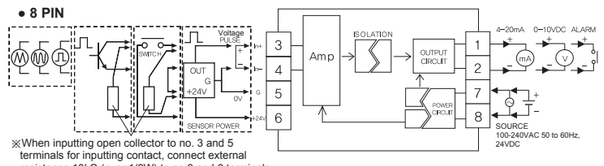
● 11 PIN



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

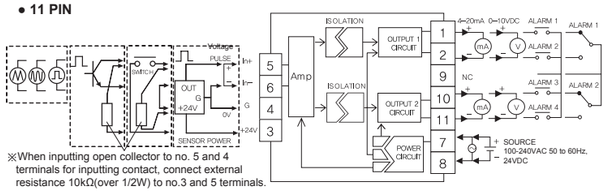
■ CN-640□-□

● 8 PIN



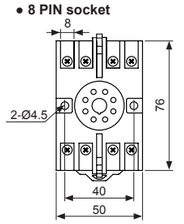
※When inputting open collector to no. 3 and 5 terminals for inputting contact, connect external resistance 10kΩ (over 1/2W) to no.3 and 6 terminals.

● 11 PIN

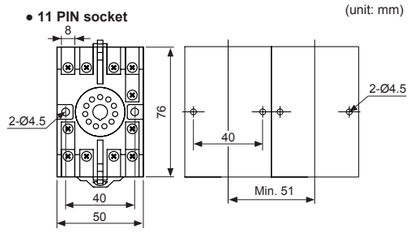


※When inputting open collector to no. 5 and 4 terminals for inputting contact, connect external resistance 10kΩ(over 1/2W) to no.3 and 5 terminals.

● 8 PIN socket



● 11 PIN socket



▣ Specification

		CN-610□-□	CN-640□-□
Power supply	AC voltage	100-240 VAC 50 to 60 Hz	
	DC voltage	24 VDC	
Allowable voltage range		90 to 110% of rated voltage	
Power consumption	AC voltage	Max. 8 VA	
	DC voltage	Max. 3 W	
Display method		4digit : 12 Segment LCD Display (selectable red, green, yellow) Graphic bar and Input/Unit display part (red)	
Character size		Display part : 6.4×11.0 mm (12 Segment), Input/Unit display part : 1.4×2.75 mm (unit)	
Input type	RTD	JPt100Ω, DPt100Ω, DPt50Ω, Cu50Ω, Cu100Ω	——
	TC	K, J, E, T, R, B, S, N, C, L, U, PLII	——
	Analog	• Voltage : -50.0-50.0 mV, -199.9-200.0 mV, -1.000-1.000 V, -1.00-10.00 V • Current : 0.00-20.00 mA, 4.00-20.00 mA	——
	Pulse input	——	0 to 50.00 kHz(input impedance 10 kΩ)
Output	Transmission output	0-20 mA(adjustable output range), load resistance max. 600 Ω (accuracy: ±0.3 F.S., resolutions: 8000)	
		0-10 VDC(adjustable output range), load resistance max. 10 kΩ (accuracy: ±0.3 F.S., resolutions: 8000)	
	Alarm output	1-point : Relay contact capacity 250 VAC 5 A 1 a, 2-point : Relay contact capacity 250 VAC 3 A 1 c, 4-point : Relay contact capacity 250 VAC 5 A 1 a	
Display accuracy		±0.2%F.S. ±1digit (25±5 ℃), ±0.3%F.S. ±1digit (-10 to 20 ℃, 30 to 50 ℃) ※CN-610□-□ : For TC, the input below -100 ℃ is [±0.4%F.S.] ±1digit (TC-T, TC-U is max. ±2.0 ℃)	
Setting method		Set by front keys	
Sampling cycle		Analog input : 100 ms, Temperature sensor input : 250 ms	——
Display cycle		——	Same with pulse input cycle When pulse input cycle is over 10 sec., it is updated by every 10 sec.
Dielectric voltage		2000 VAC 50/60 Hz for 1 min. (between input terminal and power terminal)	
Vibration		0.75 mm amplitude at frequency of 5 to 55 Hz (for 1 min.) in each of X, Y, Z directions for 2 hours	
Insulation resistance		Min. 100 MΩ (at 500VDC megger)	
Noise resistance		Square shaped noise by noise simulator (pulse width 1 μs) ±2 kV	
Memory retention		Approx. 10 years (non-volatile semiconductor memory type)	
Environ-ment	Ambient temperature	−10 to 50 ℃, storage : −20 to 60 ℃	
	Ambient humidity	35 to 85%RH, storage : 35 to 85%RH	
Approval		CE	——
Unit weight		Approx. 160 g	Approx. 200 g

※Environment resistance is rated at no freezing or condensation.

▣ Factory default

■ CN-610□-□ (universal input)

◎ **Monitoring mode**

Parameter	Default	Parameter	Default	Parameter	Default	Parameter	Default
oUt1	----	AL1	100.0	AL3	100.0	H.PEK	----
oUt2	----	AL2	000.0	AL4	000.0	L.PEK	----

◎ **Program mode**

Parameter	Default	Parameter	Default	Parameter	Default	Parameter	Default
IN-P	A.MA2	Lo.R1	04.00 *1	00.00 *2	EXIo	SP	SPAN	1.000
UNIt	°C	Ho.R1	20.00 *1	10.00 *2	AL-1	At.1A	AV.F	01
d.UNt	°/o	Lo.R2	04.00 *1	00.00 *2	AL-2	At.2A	MAV.F	04
L-RG	04.00	Ho.R2	20.00 *1	10.00 *2	AL-3	At.1A	dI-K	Hold
H-RG	20.00	bAR		oUt1	AL-4	At.2A	CoLR	GRN
d.P	0.0	Lo.U1		000.0	A-HY	001	bURN	oN
L-SC	000.0	Ho.U1		100.0	IN.SF	LIN	USER	StNd
H-SC	100.0	Lo.U2		000.0	0.PSI	08.00	LoCK	oFF
IN-b	000	Ho.U2		100.0				

※ 1. Displayed only for current transmission output, alarm output model (CN-610□-C1/C2/R1/R2/R4).
※ 2. Displayed only for voltage transmission output model (CN-61□-V1/V2).

■ CN-640□-□ (pulse input)

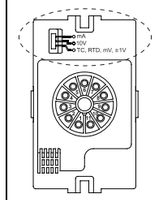
◎ **Monitoring mode**

Parameter	Default	Parameter	Default	Parameter	Default	Parameter	Default
oUt1	----	AL1	000.0	AL3	100.0	H.PEK	----
oUt2	----	AL2	000.0	AL4	100.0	L.PEK	----

◎ **Program mode**

Parameter	Default	Parameter	Default	Parameter	Default	Parameter	Default
IN-P	50KH	Lo.R1	00.00	Ho.U2	50.00	MAV.F	04
d.UNt	KHZ	Ho.R1	10.00	EXIo	SP	dI-K	Hold
L-RG	00.00	Lo.R2	00.00	AL-1	At.1A	CoLR	GRN
H-RG	50.00	Ho.R2	10.00	AL-2	At.1A	USER	StNd
d.P	0.00	bAR	oUt1	AL-3	At.1A	LoCK	oFF
L-SC	00.00	Lo.U1	00.00	AL-4	At.1A		
H-SC	50.00	Ho.U1	50.00	A-HY	001		
IN-b	000	Lo.U2	00.00	SPAN	1.000		

▣ Input type selection switch



- mA : Select it for 0(4)-20 mA input
- 10 V :Select it for -1 V-10 V input
- TC, RTD, mV, ±1V : Select it for RTD, TC temperature sensor or ±1 V, mV input

※The pulse input model (CN-640□-□) does not have this input type selection switch.
※8 pin and 11 pin models have same position of the switch.

•This product is multi-input. Select the desired input type by the input type selection switch and select the input type at [IN-P].
•The selection of the input type selection switch and that of [IN-P] should be same to display correct value.
Factory default is 4-20 mA.

▣ Input type and range

■ CN-610□-□ (universal input)

Input type		Parameter	Input range (℃)	Input range (℉)
Thermo-couple	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
RTD	Cu50Ω	CU50	−199.9 to 200.0	−199.9 to 392.0
	Cu100Ω	CU.10	−199.9 to 200.0	−199.9 to 392.0
	JPt100Ω	JPt.1	−199.9 to 600.0	−328 to 1112
	DPt50Ω	dPt.5	−199.9 to 600.0	−328 to 1112
	DPt100Ω	dPt.1	−199.9 to 850.0	−328 to 1530
Analog	Current 0.00 - 20.00mA	AnA1	-1999 to 9999 (Display range is variable according to decimal point position.)	
	Current 4.00 - 20.00mA	AnA2		
	Voltage −50.0 - 50.0mV	AnV1		
	Voltage −199.9 - 200.0mV	AnV2		
	Voltage −1.000 - 1.000V	A-V1		
	Voltage −1.00 - 10.00V	A-V2		

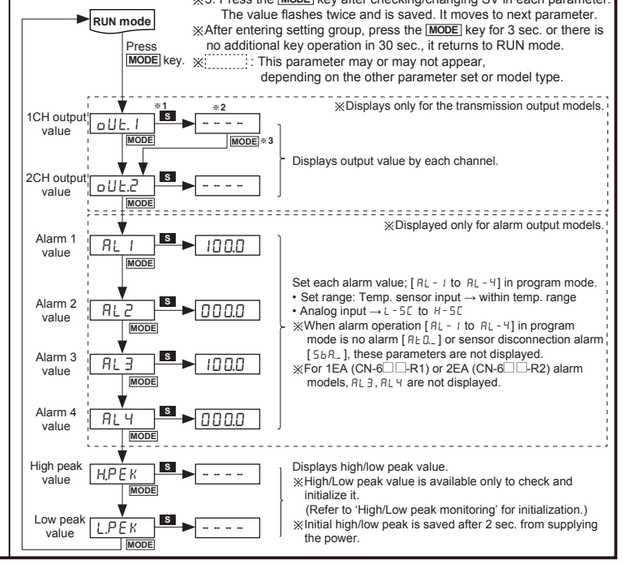
■ CN-640□-□ (pulse input)

Input type		Measuring cycle	Parameter	Range
Pulse	0 to 9.999 Hz	Max. 10 sec.	10H	-1999 to 9999 (Display range is variable according to decimal point position.)
	0 to 99.99 Hz	Max. 10 sec.	100H	
	0 to 999.9 Hz	Max. 10 sec.	1KH	
	0 to 9.999 kHz	Max. 1 sec.	10KH	
	0 to 50.00 kHz	Max. 0.1 sec.	50KH	

※Pulse input: Non-contact 0 to 50 kHz, Contact 0 to 45 Hz (displays 0 for below 0.1Hz)
※Input Low Level : 0-1 VDC / Input High Level : 5-24 VDC
※Duty Ratio : 30 to 70%
※The principle of displaying frequency is converting the time difference between input pulses to the frequency. 1 sec. is required to measure 1 Hz, and 10 sec. is required to measure 0.1 Hz. Therefore, it is normal that the lower pulse, the slower response speed. In case of 0 Hz, if there are no pulses for over 2 sec., it is programmed to display 0 Hz to prevent slow response speed.

▣ Monitoring mode

※1. S :Press any key among the ≪, ∧, ≫.
※2. ≪ : Moves digits / ≫, ∧: Changes SV.
※3. Press the MODE key after checking/changing SV in each parameter. The value flashes twice and is saved. It moves to next parameter.
※After entering setting group, press the MODE key for 3 sec. or there is no additional key operation in 30 sec., it returns to RUN mode.
※[ ] : This parameter may or may not appear, depending on the other parameter set or model type.



■ Program mode

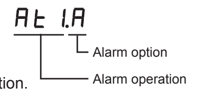
※These parameters are based on CN-610□-□ (universal input). For parameter factory default of CN-640□-□, refer to the ■ Factory default.
※1 to 5. These parameters are not displayed at CN-640□-□ (pulse input).
※6. S: Press any key among the ≪, ⩓, ⩔.
※7. ≪ : Moves digits / ⩓, ⩔: Changes SV.
※8. Press the MODE key after checking/changing SV in each parameter. The value flashes twice and is saved. It moves to next parameter.
※After entering setting group, press the MODE key for 3 sec. or there is no additional key operation in 30 sec., it returns to RUN mode.
※: This parameter may or may not appear, depending on the other parameter set or model type.

RUN mode — Press MODE key for 3 sec.

- Input type — IN-P ※6 → AMA2 ※7 ※8: Select input type. (Refer to「Input type and range」.)
- ※1 Temperature unit — UNIT → oC: ※Displayed only when selecting temperature sensor input type. Select temperature unit. oC ↔ oF
- Display unit — dUNT → % : ※Displayed only when selecting analog input type. Select front display unit. • Set range: CN-610□-□(universal input): %↔oF↔mV↔V↔mA↔oC↔oF; CN-640□-□(pulse input): kHz↔Hz↔%↔oF
- Low limit input value — L-RG → 04.00: Set low limit of input range. • Set range: within analog input type range
- High limit input value — H-RG → 20.00: Set high limit of input range. • Set range: within analog input type range
- Decimal point — dP → 0.0: Select decimal point position of display scale value. 0.0 ↔ 0.00 ↔ 0.000 ↔ 0
- Low limit scale value — L-SC → 000.0: Set low limit scale value. • Set range: -1999 to 9999
- High limit scale value — H-SC → 100.0: Set high limit scale value. • Set range: -1999 to 9999
- Input correction — IN-b → 000: Set input correction value. • Set range: -999 to 999
- ※Displays only for the transmission output models.
- Trans. output 1 low-limit — LoR1 → 04.00: Set low limit value of transmission output 1. • Set range: Current output → 0-20 mA, Voltage output → 0-10 VDC
- Trans. output 1 high-limit — HoR1 → 20.00: Set high limit value of transmission output 1. • Set range: Current output → 0-20 mA, Voltage output → 0-10 VDC
- Trans. output 2 low-limit — LoR2 → 04.00: Set low limit value of transmission output 2. • Set range: Current output → 0-20 mA, Voltage output → 0-10 VDC
- Trans. output 2 high-limit — HoR2 → 20.00: Set high limit value of transmission output 2. • Set range: Current output → 0-20 mA, Voltage output → 0-10 VDC
- Bar display CH — bAR → oUt1: Select the channel for Bar display. oUt1 ↔ oUt2. ※Displayed only when selecting user level [USER] as HIGH.
- Trans. output 1 low-limit scale — LoU1 → 000.0: Set low limit scale value of transmission output 1. • Set range: Temp. sensor input → within temp. range, Analog input → L-SC to H-SC
- Trans. output 1 high-limit scale — HoU1 → 100.0: Set high limit scale value of transmission output 1. • Set range: Temp. sensor input → within temp. range, Analog input → L-SC to H-SC
- Trans. output 2 low-limit scale — LoU2 → 000.0: Set low limit scale value of transmission output 2. • Set range: Temp. sensor input → within temp. range, Analog input → L-SC to H-SC
- Trans. output 2 high-limit scale — HoU2 → 100.0: Set high limit scale value of transmission output 2. • Set range: Temp. sensor input → within temp. range, Analog input → L-SC to H-SC
- Input and trans. output extension — EXIo → SP: ※Displayed only for transmission output models with selecting analog input type. Select extension range of analog input and transmission output. ※Displayed only when selecting user level [USER] as HIGH. SP ↔ 10P ↔ 0P
- ※Displayed only for alarm output models.
- AL1 mode — AL-1 → At1A; AL2 mode — AL-2 → At2A; AL3 mode — AL-3 → At1A; AL4 mode — AL-4 → At2A: Set AL1 to AL4 alarm operation and option. <Alarm operation> AL-1, AL-2, AL-3, AL-4: At1A, At2A, Sb A, At0 ; <Alarm option> At1A, At1b, At1C, At1d. Next parameter.
- ※SV changing method of AL-2 to AL-4 is same as AL-1's.
- ※For 1EA (CN-6□□-R1) or 2EA (CN-6□□-R2) alarm models, AL-3, AL-4 are not displayed.
- ※No alarm [At0], disconnection alarm [SbA] do not have alarm option.
- ※Set alarm value [AL1 to AL4] in monitoring mode.
- AL output hysteresis — A-HY → 001: Set alarm output hysteresis. • Set range: 001 to 999. ※When alarm operation [AL-1 to AL-4] in program mode is no alarm [At0] or sensor disconnection alarm [SbA], this parameter is not displayed.
- ※2 Input special function — INSF → LIN: ※Displayed only when selecting analog input type. Select input special function. LIN ↔ Root ↔ SQAR ↔ tUF
- ※3 Atmospheric pressure — 0PSI → 08.00: Set analog input value for atmospheric pressure(0) at Two Unit Function. • Set range: L-RG to H-RG. ※Displayed when setting input special function [INSF] as tUF.
- Span correction — SPAN → 1.000: Correct the error of display value for 100% input. • Set range: 0.900 to 1.100. ※Displayed only when selecting user level [USER] as HIGH.
- ※4 Normal average digital filter — AVF → 01: Set the number of normal average digital filters. • Set range: 01 to 16. ※Displayed only when selecting user level [USER] as HIGH.
- Moving average digital filter — MAVF → 04: Set the number of moving average digital filters. • Set range: 01 to 16. ※Displayed only when selecting user level [USER] as HIGH.
- Digital input key — dI-K → HoLd: Select digital input function by front keys. ※Press ⩓, ⩔ keys for 3 sec. at the same time and it executes the selected function. ※For the model without alarm output (CN-6□□-C1/C2/V1/V2), ALRE is not displayed. HoLd ↔ ZERo ↔ ALRE
- Display color — CoLR → GRN: Select display part color for RUN mode and error. ※Refer to「Display color」. GRN ↔ YELo ↔ R--G ↔ G--R ↔ REd
- ※5 Sensor disconnection alarm output — bURN → oN: ※Displayed only when selecting temperature sensor input type. Select output status when sensor disconnection. oN ↔ oFF
- User level — USER → StNd: Select user level. StNd ↔ HIGH
- Lock — LoCK → oFF: Select lock function. oFF ↔ LoC1 ↔ LoC2

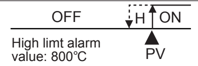
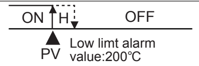
■ Functions

■ Alarm [AL-1, AL-2, AL-3, AL-4]



This product has 1 alarm or 2 or 4 alarms to operate individually when the value is too high or low.
Alarm function is set by the combination of alarm operation and alarm option.
To clear alarm, use digital input (setting as ALRE for dI-K) or turn the power OFF and ON.
※For the model without alarm output (CN-6□□-C1/C2/V1/V2), these parameters are not displayed.

◎ Alarm operation

Mode	Name	Alarm operation	Descriptions
At0_	—	—	No alarm operation
At 1□	High limit alarm		PV ≥ alarm temperature, alarm is ON
At 2□	Low limit alarm		PV ≤ alarm temperature, alarm is ON
SbA_ ※1	Sensor break alarm	—	It will be ON when it detects sensor disconnection. Sensor break alarm does not have alarm option.

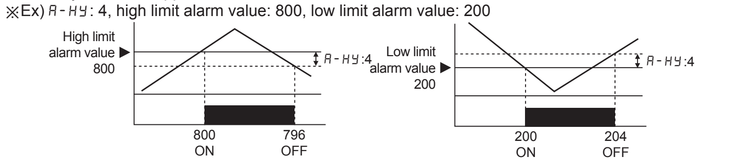
※1. Only for CN-610□-□. ※H : Alarm output hysteresis

◎ Alarm option

Option	Name	Descriptions
At□A	Standard alarm	If it is an alarm condition, alarm output is ON. Unless an alarm condition, alarm output is OFF.
At□b	Alarm latch	If it is an alarm condition, alarm output is ON. Before clearing the alarm, an ON condition is latched. (Holding the alarm output)
At□C	Standby sequence	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.
At□d	Alarm latch and standby sequence	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 [Program mode: A-HY]

Set the interval of ON/OFF alarm output.
The set hysteresis is applied to AL1 to AL4 and it is as below.
※Ex) A-HY: 4, high limit alarm value: 800, low limit alarm value: 200



■ High/Low peak monitoring [Monitoring mode: H.PEK, L.PEK]

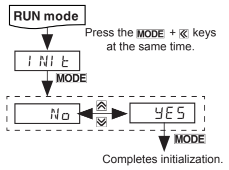
This function is to save high/low peak to check the invisible abnormal condition of system at [H.PEK] or [L.PEK] in monitoring mode.
When the high/low peak is out of the temperature range, it displays HHHH or LLLL.
To initialize high/low peak, press the ⩓, ⩔ keys at the same time for 3 sec. at [H.PEK] or [L.PEK]. In this case, peak value is the present input value.

■ Error

Display	Descriptions	Troubleshooting
LLLL	Flashes when measured sensor input is lower than the temperature range.	When input is moved within the temperature range, it is cleared.
HHHH	Flashes when measured sensor input is higher than the temperature range	When input is moved within the temperature range, it is cleared.
bURN	Flashes when the sensor is break or not connected.	Check temperature sensor connection.
ERR ※1	Flashes when there is error to SV.	Check set conditions and re-set it.
ERR2	Flashes when [IN-P] setting and input type selection switch setting are not same.	Check input type.

※1. Only for CN-610□-□.

■ Parameter initialization



To initialize all parameter as factory default, supply the power to the product with pressing the MODE and ≪ keys at the same time and it enters initialization parameter.
※Parameter initialization is available only when lock [LoCK] is set as oFF.

■ Temperature unit [Program mode: UNIt]

Temperature unit (℃/℉) is selectable. When changing temperature unit, user input range, display scale, output scale, alarm SV are initialized. You should set the parameters again for your purpose.
※When selecting analog input, this parameter [UNIt] is not displayed.

■ Front display unit [Program mode : dUNt]

• When selecting analog input, select the unit (mV, V, mA, A, ℃, ℉, %)of display value. (CN-610□-□)
• When selecting pulse input, select the unit (kHz, Hz, %)of display value. (CN-640□-□)
• When not displaying unit, set oFF and it turns OFF all indicators.

■ User input range [Program mode : L-RG, H-RG]

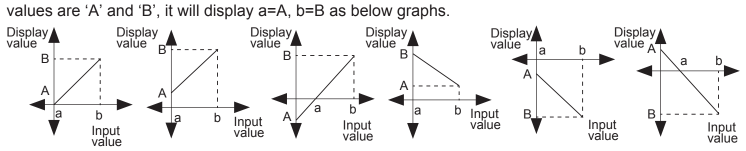
When selecting analog input, you can set the input range for your purpose.
Set low limit input value [L-RG] and high limit input value [H-RG] to limit the input range.
• Set conditions : Low limit input value [L-RG] +20% F.S. < High limit input value [H-RG]

■ Decimal point [Program mode: dP]

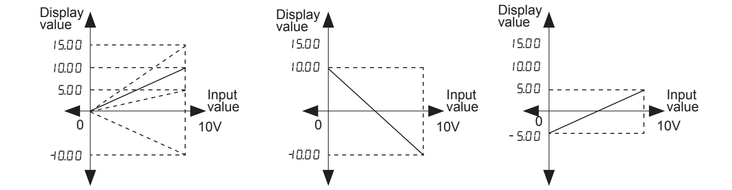
It is able to change decimal point position for high/low limit scale value. It changes decimal point position of display value.

■ Display scale [Program mode: L-SC, H-SC]

For analog input, this function is to set (-1999 to 1999) for particular high/low limit value in order to display high/low limit value of measurement input. If measurement inputs are 'a' and 'b' and particular values are 'A' and 'B', it will display a=A, b=B as below graphs.



Display scale function is able to change display value for max./min. measured input by setting high limit scale [H-SC] and low limit scale [L-SC] in program mode.
※Ex) Set high/low scale value (input range is 0 to 10V)
• L-SC=0.00, H-SC=5.00, 10.00, 15.00, 40.00
• L-SC=10.00, H-SC=40.00
• L-SC=-5.00, H-SC=5.00



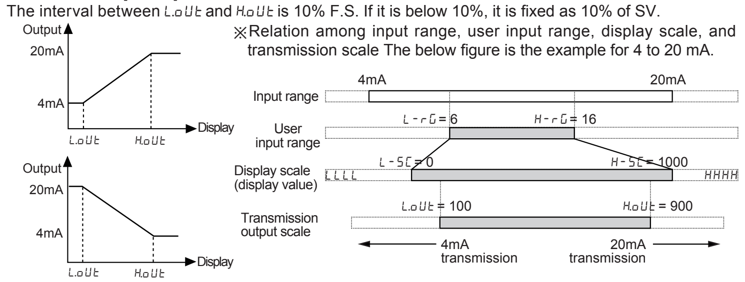
※When changing input type, high/low scale is changed as factory default.

■ Input correction [Program mode: IN-b]

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.
Variable temperature sensors have accuracy level. Because high accuracy type is expansive, standard thermocouples are generally used.
In this case, temperature sensor may occur error. By executing this function, you can get more accurate 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.
(If INSF=tUF, IN-b as atmospheric pressure input value not as input correction function. Refer to Two unit function.)
Ex) When measured temperature is 4 ℃ and actual temperature is 0 ℃. Set IN-b as -4, and and display value is 0 ℃.

■ Transmission output range[Program mode: LoR□, HoR□]
Transmission output scale[Program mode: LoU□, HoU□]

For 4-20 mA current output, this function is to set the display value for 4 mA [LoUt] and the display value for 20 mA [HoUt].
The interval between LoUt and HoUt is 10% F.S. If it is below 10%, it is fixed as 10% of SV.
※Relation among input range, user input range, display scale, and transmission scale The below figure is the example for 4 to 20 mA.



■ Bar display channel[Program mode: bAR, User level: HIGH]

This function is to select OUT1 or OUT2 for Bar display of transmission output scale.
※Only for the model which has two transmission outputs (CN-6□□-C2/V2), this parameter is displayed.

■ Input and transmission output extension[Program mode : EXIo]

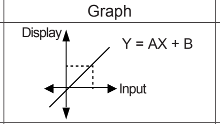
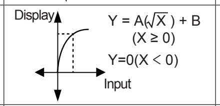
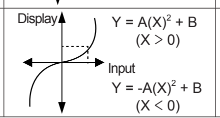
This function is to extend analog input and 4 to 20 mA, 0-10 VDC transmission output to 5% or 10% range.
The below table is the case of 4 to 20 mA transmission output range setting.

Mode	Operation
0P	Outputs 4 to 20 mA within analog input range.
SP	Outputs 3.2 to 20.8 mA for 5% out of the analog input range.
10P	Outputs 2.4 to 21.6 mA for 10% out of the analog input range.

※This parameter is not displayed for not transmission output (4-20 mA, 0-10 V) model, or for selecting temperature sensor input.
※Below 0 mA, 0 VDC cannot extend.
※±1 VDC, 10 VDC input are available to extend only 5%.

■ Input special function [Program mode: INSF]

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

Parameter	Functions	Graph	Applications
LIN	Outputs as input value		Standard characteristics. Input for linearity.
Root	Outputs the rooted (√) input value		Used for measuring flows by pressure signal.
SQAR	Outputs the squared input value		Used for outputting differential pressure by flow signal.
tUF	Refer to 'Two unit function'		

※Display value and mA output value for SQAR :

Display value (output value) $=\{(\frac{\text{Input value} - L\text{-}RG}{H\text{-}RG - L\text{-}RG})^2 \times (H\text{-}SC - L\text{-}SC)\} + L\text{-}SC$

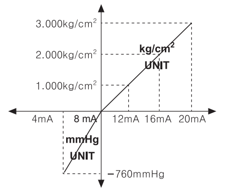
※Display value and mA output value for Root :

Display value (output value) $=\{(\sqrt{\frac{\text{Input value} - L\text{-}RG}{H\text{-}RG - L\text{-}RG}}) \times (H\text{-}SC - L\text{-}SC)\} + L\text{-}SC$

◎ Two Unit Function [tUF]

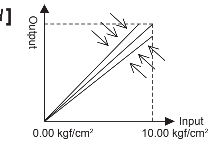
When connecting a pressure sensor, compound pressure which is below atmospheric pressure (0) is for vacuum as mmHg and which is atmospheric pressure or over it is for positive pressure as kg/cm².
Atmospheric pressure is 0kg/cm². When this unit does not display 0kg/cm², you can correct zero-point adjustment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

■ Atmospheric pressure (0) setting for Two Unit Function [Program mode: 0PSI, INSF: tUF]



This function is to set analog input value for atmospheric pressure (0) at analog input range.
Ex) When pressure range is -760.0 mmHg to 3.000 kg/cm², and pressure transmitter outputs 4-20 mA and it outputs 8.00 mA for atmospheric pressure (0), set input special function as tUF, H-SC: 3000, dP: 0.000, 0PSI: 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.
※This function is only for CN-610□-□.

■ Span correction[Program mode: SPAN, User level: HIGH]



It corrects the error of display value for 100% input.
• Set range: 0.900 to 1.100

■ Digital filter
[Program mode: AV.F/MAV.F, User level: HIGH]

Digital filter is able to stably display and output the noise from input line and irregular signals.
Normal average filter AVF displays the averaged N times of input values periodically. Moving average filter MAVF displays the moving averaged N times of input values in real time.
• Filter Set range: 01 to 16
※When setting as 01, digital filter function does not run.

■ Digital input [Program mode: dI-K]

By front digital input keys (D.IN3: 4 + 3 for 3 sec.), one of three functions executes as the below table.

Function		Operaiton
ALRE	Alarm clear	※When alarm is ON in RUN mode, it clears alarm forcibly. (It applies only for alarm latch, alarm latch and standby sequence options.) ※Alarm clear operates only when the value is out of the alarm value range. After clearing alarm, alarm operates its option normally. ※For the model without alarm output (CN-6□□-C1/C2/V1/V2), this parameter is not displayed.
HoLd	Display HOLD	Temporarily indicated value is stopped in order to check indicated value in unstable input.
ZERo	Zero-point adjust-ment	Set preset display value as 0. This function is related with input correction [IN-b]. When executing zero adjustment function in display value as 4, input correction value IN-b is set -4 automatically.

■ Display color [Program mode: CLoR]

◎ EVENT: When occurring alarm and displaying HHHH, LLLL, bURN, ERR

Parameter	Display color	
SV	RUN	EVENT
REd	Red	Red
GRN	Green	Green
YELo	Yellow	Yellow
R--G	Red	Green
G--R	Green	Red

This function is to change display color for occurring error, operating alarm automatically. User can check the status of this unit directly.
※Color of monitoring mode, program mode is red.

■ Alarm output for disconnecting input sensor [Program mode: bURN]

When disconnecting input sensor, you can set the status of transmission output.
It flashes bURN and it outputs the set value of HHHH or LLLL.
For transmission output, it outputs the set max./min. value of I/O expansion function.

Parameter	SV	Transmission output (4-20 mA)	Alarm output	
bURN	oN	20 mA	High limit alarm ON	Low limit alarm OFF
	oFF	4 mA	High limit alarm OFF	Low limit alarm ON

■ Lock [Program mode: LoCK]

It limits to check parameter set value and to change it.

	oFF	LoC1	LoC2
Program mode	●	◐	○
Monitoring mode	●	●	◐

●: Enable to check/set, ◐: Enable to check, disable to set, ○: Disable to check/set
※In LoC2, only LoCK parameter displays in program mode.

■ Caution for using

1. For connecting the power, use a crimp terminal(M3.5, min. 7.2 mm).
2. The connection of this unit should be separated from the power line and high voltage line in order to prevent inductive noise.
3. Install a power switch or a circuit breaker to supply or cut off the power.
4. Switch or circuit breaker should be installed nearby users for convenient control.
5. Do not use this unit near the high frequency instruments (high frequency welding machine & sewing machine, large capacity SCR controller).
6. When supplying input, if HHHH or LLLL is displayed, measured input may have problem. Turn off the power and check the line.
7. Installation environment
   ① It shall be used indoor. ② Pollution Degree 2
   ③ Altitude max. 2,000 m ④ Installation category II

※It may cause malfunction if above instructions are not followed.

■ Major products

- ■ Photoelectric sensors
- ■ Fiber optic sensors
- ■ Door sensors
- ■ Door side sensors
- ■ Area sensors
- ■ Proximity sensors
- ■ Pressure sensors
- ■ Rotary encoders
- ■ Connectors/Sockets
- ■ Switching mode power supplies
- ■ Control switches/Lamps/Buzzers
- ■ I/O Terminal Blocks & Cables
- ■ Stepper motors/drivers/motion controllers
- ■ Graphic/Logic panels
- ■ Field network devices
- ■ Laser marking system(Fiber, CO_2, Nd:YAG)
- ■ Laser welding/soldering system
- ■ Temperature controllers
- ■ Temperature/Humidity transducers
- ■ SSR/Power controllers
- ■ Counters
- ■ Timers
- ■ Panel meters
- ■ Tachometer/Pulse(Rate)meters
- ■ Display units
- ■ Sensor controllers
- ■ Recorders
- ■ Indicators
- ■ Converters
- ■ Controllers
- ■ Thyristor units
- ■ Pressure transmitters
- ■ Temperature transmitters

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