

Isolated Converters

CN-6000 Series INSTRUCTION MANUAL

TCD210080AA

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 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 ① ② - ③

① Input

- 10: Universal input
- 40: Pulse input

② Power supply

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

③ Output

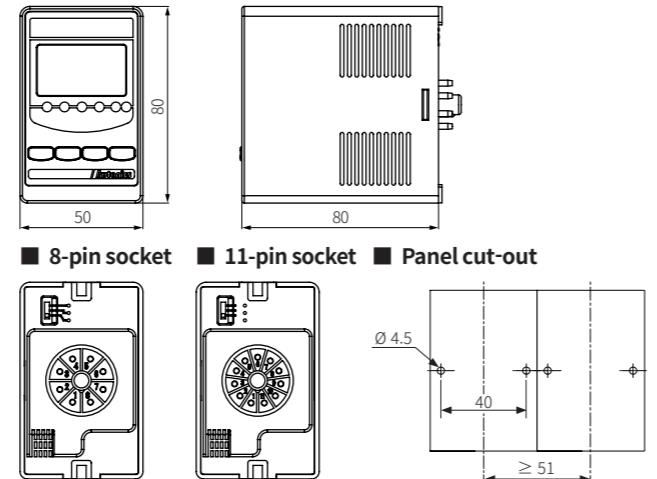
- C1: Transmission (DC 0 - 20 mA) output × 1
- C2: Transmission (DC 0 - 20 mA) output × 2
- V1: Transmission (0 - 10 VDC=) output × 1
- V2: Transmission (0 - 10 VDC=) output × 2
- R1: Alarm output × 1
- R2: Alarm output × 2
- R4: Alarm output × 4

Product Components

- Product
- 8-pin socket (output: C1, V1, R1 model)
- 11-pin socket (output: C2, V2, R2, R4 model)
- Instruction manual
- Digital input
- Input type display part⁰¹⁾

Dimensions

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



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, ±1VDC= |

Unit Descriptions



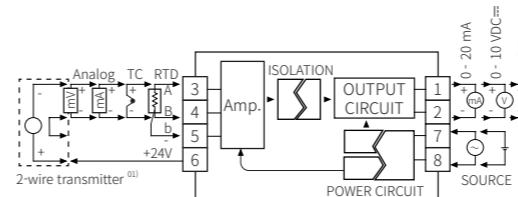
| No. | Part name | Name plate | Function |
|-----|--|--|---|
| 1 | Display part (red, green, yellow) | - | Run mode: Displays current measured value. Set mode: Displays parameters. • Color selectable |
| 2 | Unit display part (red) | - | - |
| 3 | Output scale bar | [Transmission output model] Displays output as % by scale bars. | - |
| 4 | Alarm output indicator | [Alarm output model] Turns ON when the alarm output is on. | - |
| 5 | MODE key | [MODE] | Used to enter monitoring mode and program mode, move to parameters, save SV and return to RUN mode. |
| 6 | Setting key | [◀], [▼], [▶] | Used to change parameter SV. |
| 7 | Digital input | D.I.N3 | Press the [▼] + [▶] keys for 3 sec, it operates the set function at digital input key parameter. |
| | 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

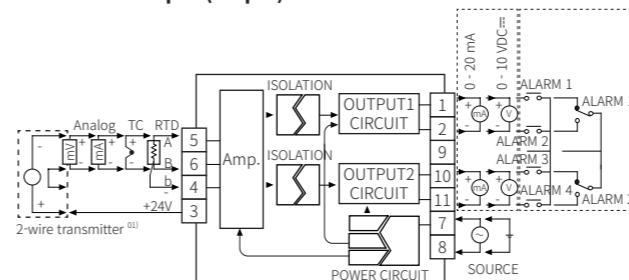
- SOURCE: 100 - 240 VAC ~ 50 / 60 Hz 8 VA
- 24 VDC = 3 W

■ Universal input (8-pin)



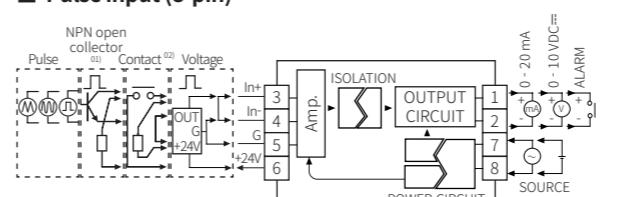
01) When using 2-wire transmitter, short between no.4 and 5 terminals.

■ Universal input (11-pin)



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

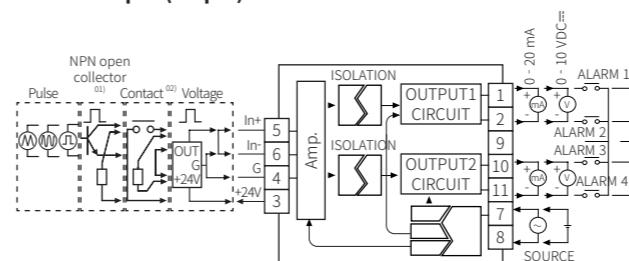
■ Pulse input (8-pin)



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 6 terminals for NPN open collector input.

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

Specifications

| Model | CN-610□-□ | CN-640□-□ |
|---------------------------------------|--|-----------------------------|
| Input type⁰¹⁾ | 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 accuracy⁰²⁾ | 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 cycle⁰³⁾ | - | 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) |
| Approval | CE EAC | |

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 ~ ± 10 % 50 / 60 Hz | 24 VDC = ± 10 % | |
| 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 (for 1 minute) 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

| | | | |
|-----------------|--------------------------------|--------------|-------|
| [▲] + [▼] 3 sec | → Digital input ⁰¹⁾ | Auto | → |
| [MODE] | → Monitoring mode | [MODE] 3 sec | → RUN |
| [MODE] 3 sec | → Program mode | [MODE] 3 sec | → |
| [MODE] + [◀] | → Reset | [MODE] | → |

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

Monitoring Mode

| Parameter | Display | Defaults | Setting range</th |
| --- | --- | --- | --- |

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 | I N - P | RMA2 | • Refer to Input Type and Range | - |
| P1-2 Temperature unit ⁽¹⁾ | UNI E | °C | °C, °F | P1-1 Input type: Temp. sensor |
| P1-3 Display unit | dUNt | 0% a | %, OFF, mV, V, mA, A, °C, °F | |
| P1-4 Low-limit input value | L - RG | 0400 | Within input type range • Low-limit input value + 20 % F.S. < High-limit input value | |
| P1-5 High-limit input value | H - RG | 2000 | | |
| P1-6 Decimal point position | dP | 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 | 0000 | -1999 to 9999 | |
| P1-8 High-limit scale | H - SC | 1000 | | |
| P1-9 Input correction | I N - b | 000 | -999 to 999 | |
| P1-10 Low-limit value of transmission output 1 | L o R 1 | 0400 | [Transmission (DC 0 - 20 mA) output model] DC 0 - 20 mA | |
| P1-11 High-limit value of transmission output 1 | | 0000 | [Transmission (0 - 10 VDC=) output model] 0 - 10 VDC= | |
| P1-12 Low-limit value of transmission output 2 | L o R 2 | 0400 | [Transmission (DC 0 - 20 mA) output model] DC 0 - 20 mA | |
| P1-13 High-limit value of transmission output 2 | | 0000 | [Transmission (0 - 10 VDC=) output model] 0 - 10 VDC= | |
| P1-14 Bar display CH | bRR | OUT 1 | [Transmission output model] OUT1, OUT2 | P1-37 User level: HIGH |
| P1-15 Low-limit scale value of transmission output 1 | L o U 1 | 0000 | | |
| P1-16 High-limit scale value of transmission output 1 | L o U 1 | 1000 | [Transmission output model] Temperature sensor input : within temperature range Analog input : low-limit to high-limit scale | |
| P1-17 Low-limit scale value of transmission output 2 | | 0000 | | |
| P1-18 High-limit scale value of transmission output 2 | L o U 2 | 1000 | | |
| P1-19 Input and transmission output extension ⁽²⁾ | | E x J o | 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 | A L - 1 | A L I A | [Alarm output model] □□□ AT1: Absolute high limit alarm, AT2: Absolute low limit alarm, SBA: sensor break alarm, ATO: no alarm output | |
| P1-21 Alarm 1 option | | A L I A | [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 | A L - 2 | A L 2 A | [Alarm output model] | |
| P1-23 Alarm 2 option | | A L 2 A | Same as 'P1-20 / 21 Alarm 1 operation / option' | |
| P1-24 Alarm 3 operation | A L - 3 | A L 3 A | • Depending on the number of alarm outputs, whether to display alarm 3 / 4 is different. | |
| P1-25 Alarm 3 option | | A L 3 A | | |
| P1-26 Alarm 4 operation | A L - 4 | A L 2 A | | |
| P1-27 Alarm 4 option | | A L 2 A | | |
| P1-28 Alarm output hysteresis | A - H Y | 00 1 | [Alarm output model] 001 to 999 | P1-20 to 27 Alarm operation / option: AT1A, AT2A |

(1) When changing the setting value, input type, high / low-limit scale, high / low-limit scale value of transmission output 1 / 2, and ALL to 4 are reset.

(2) 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 S F | L I N | LIN: output the input value, ROOT: output the square root of the input value, SQR: output the square of the input value, TUF: Two Unit Function ⁽¹⁾ | P1-1 Input type: Analog |
| P1-30 Atmospheric pressure | QPSI | 0800 | Low-limit to high-limit input value | P1-1 Input type: Analog & P1-29 Input special function: TUF |
| P1-31 Span correction | SPAN | I 000 | 0.900 to 1.100 | P1-1 Input type: Analog & P1-37 User level: HIGH |
| P1-32 Normal average digital filter | R VF | 0 1 | 01(OFF) to 16 | P1-37 User level: HIGH |
| P1-33 Moving average digital filter | M RV F | 0 4 | | |
| P1-34 Digital input key | dI - K | H o l d | HOLD: hold display value, ZERO: remote zero, ALRE: alarm reset ⁽²⁾ • Press the [◀] + [▲] keys for 3 sec to operates with the set function. | - |
| P1-35 Display part color ⁽²⁾ | C o L R | G R N | 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 | b U R N | o N | ON, OFF • Refer to the error. | P1-1 Input type: Temp. sensor |
| P1-37 User level | U S E R | S t N d | STND, HIGH | - |

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, ALRE 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 | S O K H | • Refer to Input Type and Range | - |
| P2-2 Display unit | d U N t | K H Z | kHz, Hz, %, OFF | - |
| P2-3 Low-limit input value | L - R G | 0000 | Within input type range • Low-limit input value + 20 % F.S. < High-limit input value | - |
| P2-4 High-limit input value | H - R G | 5000 | | |
| P2-5 Decimal point position | dP | 000 | 0.0, 0.00, 0.000, 0 • Set the decimal point position of the high / low-limit scale. | - |
| P2-6 Low-limit scale | L - S C | 0000 | -1999 to 9999 | - |
| P2-7 High-limit scale | H - S C | 5000 | | |
| P2-8 Input correction | I N - b | 000 | -999 to 999 | - |
| P2-9 Low-limit value of transmission output 1 | L o R 1 | 0 4 0 0 | [Transmission (DC 0 - 20 mA) output model] DC 0 - 20 mA | |
| P2-10 High-limit value of transmission output 1 | H o R 1 | 2 0 0 0 | [Transmission (DC 0 - 20 mA) output model] DC 0 - 20 mA | |
| P2-11 Low-limit value of transmission output 2 | L o R 2 | 0 4 0 0 | [Transmission (DC 0 - 20 mA) output model] DC 0 - 20 mA | |
| P2-12 High-limit value of transmission output 2 | H o R 2 | 2 0 0 0 | [Transmission (DC 0 - 20 mA) output model] DC 0 - 20 mA | |
| P2-13 Bar display CH | bRR | o U t 1 | [Transmission output model] OUT1, OUT2 | P2-32 User level: HIGH |
| P2-14 Low-limit scale value of transmission output 1 | L o U 1 | 0000 | | |
| P2-15 High-limit scale value of transmission output 1 | H o U 1 | 5000 | [Transmission output model] Low-limit to high-limit scale | |
| P2-16 Low-limit scale value of transmission output 2 | L o U 2 | 0000 | | |
| P2-17 High-limit scale value of transmission output 2 | H o U 2 | 5000 | | |
| P2-18 Input and transmission output extension | E x J o | 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 | P2-32 User level: HIGH |
| P2-19 Alarm 1 operation | A L - 1 | A L 1 R | [Alarm output model] □□□ AT1: Absolute high limit alarm, AT2: Absolute low limit alarm, SBA: sensor break alarm, ATO: no alarm output | |
| P2-20 Alarm 1 option | | A L 1 R | [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 | A L - 2 | A L 2 R | [Alarm output model] | |
| P2-22 Alarm 2 option | | A L 2 R | Same as 'P2-19 / 20 Alarm 1 operation / option' | |
| P2-23 Alarm 3 operation | A L - 3 | A L 3 R | • Depending on the number of alarm outputs, whether to display alarm 3 / 4 is different. | |
| P2-24 Alarm 3 option | | A L 3 R | | |
| P2-25 Alarm 4 operation | A L - 4 | A L 2 R | [Alarm output model] | |
| P2-26 Alarm 4 option | | A L 2 R | Same as 'P2-19 / 20 Alarm 1 operation / option' | |
| P2-27 Alarm output hysteresis | A - H Y | 00 1 | [Alarm output model] 001 to 999 | P2-19 to 26 Alarm operation / option: AT1A, AT2A |
| P2-28 Span correction | SPAN | I 000 | 0.900 to 1.100 | P2-32 User level: HIGH |
| P2-29 Moving average digital filter | M RV F | 0 4 | 01(OFF) to 16 | |
| P2-30 Digital input key | dI - K | H o l d | HOLD: hold display value, ZERO: remote zero, ALRE: alarm reset ⁽²⁾ • Press the [◀] + [▲] keys for 3 sec to operates with the set function. | - |
| P2-31 Display part color | C o L R | G R N | 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 | U S E R | S t N d | STND, HIGH | - |
| P2-33 Lock | L o C K | o F F | 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 | -199.9 to 200.0 | -199.9 to 392.0 |
| | Cu100 Ω | -199.9 to 200.0 | -199.9 to 392.0 |
| JPt100 Ω | J Pt, I | -199.9 to 600.0 | -328 to 1112 |
| DPt50 Ω | d Pt, 5 | -199.9 to 600.0 | -328 to 1112 |
| DPt100 Ω | d Pt, I | -199.9 to 850.0 | -328 to 1530 |
| K (CA) | t C, I | -200 to 1350 | -328 to 2462 |
| K (CA) | t C, K 2 | -199.9 to 999.9 | -328 to 1832 |
| J (IC) | t C - J | -199.9 to 800.0 | -328 to 1472 |
| E (CR) | t C - E | -199.9 to 800.0 | -328 to 1472 |
| T (CC) | t C - t | -199.9 to 400.0 | -199.9 to 752.0 |
| B (PR) | t C - b | 400 to 1800 | 752 to 3272 |
| Thermocouple | t C - R | 0 to 1750 | 32 to 3182 |
| S (PR) | t C - S | 0 to 1750 | 32 to 3182 |
| N (NN) | t C - N | -200 to 1300 | -328 to 2372 |
| C (W5) | t C - C | 0 to 2300 | 32 to 4172 |
| L (IC) | t C - L | -199.9 to 900.0 | -328 to 1652 |
| U (CC) | t C - U | -199.9 to 400.0 | -199.9 to 752.0 |
| Platinum II | t C - P | 0 to 1390 | 32 to 2534 |
| Analog | 0.00 - 20.00 mA | R M A 1 | |
| | 4.00 - 20.00 mA | R M A 2 | |
| | -50.00 - 50.00 mVDC= | R M V 1 | |
| | -199.9 - 199.9 mVDC= | R M V 2 | |
| | -1.000 - 1.000 VDC= | R - V 1 | |
| | -1.00 - 1.00 VDC= | R - V 2 | |

-1999 to 9999