

# Isolated HART temperature transmitter PT100 and thermocouple

CNL40iG

LOREME

- **Universal** RTD (3 or 4 wires), thermocouple, mV, mA
- **CNL40iG** Galvanic isolation
- **CNL40iGH** + HART protocol
- **Fully configurable** RS232 and HART
- **FDT certified DTM HART Drivers**
- **Loop powered:** Powered by the 4-20 mA loop current
- **SIL2 conformity** hardware



The CNL40ig is a universal smart in-head mounting temperature sensor transmitters. Cover all temperature measurement (RTD and thermocouples) in all range with an unique device. The CNL40igH integrate the HART communication protocol, FDT compliant and it is available with SIL2 conformity according to IEC 61508 standard.

## Temperature measurement:

- Thermocouples, platinum resistance sensor.

## Sensor correction:

- RTD and thermocouple linearization,
- Cold junction compensation for thermocouple,
- Line length compensation for RTD.

## Process measures:

- Voltage (mV), current (mA) on external shunt.

## Signal conditioning:

- Square root extraction (on process measures),
- Programmable sensor breaking safety value,
- Programmable response time from 0.2 to 60 sec, (measure filtering function)
- Reverse or standard output,
- Measure offset adjustment,
- Neutralization of ambient thermal variation effects

## Features:

- Temperature sensor in-head anti-vibration mounting: optimal fitting of measure element in thermowell with the spring loaded. Improved reliability and response time accuracy.
- wiring on spring terminal (stainless) (1.5mm<sup>2</sup> wire section),
- loop voltage presence indicated by Led,
- reverse polarity protected,
- input/output isolation (elimination of measure errors due to ground loop),
- protection rating (enclosure/terminals): IP68 / IP20

## Mounting and connection:

- For DIN B head, M4 screw (33mm between axis)
- wide central tunnel for wires path (7 mm diameter)

## Performance / Environment:

- Long-term stability 0.1 % / year,
- operating temperature up to 85 °C peak,
- excellent EMC performance,
- resistant, protected against shocks and vibrations (silicon bonding resin)

## Configuration

- setting by RS232 serial link (terminal mode without specific software)
- USB-RS232 cable available separately
- Online communication and setting with standard HART programming handheld (cnl40igH)

## Operational safety data: hardware

Type B components, HFT = 0

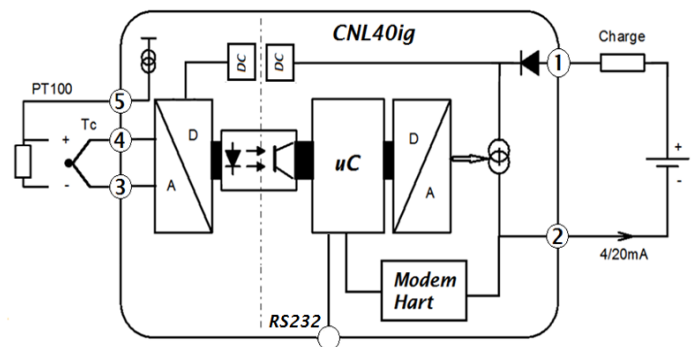
$\lambda f$  : 458 fit (1/MTBF)

DC : 91.8 % (Diagnostic Coverage)

PFH : 21 fit (Probability of Failure per Hour)

SFF : 95.4.1 % (Safe Failure Fraction)

## Synoptic



## Version and order code

- CNL40ig:** isolated RTD 3 wires, thermocouple, mV, mA input  
**CNL40ig-NW:** Special thermocouple: N, W3, W5, ...  
**CNL40igH:** isolated RTD 3 wires, thermocouple, mV, mA input (with HART communication protocol)  
**CNL40ig-4f:** isolated RTD 4 wires, thermocouple, mV, mA input  
**CNL40igH-4f:** isolated RTD 4 wires, thermocouple, mV, mA input (with HART communication protocol)

**Option :** /SIL2Sil2 hardware

| INPUT                                                                |                  |                                   |                                    |
|----------------------------------------------------------------------|------------------|-----------------------------------|------------------------------------|
| TYPE                                                                 | RANGE            | ACCURACY                          |                                    |
|                                                                      |                  | (24bits resol.)<br><b>CNL40IG</b> | (20bits resol.)<br><b>CNL40IGL</b> |
| Tc B                                                                 | 200....1800 °C   | +/- 2 °C                          | +/- 2 °C                           |
| Tc E                                                                 | -250....1000 °C  | +/- 0.4 °C                        | +/- 0.7 °C                         |
| Tc J                                                                 | -200....600 °C   | +/- 0.4 °C                        | +/- 0.7 °C                         |
| Tc K                                                                 | -200....1350 °C  | +/- 0.4 °C                        | +/- 0.7 °C                         |
| Tc R                                                                 | 0....1750 °C     | +/- 1 °C                          | +/- 1.5 °C                         |
| Tc S                                                                 | -50....1600 °C   | +/- 1.5 °C                        | +/- 1.5 °C                         |
| Tc T                                                                 | -250....400 °C   | +/- 0.5 °C                        | +/- 0.7 °C                         |
| <b>CNL40IG-NW</b>                                                    |                  |                                   |                                    |
| Tc N                                                                 | -250.....1500 °C | +/- 0.5 °C                        |                                    |
| TC W3                                                                | 0.....2300 °C    | +/- 2 °C                          |                                    |
| TC W5                                                                | 0.....2300 °C    | +/- 2 °C                          |                                    |
| Compensation T°                                                      | -20 to 85 °C     | +/- 0.3 °C                        | +/- 0.4 °C                         |
| Input impedance                                                      |                  | >1Mohms                           |                                    |
| RTD<br>(2, 3 wires mounting)<br>excitation current<br>Line influence | -200/800°C       | +/- 0.3 °C                        | +/- 0.4 °C                         |
|                                                                      |                  | 300 µA                            |                                    |
|                                                                      |                  | 0.3°C / 10 Ohms                   |                                    |
| Voltage                                                              | 0 /120 mV        | +/- 0,02 mV                       | +/- 0,02 mV                        |
| Current                                                              | 0 /30 mA         | +/- 0,025 mA                      | +/- 0,025 mA                       |
| (on external 2,5 Ohms shunt)                                         |                  |                                   |                                    |
| Response time                                                        |                  | ~ 200 ms                          |                                    |
| Sampling rate                                                        |                  | 6 / second                        |                                    |

| POWER SUPPLY / OUTPUT (14 bits resolution) |             |                     |
|--------------------------------------------|-------------|---------------------|
| TYPE                                       | RANGE       | ACCURACY            |
| Loop powered                               | 13 to 40Vdc |                     |
| Current                                    | 4 / 20 mA   | +/- 0.01 mA         |
| Load @ 24Vdc                               |             | 550 Ohms            |
| Power supply influence                     |             | 0.002 % / V         |
| Load influence                             |             | 0.004 % / 100 Ohms  |
| Intrinsic consumption                      |             | <3.6 mA             |
| Burn out current                           |             | 3.6... 21mA         |
| Dielectric strength (Input / Output)       |             | 1000 Vrms (CNL40ig) |

## ENVIRONMENT

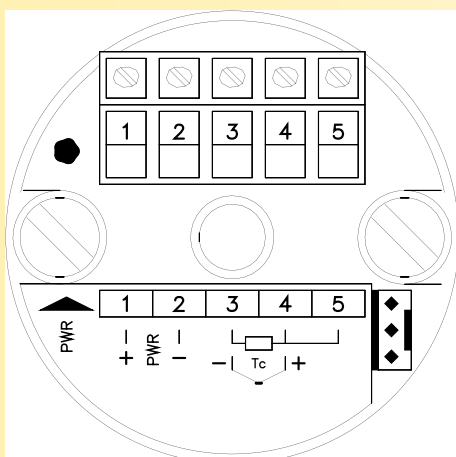
|                             |                        |
|-----------------------------|------------------------|
| Operating temperature       | -30 to +65 °C          |
| Storage temperature         | -30 to +85 °C          |
| Influence (% of full scale) | < 0.01 % / °C          |
| Relative humidity           | 85 % not condensed     |
| Weight                      | 45 g                   |
| MTBF (IEC 62380)            | > 2 180 000 Hrs @ 30°C |
| Life time                   | > 250 000 Hrs @ 30°C   |

## Electromagnetic compatibility 2014/30/UE / Low Voltage Directive 2014/35/UE

| Immunity standard for industrial environments<br>EN 61000-6-2 |                         | Emission standard for industrial environments<br>EN 61000-6-4 |
|---------------------------------------------------------------|-------------------------|---------------------------------------------------------------|
| EN 61000-4-2 ESD                                              | EN 61000-4-8 AC MF      | EN 55011<br>group 1<br>class A                                |
| EN 61000-4-3 RF                                               | EN 61000-4-9 pulse MF   |                                                               |
| EN 61000-4-4 EFT                                              | EN 61000-4-11 AC dips   |                                                               |
| EN 61000-4-5 CWG                                              | EN 61000-4-12 ring wave |                                                               |
| EN 61000-4-6 RF                                               | EN 61000-4-29 DC dips   |                                                               |

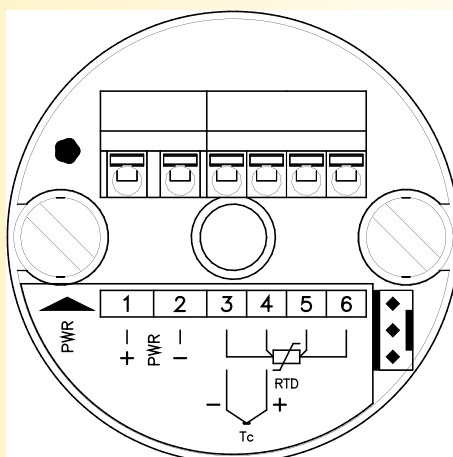


## WIRING AND OUTLINE DIMENSIONS:



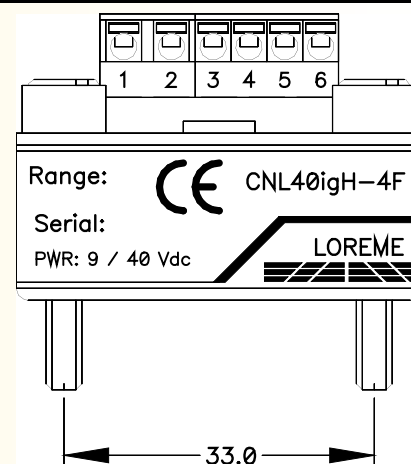
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Spring terminal block  
1.5mm<sup>2</sup> section

