

MTL4073 TEMPERATURE CONVERTER

THC or RTD input



The MTL4073 converts a low level dc signal from a temperature sensor mounted in a hazardous area into a 4/20mA current for driving a safe-area load. Software selectable features include linearisation, ranging, monitoring, testing and tagging for eight thermocouple types and 2-, 3-, and 4-wire RTDs. For THC inputs requiring cold-junction compensation, an SCJ01 hazardous-area connector (which is provided with an integral CJC sensor) should be used. Configuration is carried out using a personal computer.

SPECIFICATION

See also common specification, cable parameters and approvals and details of SCJ01 hazardous-area connector, with integral CJC sensor, for thermocouple inputs requiring cold junction compensation, in 'MTL4000 Series Accessories'

Number of channels

One

Signal source

Types J, K, T, E, R, S, B or N THCs to BS 4937

EMF input

2/3/4-wire platinum RTDs to BS 1904/DIN 43760 (100Ω at 0°C)

Location of signal source

Zone 0, IIC, T4 hazardous area

Div.1, Group A, hazardous location

Input signal range

-75 to +75mV, or 0 to 400Ω

Input signal span

3 to 150mV, or 10 to 400Ω

RTD excitation current

200μA nominal

Cold junction compensation

Automatic or selectable

Cold junction compensation error

≤1.0°C

Common mode rejection

120dB for 240V at 50Hz or 60Hz

Series mode rejection

40dB for 50Hz or 60Hz

Calibration accuracy (at 20°C)

(includes hysteresis, non-linearity and repeatability)

Inputs:

mV/THC: ±15μV or ±0.05% of input value (whichever is greater)

RTD: ±80mΩ

Output: ±11μA

Temperature drift (typical)

Inputs:

mV/THC: ±0.003% of input value/°C

RTD: ±7mΩ/°C

Output: ±0.6μA/°C

Example of calibration accuracy and temperature drift (RTD input)

Span: 250Ω

Accuracy: ±(0.08/250 + 11/16000) × 100% = 0.1% of span

Temperature drift: ±(0.007/250 × 16000 + 0.6) μA/°C = ±1.0μA/°C

Safety drive on sensor burnout

Upscale, downscale, or off

Output range

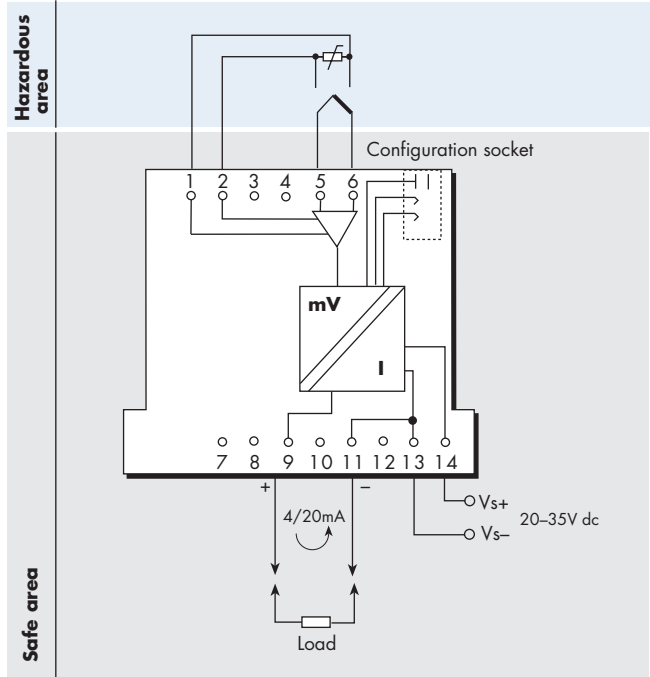
4 to 20mA nominal (direct or reverse)

Maximum load resistance

600Ω

LED indicator

Green: one provided for power and status indication



| Terminal | Function |
|----------|-----------------------|
| 1 | 3-wire RTD input -ve |
| 2 | 4-wire RTD input +ve |
| 5 | THC/EMF/RTD input +ve |
| 6 | THC/EMF/RTD input -ve |
| 9 | Output +ve |
| 11 | Output -ve |
| 13 | Supply -ve |
| 14 | Supply +ve |

Power requirement, Vs

57mA at 24V

55mA at 20V

60mA at 35V with 20mA signal

Power dissipation within unit

1.2W at 24V with 20mA signal

2.0W at 35V

Isolation

250V ac between safe- and hazardous-area circuits

Safety description

Terminals 5 and 6

Non-energy-storing apparatus ≤1.2V, ≤0.1A, ≤20μJ, and ≤25mW. Can be connected without further certification into any IS loop with open-circuit voltage not more than 10V.

Terminals 1 and 2

7.2V, 950Ω, 8mA

Configuration socket

U_{max}: in = 11.2V, I_{max}: in = 12mA, W_{max}: in = 280mW

U_{max}: out = 7.2V, I_{max}: out = 8mA, W_{max}: out = 15mW

FM entity parameters

Terminals 1, 2, 5 and 6

V_t ≤ 7.2V, I_t ≤ 11.5mA, C_a ≤ 11.0μF, L_a ≤ 245mH

Terminals 5 and 6 only

V_t ≤ 1.2V, I_t ≤ 3.8mA, C_a ≤ 1000μF, L_a ≤ 3.6mH

Standard configuration

| | |
|-------------------------------|---------------------|
| Input type | Type K thermocouple |
| Linearisation/CJ Compensation | enabled/enabled |
| Units | °C |
| Damping/Smoothing value | 0 seconds/0 seconds |
| Output zero | 0°C |
| Output span | 250°C |
| Tag and description fields | blank |
| Open circuit alarm | set high (upscale) |
| Transmitter failure alarm | set low (downscale) |
| CJ failure alarm | set low (downscale) |
| Line frequency | 50Hz |

Configurator

A personal computer running MTL PCS45 software with a PCL45 interface.



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