MTL4073 TEMPERATURE CONVERTER
THC or RTD input

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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) x 100% =0.1% of span
Temperature drift: ± (0.007/250 x 16000 + 0.6) µA/°C = ±1.0µA/°C
Safety drive on sensor burnout
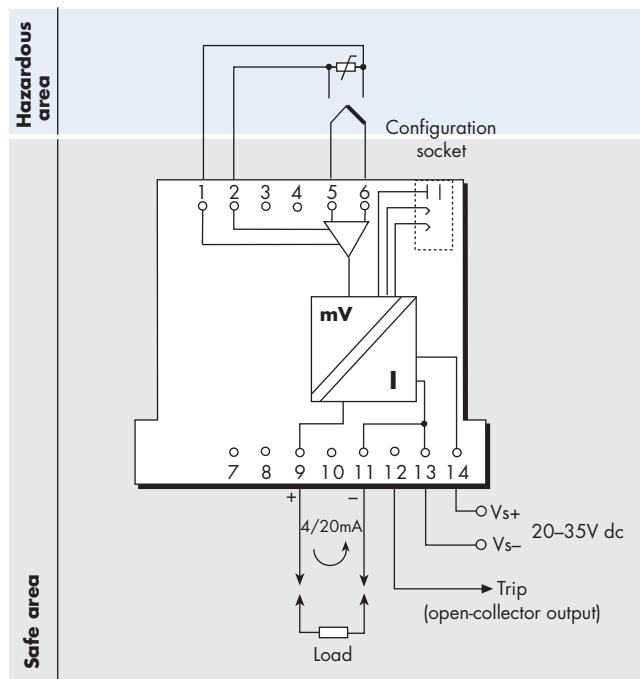Upscale, downscale, or off
Output range
4 to 20mA nominal (direct or reverse)
Maximum load resistance
600Ω
LED indicator
Green: one provided for power and status indication

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
$V_t \leq 7.2V$, $I_t \leq 11.5mA$, $C_a \leq 11.0µF$, $L_a \leq 245mH$

Terminals 5 and 6 only
$V_t \leq 1.2V$, $I_t \leq 3.8mA$, $C_a \leq 1000µF$, $L_a \leq 3.6mH$
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.