MTL3073 TEMPERATURE CONVERTER

THC or RTD input

The MTL3073 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 integral CJC sensor is provided within the module. Configuration is carried out via a PC using the PCL45 interface and PCS45 software.

SPECIFICATION

See also 'Common specification'

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
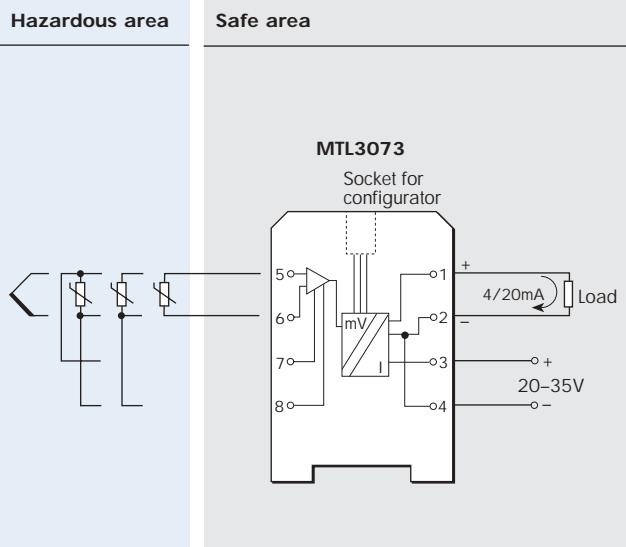Upscale, downscale, or off

Output range
4 to 20mA nominal (direct or reverse)

Maximum load resistance
600Ω

LED indicator
Green: one provided for power and status indication

Hazardous area | **Safe area**

MTL3073
Socket for configurator

Power requirement
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

Replaceable fuse
100mA, 5 x 20mm glass to DIN41571 sht. 2, semi-time-lag (M)

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 7 and 8
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 5, 6, 7 and 8
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
Weight
170g

Default configuration
Unless ordered differently, every module is supplied with the following default configuration.

Input type	Type K thermocouple
Linerisaton	enabled
Units	°C
CJ Compensation	enabled
Damping value	0 seconds
Smoothing value	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.