MTL MTL Series Service Manual

MTL3073

1. Description

The MTL3073 converts a low-level dc signal from a temperature

3. Product Information

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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.

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

Umax: in = 11.2V, Imax: in = 12mA, Wmax: in = 280mW

Umax: out = 7.2V, Imax: out = 8mA, Wmax: out = 15mW

FM entity parameters

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Terminals 5, 6, 7 and 8

Vt ≤7.2V, It ≤11.5mA, Ca ≤11.0µF, La ≤245mH

Terminals 5 and 6 only

Vt ≤1.2V, It ≤3.8mA, Ca ≤1000µF, La ≤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 ºC

CJ Compensation enabled

Damping value 0 seconds

Smoothing value 0 seconds

Output zero 0ºC

Output span 250ºC

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.

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)

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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