

MTL MTL Series Service Manual

MTL5074

1. Description

The MTL5074 converts a low-level dc signal from a temperature sensor

3. Product Information

The MTL5074 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- or 4-wire RTDs. For thermocouples requiring coldjunction compensation, the HAZ-CJC plug can be ordered with the product, and includes an integral CJC sensor.

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/DIN43760 (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 impedance 10MΩ)

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

Power requirement, Vs with 20mA signal

68mA at 24V

82mA at 20V

52mA at 35V

Power dissipation within unit with 20mA signal

1.5W at 24V

1.6W at 35V

Terminal Function

1 THC/EMF/RTD input -ve

3 THC/EMF/RTD input +ve

4 3-wire RTD input -ve

5 4-wire RTD input +ve

11 Output -ve

12 Output +ve

13 Supply -ve

14 Supply +ve

Isolation

250V ac between safe- and hazardous-area circuits and power

supply

Safety description

Terminals 1 and 3

i) Without CJ plug

Vout = 1.1V

Iout = 7mA

Pout = 2mW

Non-energy-storing apparatus $\leq 1.2V$, $\leq 0.1A$, $\leq 20\mu J$ and $\leq 25mW$.

Can be connected without further certification into any IS loop

with open-circuit voltage not more than 10V.

ii) With CJ plug

Vout = 6.6V, Iout = 10mA

Pout = 17mW

Terminals 1 and 3, 4 and 5

Vout = 6.6V, Iout = 76mA, Pout = 0.13W

Configuration socket (CON6)

Vout = 8.3V, Iout = 15mA, Pout = 26mW

Standard configuration

Input type RTD, 3-wire

Linearisation enabled

CJ Compensation disabled

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.

TO ORDER, specify:

MTL5074 Includes HAZ-CJC signal plug (with internal CJC sensor). For use with thermocouple, mV or RTD inputs.

MTL5074-RTD Includes standard HAZ1-3 signal plug. For use with mV or RTD inputs. (Can be used with thermocouples with cold-junction compensation if

HAZ-CJC plug is fitted.)

HAZ-CJC Hazardous-area signal plug for terminals 1 to 3 including cold-junction compensation sensor.