

MTL5074 TEMPERATURE CONVERTER

THC or RTD input



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 cold-junction 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 (100 Ω 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 400 Ω (Input impedance 10M Ω)

Input signal span

3 to 150mV, or 10 to 400 Ω

RTD excitation current

200 μ A nominal

Cold junction compensation

Automatic or selectable

Cold junction compensation error

$\leq 1.0^\circ\text{C}$

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: $\pm 15\mu\text{V}$ or $\pm 0.05\%$ of input value (whichever is greater)

RTD: $\pm 80\text{m}\Omega$

Output: $\pm 11\mu\text{A}$

Temperature drift (typical)

Inputs:

mV/THC: $\pm 0.003\%$ of input value/ $^\circ\text{C}$

RTD: $\pm 7\text{m}\Omega/^\circ\text{C}$

Output: $\pm 0.6\mu\text{A}/^\circ\text{C}$

Example of calibration accuracy and temperature drift (RTD input)

Span: 250 Ω

Accuracy: $\pm (0.08/250 + 11/16000) \times 100\%$
 $= 0.1\%$ of span

Temperature drift: $\pm (0.007/250 \times 16000 + 0.6) \mu\text{A}/^\circ\text{C}$
 $= \pm 1.0\mu\text{A}/^\circ\text{C}$

Safety drive on sensor burnout

Upscale, downscale, or off

Output range

4 to 20mA nominal (direct or reverse)

Maximum load resistance

600 Ω

LED indicator

Green: one provided for power and status indication

Power requirement, V_s with 20mA signal

68mA at 24V

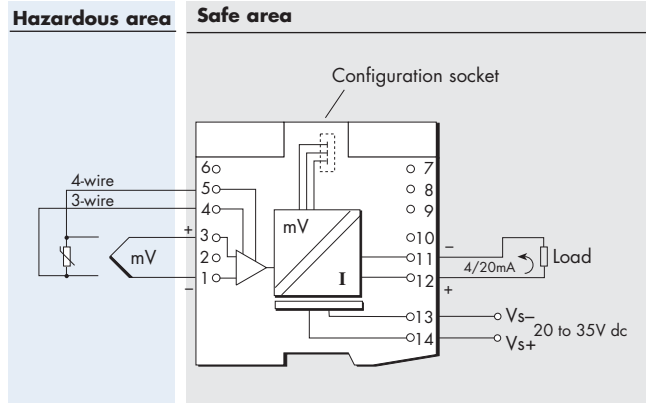
82mA at 20V

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

$V_{\text{out}} = 1.1\text{V}$

$I_{\text{out}} = 7\text{mA}$

$P_{\text{out}} = 2\text{mW}$

Non-energy-storing apparatus $\leq 1.2\text{V}$, $\leq 0.1\text{A}$, $\leq 20\mu\text{J}$ and $\leq 25\text{mW}$. Can be connected without further certification into any IS loop with open-circuit voltage not more than 10V.

ii) With CJ plug

$V_{\text{out}} = 6.6\text{V}$, $I_{\text{out}} = 10\text{mA}$

$P_{\text{out}} = 17\text{mW}$

Terminals 1 and 3, 4 and 5

$V_{\text{out}} = 6.6\text{V}$, $I_{\text{out}} = 76\text{mA}$

$P_{\text{out}} = 0.13\text{W}$

Configuration socket (CON6)

$V_{\text{out}} = 8.3\text{V}$, $I_{\text{out}} = 15\text{mA}$

$P_{\text{out}} = 26\text{mW}$

Standard configuration

Input type	RTD, 3-wire
Linearisation	enabled
CJ Compensation	disabled
Units	$^\circ\text{C}$
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.



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