MTL5074 TEMPERATURE CONVERTER

THC or RTD input

CE

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 (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

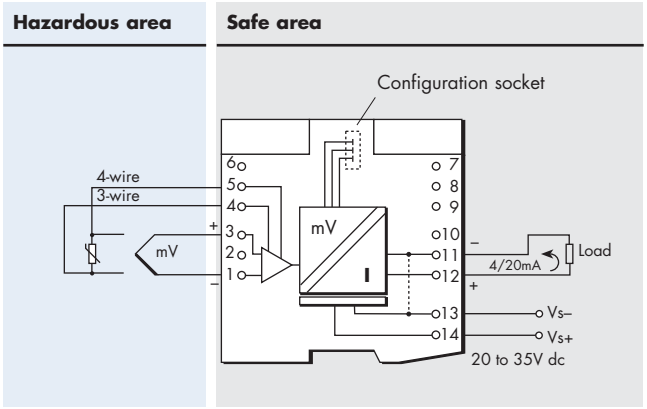
Temperature drift (typical)

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
V_{out} = 1.1V
I_{out} = 7mA
P_{out} = 2mW
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.
ii) With CJ plug
V_{out} = 6.6V, I_{out} = 10mA
P_{out} = 17mW
Terminals 1 and 3, 4 and 5
V_{out} = 6.6V, I_{out} = 76mA
P_{out} = 0.13W
Configuration socket (CON6)
V_{out} = 8.3V, I_{out} = 15mA
P_{out} = 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.

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