Extract from the online catalog

MACX MCR-EX-SL-TC-I-NC

Order No.: 2865586

http://eshop.phoenixcontact.de/phoenix/treeViewClick.do?UID=2865586

Ex-i temperature measuring transducer: Converts signals from thermocouples installed in Ex areas and mV sources and transmits a 0/4-20 mA signal to a load in a safe area. Freely programmable, 3-way isolation, SIL2

Commercial data	
GTIN (EAN)	4 046356 160513
sales group	H724
Pack	1 pcs.
Customs tariff	85437090
Catalog page information	Page 457 (IF-2011)

Product notes

WEEE/RoHS-compliant since: 08/03/2006

http://www.download.phoenixcontact.com
Please note that the data given here has been taken from the online catalog. For comprehensive information and data, please refer to the user documentation. The General Terms and Conditions of Use apply to Internet downloads.

Technical data

Input data

Input	Intrinsically safe
Sensor types that can be used (TC)	E, J, K, N as per IEC / EN 60584, L as per DIN 43760
Input signal range	-20 mV ... 70 mV

Measuring range span	(Min. 50 K for thermocouples, 3 mV for mV sources)

Output data

Signal output	Current output
Current output signal	0 mA ... 20 mA
	4 mA ... 20 mA
Load/output load current output	max. 500 Ω
Output ripple (current)	< 50 μA_{PP}
Behavior in the event of a sensor error	As per NE 43 or can be freely defined

Power supply

Nominal supply voltage	24 V DC
Supply voltage range	19.2 V DC ... 30 V DC
Max. current consumption	< 40 mA (24 V DC)
Power consumption	< 1 W

Connection data

Conductor cross section solid min.	0.2 mm²
Conductor cross section solid max.	2.5 mm²
Conductor cross section stranded min.	0.2 mm²
Conductor cross section stranded max.	2.5 mm²
Conductor cross section AWG/kcmil min.	24
Conductor cross section AWG/kcmil max	14
Stripping length	7 mm
Screw thread	M3
Connection method	Screw connection
Tightening torque, min	0.5 Nm
Tightening torque max	0.6 Nm

General data

No. of channels	1
Temperature coefficient, typical	0.01 %/K
Typical cold point errors	± 1 K
Ambient temperature (operation)	-20 °C ... 60 °C (Any mounting position)
Ambient temperature (storage/transport)	-40 °C ... 80 °C
Permissible humidity (operation)	5 % ... 95 % (no condensation)

Step response (0–99%)	Typ. 800 ms (With SIL)
	max. 1200 ms (With SIL)
	Typ. 700 ms (Without SIL)
	max. 1100 ms (Without SIL)
Alignment zero	± 5 %
Alignment span	± 5 %
Status display	Green LED (supply voltage, PWR)
	Red LED, flashing (line, sensor error, ERR)
	Red LED (module error, ERR)
Width	12.5 mm
Height	99 mm
Depth	114.5 mm
Inflammability class acc. to UL 94	V0
Pollution degree	2
Surge voltage category	II
Housing material	PA 66-FR
Degree of protection	IP20
Color	green
Electrical isolation input / output / supply	2.5 kV (50 Hz, 1 min., test voltage)
Electrical isolation input / output	375 V (Peak value in accordance with EN 60079-11)
Electrical isolation input / supply	375 V (Peak value in accordance with EN 60079-11)
Conformance	CE-compliant, additionally EN 61326
ATEX	Ex II (1) G [Ex ia] IIC
	Ex II (1) D [Ex iaD]
	Ex II 3G Ex nA ic IIC T4 X
IECEx	[Ex ia] IIC; [Ex iaD]; Ex nA ic [ia] IIC T4
UL, USA / Canada	Class I Div 2; IS for Class I, II, III Div 1
Functional safety (SIL)	SIL 2 TÜV Rheinland 968/EZ374.00/09

Safety characteristic data

Integrity requirement	for IEC 61508 - Low demand
Architecture	Single-channel, 1oo1
Equipment type	Type B
Safety Integrity Level (SIL)	2
Safe Failure Fraction (SFF)	96.5 %
MTBF	123 Years

λ_{SU}	1.42 x 10^{-7} (142 FIT)
λ_{SD}	4.38 x 10^{-7} (438 FIT)
λ_{DU}	3.24 x 10^{-8} (32.4 FIT)
λ_{DD}	3.14 x 10^{-7} (314 FIT)
Probability of a hazardous failure on demand (PFD_{AVG})	1.31 x 10^{-4} (1 year)
	2.62 x 10^{-4} (2 years)
	3.93 x 10^{-4} (3 years)
	6.55 x 10^{-4} (5 years)
	9.17 x 10^{-4} (7 years)
	1.05 x 10^{-3} (8 years)
Diagnostic coverage (DC)	90.7 %
Integrity requirement	for IEC 61508 - High demand
Architecture	Single-channel, 1oo1
Equipment type	Type B
Safety Integrity Level (SIL)	Up to 2
Safe Failure Fraction (SFF)	90.7 %
MTBF	123 Years
λ_{SU}	1.42 x 10^{-7} (150 FIT)
λ_{SD}	4.38 x 10^{-7} (438 FIT)
λ_{DU}	3.24 x 10^{-8} (32.4 FIT)
λ_{DD}	3.14 x 10^{-7} (314 FIT)
Probability of a hazardous failure per hour (PFH_D)	3,24 x 10^{-8}
Diagnostic coverage (DC)	90.7 %

Safety data

Max. voltage U_o	6 V
Max. current I_o	4.7 mA
Max. power P_o	7 mW
Gas group	II C
Max. external inductivity L_o	100 mH
Max. external capacity C_o	1.5 µF
Gas group	II C
Max. external inductivity L_o	10 mH
Max. external capacity C_o	1.9 µF

Gas group	II C
Max. external inductivity L_o	1 mH
Max. external capacity C_o	2.7 µF
Safety-related maximum voltage U_m	253 V AC (125 V DC)
Gas group	II B
Max. external inductivity L_o	100 mH
Max. external capacity C_o	7 µF
Gas group	II B
Max. external inductivity L_o	10 mH
Max. external capacity C_o	9.4 µF
Gas group	II B
Max. external inductivity L_o	1 mH
Max. external capacity C_o	15 µF

Certificates / Approvals

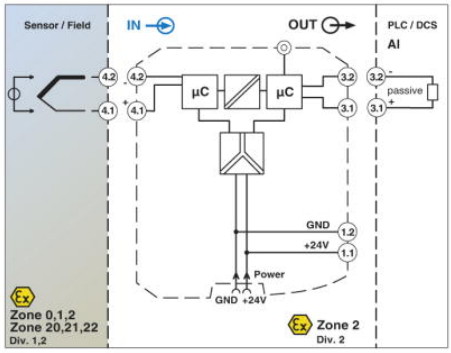
Certification	TUEV-RH
Certification Ex:	IECEx
Certifications applied for:	UL Listed / CUL Listed

Accessories

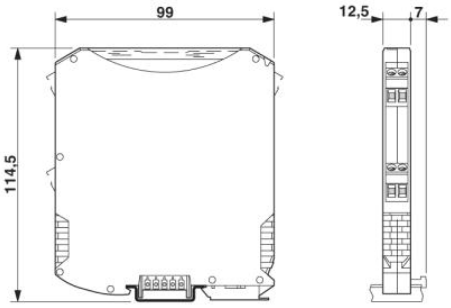
Item	Designation	Description
Cable/conductor		
2811271	IFS-USB-PROG-ADAPTER	Programming adapter with USB interface, for programming with the IFS-CONF, MACX-MCR-CONF and UPS-CONF software

Diagrams/Drawings

Block diagram



Dimensioned drawing



Address

PHOENIX CONTACT Inc., USA
586 Fulling Mill Road
Middletown, PA 17057,USA
Phone (800) 888-7388
Fax (717) 944-1625
http://www.phoenixcon.com