



# Thermocouple Converter LB5102A

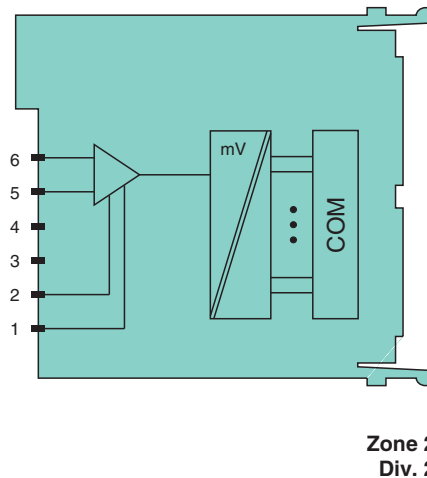
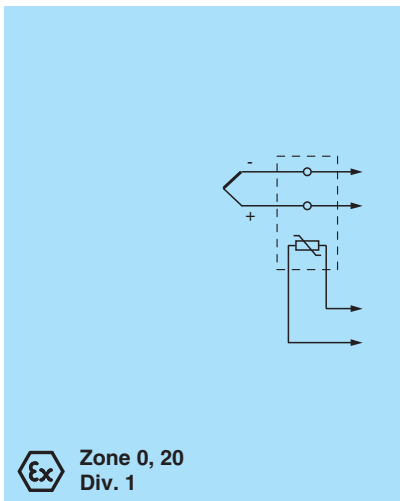
- 1-channel
- Input Ex ia
- Mounting in Zone 2, Class I/Div.2 or in the safe area
- Converter for thermocouples and mV-signals
- Simulation mode for service operations (forcing)
- Line fault detection (LFD)
- Permanently self-monitoring
- Module can be exchanged under voltage



## Function

The mV input accepts thermocouple or mV signals from the hazardous area.  
Open circuit line fault alarms are detected.  
The input is galvanically isolated from the bus and the power supply (EN 60079-11).

## Connection



## Technical Data

| Slots                                 |                |                                                               |        |
|---------------------------------------|----------------|---------------------------------------------------------------|--------|
| Occupied slots                        |                | 1                                                             |        |
| Supply                                |                |                                                               |        |
| Connection                            |                | backplane bus                                                 |        |
| Rated voltage                         | U <sub>r</sub> | 12 V DC , only in connection with the power supplies LB9***   |        |
| Power dissipation                     |                | 0.45 W                                                        |        |
| Power consumption                     |                |                                                               | 0.45 W |
| Internal bus                          |                |                                                               |        |
| Connection                            |                | backplane bus                                                 |        |
| Interface                             |                | manufacturer-specific bus to standard com unit                |        |
| Input                                 |                |                                                               |        |
| Compensation (reference junction CJC) |                | internal cold junction compensation or external cold junction |        |
| temperature input                     |                |                                                               |        |

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Refer to "General Notes Relating to Pepperl+Fuchs Product Information".

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## Technical Data

|                                                                |                                                                                                                                                                                                                                                        |
|----------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Number of channels                                             | 1                                                                                                                                                                                                                                                      |
| Suitable field devices                                         |                                                                                                                                                                                                                                                        |
| Field device [2]                                               | Thermocouple                                                                                                                                                                                                                                           |
| Field device [4]                                               | mV source                                                                                                                                                                                                                                              |
| Suitable sensors                                               |                                                                                                                                                                                                                                                        |
| Sensor                                                         | thermocouples U, B, E, T, K, S, R, L, J, N, Pallaplat and mV sources                                                                                                                                                                                   |
| Connection                                                     | cold junction: 1, 2<br>thermocouple: 5+, 6-                                                                                                                                                                                                            |
| Measurement range                                              | -75 ... mV ... 75 mV                                                                                                                                                                                                                                   |
| Smallest span                                                  | 5 mV for 0.1 % accuracy                                                                                                                                                                                                                                |
| Linearity error                                                | 0.1 %                                                                                                                                                                                                                                                  |
| Conversion time                                                | internal cold junction:<br>max. 120 ms without LFD<br>max. 240 ms with LFD external cold junction:<br>max. 20 ms without LFD<br>max. 80 ms with LFD                                                                                                    |
| Compensation (reference junction CJC)                          | internal cold junction compensation or external cold junction                                                                                                                                                                                          |
| Line fault detection                                           | can be switched on/off for each channel via configuration tool ,                                                                                                                                                                                       |
| Open-circuit                                                   | > 1 kΩ                                                                                                                                                                                                                                                 |
| <b>Transfer characteristics</b>                                |                                                                                                                                                                                                                                                        |
| Deviation                                                      |                                                                                                                                                                                                                                                        |
| Influence of ambient temperature                               | max. 0,1 %/10 K                                                                                                                                                                                                                                        |
| <b>Indicators/settings</b>                                     |                                                                                                                                                                                                                                                        |
| LED indication                                                 | Power LED (P) green: supply<br>Status LED (1) red: line fault                                                                                                                                                                                          |
| Coding                                                         | optional mechanical coding via front socket                                                                                                                                                                                                            |
| <b>Directive conformity</b>                                    |                                                                                                                                                                                                                                                        |
| Electromagnetic compatibility                                  |                                                                                                                                                                                                                                                        |
| Directive 2014/30/EU                                           | EN 61326-1:2013                                                                                                                                                                                                                                        |
| <b>Conformity</b>                                              |                                                                                                                                                                                                                                                        |
| Electromagnetic compatibility                                  | NE 21                                                                                                                                                                                                                                                  |
| Degree of protection                                           | IEC 60529                                                                                                                                                                                                                                              |
| Environmental test                                             | EN 60068-2-14                                                                                                                                                                                                                                          |
| Shock resistance                                               | EN 60068-2-27                                                                                                                                                                                                                                          |
| Vibration resistance                                           | EN 60068-2-6                                                                                                                                                                                                                                           |
| Damaging gas                                                   | EN 60068-2-42                                                                                                                                                                                                                                          |
| Relative humidity                                              | EN 60068-2-78                                                                                                                                                                                                                                          |
| <b>Ambient conditions</b>                                      |                                                                                                                                                                                                                                                        |
| Ambient temperature                                            | -40 ... 60 °C (-40 ... 140 °F)                                                                                                                                                                                                                         |
| Storage temperature                                            | -40 ... 85 °C (-40 ... 185 °F)                                                                                                                                                                                                                         |
| Relative humidity                                              | 95 % non-condensing                                                                                                                                                                                                                                    |
| Altitude                                                       | max. 2000 m                                                                                                                                                                                                                                            |
| Shock resistance                                               | shock type I, shock duration 11 ms, shock amplitude 15 g, number of shocks 18                                                                                                                                                                          |
| Vibration resistance                                           | frequency range 10 ... 150 Hz; transition frequency: 57.56 Hz, amplitude/acceleration<br>± 0.075 mm/1 g; 10 cycles<br>frequency range 5 ... 100 Hz; transition frequency: 13.2 Hz amplitude/acceleration ± 1<br>mm/0.7 g; 90 minutes at each resonance |
| Damaging gas                                                   | designed for operation in environmental conditions acc. to ISA-S71.04-1985, severity<br>level G3                                                                                                                                                       |
| <b>Mechanical specifications</b>                               |                                                                                                                                                                                                                                                        |
| Degree of protection                                           | IP20 when mounted on backplane                                                                                                                                                                                                                         |
| Connection                                                     | removable front connector with screw flange (accessory)<br>wiring connection via spring terminals (0.14 ... 1.5 mm <sup>2</sup> ) or screw terminals<br>(0.08 ... 1.5 mm <sup>2</sup> )                                                                |
| Mass                                                           | approx. 90 g                                                                                                                                                                                                                                           |
| Dimensions                                                     | 16 x 100 x 102 mm (0.63 x 3.9 x 4 inch)                                                                                                                                                                                                                |
| <b>Data for application in connection with hazardous areas</b> |                                                                                                                                                                                                                                                        |

Technical Data

|                                  |                |                                                                                                                                                                                                                                                                                         |
|----------------------------------|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EU-type examination certificate  |                | PTB 03 ATEX 2042 X                                                                                                                                                                                                                                                                      |
| Marking                          |                | Ⓔ II (1)G [Ex ia Ga] IIC<br>Ⓔ II (1)D [Ex ia Da] IIIC<br>Ⓔ I (M1) [Ex ia Ma] I                                                                                                                                                                                                          |
| Input                            |                |                                                                                                                                                                                                                                                                                         |
| Voltage                          | U <sub>o</sub> | 1.8 V                                                                                                                                                                                                                                                                                   |
| Current                          | I <sub>o</sub> | 43 mA                                                                                                                                                                                                                                                                                   |
| Power                            | P <sub>o</sub> | 67 mW (trapezoid characteristic curve)                                                                                                                                                                                                                                                  |
| Certificate                      |                | PF 08 CERT 1234 X                                                                                                                                                                                                                                                                       |
| Marking                          |                | Ⓔ II 3 G Ex nA IIC T4 Gc                                                                                                                                                                                                                                                                |
| Galvanic isolation               |                |                                                                                                                                                                                                                                                                                         |
| Input/power supply, internal bus |                | safe electrical isolation acc. to EN 60079-11, voltage peak value 375 V                                                                                                                                                                                                                 |
| Directive conformity             |                |                                                                                                                                                                                                                                                                                         |
| Directive 2014/34/EU             |                | EN IEC 60079-0:2018+AC:2020<br>EN 60079-11:2012<br>EN 60079-15:2010                                                                                                                                                                                                                     |
| International approvals          |                |                                                                                                                                                                                                                                                                                         |
| ATEX approval                    |                | PTB 03 ATEX 2042 X                                                                                                                                                                                                                                                                      |
| UL approval                      |                | E106378                                                                                                                                                                                                                                                                                 |
| Control drawing                  |                | 116-0322                                                                                                                                                                                                                                                                                |
| IECEX approval                   |                |                                                                                                                                                                                                                                                                                         |
| IECEX certificate                |                | IECEX BVS 09.0037X                                                                                                                                                                                                                                                                      |
| IECEX marking                    |                | Ex nA [ia Ga] IIC T4 Gc<br>[Ex ia Da] IIIC<br>[Ex ia Ma] I                                                                                                                                                                                                                              |
| General information              |                |                                                                                                                                                                                                                                                                                         |
| System information               |                | The module has to be mounted in appropriate backplanes (LB9***) in Zone 2 or outside hazardous areas. Here, observe the corresponding declaration of conformity. For use in hazardous areas (e. g. Zone 2, Zone 22 or Div. 2) the module must be installed in an appropriate enclosure. |
| Supplementary information        |                | EC-Type Examination Certificate, Statement of Conformity, Declaration of Conformity, Attestation of Conformity and instructions have to be observed where applicable. For information see <a href="http://www.pepperl-fuchs.com">www.pepperl-fuchs.com</a> .                            |

Assembly

Front view

