

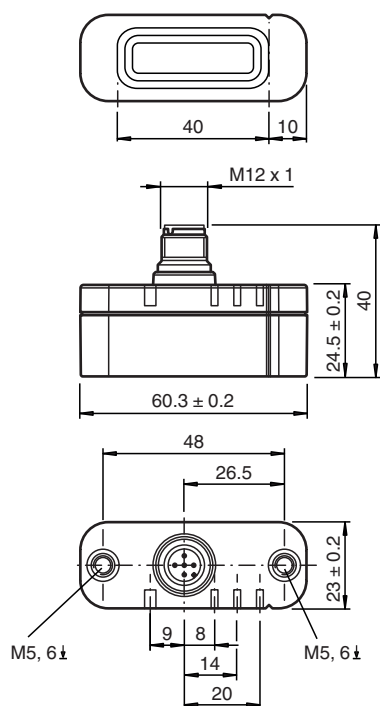


## Inductive positioning system PMI40-F90-IU2EP-IO-V15-3G-3D

- Parameterization and diagnosis via IO-Link
- Measuring range 0 ... 40 mm
- Parameterisable measuring range
- Analog current or voltage output, programmable
- 2 Push-pull outputs
- Switch points programmable via IO-Link



### Dimensions



### Technical Data

#### General specifications

|                            |                                                                                  |                                    |
|----------------------------|----------------------------------------------------------------------------------|------------------------------------|
| Switching element function | Analog current or voltage output, programmable<br>2 switch outputs, programmable |                                    |
| Object distance            |                                                                                  | 0.5 ... 3 mm , recommended: 1.5 mm |
| Measurement range          |                                                                                  | 0 ... 40 mm                        |
| Linearity range            |                                                                                  | 1 ... 39 mm                        |

#### Nominal ratings

|                             |                            |                                                                             |
|-----------------------------|----------------------------|-----------------------------------------------------------------------------|
| Operating voltage           | U <sub>B</sub>             | 12 ... 30 V DC<br>(13 ... 30 V when analog voltage output is parameterized) |
| Reverse polarity protection | reverse polarity protected |                                                                             |

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

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## Technical Data

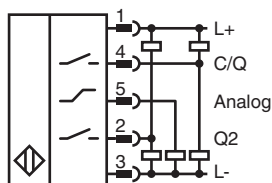
|                                                 |                |                                                                                                                                                                               |
|-------------------------------------------------|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Linearity error                                 |                | within measuring range: $\pm 0.8$ mm<br>within linearity range: $\pm 0.4$ mm                                                                                                  |
| Repeat accuracy                                 | R              | $\pm 0.1$ mm                                                                                                                                                                  |
| Resolution                                      |                | 50 $\mu$ m                                                                                                                                                                    |
| Temperature drift                               |                | $\pm 0.5$ mm (-25 °C ... 70 °C)                                                                                                                                               |
| No-load supply current                          | I <sub>0</sub> | $\leq 40$ mA                                                                                                                                                                  |
| Operating voltage indicator                     |                | LED green                                                                                                                                                                     |
| <b>Functional safety related parameters</b>     |                |                                                                                                                                                                               |
| MTTF <sub>d</sub>                               |                | 382 a                                                                                                                                                                         |
| Mission Time (T <sub>M</sub> )                  |                | 20 a                                                                                                                                                                          |
| Diagnostic Coverage (DC)                        |                | 0 %                                                                                                                                                                           |
| <b>Indicators/operating means</b>               |                |                                                                                                                                                                               |
| LED S1                                          |                | switching state Switching output 1                                                                                                                                            |
| LED S2                                          |                | switching state Switching output 2                                                                                                                                            |
| LED S3                                          |                | Damping element in the configured analog measuring range                                                                                                                      |
| LED STATUS                                      |                | Status display LED, green/red (Power on, communication/error, missing damping element)                                                                                        |
| <b>Interface</b>                                |                |                                                                                                                                                                               |
| Interface type                                  |                | IO-Link (via C/Q = Pin 4)                                                                                                                                                     |
| IO-Link Revision                                |                | 1.1                                                                                                                                                                           |
| Device profile                                  |                | Smart Sensor                                                                                                                                                                  |
| Device ID                                       |                | 0x200204 (2097668)                                                                                                                                                            |
| Transfer rate                                   |                | COM 2 (38.4 kBaud)                                                                                                                                                            |
| Value range                                     |                | 0000h ... 3200h                                                                                                                                                               |
| Min. cycle time                                 |                | 2.3 ms                                                                                                                                                                        |
| Process data width                              |                | Process data input: 16 Bit<br>Process data output: none                                                                                                                       |
| SIO mode support                                |                | yes                                                                                                                                                                           |
| Compatible master port type                     |                | A                                                                                                                                                                             |
| <b>Switching output</b>                         |                |                                                                                                                                                                               |
| Output type                                     |                | 2 push-pull outputs (can be parameterized), short-circuit-proof, reverse polarity protection, surge-proof                                                                     |
| Operating current                               | I <sub>L</sub> | $\leq 100$ mA / output                                                                                                                                                        |
| Switching window                                |                | $\pm 1$ mm                                                                                                                                                                    |
| Switching hysteresis                            |                | 0.2 mm                                                                                                                                                                        |
| Voltage drop                                    |                | $\leq 3$ V                                                                                                                                                                    |
| Short-circuit protection                        |                | pulsing                                                                                                                                                                       |
| <b>Analog output</b>                            |                |                                                                                                                                                                               |
| Output type                                     |                | 1 current output: 4 ... 20 mA or 1 voltage output: 0 ... 10 V, programmable                                                                                                   |
| Load resistor                                   |                | current output: $\leq 400$ $\Omega$<br>voltage output: $\geq 1000$ $\Omega$                                                                                                   |
| Short-circuit protection                        |                | voltage output: current limit                                                                                                                                                 |
| <b>Compliance with standards and directives</b> |                |                                                                                                                                                                               |
| Standard conformity                             |                |                                                                                                                                                                               |
| Standards                                       |                | EN 60947-5-2:2007<br>EN 60947-5-2/A1:2012<br>IEC 60947-5-2:2007<br>IEC 60947-5-2 AMD 1:2012<br>EN 60947-5-7:2003<br>EN 61131-9:2013<br>IEC 60947-5-7:2003<br>IEC 61131-9:2013 |
| <b>Approvals and certificates</b>               |                |                                                                                                                                                                               |
| UL approval                                     |                | cULus Listed, Class 2 Power Source, Type 1 enclosure                                                                                                                          |
| <b>Ambient conditions</b>                       |                |                                                                                                                                                                               |
| Ambient temperature                             |                | -25 ... 85 °C (-13 ... 185 °F)                                                                                                                                                |
| <b>Mechanical specifications</b>                |                |                                                                                                                                                                               |

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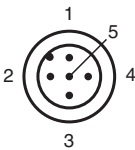
## Technical Data

|                                                         |                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|---------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Connection type                                         | 5-pin, M12 x 1 connector                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Degree of protection                                    | IP67 / IP69K                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Material                                                |                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Housing                                                 | PBT, stainless steel 1.4571 , brass, nickel-plated                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Target                                                  | mild steel, e. g. 1.0037, SR235JR (formerly St37-2)                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Mass                                                    | 56 g                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Data for application in connection with hazardous areas |                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Equipment protection level                              | Gc (nA) , Dc                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Equipment protection level Gc (nA)                      |                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Type of protection                                      | "n"                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| CE marking                                              | [*PD-Z02586A*]                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Certificates                                            |                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| ATEX certificate                                        | PF 15 CERT 3754 X                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| ATEX marking                                            | Ⓔ II 3G Ex nA IIC T6 Gc                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Standards                                               | EN 60079-0:2012+A11:2013 , EN 60079-15:2010                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Possible characteristics                                | maximum operating voltage U <sub>Bmax</sub> , maximum load current I <sub>Lmax</sub> , minimum series resistance R <sub>V</sub> , maximum analog output voltage U <sub>Amax</sub> , maximum analog output current I <sub>Amax</sub> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Maximum permissible ambient temperature                 | T <sub>amb</sub>                                                                                                                                                                                                                    | Also observe the maximum permissible ambient temperature stated in the general technical data.<br>Keep to the lower of the two values.<br><b>mode of operation 1</b><br>at U <sub>Bmax</sub> = 30 V and maximum 2 switching outputs with each I <sub>Lmax</sub> =100 mA and 1 analog output with I <sub>Amax</sub> = 20mA or U <sub>Amax</sub> = 10 V : 30 °C (86 °F)<br><b>mode of operation 2</b><br>at U <sub>Bmax</sub> = 30 V and maximum 1 switching output with I <sub>Lmax</sub> =100 mA : 50 °C (122 °F) |
| Equipment protection level Dc                           |                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Type of protection                                      | Protection by enclosure "tc"                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| CE marking                                              | [*PD-Z02586A*]                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Certificates                                            |                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| ATEX certificate                                        | PF 15 CERT 3774 X                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| ATEX marking                                            | Ⓔ II 3D Ex tc IIIC T80°C Dc                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Standards                                               | EN 60079-0:2012/A11+2013 , EN 60079-31:2014                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Possible characteristics                                | maximum operating voltage U <sub>Bmax</sub> , maximum load current I <sub>Lmax</sub> , minimum series resistance R <sub>V</sub> , maximum analog output voltage U <sub>Amax</sub> , maximum analog output current I <sub>Amax</sub> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Maximum permissible ambient temperature                 | T <sub>amb</sub>                                                                                                                                                                                                                    | Also observe the maximum permissible ambient temperature stated in the general technical data.<br>Keep to the lower of the two values.<br><b>mode of operation 1</b><br>at U <sub>Bmax</sub> = 30 V and maximum 2 switching outputs with each I <sub>Lmax</sub> =100 mA and 1 analog output with I <sub>Amax</sub> = 20mA or U <sub>Amax</sub> = 10 V : 30 °C (86 °F)<br><b>mode of operation 2</b><br>at U <sub>Bmax</sub> = 30 V and maximum 1 switching output with I <sub>Lmax</sub> =100 mA : 50 °C (122 °F) |
| General information                                     |                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Use in the hazardous area                               | see instruction manuals                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

## Connection



Connection Assignment

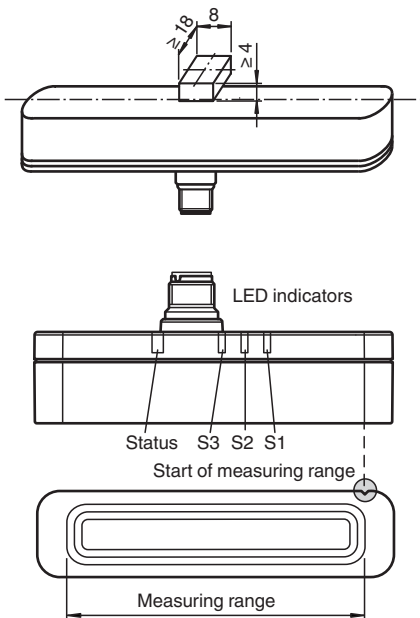


Wire colors in accordance with EN 60947-5-2

|   |    |         |
|---|----|---------|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue)  |
| 4 | BK | (black) |
| 5 | GY | (gray)  |

Application

dimensions for the target object:



Accessories

|  |                     |                                                                    |
|--|---------------------|--------------------------------------------------------------------|
|  | <b>BT-F90-W</b>     | Damping element for sensors of type F90, F112, and F166; side hole |
|  | <b>MH-F90</b>       | Mounting bracket for mounting of F90 sensors                       |
|  | <b>V15-G-2M-PVC</b> | Female cordset, M12, 5-pin, PVC cable                              |
|  | <b>V15-W-2M-PVC</b> | Female cordset, M12, 5-pin, PVC cable                              |

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## Operation

**Attention!**

If the sensor is supplied via an IO-Link-Master, ensure that the sum of the no-load supply current and operating currents of all sensor outputs does not exceed the maximum current the IO-Link-Master can supply.