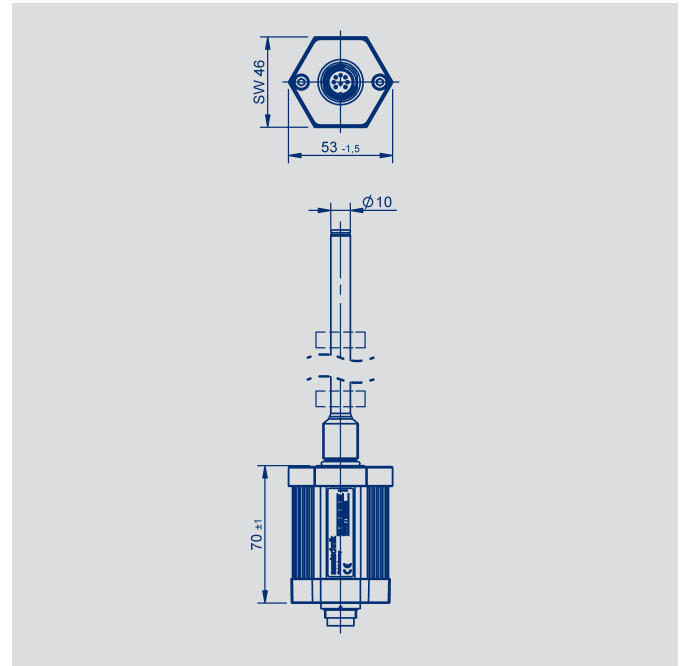
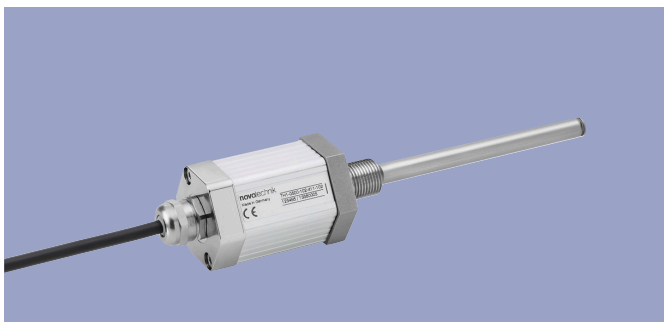
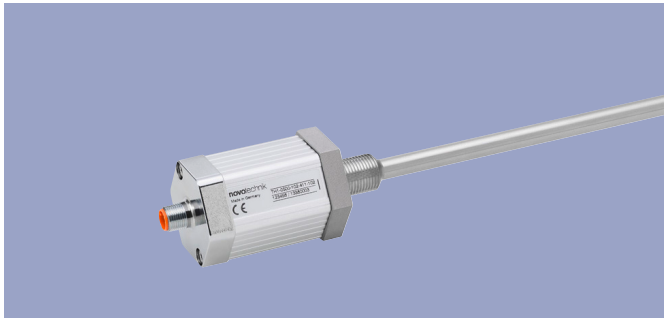


NOVOSTRICTIVE
Transducer
up to 4250 mm
touchless

Series TH1



Special features

- Touchless magnetostrictive measurement technology
- Rod style transducer, integratable
- Non-contacting position detection with ring shaped position marker
- Unlimited mechanical life
- Resolution up to 1 μm , independently of length
- Low temperature coefficient <15 ppm/K
- Position-Teach-In
- Insensitive to shock and vibration
- Protection class IP67 / IP68
- Operating pressure up to 350 bar
- Interfaces: Analog, SSI, Impulse, CANopen

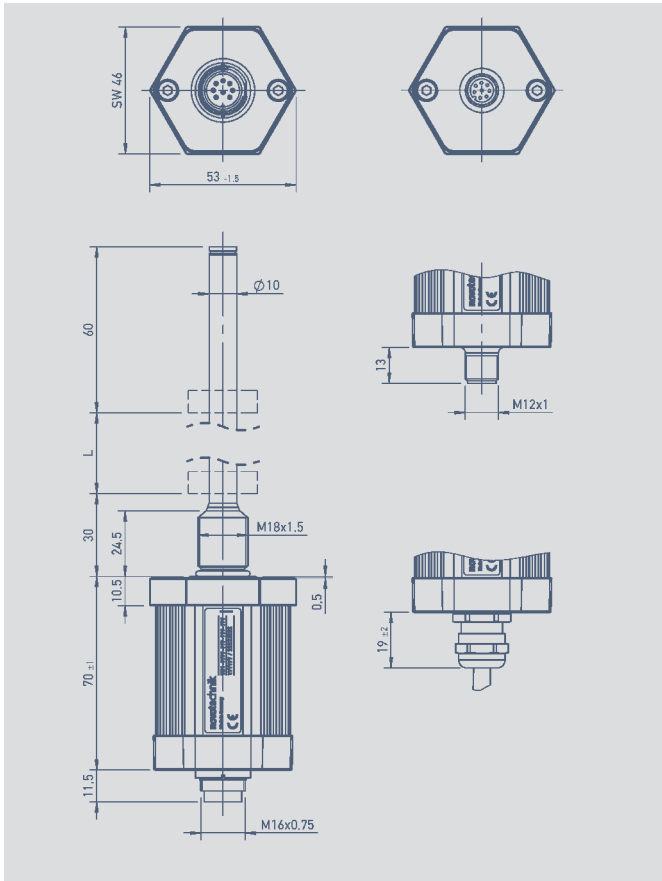
Applications

- Fluid Power
Pneumatic- or Hydraulic Cylinder
- Manufacturing Engineering
- Mobile Machinery

Contents

| | |
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| M16 Connector System | 15 |

Mechanical Data



Description

| | |
|---------------------|---|
| Housing | Aluminum, anodized, rod: stainless steel |
| Mounting | Bushing M18x1,5 for screw plug hole per ISO6149 Bushing 3/4"-16UNF for screw plug hole per SAE J475 |
| Position marker | Ring shaped position marker |
| Messverfahren | NOVOSTRICTIVE, touchless magnetostrictive |
| Electr. connections | Connector M12x1, 5-pol. / 8-pin., shielded Connector M16x0,75 (IEC 130-9), 6-pin. / 8-pin., shielded PUR-cable, 8x0,25 mm ² , shielded; 1 m, 3 m oder 5 m length |
| Electronic | SMD with ASIC, integrated Connector casing (shield) is connected to the sensor housing. Housing is capacitively decoupled to the electronics |

Mechanical Data

| | | |
|---|---|------------------|
| Dimensions | see dimension drawing | |
| Electrical measuring range (Dimension L) | 0050 up to 4250 mm in 25 mm steps. Other length on request. | |
| Max. operational speed with valid output signal | 10 | ms ⁻¹ |
| Max. operational acceleration with valid output signal | 200 | ms ⁻² |
| Shock (IEC 60068-2-27) | 100 (11 ms) (single hit) | g |
| Vibration (IEC 60068-2-6) | 20 (5...2000 Hz, Amax = 0.75 mm) | g |
| Protection class (DIN EN 60529) | IP67 with fastened connector IP68 with cable connection | |
| Life | Mechanically unlimited | |
| Operating temperature range | -40 ... +85 | °C |
| Storage temperature range | -40 ... +100 | °C |
| Operating humidity range | 0 ... 95 (no condensation) | % R.H. |
| Pressure rating | | |
| Operating pressure | ≤ 350 | bar |
| Pressure peaks | ≤ 600 | bar |
| Burst pressure | > 700 | bar |

Technical Data Analog Versions

| Type designations | TH1- _____ - 41 _ - _____ Voltage | TH1- _____ - 42 _ - _____ Current | |
|--|---|--|------------|
| Electrical Data | | | |
| Electrical measuring range (dimension L) | 0050 up to 4250 | | mm |
| Output signal | 0.1 ... 10 V (load $\geq 5 \text{ k}\Omega$) | 0.1 ... 20 mA (burden $\leq 500 \Omega$) 4 ... 20 mA (burden $\leq 500 \Omega$) | |
| Number of channels | 2 | 1 | |
| Update rate * | ≤ 16 | | kHz |
| Resolution | 16 | | Bit |
| Absolute linearity | $\leq \pm 0.02$ (min. $\pm 50 \mu\text{m}$) ** | | % FS |
| Tolerance of electr. zero point | ± 0.5 (min. 2 x reproducibility) | | mm |
| Reproducibility | ≤ 0.03 | | % FS |
| Hysteresis | ≤ 0.01 | | % FS |
| Temperature error | ≤ 30 (min. 0.01 mm/K) | | ppm/K |
| Supply voltage Ub | 24 (19 ... 30) | | VDC |
| Supply voltage with galvanic isolation | 24 (18 ... 36) | | VDC |
| Supply voltage ripple | ≤ 10 | | % Vss |
| Current consumption | ≤ 100 | | mA |
| Overvoltage protection | 40 (temporary / 1 min.) | | VDC |
| Polarity protection | Yes, up to supply voltage Ub max. | | VDC |
| Short circuit protection | Yes (outputs vs. GND and supply voltage Ub max.) | | |
| Insulation resistance (500 VDC) | ≥ 10 | | M Ω |
| Environmental Data | | | |
| MTTF (DIN EN ISO 13849-1 parts count method, w/o load, wc) | 28 | | Years |
| Functional safety | If you need assistance in using our products in safety-related systems, please contact us | | |
| EMC compatibility | EN 61000-4-2 Electrostatic discharges (ESD) 4 kV, 8 kV EN 61000-4-3 Electromagnetic fields 10 V/m EN 61000-4-4 Electrical fast transients (burst) 2 kV EN 61000-4-6 Conducted disturbances, induced by RF-fields 10 V eff. EN 55011 Radiated disturbances class B | | |

*) Data are extrapolated, internal measuring rate depends on length.
**) Valid for channel 1; channel 2 with additional offset and gradient tolerances (inverted signal from channel 1).
Measured with position marker Z-TH1-P18 or Z-TH1-P19.



Pin assignment

| Output connector code 101, 102 | Cable code 20_ | Connector with cable (Accessories) | Analog voltage | Analog current | Output connector code 103 | Analog Voltage | Analog Current |
|--------------------------------|----------------|------------------------------------|-------------------|-------------------|---------------------------|-------------------|-------------------|
| PIN 1 | YE | WH | do not connect | 0(4)...20 mA | PIN 1 | 0 ...+10 V | 0 (4)...20 mA |
| PIN 2 | GY | BN | Signal GND | Signal GND | PIN 2 | Signal GND | Signal GND |
| PIN 3 | PK | GN | +10...0 V | do not connect | PIN 3 | +10...0 V | do not connect |
| PIN 4 | RD | YE | DIAG * | DIAG * | PIN 4 | GND | GND |
| PIN 5 | GN | GY | 0...+10 V | do not connect | PIN 5 | Supply voltage Ub | Supply voltage Ub |
| PIN 6 | BU | PK | GND | GND | PIN 6 | GND | GND |
| PIN 7 | BN | BU | Supply voltage Ub | Supply voltage Ub | | | |
| PIN 8 | WH | RD | PROG * | PROG * | | | |

*) Connect only for Teach-In-function (see manual).

Ordering Specifications
Analog Versions
- Voltage
- Current

Ordering Specifications

Preferred types printed in bold

Electrical interface
4: Analog Interface

Output signal analog interface 4 _ _

1: Voltage output
2: Current output

Analog interface voltage output 41_

1: 0 ... 10 V und 10 ... 0 V

Analog interface current output 42_

1: 0 ... 20 mA
2: 20 ... 0 mA
3: 4 ... 20 mA
4: 20 ... 4 mA

Electrical connection

101: Connector M16x0,75 (IEC 130-9), 8-pin

102: Connector M12x1, 8-pin

103: Connector M16x0,75 (IEC 130-9), 6-pin

201: Cable, 8-pol., shielded, 1 m

203: Cable, 8-pol., shielded, 3 m

205: Cable, 8-pol., shielded, 5 m

Other cable length and assembled connectors on request

T H 1 - 0 8 0 0 - 1 0 2 - 4 1 1 - 1 0 2

Series

Electrical measuring range
Standard length
0050 up to 4250 mm
in 25 mm-steps.
Other Length on request

Mechanical version

102: Screw flange M18x1.5, zero point at 30 mm

103: Screw flange 3/4" - 16UNF, zero point at 30 mm

104: Screw flange M18x1.5, zero point at 51 mm

105: Screw flange 3/4" - 16UNF, zero point at 51 mm

106: Screw flange M18x1.5, zero point at 30 mm, for supporting at rod end *

107: Screw flange 3/4" - 16UNF, zero point at 30 mm, for supporting at rod end *

108: Screw flange M18x1.5, zero point at 51 mm, for supporting at rod end *

109: Screw flange 3/4" - 16UNF, zero point at 51 mm, for supporting at rod end *

Other mechanical versions on request

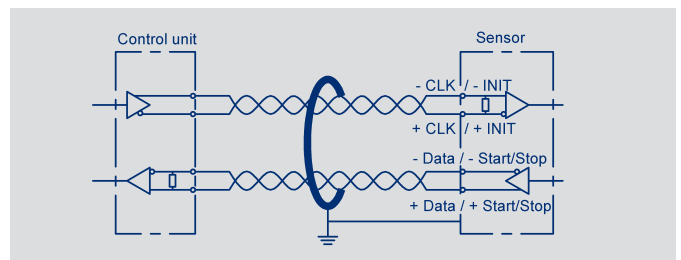
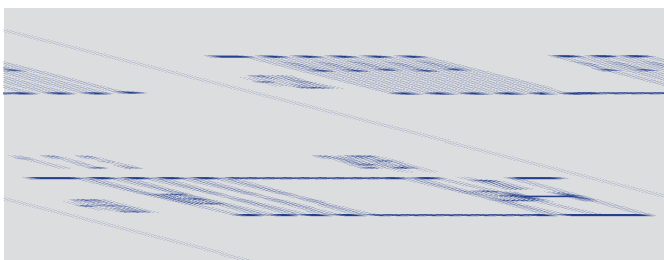
*) with internal thread M4x6 at rod end and additional length 7.5 mm

Important: Avoid equalizing currents in the cable shield caused by potential differences.
Twisted pair cable (STP) is recommended.

Technical Data SSI-Interface

| | | |
|---|--|-------|
| Type designations | TH1 - - - - - 2 - - - - - Synchron-Serial-Interface (SSI) | |
| Electrical Data | | |
| Electrical measuring range (dimension L) | 0050 up to 4250 | mm |
| Protocol | SSI 24 and 25 bit (26 bit on request) | |
| Inputs | RS422 | |
| Monoflop time (tm) | 30 | µs |
| Encoding | Gray, Binary | |
| Update rate * | 16 | kHz |
| Resolution | 1, 5 or 10 see ordering specifications (other resolutions on request) | |
| Absolute linearity | ≤ ±10 µm up to 1000 mm, ≤ ±25 µm up to 2500 mm, ≤ ±40 µm up to 4250 mm ** | |
| Tolerance of electr. zero point | ± 0.5 | mm |
| Reproducibility | ≤ 6 | µm |
| Hysteresis | ≤ 4 | µm |
| Temperature error | ≤ 15 (min. 0,01 mm/K) | ppm/K |
| Supply voltage Ub | 24 (13 ... 34) | VDC |
| Supply voltage ripple | ≤ 10 | % Vss |
| Overvoltage protection | 40 (permanent) | VDC |
| Current consumption | ≤ 100 | mA |
| Polarity protection | Yes, up to supply voltage Ub max. | |
| Short circuit protection | Yes (outputs vs. GND and supply voltage Ub up to 7 V) | |
| Ohmic load at outputs | > 120 | Ω |
| Max. Clock rate | 2 | MHz |
| Insulation resistance (500 VDC) | ≥ 10 | MΩ |
| Environmental Data | | |
| MTTF (DIN EN ISO 13849-1, parts count method, w/o load, wc) | 32 | Years |
| Functional safety | If you need assistance in using our products in safety-related systems, please contact us | |
| EMC compatibility | EN 61000-4-2 Electrostatic discharges (ESD) 4 kV, 8 kV EN 61000-4-3 Electromagnetic fields 10 V/m EN 61000-4-4 Electrical fast transients (burst) 1 kV EN 61000-4-6 Conducted disturbances, induced by RF-fields 10 V eff. EN 61000-4-8 Magnetfelder mit energietechnischen Frequenzen 3 A/m EN 55011 Radiated disturbances class B | |

*) Data are extrapolated, internal measuring rate depends on length.
**) Measured with resolution 1 µm.
At higher resolution, the permissible linearity error is increased by the resolution.



Pin assignment

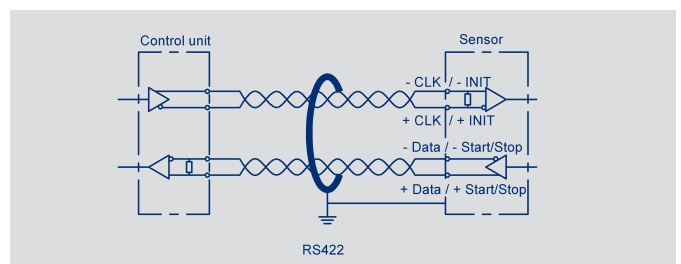
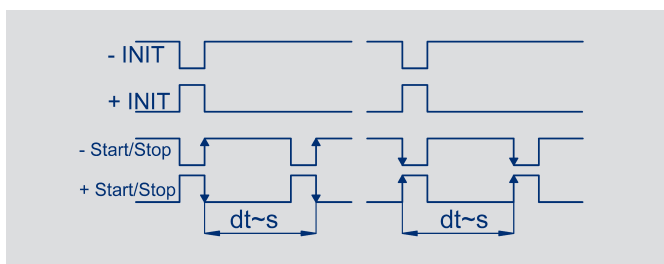
| Output connector code 101, 102 | Cable code 20 _ | Connector with cable (Accessories) | SSI-Interface |
|--------------------------------|-----------------|------------------------------------|-------------------|
| PIN 1 | YE | WH | Clk + |
| PIN 2 | GY | BN | Data + |
| PIN 3 | PK | GN | Clk - |
| PIN 4 | RD | YE | do not connect |
| PIN 5 | GN | GY | Data - |
| PIN 6 | BU | PK | GND |
| PIN 7 | BN | BU | Supply voltage Ub |
| PIN 8 | WH | RD | do not connect |

| Output connector code 103 | SSI-Interface |
|---------------------------|-------------------|
| Pin 1 | Data - |
| Pin 2 | Data + |
| Pin 3 | Clk + |
| Pin 4 | Clk - |
| Pin 5 | Supply voltage Ub |
| Pin 6 | GND |

Technical Data Impulse-Interface

| | | |
|---|---|-------------------|
| Type designations | TH1- _____ - 11 _ - _____ Start-Stop-Impulse-Interface | |
| Electrical Data | | |
| Electrical measuring range (dimension B) | 0050 up to 4250 | mm |
| Protocol | Impulse | |
| Inputs | RS422 | |
| Update rate * | 0.25 ... 1 | kHz |
| Resolution | Depending on interpretation, normalized to 2800 ms ⁻¹ | |
| Absolute linearity | ≤ ± 50 | µm |
| Tolerance of electr. zero point | ± 0.5 | mm |
| Reproducibility | ≤ 6 | µm |
| Hysteresis | ≤ 4 | µm |
| Temperature error | ≤ 15 (min. 0,01 mm/K) | ppm/K |
| Supply voltage Ub | 24 (13 ... 34) | VDC |
| Supply voltage ripple | ≤ 10 | % V _{ss} |
| Overvoltage protection | 40 (permanent) | VDC |
| Current consumption | ≤ 100 | mA |
| Polarity protection | Yes, up to supply voltage Ub max. | |
| Short circuit protection | Yes (outputs vs. GND and supply voltage Ub up to 7 V) | |
| Insulation resistance (500 VDC) | ≥ 10 | MΩ |
| Environmental Data | | |
| MTTF (DIN EN ISO 13849-1, parts count method, w/o load, wc) | 27 | Years |
| Functional safety | If you need assistance in using our products in safety-related systems, please contact us | |
| EMC compatibility | EN 61000-4-2 Electrostatic discharges (ESD) 4 kV, 8 kV EN 61000-4-3 Electromagnetic fields 10 V/m EN 61000-4-4 Electrical fast transients (burst) 2 kV EN 61000-4-6 Conducted disturbances, induced by RF-fields 10 V eff. EN 55011 Radiated disturbances class B | |

*) Data are extrapolated, internal measuring rate depends on lengths.



| Output connector code 101, 102 | Cable code 20 _ | Connector with cable (Accessories) | Start/Stop-Impulse-Interface |
|--------------------------------|-----------------|------------------------------------|------------------------------|
| PIN 1 | YE | WH | INIT + |
| PIN 2 | GY | BN | Start/Stop + |
| PIN 3 | PK | GN | INIT - |
| PIN 4 | RD | YE | do not connect |
| PIN 5 | GN | GY | Start/Stop - |
| PIN 6 | BU | PK | GND |
| PIN 7 | BN | BU | Supply voltage Ub |
| PIN 8 | WH | RD | do not connect |

| Output connector code 103 | Start/Stop-Impulse-Interface |
|---------------------------|------------------------------|
| Pin 1 | Start/Stop - |
| Pin 2 | Start/Stop + |
| Pin 3 | INIT + |
| Pin 4 | INIT - |
| Pin 5 | Supply voltage Ub |
| Pin 6 | GND |

Ordering Specifications
Digital Versions
- SSI
- Start-Stop-Impulse

Ordering Specifications

Preferred types printed in bold

Electrical Interface

- 1: Impulse-Interface**
- 2: SSI-Interface**

Output Signal Impulse-Interface 1 __

- 1: Impulse-Interface Start Stop Signal**

Output Signal SSI-Interface 2 __

- 1: SSI 24 bit**
- 2: SSI 25 bit
- 7: SSI 26 bit (25 = alarm, 26 = parity even) on request

Impulse-Interface Start Stop Signal 11_

- 4: For 1 up to 3 position marker variabel**

SSI-Interface 2 __

- 1: Binary code; resolution 5 µm**
- 2: Gray code; resolution 5 µm
- 4: Binary code; resolution 1 µm
- 5: Gray code; resolution 1 µm
- 7: Binary code; resolution 10 µm
- 8: Gray code; resolution 10 µm

Electrical connection

- 101: Connector M16x0,75 (IEC 130-9), 8-pin
- 102: Connector M12x1, 8-pin**
- 103: Connector M16x0,75 (IEC 130-9), 6-pin
- 201: Cable, 8-pol., shielded, 1 m**
- 203: Cable, 8-pol., shielded, 3 m
- 205: Cable, 8-pol., shielded, 5 m
- Other Cable length and assembled connectors on request

T H 1 - 0 8 0 0 - 1 0 2 - 2 1 1 - 1 0 2

Series

Electrical measuring range

Standard lengthn

0050 up to 4250 mm

in 25 mm-steps.

Other Length on request

Mechanical version

102: Screw flange M18x1.5, zero point at 30 mm

103: Screw flange 3/4" - 16UNF, zero point at 30 mm

104: Screw flange M18x1.5, zero point at 51 mm

105: Screw flange 3/4" - 16UNF, zero point at 51 mm

106: Screw flange M18x1.5, zero point at 30 mm, for supporting at rod end *

107: Screw flange 3/4" - 16UNF, zero point at 30 mm, for supporting at rod end *

108: Screw flange M18x1.5, zero point at 51 mm, for supporting at rod end *

109: Screw flange 3/4" - 16UNF, zero point at 51 mm, for supporting at rod end *

Other mechanical versions on request

*) with internal thread M4x6 at rod end and additional length 7.5 mm

Important: Avoid equalizing currents in the cable shield caused by potential differences.

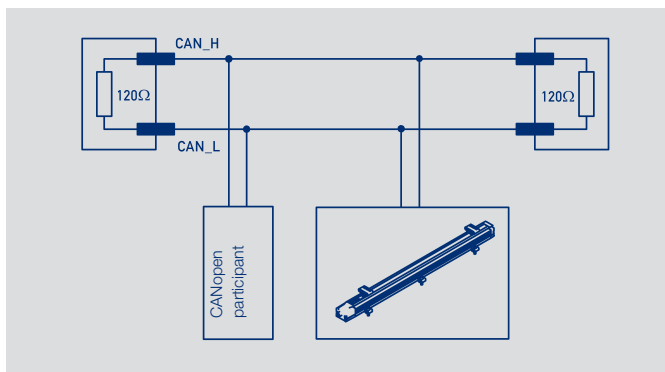
Twisted pair cable (STP) is recommended.

Technical Data



| | | |
|---|---|---|
| Type designations | TH1 - _ _ _ _ - 6 _ _ _ _ CANopen-Interface | |
| Electrical Data | | |
| Measured variables | Position and speed | |
| Electrical measuring range (dimension B) | 0050 up to 4250 | mm |
| Measuring range speed | 0 ... 10 | ms ⁻¹ |
| Number of position marker | 1 / 2 see ordering specifications | |
| Output signal / Protocol | CANopen protocol to CiA DS-301 V4.2.0, Device profile DS-406 V3.2 Encoder class C2, LSS services to CiA DS-305 V1.1.2 | |
| Programmable parameter | Position, speed, cams, working areas, temperature, node-ID, baud rate | |
| Node-ID | 0 ... 127 (default 127) | |
| Baudrate | 10 ... 1000 see ordering specifications | kBaud |
| Resolution position | 1 or 5 see ordering specifications | |
| Resolution speed | Resolution 1 µm 0.1 | Resolution 5 µm 0.5 mms ⁻¹ |
| Update rate * | ≤ 16 kHz | |
| Absolute linearity | ≤ ±10 µm up to 1000 mm, ≤ ±25 µm up to 2500 mm, ≤ ±40 µm up to 4250 mm ** | |
| Tolerance of electr. zero point | 0.5 | ±mm |
| Reproducibility | ≤ 6 | µm |
| Hysteresis | ≤ 4 | µm |
| Temperature error | ≤ 15 (min. 0.01 mm/K) ppm/K | |
| Supply voltage Ub | 24 (13 ... 34) VDC | |
| Supply voltage ripple | ≤ 10 % Vss | |
| Current consumption | ≤ 100 mA | |
| Overvoltage protection | 40 (permanent) VDC | |
| Polarity protection | Yes, up to supply voltage Ub max. | |
| Short circuit protection | Yes (outputs vs. GND und supply voltage Ub max.) | |
| Insulation resistance (500 VDC) | ≥ 10 MΩ | |
| Bus termination internal | no | |
| Environmental Data | | |
| MTTF (DIN EN ISO 13849-1 parts count method, w/o load, wc) | 25 | Years |
| Functional safety | If you need assistance in using our products in safety-related systems, please contact us | |
| EMC compatibility | EN 61000-4-2 Electrostatic discharges (ESD) 4 kV, 8 kV EN 61000-4-3 Electromagnetic fields 10 V/m EN 61000-4-4 Electrical fast transients (burst) 1 kV EN 61000-4-6 Conducted disturbances, induced by RF-fields 10 V eff. EN 55016-2-3 Noise radiation class B | |

*) Data are extrapolated, internal measuring rate depends on length.
**) Measured with resolution 1 µm.
At higher resolution, the permissible linearity error is increased by the resolution.



Pin assignment

| PIN | Output connector code 105 | Output connector code 106 |
|-------|---------------------------|---------------------------|
| PIN 1 | CAN_L | CAN_SHLD * |
| PIN 2 | CAN_H | Supply voltage Ub |
| PIN 3 | CAN_SHLD | GND |
| PIN 4 | do not connect | CAN_H |
| PIN 5 | Supply voltage Ub | CAN_L |
| PIN 6 | GND | n/a |

*) CAN_SHLD: CAN-shield, internally connected to housing

Ordering
Specifications



Ordering Specifications

Preferred types printed in bold

Electrical interface
6: CANopen-Interface

Output signal

- 1: 1 x position resolution 5 µm and 1 x speed resolution 0.5 mms⁻¹ (1 position marker fix)**
- 3: 1 x position resolution 1 µm and 1 x speed resolution 0.1 mms⁻¹ (1 position marker fix)
- 5: 2 x position resolution 5 µm and 2 x speed resolution 0.5 mms⁻¹ (2 position marker fix)
- 6: 2 x position resolution 1 µm and 2 x speed resolution 0.1 mms⁻¹ (2 position marker fix)

Baud rate

- 1: Baud rate 1000 kBaud
- 2: Baud rate 800 kBaud
- 3: Baud rate 500 kBaud**
- 4: Baud rate 250 kBaud
- 5: Baud rate 125 kBaud
- 7: Baud rate 50 kBaud
- 8: Baud rate 20 kBaud
- 9: Baud rate 10 kBaud

Electrical connection

- 105: Connector M16x0,75 (IEC130-9), 6-pin
- 106: Connector M12x1, 5-pin**

T H 1 - 0 8 0 0 - 1 0 2 - 6 1 3 - 1 0 6

Series

Electrical measuring range
Standard length
0050 up to 4250 mm
in 25 mm-steps.
Other Lengths on request

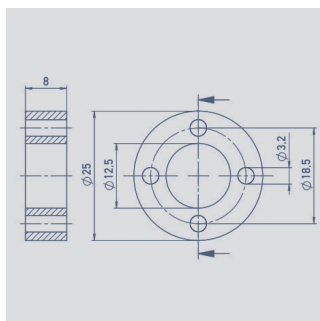
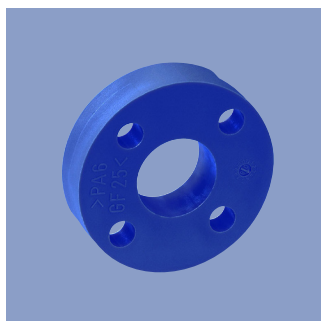
Mechanical version

- 102: Screw flange M18x1.5, zero point at 30 mm**
- 103: Screw flange 3/4" - 16UNF, zero point at 30 mm
- 104: Screw flange M18x1.5, zero point at 51 mm
- 105: Screw flange 3/4" - 16UNF, zero point at 51 mm
- 106: Screw flange M18x1.5, zero point at 30 mm, for supporting at rod end *
- 107: Screw flange 3/4" - 16UNF, zero point at 30 mm, for supporting at rod end *
- 108: Screw flange M18x1.5, Zero point at 51 mm, for supporting at rod end *
- 109: Screw flange 3/4" - 16UNF, zero point at 51 mm, for supporting at rod end *
- Other mechanical versions on request

*) with internal thread M4x6 at rod end and additional length 7.5 mm

Important: Avoid equalizing currents in the cable shield caused by potential differences.
Twisted pair cable (STP) is recommended.

Position marker

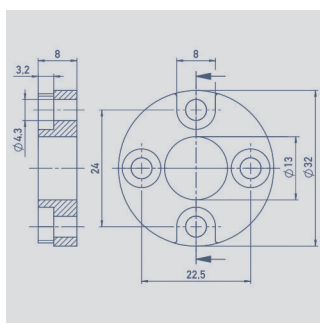
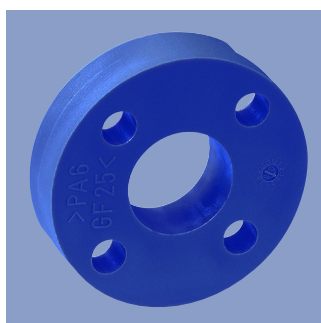


Ring Position Marker Z-TH1-P18

P/N 005697

Series TH1 / TIM

| | |
|---|----------------------|
| Material | PA6-GF25 |
| Weight approx. | 12 g |
| Operating temperature | -40 ... +100° C |
| Surface pressure max. | 40 N/mm ² |
| Fastening torque of mounting screws, max. | 1 Nm |

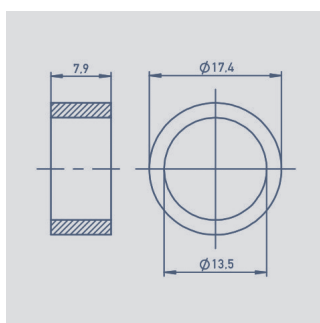
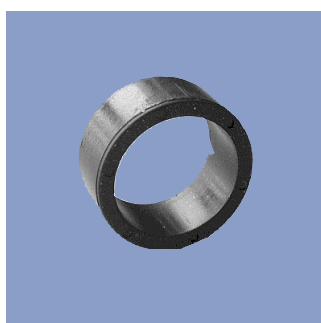


Ring Position Marker Z-TH1-P19

P/N 005698

Series TH1 / TIM

| | |
|---|----------------------|
| Material | PA6-GF25 |
| Weight approx. | 14 g |
| Operating temperature | -40 ... +100°C |
| Surface pressure max. | 40 N/mm ² |
| Fastening torque of mounting screws, max. | 1 Nm |

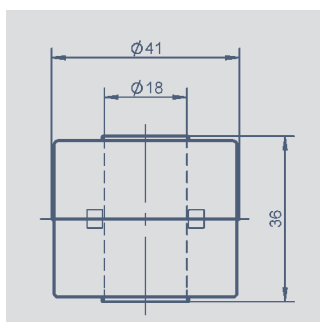
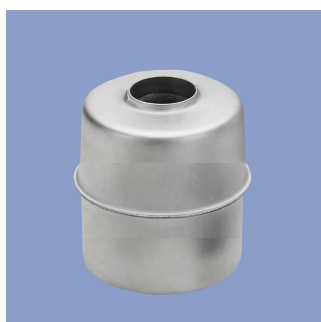


Ring Position Marker Z-TIM-P20

P/N 005699

Series TH1 / TIM

| | |
|--|----------------------|
| Material | PA-Neonbond Compound |
| Weight approx. | 5 g |
| Operating temperature | -40 ... +100°C |
| Surface pressure max. | 10 N/mm ² |
| Mounting via lock washer and lock ring | |



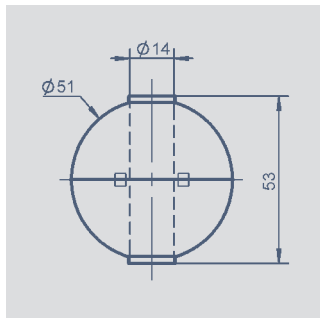
Cylinder - Floating Position Marker Z-TH1-P21

P/N 056044

Series TH1 / TIM

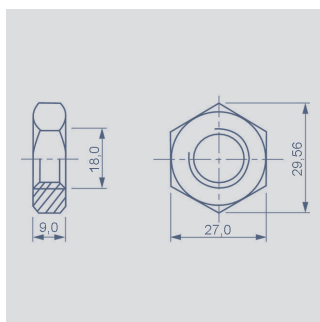
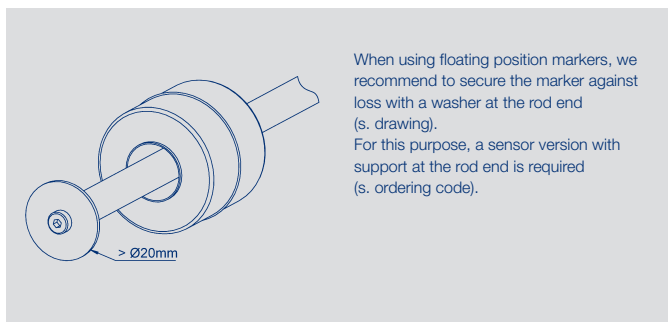
| | |
|----------------------------|-----------------------|
| Material | 1.4404 |
| Weight approx. | 20 g |
| Operating temperature | -40 ... +100°C |
| Compression strength, min. | < 8 bar |
| Density | 740 kg/m ³ |
| Immersion depth in water | 26,6 mm |

Position marker Fastening elements

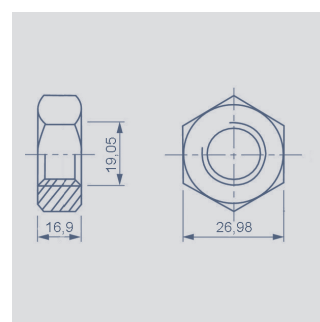


Bowl - Floating Position Marker Z-TH1-P22
P/N 056045
Series TH1 / TIM

| | |
|----------------------------|-----------------------|
| Material | 1.4571 |
| Weight approx. | 42 g |
| Operating temperature | -40 ... +100°C |
| Compression strength, min. | < 60 bar |
| Density | 720 kg/m ³ |
| Immersion depth in water | 36,7 mm |

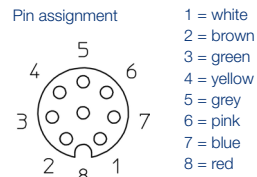
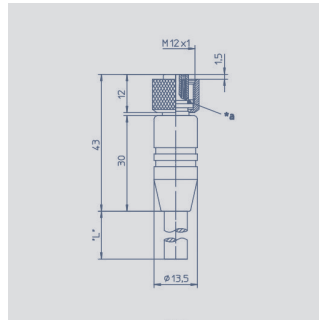


Mounting nut ISO 8675,
M18x1.5-A2
P/N 056090
Z-TH1-M01



Mounting nut DIN 934,
3/4" - 16UNF-A2
P/N 056091
Z-TH1-M02

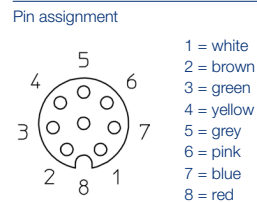
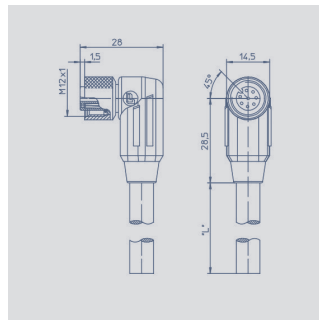
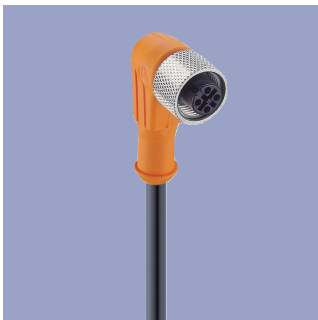
Connector System M12



M12x1 Mating female connector 8-pin, straight, A-coded, with molded cable, shielded, IP67, open ended

| | | |
|-------------------|--|--|
| Connector housing | Plastic PA | |
| Cable sheath | PUR; Ø = max. 8 mm -25 °C...+80 °C (moved) -50 °C...+80 °C (fixed) | |

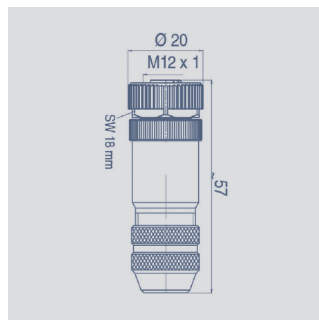
| | | |
|---------------|--------------------------|------------|
| Wires | PP, 0.25 mm ² | |
| Length | Type | P/N |
| 2 m | EEM 33-86 | 005629 |
| 5 m | EEM 33-90 | 005635 |
| 10 m | EEM 33-92 | 005637 |



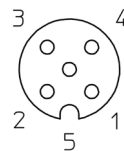
M12x1 Mating female connector 8-pin, angled, A-coded, with modded cable, shielded, IP67, open ended

| | | |
|------------------|---|--|
| Connecto housing | Plastic PA | |
| Cable sheath | PUR; Ø = max. 8 mm, -25 °C...+80 °C (moved) -50 °C...+80 °C (fixed) | |

| | | |
|---------------|--------------------------|------------|
| Wires | PP, 0.25 mm ² | |
| Length | Type | P/N |
| 2 m | EEM 33-87 | 005630 |
| 5 m | EEM 33-91 | 005636 |
| 10 m | EEM 33-93 | 005638 |

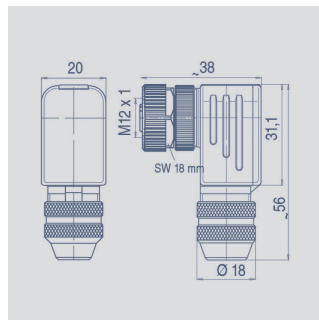


Pin assignment

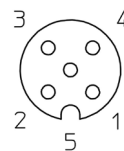


M12x1 Mating female connector 5-pin, straight, A-coded, with coupling nut, screw termination, IP67, shieldable, CAN-bus

| | | |
|-------------------|------------------------------------|--|
| Connector housing | Metall -40 °C...+85 °C | |
| For wire gauge | 6..8 mm, max. 0.75 mm ² | |
| Type | EEM 33-73, P/N 005645 | |



Pin assignment

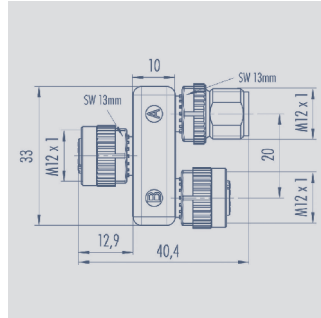


M12x1 Mating female connector 5-pin, angled, A-coded, with coupling nut, screw termination, IP67, shieldable, CAN-Bus

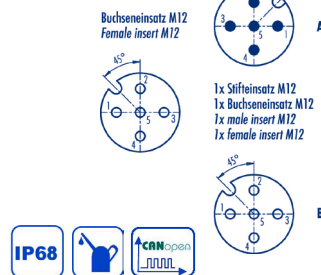
| | | |
|-------------------|------------------------------------|--|
| Connector housing | Metall -40 °C...+85 °C | |
| For wire gauge | 6..8 mm, max. 0.75 mm ² | |
| Type | EEM 33-75, P/N 005646 | |

It is possible to turn and fix the contact carrier in 90° positions.

Connector System M12



Pin assignment

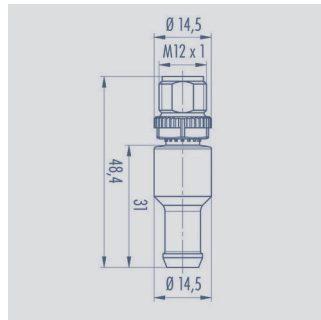


M12x1 splitter / T-connector, 5-pin, A-coded, IP68, 1:1 connection, female - male -female, CAN-bus

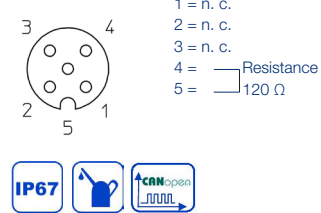
Connector housing PUR

Temperature range -25 °C... +85 °C

Type EEM 33-45, P/N 056145



Pin assignment

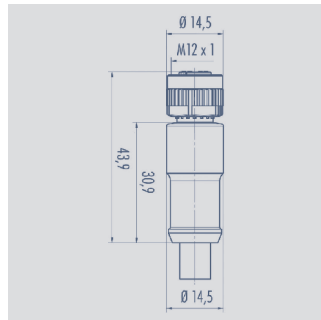


M12x1 terminating resistor, 5-pin, A-coded, IP67, 120 Ω resistance, CAN-bus

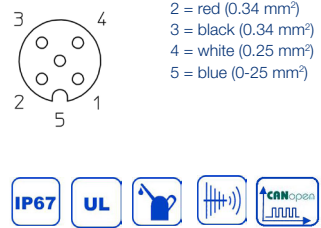
Connector housing PUR

Temperature range -25 °C... +85 °C

Type EEM 33-47, P/N 056147



Pin assignment



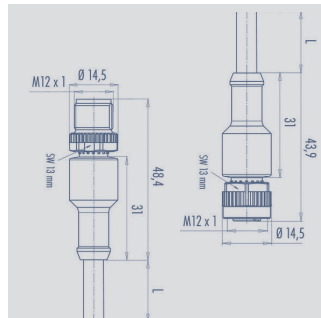
M12x1 Mating female connector 5-pin, straight, A-coded, with molded cable, IP67, shielded, open ended, CAN-bus

Connector housing PUR

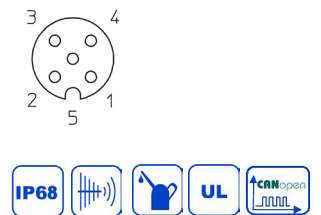
Cable sheath PUR Ø = max. 7.2 mm, -25 °C...+85 °C (moved)

Wires PP 2x 0.25 mm² + 2 x 0.34 mm²

| Length | Type | P/N |
|--------|-----------|--------|
| 2 m | EEM 33-41 | 056141 |
| 5 m | EEM 33-42 | 056142 |
| 10 m | EEM 33-43 | 056143 |



Pin assignment



M12x1 Mating female connector, 5-pin, straight, A-coded, with molded cable, IP68, shielded, CAN-Bus

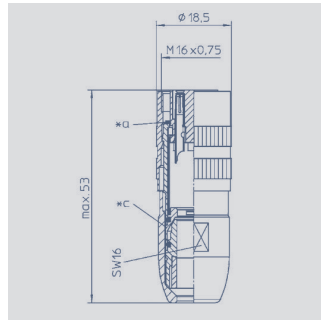
Connector housing PUR

Cable sheath PUR; Ø 7.2 mm -25 °C... +85 °C (fixed)

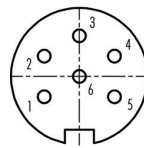
| Length | Type | P/N |
|--------|-----------|--------|
| 5 m | EEM 33-44 | 056144 |

**Connector System
M16**

**Connector System
M16**



Pin assignment

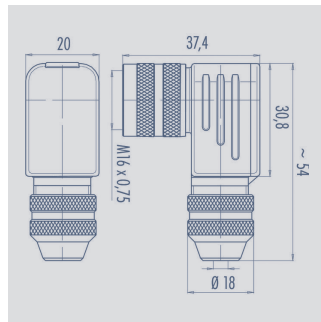


**M16x0.75 Mating female connector
6-pin, straight, with coupling nut, solder
terminal, IP68, shielded**

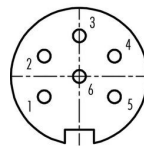
Connector housing CuZn
(Brass, nickel plated)
-40 °C... +85 °C

For wire gauge 4...8 mm,
max. 0.75 mm²

Type EEM 33-82, P/N 005639



Pin assignment

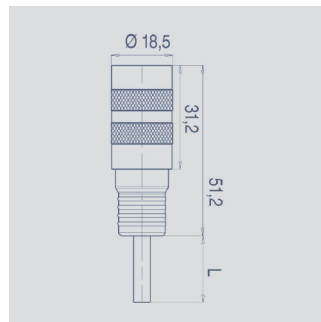


**M16x0.75 Mating female connector
6-pin, angled, with coupling nut, solder
terminal, IP67, shielded**

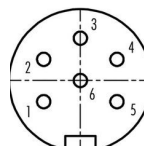
Connector housing CuZn
(Brass, nickel plated)
-40 °C... +95 °C

For wire gauge 6...8 mm, PG 9
max. 0.75 mm²

Type EEM 33-94, P/N 005648



- 1 = white
- 2 = brown
- 3 = blue
- 4 = black
- 5 = grey
- 6 = green



**M16x0.75 Mating female connector,
6-pin, straight, with molded cable,
2 m length, shielded, IP67, open ended**

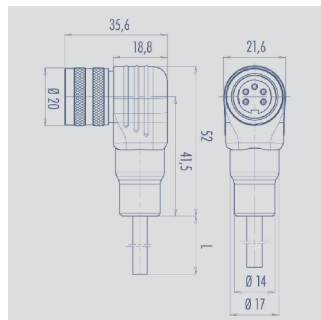
Connector housing PUR

Cable sheath PUR; Ø max. 6 mm,
-5...+70 °C (moved)
-20...+70 °C (fixed)

Wires PVC, 6 x 0.25 mm²

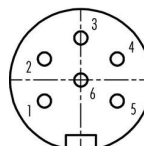
Type EEM 33-26, P/N 056126

This coupling can be used in combination with 5-pin M16 connectors. Than „pin 6/ green“ is open.



Pin assignment

- 1 = white
- 2 = brown
- 3 = blue
- 4 = black
- 5 = grey
- 6 = green



**M16x0.75 Mating female connector 6-pin,
angled, with molded cable, 2 m length,
shielded, IP67, open ended**

Connector housing PUR

Cable sheath PUR; Ø max. 6 mm,
-5...+70 °C (moved)
-20...+70 °C (fixed)

Wires PVC, 6 x 0.25 mm²

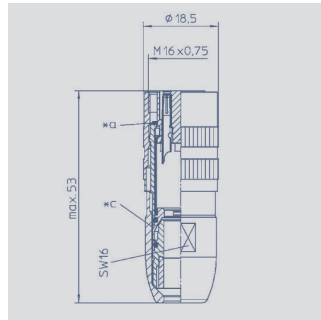
Type EEM 33-27, P/N 056127

This coupling can be used in combination with 5-pin M16 connectors. Than „pin 6 / green“ is open.

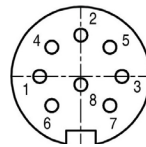
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Pin assignment

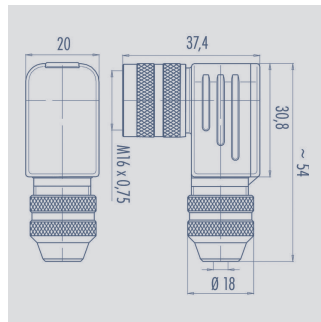


**M16x0.75 Mating female connector,
8-pin, straight, with coupling nut,
solder terminal, IP68, shielded**

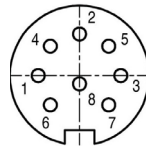
| | |
|-------------------|--|
| Connector housing | CuZn (Brass, nickel plated) -40 °C... +85 °C |
|-------------------|--|

| | |
|----------------|--|
| For wire gauge | 4...8 mm, max. 0.75 mm ² |
|----------------|--|

Type EEM 33-84, P/N 005627



Pin assignment



**M16x0.75 Mating female connector,
8-pin, angled, with coupling nut,
solder terminal, IP67, shielded**

| | |
|-------------------|--|
| Connector housing | CuZn (Brass, nickel plated) -40 °C... +95 °C |
|-------------------|--|

| | |
|----------------|---|
| For wire gauge | 6...8 mm, PG 9 max. 0.75 mm ² |
|----------------|---|

Type EEM 33-85, P/N 005628

IP67

Protection class IP67 to
DIN EN 60529

IP68

Protection class IP68 to
DIN EN 60529



CAN-bus



Very good Electromagnetic
Compatibility (EMC) and shield
systems



Very good resistance to oils, coolants and lubricants



UL - approved



Suited for applications in
dragchains

Note: The protection class is valid only in locked position with its plugs.
The application of these products in harsh environments must be checked in particular cases.