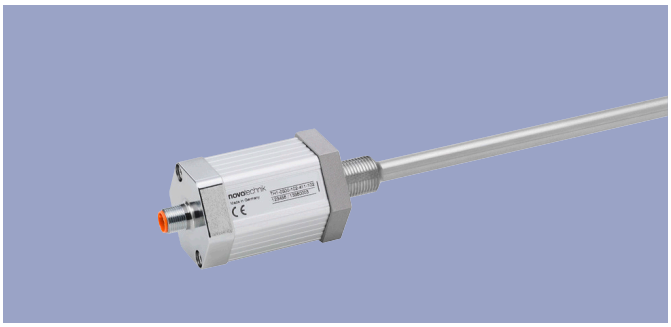
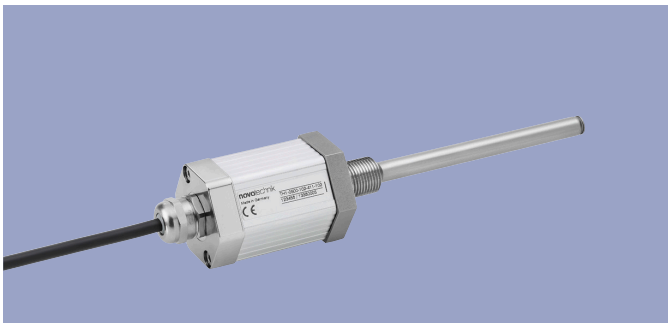
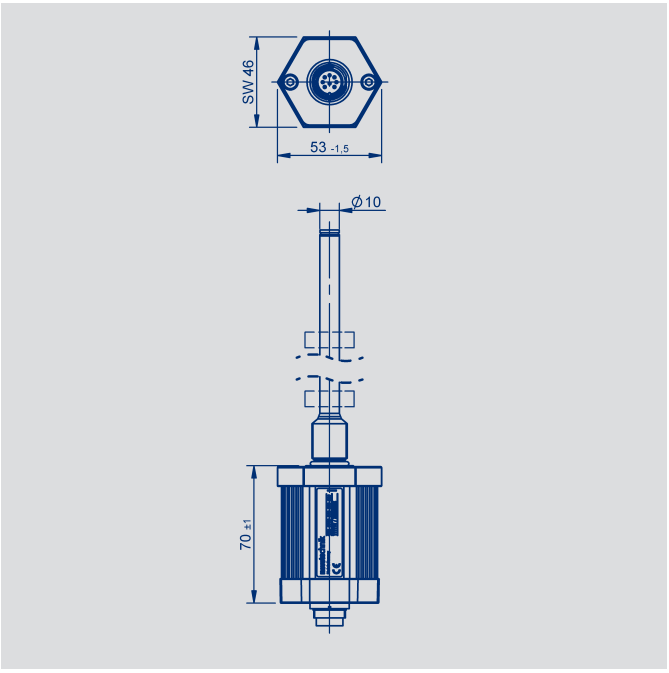
novotechnik
Siedle Group

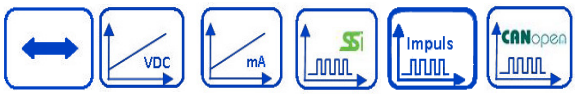
NOVOSTRICTIVE Transducer up to 4250 mm touchless

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, indepentently 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

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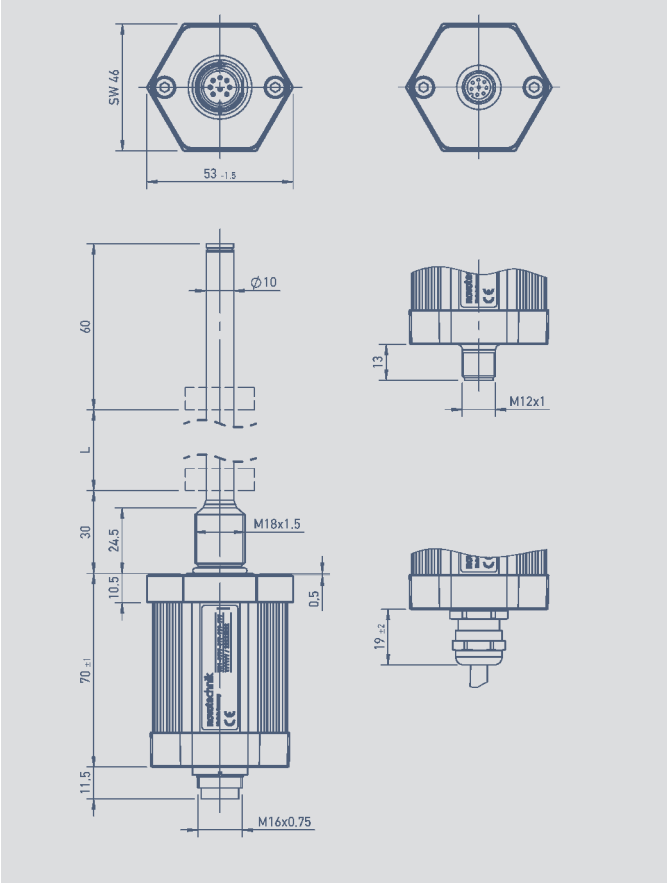
Contents

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-pon., shielded PUR-cable, 8x0,25 mm², 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 ouput signal	10	ms^{-1}
Max. operational acceleration with valid ouput 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 Pressure peaks Burst pressure	 ≤ 350 ≤ 600 > 700	 bar bar 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 ≥ 5 kΩ)	0.1 ... 20 mA (burden ≤ 500 Ω) 4 ... 20 mA (burden ≤ 500 Ω)	
Number of channels	2	1	
Update rate *	≤ 16		kHz
Resolution	16		Bit
Absolute linearity	≤ ± 0.02 (min. ± 50 µm) **		% 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		MΩ
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 contac us		
EMC compatibility CE	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
PIN 1	YE	WH	do not connect	0(4)...20 mA
PIN 2	GY	BN	Signal GND	Signal GND
PIN 3	PK	GN	+10...0 V	do not connect
PIN 4	RD	YE	DIAG *	DIAG *
PIN 5	GN	GY	0...+10 V	do not connect
PIN 6	BU	PK	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).

Output connector code 103	Analog Voltage	Analog Current
PIN 1	0 ...+10 V	0 (4)...20 mA
PIN 2	Signal GND	Signal GND
PIN 3	+10...0 V	do not connect
PIN 4	GND	GND
PIN 5	Supply voltage Ub	Supply voltage Ub
PIN 6	GND	GND

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

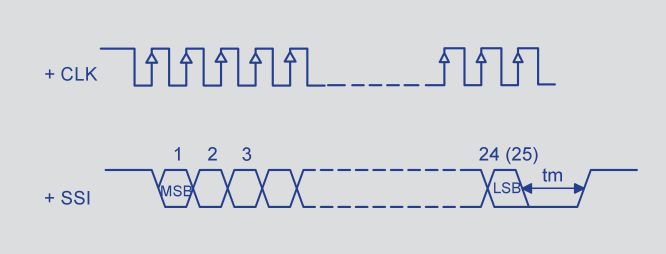
*) with internal thread M4x6 at rod end and additional length 7.5 mm

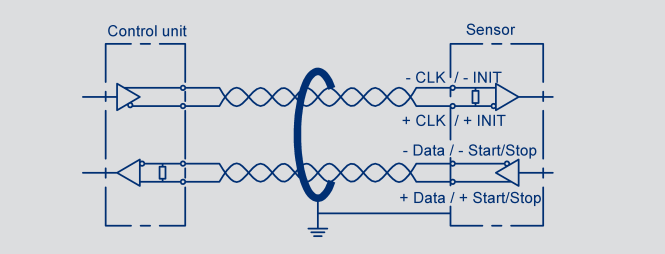
Important: Avoid equalizing currents in the cable shield caused by potential differences.
Twisted pair cable (STP) is recommended.

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)	µm
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 contac us	
EMC compatibility CE	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

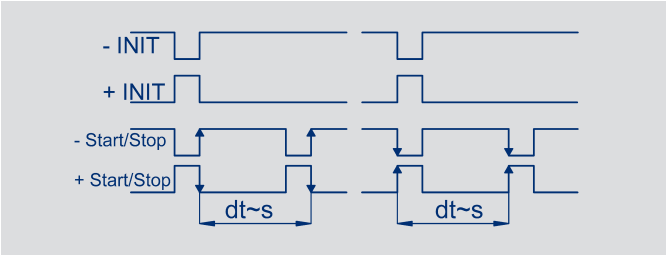
Output connector code 101, 102	Cable code 20 _	Connector with cable (Accessories)	SSI-Interface
PIN 1	YE	WH	Clk +
PIN 2	GY	BN	Data +
PIN 3	PK	GN	Clk -
PIN 4	RD	YE	do not connect
PIN 5	GN	GY	Data -
PIN 6	BU	PK	GND
PIN 7	BN	BU	Supply voltage Ub
PIN 8	WH	RD	do not connect

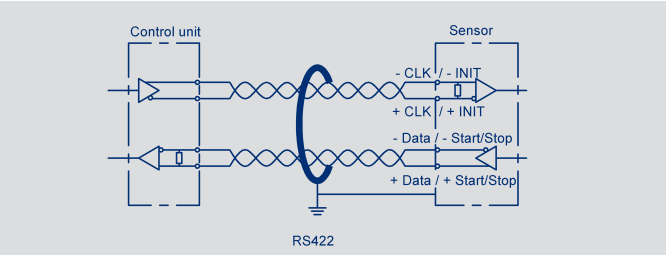
Output connector code 103	SSI-Interface
Pin 1	Data -
Pin 2	Data +
Pin 3	Clk +
Pin 4	Clk -
Pin 5	Supply voltage Ub
Pin 6	GND

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	% 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)	
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 contac us	
EMC compatibility CE	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.





Pin assignment

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

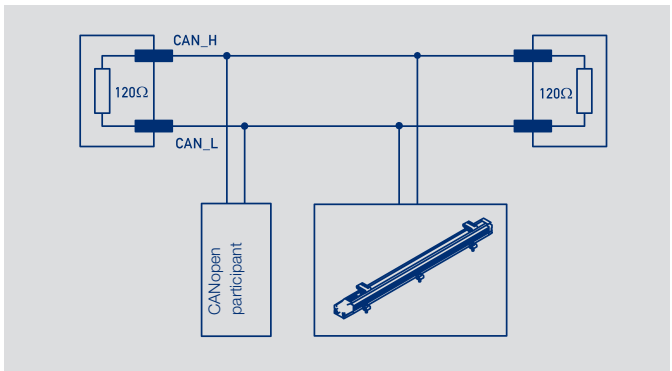
Important: Avoid equalizing currents in the cable shield caused by potential differences.
Twisted pair cable (STP) is recommended.

Technical Data

CANopen®

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	µm
Resolution speed	Resolution 1 µm / Resolution 5 µm 0.1 / 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 CE	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

CANopen®

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

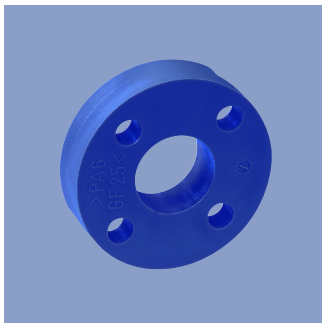
Electrical measuring range
Standard length
0050 up to 4250 mm
in 25 mm-steps.
Other Lengths on request

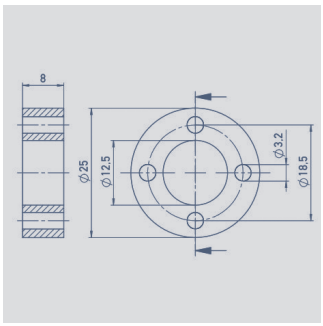
Mechanical version
102: Screw flange M18x1.5, zero point at 30 mm
103: Screw flange 3/4“ - 16UNF, zero point at 30 mm
104: Screw flange M18x1.5, zero point at 51 mm
105: Screw flange 3/4“ - 16UNF, zero point at 51 mm
106: Screw flange M18x1.5, zero point at 30 mm, for supporting at rod end *
107: Screw 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.

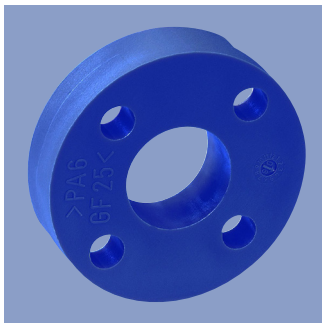
Position marker

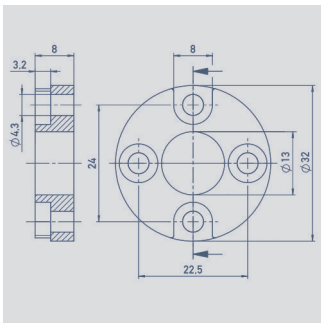




Ring Position Marker Z-TH1-P18
P/N 005697
Series TH1 / TIM

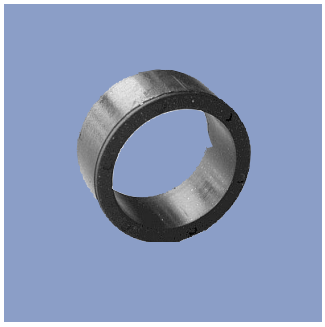
Material	PA6-GF25
Weight approx.	12 g
Operating temperature	-40 ... +100° C
Surface pressure max.	40 N/mm²
Fastening torque of mounting screws, max.	1 Nm

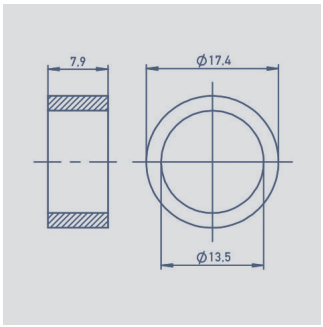




Ring Position Marker Z-TH1-P19
P/N 005698
Series TH1 / TIM

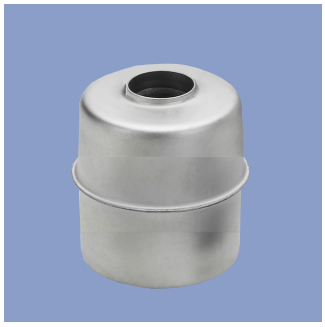
Material	PA6-GF25
Weight approx.	14 g
Operating temperature	-40 ... +100°C
Surface pressure max.	40 N/mm²
Fastening torque of mounting screws, max.	1 Nm

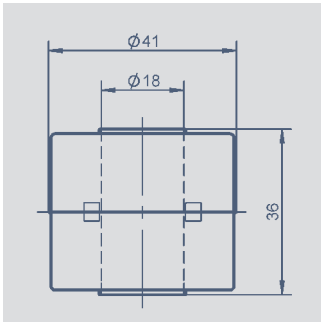




Ring Position Marker Z-TIM-P20
P/N 005699
Series TH1 / TIM

Material	PA-Neonbond Compound
Weight approx.	5 g
Operating temperature	-40 ... +100°C
Surface pressure max.	10 N/mm²
Mounting via lock washer and lock ring	

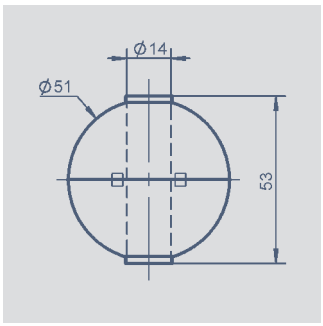




Cylinder - Floating Position Marker Z-TH1-P21
P/N 056044
Series TH1 / TIM

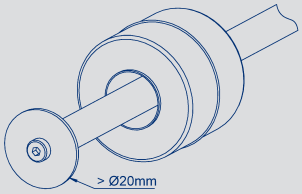
Material	1.4404
Weight approx.	20 g
Operating temperature	-40 ... +100°C
Compression strength, min.	< 8 bar
Density	740 kg/m³
Immersion depth in water	26,6 mm

Position marker
Fastening elements

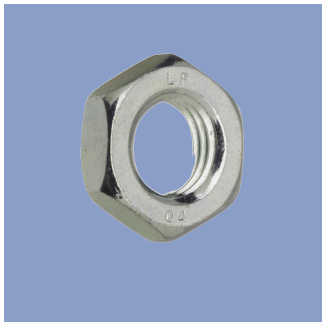


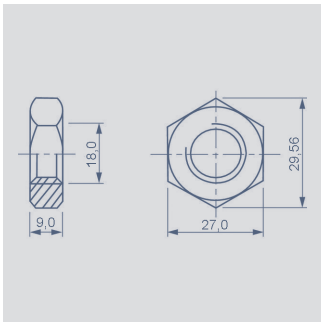
Bowl - Floating Position Marker Z-TH1-P22
P/N 056045
Series TH1 / TIM

Material	1.4571
Weight approx.	42 g
Operating temperature	-40 ... +100°C
Compression strength, min.	< 60 bar
Density	720 kg/m³
Immersion depth in water	36,7 mm

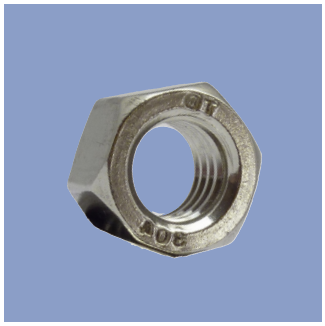


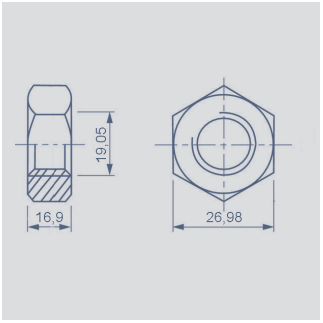
When using floating position markers, we recommend to secure the marker against loss with a washer at the rod end (s. drawing).
For this purpose, a sensor version with support at the rod end is required (s. ordering code).





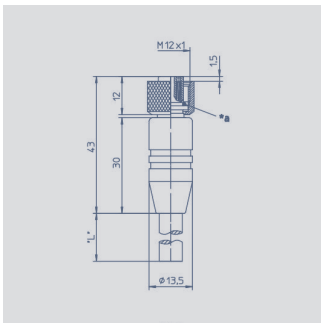
Mounting nut ISO 8675,
M18x1.5-A2
P/N 056090
Z-TH1-M01



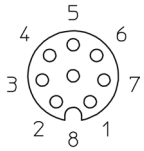


Mounting nut DIN 934,
3/4“ - 16UNF-A2
P/N 056091
Z-TH1-M02

Connector System M12



Pin assignment

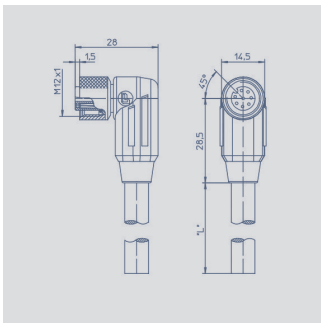


1 = white
2 = brown
3 = green
4 = yellow
5 = grey
6 = pink
7 = blue
8 = red

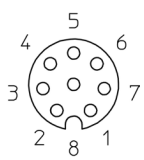
M12x1 Mating female connector 8-pin, straight, A-coded, with molded cable, shielded, IP67, open ended

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 mm²

Length	Type	P/N
2 m	EEM 33-86	005629
5 m	EEM 33-90	005635
10 m	EEM 33-92	005637



Pin assignment

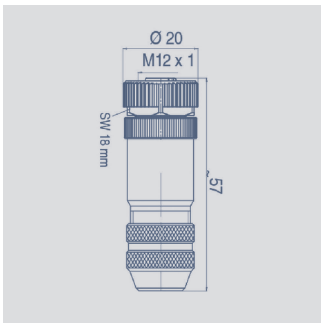


1 = white
2 = brown
3 = green
4 = yellow
5 = grey
6 = pink
7 = blue
8 = red

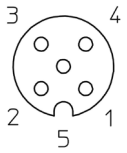
M12x1 Mating female connector 8-pin, angled, A-coded, with modled cable, shielded, IP67, open ended

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 mm²

Length	Type	P/N
2 m	EEM 33-87	005630
5 m	EEM 33-91	005636
10 m	EEM 33-93	005638



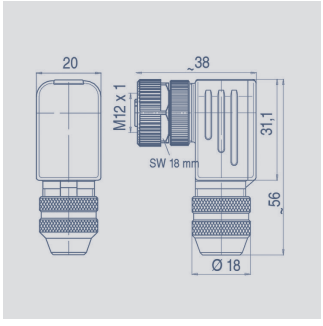
Pin assignment



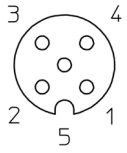
M12x1 Mating female connector 5-pin, straight, A-coded, with coupling nut, srew termination, IP67, shieldable, CAN-bus

Connector housing	Metall -40 °C...+85 °C
For wire gauge	6...8 mm, max. 0.75 mm²

Type EEM 33-73, P/N 005645



Pin assignment



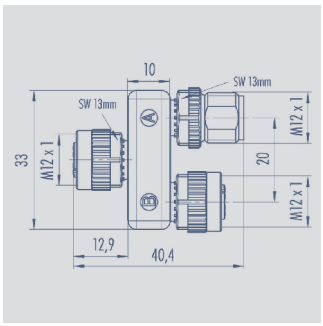
M12x1 Mating female connector 5-pin, angled, A-coded, with coupling nut, screw termination, IP67, shieldable, CAN-Bus

Connector housing	Metall -40 °C...+85 °C
For wire gauge	6...8 mm, max. 0.75 mm²

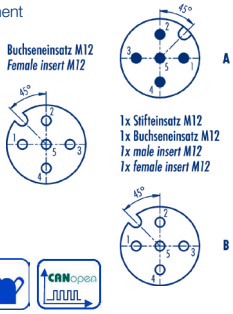
Type EEM 33-75, P/N 005646

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

Connector System M12



Pin assignment

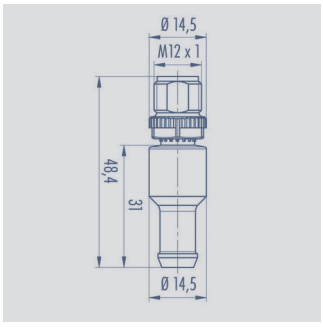


IP68 CANopen

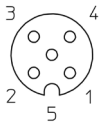
M12x1 splitter / T-connector, 5-pin, A-coded, IP68, 1:1 copnnection, female - male -female, CAN-bus

Connector housing	PUR
Temperature range	-25 °C... +85 °C

Type EEM 33-45, P/N 056145



Pin assignment



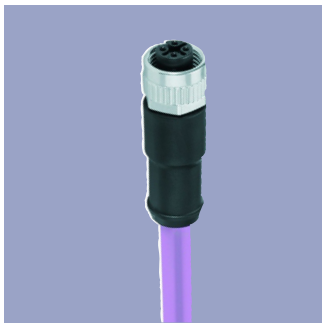
1 = n. c.
2 = n. c.
3 = n. c.
4 = Resistance
5 = 120 Ω

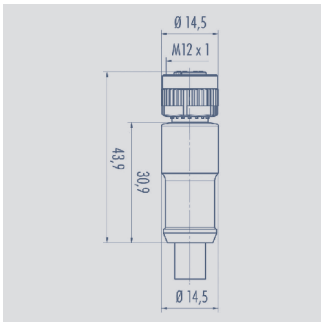
IP67 CANopen

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

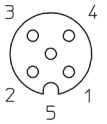
Connector housing	PUR
Temperature range	-25 °C... +85 °C

Type EEM 33-47, P/N 056147





Pin assignment



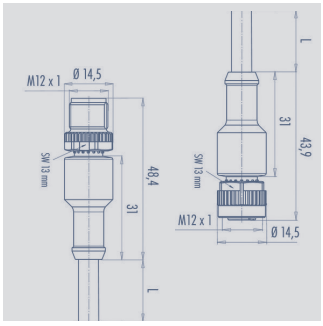
1 = Shield
2 = red (0.34 mm²)
3 = black (0.34 mm²)
4 = white (0.25 mm²)
5 = blue (0-25 mm²)

IP67 UL CANopen

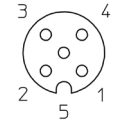
M12x1 Mating female connector 5-pin, straight, A-coded, with molded cable, IP67, shielded, open ended, CAN-bus

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



IP68 UL CANopen

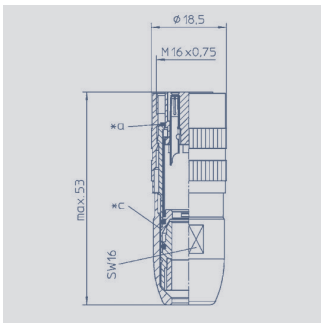
M12x1 Mating female connector, 5-pin, straight, A-coded, with molded cable, IP68, shielded, CAN-Bus

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

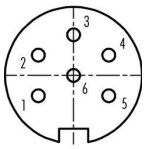
Length	Type	P/N
5 m	EEM 33-44	056144

Connector System
M16

Connector System
M16



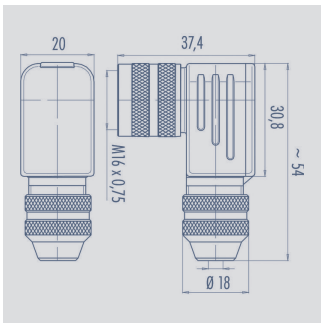
Pin assignment



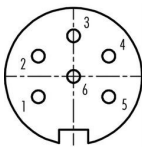
IP68

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	



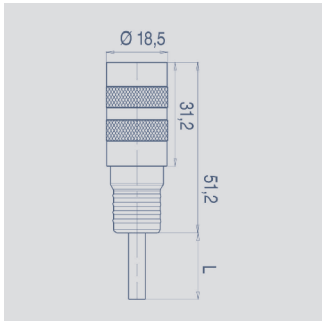
Pin assignment

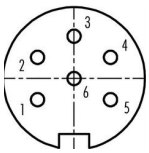


IP67 UL

M16x0,75 Mating female connector 6-pin, angled, with couplingnut, 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	





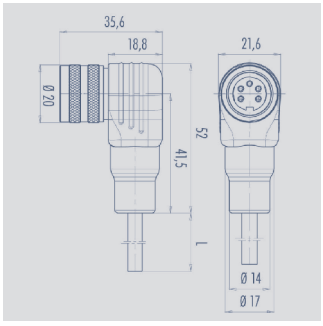
1 = white
2 = brown
3 = blue
4 = black
5 = grey
6 = green

IP67

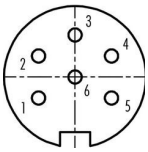
M16x0.75 Mating female connector, 6-pin, straight, with molded cable, 2 m length, shielded, IP67, open ended

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



Pin assignment



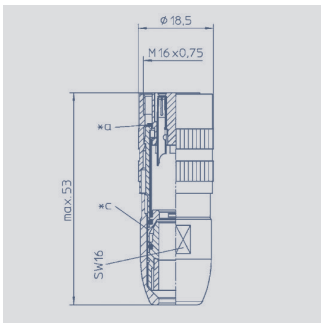
1 = white
2 = brown
3 = blue
4 = black
5 = grey
6 = green

IP67

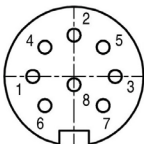
M16x0.75 Mating female connector 6-pin, angled, with molded cable, 2 m length, shielded, IP67, open ended

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

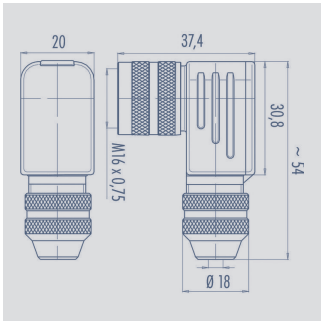


Pin assignment

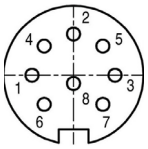


M16x0.75 Mating female connector, 8-pin, straight, with coupling nut, solder terminal, IP68, shielded

Connector housing	CuZn (Brass, nickel plated) -40 °C... +85 °C
For wire gauge	4...8 mm, max. 0.75 mm²
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 mm²
Type EEM 33-85, P/N 005628	

IP67 Protection class IP67 to DIN EN 60529

IP68 Protection class IP68 to DIN EN 60529

CANopen CAN-bus

Very good Electromagnetic Compatibility (EMC) and shield systems

Very good resistance to oils, coolants and lubricants

UL 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.