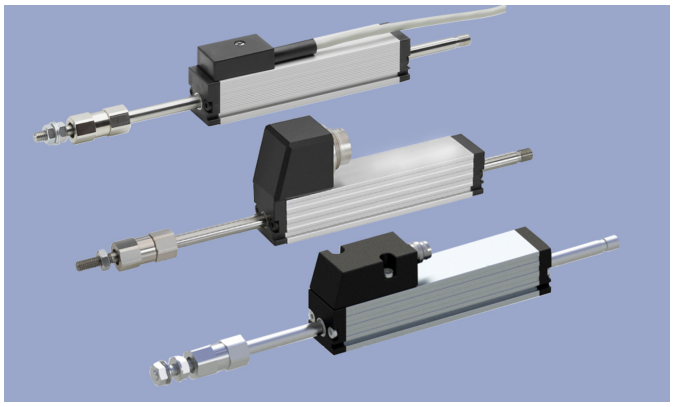
novotechnik
Siedle Group

Short Stroke Transducer Potentiometric

T/TS



Special Features

- Extremely compact design 18 x 18 mm
- Long life up to 100 million movements
- Outstanding linearity up to ±0.05 %
- Repeatability to ±0.002 mm
- Actuating shaft with double-sided support
- Insensitive to shock and vibration
- Optionally cable or plug connection
- Special ball-coupling eliminates lateral forces
- High operational speeds - up to 10 m/s
- Spring-loaded series TR/TRS with internal return spring, series TE1 with integrated signal processing for normalized outputs (current or voltage) or inductive series LS1 in same design see separate data sheets

Applications

- Measuring/control technology
- Manufacturing Engineering (woodwork machines, riveting machines, packaging machines, welding machines)
- Assembly/test devices
- Medical appliances
- Building automation

Compact transducer with proven conductive-plastic technology.
The model with push rod and ball coupling enables a backlash- and lateral force-free operation even with parallel and angular displacement of transducer and measuring direction. Characteristic for the robust design is the double-sided support of the actuating rod.
Signal conditioners or high impedance voltage inputs are used for electrical connection of these potentiometers.

Description

Material	Housing: aluminium AlMgSi, anodized Actuating rod: stainless steel 1.4305 / AISI 303
Mounting	Adjustable clamps 2x Z-45 and 4x cylinder screws M4x10 DIN EN ISO 1207 (included in delivery)
Fastening torque of mounting	max. 140 Ncm
Bearing	Double-sided DU glide bearings
Ball coupling	Hardened ball with spring pressure on carbide plate (included in delivery)
Resistance element	Conductive plastic
Wiper	Precious metal multi-finger wiper, elastomer damped
Electrical connection	Cable 3x 0.14 mm² (AWG 26), PVC, shielded, L = 2 m / Connector M8x1, 3-pin / Connector M16x0.75 (IEC 130-9), 5-pin

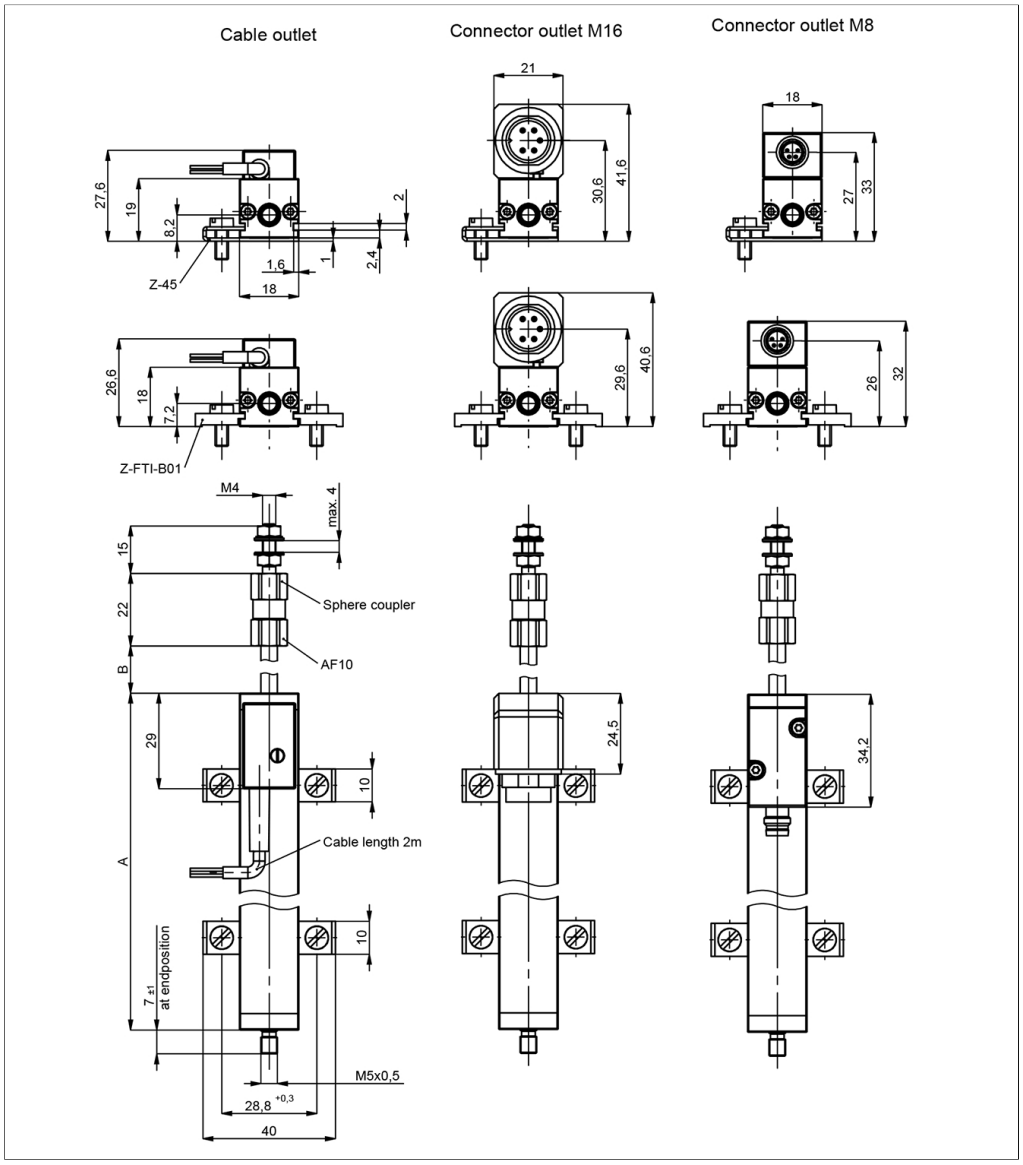
Mechanical Data

Type	**T/TS-0025...**	**T/TS-0050...**	**T/TS-0075...**	**T/TS-0100...**	**T/TS-0150...**
Dimensions	See dimension drawing				
Length of housing (dimension A +1 mm)	63 mm	88 mm	113 mm	138 mm	188 mm
Mechanical travel (dim. B ±1.5 mm)	30 mm	55 mm	80 mm	105 mm	155 mm
Weight (cable/connector version)	140/86 g	160/107 g	170/132 g	190/150 g	220/190 g
Weight actuating rod with wiper a. coupling	35 g	43 g	52 g	58 g	74 g
Operating force, horizontal	≤ 0.3 N				
Max. displacement of ball coupling	±1 mm parallel offset, ±2,5° angular offset				

Ordering Specifications

P/N	Type	Defined electr. measuring range	Electrical connection	Independent linearity	
400023202	T-0025	0 ... 25 mm	Cable	≤ ±0.2 %FS	Preferred type
400023203	T-0050	0 ... 50 mm	Cable	≤ ±0.15 %FS	Preferred type
400023204	T-0075	0 ... 75 mm	Cable	≤ ±0.1 %FS	Preferred type
400023205	T-0100	0 ... 100 mm	Cable	≤ ±0.075 %FS	Preferred type
400023206	T-0150	0 ... 150 mm	Cable	≤ ±0.075 %FS	Preferred type
400107032	TS-0025-101	0 ... 25 mm	Connector M8	≤ ±0.2 %FS	Preferred type
400107035	TS-0050-101	0 ... 50 mm	Connector M8	≤ ±0.15 %FS	Preferred type
400107038	TS-0075-101	0 ... 75 mm	Connector M8	≤ ±0.1 %FS	Preferred type
400107040	TS-0100-101	0 ... 100 mm	Connector M8	≤ ±0.075 %FS	Preferred type
400107042	TS-0150-101	0 ... 150 mm	Connector M8	≤ ±0.075 %FS	Preferred type
400023232	TS-0025	0 ... 25 mm	Connector M16	≤ ±0.2 %FS	Preferred type
400023233	TS-0050	0 ... 50 mm	Connector M16	≤ ±0.15 %FS	Preferred type
400023234	TS-0075	0 ... 75 mm	Connector M16	≤ ±0.1 %FS	Preferred type
400023235	TS-0100	0 ... 100 mm	Connector M16	≤ ±0.075 %FS	Preferred type
400023236	TS-0150	0 ... 150 mm	Connector M16	≤ ±0.075 %FS	Preferred type
400023207	T-0025-1	0 ... 25 mm	Cable	≤ ±0.1 %FS	
400023208	T-0050-1	0 ... 50 mm	Cable	≤ ±0.1 %FS	
400023209	T-0050-05	0 ... 50 mm	Cable	≤ ±0.05 %FS	
400023213	T-0075-05	0 ... 75 mm	Cable	≤ ±0.05 %FS	
400023214	T-0100-05	0 ... 100 mm	Cable	≤ ±0.05 %FS	
400023215	T-0150-05	0 ... 150 mm	Cable	≤ ±0.05 %FS	
400107033	TS-0025-1-101	0 ... 25 mm	Connector M8	≤ ±0.1 %FS	
400107037	TS-0050-1-101	0 ... 50 mm	Connector M8	≤ ±0.1 %FS	
400107036	TS-0050-05-101	0 ... 50 mm	Connector M8	≤ ±0.05 %FS	
400107039	TS-0075-05-101	0 ... 75 mm	Connector M8	≤ ±0.05 %FS	
400107041	TS-0100-05-101	0 ... 100 mm	Connector M8	≤ ±0.05 %FS	
400107043	TS-0150-05-101	0 ... 150 mm	Connector M8	≤ ±0.05 %FS	
400023237	TS-0025-1	0 ... 25 mm	Connector M16	≤ ±0.1 %FS	
400023238	TS-0050-1	0 ... 50 mm	Connector M16	≤ ±0.1 %FS	
400023239	TS-0050-05	0 ... 50 mm	Connector M16	≤ ±0.05 %FS	
400023243	TS-0075-05	0 ... 75 mm	Connector M16	≤ ±0.05 %FS	
400023244	TS-0100-05	0 ... 100 mm	Connector M16	≤ ±0.05 %FS	
400023245	TS-0150-05	0 ... 150 mm	Connector M16	≤ ±0.05 %FS	

Drawing



CAD data see
www.novotechnik.de/en/download/cad-data/

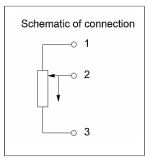
Technical Data

Type	T/TS-0025...	T/TS-0050...	T/TS-0075...	T/TS-0100...	T/TS-0150...
Electrical measuring range	0 ... 27 mm	0 ... 52 mm	0 ... 77 mm	0 ... 102 mm	0 ... 152 mm
Defined electr. measuring range	0 ... 25 mm	0 ... 50 mm	0 ... 75 mm	0 ... 100 mm	0 ... 150 mm
Output	Voltage divider				
Resistance value	1 kΩ	5 kΩ	5 kΩ	5 kΩ	5 kΩ
Resistance tolerance	± 20 %				
Independent linearity	≤ ±0.2 %FS Pref.version ≤ ±0.1 %FS	≤ ±0.15 %FS Pref. version ≤ ±0.1 %FS ≤ ±0.05 %FS	≤ ±0.1 %FS Pref.version ≤ ±0.05 %FS	≤ ±0.075 %FS Pref.version ≤ ±0.05 %FS	≤ ±0.075 %FS Pref.version ≤ ±0.05 %FS
Repeatability	≤ ±0.002 mm				
Recommended operating wiper current	≤ 1 µA				
Max. wiper current in case of malfunction	10 mA				
Max. supply voltage Ub	42 VDC				
Effective temp. coefficient of the output-to-applied voltage ratio	typ. 5 ppm/K				
Insulation resistance (500 VDC)	≥ 10 MΩ				
Dielectric strength (500 VAC, 50 Hz)	≤ 100 µA				
Environmental Data					
Max. operational speed	10 m/s				
Vibration IEC 60068-2-6	20 g, 5 ... 2000 Hz, Amax = 0.75 mm				
Shock IEC 60068-2-27	50 g, 11 ms				
Protection class DIN EN 60529	IP40				
Operating temperature	-30 ... +100°C, -30 ... +85°C (connector M8)				
Operating humidity	0 ... 95 % R.H. (no condensation)				
Life	> 100 Mio. movements				
Functional safety	If you need assistance in using our products in safety-related systems, please contact us				
Traceability	Serial number on type labeling: production batch of the sensor assembly and relevant sensor components				

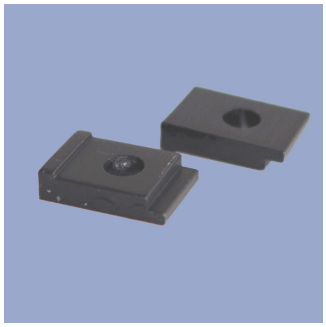
Important:
All values specified in this data sheet for linearity, lifetime and temperature coefficient are only valid for a sensor used as a voltage divider with virtually no load applied to the wiper (Ie ≤ 1 µA).

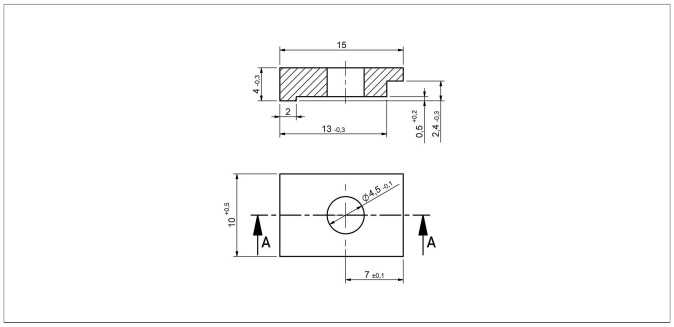
Connection Assignment

Signal	Cable	Connector M8	Connector M16
Connection 1	BN	Pin 3	Pin 1
Connection 2 Signal output	RD	Pin 4	Pin 2
Connection 3	OG	Pin 1	Pin 3
Do not connect	-	-	Pin 4
Do not connect	-	-	Pin 5
	Direction of output characteristic while extending the rod: increasing: supply voltage Ub at connection 3 falling: supply voltage Ub at connection 1		



Sensor Mounting



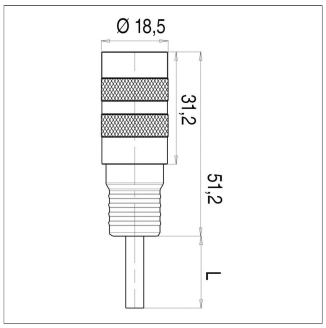


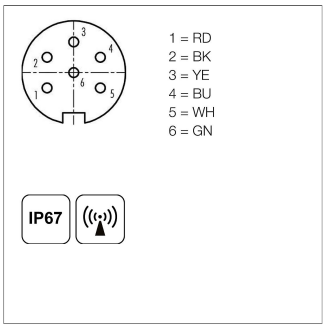
Z-FTI-B01
4 single clamps for lower total height, with screw M4x10 - 4.8 tinned

Material	Aluminium, anodized

P/N	Type
400059010	Z-FTI-B01

Connector System M16





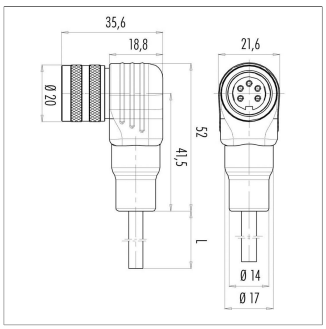
EEM-33-26

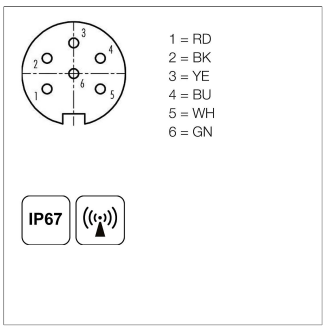
M16x0.75 Mating female connector, 6-pin, straight, with molded cable, shielded, IP67, open ended

Use in combination with 5-pin M16 connectors possible, than pin 6/GN is open.

Plug housing	PUR
Cable sheath	PUR, Ø = max. 6 mm, -5 ... +70°C (moved) -20 ... +70°C (fixed)
Lead wires	PVC, 6x0.25 mm²

P/N	Type	Length
400056126	EEM-33-26	2 m





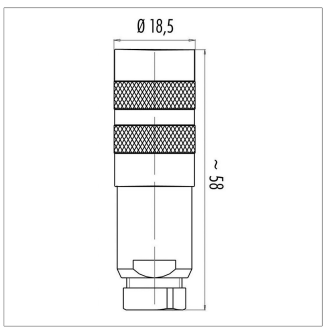
EEM-33-27

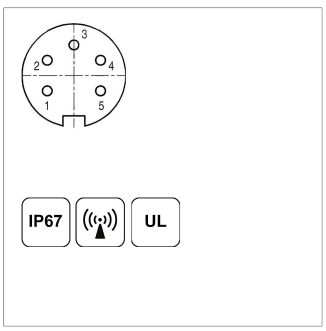
M16x0.75 Mating female connector, 6-pin, angled, with molded cable, shielded, IP67, open ended

Use in combination with 5-pin M16 connectors possible, than pin 6/GN is open.

Plug housing	PUR
Cable sheath	PUR, Ø = max. 6 mm, -5 ... +70°C (moved) -20 ... +70°C (fixed)
Lead wires	PVC, 6x0.25 mm²

P/N	Type	Length
400056127	EEM-33-27	2 m



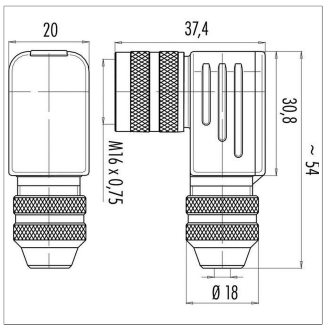


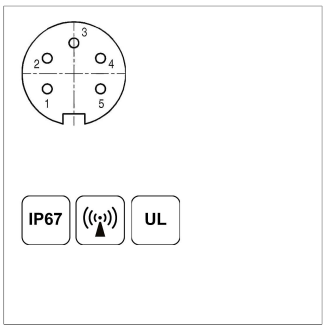
EEM-33-76

M16x0.75 Mating female connector, 5-pin, straight, with coupling nut, solder terminal, shielded, IP67

Plug housing	CuZn nickel plated, -40 ... +95°C
For wire gauge	4 ... 6 mm, PG7 max. 0.75 mm²

P/N	Type
400005614	EEM-33-76





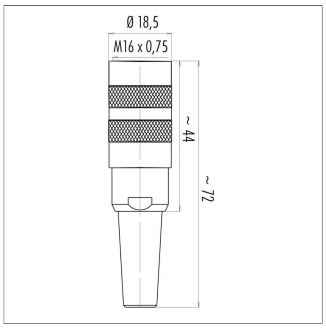
EEM-33-77

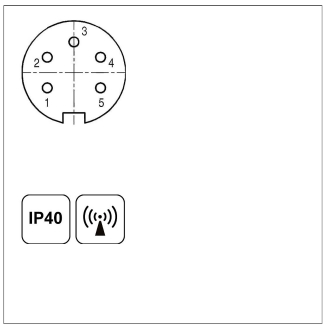
M16x0.75 Mating female connector, 5-pin, angled, with coupling nut, solder terminal, shielded, IP67

Plug housing	CuZn nickel plated, -40 ... +95°C
For wire gauge	4 ... 6 mm, PG7 max. 0.75 mm²

P/N	Type
400005615	EEM-33-77

Connector System M16

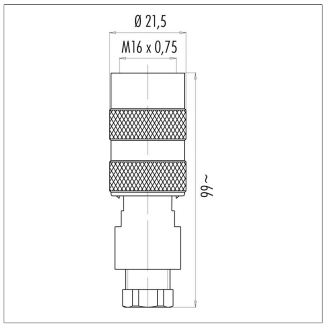


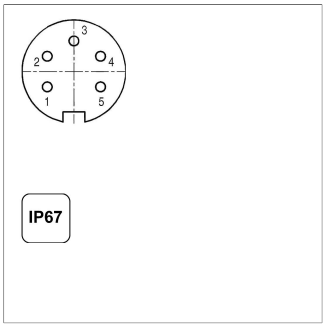


EEM-33-71
M16x0.75 Mating female connector, 5-pin, straight, with coupling nut, solder terminal, shielded, IP40

Plug housing	CuZn nickel plated, -40 ... +85°C
For wire gauge	4 ... 6 mm, max. 0.75 mm²

P/N	Type
400005612	EEM-33-71

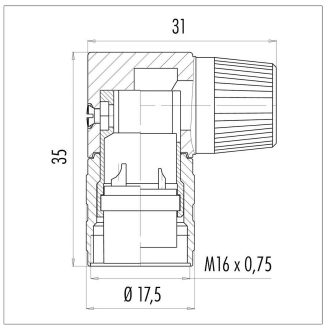


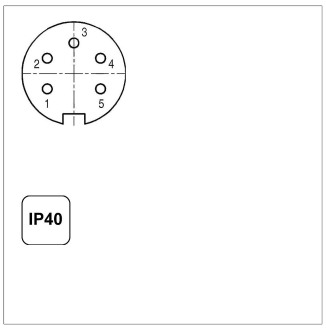


EEM-33-70
M16x0.75 Mating female connector, 5-pin, straight, with coupling nut, solder terminal, unshielded, IP67

Plug housing	PA, -40 ... +95°C
For wire gauge	4 ... 6 mm, max. 0.75 mm²

P/N	Type
400005611	EEM-33-70





EEM-33-72
M16x0.75 Mating female connector, 5-pin, angled, with coupling nut, solder terminal, unshielded, IP40

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

P/N	Type
400005613	EEM-33-72

IP67 Protection class IP67 DIN EN 60529

IP68 Protection class IP68 DIN EN 60529

Very good Electromagnetic Compatibiliy (EMC) and shield systems

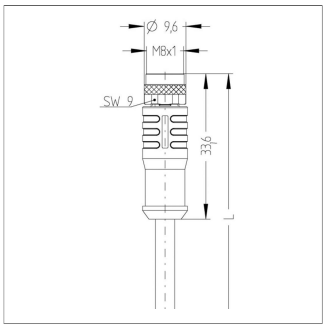
Very good resistance to oils, coolants and lubricants

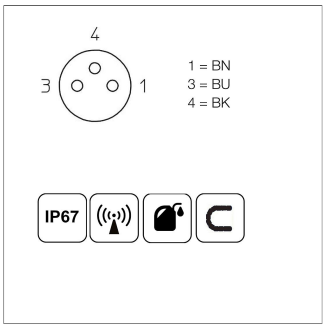
Suited for applications in dragchains

UL UL - approved

CAN CAN-Bus

Connector System M8



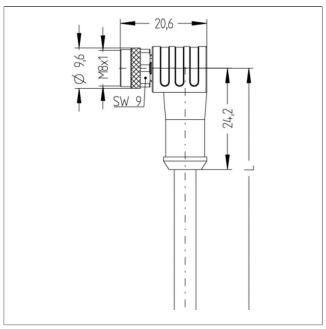


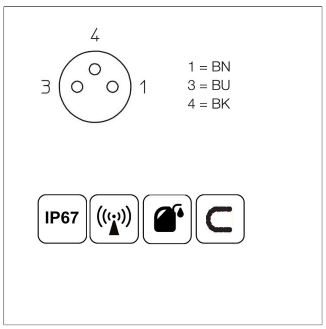
EEM-33-56/58/60

M8x1 Mating female connector, 3-pin, straight, with molded cable, shielded, IP67, open ended

Plug housing	TPU
Cable sheath	PUR, Ø = max. 6 mm, -40 ... +90°C
Lead wires	PP, 3x 0.34 mm²*

P/N	Type	Length
400005602	EEM-33-56	2 m
400005604	EEM-33-58	5 m
400005606	EEM-33-60	10 m



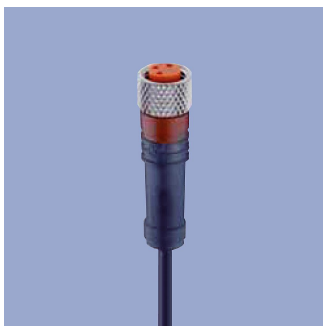


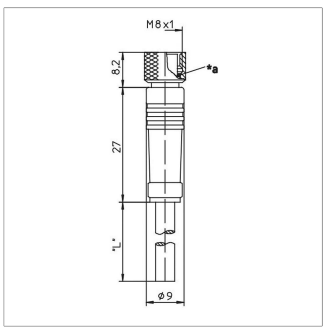
EEM-33-57/59/61

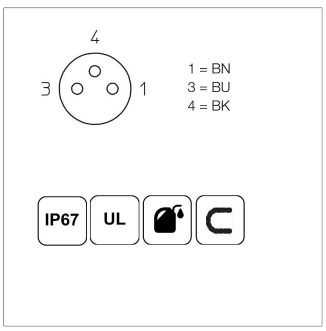
M8x1 Mating female connector, 3-pin, angled, with molded cable, shielded, IP67, open ended

Plug housing	TPU
Cable sheath	PUR, Ø = max. 6 mm, -40 ... +90°C
Lead wires	PP, 3x 0.34 mm²*

P/N	Type	Length
400005603	EEM-33-57	2 m
400005605	EEM-33-59	5 m
400005607	EEM-33-61	10 m





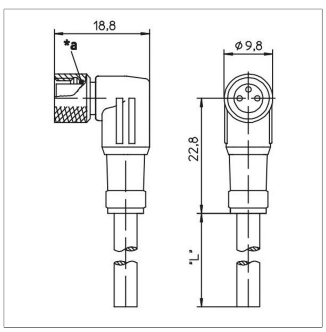


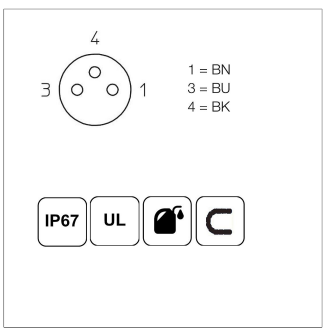
EEM-33-64/66/68

M8x1 Mating female connector, 3-pin, straight, with molded cable, not shielded, IP67, open ended

Plug housing	PA
Cable sheath	PUR, Ø = max. 6 mm, -40 ... +90°C
Lead wires	PP, 0.34 mm²

P/N	Type	Length
400005617	EEM-33-64	2 m
400005619	EEM-33-66	5 m
400005643	EEM-33-68	10 m





EEM-33-65/67/69

M8x1 Mating female connector, 3-pin, angled, with molded cable, not shielded, IP67, open ended

Plug housing	PA
Cable sheath	PUR, Ø = max. 6 mm, -40 ... +90°C
Lead wires	PP, 0.34 mm²

P/N	Type	Length
400005618	EEM-33-65	2 m
400005620	EEM-33-67	5 m
400005644	EEM-33-69	10 m

IP67 Protection class IP67 DIN EN 60529

IP68 Protection class IP68 DIN EN 60529

Very good Electromagnetic Compatibiliy (EMC) and shield systems

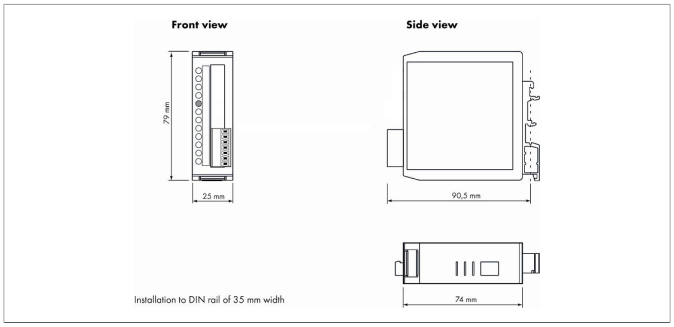
Very good resistance to oils, coolants and lubricants

Suited for applications in dragchains

UL UL - approved

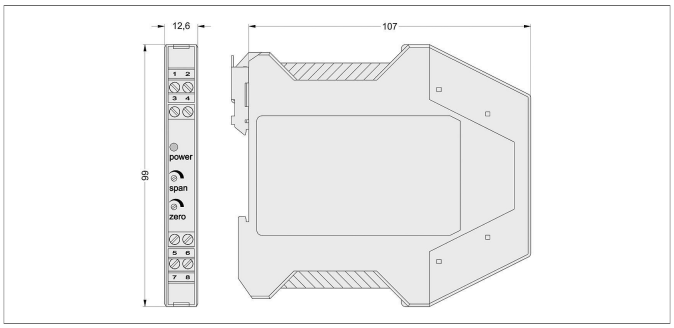
CAN CAN-Bus

Signal Processing



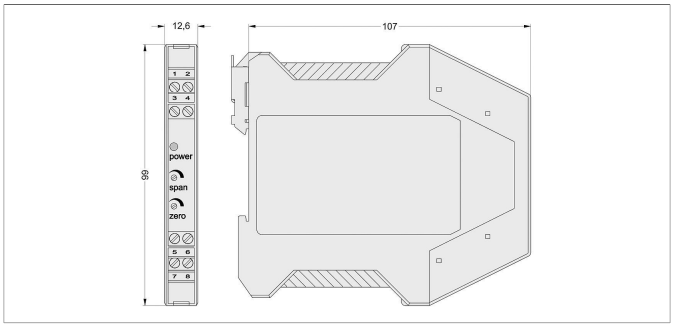
MUP-080
Cost-efficient signal conditioner with fixed output range, voltage or current output. Not adjustable.
Detailed data see separate data sheet.

P/N	Type	Output
400054220	MUP-080-111	0 ... 10 V
400054221	MUP-080-113	4 ... 20 mA



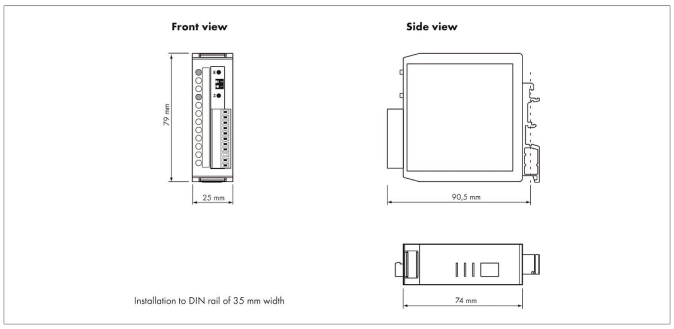
MUP-110
Signal conditioner in compact size with voltage or current output, adjustable zero and span.
Detailed data see separate data sheet.

P/N	Type	Output
400054010	MUP-110-0	0 ... 20 mA
400054011	MUP-110-1	0 ... 10 V
400054014	MUP-110-4	4 ... 20 mA



MUP-160
Signal conditioner in compact size with voltage or current output, adjustable zero and span. With galvanic isolation.
Detailed data see separate data sheet.

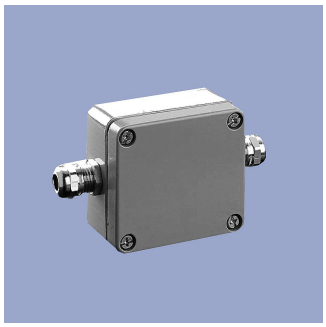
P/N	Type	Output
400054060	MUP-160-0	0 ... 20 mA
400054061	MUP-160-1	0 ... 10 V
400054064	MUP-160-4	4 ... 20 mA

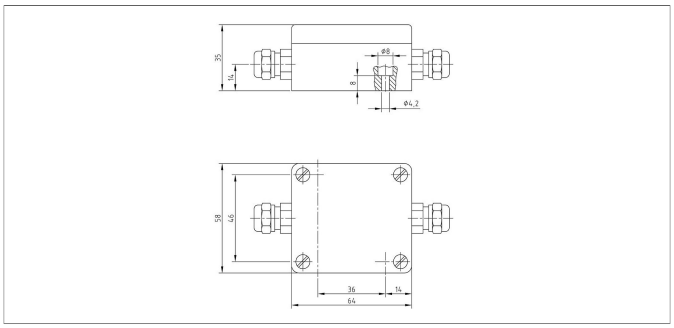


MUP-400
Signal conditioner with simple teach-in function to adapt start and end point. Switchable current or voltage output. Available with or without galvanic isolation.
Detailed data see separate data sheet.

P/N	Type	Isolation
400054201	MUP-400-01	w/o
400054202	MUP-400-11	with

Signal Processing

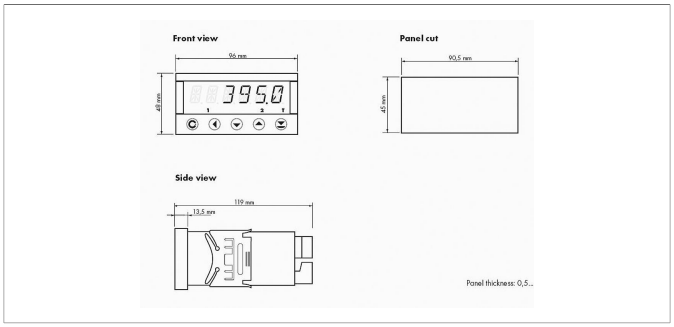




MUK-350

Signal conditioner inside robust housing, even for outside use. Zero point and span adjustable. Detailed data see separate data sheet.

P/N	Type	Output
400054171	MUK-350-0	0 ... 20 mA
400054172	MUK-350-1	0 ... 10 V
400054173	MUK-350-4	4 ... 20 mA
400054174	MUK-350-6	± 10 V



MAP-4000

Multifunctional measuring device with digital display for direct connnection of potentiometric and normalized signals.

- Supply voltage 10...30 VDC, 80...250 VDC or AC
- High accuracy up to 0.1%
- Adjustable supply voltage for sensors 5...24 V
- Temperature coefficient 100 ppm/K
- Optional RS 232, RS 485, analog output, limited switch
- Complete data see separate data sheet

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