

## Position Transducers 25,50,75,100,150 mm

Series T, TS



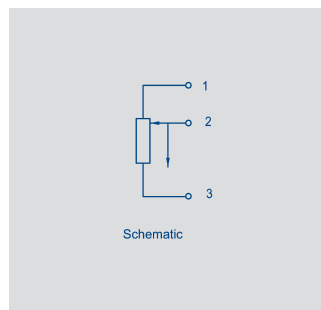
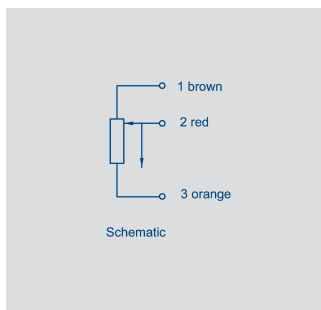
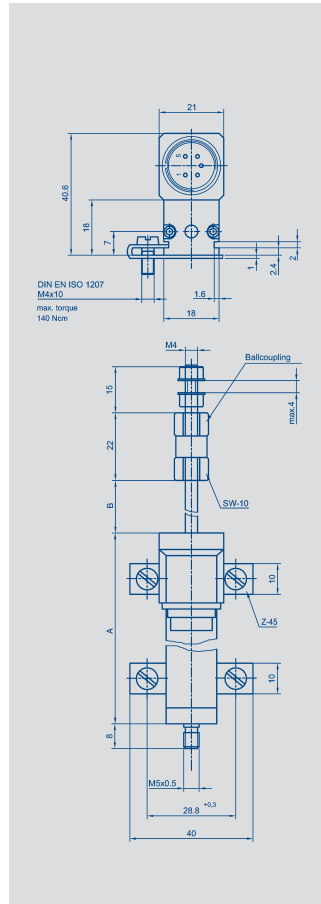
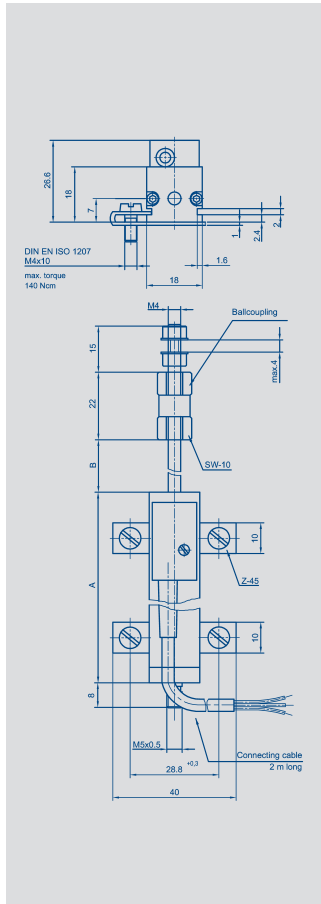
### Special features

- long life -  $100 \times 10^6$  movements
- outstanding linearity up to  $\pm 0.075\%$
- actuating shaft with double bearing system
- special ball coupling eliminates sideways forces
- high operational speeds up to 10 m/s
- insensitive to shock and vibration
- choice of plug or cable connection

Position transducers employing conductive plastic resistance and collector tracks provide direct means of measurement in control and regulation systems and in instrumentation.

Using this type of transducer, problems traditionally associated with rotary potentiometers, especially reliability, life expectancy, accuracy and operational speed, are overcome. Thus opening up new fields of application in direct position measurement.

A ball coupling (which may be fitted to either end of the shaft) offers backlash-free operation even where there are parallel or angular errors between the transducer axis and the direction of movement. The elastomer-damped, independently sprung precious metal multi-finger wiper has been designed to provide a reliable contact even at high speeds or when experiencing shock or vibration.



### Description

Housing	aluminium, anodized
Actuating shaft	stainless steel
Bearings	both ends in DU plastic bearings
Fixings	adjustable clamps
Ball coupling	stainless steel with a hardened ball sprung against a hardened plate surface
Resistance element	conductive-plastic
Wiper assembly	precious metal multi-finger wiper, elastomer-damped
Electrical connections	3core stress-relieved shielded cable, 2 m plug connector

Type designations	T25 TS25	T50 TS50	T75 TS75	T100 TS100	T150 TS150	with cable with plug
<b>Electrical Data</b>						
Defined electrical range	25	50	75	100	150	mm
Nominal resistance	1	5	5	5	5	kΩ
Resistance tolerance	20					±%
Independent linearity	0.2	0.15	0.1	0.075	0.075	±%
Repeatability	0.002					mm
Recommended operating wiper current	≤1					μA
Max. wiper current in case of malfunction	10					mA
Max. permissible applied voltage	42					V
Effective temperature coefficient of the output-to-applied voltage ratio	typical 5					ppm/K
Insulation resistance (500 VDC, 1 bar, 2 s)	≥10					MΩ
Dielectric strength (50 Hz, 2 s, 1 bar, 500 VAC)	≤100					μA
<b>Mechanical Data</b>						
Overall length (dimension A)	63	88	113	138	188	+1 mm
Mechanical stroke (dimension B)	30	55	80	105	155	±1,5 mm
Weight with cable	140	160	170	190	220	g
Weight with plug	86	107	132	150	190	g
Weight of the actuating shaft, with coupling and wiper block	35	43	52	58	74	g
Operating force (horizontal)	≤ 0.30					N
Compensation provided by ball bearing	±1 mm parallel offset, ±2.5° angular offset					
Maximum permitted torque for fixing screws (with washer)	140					Ncm

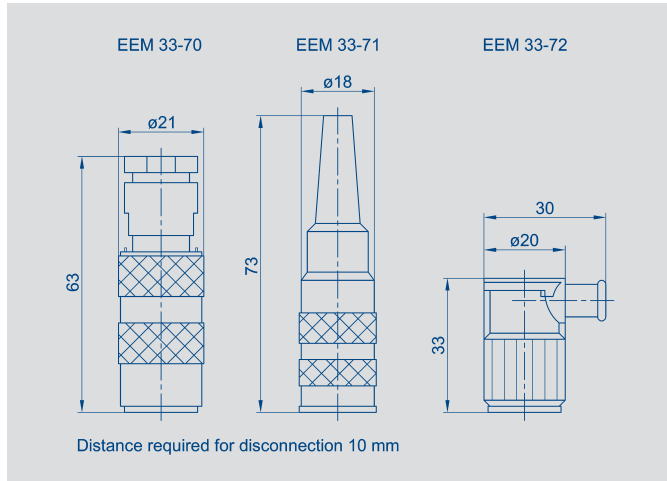
<b>Environmental Data</b>		
Temperature range	-30... +100	°C
Vibration	5... 2000 A <sub>max</sub> = 0.75 a <sub>max</sub> = 20	Hz mm g
Shock	50 11	g ms
Life	>100 x 10 <sup>6</sup>	movements
Protection class	IP 40 (DIN 400 50 / IEC 529)	

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#### Included in delivery

2 fixing clamps Z-45 incl.  
4 screws M4x10,  
1 ball coupling

#### Recommended accessories

Plug type EEM 33-70  
protection class IP 67,  
Plug type EEM 33-71  
protection class IP 40,  
Plug type EEM 33-72  
protection class IP 40,  
Process-controlled indicators  
MAP... with display,  
Signal conditioner  
MUP... /MUK ... for  
standardized output signals.

#### Important

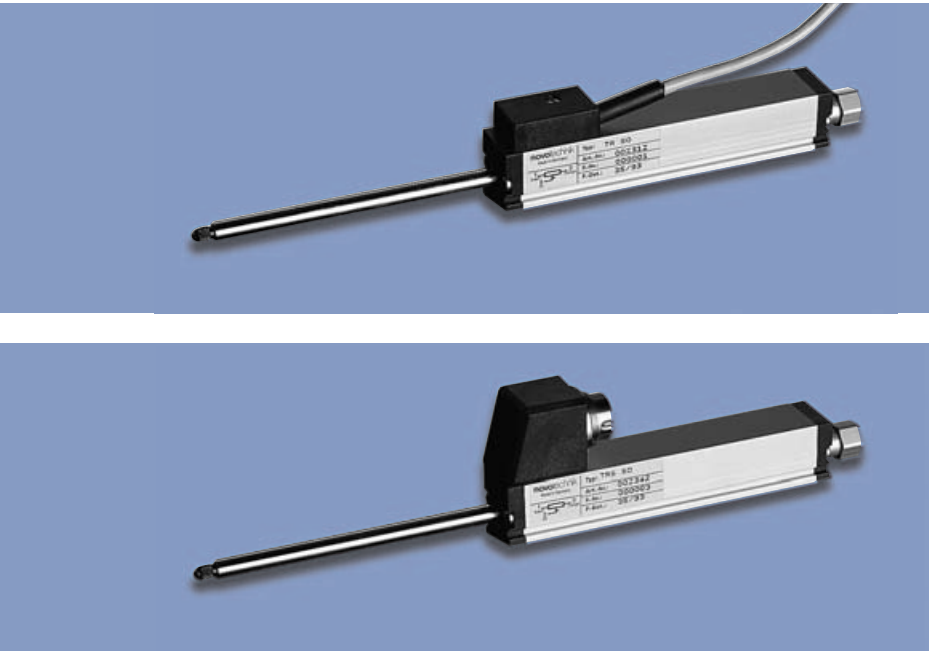
All the values given in this data sheet for linearity, lifetime and temperature coefficient in the voltage dividing mode are quoted for the device operating with the wiper voltage driving on operational amplifier working as a voltage follower, where virtually no load is applied to the wiper ( $I_e \leq 1 \mu A$ ).

#### Order designations

Type	Art.no.
T 25	002302
TS 25	002332
T 50	002303
TS 50	002333
T 75	002304
TS 75	002334
T 100	002305
TS 100	002335
T 150	002306
TS 150	002336

**Position Transducers  
with restoring spring  
10, 25, 50, 75, 100 mm**

Series TR, TRS



**Special features**

- long life -  $100 \times 10^6$  movements
- outstanding linearity - up to 0.075 %
- choice of plug or cable connection
- DIN standard gauging end
- double bearing system on shaft
- insensitive to shock and vibration

Position sensors employing conductive-plastic resistance and collector tracks provide direct means of measuring position or profile, without the need of any form of solid mechanical coupling.

An important and special feature of these particular units is their robust, industry-proven design. Of particular significance is the double bearing arrangement which really comes into its own when side forces (such as would be experienced in a cam-following application) are met. The rear end of the actuator shaft has a special collar, which can be very easily employed where automatic retraction by means of air cylinders or solenoid is required.



Type designations	TR 10	TR 25 TRS 25	TR 50 TRS 50	TR 75 TRS 75	TR 100 TRS 100	with cable with plug
<b>Electrical Data</b>						
Defined electrical range	10	25	50	75	100	mm
Nominal resistance	1	1	5	5	5	kΩ
Resistance tolerance	20					± %
Independent linearity	0.25	0.2	0.15	0.1	0.075	± %
Repeatability	0.002					mm
Recommended operating wiper current	≤1					μA
Max. wiper current in case of malfunction	10					m
Max. permissible applied voltage	24	42	42	42	42	V
Effective temperature coefficient of the output-to-applied voltage ratio	typical 5					ppm/°K
Insulation resistance (500 VDC, 1 bar, 2 s)	≥ 10					MΩ
Dielectric strength (50 Hz, 2 s, 1 bar, 500 VAC )	≤ 100					μA
<b>Mechanical Data</b>						
Overall length (dimension A)	48	63	94.4	134.4	166	+1mm
Mechanical stroke (dimension B)	15	30	55	80	105	±1.5 mm
Dimension C (at TR)	7	12	12	12	12	mm
Dimension D (at TR)	6	32	32	32	32	mm
Weight with cable	80	120	150	180	200	g
Weight with plug		74	100	128	150	g
Weight of the actuating shaft with coupling and wiper block	18	25	36	48	57	g
Operating force (horizontal)	≤ 5					N
Operating frequency max. (In critical applications mount the transducer with the gauging head upwards.)	20	18	14	11	10	Hz
Maximum permitted torque for fixing screws	140					Ncm

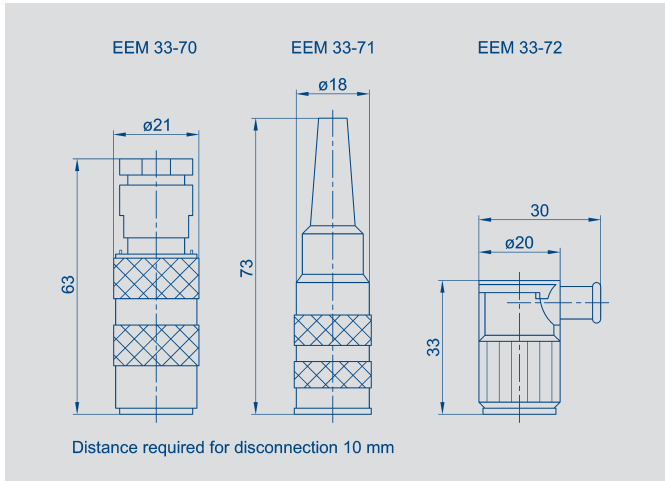
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Shock	50 11	g ms
Life	> 100 x 10 <sup>6</sup>	movem.
Protection class	IP 40 (DIN 400 50 / IEC 529)	

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#### Included in delivery

2 fixing clamps Z-45 incl.  
4 screws M4x10,  
1 gauging head with hardened  
ball point

#### Recommended accessories

Plug type EEM 33-70,  
protection class IP 67  
Plug type EEM 33-71,  
protection class IP 40  
Plug type EEM 33-72,  
protection class IP 40  
1 roller head Z 50  
Process-controlled indicators  
MAP... with display,  
Signal conditioner MUP.../  
MUK ... for standardized out-  
put signals

#### Important

All the values given in this  
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working as a voltage follower,  
where virtually no load is app-  
plied to the wiper ( $I_e \leq 1 \mu A$ ).

#### Order designations

Type	Art.no.
TR 10	002360
TR 25	002361
TRS 25	002371
TR 50	002362
TRS 50	002372
TR 75	002363
TRS 75	002373
TR 100	002364
TRS 100	002374