Position Transducers with Restoring Spring  
10, 25, 50, 75, 100 mm  
TR, TRS Series

**Special features**
- long life – $100 \times 10^6$ movements  
- outstanding linearity – up to $\pm 0.075\%$  
- choice of plug or cable connection  
- DIN standard gauging end  
- double bearing system on shaft  
- insensitive to shock and vibration  
- Repeatability to $\pm 0.002$ mm

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

One important feature of the TR, TRS Series is the industry proven double-bearing systems on both actuator shaft and spring. This arrangement reduces side load errors that could occur in an application such as cam-following and is one of the design factors that enables the outstanding linearity of this series.

The back end of the actuator shaft has a special collar that allows the attachment of an air cylinder of solenoid to automatically retract the actuator when required.

### Description

<table>
<thead>
<tr>
<th>Description</th>
<th>Type</th>
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</thead>
<tbody>
<tr>
<td>Housing</td>
<td>aluminum, anodized</td>
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<tr>
<td>Actuating shaft</td>
<td>stainless steel with anti-rotation device, inside thread M 2.5 x 6</td>
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<tr>
<td>Fixings</td>
<td>adjustable clamps</td>
</tr>
<tr>
<td>Gauging head</td>
<td>stainless steel with external M 2.5 thread and hardened ball point</td>
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<tr>
<td>Bearings</td>
<td>both ends in DU plastic bearings</td>
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<tr>
<td>Resistance element</td>
<td>conductive plastic</td>
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<tr>
<td>Wiper assembly</td>
<td>precious metal multi-finger wiper, elastomer-damped</td>
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<tr>
<td>Electrical connections type TR</td>
<td>three conductor stress-relieved, shielded cable, 2 m plug connector</td>
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<tr>
<td>type TRS</td>
<td></td>
</tr>
</tbody>
</table>
Type designations | TR 10 | TR 25 | TR 50 | TR 75 | TR 100 | with cable | with plug
---|---|---|---|---|---|---|---
Electrical Data
Defined electrical range | 10 | 25 | 50 | 75 | 100 | mm
Nominal resistance | 1 | 1 | 5 | 5 | 5 | kΩ
Resistance tolerance | 20 | ±% | 0.25 | 0.2 | 0.15 | 0.1 | 0.075 | ±% | 0.002 | mm
Repeatability | ≤ 1 | µA | 0.2 | 0.1 | 0.15 | 0.1 | 0.075 | ±% | 0.002 | mm
Recommended operating wiper current | 10 | m | 24 | 42 | 42 | 42 | 42 | V | 24 | 42 | 42 | 42 | 42 | V
Max. permissible applied voltage | 24 | 42 | 42 | 42 | 42 | V | 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
Mechanical Data
Overall length (dimension A) | 48 | 63 | 94.4 | 134.4 | 166 | mm | 48 | 63 | 94.4 | 134.4 | 166 | mm
Mechanical stroke (dimension B) | 15 | 30 | 55 | 80 | 106 | mm | 15 | 30 | 55 | 80 | 106 | mm
Dimension C (at TR) | 7 | 12 | 12 | 12 | 12 | mm | 7 | 12 | 12 | 12 | 12 | mm
Dimension D (at TR) | 6 | 32 | 32 | 32 | 32 | mm | 6 | 32 | 32 | 32 | 32 | mm
Weight with cable | 80 | 120 | 150 | 180 | 200 | g | 80 | 120 | 150 | 180 | 200 | g
Weight of the actuating shaft with coupling and wiper block | 18 | 25 | 48 | 57 | g | 18 | 25 | 48 | 57 | g
Operating force (horizontal) | ≤ 5 | N | 20 | 18 | 14 | 11 | 10 | Hz | 20 | 18 | 14 | 11 | 10 | Hz
Maximum permitted torque for fixing screws | 140 | Ncm
Environmental Data
Temp. range | -30...+100 °C |
Vibration | 5...2000 Hz | Amax = 0.75 mm/s | amax = 20 g |
Shock | 50 g | 11 ms |
Life | > 100 x 10⁶ movements |
Protection class | IP 40 (EN 400 50 / IEC 529) |
Order designations
Type | Art. no.
---|---
TR 10 | 023260
TR 25 | 023261
TRS 25 | 023271
TR 50 | 023262
TRS 50 | 023272
TR 75 | 023263
TRS 75 | 023273
TR 100 | 023264
TRS 100 | 023274

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 output signals

Important
All values given for this series – including linearity, lifetime, micro-linearity, resistance to external disturbances and temperature coefficient in voltage dividing mode – are quoted for the device operating with the wiper voltage driving an operational amplifier working as a voltage follower where virtually no load is applied to the wiper (le ≤ 1 µA).