FMS Tension Control / Force Sensors

**UMGZ.P Force Measuring Block with increased stiffness as drop-in replacement for Philips series PR 9951**

- **Direct replacement of Philips PR 9951:**
  No mechanical changes on machine frame

- **10-times overload protection:**
  No recalibration required

- **Accuracy class 0.5%:**
  Highly linear measuring characteristic

- **Stainless steel force sensor:**
  Corrosion resistant, ultra durable

*UMGZ.P*

The force measuring blocks of the UMGZ.P series are designed as drop-in replacement for the discontinued Philips PR 9951 series.

The UMGZ.P force measuring blocks feature exceptional durability and operational reliability. Constructed of stainless steel and with their high overload protection these rugged products provide accurate web tension measurement even under the most stringent requirements. They are used in any application where an easy access to and fast change of rollers is vital.

*Functional Description*

The force is applied via the standard pillow block to the force measuring block. A Wheatstone full-bridge circuit, containing four foil-based strain gauges, measures the current material tension. This measuring signal is received in the FMS measuring amplifier for further processing. The used measuring principle eliminates angular deflection and ensures tension measurement with the highest accuracy and reliability even at low wrap angles and with heavy rollers. The UMGZ.P force measuring blocks are compatible with the full line of FMS electronics.
UMGZ.P | Dimensions

Sketch: UMGZ.P measure in horizontal direction.

Sketch: All force measuring blocks of the UMGZ.P series feature an integrated mechanical overload protection. This design prevents the force sensor as well as your machine from damage during installation and operation.

Orientation of the electrical connections

Setup with one force measuring block with connection “S” South and one force measuring block with connection “N” North.

Setup with two identical force measuring blocks with connection “S” South.
### Nominal forces, stiffness

<table>
<thead>
<tr>
<th>Size</th>
<th>Nominal force $F_{nom}$ in N (lbf)</th>
<th>Weight in kg (lb)</th>
<th>Stiffness at $F_{nom}$ in mm (in.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>UMGZ.P.080.1000</td>
<td>1000 (225)</td>
<td>23 (50)</td>
<td>0.4 (0.016)</td>
</tr>
<tr>
<td>UMGZ.P.080.2000</td>
<td>2000 (450)</td>
<td>23 (50)</td>
<td>0.3 (0.012)</td>
</tr>
<tr>
<td>UMGZ.P.080.3000</td>
<td>3000 (675)</td>
<td>23 (50)</td>
<td>0.2 (0.008)</td>
</tr>
</tbody>
</table>

### Technical Data

<table>
<thead>
<tr>
<th>Sensitivity</th>
<th>0.5 mV/V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tolerance of sensitivity</td>
<td>&lt; ±0.2 %</td>
</tr>
<tr>
<td>Accuracy class</td>
<td>± 0.5 % ($F_{nom}$)</td>
</tr>
<tr>
<td>Temperature coefficient</td>
<td>± 0.1 % / 10 K</td>
</tr>
<tr>
<td>Temperature range</td>
<td>−10 to +60 °C (14 to 140 °F)</td>
</tr>
<tr>
<td>Input resistance</td>
<td>350 Ω</td>
</tr>
<tr>
<td>Excitation voltage</td>
<td>1 to 7 VDC</td>
</tr>
<tr>
<td>Overload protection</td>
<td>up to 10 times nominal force $F_{nom}$</td>
</tr>
<tr>
<td>Material measuring body</td>
<td>Stainless steel</td>
</tr>
<tr>
<td>Protection rating</td>
<td>IP 42</td>
</tr>
<tr>
<td>Repeatability error</td>
<td>0.05 %</td>
</tr>
</tbody>
</table>

### Order Code

UMGZ.P 080. 2000. H. N. H14

- **Options**
  - Electr. connection (N = North, S = South)
  - Measuring direction (H = Horizontal)

- **Nominal force**
  - Series
  - Size

### Options

- **H 14** right angle connector
- **H 16** up to 120 °C (250 °F), with PG gland (H21) up to 150 °C (300 °F)
- **H 21** PG gland with 10 m (33 ft) cable

### Scope of supply

- Force measuring block
- straight connector
- Installation instruction

### Not included in scope of supply

- Installation material
- Cable
- Pillow block
**DATA SHEET**

FMS Tension Control | Force Sensors | UMGZ.P

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**UMGZ.P | Typical Application**

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**Other FMS Products | Tension Control**

<table>
<thead>
<tr>
<th>Measuring amplifiers</th>
<th>Tension controllers</th>
<th>ATEX-Intrinsically safe barriers</th>
</tr>
</thead>
</table>

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**FMS Force Measuring Systems AG**

FMS Force Measuring Systems AG is a worldwide market leader in the fields of tension measurement/control, web guiding, and specialized telemetry technologies. Our standard and custom solutions are applied in the converting, metals, paper, textile and wire & cable industries. FMS Force Measuring Systems AG’s advanced technology, high quality components and extensive application knowledge supports customers around the world in maximizing productivity. Since 1993 our highly skilled workforce has crafted superior solutions and set the benchmark in the industry.