FMS Tension Control / Force Sensors

SMGZ-Series Hermetically Sealed Measuring Block for Strip Tension Control

- **Durability, corrosion Resistant:**
  IP 67, inert gas filled, chemical, oil and solvent resistant

- **Highest reliability:**
  Overload capacity at 10-times nominal force, stainless steel construction

- **Increased stiffness, robust Design:**
  2 year FMS warranty

- **Maximum Flexibility:**
  Nominal forces from 1 to 100 kN (225 to 22500 lbf)

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**SMGZ-Series**

The force sensors of the SMGZ-Series, designed for the measurement of strip tension on continuous metal processing lines, are used in combination with standard pillow blocks. This feature allows for easy maintenance or exchange of the blocks, bearings and roll. Block mounting is simple utilizing four fasteners into the bottom surface and mounting holes for the pillow block bearing are included based on your specifications. In addition, the 6 m cable allows for an electrical connection away from the harsh environment. The SMGZ-Series is available in two measuring versions, horizontal and vertical, and thus can be specified for use in any mounting orientation and strip wrap configuration. With the superior performance of the SMGZ-Series, accurate tension readings are obtained even with low web wrap angles and high roll weights.

**Functional Description**

The SMGZ-Series design, incorporating dual bending beams, eliminates the load-specific influences of torque. The movement of the bending beams is detected by a set of strain gages arranged in a full bridge circuit. The resulting electrical signal, which is proportional to the applied force, is then amplified for use in monitoring or controlling web tension. The red point located on the sensor body indicates the positive measuring direction, and the substantial overload protection (10-times nominal force) translates to eliminated / minimized calibration issues due to machine upset conditions. The hermetically sealed sensor cover will provide protection for the measuring electronics inside the sensor body from dirt, etc.
**SMGZ-Series Dimensions**

**Vertical**
- Sketch: depending on the direction of the resulting force, a horizontal or vertical version must be selected.
- Orientation of the electrical connection

**Horizontal**
- Sketch: depending on the direction of the resulting force, a horizontal or vertical version must be selected.
- Orientation of the electrical connection

**Horizontal or vertical measuring direction**
- Vertical: Straight connector with flexible protection hose
- Bottom view with mounting hole for machine frame

**FMS Sealing**
- Vertical: Straight connector with flexible protection hose
- Bottom view with mounting hole for machine frame

**Orientation of the electrical connection**
- **VERTICAL** (resulting force)
- **HORIZONTAL** (resulting force)

**Illustration**
- Illustration with two measuring blocks with “S” South oriented electrical connections. The version “vertical” does not have a red point.
- Illustration with one measuring block with “S” South oriented and one with “N” North oriented electrical connection.
## SMGZ-Series | Nominal force, roll

<table>
<thead>
<tr>
<th>Size</th>
<th>Shaft diameter in mm</th>
<th>Nominal force $F_{\text{Nom}}$ in kN</th>
<th>Stiffness in mm $F_{\text{Nom}} &lt; 10$ kN</th>
<th>$F_{\text{Nom}} \geq 10$ kN</th>
</tr>
</thead>
<tbody>
<tr>
<td>SMGZ 100.C</td>
<td>20 to 50</td>
<td>1 to 20</td>
<td>0.14</td>
<td>0.06</td>
</tr>
<tr>
<td>SMGZ 200.C</td>
<td>40 to 85</td>
<td>1 to 40</td>
<td>0.14</td>
<td>0.06</td>
</tr>
<tr>
<td>SMGZ 300.C</td>
<td>75 to 100</td>
<td>5 to 50</td>
<td>0.14</td>
<td>0.06</td>
</tr>
<tr>
<td>SMGZ 400.C</td>
<td>85 to 120</td>
<td>10 to 100</td>
<td>–</td>
<td>0.06</td>
</tr>
<tr>
<td>SMGZ 500.C</td>
<td>110 to 160</td>
<td>10 to 100</td>
<td>–</td>
<td>0.06</td>
</tr>
</tbody>
</table>

## SMGZ-Series | Dimensions, weight

<table>
<thead>
<tr>
<th>Size</th>
<th>Dimensions in mm</th>
<th>Bottom bore pattern in mm</th>
<th>Weight in kg</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>L x B x H</td>
<td>L x 3 x D 2</td>
<td></td>
</tr>
<tr>
<td>SMGZ 100.C</td>
<td>230 x 90 x 125</td>
<td>170 x M16</td>
<td>20</td>
</tr>
<tr>
<td>SMGZ 200.C</td>
<td>320 x 90 x 125</td>
<td>260 x M20</td>
<td>28</td>
</tr>
<tr>
<td>SMGZ 300.C</td>
<td>380 x 110 x 125</td>
<td>320 x M24</td>
<td>41</td>
</tr>
<tr>
<td>SMGZ 400.C</td>
<td>450 x 130 x 125</td>
<td>390 x M24</td>
<td>57</td>
</tr>
<tr>
<td>SMGZ 500.C</td>
<td>560 x 170 x 150</td>
<td>470 x M30</td>
<td>73</td>
</tr>
</tbody>
</table>

## SMGZ-Series | Technical data

- **Sensitivity**: 0.5 mV/V
- **Tolerance of sensitivity**: $< \pm 0.2\%$
- **Accuracy class**: $\pm 0.5\% (F_{\text{Nom}})$
- **Temperature coefficient**: $\pm 0.1\% / 10$ K
- **Temperature range**: $-10$ to $+90$ °C
- **Input resistance**: 350 Ω
- **Excitation voltage**: 1 to 10 VDC
- **Overload protection**: 10-times nominal force $F_{\text{Nom}}$
- **Material measuring body**: Stainless steel
- **Protection class**: IP 67
- **Electrical connection**: PG gland with 6 m cable (VG 95218), other lengths on request
- **Repeatability error**: 0.05 %
- **Measuring range**: 20:1

## SMGZ-Series | Order code

<table>
<thead>
<tr>
<th>SMGZ</th>
<th>200 .C .40K.</th>
<th>H. N.</th>
<th>H14</th>
</tr>
</thead>
<tbody>
<tr>
<td>Series</td>
<td>Options</td>
<td>Elec. connection (N = North, S = South) measuring direction (H = Horizontal, V = Vertical)</td>
<td>Nominal force in 1000 N</td>
</tr>
<tr>
<td>Revision status</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## SMGZ-Series | Options

- H14 | Right-angle connection

## SMGZ-Series | Scope of delivery

- Force measuring block
- Straight electrical connection
- 6 m cable
- 5 m cable protection hose, other lengths on request
- The sealing of the open end of the cable is provided with a threaded connection M16 x 1.5mm (female thread required)
FMS Force Measuring Systems AG

Since 1993 FMS Force Measuring Systems AG has been a worldwide market leader in the fields of tension control and web guiding, and the only manufacturer that covers a complete range of measurement, control and telemetry technologies. Its customized solutions are applied in the converting, metals, paper, textile and the wire & cable industries. With industry leading technology, high quality construction, and a wide array of products FMS serves customers worldwide to help them maximize their production performance.