Position indication for manually operated valves

Limit switching device WSH 10.2 – WSH 16.2/WSHEx 10.2 – WSHEx 16.2
Industrial and special solutions

- Air conditioning
- Food industry
- Chemical/pharmaceutical industry
- Vessel and submarine ship building
- Steel mills
- Paper industry
- Cement industry
- Mining industry

Applications

Power
- Conventional power plants (coal, gas, oil)
- Hydroelectric power plants
- Geothermal power plants
- Solar thermal power plants
- Bio gas power stations

Water industry
- Sewage treatment plants
- Water treatment plants
- Drinking water distribution
- Seawater desalination
- Steel construction for water resources

Oil & gas
- Exploration, offshore plants
- Refineries
- Distribution
- Gas tanks
- Tank farms

Industrial and special solutions
- Air conditioning
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- Paper industry
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AUMA actuators provide reliable information on the valve position - locally via a position indicator and via remote position signal in the control room.

Automation of the valve might not be necessary, but accurate information on valve position is required.

The WSH limit switching device is perfectly suited for these applications. The device provides the user with the required information for target-oriented action. The WSHEx version is approved for use in potentially explosive atmospheres.

For detailed product selection, please refer to the separate data sheets. On request, AUMA engineers within field service and within our subsidiaries can assist you in defining the correct device for the application.

The latest information on the AUMA products can be found on the Internet at www.auma.com. All documents, including dimensional drawings, wiring diagrams, technical and electrical data sheets as well as final inspection records are available on the Internet in digital form.
The WSH perfectly fits into AUMA’s modular product range. Different output drive types or the combination with an AUMA gearbox ensure that the device can be adapted to any valve type. The torque ranges of the different devices are adapted to each other. Standard flanges and output drive types facilitate the assembly of the various devices.

[1] **WSH mounted on stem gate valve with rising stem**

The output flange of the WSH is fitted with an output drive type A containing a stem nut. The rising stem is passed through the hollow output shaft of the WSH. A stem protection tube protects operators against injuries and the stem from dirt.

[2] **WSH with GK bevel gearbox mounted on gate valve with non-rising stem.**

The bevel gearbox has two functions. By shifting the input shaft by 90°, the gearbox can be mounted when access is difficult. The bevel gearbox is available with different reduction ratios and therefore reduces the manual forces required at the WSH. The GK is also equipped with a hollow shaft through which a rising stem can be passed, if required. The WSH is screwed to the input flange of the GK.

[3] **WSH with GST spur gearbox mounted on gate valve with non-rising stem**

In the same way as the GK, the GST spur gearbox extends the application range of the WSH. Just like the GK, the GST is also available with various reduction ratios.
**WSH with GS part-turn gearbox mounted on a ball valve**

In combination with a GS gearbox, the WSH can also be used on part-turn valves such as ball valves and butterfly valves. The WSH is screwed to the input flange of the GS gearbox. The GS gearbox has a high reduction ratio. When using primary reduction gearings with the worm gearbox, the manual forces at WSH can be additionally reduced.

**WSH with LE linear thrust unit mounted on a shut-off valve**

In the same way as with other gearboxes, the WSH can also be combined with AUMA LE linear thrust units. Thereby, the WSH is also suitable for valves requiring linear movement.

**Output drive types**

The output drive types B1, B2, B3, or B4 in accordance with EN ISO 5210 or B in accordance with DIN 3210 are directly integrated into the WSH hollow shaft.

For mounting the WSH on gate valves with rising stem, an output drive type A [6a] is required. The mounting flange together with the stem nut and thrust bearings form an assembly, suitable for accepting thrust. Upon request, the stem nut can be supplied with threaded hole drilled in the factory.

For AF [6b], the stem nut is spring-loaded. This compensates for thermal expansion of the stem.
Design principle - Functions

[1] Valve attachment
According to EN ISO 5210 or DIN 3210. Various output drive types are available.

[2] Hollow output shaft
Rising stems pass through the hollow shaft. The torque is transmitted from the handwheel to the hollow shaft via splines.

[3] Handwheel
The handwheel is available with different diameters. The handwheel is fitted on the splines of the hollow shaft and secured with a snap ring. As standard, the handwheels are equipped with a ball handle.

For non-rinsing stems, the handwheel hole is sealed with a threaded plug. For rising stems, a protection tube, which covers the rising stem, is fitted instead of the threaded plug.

[5] Control unit
The crown wheel transmits the rotary movement to the control unit. The control unit measures the travel and activates the respective limit switches at the set switching points. The limit switches are wired to the electrical connection so that the limit switch signal can be fed from there to the control room.
Electronic position transmitter RWG (option)

The RWG converts the current valve position in a 0/4 – 20 mA current signal. This signal is connected to the WSH electrical connection and can be transmitted from there to the control room. The RWG can be configured for 2-wire, 3-wire or 4-wire configuration.

Mechanical position indicator

The mechanical position indicator allows for reliable reading of the current valve position, even if the valve is either not equipped with a position indicator or if the valve position indicator is difficult to access.

Electrical plug/socket connection

Once connected, the wiring remains undisturbed, even if the WSH has to be disconnected from the connection to the control room, e.g. for maintenance purposes. The electrical connection can thus quickly be disconnected and restored.

The electrical connection can be positioned on the valve at every 90°.

Electrical connection explosion-proof version

The terminal connection for use in potentially explosive atmospheres is equipped with terminal blocks arranged on a terminal frame.
AUMA actuators are used worldwide; in all climate zones, in industrial plants of all kinds under special local ambient conditions. AUMA devices have to operate reliably and for a long time under any conditions without requiring major maintenance work.

For this reason, AUMA has focussed on making AUMA devices resistant to the most unfavourable conditions and has adapted protective measures to the state-of-the-art technology.

**Enclosure protection**

**IP 67**

AUMA device conform to enclosure protection IP 67 according to EN 60529. IP 67 means protection against immersion up to 1 m head of water for max. 30 minutes.

**IP 68**

On request, AUMA devices are available with improved enclosure protection IP 68 according to EN 60 529. IP 68 means protection against submersion up to 8 m head of water for max. 96 hours.

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**Service conditions**
**Corrosion protection**

**Standard (KN)**

The standard AUMA corrosion protection KN is a high quality coating. This is suitable for outdoor installation and for slightly aggressive atmospheres with a low level of pollution.

**KS**

AUMA recommends this corrosion protection class for installation in occasionally or permanently aggressive atmospheres with a moderate pollutant concentration.

**KX**

AUMA recommends this corrosion protection class for installation in extremely aggressive atmospheres with high humidity and a high pollutant concentration.

**Colour**

The standard colour of the finish coating is AUMA silver-grey A0001 (similar to RAL 7037). Other colours are possible on request.

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**Ambient temperatures**

<table>
<thead>
<tr>
<th>WSH</th>
<th>WSHEX</th>
</tr>
</thead>
<tbody>
<tr>
<td>-40 °C to +80 °C</td>
<td>-40 °C to +60 °C</td>
</tr>
</tbody>
</table>

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**Explosion protection**

For the installation of actuators in potentially hazardous or explosive areas, special protective measures are required. These are stipulated in the European Standards EN 60079-0, 60079-7, and 60079-11. The KEMA as European test authority certifies the conformity of the equipment with the mentioned standards.

**Explosion protection classification WSHEX**

- I12G Ex e IIC T4
  (without electronic position transmitter RWG 5020 Ex)
- I12G Ex e [ib] IIB T4
  (with mounted electronic position transmitter RWG 5020 Ex)
- I12G c IIC T4
### Technical data

<table>
<thead>
<tr>
<th>Type</th>
<th>Output torque max. Nm</th>
<th>Valve attachment</th>
<th>Handwheel</th>
<th>Diameter mm</th>
<th>Reduction ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>WSH/WSHEx 10.2</td>
<td>170</td>
<td>F10</td>
<td>G0</td>
<td>400</td>
<td>1 : 1</td>
</tr>
<tr>
<td>WSH/WSHEx 14.2</td>
<td>400</td>
<td>F14</td>
<td>G1/2</td>
<td>400/500</td>
<td>1 : 1</td>
</tr>
<tr>
<td>WSH/WSHEx 16.2</td>
<td>800</td>
<td>F16</td>
<td>G3</td>
<td>630</td>
<td>1 : 1</td>
</tr>
</tbody>
</table>

#### Limit switches

<table>
<thead>
<tr>
<th>Versions</th>
<th>Application/description</th>
<th>Type of contact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single switch</td>
<td>Standard</td>
<td>One NC and one NO contact</td>
</tr>
<tr>
<td>Tandem switch (option)</td>
<td>For switching two different potentials. The switches have two compartments with galvanically isolated switches in a common sealed housing. The two switches are operated together; one switch is leading and should be used for signalisation.</td>
<td>Two NC and two NO contacts</td>
</tr>
<tr>
<td>Triple switches (option)</td>
<td>For applications where three different potentials are to be switched. The switch consists of one single and one tandem switch.</td>
<td>Three NC and three NO contacts</td>
</tr>
</tbody>
</table>

### Rated power

<table>
<thead>
<tr>
<th>Type of current</th>
<th>Switch rating I&lt;sub&gt;max&lt;/sub&gt;</th>
<th>30 V</th>
<th>125 V</th>
<th>250 V</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC (inductive load) cos φ = 0.8</td>
<td>5 A</td>
<td>5 A</td>
<td>5 A</td>
<td></td>
</tr>
<tr>
<td>DC (resistive load)</td>
<td>2 A</td>
<td>0.5 A</td>
<td>0.4 A</td>
<td></td>
</tr>
</tbody>
</table>

With gold-plated contacts (recommended for controls with low voltages < 30 V/100 mA)

- **Voltage:** min 5 V, max. 50 V
- **Current:** min 4 mA, max. 400 mA

#### Contacts - other features

| Contact material | Silver (standard), gold (option) |

#### Remote position transmitter

**Precision potentiometer**

<table>
<thead>
<tr>
<th>Linearity</th>
<th>Power</th>
<th>Resistance (standard)</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤ 1 %</td>
<td>0.5 W</td>
<td>0.2 kΩ</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Single</th>
<th>Tandem</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.1 kΩ, 0.5 kΩ, 1.0 kΩ, 5.0 kΩ</td>
<td>0.5/0.5 kΩ, 1.0/1 kΩ, 5.0/5 kΩ, 0.2/5.0 kΩ</td>
</tr>
</tbody>
</table>

**Electronic remote position transmitter RWG**

<table>
<thead>
<tr>
<th>Output signal</th>
<th>Power supply</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 – 20 mA</td>
<td>24 V DC, ±15 % smoothed</td>
</tr>
<tr>
<td>0/4 – 20 mA</td>
<td></td>
</tr>
</tbody>
</table>
**Electrical connection**

<table>
<thead>
<tr>
<th>AUMA plug/socket connector - not Ex</th>
<th>Protective earth</th>
<th>Control contacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of contacts max.</td>
<td>1 (leading contact)</td>
<td>50 pins/sockets</td>
</tr>
<tr>
<td>Designation</td>
<td>PE</td>
<td>1 to 50</td>
</tr>
<tr>
<td>Connecting voltage max.</td>
<td>250 V</td>
<td></td>
</tr>
<tr>
<td>Type of customer connection</td>
<td>Screw for ring lug</td>
<td>Screw, crimping (option)</td>
</tr>
<tr>
<td>Cross section max.</td>
<td>6 mm²</td>
<td>2.5 mm²</td>
</tr>
<tr>
<td>Material - pin socket carrier</td>
<td>Polyamide</td>
<td>Polyamide</td>
</tr>
<tr>
<td>Material - contacts</td>
<td>Brass</td>
<td>Brass, tin plated or gold plated (option)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Terminal frame with terminal blocks - explosion-proof</th>
<th>Protective earth</th>
<th>Terminals</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of contacts max.</td>
<td>1 (leading contact)</td>
<td>36</td>
</tr>
<tr>
<td>Designation</td>
<td>PE</td>
<td>1 to 36</td>
</tr>
<tr>
<td>Connecting voltage max.</td>
<td>250 V</td>
<td></td>
</tr>
<tr>
<td>Type of customer connection</td>
<td>Screw for ring lug</td>
<td>Cage clamp</td>
</tr>
<tr>
<td>Cross section max.</td>
<td>10 mm²</td>
<td>2.5 mm² flexibel, 4 mm² massiv</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Thread dimensions of cable entries (selected choice)</th>
<th>Plug cover S</th>
<th>Plug cover SH</th>
</tr>
</thead>
<tbody>
<tr>
<td>M-threads (standard)</td>
<td>1 x M20 x 1.5/1 x M25 x 1.5/1 x M32 x 1.5</td>
<td>1 x M20 x 1.5/2 x M25 x 1.5/1 x M32 x 1.5</td>
</tr>
<tr>
<td>Pg-threads (option)</td>
<td>1 x Pg 13.5; 1 x Pg 21; 1 x Pg 29</td>
<td>1 x Pg 13.5; 2 x Pg 21; 1 x Pg 29</td>
</tr>
<tr>
<td>NPT-threads (option)</td>
<td>2 x ¾&quot; NPT; 1 x 1¼&quot; NPT</td>
<td>1 x ¾&quot; NPT; 2 x 1&quot; NPT; 1 x 1¼&quot; NPT</td>
</tr>
<tr>
<td>G-threads (option)</td>
<td>2 x G ¾&quot;; 1 x G 1¼&quot;</td>
<td>1 x G ¾&quot;; 2 x G 1&quot;; 1 x G 1¼&quot;</td>
</tr>
</tbody>
</table>

**Heater**

<table>
<thead>
<tr>
<th>Heater in control unit to reduce condensation (standard)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Heating element</td>
<td>Self-regulating PTC element</td>
</tr>
<tr>
<td>Voltage ranges</td>
<td>110 V – 250 V DC/AC</td>
</tr>
<tr>
<td></td>
<td>24 V – 48 V DC/AC (option)</td>
</tr>
<tr>
<td>Power</td>
<td>5 W – 20 W</td>
</tr>
</tbody>
</table>
[1] Multi-turn actuators
SA 07.2 – SA 16.2
SA 25.1 – SA 48.1
Torques from 10 to 32,000 Nm
Output speeds from 4 to 180 rpm

Torques from 10 to 1,000 Nm
Output speeds from 4 to 180 rpm

[3] Linear actuators SA/LE
combination of multi-turn actuator SA and linear thrust unit LE
Thrusts from 4 kN to 217 kN
Strokes up to 500 mm
Linear speeds from 20 to 360 mm/min

[4] Part-turn actuators
SG 05.1 – SG 12.1
Torques from 100 to 1,200 Nm
Operating times for 90° from 4 to 180 s

Combination of multi-turn actuator SA and part-turn gearbox GS
Torques up to 675,000 Nm

[6] Bevel gearboxes
GK 10.2 – GK 40.2
Torques up to 16,000 Nm

[7] Spur gearboxes
GST 10.1 – GST 40.1
Torques up to 16,000 Nm

[8] Lever gearboxes
GF 50.3 – GF 250.3
Torques up to 32,000 Nm

Subject to change without notice. The product features and technical data provided do not express or imply any warranty.

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