Electric actuators – Valve gearboxes

INFORMATION REQUIRED WITH MOTOR OPERATED VALVE ORDER:

1. Type of valve – (Butterfly Valve) (RW Gate Valve) (DD Gate Valve) (Plug Valve)

2. End connection

3. Valve size and quantity.

4. Maximum pressure against which valve will be required to operate (Maximum Differential Pressure) and flow rate in feet/sec. if available.

5. Current Characteristics (Voltage, Phase, Cycles, A.C. or D.C.).

6. Opening or Closing time in seconds or inches per minute (Standard is 12” per minute).

7. Service: Water, etc.

8. Frequency of service; regulating or intermittent duty.

9. Maximum temperature at location of valve control.

10. Type motor desired: Weather-proof, Explosion-proof, etc.

11. Type of Reversing Controller (NEMA-Class).
12. Type of Pushbutton Station (NEMA-Class) (Normally NEMA-1 or NEMA-4). (Flush or Surface mounted) Number of Push buttons or Lights- Usually 3 buttons, 2 lights).

13. Control Voltage.

14. Any special requirements such as mechanical dial position indicator, hand off automatic switch on pushbutton stations, etc.

15. Complete specification will be required with inquiry for all motor valves.
Electric actuators - Valve gearboxes
Industrial processes require automation and automation requires actuators. Reliably operating actuators are crucial to the safety and economic viability of industrial plants. However, industrial processes vary. Each industry has its specific requirements and many actuator applications require individual solutions. Applications vary between OPEN/CLOSE and modulating duty; watertight, submersible and explosionproof locations and a wide array of control system interface requirements. In order to make industrial automation possible, great flexibility is demanded of the actuator and the actuator manufacturer. For this reason, AUMA has a wide modular product range with electric multi-turn, part-turn, linear and lever actuators, as well as several different valve gearboxes. Actuator controls including micro-processor based controls and a variety of fieldbus interfaces, enable the optimal connection of the motor operated valves to the process control system. This makes it possible to find the suitable automation solution for almost every valve.

AUMA has been developing and building electric actuators and valve gearboxes for over 45 years. During that time, AUMA has acquired a know-how which cannot be surpassed. AUMA is one of the leading electric actuator manufacturers world wide. This brochure provides an overview on AUMA products and services. Detailed information can be requested from AUMA or can be found on the Internet at www.auma.com.
AUMA electric actuators are employed wherever the automation of a valve requires rotation, swivel movement, linear movement or actuation via a lever.

**Power**
- Conventional power plants (coal, gas, oil)
- Nuclear power plants
- Hydroelectric power plants
- Geothermal power plants
- Solar power plants
- Biogas power plants

**Water**
- Sewage treatment plants
- Water treatment plants
- Drinking water distribution
- Sea water desalination
- Steel construction for water resources

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

**Industrial and special solutions**
- Air conditioning
- Food industry
- Chemical/pharmaceutical industry
- Vessel and submarine shipbuilding
- Steel mills
- Paper industry
- Cement industry
- Mining industry
Multi-turn actuators
e.g. for gate valves, globe valves and sluice gates

[1] Multi-turn actuators
SA 07.2 – SA 16.2/SA 25.1 – SA 48.1
Torques from 7 to 23,600 ft lb
Speeds from 4.8 to 216 rpm

Torques up to 11,800 ft lb

Torques up to 11,800 ft lb

Torques up to 59,000 ft lb
Linear actuators

*e.g. for gate valves or globe valves*

[1] Actuator/linear thrust unit combinations SA/LE
Thrusts from 855 to 48,825 lb
Strokes up to 19.7 in
Speeds from 1 to 17 in/min

[2] For the operation of lever arrangements, the LE can be mounted on a base
Part-turn actuators

*Part-turn actuators* e.g. for butterfly valves, plug valves and ball valves

[1] Part-turn actuators SGC 04.1 – SGC 10.1
Torques from 19 to 370 ft lb
Speeds for 90° from 4 to 90 sec

[2] Part-turn actuators SG 03.3 – SG 04.3
Torques up to 46 ft lb
Speeds for 90° from 7 to 26 sec

[3] Part-turn actuators SG 05.1 – SG 12.1
Torques from 66 to 880 ft lb
Speeds for 90° from 6 to 180 sec

Torques up to 498,000 ft lb
**Lever actuators**

*e.g. for butterfly valves and part-turn dampers with lever arrangement*

[1] Actuator/lever gearbox combinations SA/GF
    Torques up to 23,600 ft lb

[2] Lever actuators SGF 05.1 – SGF 12.1
    Torques from 66 to 880 ft lb
    Speeds for 90° from 6 to 180 sec
**Actuators with controls**

Actuator controls with integral local controls are available for the actuators SA up to size 16.2 and all part-turn actuators SG. They form the optimal interface between process control and actuator.

The controls can be supplied in a variety of versions. Whether parallel control or via fieldbus, whether simple OPEN-CLOSE functionality or an integral PID control - almost every process integration imaginable is possible.

In planning, commissioning, and operation, AUMA actuator controls have a clear advantage over a separate external control wiring. The economy of integral controls has a positive impact on overall plant cost.

[1] Multi-turn actuator SA with integral controls AUMATIC
The AUMATIC is the ideal solution for OPEN - CLOSE control applications.

The microprocessor based AUMATIC offers a variety of functions from positioning to operating data logging and fieldbus control.
Part-turn actuator SGC are always equipped with integral controls. The controls are integrated into the actuator housing. Like all AUMA actuators, the SGC type range is available with parallel and fieldbus interface.

The controls cannot only be mounted directly to the actuators, but also separately on a wall bracket. This is recommended when:

- the controls and therefore also the local controls would be difficult to access,
- heavy vibrations or high temperatures within the vicinity of the valve could disturb the electronics.
Multi-turn gearboxes
for manually operated valves

[1] Spur gearboxes GST 10.1 – GST 40.1
Torques up to 11,800 ft lb
Reduction ratios from 1:1 to 22:1

[2] Bevel gearboxes GK 10.2 – GK 40.2
Torques up to 11,800 ft lb
Reduction ratios from 1:1 to 22:1

Torques up to 590 ft lb
Reduction ratio 1:1
The limit switching WSH is designed for
the remote indication of the end positions
and the valve position in a control room.
The valve position can be read locally
from a position indicator on the device.
Part-turn gearboxes
for manually operated valves

[1] Worm gearboxes GS 50.3 – GS 250.3
GS 160 – GS 500, GS 630.3
Torques up to 498,000 ft lb
Reduction ratios from 39:1 to 6,939:1
The worm gearboxes can also be supplied without end stops for multi-turn applications.

[2] Valve position indicators WSG und WGD
for indication of the valve position in a control room. The valve position indicators are mounted directly onto the worm gearboxes GS.
### For motor driven valves

<table>
<thead>
<tr>
<th>Multi-turn actuators</th>
<th>Torque or thrust</th>
<th>Speed or Operating time*</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>SA 07.2 – SA 16.2/SA 25.1 – SA 48.1</td>
<td>7 to 23,600 ft lb</td>
<td>4.8 to 216 rpm</td>
<td>Vectors for OPEN - CLOSE duty, modulating duty and explosion-proof applications</td>
</tr>
<tr>
<td>with bevel gearboxes GK 10.2 – GK 40.2</td>
<td>up to 11,800 ft lb</td>
<td>depending on reduction</td>
<td></td>
</tr>
<tr>
<td>Multi-turn actuators SA 07.2 – SA 16.2 with spur gearboxes GST 10.1 – GST 40.1</td>
<td>up to 11,800 ft lb</td>
<td>depending on reduction</td>
<td>Combinations of a smaller actuator and a gearbox are often less expensive than a large actuator</td>
</tr>
<tr>
<td>up to 59,000 ft lb</td>
<td>2 rpm – 16 rpm</td>
<td></td>
<td>e.g. for high pressure gate or globe valves with high torque requirement</td>
</tr>
<tr>
<td>Part-turn actuators SG 05.1 – SG 12.1</td>
<td>66 to 880 ft lb</td>
<td>6 to 180 sec for 90°</td>
<td>Actuator for OPEN - CLOSE duty, explosion-proof version available</td>
</tr>
<tr>
<td>Part-turn actuators SG 03.3 – SG 04.3 up to 46 ft lb</td>
<td>7 to 26 sec for 90°</td>
<td></td>
<td>Small, lightweight and inexpensive electric actuator for the automation of small OPEN-CLOSE part-turn valves</td>
</tr>
<tr>
<td>Part-turn actuators SGC 04.1 – SGC 10.1</td>
<td>19 to 310 ft lb</td>
<td>4 to 90 sec for 90°</td>
<td>Very compact actuator design. Actuator controls are integrated into the actuator housing</td>
</tr>
<tr>
<td>Multi-turn actuators SA 07.2 – SA 16.2/SA 25.1 – SA 48.1 with worm gearboxes GS 50 – GS 630</td>
<td>up to 498,000 ft lb</td>
<td>8 to 466 sec for 90°</td>
<td>Suitable for part-turn applications up to highest torque requirements</td>
</tr>
<tr>
<td>Multi-turn actuators SA 07.2 – SA 16.2 with linear thrust units LE 12.1 – LE 200.1</td>
<td>885 to 48,825 lb</td>
<td>1 to 17 in/min</td>
<td>Strokes up to 19.7 in possible</td>
</tr>
<tr>
<td>Lever actuators SGF 05.1 – SGF 12.1</td>
<td>66 to 880 ft lb</td>
<td>6 to 180 sec for 90°</td>
<td>Based on part-turn actuators SG</td>
</tr>
<tr>
<td>Multi-turn actuators SA 07.2 – SA 16.2/SA 25.1 – SA 48.1 with lever gearboxes GF 50.3 – GF 250.3</td>
<td>up to 23,600 ft lb</td>
<td>15 to 327 sec for 90°</td>
<td>Lever gearboxes based on worm gearboxes GS</td>
</tr>
</tbody>
</table>

### For manually operated valves

<table>
<thead>
<tr>
<th>Bevel gearboxes GK 10.2 – GK 40.2</th>
<th>Reductions</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>up to 11,800 ft lb</td>
<td>1:1 – 22:1</td>
<td>Displaces input orientation by 90°</td>
</tr>
<tr>
<td>Spur gearboxes GST 10.1 – GST 40.1</td>
<td>up to 11,800 ft lb</td>
<td>1:1 – 22:1</td>
</tr>
<tr>
<td>Limit switching WSH 10.2 – WSH 14.2</td>
<td>up to 590 ft lb</td>
<td>1:1</td>
</tr>
<tr>
<td>Worm gearboxes GS 50.3 – GS 250.3, GS 160 – GS 500 and GS 630.3</td>
<td>up to 498,000 ft lb</td>
<td>39:1 – 6,939:1</td>
</tr>
<tr>
<td>Valve position indicators WSG/WGD</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* For multi-turn actuators output speed, for part-turn actuators operating time for 90° movement, for linear actuators stroke speed
The reliability of actuators is crucial to the safety of entire plants. Therefore, it is imperative to choose an appropriate configuration of actuators and to optimally integrate the actuator into the process control system. Actuators are found in all industry sectors. The resulting variety of requirements makes extensive know-how necessary even in the planning stage. The careful selection of the devices is the prerequisite for smooth installation and commissioning. However, if a fault should occur during operation, it must be eliminated as soon as possible.

This defines the AUMA service concept. For this reason, AUMA offers a range of services.

**Advice via telephone/e-mail**

At AUMA, engineers assist as competent partners in every phase of the project. This means that questions can be answered quickly and plans can be finalized early in the design process. If a dimensional drawing or a wiring diagram is required at short notice, the necessary documents are quickly available via fax or email.

**Internet**

The AUMA website presentation (www.auma.com or www.auma-usa.com) offers up-to-date and extensive information around the clock. Besides general information, comprehensive documentation is available, as well. Have a look. It is well worth a visit.

**Trouble shooting, commissioning and maintenance**

To react quickly and competently to customer requirements around the globe, AUMA has established a worldwide network of subsidiaries and representatives. Optimal-ly equipped with service units and special tools, the AUMA technicians can eliminate faults efficiently.

Apart from trouble shooting, several additional services are available. The commissioning service for actuators ensures correct function right from the beginning. And with a maintenance contract, the long-term conservation of the value of AUMA products can be ensured.

**Automation/modernisation**

Valves are often still fully functional after many decades; however, the actuator technology is then no longer compatible with the new process control system and needs to be replaced. The AUMA automation centers provide everything necessary to modernize the actuator technology in an older plant - from the preparation of a quotation, the design, and production of special adapters to commissioning.
AUMA - worldwide service

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For the name and phone number of the office nearest you, call us at 724-743-2862 or visit our website at www.auma-usa.com/saleserv.htm
AUMA - the Company

AUMA has been designing and manufacturing actuators since 1964. The modular design and easy to use features of AUMA products have made them the preferred electric actuator of many plant owners and operators worldwide. The Company has sales and service facilities or representation in forty-seven countries.

In North America, AUMA Actuators, Inc. is headquartered in Canonsburg, PA. An organization of seven factory offices and over 50 independent sales agents in North America assure actuator users and specifiers that AUMA support is close to virtually any location.