KITZ KELMO® EX SERIES
Electric Actuators for Ball and Butterfly Valves

KITZ CORPORATION
Next Generation Electrical Actuator

Realization of Upgraded General-Purpose Actuators

EX SERIES

EXH: High speed actuator for ball valves.

EXS: Standard speed actuator for ball valves and butterfly valves.
The modularization and the adoption of common parts have brought significant advantage to EXS and EXH series, such as:

**Better Cost Performance**
Compared with other equivalent actuators, EXS and EXH are superior in specification and performance.

**Instant Option Availability**
EXS and EXH can be used for various applications just by instant replacement of the modules of parts and exchangeable extension circuit boards.

**Improvement of Operability and Maintenance**

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**Easiness**
In addition to modulation and adoption of common parts, the highly visible position indicator and manual handle also contribute to speedy maintenance.

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**Manual Override**
An actuator can be manually operated by the easy-to-use rotated handle. Auxiliary hexagonal wrenches will make operation easier.

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**Position Indicator**
The actuator comes with the newly visible position indicator with a transparent cover as standard.

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**Precision Adjustable Cam / Standard Auxiliary Limit Switch**
Cams are adjustable to precise position. Two auxiliary limit switches, in addition to two standard limit switches, are provided, which can be used for output signals with the voltage that users select. Two more auxiliary limit switches or a potentiometer can be added as an option. Special limit switches are available for extremely small gaps (50mA or smaller).

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**Interlock Switch**
The interlock switch will cut off power supply by being pulled it up, which will ensure safe manual operation. The manual mode can be indicated by output signal.

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**Stainless Steel Exterior Bolting**
All bolts used outside the actuator are made of stainless steel. Combined with the adoption of the fail-off/preset lugs, the actuator features high durability and reliability suitable for long service.

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**Adoption of Planetary Gear**
A planetary gear is used in the output reduction gear system, which enables to achieve high reduction ratio with compact design.
The adoption of common parts and part modularization have enabled flexible modification, which will widen the applications of the actuator.

Optional specification

Power supply
- AC110V 50/60Hz
- AC115V 50/60Hz
- AC120V 60Hz
- AC220V 50/60Hz
- AC230V 50/60Hz
- AC240V 50Hz
- AC110V/50Hz, AC120V/60Hz, AC230V/50Hz
Allowable fluctuation of supply voltage is limited within between minus 10% and plus 5% for 50Hz.

Relays
Relays (on-off by a contact) can be provided in the actuator by using extension circuit boards

Limit switch specification
Contact for Micro-load (Minute electrical current)
Two standard limit switches can be replaced by optional limit switches for micro-load (minute electrical current)

Potentiometer output
135ø (Coil type)
500ø (Coil type)

The valve opening degree is indicated by resistance value.

Auxiliary limit switch specification
- Two more additional limit switches can be added.
- Switches for micro load application are also available.
- Including four standard limit switches, total six switches can be used. (In case the potentiometer is used, four limit switches in total can be used at maximum.)

Terminal box
- G½ two conduit ports
- G½ one conduit port
- NPT½ two conduit ports
- NPT½ one conduit port
- M20 one conduit port

Terminal box with two G½ conduit port is equipped as standard for EKS type.
For EXM type, the use of the terminal box will enable the actuator to connect cables without removing the cover and to extend the actuator functions by using optional circuit boards.

Conduit port
- G½, NPT½, NPT¾, M20
### Specification

<table>
<thead>
<tr>
<th>Power Supply</th>
<th>EXH100/200-1</th>
<th>EXH100/200-2</th>
<th>EXH100/200-3</th>
<th>EXH100/200-4</th>
<th>EXH100/200-5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output Torque (N·m)</td>
<td>0.8</td>
<td>0.8</td>
<td>0.65</td>
<td>0.65</td>
<td>0.65</td>
</tr>
<tr>
<td>Rated Current (A)</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Motor Type</td>
<td>100V AC</td>
<td>200V AC</td>
<td>200V AC</td>
<td>200V AC</td>
<td>200V AC</td>
</tr>
<tr>
<td>Motor Output [W]</td>
<td>300</td>
<td>300</td>
<td>300</td>
<td>300</td>
<td>300</td>
</tr>
<tr>
<td>Reversible</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Rotating Direction</td>
<td>Clockwise and counterclockwise</td>
<td>Clockwise and counterclockwise</td>
<td>Clockwise and counterclockwise</td>
<td>Clockwise and counterclockwise</td>
<td>Clockwise and counterclockwise</td>
</tr>
<tr>
<td>Duty Factor (%E)</td>
<td>90</td>
<td>90</td>
<td>90</td>
<td>90</td>
<td>90</td>
</tr>
<tr>
<td>Valve Closing Time (SEC)</td>
<td>0.05</td>
<td>0.05</td>
<td>0.05</td>
<td>0.05</td>
<td>0.05</td>
</tr>
<tr>
<td>Space Heater Volume [m³]</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Position Limit Switch</td>
<td>Two switches with voltage and two without voltage supplied</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Switch Contact Voltage</td>
<td>250V AC 11A least resistance load</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Insulation Class</td>
<td>J/B Class 5, Strength : 1500V AC 1 min. or 1600V 1 sec. ; Resistance &gt; 100kΩ minimum at 500V DC</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>Overload Protection</td>
<td>Thermal protection</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Service Environment</td>
<td>Indoor / Outdoor (Submergence and direct sunlight must be avoided)</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Waterproof</td>
<td>Equivalent to IP-65</td>
<td></td>
<td></td>
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<tr>
<td>Ambient Temperature</td>
<td>-10°C ~ +55°C</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Conduct Port</td>
<td>EXH</td>
<td>EXH</td>
<td>EXH</td>
<td>EXH</td>
<td>EXH</td>
</tr>
<tr>
<td>Mounting Position</td>
<td>Front panel position and horizontal position (no downward position)</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Manual Operation</td>
<td>Push pull manual override handle knob for manual operation, which will activate the built-in switch to cut off power supply. For the restoration of electrical operation, push down the handle knob.</td>
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<tr>
<td>Mechanical Stopper</td>
<td>EXH</td>
<td>EXH</td>
<td>EXH</td>
<td>EXH</td>
<td>EXH</td>
</tr>
<tr>
<td>Position Indicator</td>
<td>EXH</td>
<td>EXH</td>
<td>EXH</td>
<td>EXH</td>
<td>EXH</td>
</tr>
<tr>
<td>Mounting Flange</td>
<td>In accordance with ISO22811</td>
<td></td>
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</tr>
</tbody>
</table>

### Circuit Diagram

![Circuit Diagram](image)

### Product Code

EX Series Product Code

- **Actuator size**
  - EXS : Standard speed actuator for ball valves and butterfly valves.
  - EXH : High speed actuator for ball valves.

- **Power supply**
  - 100V / AC100V
  - 200V / AC200V
**Precautions**

- Ensure to read and follow instructions of operation manual when handling the actuator introduced in this catalog.
- Handle the product carefully so that it may not fall or drop on the ground. Any extraordinary mechanical impact should be avoided.
- Avoid sifting of the product in a dust-free, low humidity and well-ventilated place is recommended.
- DO NOT remove protective cover until installation.
- DO NOT apply excessive load or stress on the product, which may damage the product or cause personal injury.
- Allow sufficient room for manual operation or the removal of the actuator cover, when the valve is installed in the pipeline.
- Where the actuator is exposed to sunlight or rainwater while in service, use appropriate protection for trouble-free operation. Also use insulation boards for heat generated from the equipment around the actuator.
- Take some appropriate measures, if the possibilities of damage by fumy atmosphere, snow or freezing are expected.
- Avoid installing the valve where the actuator may be hampered by vibration caused by equipment such as pumps or engines.
- Before installation, the connecting pipes should be cleaned to remove any foreign objects such as sand, dust or welding spatter.
- When threaded valves are screwed into pipes, apply a spinner to the ends of valves on the side of the connecting pipe being inserted.
- For flanged valves, alternately tighten bolts of the end flanges in a star pattern to ensure to fasten the flanges properly.
- The actuator should not be mounted downward in any piping orientation.
- The pipeline should be flushed to remove foreign particles from pipes.
- Cast iron or cast carbon steel valves are used in the water line, be aware that rust may develop in the valves, which may damage the ball seats, leading to operation failure. Pay extra attention on valve selection and protection from rust.
- Connect cables correctly in accordance with the circuit diagram.
- Ensure to use a terminal base when connecting cables.
- After connecting cables, conduct an insulation resistance test to ensure its insulation.
- Ensure the housing is securely sealed with such sealing materials as O-rings to prevent dust or water from entering the housing.
- DO NOT try to operate two or more actuators at the same time with only one operation switch. Other electrical equipment should not also be operated at the same time with one operation switch.
- Ensure the space heater to be activated at all the time to keep the inside of the actuator warm for the prevention of due condensation, which may result in operational malfunction.
- Ensure the actuator is powered off, when it is used for manual operation.
- Place at least one-second interval, when the direction of operation is reversed. Failure to follow this instruction may result in operation malfunction.
- DO NOT make any unauthorized modifications. Such modifications may result in causing a troubled operation or accidents. We shall not be responsible for any troubles or accidents caused by improper use of the products.
- Refer to our catalogs for more details on valve information.

**WARNING**

This product is not designed for explosion-proof. DO NOT use it in any inflammable or corrosive gaseous environment. Also DO NOT use it for handling inflammable fluid.
- DO NOT disassemble the actuator while the unit is being energized.
- DO NOT put your fingers or insert any foreign objects within the valve core before or during valve operation.

**CAUTION**

Technical data published in this catalog have been developed from our design calculation, in-house testing, field reports provided by our customers and/or published official standards or specifications.

They are good only to cover typical applications as a general guideline to users of KITZ products introduced in this catalog.

For any specific application, users are kindly requested to contact KITZ Corporation for technical advice, or to carry out their own study and evaluation for providing suitability of these products to such an application. Failure to follow this request could result in property damage and/or personal injury, for which we shall not be liable.

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*ISO 9001 certified since 1989*

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