M6410C/L, M7410C
Small 3-Position Linear Valve Actuators

GENERAL
The Honeywell M6410C/L and M7410C actuators are specifically designed to provide floating control together with the V5822/23, V5832/33, V5825B, and VSMF series of small linear valves. These actuators are used in fan-coil-units, induction units, small reheaters and recoolers, and for zone control applications. They are employed in electronic temperature control systems using hot and/or cold water as the controlled medium.

The M6410C/L and M7410C actuators are suitable for Honeywell Excel series controllers as well as for Honeywell individual room temperature controllers. These controllers track the precise valve position by counting the number of individual control pulses which move the valve from one position to another. For this reason, the actuators do not need end switches or a feedback potentiometer. The absence of these mechanical components ensures long-term reliability.

The actuators are also compatible with any controller providing intelligent position control and having a built-in shut-off function.

These actuators are well suited for applications where space is limited and minimum power consumption is required. The actuators are both attractive and robust in design.

FEATURES
- Small size allows installation where space is limited
- Low power consumption
- Reliable long-term operation because mechanical feedback potentiometers and mechanical end switches are not required
- Magnetic coupling for stem force limitation and self-adjustment of the close-off-point
- Reversible synchronous AC motor
- Suitable for three-position modulating control without proportional feedback
- Supplied with pre-wired connection cable
- Simple, standardized valve/actuator coupling; no tools required for mounting
- Visual valve position indicator furnished with actuators
- Manual operation provided by the valve adjustment cap, extra knob, or with a hexagon key
- Auxiliary switch

SPECIFICATIONS
Motor
Input voltage 24 Vac +10%/-20%; 50/60 Hz
230 Vac +10%/-15%; 50/60 Hz
Power consumption 0.7 VA (24-V models)
7.0 VA (230-V models)*
Control mode floating
Stroke 6.5 mm
Running time 150 s at 50 Hz, 125 s at 60 Hz
Stem force version-dependent (see Table 1)
Protection standard IP 43 as per EN60529
Insulation class II/III, depending on type (as per EN 60730)
Connection cables 1.5 m
Ambient operating limits 0…60 °C
Medium valve temp. max. 120 °C
Weight 0.4 kg
Suitable valves Select in accordance with stem force; see Table 1
Manual operation see Table 1
*The controller output stage of 230-V models must be suitable for voltage peaks of up to 800 volts.

Auxiliary Switches
Ratings 5...24 V, max. 100 mA
24...230 Vac, max 3 (1) A
Switch position S1 (fixed): 17.8 ± 0.2 mm
(factory-supplied) S2 (adjustable): 11.7 ± 0.2 mm
OPERATION
The actuator is moved by a screw spindle driven in both directions, through a set of gears, by a synchronous motor. A magnetic clutch limits the torque of the gear assembly and the driving force of the actuator.

Table 1. Versions

<table>
<thead>
<tr>
<th>version</th>
<th>power supply</th>
<th>manual operation</th>
<th>stem force</th>
<th>aux. switch S1</th>
<th>aux. switch S2</th>
<th>housing type</th>
<th>OS number</th>
</tr>
</thead>
<tbody>
<tr>
<td>standard</td>
<td>24 Vac</td>
<td>provided by valve adj. cap</td>
<td>180 N</td>
<td>--</td>
<td>--</td>
<td>A</td>
<td>M7410C1007</td>
</tr>
<tr>
<td></td>
<td>24 Vac</td>
<td></td>
<td>300 N</td>
<td>--</td>
<td>--</td>
<td>B</td>
<td>M7410C1015</td>
</tr>
<tr>
<td>with manual operation</td>
<td>24 Vac</td>
<td>integrated</td>
<td>180 N</td>
<td>--</td>
<td>--</td>
<td>C</td>
<td>M6410C2023</td>
</tr>
<tr>
<td></td>
<td>24 Vac</td>
<td></td>
<td>300 N</td>
<td>--</td>
<td>--</td>
<td>C</td>
<td>M6410C2031</td>
</tr>
<tr>
<td></td>
<td>230 Vac</td>
<td></td>
<td>180 N</td>
<td>--</td>
<td>--</td>
<td>C</td>
<td>M6410L2023</td>
</tr>
<tr>
<td></td>
<td>230 Vac</td>
<td></td>
<td>300 N</td>
<td>--</td>
<td>--</td>
<td>C</td>
<td>M6410L2031</td>
</tr>
<tr>
<td>with manual operation and aux.</td>
<td>24 Vac</td>
<td>integrated</td>
<td>180 N</td>
<td>X</td>
<td>X</td>
<td>C</td>
<td>M6410C4029</td>
</tr>
<tr>
<td>switches</td>
<td>24 Vac</td>
<td></td>
<td>300 N</td>
<td>X</td>
<td>X</td>
<td>C</td>
<td>M6410C4037</td>
</tr>
<tr>
<td></td>
<td>230 Vac</td>
<td></td>
<td>180 N</td>
<td>X</td>
<td>X</td>
<td>C</td>
<td>M6410L4029</td>
</tr>
<tr>
<td></td>
<td>230 Vac</td>
<td></td>
<td>300 N</td>
<td>X</td>
<td>X</td>
<td>C</td>
<td>M6410L4037</td>
</tr>
</tbody>
</table>

MOUNTING
The actuator may be mounted only beside or above the valve. Adjust the valve to the correct position before mounting.

Before the actuator is fixed to the valve, remove the adjustment cap (Fig. 2). Ensure that the actuator is in the retract (factory-supplied) position before fixing the actuator to the valve body.

Fig. 1. Mounting positions

Fig. 2. Remove protection cap

The actuator must be mounted by hand. Do not use tools or additional force as this may damaged actuator and valve.

ELECTRIC WIRING OF MOTOR
A fuse with a contact gap of at least 3 mm for each pole must be fitted with the fixed installation. The fuse rate is max. 2 A. The electrical installation must comply with Fig. 4.

Fig. 3. Mounting the actuator

Fig. 4. Electric wiring of motor
CABLE COLORS FOR 24-V MODELS (M6410C, M7410C)

<table>
<thead>
<tr>
<th>COM</th>
<th>WHITE</th>
<th>GREEN</th>
<th>BROWN</th>
</tr>
</thead>
</table>

CABLE COLORS FOR 230-V MODELS (M6410L)

<table>
<thead>
<tr>
<th>WORKING PORT A</th>
</tr>
</thead>
<tbody>
<tr>
<td>V58x2A (DN15, DN20)</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>V5832B (DN25-DN40), VSMF, V5825B</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>DN15-DN40</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>DN15, DN20</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

Fig. 5. Cable colors, valve action

MANUAL OPERATION
The actuators with integrated manual operation (see Table 1) feature a hexagonal key hole for manual operation. For more comfort, an additional knob for manual adjustment is packed separately. To avoid damaging the valve, separate the actuator from the power supply before adjusting manually.

Fig. 6. Manual operation

COMMISSIONING
A functional check of the valve actuator can be carried out by changing the controller setpoint by 5 °C or more. The resultant movement of the actuator stem (Fig. 7) indicates whether the valve is opening or closing.

Fig. 7. Movement of the actuator stem

AUXILIARY SWITCHES
The actuators with the OS-number M*****40** feature two auxiliary switches, each with its own cable. Auxiliary switch S1 switches when the stem reaches its fixed switchpoint. Auxiliary switch S2 switches when the stem reaches its adjustable switchpoint.

Fig. 8. Auxiliary switch cables

Adjustment of Auxiliary Switch 2
Auxiliary switch 2 should be adjusted by skilled personnel, only.
Move the actuator to the position where the switch is to be tripped. Cut the plastic skin with a sharp knife. The adjustment screw is accessible below the skin. First turn the screw clockwise until the end stop is reached. Then turn the screw counterclockwise until the switch point is achieved. To check that the required position has been set, move the actuator. Finally, seal the adjustment hole with a piece of tape.

Fig. 9. Adjustment of auxiliary switch S2
Electric Wiring of Auxiliary Switches

The electrical installation must comply with Fig. 10. If the auxiliary switch is connected to 230 Vac, a switch with a contact gap of at least 3 mm for each pole must be fitted with the installation.

Application Example: Switching Off an Electrical Appliance

2-Way-Valve (N.O.), S2

All Other Valves (N.C.), S1

dimensions (mm)

HOUSING TYPE 'A'

HOUSING TYPE 'B'

HOUSING TYPE 'C'

Fig. 10. Electric wiring of auxiliary switch

Fig. 12. Application example of auxiliary switch

Fig. 13. Application example of auxiliary switch

Fig. 11. Cable colors, valve action

Fig. 14. Housing types