Magnetic Valves use magnetic actuation to enhance response time and provide stability. Large signal changes switch the actuator to the large signal band, allowing high-gain response to quickly position the valve element. Small signal changes switch the actuator to the small signal band to provide loop stability and precise positioning.

**Note:** To use any current magnetic valve with phase cut control signal use SEZ91.6 signal converter.
Save trees with paperless invoicing

Once your order has been shipped, an invoice will be sent to you via e-mail, so you can conserve paper while avoiding the hassles of paperwork.
Control Valves for Hot and Chilled Water

Description
The Magnetic MX.. Mixing Valve uses magnetic actuation to enhance response time and provide stability. Large signal changes switch the actuator to the large signal band, allowing high-gain response to quickly position the valve element. Small signal changes switch the actuator to the small signal band to provide loop stability and precise positioning.

Features
- Fast positioning time (< 2 seconds)
- 1000:1 resolution
- Magnetic actuation
- No periodic maintenance
- Manual override
- Auto calibration
- Dip switch selectable signal input (0 to 10 V or 4 to 20 mA)
- Dip switch selectable flow characteristic
- Built-in position feedback

Applications
The Magnetic MX.. Mixing Valve is designed for modulating control of chilled water and low-pressure hot water and is well suited for HVAC systems.

The valves can be configured for straight-through or 3-way applications and can be used in closed loop applications. Valves are shipped with NPT screwed fittings. A flanged version is also available in the 2-1/2" line size.

Application Drawing

Hydraulic Circuits.

Key
A  Mixing circuit
B  Mixing circuit with bypass (underfloor heating)
C  Injection circuit
D  Diverting circuit
E  Injection circuit with straight-through valve
Magnetic Control Valve Specifications

Type of Operation ......................................................... Modulating
Positioning Time ......................................................... < 2 sec.
Ambient Temperature .............................................. 23 to 113°F (-5 to +45°C)
Valve Body Material .................................................... Cast Iron
Seat/Inner Valve Material ........................................ Brass/steel
Permissible Operating Pressure .................................. 150 psi
Leakage
A→AB ........................................................................ Max. 0.02% Cv
B→AB ........................................................................ Max. 0.2% Cv

Media Temperature ......................................................... 34 to 266°F (1 to 130°C)
Valve Flow Characteristic ............................................. Linear or Equal Percentage
Resolution ................................................................. 1000:1
Mounting Position ...................................................... Upright to horizontal

Sizing

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Line Size (in.)</th>
<th>C_v (gpm)</th>
<th>( \Delta P_{\text{max}} ) (psi)</th>
<th>Max. Close-off Pressure (psi)</th>
<th>( S_{\text{NA}} ) (VA)</th>
<th>( P_{\text{med}} ) (W)</th>
<th>I_{\text{rel}} ) (A)</th>
<th>Wire Gauge</th>
</tr>
</thead>
<tbody>
<tr>
<td>MXG461.15-0.6U</td>
<td>1/2</td>
<td>0.7</td>
<td>44</td>
<td>3</td>
<td>29</td>
<td>5</td>
<td>3.15</td>
<td></td>
</tr>
<tr>
<td>MXG461.15-1.5U</td>
<td>1/2</td>
<td>1.7</td>
<td>44</td>
<td>3</td>
<td>29</td>
<td>5</td>
<td>3.15</td>
<td></td>
</tr>
<tr>
<td>MXG461.15-3.0U</td>
<td>1/2</td>
<td>3.5</td>
<td>44</td>
<td>3</td>
<td>29</td>
<td>5</td>
<td>3.15</td>
<td></td>
</tr>
<tr>
<td>MXG461.20-5.0U</td>
<td>3/4</td>
<td>5.8</td>
<td>44</td>
<td>3</td>
<td>29</td>
<td>5</td>
<td>3.15</td>
<td></td>
</tr>
<tr>
<td>MXG461.25-8.0U</td>
<td>1</td>
<td>9.3</td>
<td>44</td>
<td>3</td>
<td>29</td>
<td>5</td>
<td>3.15</td>
<td></td>
</tr>
<tr>
<td>MXG461.32-12U</td>
<td>1-1/4</td>
<td>14.0</td>
<td>44</td>
<td>3</td>
<td>29</td>
<td>5</td>
<td>3.15</td>
<td></td>
</tr>
<tr>
<td>MXG461.40-20U</td>
<td>1-1/2</td>
<td>23.0</td>
<td>44</td>
<td>3</td>
<td>44</td>
<td>6</td>
<td>4.00</td>
<td></td>
</tr>
<tr>
<td>MXG461.50-30U</td>
<td>2</td>
<td>35.0</td>
<td>44</td>
<td>3</td>
<td>44</td>
<td>6</td>
<td>4.00</td>
<td></td>
</tr>
<tr>
<td>MXF461.65-50U</td>
<td>2-1/2</td>
<td>58.0</td>
<td>44</td>
<td>3</td>
<td>44</td>
<td>6</td>
<td>5.00</td>
<td></td>
</tr>
</tbody>
</table>

All data relates to a supply of 24 Vac.

Key
\( \Delta P_{\text{max}} \) Maximum permissible differential pressure across the valve’s control path, valid for the entire actuating range of the motorized valve.
\( S_{\text{NA}} \) Nominal apparent power for selecting transformer
\( P_{\text{med}} \) Typical power consumption
I_{\text{rel}} Required slow fuse
C_v Flow rate to IEC534-2-4
L Maximum cable length. With four-wire connections, the maximum permissible length of the separate 16 AWG Cu (copper) signal cable is 656 feet. With three wire connections, the maximum permissible cable length is reduced to 1/3 of the values shown in the table.
1 All data relates to a 24 Vac supply.

MX.. Valves with Electronics Module Product Ordering

<table>
<thead>
<tr>
<th>Valve Size</th>
<th>Cv</th>
<th>Part No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>NPT Union</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1/2&quot;</td>
<td>0.7</td>
<td>MXG461.15-0.6U</td>
</tr>
<tr>
<td>1/2&quot;</td>
<td>1.8</td>
<td>MXG461.15-1.5U</td>
</tr>
<tr>
<td>1/2&quot;</td>
<td>3.5</td>
<td>MXG461.15-3.0U</td>
</tr>
<tr>
<td>3/4&quot;</td>
<td>5.9</td>
<td>MXG461.20-5.0U</td>
</tr>
<tr>
<td>1&quot;</td>
<td>9.4</td>
<td>MXG461.25-8.0U</td>
</tr>
<tr>
<td>1-1/4&quot;</td>
<td>14.0</td>
<td>MXG461.32-12U</td>
</tr>
<tr>
<td>1-1/2&quot;</td>
<td>23.4</td>
<td>MXG461.40-20U</td>
</tr>
<tr>
<td>2&quot;</td>
<td>35.1</td>
<td>MXG461.50-30U</td>
</tr>
</tbody>
</table>

Flanged

| 2-1/2" | 58.2 | MXF461.65-50U* |

Table Note:
*No blanking flange

Accessories & Service Kits

www.usa.siemens.com/hvac
### Dimensions and Weights

**MX461...U Valves with Electronics Module**

Dimensions shown in inches (mm).

<table>
<thead>
<tr>
<th>Part No.</th>
<th>DI</th>
<th>DA</th>
<th>L</th>
<th>L1</th>
<th>L2*</th>
<th>H</th>
<th>E</th>
<th>F</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>MXG461.15-0.U</td>
<td>1/2</td>
<td>1</td>
<td>3.15 (80)</td>
<td>1.67 (42.5)</td>
<td>2.01 (51)</td>
<td>9.45 (240)</td>
<td>3.15 (80)</td>
<td>3.94 (100)</td>
<td>8.4 (3.8)</td>
</tr>
<tr>
<td>MXG461.15-1.U</td>
<td>1/2</td>
<td>1</td>
<td>3.15 (80)</td>
<td>1.67 (42.5)</td>
<td>2.01 (51)</td>
<td>9.45 (240)</td>
<td>3.15 (80)</td>
<td>3.94 (100)</td>
<td>8.4 (3.8)</td>
</tr>
<tr>
<td>MXG461.15-3.U</td>
<td>1/2</td>
<td>1</td>
<td>3.15 (80)</td>
<td>1.67 (42.5)</td>
<td>2.01 (51)</td>
<td>9.45 (240)</td>
<td>3.15 (80)</td>
<td>3.94 (100)</td>
<td>8.4 (3.8)</td>
</tr>
<tr>
<td>MXG461.20-5.U</td>
<td>3/4</td>
<td>1-1/4</td>
<td>3.74 (95)</td>
<td>2.07 (52.5)</td>
<td>2.40 (51)</td>
<td>10.24 (260)</td>
<td>3.15 (80)</td>
<td>3.94 (100)</td>
<td>9.3 (4.2)</td>
</tr>
<tr>
<td>MXG461.25-8.U</td>
<td>1</td>
<td>1-1/2</td>
<td>4.33 (110)</td>
<td>2.22 (56.5)</td>
<td>2.56 (65)</td>
<td>10.63 (270)</td>
<td>3.15 (80)</td>
<td>3.94 (100)</td>
<td>10.4 (4.7)</td>
</tr>
<tr>
<td>MXG461.32-12.U</td>
<td>1-1/4</td>
<td>2</td>
<td>4.92 (125)</td>
<td>2.66 (67.5)</td>
<td>2.99 (76)</td>
<td>11.22 (285)</td>
<td>3.15 (80)</td>
<td>3.94 (100)</td>
<td>12.3 (5.6)</td>
</tr>
<tr>
<td>MXG461.40-20.U</td>
<td>1-1/2</td>
<td>2-1/4</td>
<td>5.51 (140)</td>
<td>3.17 (80.5)</td>
<td>3.70 (94)</td>
<td>12.60 (320)</td>
<td>3.94 (100)</td>
<td>4.72 (120)</td>
<td>20.5 (9.3)</td>
</tr>
<tr>
<td>MXG461.50-30.U</td>
<td>2</td>
<td>2-3/4</td>
<td>6.69 (170)</td>
<td>3.68 (93.5)</td>
<td>4.29 (109)</td>
<td>13.39 (340)</td>
<td>3.94 (100)</td>
<td>4.72 (120)</td>
<td>26.2 (11.9)</td>
</tr>
</tbody>
</table>

**Table Note:**

*When used as a straight-through valve*
Dimensions and Weights

MX.461...U Flanged Valves with Electronics Module

Dimensions shown in inches (mm).

<table>
<thead>
<tr>
<th>Part No.</th>
<th>L</th>
<th>L1</th>
<th>D</th>
<th>b</th>
<th>k</th>
<th>d 4X</th>
<th>H</th>
<th>E</th>
<th>F</th>
<th>Weight</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>MXF461.65-50U</td>
<td>11.42 (290)</td>
<td>4.92 (125)</td>
<td>7.00 (177.8)</td>
<td>0.88 (22.4)</td>
<td>5.50 (139.7)</td>
<td>0.75 (19.05)</td>
<td>15.43 (392)</td>
<td>3.15 (80)</td>
<td>3.94 (100)</td>
<td>63.1 (28.6)</td>
<td></td>
</tr>
</tbody>
</table>
The Magnetic M3P..FY Mixing Valve is designed for modulating control of chilled water and low-pressure hot water, especially in HVAC systems. The valves are also configured for straight-through applications. The valves may be shipped with flanged fittings: 2BN is two-way with Companion Flange Kit, and 3BN is three-way with Companion Flange Kit. The valves are used in closed loop applications.

**Description**

The Magnetic M3P..FY Mixing Valve is used to enhance response time and provide stability. Large signal changes switch the actuator to the large-signal band, allowing high gain response to quickly position the valve element. Small signal changes switch the actuator to the small-signal band to provide loop stability and precise positioning.

**Features**

- Fast positioning time (< 1 second)
- >1000:1 resolution
- Magnetic actuation
- No periodic maintenance
- Manual override
- Built-in position control and feedback
- Low friction, heavy-duty and maintenance free

**Applications**

The Magnetic M3P..FY Mixing Valve is designed for modulating control of chilled water and low-pressure hot water, especially in HVAC systems. The valves are also configured for straight-through applications. The valves may be shipped with flanged fittings: 2BN is two-way with Companion Flange Kit, and 3BN is three-way with Companion Flange Kit. The valves are used in closed loop applications.

**Diagram**

Block Diagram of Signal Converter.

**Key**

E Phase cut converter  
G Bridge rectifier  
M Magnetic Valve  
Q Phase cut output  
R Input resistor 50K Ohms  
T Voltage/current converter (load on 250 Ohms to NS)  
U Position/Voltage converter  
V Differential amplifier
M3P...FY Valves Specifications

Type of Operation ......................................................... Modulating
Positioning Time ............................................................... ≤ 1 sec.
Ambient Temperature ..................................................... 35 to 122°F (2 to 50°C)
Valve Body Material ....................................................... Cast Iron
Seat/Inner Valve Material ................................................ Chrome/Nickel Steel
Max. Body Pressure ......................................................... 230 psi
Leakage (at 14.5 psi (1 bar))
1 → 3 ........................................................................... Max. 0.03% Cv
2 → 3 ............................................................................... Approx. 2% Cv

Media Temperature ........................................... 36 to 248°F (2 to 120°C)
Valve Flow Characteristic ........................................ Linear
Valve Stem Seal Material .................................................. O-ring
Resolution ......................................................................... 1000:1
Mounting Position ......................................................... Upright to horizontal

Sizing

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Valve Size (in.)</th>
<th>C_v (gpm)</th>
<th>△ P_v max (psi)</th>
<th>P_h (VA)</th>
<th>P_med (VA)</th>
<th>Wire Gauge (AWG)</th>
</tr>
</thead>
<tbody>
<tr>
<td>M3P80FY</td>
<td>3</td>
<td>93</td>
<td>44</td>
<td>3</td>
<td>80</td>
<td>16, 14, 12</td>
</tr>
<tr>
<td>M3P100FY</td>
<td>4</td>
<td>152</td>
<td>29</td>
<td>2</td>
<td>120</td>
<td></td>
</tr>
</tbody>
</table>

Key

△ P_v max Max. admissible pressure differential/Close-off Pressure
C_v Flow rate
P_h Nominal power
P_med Mean operating power

M3P...FY Valves with ZM Module

Product Ordering

<table>
<thead>
<tr>
<th>Description</th>
<th>C_v</th>
<th>Part No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Without Flanges</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3&quot; 3-way, Pilot Position</td>
<td>93</td>
<td>M3P80FY</td>
</tr>
<tr>
<td>4&quot; 3-way, Pilot Position</td>
<td>152</td>
<td>M3P100FY</td>
</tr>
<tr>
<td>With Flanges</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3&quot; 2-way, Pilot Position</td>
<td>93</td>
<td>M3P80FY/2BN</td>
</tr>
<tr>
<td>4&quot; 2-way, Pilot Position</td>
<td>152</td>
<td>M3P100FY/2BN</td>
</tr>
<tr>
<td>3&quot; 3-way, Pilot Position</td>
<td>93</td>
<td>M3P80FY/3BN</td>
</tr>
<tr>
<td>4&quot; 3-way, Pilot Position</td>
<td>152</td>
<td>M3P100FY/3BN</td>
</tr>
</tbody>
</table>

Table Note:

*No blanking flange

Accessories & Service Kits
# Dimensions and Weights

## M3P..FY Control Valve

Dimensions shown in inches (mm).

### Dimensions and Weights

<table>
<thead>
<tr>
<th>Part No.</th>
<th>L</th>
<th>L1</th>
<th>D</th>
<th>b</th>
<th>k</th>
<th>d</th>
<th>H</th>
<th>E</th>
<th>F</th>
<th>Weight lb. (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>M3P80FY</td>
<td>12.20 (310)</td>
<td>5.51 (140)</td>
<td>7.87 (200)</td>
<td>0.87 (22)</td>
<td>6.30 (160)</td>
<td>8x 0.71 (8x18)</td>
<td>20.00 (508)</td>
<td>5.71 (145)</td>
<td>4.88 (124)</td>
<td>100.0 (45.5)</td>
</tr>
<tr>
<td>M3P100FY</td>
<td>13.78 (350)</td>
<td>6.30 (160)</td>
<td>8.66 (220)</td>
<td>0.94 (24)</td>
<td>7.09 (180)</td>
<td>8x 0.71 (8x18)</td>
<td>22.44 (570)</td>
<td>5.71 (145)</td>
<td>4.88 (124)</td>
<td>130.0 (59.0)</td>
</tr>
</tbody>
</table>

**Table Notes:**
Counter flanges are not supplied. Flange dimensions to DIN2533, PIN16
FREE Valve Tagging

Perfect for large and complex jobs! Simply specify each valve’s location when placing your initial order and we will tag them before shipping, saving you time and expense. And, use the online order form to place orders easily — once you enter a valve or valve actuator part number, a text box accepts tag information.

Try out this FREE service today. Give us a call at 1-888-593-7876 or visit us online at www.usa.siemens.com/buildingtechnologiesonlineordering
Modulating Control Valves

with Magnetic Actuators, Positioning Control and Position Feedback for Hot Water and Steam

Description

MVF461H Series Modulating Control Valves are control valves with magnetic actuators, for modulating control of hot water, high temperature hot water, and steam.

Features

- Fast positioning time (< 2 seconds)
- Selectable valve characteristic: Equal percentage or linear
- Selectable standard interface: 0/2 to 10 Vdc or 0/4 to 20 mA
- High resolution (>1:1000)
- High rangeability
- Wear-free inductive stroke measurement
- Spring return A-AB closed when de-energized
- Positioning control and position feedback signal
- Low-friction, heavy-duty and maintenance-free

Applications

The MVF461H... Control Valves are through-port valves with magnetic actuators. The actuator is equipped with an electronics module for positioning control and position feedback. If the power is off, the valve control path A-AB is closed.

The short positioning time, high resolution and high rangeability make these valves ideal for proportional control of district heating stations, and heating applications using high temperature hot water and steam.
MVF461H Modulating Control Valve Specifications

Electrical
Low-voltage Use Only ..................................................Class 2 (SELV, PELV)
24 Vac
Operating Voltage ....................................................24 Vac +20/-15%
Frequency .................................................................45 to 65 Hz
Typical Power Consumption ........................................See Sizing Table
Standby ......................................................................<1 W (valve fully closed)
Nominal Apparent Power ..............................................See Sizing Table
Suitable Fuse ................................................................Slow
24 Vdc
Operating Voltage ......................................................20 to 30 Vdc

Functional Data of Actuator
Input
Positioning Signal Y ....................................................0/2 to 10 Vdc, 0/4 to 20mA
Impedance
0/2 to 10 Vdc ..............................................................100 kΩ/5nF
0/4 to 20 mA ..............................................................240 kΩ/5nF

Forced Control
Impedance ......................................................................22 kΩ
Closing the Valve (Z connected to G0) ..........................<1 Vac; <0.8 Vdc
Opening the valve (Z connected to G0) .........................> 6 Vac; >5 Vdc
No Function (Z not wired) ..............................................Positioning signal Y active

Output
Position Feedback Signal Voltage ..............................0/2 to 10 Vdc;
Load resistance > 500Ω
Current ........................................................................0/4 to 20 mA;
Load resistance < 500Ω
Stroke Measurement ....................................................Inductive
Nonlinearity ...............................................................±3% of end value

Functional Data of Valve
Nominal Pressure .........................................................ANSI 125 (PN 16)
Perm. Operating Pressure1 ...........................................Water up to 248°F (120°C)
232 psi (16 bar)
Water above 248°F (120°C); 188 psi (13 bar)
Saturated steam; 130 psi (9 bar)

Pressure Differential \( \Delta p_{\text{max}}/\Delta p_{S} \)..........................145 psi (10 bar)
Leakage at \( \Delta p = 0.1 \text{ MPa (1 bar)} \) .........................A ➔ AB Maximum 0.05% CV

Media Temperature .....................................................34 to 356°F (>1 to 180°C)

Valve Characteristic2 ..................................................Equal percentage or linear, optimized near the closing point

Type of Operation .......................................................Modulating
Position when De-energized ........................................A ➔ AB closed
Orientation .................................................................Upright to horizontal
Positioning Time .........................................................< 2 seconds

Materials
Valve Body ....................................................................Modular Cast Iron
Cover Flange .................................................................Modular Cast Iron
Seat/Inner Valve ..........................................................Stainless Steel
Valve Stem Seal ...........................................................EPDM (O-ring)

Electrical Connections
Cable Entries .............................................................3 x M20 x 1.5 or PG13.5/G1/2
Connection Terminals ..............................................Screw terminals for up to 12 AWG wires
Min. cross-sectional area 4) 0.75 mm²

Ambient Conditions
Temperature
Operation and Storage ..............................................23 to 113°F (-5 to +45°C)
Transport ....................................................................-13 to +158°F (-25 to +70°C)
Humidity ......................................................................5 to 95% RH, non-condensing

Agency Approvals
Conforms to CE requirements
UL 873
Certified to Canadian standard C22.2
No. 24
C-Tick N-474
PED 97/23/EC: pressure-carrying parts Par. 1,
section. 2.1.4 / Par. 3, section 3Fluid group 2

Notes
1Tested at 1.5 x PN (24 bar), similar to DIN 3230-3
2Can be selected via DIP switch.
3In case of strong vibrations, use high-flex stranded wires.

Sizing

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Line Size (in.)</th>
<th>( C_{v} ) (gpm)</th>
<th>( \Delta p_{S} ) (psi)</th>
<th>( \Delta p_{\text{max}} ) (bar)</th>
<th>( S_{\text{NA}} ) (VA)</th>
<th>( P_{\text{med}} ) (W)</th>
<th>( I_{n} ) Fuse</th>
<th>Wire Gauge (AWG)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MFV461H15-0.6</td>
<td>1/2</td>
<td>0.7</td>
<td>145</td>
<td>145</td>
<td>33</td>
<td>15</td>
<td>3.15</td>
<td>130 215 360</td>
</tr>
<tr>
<td>MFV461H15-1.5</td>
<td>1/2</td>
<td>1.8</td>
<td>145</td>
<td>145</td>
<td>33</td>
<td>15</td>
<td>3.15</td>
<td>130 215 360</td>
</tr>
<tr>
<td>MFV461H15-3</td>
<td>1/2</td>
<td>3.5</td>
<td>145</td>
<td>145</td>
<td>33</td>
<td>15</td>
<td>3.15</td>
<td>130 215 360</td>
</tr>
<tr>
<td>MFV461H20-5</td>
<td>3/4</td>
<td>5.9</td>
<td>145</td>
<td>145</td>
<td>33</td>
<td>15</td>
<td>3.15</td>
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<td>26</td>
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<td>65 100 165</td>
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Key

- \( \Delta p_{\text{max}} \): Maximum permissible differential pressure across the valve’s control path, valid for the entire actuating range of the motorized valve (maximum recommended operating differential pressure)
- \( \Delta p_{S} \): Maximum permissible differential pressure at which the motorized valve will close securely against the pressure (close-off pressure)
- \( S_{\text{NA}} \): Nominal apparent power for selecting the transformer
- \( P_{\text{med}} \): Average true power
- \( I_{n} \): Slow fuse (mandatory)
- \( C_{v} \): Nominal flow rate of cold water 41 to 86°F (5 to 30°C)
- \( L \): Maximum cable length. With four-wire connections the maximum permissible length of the separate 14 AWG Cu signal cable is 656 feet (200 m)

Accessories & Service Kits

www.usa.siemens.com/hvac
# MVF461H Modulating Control Valve

## Product Ordering

<table>
<thead>
<tr>
<th>Valve Size (in)</th>
<th>Cv</th>
<th>Part No.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Without Flanges</strong></td>
<td></td>
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<tr>
<td>1/2</td>
<td>0.7</td>
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<td>1/2</td>
<td>1.8</td>
<td>MVF461H15-1.5</td>
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<td>1/2</td>
<td>3.5</td>
<td>MVF461H15-3</td>
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<td>3/4</td>
<td>5.9</td>
<td>MVF461H20-5</td>
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<td>9.4</td>
<td>MVF461H25-8</td>
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<td>1-1/4</td>
<td>14.0</td>
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<td>23.3</td>
<td>MVF461H40-20</td>
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<td>MVF461H50-30</td>
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<td><strong>With NPT Flanges</strong></td>
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<td>MVF461H15-3-N</td>
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<td>3/4</td>
<td>5.9</td>
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</tr>
<tr>
<td>1-1/4</td>
<td>14.0</td>
<td>MVF461H32-12-N</td>
</tr>
<tr>
<td>1-1/2</td>
<td>23.3</td>
<td>MVF461H40-20-N</td>
</tr>
<tr>
<td>2</td>
<td>35.0</td>
<td>MVF461H50-30-N</td>
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<td><strong>With Weld Flanges</strong></td>
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<td>1/2</td>
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<td>1/2</td>
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<td>5.9</td>
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<td>14.0</td>
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<td>35.0</td>
<td>MVF461H50-30-W</td>
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</tbody>
</table>

## Ordering Notes

- When placing an order, specify the quantity, product number and description.
  
  **Example:** 1 MVF461H15-0.6 valve
- The valve body and magnetic actuator assemblies cannot be separated.
## Dimensions and Weights

Dimensions shown in inches (mm).

### Table of Dimensions and Weights

<table>
<thead>
<tr>
<th>Part No.</th>
<th>DN</th>
<th>L</th>
<th>D</th>
<th>D2</th>
<th>B</th>
<th>K</th>
<th>H</th>
<th>E</th>
<th>F</th>
<th>Weight</th>
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</thead>
<tbody>
<tr>
<td>MVF461H15-0.6</td>
<td>15</td>
<td>5.12 (130)</td>
<td>3.74 (95)</td>
<td>0.16x0.55 (4x14)</td>
<td>0.55 (14)</td>
<td>2.56 (65)</td>
<td>13.4 (340)</td>
<td>3.15 (80)</td>
<td>4.53 (115)</td>
<td>18.3 (8.3)</td>
</tr>
<tr>
<td>MVF461H15-1.5</td>
<td>15</td>
<td>5.12 (130)</td>
<td>3.74 (95)</td>
<td>0.16x0.55 (4x14)</td>
<td>0.55 (14)</td>
<td>2.56 (65)</td>
<td>13.4 (340)</td>
<td>3.15 (80)</td>
<td>4.53 (115)</td>
<td>18.3 (8.3)</td>
</tr>
<tr>
<td>MVF461H15-3</td>
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<td>5.12 (130)</td>
<td>3.74 (95)</td>
<td>0.16x0.55 (4x14)</td>
<td>0.55 (14)</td>
<td>2.56 (65)</td>
<td>13.4 (340)</td>
<td>3.15 (80)</td>
<td>4.53 (115)</td>
<td>18.3 (8.3)</td>
</tr>
<tr>
<td>MVF461H20-5</td>
<td>20</td>
<td>5.91 (150)</td>
<td>4.13 (105)</td>
<td>0.16x0.55 (4x14)</td>
<td>0.63 (16)</td>
<td>2.95 (75)</td>
<td>13.3 (339)</td>
<td>3.15 (80)</td>
<td>4.53 (115)</td>
<td>19.6 (8.9)</td>
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<tr>
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<td>25</td>
<td>6.30 (160)</td>
<td>4.53 (115)</td>
<td>0.16x0.55 (4x14)</td>
<td>0.63 (16)</td>
<td>3.35 (85)</td>
<td>13.6 (346)</td>
<td>3.15 (80)</td>
<td>4.53 (115)</td>
<td>22.1 (10.0)</td>
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<tr>
<td>MVF461H32-12</td>
<td>32</td>
<td>7.09 (180)</td>
<td>5.51 (140)</td>
<td>0.16x0.71 (4x18)</td>
<td>0.71 (18)</td>
<td>3.94 (100)</td>
<td>15.12 (384)</td>
<td>3.94 (100)</td>
<td>4.92 (125)</td>
<td>34.6 (15.7)</td>
</tr>
<tr>
<td>MVF461H40-20</td>
<td>40</td>
<td>7.87 (200)</td>
<td>5.91 (150)</td>
<td>0.16x0.71 (4x18)</td>
<td>0.71 (18)</td>
<td>4.33 (110)</td>
<td>15.79 (401)</td>
<td>3.94 (100)</td>
<td>4.92 (125)</td>
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<tr>
<td>MVF461H50-30</td>
<td>50</td>
<td>9.05 (230)</td>
<td>6.50 (165)</td>
<td>0.16x0.71 (4x18)</td>
<td>0.79 (20)</td>
<td>4.92 (125)</td>
<td>17.58 (449)</td>
<td>4.92 (125)</td>
<td>5.43 (138)</td>
<td>60.0 (27.2)</td>
</tr>
</tbody>
</table>

Table expressed in inches (mm).
Modulating Control Valves
with Magnetic Actuators, Positioning Control and Position Feedback for Domestic Water

Description
The MXG461B Modulating Control Valve is a control valve with magnetic actuators, for modulating control of domestic water, cold water and hot water systems.

Features
• Fast positioning time (< 2 seconds)
• Selectable valve characteristic: Equal percentage or linear
• Selectable standard interface: 0/2 to 10 Vdc or 0/4 to 20 mA
• High resolution (>1:1000)
• High rangeability
• Wear-free inductive stroke measurement
• Spring return A*AB closed when de-energized
• Positioning control and position feedback signal
• Low-friction, heavy-duty and maintenance-free

Applications
The MXG461B... Modulating Control Valves are through-port or mixing valves with magnetic actuators. The actuator is equipped with an electronics module for positioning control and position feedback. If the power is off, the valve control path A*AB is closed.

The short positioning time, high resolution and high rangeability make these valves ideal for modulating control of domestic, hot and cold water systems.

Key
A Mixing circuit
B Mixing circuit with bypass (underfloor heating system)
C Injection circuit
D Diverting circuit
E Injection circuit with throughport valve

Caution
1. Use the valve only as a mixing or straight-through valve, not a diverting valve. Note the direction of flow.
2. Do not allow high temperature water (W) to enter the mixing water circuit (M).
3. Ensure that adequate air venting is provided for the entire hydraulic system.
4. Select a non-return valve with minimum pressure loss for the circulating pipes.


**MXG461B Modulating Control Valve Specifications**

**Electrical**

Low-voltage Use Only ............................................. Class 2 (SELV, PELV)

24 Vac

Operating Voltage ................................................. 24 Vac +20/-15%

Frequency ............................................................. 45 to 65 Hz

Typical Power Consumption ........................................ See Table 1 Pmed

Nominal Apparent Power ........................................... See Sizing Table

24 Vdc

Operating Voltage ................................................... 20 to 30 Vdc

**Functional Data of Actuator**

**Input**

Positioning Signal Y 0/2 to 10 Vdc or 0/4 to 20mA

Impedance 0/2 to 10Vdc.................................................. 100 kΩ/5nF

0/4 to 20 mA ................................................................ 240 Ω/5nF

**Forced Control**

Impedance .............................................................. 22 kΩ

Closing the Valve (Z connected to G0) .............................. <1 Vac; <0.8 Vdc

Opening the Valve (Z connected to G0) ............................. > 6 Vac; >5 Vdc

No Function (Z not wired) ......................................... Positioning signal Y active

**Output**

Position Feedback Signal Voltage ................................ 0/2 to 10 Vdc;

Current ........................................................................ load resistance > 500Ω

load resistance < 500Ω

Stroke Measurement ..................................................... Inductive

Nonlinearity ................................................................ 0.3% of full scale

**Functional Data of Valve**

Nominal Pressure ....................................................... ANSI 125 (PN 16)

Operating Pressure \( P_{op}^{\text{max}} \) .................................. 232 psi (16 bar)

Pressure Differential \( P_{dP}^{\text{max}} \) ............................... See Sizing Table.

Leakage ......................................................................... A-AB Maximum 0.05% Cv

B-AB Depends on application data (0.2% Cv)

Water Temperature ...................................................... 4 to +248°F (-20 to +120°C)

Valve Characteristic 

Equal percentage or linear, optimized near the closing point

**Materials**

<table>
<thead>
<tr>
<th>Valve Body</th>
<th>Red Bronze</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cover Flange</td>
<td>Red Bronze</td>
</tr>
<tr>
<td>Seat/Inner Valve</td>
<td>Steel</td>
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</tbody>
</table>

**Nominal Apparent Power**

Average true power

Slow fuse (mandatory)

Nominal flow rate of cold water 41 to 86°F (5 to 30°C)

Valve Stem Seal ..................................................... EPDM (O-ring)

Pipe Connections .................................................... Screwed Fittings, Bronze/brass

**Ambient Conditions**

Temperature

Operation and Storage ............................................. 23 to 113°F (-5 to 45°C)

Transport ............................................................. -13 to +158°F (-25 to +70°C)

Humidity ...................................................................... 5 to 95% RH

**Agency Approvals** ....................................................... IP31 to IEC 529

Conforms to CE requirements

UL 873

Certified to Canadian standard C22.2 No. 24

C-Tick N-474

PED 97/23/EC:

pressure-carrying parts

Par. 1, section. 2.1.4 / Par. 3, section 3

Fluid group 2

**Notes**

1 Tested at 1.5 x PN (24 bar), similar to DIN 3230-3

2 For medium temperatures <32°F (0°C), the Z666 stem heating element is required.

3 Can be selected via DIP switch.

4 In case of strong vibrations, use high-flex stranded wires.

**Sizing**

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Valve Size (in.)</th>
<th>( C_p ) (gpm)</th>
<th>( \Delta P_s ) (psi)</th>
<th>( \Delta P_{op}^{\text{max}} ) (bar)</th>
<th>( S_{na} ) (VA)</th>
<th>( P_{med} ) (W)</th>
<th>( I_n ) (Fuse)</th>
<th>Wire Gauge (AWG)</th>
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<td>0.7</td>
<td>145</td>
<td>70</td>
<td>33</td>
<td>15</td>
<td>3.15</td>
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<td>215</td>
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<td>70</td>
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<td>15</td>
<td>3.15</td>
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<td>3.15</td>
<td>130</td>
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<td>22</td>
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<td>100</td>
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</tbody>
</table>

**Key**

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\( \Delta P_s \) Maximum permissible differential pressure at which the motorized valve will close securely against the pressure (close-off pressure)

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\( P_{med} \) Average true power

\( I_n \) Slow fuse (mandatory)

\( C_p \) Nominal flow rate of cold water 41 to 86°F (5 to 30°C)

\( L \) Maximum cable length. With four-wire connections the maximum permissible length of the separate 14 AWG Cu signal cable is 656 feet (200 m)

**Accessories & Service Kits**

www.usa.siemens.com/hvac
# MXG461B Modulating Control Valve

## Product Ordering

<table>
<thead>
<tr>
<th>Valve Size (in)</th>
<th>Cv</th>
<th>Part No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/2</td>
<td>0.7</td>
<td>MXG461B15-0.6</td>
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<tr>
<td>1/2</td>
<td>1.8</td>
<td>MXG461B15-1.5</td>
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<td>1/2</td>
<td>3.5</td>
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<td>5.8</td>
<td>MXG461B20-5</td>
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<td>MXG461B25-8</td>
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<td>1-1/4</td>
<td>14</td>
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<td>1-1/2</td>
<td>23</td>
<td>MXG461B40-20</td>
</tr>
<tr>
<td>2</td>
<td>35</td>
<td>MXG461B50-30</td>
</tr>
</tbody>
</table>

**Ordering Notes**

- When placing an order, specify the quantity, product number and description.
  
  **Example:** 1 MXG461B15-0.6 valve and 1 Z366 stem heater

- The valve body and magnetic actuator assemblies cannot be separated. The brass/bronze fittings are included. The Z366 stem heater must be ordered separately.

- The screwed fittings and gaskets are supplied with these valves.
## Dimensions and Weights

Dimensions shown in inches (mm).

### Table

<table>
<thead>
<tr>
<th>Part No.</th>
<th>DN</th>
<th>G</th>
<th>L1</th>
<th>L2</th>
<th>L3</th>
<th>H</th>
<th>E</th>
<th>F</th>
<th>Weight (lb. (kg))</th>
</tr>
</thead>
<tbody>
<tr>
<td>MXG461B15-0.6</td>
<td>15</td>
<td>Rp x G1B</td>
<td>3.15</td>
<td>1.67</td>
<td>1.97</td>
<td>13.4</td>
<td>3.15</td>
<td>4.53</td>
<td>15.65 (7.1)</td>
</tr>
<tr>
<td>MXG461B15-1.5</td>
<td>15</td>
<td>Rp x G1B</td>
<td>3.15</td>
<td>1.67</td>
<td>1.97</td>
<td>13.4</td>
<td>3.15</td>
<td>4.53</td>
<td>16.09 (7.3)</td>
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<td>Rp x G1B</td>
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<td>1.67</td>
<td>1.97</td>
<td>13.4</td>
<td>3.15</td>
<td>4.53</td>
<td>16.09 (7.3)</td>
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<td>Rp x G1xB</td>
<td>3.74</td>
<td>2.07</td>
<td>2.36</td>
<td>13.3</td>
<td>3.15</td>
<td>4.53</td>
<td>16.97 (7.7)</td>
</tr>
<tr>
<td>MXG461B25-8</td>
<td>25</td>
<td>Rp 1 G1xB</td>
<td>4.33</td>
<td>2.22</td>
<td>2.52</td>
<td>13.6</td>
<td>3.15</td>
<td>4.53</td>
<td>18.73 (8.5)</td>
</tr>
<tr>
<td>MXG461B32-12</td>
<td>32</td>
<td>Rp 1x G2B</td>
<td>4.92</td>
<td>2.66</td>
<td>2.95</td>
<td>15.12</td>
<td>3.94</td>
<td>4.92</td>
<td>28.22 (12.8)</td>
</tr>
<tr>
<td>MXG461B40-20</td>
<td>40</td>
<td>Rp 1x G2xB</td>
<td>5.51</td>
<td>3.17</td>
<td>3.68</td>
<td>15.79</td>
<td>3.94</td>
<td>4.92</td>
<td>32.19 (14.6)</td>
</tr>
<tr>
<td>MXG461B50-30</td>
<td>50</td>
<td>Rp 2 G2xB</td>
<td>6.69</td>
<td>3.68</td>
<td>4.2</td>
<td>402</td>
<td>3.94</td>
<td>4.92</td>
<td>41.00 (18.6)</td>
</tr>
</tbody>
</table>

Table expressed in inches (mm).

**Table Notes:**
- A: External thread G...B to ISO228/1
- DN: Internal thread Rp to ISO7/1
- Fittings to ISO 49/DIN 2950 (supplied complete with flange gaskets)
Terminal Housing for Magnetic Valves

**Description**
ZM../A Terminal Modules are signal transducers/power amplifiers. They convert a 0 to 10 Vdc or 4 - 20 mA control signal and a 24 Vac power supply into a 0 to 20 Vdc phase cut signal.

**Applications**
ZM../A Terminal Modules are for use with Magnetic Valves only.
## Terminal Housing Specifications

**Supply Voltage** ........................................... 24 Vac +15/-10%, Class 2, 50/60 Hz

**Current Consumption** ................................ Max. 1 mA @ 0 to 10 Vdc  
( input impedance 2 x 56 kΩ)

**Control Signals** ................................. 0 to 10 Vdc, 4 to 20 mA, 0 to 20 Vdc phase cut

**Shunt Resistance (4 to 20 mA)** ............................... 150 Ohms

**Mean Operating Data** ................................ Refer to appropriate Valve.

**Housing Material** .................................................. Aluminum

**Connection Terminals** .............................. For max. 1 x 12 AWG or 2 x 14 AWG

**Ambient Temperature**
- ZM100/A, ZM110, ZM120/A ......................... 36 to 122°F (2 to 50°C)
- ZM101/A, ZM111, ZM121/A ......................... -40 to +122°F (-40 to +50°C)
- ZM200/A, ZM210, ZM220/A ......................... 36 to 122°F (2 to 50°C)

**Agency Approvals** .................................................. Conforms to CE requirements

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### Terminal Housing Product Ordering

<table>
<thead>
<tr>
<th>Description</th>
<th>Part No.</th>
</tr>
</thead>
</table>
| **Terminal Housing.**  
Converting 0-10 Vdc input to 0-20 Vdc phase cut output.  
- up to 40 W, IP30 rated housing  
- up to 40 W, IP54 rated housing  
- up to 120 W, IP30 rated housing | ZM100/A      |
| **Terminal Housing.**  
For straight through 0-20 Vdc electrical housing only.  
- up to 40 W, IP30 rated housing  
- to 40 W, IP54 rated housing  
- up to 120 W, IP30 rated housing | ZM110        |
| **Terminal Housing.**  
Converting 0-20 mA/24 Vdc input to 0-20 Vdc phase cut output.  
- up to 40 W, IP30 rated housing  
- up to 40 W, IP54 rated housing  
- up to 120 W, IP30 rated housing | ZM120/A      |

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### Accessories & Service Kits

**Dimensions**
- ZM1.. .......................................................... 1.6”H x 2.4”W x 3.0”D
- ZM2.. .......................................................... 1.6”H x 3.5”W x 4.5”D

**Shipping Weights**
- ZM100/A, ZM111, ZM120/A.................................0.5 lb.
- ZM101/A, ZM121/A............................................0.5 lb.
- ZM110 ..............................................................0.4 lb.
- ZM200/A, ZM210, ZM220/A.................................1.0 lb.
- ZM210 ..............................................................0.8 lb.
- ZM220/A..........................................................1.0 lb.