GMX24-MFT
Modulating, Non-Spring Return, 24 V, Multi-Function Technology®

Technical Data

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power Supply</td>
<td>24 VAC, ±20%, 50/60 Hz, 24 VDC, ±10%</td>
</tr>
<tr>
<td>Power consumption in operation</td>
<td>4.5 W</td>
</tr>
<tr>
<td>Power consumption in rest position</td>
<td>1.5 W</td>
</tr>
<tr>
<td>Transformer sizing</td>
<td>7 VA (class 2 power source)</td>
</tr>
<tr>
<td>Shaft Diameter</td>
<td>1/2” to 1.05” round, centers on 1/2” and 3/4” with insert, 1.05” without insert</td>
</tr>
<tr>
<td>Electrical Connection</td>
<td>18 GA plenum cable with 1/2” conduit connector, degree of protection NEMA 2 / IP54, 3 ft [1 m] 10 ft [3 m] and 16ft [5 m]</td>
</tr>
<tr>
<td>Overload Protection</td>
<td>electronic throughout 0° to 95° rotation</td>
</tr>
<tr>
<td>Operating Range</td>
<td>DC 2...10 V (default), 4...20 mA w/ ZG-R01 (500 Ω, 1/4 W resistor), variable (VDC, on/off, floating point)</td>
</tr>
<tr>
<td>Operating range Y variable</td>
<td>Start point DC 0.5...30 V End point DC 2.5...32 V</td>
</tr>
<tr>
<td>Input Impedance</td>
<td>100 kΩ for DC 2...10 V (0.1 mA), 500 Ω for 4...20 mA, 1500 Ω for PWM, On/Off and Floating point</td>
</tr>
<tr>
<td>Position Feedback</td>
<td>DC 2...10 V, Max. 0.5 mA, VDC variable</td>
</tr>
<tr>
<td>Angle of rotation</td>
<td>Max. 95°, adjustable with mechanical stop</td>
</tr>
<tr>
<td>Torque motor</td>
<td>360 in-lb [40 Nm]</td>
</tr>
<tr>
<td>direction of rotation motor</td>
<td>reversible with built-in switch</td>
</tr>
<tr>
<td>Position indication</td>
<td>reflective visual indicator (snap on)</td>
</tr>
<tr>
<td>Manual override</td>
<td>external push button</td>
</tr>
<tr>
<td>Running time motor</td>
<td>default 150 sec, variable 75...300 sec</td>
</tr>
<tr>
<td>Ambient humidity</td>
<td>5...95% r.h. non-condensing</td>
</tr>
<tr>
<td>Ambient temperature</td>
<td>-22...122°F [-30...50°C]</td>
</tr>
<tr>
<td>Non-operating temperature</td>
<td>-40...176°F [-40...80°C]</td>
</tr>
<tr>
<td>Degree of Protection</td>
<td>IP54, NEMA 2, UL Enclosure Type 2</td>
</tr>
<tr>
<td>Housing material</td>
<td>UL94-5VA</td>
</tr>
<tr>
<td>Agency Listing</td>
<td>cULus acc. to UL60730-1A/-2-14, CAN/CSA E60730-1.02, CE acc. to 2004/108/EC and 2006/95/EC</td>
</tr>
<tr>
<td>Noise level, motor</td>
<td>&lt;45 dB (A)</td>
</tr>
<tr>
<td>Maintenance</td>
<td>maintenance free</td>
</tr>
<tr>
<td>Quality Standard</td>
<td>ISO 9001</td>
</tr>
<tr>
<td>Weight</td>
<td>2.69 lb [1.22 kg]</td>
</tr>
</tbody>
</table>

†Rated Impulse Voltage 800V, Type action 1, Control Pollution Degree 3.

Torque min. 360 in-lb, for control of damper surfaces up to 90 sq. ft.

Application

For proportional modulation of dampers in HVAC systems. Actuator sizing should be done in accordance with the damper manufacturer’s specifications.

The actuator is mounted directly to a damper shaft up to 1.05” in diameter by means of its universal clamp. A crank arm and several mounting brackets are available for applications where the actuator cannot be direct coupled to the damper shaft.

The default parameters for 2 to 10 VDC applications of the …MFT actuator are assigned during manufacturing. If necessary, custom versions of the actuators can be ordered. The parameters can be changed by two means: pre-set and custom configurations from Belimo or on-site configurations using the Belimo PC-Tool software.

Operation

The actuator is not provided with and does not require any limit switches, but is electronically protected against overload. The anti-rotation strap supplied with the actuator will prevent lateral movement.

The GMB(X) series provides 95° of rotation and a visual indicator indicates position of the actuator. When reaching the damper or actuator end position, the actuator automatically stops. The gears can be manually disengaged with a button on the actuator cover.

The GMB(X)24-MFT actuators use a brushless DC motor, which is controlled by an Application Specific Integrated Circuit (ASIC). The ASIC monitors and controls the actuator’s rotation and provides a digital rotation sensing (DRS) function to prevent damage to the actuator in a stall condition. Power consumption is reduced in holding mode.

Add-on auxiliary switches or feedback potentiometers are easily fastened directly onto the actuator body for signaling and switching functions.
GMX24-MFT
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Dimensions (Inches [mm])

| Ø 1/2" to 1.05" [12.7 to 26.67] |
| 2/5" to 1.05" [10 to 26.67]   |

To center of mounting slot.
GMX24-MFT
Modulating, Non-Spring Return, 24 V, Multi-Function Technology®

KGB
Ball joint

TF-GMA
Standard GK/GM clamp (1/2” to 1.05’’).

SH10
Push rod for KG10A ball joint (36” L, 3/8” diameter).

SH8
Push rod for KG6 & KG8 ball joints (36” L, 5/16” diameter).

TF-CC US
Cable conduit connector, 1/2”.

TOOL-07
13 mm wrench.

ZG-100
Univ. right angle bracket 17”x11-1/8”x6” (HxWxbase).

ZG-101
Univ. right angle bracket 13x11x7-7/16” (HxWxbase).

ZG-102
Dual actuator mounting bracket.

ZG-103
Univ. right angle bracket 7-1/2x11x2-3/4” (HxWxbase).

ZG-104
Univ. right angle bracket 13-5/8x7x4” (HxWxbase).

ZG-109
Right angle bracket for ZS-260.

ZG-110
Stand-off bracket for ZS-260.

ZG-DC1
Damper clip for damper blade, 3.5” width.

ZG-DC2
Damper clip for damper blade, 6” width.

Z-GMA
Mounting and linkage kit

ZK1-GEN
Connection cable

ZK2-GEN
Connection cable

ZS-100
Weather shield - galvanneal 13x8x6” (LxWxD).

ZS-101
Base plate for ZS-100.

ZS-150
Weather shield - PC w/ foam seal 16x8-3/8x4” (LxWxD).

ZS-260
Explosion proof housing.

ZS-300
NEMA 4X, 304 stainless steel enclosure.

ZS-300-1
ZS-300 without brackets.

ZS-300-5
NEMA 4X, 316L stainless steel enclosure.

ZS-300-BK
ZS-300 Mounting Bracket Set

ZS-300-C1
1/2” shaft adaptor, standard with ZS-300(-5).

ZS-300-C2
3/4” shaft adaptor for ZS-300(-5).

ZS-300-C3
1” shaft adaptor for ZS-300(-5).

ADS-100
Analog to digital switch for modulating actuators.

IRM-100
Input rescaling module for modulating actuators.

MFT-XFMR
24 V transformer (120V to 24V) for PS-100.

NSV24 US
Battery back-up module for non-spring return actuators.

P10000A GR
Feedback potentiometer for damper actuators and rotary actuators

P1000A GR
Feedback potentiometer for damper actuators and rotary actuators

P1400A GR
Feedback potentiometer for damper actuators and rotary actuators

PS-100
Actuator power supply and control simulator.

PTA-250
Pulse width modulation interface for modulating actuators.

STA
Auxiliary switch for damper actuators and rotary actuators

S2A
Auxiliary switch for damper actuators and rotary actuators

SGA24

UK24LON
Gateway

ZG-R01
4 to 20 mA adaptor, 500Ω, 1/4 W resistor w/ 6” pigtail wires.

ZG-R02
50Ω voltage divider kit (resisters with wires).

ZG-R03
MFT95 resistor kit for 0 to 135Ω control applications.

ZG-R05
MFT95 resistor kit for 4 to 20 mA control applications.

ZG-R06
MFT95 resistor kit for Series 90 control applications.

ZG-SGF
Mounting plate for SGF.

ZG-X40
120 to 24 VAC, 40 VA transformer.

ZTH US
Handheld programming tool w/ ZK1-GEN, ZK2-GEN, ZK6-GEN.

24 VAC Transformer

Line
Volts

Position (-)
Feedback VDC (+)

Common
Red (+)
Wht (3)
Pnk (4)
Org (5)

Blk (1)

24 VAC Transformer (AC Only)

Line
Volts

Position (-)
Feedback VDC (+)

Common
Red (+)
Wht (3)
Pnk (4)
Org (5)

Blk (1)

24 VAC Transformer (AC only)

Line
Volts

Position (-)
Feedback VDC (+)

Common
Red (+)
Wht (3)
Pnk (4)
Org (5)

Blk (1)

PWM Control

800-543-9038 USA
866-805-7089 CANADA
203-791-8396 LATIN AMERICA / CARIBBEAN
Typical Specification

Floating point, on/off control damper actuators shall be electronic direct-coupled type, which require no crank arm and linkage and be capable of direct mounting to a shaft up to 1.05” diameter. Actuators shall have brushless DC motor technology and be protected from overload at all angles of rotation. Actuators shall have reversing switch and manual override on the cover. Run time shall be constant and independent of torque. Actuators shall be CULus listed, have a 5-year warranty, and be manufactured under ISO 9001 International Quality Control Standards. Actuators shall be as manufactured by Belimo.

Wiring Diagrams

- Actuators with appliance cables are numbered.
- Provide overload protection and disconnect as required.
- Actuators may also be powered by 24 VDC.
- Only connect common to negative (-) leg of control circuits.
- A 500 Ω resistor (ZG-R01) converts the 4 to 20 mA control signal to 2 to 10 VDC.
- Control signal may be pulsed from either the Hot (Source) or Common (Sink) 24 VAC line.
- For triac sink the Common connection from the actuator must be connected to the Hot connection of the controller. Position feedback cannot be used with a triac sink controller; the actuator internal common reference is not compatible.
- IN4004 or IN4007 diode. (IN4007 supplied, Belimo part number 40155).
- Actuators may be controlled in parallel. Current draw and input impedance must be observed.
- Master-Slave wiring required for piggy-back applications. Feedback from Master to control input(s) of Slave(s).