ACTUATOR

MFH Electrical Actuator

SPECIFICATIONS

Maplef MFH

Supply voltage	: 24V AC/DC ±10%, 50/60 Hz
Type	: Electrical, bi-directional synchronous motor
Power consumption	: 24V AC: 1.5VA standby / 6VA operating / 8.5VA max. 24V DC: 0.6W standby / 2.6W operating / 4.1W max.
Inrush current	: 10A (peak)
Control signal	: Analog 0(2)-10V DC, <0.5mA or digital 3-point floating and ON/OFF
Resolution	: 1:100 (0-10V analog) and 1:80 (2-10V analog)
Feedback	: Yes, control signal (analog) or 0-10V DC (digital ON/OFF)
Failsafe function	: Fail in place
Manual override	: Yes
Position indicator	: Yes
Operation time	: 22 sec/mm
Actuating force	: 600N -50N/+100N
Stroke	: 7 mm / 0.276 in
Ambient temperature[1]	: 0°C to +50°C / +32°F to +122°F
Media temperature	: 0°C to +120°C / +32°F to +248°F
Humidity rating	: 0..85% rH, no condensation
Protection	: IP54 incl. upside-down, class III, indoor use only
CE conformity	: EN 60730
Cable	: Fixed, 5 wires x 0.50 mm2, 1.5 meter Fixed, 5 wires x AWG20, 4.9 ft
Closing point adjustment	: During operation the actuator will self-adjust according to the closing point and stroke length of the valve.

Note 1: Including °5+C self-generated heat based on UL requirements

ACTUATOR
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SPECIFICATIONS (...continued)

Maplef MFH-BUS

Supply voltage	: 24V AC/DC ±10%, 50/60 Hz
Type	: Electrical, bi-directional synchronous motor
Power consumption	: 24V AC: 2.2 VA standby / 4.8VA operating / 9.0VA max. 24V DC: 1.1 W standby / 2.5W operating / 4.7W max.
Inrush current	: 24V AC: 7.2A (peak)
24V DC	: 5.0A (peak)
Control signal	: 0-100% (BACnet or Modbus)
Resolution	: 1:100 (0-10V)
Feedback	: Yes, 0-100% (BACnet or Modbus)
Failsafe function	: Fail in place
Manual override	: Yes, with magnet
Position indicator	: Yes
Operation time	: 22 sec/mm (alternatively 16 sec/mm or 28 sec/mm)
Actuating force	: 500N -50N/+100N
Stroke	: 14 mm / 0.55 in
Ambient temperature[2]	: 0°C to +50°C / +32°F to +122°F
Media temperature	: -10°C to +120°C / +14°F to +248°F
Humidity rating	: 0..85% rH, no condensation
Protection	: IP54 incl. upside-down, class III, indoor use only
CE conformity	: EN 60730
Closing point adjustment	: During operation the actuator will self-adjust according to the closing point of the valve
Cable	: 2 groups:
- Group 1	: Fixed, 2x2 wires x 0.34 mm², 1.5 meter Fixed, 2x2 wires x AWG22, 4.9 ft Fixed, 2 wires x 0.50 mm², 1.5 meter Fixed, 2 wires x AWG20, 4.9 ft
- Group 2	: Fixed, 4 wires x 0.50 mm², 1.5 meter Fixed, 4 wires x AWG20, 4.9 ft
Recommended cable	: Twisted pair with shielding (characteristic impedance ~120Ω)
Recommended cable length	: Baud rate dependent: 9600 and 19200 baud rate - max. 1000 meter 38400 and 57600 baud rate - max. 750 meter 76800 baud rate - max. 650 meter 115200 baud rate - max. 500 meter

Modbus:

Transmission type	: RTU slave
Interface	: EIA-485 / RS-485
Baud rates supported	: 9600, 19200, 38400, 57600, 76800 and 115200
Start/stop bits	: 8N2 (standard)
Participants	: Up to 32 recommended, max. 64 participants
Load	: 1/8 unit load

BACnet:

Protocol	: BACnet MS/TP Master
Interface	: EIA-485 / RS-485
Device profile	: BACnet Application Specific Controller (B-ASC) type server
Baud rates supported	: 9600, 19200, 38400, 57600, 76800 and 115200
Services (BIBBS) supported	: DS-RP-B, DS-RPM-B, DS-WP-B, DS-WPM-B, DS-COV-B, DM-DDB-B, DM-DOB-B, DM-DCC-B, DM-TS-B, DM-RD-B and DM-R-B
Participants	: Up to 32 recommended, max. 64 participants
Load	: 1/8 unit load.

Note 2: Including °5+C self-generated heat based on UL requirements.

ACTUATOR
MFH Electrical Actuator

SPECIFICATIONS (...continued)

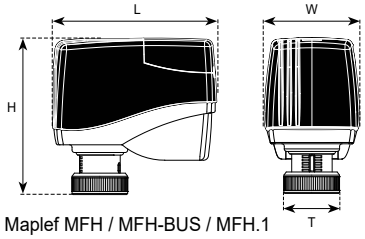
Maplef MFH.1

Supply voltage	: 24V AC/DC ±10%, 50/60 Hz
Type	: Electrical, bi-directional synchronous motor
Power consumption	: 24V AC: 2.6VA standby / 7.9VA operating / 9VA max. 24V DC: 1.2W standby / 3.7W operating / 4.5W max.
Inrush current	: 12A (peak)
Control signal	: Analog 0(2)-10V DC or digital 2-position with constant power supply
Resolution	: 1:100 (0-10V analog) and 1:80 (2-10V analog)
Feedback	: Yes, control signal (analog) or 0-10V DC (digital)
Failsafe function	: Yes, optional open or close (set on actuator)
Electrical override	: Yes
Position indicator	: Yes
Operation time	: 22 sec/mm (failsafe mode: 5 sec/mm)
Actuating force	: 600N -50N/+100N
Stroke	: 7 mm / 0.276 in
Ambient temperature[3]	: 0°C to +50°C / +32°F to +122°F
Media temperature	: 0°C to +120°C / +32°F to +248°F
Humidity rating	: 0..85% rH, no condensation
Protection	: IP54 incl. upside-down, class III, indoor use only
CE conformity	: EN 60730
Cable	: Fixed, 5 wires x 0.50 mm2, 1.5 meter Fixed, 5 wires x AWG20, 4.9 ft
Closing point adjustment	: During operation the actuator will self-adjust according to the closing point and stroke length of the valve.

Note 3: Including °5+C self-generated heat based on UL requirements.

DIMENSIONS AND WEIGHTS (NOMINAL)

Actuator	L mm(in)	W mm(in)	H mm(in)	T	Weight Kg(lb)
MFH	96.0 (3.78)	56 (2.20)	91 (3.58)	M30x1.5	0.30 (0.66)
MFH-BUS	96.0 (3.78)	56 (2.20)	91 (3.58)	M30x1.5	0.40 (0.88)
MFH.1	96.0 (3.78)	56 (2.20)	91 (3.58)	M30x1.5	0.34 (0.75)



Maplef MFH / MFH-BUS / MFH.1

MODEL NUMBER SELECTION

MFH

Actuator type:

Leave blank	=	no failsafe
.1	=	failsafe
-BUS	=	no failsafe, incl. Modbus and BACnet

Example:
MFH.1 = Maplef MFH actuator 24V modulating with failsafe function

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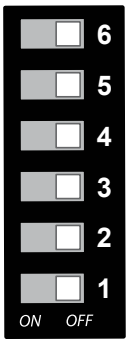
VALVE FUNCTION

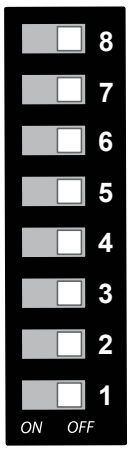
The valve functions are adjusted with the DIP switches under the connection cover

Maplef MFH



Switch #1: Auto cycle ON/OFF
If the plant specifications permit it, the auto cycle can be activated during commissioning. Auto cycle prevents the valve from jamming when the valve is not moved for a longer period of inactivity, e.g. for heating systMGV during the summer. When the auto cycle is activated, the actuator will perform 50% stroke cycle if no stroke movement has occurred during a 3-weeks period.
Factory setting = OFF.
Switch #2: Analog 2-10V DC / 0-10V DC
Setting control range by the continuous actuating signal 0-10V DC or 2-10V DC.
Factory setting = 0-10V DC.
Switch #3: Normally open / Normally close
Setting actuating direction with 10V DC control signal to "valve open" or "valve closed" as well as the position feedback.
Factory setting = Normally closed; 0V DC = valve closed.
Switch #4: Equal % control / Linear control
Setting of actuating control curve to either equal percentage or linear control.
Factory setting = Linear control.
Switch #5: has no function.
Switch #6: Re-calibration
Setting is indifferent, but flipping the switch will start re-calibration. After re-calibration the actuator will automatically go into normal operation.

Maplef MFH-BUS



Switch #1: BIT 0 ON/OFF
For bus address setting. Setting bit 0 to either 1 (=ON) or 0 (=OFF).
Factory setting = OFF.
Switch #2: BIT 1 ON/OFF
For bus address setting. Setting bit 1 to either 1 (=ON) or 0 (=OFF).
Factory setting = OFF.
Switch #3: BIT 2 ON/OFF
For bus address setting. Setting bit 2 to either 1 (=ON) or 0 (=OFF).
Factory setting = OFF.
Switch #4: BIT 3 ON/OFF
For bus address setting. Setting bit 3 to either 1 (=ON) or 0 (=OFF).
Factory setting = OFF.
Switch #5: BIT 4 ON/OFF
For bus address setting. Setting bit 4 to either 1 (=ON) or 0 (=OFF).
Factory setting = OFF.
Switch #6: BIT 5 ON/OFF
For bus address setting. Setting bit 5 to either 1 (=ON) or 0 (=OFF).
Factory setting = OFF.
Switch #7: Bus portocol
Setting bus protocol selection to either MODbus (=ON) or BACnet (=OFF)
Factory setting = OFF. Supply voltage : 24V AC/DC ±10%, 50/60 Hz

ACTUATOR
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VALVE FUNCTION (...continued)

Switch #8: Terminating resistor
Setting terminating resistor to either active (=ON) or inactive (=OFF).
Factory setting = OFF.

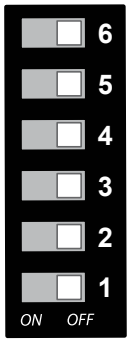
Initial setting of switches 1 to 6 is OFF, which indicates that bus communication is deactivated and the actuator is in first-time mounting position. With switches 1 to 6 binary setting of the bus address in performed.

BIT 5 (32)	BIT 4 (16)	BIT 3 (8)	BIT 2 (4)	BIT 1 (2)	BIT 0 (1)	Address
0	0	0	0	0	1	1
0	0	0	0	1	0	2
0	0	0	0	1	1	3
0	0	0	1	0	0	4
0	0	0	1	0	1	5
0	0	0	1	1	0	6
0	0	0	1	1	1	7
0	0	1	0	0	0	8
0	0	1	0	0	1	9
0	0	1	0	1	0	10
0	0	1	0	1	1	11
0	0	1	1	0	0	12
:	:	:	:	:	:	:
1	1	1	1	1	1	63

VALVE FUNCTION (...continued)

Maplef MFH.1

Switch #1: Auto cycle ON/OFF
If the plant specifications permit it, the auto cycle can be activated during commissioning. Auto cycle prevents the valve from jamming when the valve is not moved for a longer period of inactivity, e.g. for heating systMGV during the summer. When the auto cycle is activated, the actuator will perform 50% stroke cycle if no stroke movement has occurred during a 3-weeks period.
Factory setting = OFF.



Switch #2: Analog 2-10V DC / 0-10V DC
Setting control range by the continuous actuating signal 0-10V DC or 2-10V DC.
Factory setting = 0-10V DC.

Switch #3: Normally open / Normally close
Setting actuating direction with 10V DC control signal to "valve open" or "valve closed" as well as the position feedback.
Factory setting = Normally closed; 0V DC = valve closed.

Switch #4: Equal % control / Linear control
Setting of actuating control curve to either equal percentage or linear control.
Factory setting = Linear control.

Switch #5: Failsafe open/close
Setting actuator direction at power failure to "valve open" or "valve closed".
Factory setting = close.

Switch #6: Electrical override
Setting override function to ON and the actuator will open valve fully. When set to OFF again, the actuator will re-calibrate and thereafter go into normal operation mode.
Factory setting = OFF

ACTUATOR

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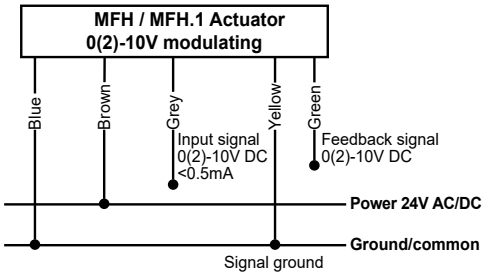
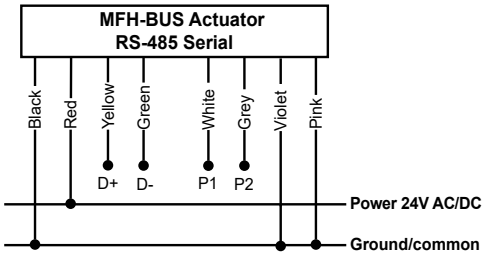
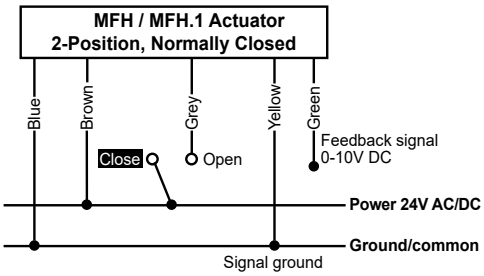
WIRING INSTRUCTION

ELECTRICAL MODULATING





ELECTRICAL 2-POSITION



ELECTRICAL 3-POINT FLOATING