# MF40 ER

## Electronic Return (SuperCap) Butterfly Valve Actuator Modulating and Two-Position Control, 40 Nm

## Product Description

The MF40ER is a robust, reliable rotary actuator for the control of the VF208W DN125-200 butterfly valves.

The MF40ER actuators utilize super capacitor technology for driving the valve either closed or open in the event of power failure.

These actuators do not require linkage kits, providing a quick and simple installation.

- 24 Vac or Vdc Power supply
- 2…10 V Position Feedback
- Long Life SuperCaps

The actuator is overload-proof, requiring no limit switches and automatically stopping when the end point is reached.

## Features

- Straightforward direct mounting onto the butterfly valve, using only two bolts. The mounting position in relation to the butterfly valve can be selected in 90° steps. There is no internal mechanical spring, and the normally open or closed functionality in the event of a power failure is governed by the POP (power off positioning) dial.
- Manual operation of the valve is possible using the actuator hand crank. The actuator drives to the control signal position with electrical supply or to the POP position when power is not present.
- All units have an adjustable angle of rotation up to 90° with mechanical limit stops adjustable from each end.
- Super capacitor technology drives the actuator to a pre-defined position in the event of power interruption. Super capacitors have advantage over traditional spring return actuators as the motor does not need to overcome mechanical spring resistance. This increases the torque output in the actuator and drives butterfly valve sizes up to DN200.

## Specifications

| | |
|---|---|
| Nominal Torque | Min. 40 Nm |
| Supply Voltage Range | |
| AC | 19.2…28.8 V 50…60 Hz |
| DC | 21.6…28.8 V |
| Running Time | |
| Motor Driven | 150 s/90° |
| Capacitor Driven | 35 s/90° |
| Control Signal | |
| MF40ER-24M | |
| Range of Operation (X) | 2…10 Vdc |
| Input Resistance | 100 kΩ |
| Position Feedback (Y) | 2-10 Vdc, max 0.5 mA |
| Position Accuracy | +/- 5% |
| Electronic Return Position | 0 (100% of max. angle or rotation (POP dial)) |
| Direction of Rotation | |
| Motor (mod.) | Reversible with Switch 0/1 |
| Electronic Return (SuperCap) position | 0 … 100% (any position between, as set by POP dial) |
| Angle of Rotation | Max. 90°, limited both ends, adjustable end stops |
| Position Indication | Mechanical |
| Electrical Connection | |
| Cable | 4 x 0.75 mm² |
| Length | 1.0 m |

| | |
|---|---|
| Power consumption | |
| Operation | 11 W @ nominal torque |
| At Rest | <3 W |
| Wire Sizing | ≤21 VA |
| Environment | |
| Operating Temperature | 0 °C…+ 50 °C |
| Media Temperature Range | -20 °C…+ 100 °C |
| Storage (Non operation) | -40 °C…+ 80 °C |
| Ambient Humidity | 95% r.h. Non-condensing |
| Sound Power Level, Motor | ≤52 dB |
| Electronic Return (SuperCap Driven) | ≤61 dB |
| Weight | approx. 2.8 kg |
| Safety | |
| Protection Class | III Safety Extra low Voltage / UL class 2 Supply |
| Degree of Protection | IP54 NEMA2, UL Enclosure Type 2 |
| Maintenance | Maintenance free |
| Control Pollution Degree | 3 |
| Mode of Operation | |
| Type 1.AA | |
| Rated Impulse Voltage | 0.8 kV |
| Standards Conformity | |
| EMC | CE according to 2004/108/EC |
| Certification | cULus to UL60730-1A, UL60730-2-14 and CAN/CSA E60730-1:02, IEC/EN 60730-1 and IEC/EN 60730-2-14 |




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## Available Products

| Part Number | Type Designation | Power Supply | | Power Consumption | | | Control Signal | Cable Size |
|---|---|---|---|---|---|---|---|---|
| | | Vac | Vdc | Operation | Rest | Wire Sizing | | |
| MF40ER-24M | MF40ER-24M 1M54 00 | 19.2 to 28.8 | 21.6 to 28.8 | 11 W | 3 W | 21 VA | 2-10 Vdc Modulating | 4 x 0.75 $mm^2$ |
| MF40ER-24T | MF40ER-24T 15M54 00 | | | | | | 2 position | 4 x 0.75 $mm^2$ |

## Mode of Operation

The modulating actuator is positioned and controlled with a standard 2…10 Vdc control signal. If the supply voltage is interrupted the valve is returned by the electrical charge of the internal super capacitors to the position indicated by the POP dial.

The direction of rotation switch changes the running direction of the actuator against the control signal. The direction of rotation switch has no influence on the power off position as set by the POP switch.

The two-position actuator (MF40ER-24T) is driven fully on by a 24 Vac or Vdc supply and is returned by the super capacitors when the 24 V supply is switched off.

## Power Off Position (POP) setting

The Power Off Position (POP) is an electronic position return feature in the MF40ER actuator.

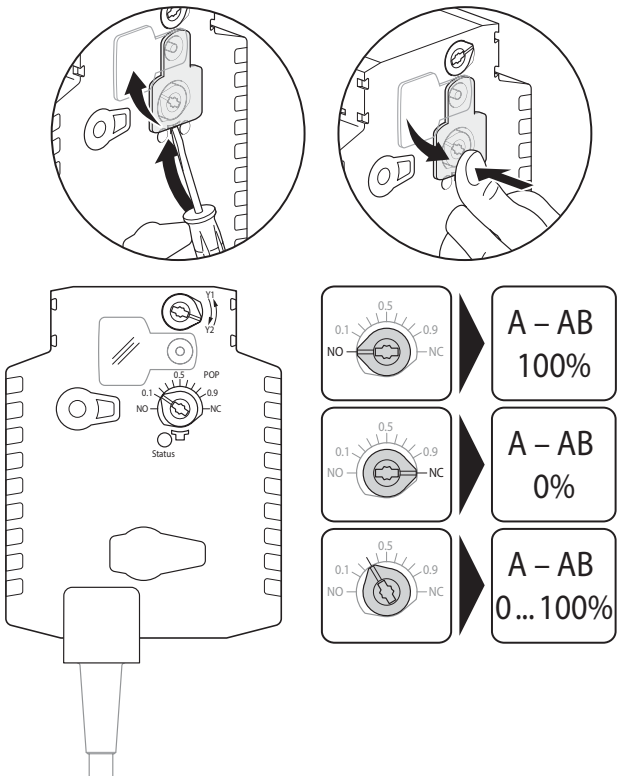
The position can be determined from the POP setting dial on the top of the actuator.

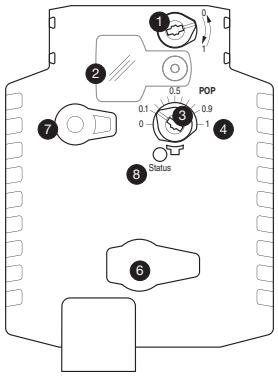
The switch always refers to an angle of rotation of 90° and does not take into account any retroactively adjusted mechanical end stops.

In the event of a power supply interruption, the actuator will move into the selected power off position, initiating after a preset bridging time (PF) of 2 sec.

## Operating Controls and indicators

Power Off Position (POP)




1. Direction of rotation switch
2. Cover, POP setting dial
3. POP setting dial
4. Scale for manual adjustment
6. No function
7. Disengagement button

| LED display 8 green | Meaning/Function |
|---|---|
| Illuminated | Operation OK / without fault |
| Blinking | POP-Function active |
| Off | – Not in Operation<br>– Pre-charging time SuperCap |



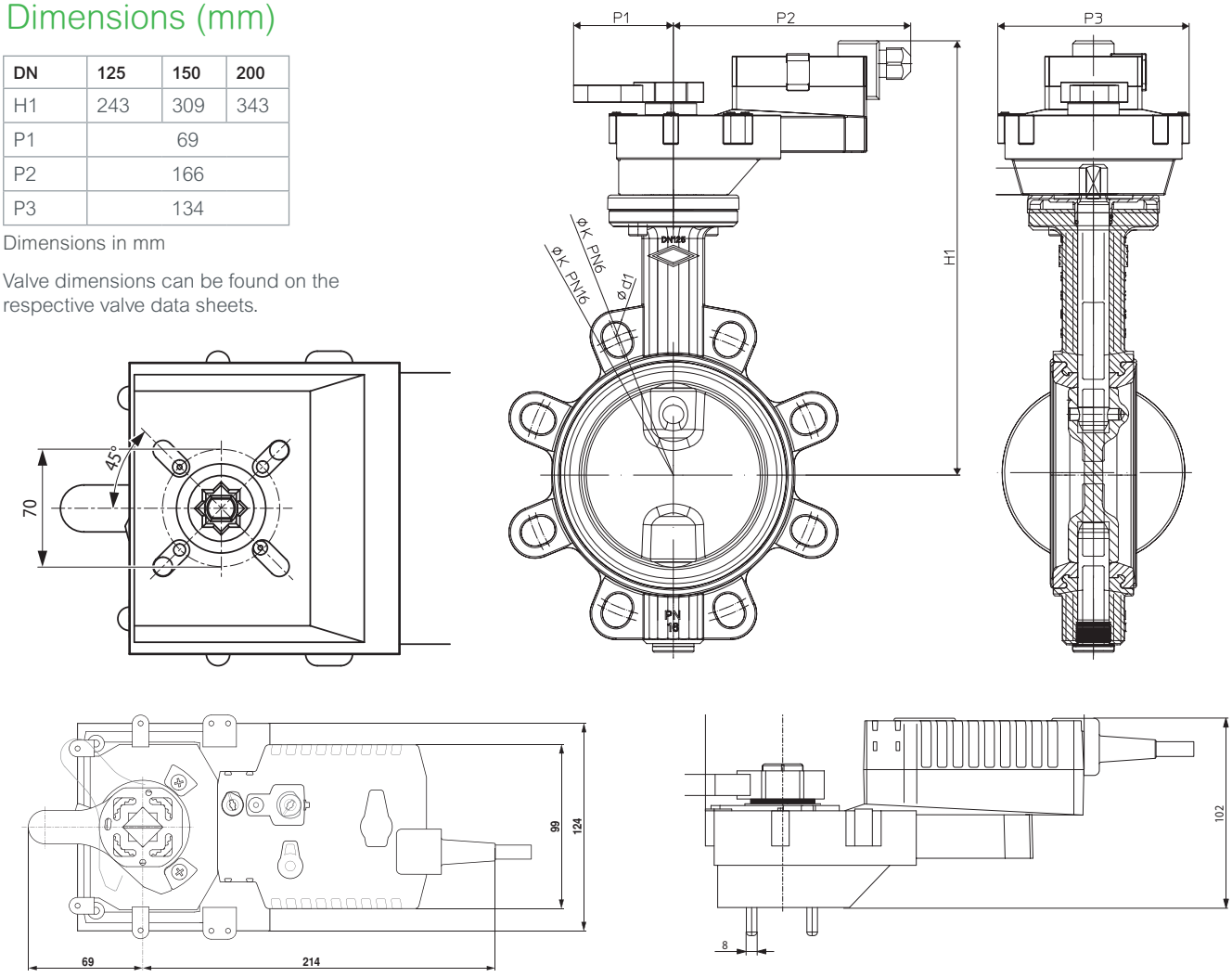
Document Number: F-27871-2

## Dimensions (mm)

| DN | 125 | 150 | 200 |
|---|---|---|---|
| H1 | 243 | 309 | 343 |
| P1 | 69 | | |
| P2 | 166 | | |
| P3 | 134 | | |

Dimensions in mm

Valve dimensions can be found on the respective valve data sheets.




## Safety Notes

- The actuator must not be used outside the specified field of application.
- It may only be installed by suitably trained or supervised personnel. Any legal regulations or other regulation issued by authorities must be observed during installation.
- The switch for changing the direction of rotation must only be operated by authorised personnel. In particular, the direction of rotation must not be reversed in a frost protection circuit.
- The actuator may only be opened at the manufacturer's site. It does not contain any serviceable or replaceable parts by the user.
- The cable and connector must not be removed from the device.
- The device contains electrical and electronic components and must not be disposed of as household refuse. All locally valid regulations and requirements must be observed.



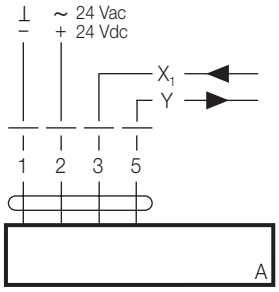
Document Number: F-27871-2

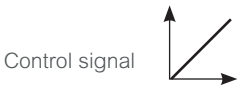
# Wiring Diagrams

## MF40ER-24M

Note

Connect via safety isolation transformer.



Control signal

Measuring voltage

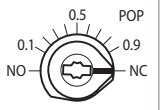
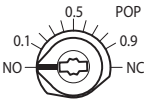
Cable colors:

1 = black

2 = red

3 = white

5 = orange

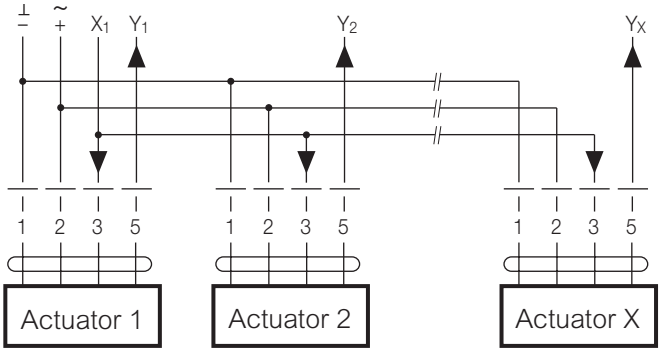
| NC | NO |
|---|---|
| A-AB=0% | A-AB=100% |
|  |  |



# Parallel Operation

Notes

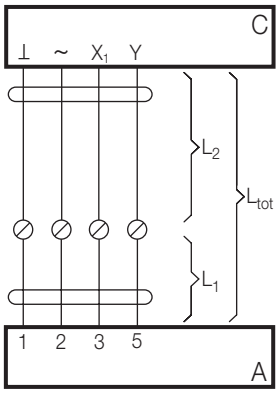
- A maximum of eight actuators can be connected in parallel.
- Parallel operation is permitted only for separated axes.
- It is imperative that the performance data is observed with parallel operation.




## Cable Lengths

Note

When several actuators are connected in parallel, the maximum cable length must be divided by the number of actuators.




A = Actuator

C = Control unit

$L_1$ = Attached connecting cable, 1 m (4 x 0,75 mm²)

$L_2$ = Customer cable

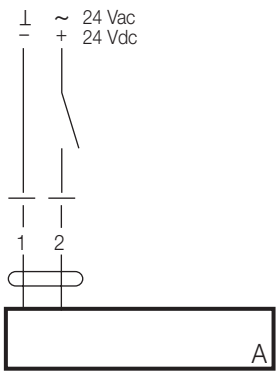
$L_{tot}$ = Maximum cable length

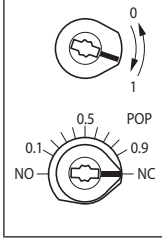
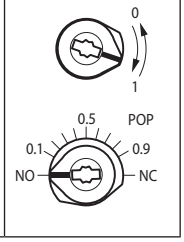
| Cross-section $L_2$ ⊥ / ~ | Max. Cable length $L_{tot} = L_1 + L_2$ | | Example for Vdc |
|---|---|---|---|
| | Vac | Vdc | |
| 0,75 mm² | ≤40 m | ≤20 m | 1 m ($L_1$) + 19 m ($L_2$) |
| 1,00 mm² | ≤50 m | ≤30 m | 1 m ($L_1$) + 29 m ($L_2$) |
| 1,50 mm² | ≤80 m | ≤45 m | 1 m ($L_1$) + 44 m ($L_2$) |
| 2,50 mm² | ≤130 m | ≤80 m | 1 m ($L_1$) + 79 m ($L_2$) |

## MF40ER-24T

Note

Connect via safety isolation transformer.




| NC | NO |
|---|---|
| A-AB=0% | A-AB=100% |
|  |  |







Document Number: F-27871-2