

Motoric Valve Drive: 24 V 3-Point Failsafe

The Motoric Valve Drive: 24 V 3-Point Failsafe is an electromotive actuator for opening and closing valves for heating and cooling systems. The predominant area of application is the energy-efficient control of water-bearing valves in the area of building services and automation.

The actuator is equipped with a failsafe function. If the power supply fails, the valve pressure plate moves into a parking position. The energy for this is provided by an internal rechargeable accumulator.

The control of the Motoric Valve Drive: 24 V 3-Point is provided by a control device with 2 or 3 point control output, e. g. a room thermostat or a building management system. The actuator is equipped with an LED for function display as well as with a manual valve setting which can be used e. g. for maintenance or for installation purposes.



1.1 Features

- OEM Design
- Suitable for AC and DC operation
- Internal energy storage for the failsafe function. Positioning in case of supply voltage failure
- Stroke 8.5 mm
- Actuating force 125 N or 200 N
- Actuating time 15 s/mm (factory setting also available in 30 s/mm)
- 2 or 3 point control operation
- Function display via LED
- Very short response times
- Maximum energy efficiency due to complete motor control via micro controller.
- Electroless self-locking transmission
- Anti-theft function by removable locking latch
- Time-dependent switch-off when reaching the limit stops
- Manual valve setting
- Very low power consumption
- Valve adapter system
- Simple plug-in installation without tools
- 100 % protection in case of leaky valves (IP 54)
- 360° installation position
- Low-noise and maintenance-free
- Pluggable connecting cable
- High functional safety and long expected service life

1.2 Variants

In its basic version, the Motoric Valve Drive: 24 V 3-Point Failsafe is delivered without logo and retracted valve pressure plate. The versions listed below are available.

Type	Operating voltage	Stroke	Actuation force	Actuation time	Scope of supply
M3PF 46825-30	24 V, AC/DC	8.5 mm	125 N	15 s/mm	<ul style="list-style-type: none"> • Motoric Valve Drive: 24 V 3-point Failsafe in individual packaging • 1 m connecting cable (pluggable), white, PVC 4 x 0.22 mm² • Installation instruction in 12 languages
M3PF 46845-30	24 V, AC/DC	8.5 mm	200 N	15 s/mm	
M3PF 46825-20	24 V, AC/DC	8.5 mm	125 N	30 s/mm	
M3PF 46845-20	24 V, AC/DC	8.5 mm	200 N	30 s/mm	

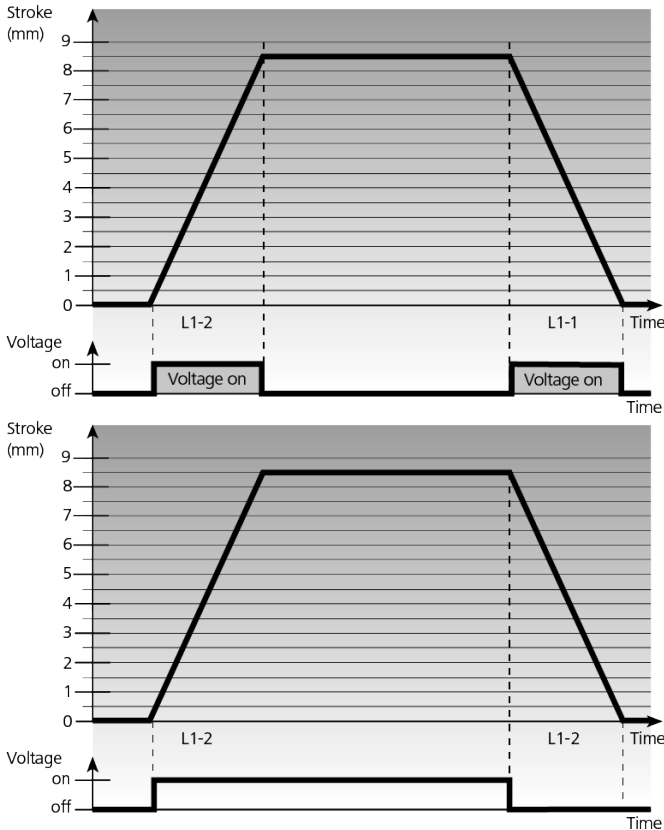
1.3 Optional differentiations to the basic version

Differentiations	
Line lengths	2 m, 3 m, 5 m; PVC in white – 4 x 0.22 mm ² - Special lengths <10 m, plug-in connection cable
Valve adapters	Adaptations are available for almost all valves
Packaging	Packaging can be manufactured and printed individually according to requirements.
Imprint on casing	Imprint of the company logo and the individual type designation
Please contact us if you have further wishes.	

2 Function

The control mechanism of the Motoric Valve Drive: 24 V 3-Point Failsafe works with a stepper motor, a microcontroller and a gearing. The force generated by the drive motor is transferred to the valve pressure plate, opening or closing the valve.

2.1 Operation



3-point control

The Motoric Valve Drive: 24 V 3-Point Failsafe is activated via the two electrical connections L1-1 and L1-2. The desired moving direction is selected via a 24 V signal at one of the connections, extracting or retracting the valve pressure plate. A 24 V signal at L1-2 retracts the valve pressure plate, a signal at L1-1 extends it. After reaching the final position the motor-driven valve actuator switches off in a time-dependent way. If the control voltage is switched off before reaching a final position, the actuator remains in its current position.

2-point control

The Motoric Valve Drive: 24 V 3-Point Failsafe can be used for a 2-point control. For this purpose, 24 V must always be applied to the electrical connection L1-1. The activation is done via the connection L1-2. A 24 V signal at L1-2 retracts the valve pressure plate maximally to its final position. The valve pressure plate remains retracted as long as the 24 V signal is applied to L1-2. If the voltage at L1-2 is switched off, the valve pressure plate extends to the end position. After reaching the final position the motor-driven valve actuator switches off in a time-dependent way.

2.2 Failsafe function

The electronics of the OEM Motoric Valve Drive: 24 V 3-Point Failsafe continuously monitors the supply voltage at terminal L1. If it fails, the actuator extends its valve spindle and closes the **NO** valve. The actuator remains in this parking position until an operating voltage is applied again.

The actuator draws the energy for the process from its internal energy storage.

Note

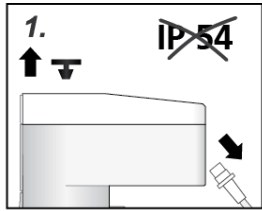
- When taking into operation after longer storage, the internal energy storage may only have a small residual charge.
- The internal energy storage is designed for at least 4 power failures per day.
- The charging time for a completely empty energy storage is max. 16 hours.
- A short start-up can trigger a failsafe event. The valve pressure plate extends and the actuator can no longer be mounted. In this case, retract the valve pressure plate manually. See section 2.7
- Perform the commissioning of the valve

2.2.1 OEM: Factory setting

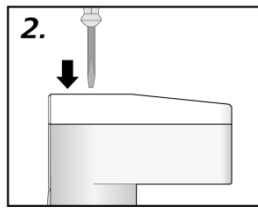
On customer request, the actuator opens or closes the valve in the failsafe case.

2.3 Manual valve setting

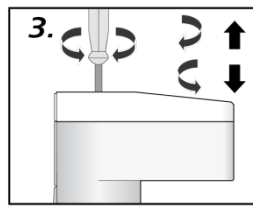
The manual valve setting allows to bring the valve pressure plate to the desired position in de-energised status. This facilitates e. g. maintenance and installation.



1. Remove the protective plug and the connecting cable or switch off the power supply.

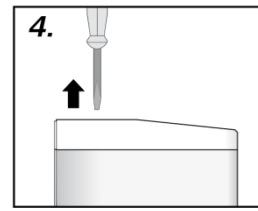


2. Introduce a screwdriver (0.3 x 2 mm) into the manual valve setting device.

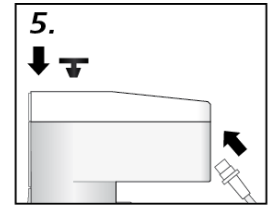


3. When turning to the right, the valve pressure plate is retracted; turning to the left extracts it.

Note: When the stop is reached, turn back to ¼.



4. Remove the screwdriver after reaching the desired position.



5. Mount the protective plug and connect the connecting cable.

Note:

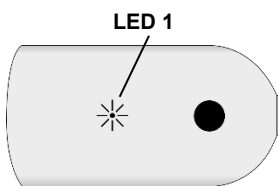
Pull the plug for manual setting. Then wait for the fail-safe function to end until the green LED 2 goes out. See also the next chapter.

2.4 Function display via LED

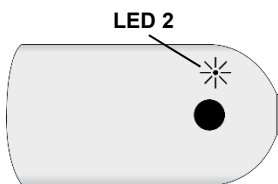
For function signalling of operating statuses, the OEM Motoric Valve Drive: 24 V 3-Point Failsafe has two multi-coloured LEDs (**LED 1, LED 2**). Green, orange and red are used as signal colours.

LED 1 signals the driving direction with green or orange light when the control voltage is applied.

LED 2 indicates the operating status of the failsafe monitoring system when operating voltage is applied to L1. If the actuator runs against the upper or lower stop, the motor and LED 1 switch off after a timeout.

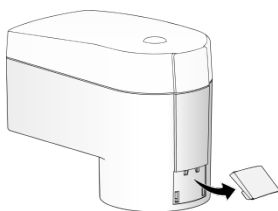


LED 1 - Signal	Meaning
Red	Error ¹
Green	Initialisation



LED 2 - Signal	Meaning
Red	Error ¹
Green	Device ready
Green (flashes)	Failsafe operation, parking position is approached
Orange	Ready for operation, battery is charging

2.5 Anti-theft device



The OEM Motoric Valve Drive: 24 V 3-Point Failsafe can be protected against unauthorised access by a simple removal of the locking latch.

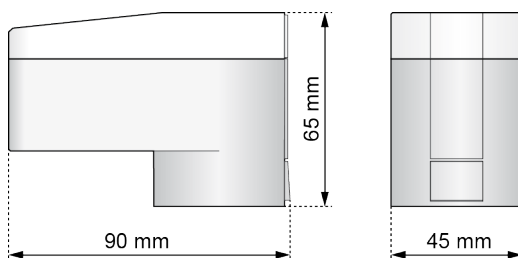
¹ In case of error: Disconnect from voltage, keep voltage free for 20 minutes and then reconnect. If this occurs more than once, replace the device.

3 Technical data

Type	M3PF 468x5	
Operating voltage	24 V AC, -10 % ... +20 %, 50-60 Hz 24 V DC, -20 % ... +20 %	
Operating power	0.2 W – 1.4 W (DC), 0.56 VA – 2.6 VA (AC)	
Power outages/day	4	
Charging time of int. battery, if empty	16 h	
Power consumption	Stand-by	<10 mA (in final position)
	Operation	AC: <160 mA DC: <100 mA
Stroke	8.5 mm	
Actuation force	Standard	125 N -20 ... +40%
	Option	200 N -20 ... +40%
Actuation time	Standard	15 s/mm
	Option	30 s/mm
Noise level	<30 dB/A	
Control system	3 point/2 point	
Minimum duty cycle	4 sec	
Function display	multi-coloured LEDs	
Fluid temperature	0 °C to +100 °C	
Storage temperature	-20 °C to +70 °C	
Ambient temperature	0 °C to +50 °C	
Degree of protection	IP 54 ¹⁾	
Protection class	III	
CE conformity according to	EN 60730	
Casing	Material	polyamide
	Colour	signal white (RAL 9003)
Casing cover	Material	(polycarbonate)
	Colour	transparent
Cable	Type	4 x 0.22 mm ² PVC
	Colour	white
	Length	1 m
Dimensions (H x W x D):	65 x 45 x 90 mm	
Weight with connecting cable (1 m)	175 g	
Surge strength according to EN 60730-1	1 kV	

1) in all installation positions

3.1 Dimensions



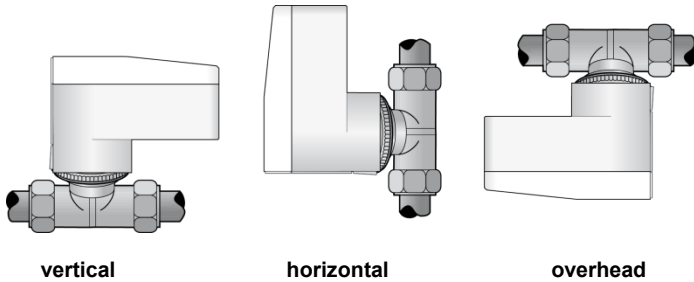
3.2 certificates



The Motoric Valve Drive: 24 V 3-Point Failsafe is NRTL approved by the TÜV Süd.

4 Installation notes

4.1 Installation position



The Motoric Valve Drive: 24 V 3-Point Failsafe can be operated in any installation position.

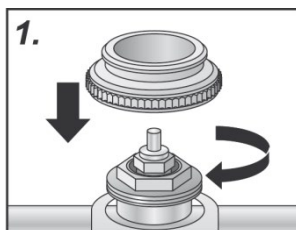
4.2 Installation with valve adapter

ATTENTION!

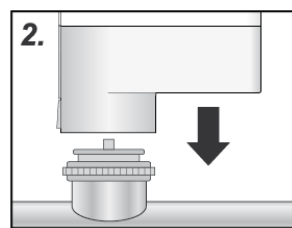
Installation with extracted valve pressure plate leads to actuator damage.

- Only install the actuator with completely retracted valve pressure plate.
- Retract an extracted valve pressure plate with the manual valve setting, or electrically.

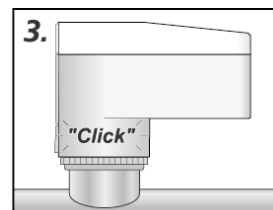
The Motoric Valve Drive: 24 V 3-Point Failsafe is mounted on the valve with a valve adapter. An extensive valve adapter assortment guarantees a perfect mechanical match of the actuator to almost all valve bottoms available on the market. The actuator is simply plugged onto the valve adapter previously installed manually. The factory retracted valve pressure plate allows easy installation.



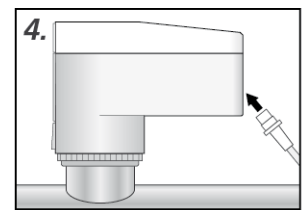
1. Screw the valve adapter manually onto the valve.



2. Position the actuator manually in vertical position to the valve adapter.



3. Simply latch the actuator to the valve adapter manually by applying vertical pressure; a clicking sound can be heard.



4. Connect the connecting cable to the actuator.

Note

The actuator should be commissioned on the valve. A short switch-on or a short supply of the operating voltage triggers the fail-safe function and the extracted valve pressure plate extends. The actuator cannot be mounted with the extracted valve pressure plate extended. It must be moved electrically or by hand to the mounting position before mounting.

4.3 Electrical connection

The control of the Motoric Valve Drive: 24 V 3-Point Failsafe is provided by a control device with 2 or 3 point control output (e. g. room thermostat) or a building management system.

Note

On site, sufficient interference suppression must be provided for the supply line to the actuator.

4.4 Connection line

We recommend the following cables for installing a 24 V system:

Cable	Section	Max. length
Standard line	0.22 mm ²	20 m
J-Y(ST)Y	0.8 mm	45 m
NYM / NYIF	1.5 mm ²	136 m

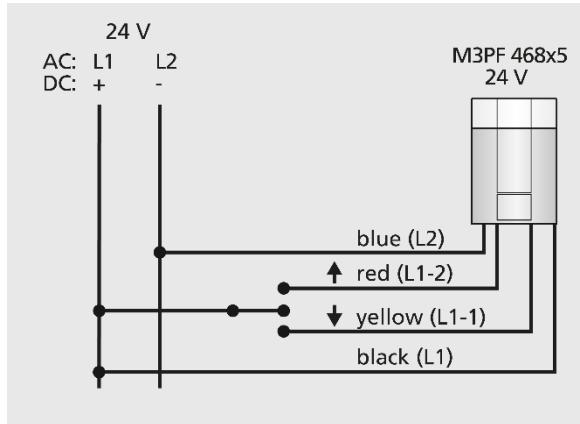
Transformer/power supply unit:

A safety isolating transformer according to EN 61558-2-6 (for AC supply) or a switching power supply according to EN 61558-2-16 (for DC supply) must always be used.

The dimensioning of the switching transformer, or the switching power supply, results from the maximum operating power of the OEM Actuators.

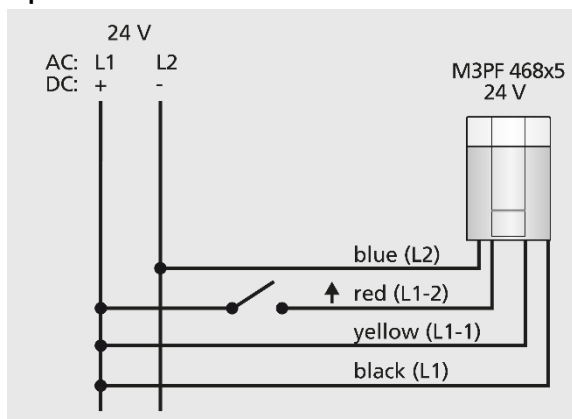
Rule of thumb: $P_{\text{Transformer}} = 3 \text{ W} \times n$
 n = Number of OEM actuators

3-point control



Function	Description
Blue (L2)	Ground
Voltage to red (L1-2)	Valve pressure plate retracts
Voltage at yellow (L1-1)	Valve pressure plate extracts
No voltage on red/yellow	The valve pressure plate remains in its current position
Black (L1)	Permanent 24 V supply

2 point control



Function	Description
Blue (L2)	Ground
Voltage to red (L1-2)	The valve pressure plate retracts until the end position
No voltage to red (L1-2)	The valve pressure plate extracts until the end position
Yellow (L1-1)	Permanent 24 V supply
Black L1	Permanent 24 V supply

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