

# EMUK Series

Servomotor

Technical Data Sheet



## Description

The **EMUK Series** actuator is an electronic servomotor with 2-point, 3-point or proportional control signal (see technical features). Used for boiler rooms, cooling units, air handling units and terminal units. Coupling the actuator with compatible valve bodies (**VBMLN Series**) is simple and requires no plumbing work (draining the system).

The 0...100% stroke indicator allows easy checking of the operation and position of the servomotor stem.

### EMUK



Electronic servomotor with 2-point, 3-point or proportional control signal. Can be coupled with **VBMLN Series** valves using an M30x1.5 threaded brass ring-nut. Power cable length: 1.5m. Nominal thrust: 500N.

IP rating: IP54

Room temperature: 0 to 50°C

**Complies with LVD 2014/35/EU and EMC 2014/30/EU.**

Type	Part no.	Control signal	Power supply	Consumption	Weight (kg)
EMUK	EMUK-230-500	2 and 3 points	230V	5.3VA	0.300
EMUK	EMUK-24-500	2 and 3 points/0-10V	24V	4.0VA	0.300

Technical features		
Model	EMUK 230-500	EMUK-24-500
Action/control	2 and 3 points	2 and 3 points
Supply voltage	230 VAC $\pm$ 10% 50/60Hz	24 VAC 60Hz
Control signal		DC 0(2)...10 v; <5mA 0....100%
Consumption	5.3 VA	4.0 VA
IP rating	IP54	IP54
IEC protection class	Class II	Class III
Stem stroke, motor only	0-7 mm	0-7 mm
Nominal thrust	500 N	500 N
Stroke time 7 mm - total stroke	22 seconds/mm	22 seconds/mm
Position status indication	visual	visual
Connection ring-nut	M30x1.5	M30x1.5
Power cable	3x0.75 mm <sup>2</sup> -1.5 m	3x0.75 mm <sup>2</sup> -1.5 m
Room temperature	0 to 50°C	0 to 50°C
Storage temperature	-10 to 55°C	-10 to 55°C
Operating and storage humidity	0-85% non-condensing	0-85% non-condensing
Fluid temperature	Min 0°C Max 120°C	Min 0°C Max 120°C
Materials: • housing • stem • ring-nut	Flame retardant plastic Stainless steel Brass	Flame retardant plastic Stainless steel Brass

## Application

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**EMUK Series** electronic servomotors coupled with **VBMLN Series** valves are used to control thermal output in heating and/or cooling systems.

Features:

- activation of **VBMLN Series** 2-way and 3-way valves;
- synchronous motor with electronic control unit and timed switch-off;
- coding switches for selecting operating time and features (EMUK-24-500);
- flow characteristics: linear (factory setting), equal percentage can be set on servomotor (EMUK24-500);
- automatic adaptation to valve stroke (EMUK-24-500 and EMUK-230-500);
- the operating direction can be selected with the connection of the cables on EMUK-24-500 and EMUK 230-500 versions;
- maintenance-free gearmotor with magnetic coupling;
- the valve can be positioned manually using a hex wrench (not supplied);
- threaded brass ring-nut for connection to the valve;
- vertical (not upside down) and horizontal installation.

### **Intended use**

This product is suitable only for the uses intended by the manufacturer, as indicated in the description.

## Operation

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**Models with 2-point and 3-point control for EMUK-230-500 and EMUK-24-500 and 0-10V for EMUK-24-500 version only.**

First connection: install the actuator on the valve, tightening the ring-nut by hand, without tools; once the actuator is installed and powered up, it will adapt automatically (self-learning) to the valve stroke.

### **Description of operation**

When voltage is applied, the servomotor is activated and the coupling stem stops in the required position.

**Direction of stroke for 2-point control: (on/off)** (the brown cable BN is live at all times)

**Direct action:** the coupling stem move inwards and the valve disc closes when the servomotor is connected to the voltage by means of the blue cable (BU) and the grey cable (GY).

**Reverse action:** the coupling stem move inwards and the valve disc closes when the servomotor is connected to the voltage by means of the blue cable (BU) and the grey cable (GY) is not connected to the voltage.

**Direction of stroke for 3-point control in 230V and 24V versions:**

**Direct action:** the coupling stem move inwards and the valve disc closes when the servomotor is connected to the voltage by means of the blue cable (MM/N) and the brown cable (BN).

**Reverse action:** the coupling stem move inwards and the valve disc closes when the servomotor is connected to the voltage by means of the blue cable (BU) and the grey cable (GY).

**Direction of stroke for 0 – 10V proportional control in the EMUK-24-500 version:**

Direction of stroke for 0 – 10V proportional control in the EMUK-24-500 version, can be selected with switch number 3 (See Table).

See electrical connections for circuit diagrams.

### Manual control

Manual control is performed when the actuator is installed on the valve.

The actuator must be disconnected from the power supply. Lift the rubber protector located on the top of the actuator and position the actuator using a 4 mm hex wrench (not supplied).

You can determine the position of the actuator by looking at the indicator between the ring-nut and the actuator body.



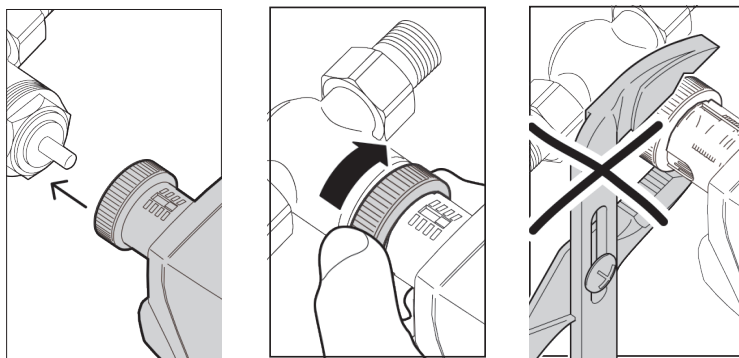
### Stroke limit

The servomotor is equipped with automatic stroke limit detection by means of a magnetic coupling. The motor continues to receive power in its stroke limit position for three minutes, after which the electronic switch shuts off the power supply.

## Installation

To install **EMUK Series** electronic servomotors, follow the instructions set out below:

1. Tighten the actuator ring-nut by hand on the threaded part of the valve. No tools are necessary.
2. Allow sufficient clearance for fitting and removal.
3. Install the servomotor vertically or horizontally as shown in the figure.
4. Tighten the servomotor ring-nut manually.



### Technical and installation notes

The unit must NOT be installed upside down.

Condensate, drips, etc. must not be allowed to enter the actuator along the valve stem.

The servomotor is fitted on the valve by means of the threaded nut and the ring-nut with no further adjustment.

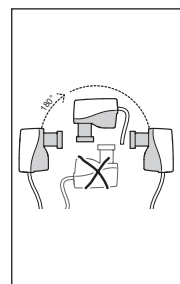
No tools are necessary. The servomotor stem couples with the valve stem automatically when you power up the servomotor (connection of MM/N and O1), or mechanically by turning it manually with a hex wrench, having first uncoupled the motor with the slide switch located next to the power cable.

Remove by unscrewing the ring-nut, pulling the servomotor upwards and releasing it from the threaded ring-nut. The threaded ring-nut can be left on the valve.

The servomotor is delivered in the mid-stroke position.

The use of a synchronous motor and magnetic coupling makes it possible to operate multiple servomotors of the same type in parallel.

- Do not open the cover.
- Opening the cover puts you at risk of injury.

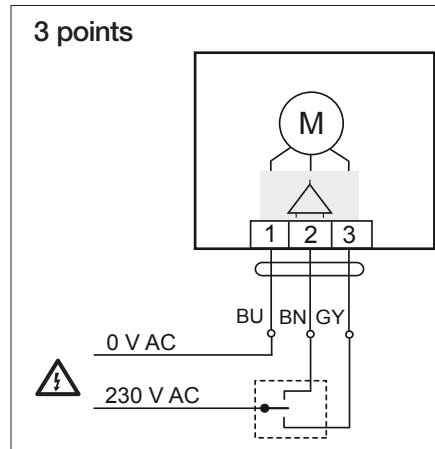
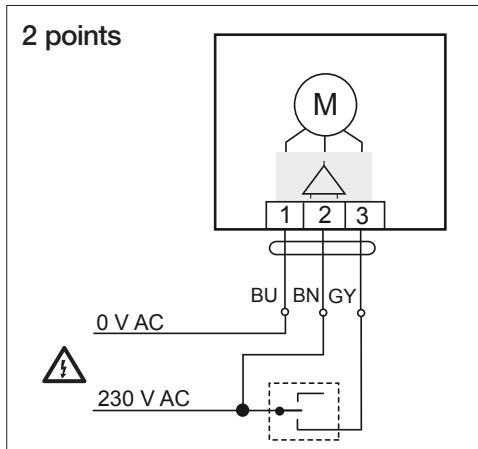


### Outdoor installation

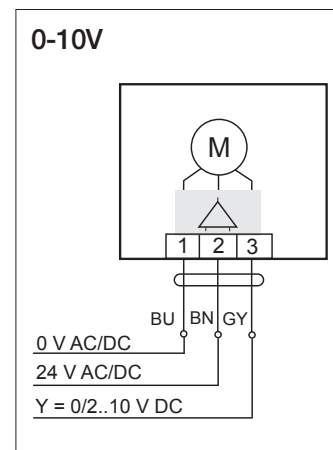
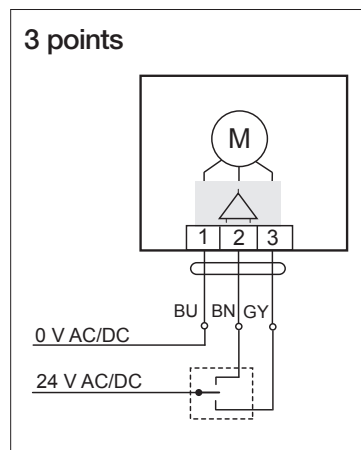
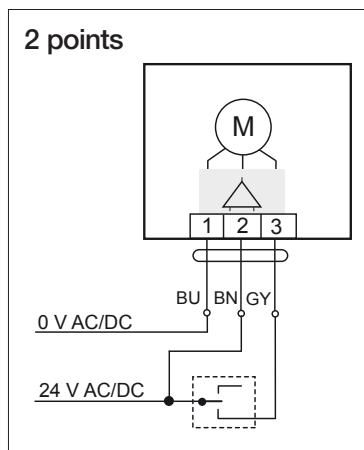
The actuators must be protected against the weather if installed outside a building.

## Electrical connections

EMUK-230-500



EMUK-24-500



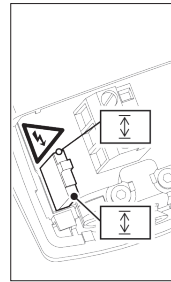
The servomotor paired with VBMLN Series valves has equal percentage flow characteristics.

To pair it with a valve with linear flow characteristics, change the position of switch number 4.

## Setting the EMUK 230-500 version

### Re-initialisation

- The valve must be reset after it has been refitted or manually adjusted.
- Disconnect the power supply and remove the cover.
- Change the position of the switch (1)
- Refit the cover and connect the power supply.
- The actuator performs an initial stroke.

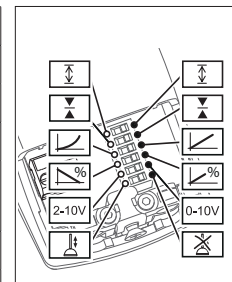


## Setting the EMUK 24-500 and 0-10V version

### Valve operation

Valve operation can be modified by means of slide switches 1 to 6 located under the top cover of the actuator

Function	Switch (A)	Function
Re-initialisation ON=OFF/OFF=ON		Re-initialisation ON=OFF/OFF=ON
Not used		Not used
Characteristic curve compensation ON		Characteristic curve compensation OFF
Actuation and positioning direction 100%...0%		Actuation and positioning direction 0%... 100%
DC 2...10V		DC 0...10V
Valve anti-block function ON		Valve anti-block function OFF



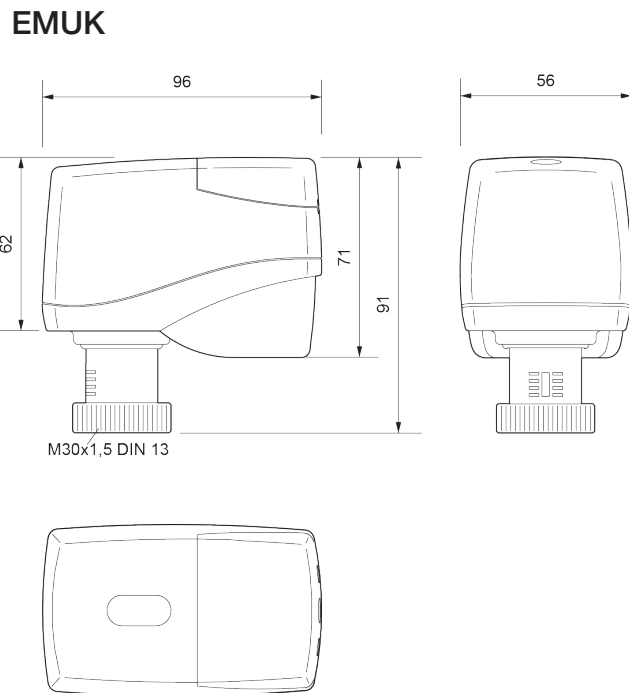
Switch	Function	Default setting	Description
1	Anti-block function	OFF	If system specifications allow, the valve operating function can be activated during commissioning. When the valve anti-block function is activated, the motor performs an open/close cycle every 21 days.
2	Setting the DC 0..10 V or DC 2..10V control signal	OFF	Default setting: DC 0..10 V.
3	Setting movement to direct-acting or reverse-acting.	OFF	Default setting: 0..100% ; "Valve opening"
4	Motor characteristic curve selection.	OFF	When the function is activated, the characteristic curve is equal percentage.
5	Not used	OFF	Not used
6	Self-learning	OFF	When the motor is refitted on the valve, the self-learning process needs to be repeated. This can be done by moving switch 6 from "OFF" to "ON" or from "ON" to "OFF". Initialisation takes place automatically every 7 days anyway. The LED (under the connections cover) flashes during initialisation.

### NOTE

If the actuator is controlled with a 3-point signal, the valve works. The "valve anti-block function" (switch 1) and the "control range setting" function (switch 2) are not active.

## Overall dimensions (mm)

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## Specification text

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### **EMUK Series**

Electronic servomotor for boiler rooms, cooling units, air handling units and terminal units EMUK Series – WATTS brand. Two-point, three-point or 0–10V proportional control signal. Connection to the valves by means of an M30x1.5 threaded brass ring-nut. Actuator operation visible by means of stroke indicator. Power cable length: 1.5 m. Nominal thrust: 500N. IP rating: IP54. Room temperature: 0 to 50°C.

Compliant with the following Directives: LVD 2014/35/EU, EMC 2014/30/EU.



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