

# EMUJC Series

Electronic actuator

## Technical Data Sheet



## Description

The actuator **EMUJC Series** is an electronic device with 2 and 3 points or proportional control signal (see technical features). It is distinguished by its compact footprint, which makes installation in small spaces possible; the actuator can be easily coupled with compatible valve bodies (**2131-3131-4131, DYN Series**) without any hydraulic operations (system drainage). The actuator's operating status (On, Off, End stroke) is clearly indicated by a LED.



### EMUJC

Compact electronic actuator for terminal units. Three-point or proportional control signal. Coupling with **2131-3131-4131, DYN Series** valves by means of brass threaded ring nut (M30x1.5). Diagnostics of actuator operating status by means of LED: On-Off, End stroke reached, in-progress stroke positioning.

Cable length: 2 m. Nominal thrust: 120 N.

Degree of protection: IP43. Ambient temperature: 0÷50°C.

Compliant with LVD 2014/35/EU, EMC 2014/30/EU.

Type	Part no.	Control signal	Power	Consumption	Weight (kg)
EMUJC	EMUJC-230	2 and 3 points	230 V	6,5 VA	0,2
EMUJC	EMUJC-24	2 and 3 points	24 V	2,5 VA	0,2
EMUJC	EMUJC-010	Proporzional 0-10V (2-10V)	24 V	2,5 VA	0,2

Technical features			
Model	EMUJC-010	EMUJC-24	EMUJC-230
Action/Control	proportional	2 and 3 points	2 and 3 points
Power supply	50/60 Hz-24 Vac ±15%	50/60 Hz-24 Vac ±15%	50/60 Hz - 230 Vac ±15%
Control signal	0÷10 Vdc <sup>(1)</sup> , 2÷10 Vdc 0÷5 Vdc, 5÷10 Vdc 0÷20 mA, 4÷20 mA	24 Vac	230 Vac
Impedance (power signal)	power: >100 kΩ current: 500 kΩ	-	-
Power consumption	2,5 VA <sup>(2)</sup> 1,5 W <sup>(3)</sup>	2,5 VA <sup>(2)</sup> 1,5 W <sup>(3)</sup>	6,5 VA <sup>(2)</sup> 2,2 W <sup>(3)</sup>
Electrical protection	IP43	IP43	IP43
Stem stroke	3,2 <sup>(1)</sup> - 4,3 - 5,5 mm	Max 6,3 mm	Max 6,3 mm
Nominal thrust	120 N +30% - 20%	120 N +30% - 20%	120 N +30% - 20%
Stroke time	8 s/mm	13 s/mm	13 s/mm
Operating status	Bi-coloured LED green/red	green LED	green LED
Coupling ring nut	M30x1,5	M30x1,5	M30x1,5
Electric cable	3x0,35 mm <sup>2</sup> -2 meters	3x0,35 mm <sup>2</sup> -2 meters	3x0,75 mm <sup>2</sup> -2 meters
Ambient temperature	0÷50°C	0÷50°C	0÷50°C
Storage temperature	-20÷65°C	-20÷65°C	-20÷65°C
Operating humidity and storage	Non-condensing	Non-condensing	Non-condensing
Temperature of fluid	Min 0°C Max 95°C	Min 0°C Max 95°C	Min 0°C Max 95°C
Noise level	< 30 dB(A)	< 30 dB(A)	< 30 dB(A)
Material:			
• housing	ABS + PC	ABS + PC	ABS + PC
• stem	PA66, 30% glass filled	PA66, 30% glass filled	PA66, 30% glass filled
• ring nut	Nickel-plated brass	Nickel-plated brass	Nickel-plated brass

**Note:** (1) Factory setting, (2) Apparent, (3) Active

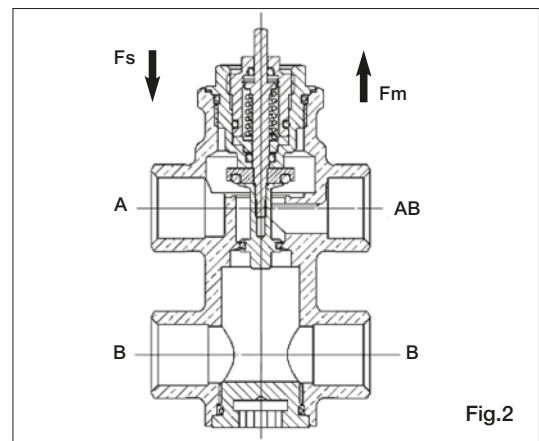
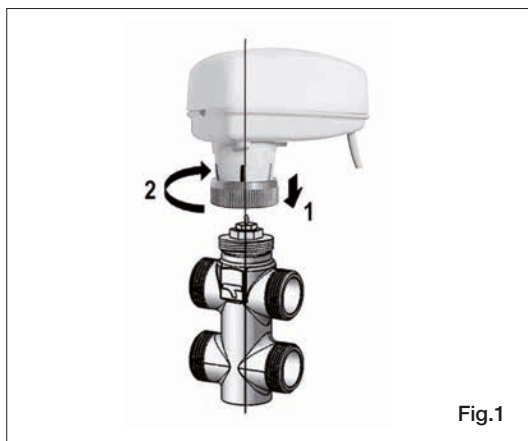
## Application

The electronic actuators **EMUJC Series**, coupled with the valves **2131-3131-4131, DYN Series**, are used in heating and/or air-conditioning systems to control the heat emission of the single terminal units.

## Operation

The operation of the **EMUJC Series** actuator is based on the rotation of a shaft driven in either direction by a set of gears. The latter are, in turn, driven by a bidirectional synchronous motor through a magnetic coupling which limits the torque transmitted and therefore also the linear output force. The actuator and valve body (**Fig.1**) are coupled by means of a threaded ring nut. The movement of the actuator is transmitted to the stem of the valve by axial contact and is kept constant by means of a spring situated inside the valve body. In this way, the valve opening and closing forces are obtained, in one direction, through the thrust exerted by the actuator (**F<sub>s</sub>** opens way **B-AB, Fig.2**) and, in the other direction, through the force of the spring (**F<sub>m</sub>** opens way **A-B, Fig.2**) situated inside the valve itself. The valve remains open if the actuator is removed from the valve body.

### Actuator - valve coupling by means of threaded ring nut



## Models with three-point control (EMUJC-230 and EMUJC-24)

### Action

When the actuator is powered between terminals 1 and 2, the stem extends. When power is removed, the actuator remains in position. When the actuator is powered between terminals 1 and 3, the stem retracts and when the signal is removed, the actuator remains in position. On the other hand, if the actuator remains powered, it stops automatically about 90 seconds after reaching the end stroke position.

Action	EMUJC-230 cable colour	EMUJC-24 cable colour	Stem movement
terminal 1 terminal 2	Blue Brown	Black Red	The stem extends
terminal 1 terminal 3	Blue Orange	Black Orange	The stem retracts

### End stroke

If the signal is continuously applied in the same direction, every 2 hours the actuator starts up for about 90 seconds (in keeping with the signal direction applied), to confirm the end stroke position.

### Check of operating status

Models with three-point control are fitted with green LEDs to indicate the operating status:





LED	Signal	Meaning
	Off	Actuator not powered
	Flashing green	Stem moving or Confirmation of end stroke position
	Steady green	End stroke position reached

## Model with proportional control (EMUJC-010)

### Action

When the control signal increases (from 0 to 10 V) in Direct Action (DA) configuration the stem extends, and in Reverse Action (RA) configuration, the stem retracts.

When the control signal decreases (from 10 to 0V) in Direct Action (DA) configuration the stem retracts, and in Reverse Action (RA) configuration, the stem extends

Action	Control signal	Stem movement
Direct Action (DA)	0÷10 Vdc	 The stem extends
	10÷0 Vdc	 The stem retracts
Reverse Action (RA)	0÷10 Vdc	 The stem retracts
	10÷0 Vdc	 The stem extends

### End stroke

If the signal is continuously applied in the same direction, every 2 hours the actuator starts up for about 60 seconds (in keeping with the signal direction applied), to confirm the end stroke position.

### Self-calibration

When it is powered, the actuator self-calibrates its end stroke position. The actuator drives the stem out for the whole available stroke of the valve until it no longer detects movement of the plug and it memorises its position.

At the end of the self-calibration cycle, the actuator positions the stem according to the control signal.






### Control signals

The actuator is set up to receive the following user-selected input control signals:

- 0÷10 Vdc
- 2÷10 Vdc
- 0÷5 Vdc
- 5÷0 Vdc
- 0÷20 mA
- 4÷20 mA

### Check of operating status

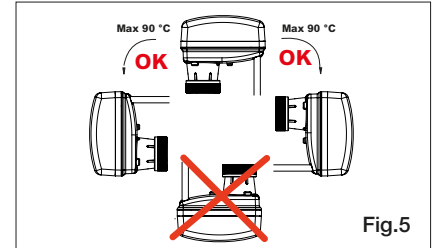
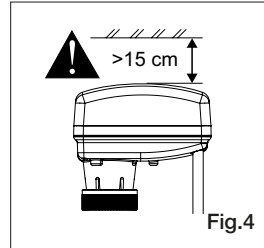
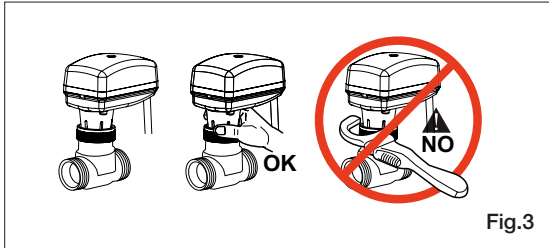
The model with proportional control is fitted with a bi-coloured LED (green/red) to indicate the operating status:

LED	Signal	Meaning
	Off	Actuator not powered
	Flashing green	Stem moving or Confirmation of end stroke position
	Steady green	Position reached
	Flashing red	Self-calibration cycle
	Steady red	No input signal (when set at 2÷10V o 4÷20 mA)

## Installation

Take the precautions below to install the **EMUJC Series** electronic actuators:

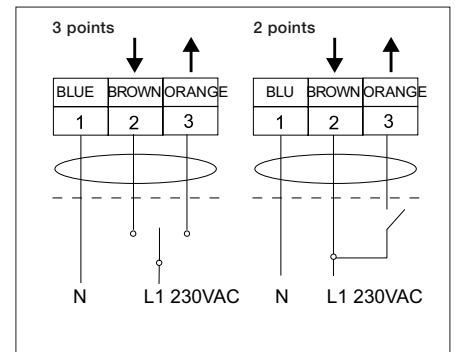
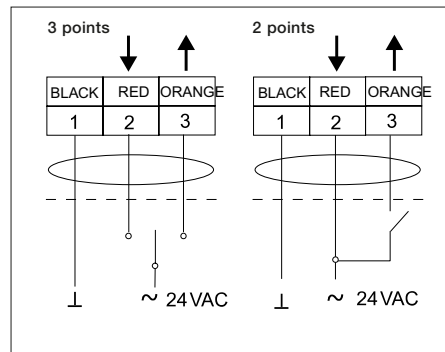
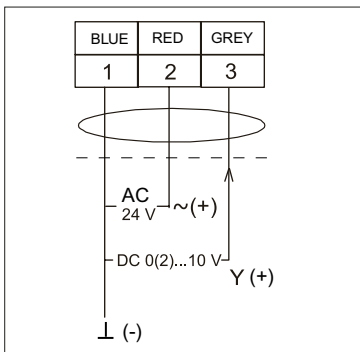
1. Position the actuator above the valve and manually screw on the ring nut (**Fig.3**). Do not use tools that could damage the actuator.
2. Make sure there is enough room for assembly and disassembly (**Fig.4**).
3. Install vertically or horizontally, making sure the actuator is at an angle of less than 90° (**Fig.5**), because any leakage from the valve could cause irreparable damage to the actuator.
4. Do not cover the actuator with insulating material to avoid overheating.
5. Never use the actuator as leverage to assemble the valve.



## Electrical wiring

When wiring the **EMUJC Series** electronic actuators, take the following precautions:

1. Electrical wiring must be done by authorised personnel, in compliance with the laws of the country of installation.
2. Mains voltage and low voltage must be powered separately.
3. Make sure the power supply conforms with the actuator voltage.
4. Before switching on, check all the wiring connections.
5. Short-circuited or improperly connected wires could cause permanent damage to the appliance.
6. The colours of the wires may change so always refer to the wiring diagrams shown on the cover of each actuator.



## Configuration

The actuators with 2 and 3 points control (EMUJC-24 and EMUJC-230) do not need any initial set-up. The proportional actuator (EMUJC-010) can be configured on the basis of the input signal, the desired action and the required stem stroke. The main configurations are shown below. For more information refer to the instruction sheet.

DIP SWITCH				ON
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6

<input type="checkbox"/> 0.10VDC	<input type="checkbox"/> 0.5VDC	<input type="checkbox"/> 5.10VDC	<input type="checkbox"/> 2.10VDC
<input type="checkbox"/> 0.20mA			<input type="checkbox"/> 4.20mA
<input type="checkbox"/> DA	<input type="checkbox"/> RA		
<input type="checkbox"/> LIN	<input type="checkbox"/> Eq%		
<input type="checkbox"/> VDC	<input type="checkbox"/> mA		

1: RANGE	4: ACTION
2: COMMAND	5: CURVE
3: SIGNAL	6: SIGNAL TYPE

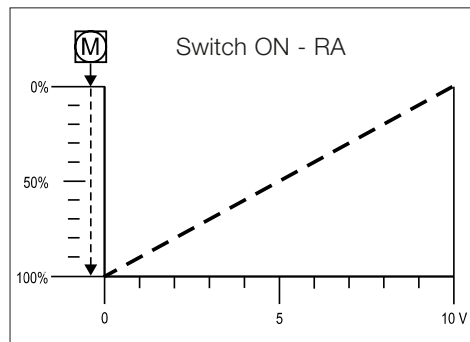
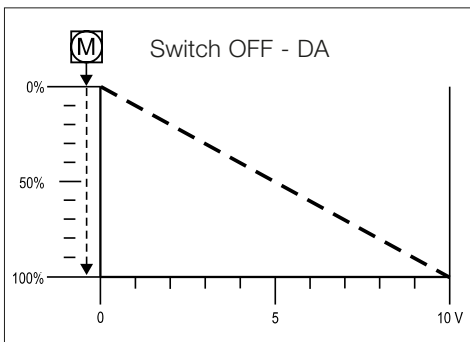
### Dip switch

#### Switches 1-2-3

Switches for setting the control signal. Switch 6 must be selected as a consequence.

#### Switches 4

Switch for setting the actuator action: DA = Direct Action, RA = Reverse Action.



#### Switches 5

Switch for setting the control characteristics.

Switch OFF = linear output to use with linear or equal percentage valves.

Switch ON = pseudo equal percentage output to use with quick-opening or on/off valves.

#### Switches 6

Switch for setting the type of control signal.

Switch OFF = signal voltage

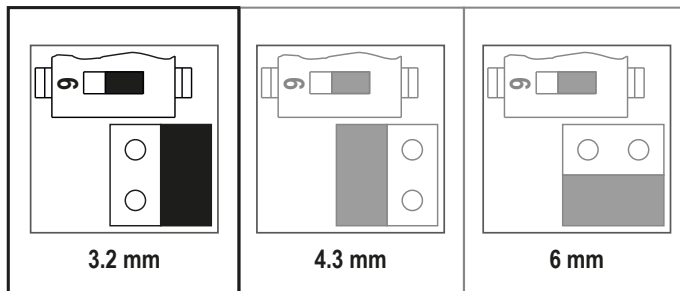
Switch ON = signal current

This switch must be set on the basis of switches 1, 2 and 3

**NOTE: all switches are factory set in the OFF position.**

## Jumper

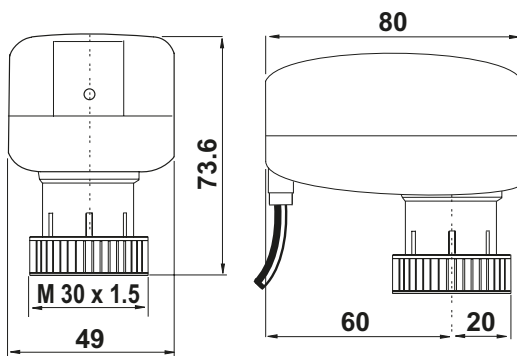
The correlation between the positions of the jumper and the stroke of the actuator stem is shown below.



**NOTE:** the stroke is factory set at 3.2mm

## Overall dimensions (mm)

### EMUJC



## Specification text

### **EMUJC Series**

Compact electronic actuator for terminals **EMUJC Series** WATTS brand. Two or three points or proportional control signal. Coupling to the valves by brass threaded nut M30x1.5. Diagnostics of actuator status by LED: On-Off indication, limit switch reached, positioning in progress. Power cable length: 2 m. Nominal thrust: 120 N. Degree of protection: IP43. Ambient temperature: 0÷50°C. Compliant with LVD 2014/35/EU, EMC 2014/30/EU.



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