

# Modulating Electromechanical Actuator Series EMUJC



## Main features

- Modulating electromechanical actuator for Compact Series 3131- 4131 valves
- Control signal 0-10V (0-5V e 5-10V)
- Nominal stroke : 2,5 mm
- Stroke control at increase in torque
- 24Vac power supply voltage
- Direct assembly by means of a threaded ring nut (M30x1.5)
- Pre-cabled



A Division of Watts Water Technologies Inc.

## Description

The **Series EMUJC** actuator is a modulating electromechanical actuator supplied with 24V by means of a three-point control or 0-10V (0-5V and 5-10V) control signal. Its distinguishing features are its compact size, which enables it to be installed in small spaces (fan coils, etc...) and its ease of assembly in that no hydraulic operations (system drainage) are required to couple the servo controls with the valve bodies. It also has a LED that signals its operating status.



### EMUJC

Modulating electromechanical actuator powered with 24V by means of a 0-10V (0-5V and 5-10V) control signal. It has a LED indicating its operating status.

Type	Part no.	Control Signal	Power supply	Cable length
EMUJC	EMUJC010	0 -10V (2 -10V)	24V	2000 mm

## Application

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

## Operation

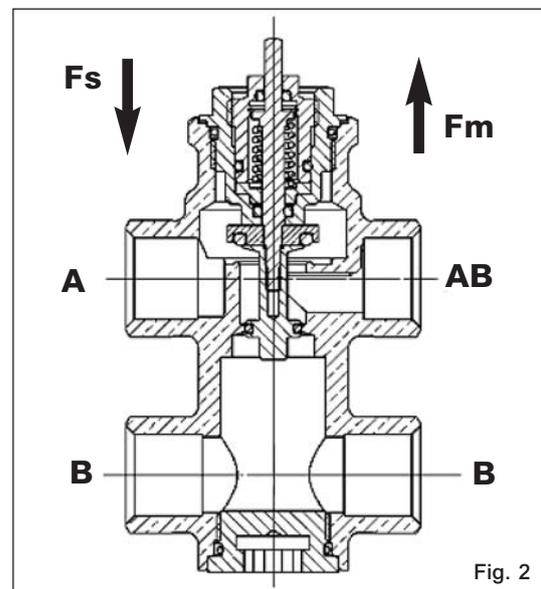
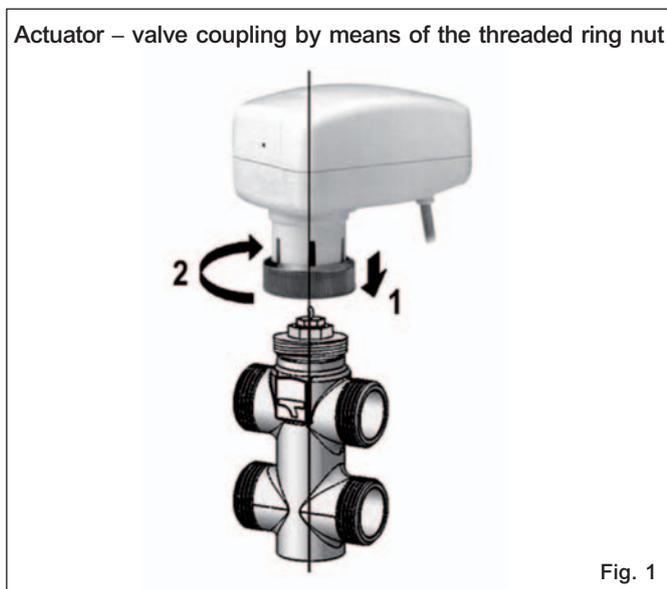
The operation of the **Series EMUJC** actuator is based on the rotation of a shaft driven in either direction by a set of gears. The latter are, in turn, driven by a bidirectional synchronous motor through a magnetic coupling which limits the torque transmitted and therefore also the linear output force.

The servomotor and valve (**Fig. 1**) are fixed to one another by means of a threaded ring nut which fits directly into the valve body itself, without any need for other tools.

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 servomotor (**F<sub>s</sub>** opens way B, **Fig. 2**) and, in the other direction, through the force of the spring (**F<sub>m</sub>** opens way A, **Fig. 2**) situated inside the valve itself.

The Series EMUJC actuator allows the valve to be opened manually simply by removing the actuator from the valve body.

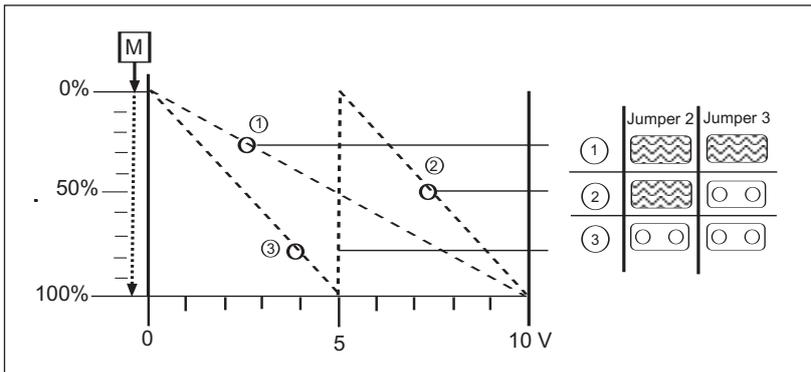


## Action

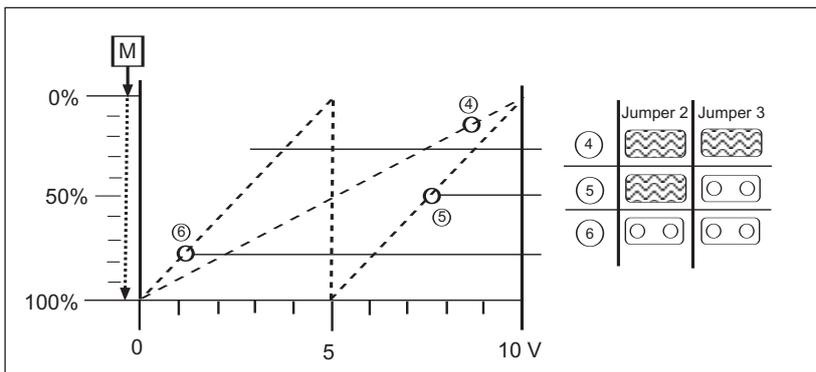
When the signal increases in Direct Action (DA) configurations or decreases in Reverse Action (RA) configurations, the motor moves a set of gears that push the valve stem straight downwards against the return spring.

When the signal decreases in Direct Action configurations or increases in Reverse Action configurations, the actuator shaft retracts, thus allowing the valve return spring to restore the stem to its normal position.

### Jumper 5, Direct Action



### Jumper 5, Reverse Action



### Limit switch confirmation

When the signal remains constant at the maximum or minimum level, to confirm the position, the motor is started every 2 hours for about 80 seconds.

### Self-calibration cycle

When it is powered, the actuator automatically calibrates its limit switch position by performing a complete rotation. The actuator drives the stem downwards for about 80 seconds to the position of the input signal.

### Anti-blocking cycle

When the anti-blocking cycle is enabled (ON), the actuator performs a complete rotation every 24 hours to remove any impurities that have accumulated in the plug and the valve seat. The anti-blocking function can be selected using jumper 1.

## Operating LED indications

ON		Power supply present, motor off. • Floating actuator : time out • Proportional actuator : running
Single blink		Motor on
Double blink		The actuator executes a limit switch confirmation or anti-blocking cycle
OFF		Power supply not present

## Calibration (Jumper setting)

Position of jumper on the card :

Jumper in position :

Jumper not in position :

1

2

3

4

5

6

Function	Jumper No.	Factory setting	Alternative setting
Anti-blocking	1	Enabled	Disabled
Input signal control	2	0...10 V	5...10 V  0...5 V
	3	0...10 V	5...10 V  0...5 V
No function	4	No function	.....
Action	5	Direct (DA)	Reverse (RA)
No function	6	No function	.....

## Factory Calibration

The setting of the modulating version is 0/10V in direct action. With 0V, the valve will be fully open.

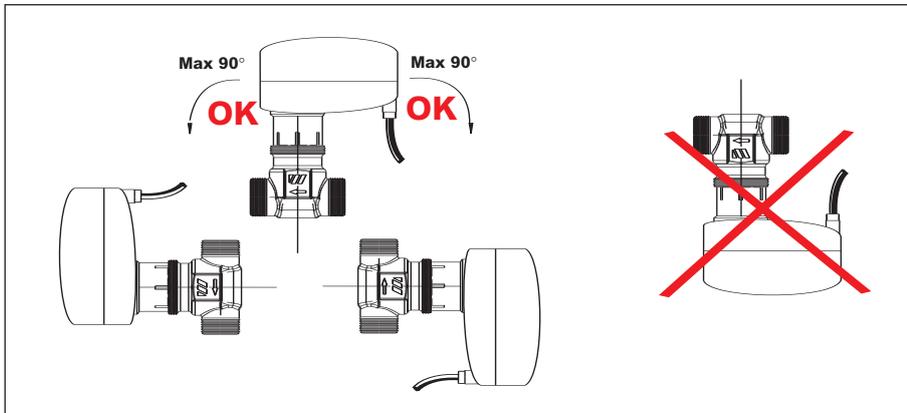
Technical characteristics	
Models	EMUJC010
Action/Control	Proportional (0...10 V, 0...5 V or 5...10 V)
Power supply	(50/60 Hz) 24 VAC ±15%
Input impedance	80 kΩ
Power consumption	Apparent : 2.7 VA when on Active : 2 W
Nominal force	120 N +30% / -20%
Maximum conventional stroke	2,5 mm when used together with valves 3131 and 4131
Maximum conventional stroke	15 s/mm
Protezione	IP40 (EN 60529)
Material :	
Cover / Shaft	PA66 - Glass + (30% total) Kelon A FR CETG/300-V0
Ring nut	Brass CuZn40Pb2
Coupling	M30 x 1.5
Colour of cover	RAL7035
Ambient operating conditions	from 0 °C a 50 °C, without condensation
Storage conditions	from -20 °C a 65 °C, without condensation
Maximum fluid temperature	95 °C
Electrical connections	flexible cable 2 m, Ø 4.5 mm
Operating status	LED
Noise	<30 dB(A)
Weight of shipment	0.15 Kg

### CE Marking

Conformity to Directive 89/336 EEC: EN 61000-6-1; EN 61000-6-3

## Installation

Never use the actuator as a lever for assembling parts.

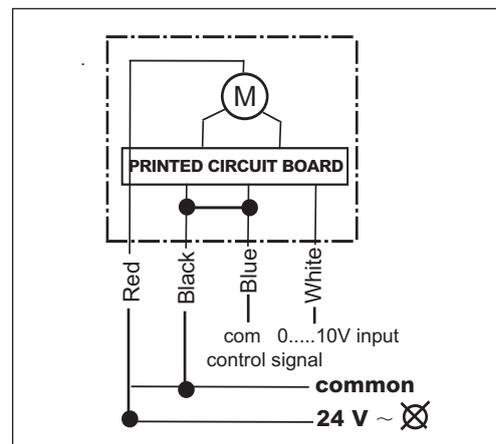


## Electrical Connections

The wiring diagram is illustrated on the outside of the motor casing.  
The ends of the connecting cable are to be connected as shown in Table 1.

Table 1	
0-10V VERSION	
Operation	(*) Cable colour
Power supply : neutral	Blue
Power supply : phase	Red
Positive control signal (+)	White
Negative control signal (-)	(**) Black

- (\*) These colours may vary:  
see the electric wiring label or the instructions sheet attached to the motor.
- (\*\*) For control units that also have a negative output signal (-), it must be connected to the neutral wire of the power supply.



## Connecting Instructions

**WARNING :**  
During assembly and maintenance, make sure that :

- The power supply is shut off to eliminate the risk of damage to the equipment and injury to persons.
- Do not touch, connect or disconnect wires with the power supply turned on.

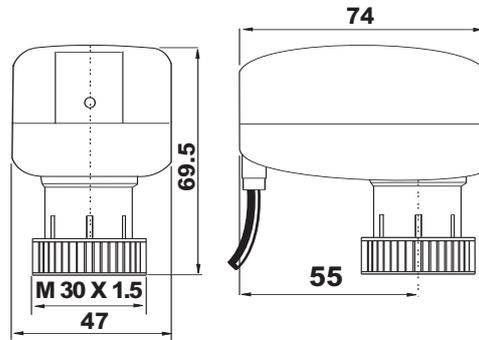
When making the electrical connections, follow the instructions given below :

- Before making the connection, make sure that the power supply is off or disconnected to eliminate the risk of damage to the material and injury to persons.
- Make sure that the power supply conforms to the specifications given on the cover of the actuator.

All connections must comply with the laws and regulations in force and must be made by specialized staff.

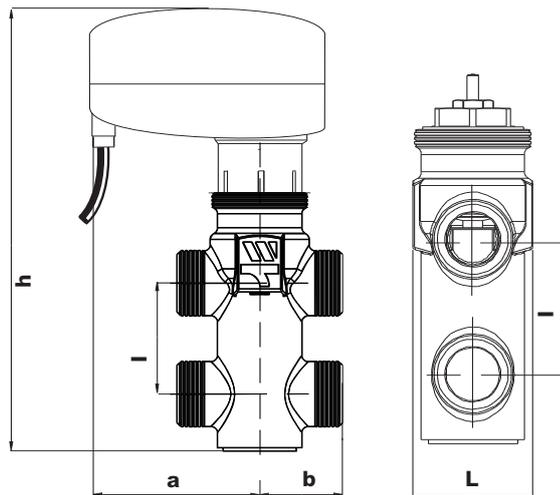
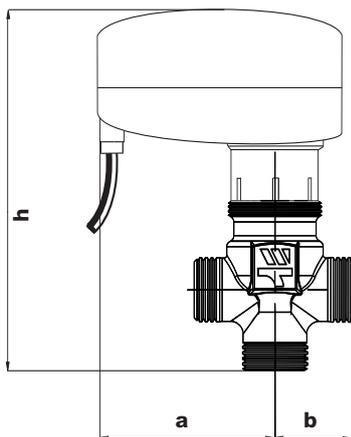
Overall dimensions (mm)

EMUJC



3131 - EMUJC

4131 - EMUJC



Valve / actuator coupling		0...10V (2-10V) Version				
	Diameter	a	b	h	i	l
2131	1/2"	55	26	105	-	32
	3/4"	55	28	105	-	32
	1"	55	41	132	-	47
3131	1/2"	55	26	118	-	32
	3/4"	55	28	120	-	32
	1"	55	41	155	-	49
4131	1/2"	55	26	145	35	31
	3/4"	55	28	158	50	33

The descriptions and photos contained in this brochure are supplied by way of information only and are not binding. Watts Industries reserves the right to make any technical or design improvements to its products without prior notice.



Watts Industries Italia S.r.l.

Via Brenno, 21 - 20046 Biassono (MI), Italy

Ph. : +39 039 4986.1 - Fax : +39 039 4986.222

e-mail : info@wattsindustries.it

www.wattsindustries.com