ACTUATOR FOR MIXING VALVES

0577EN October 2023

0-10 V PROPORTIONAL ACTUATOR (CONNECTIONS M30x1,5 mm), FOR R298 AND R298N MIXING VALVES K281 SERIES

K281X012

Description

The K281X012 actuator serves to control the R298 and R298N mixing valves in heating and cooling systems.

The actuator can be controlled from the KLIMAbus KPM20 or control unit.

Versions and product codes

Product code	Power supply	Type	Valve connection
K281X012	24 Vac/dc	0-10 V proportional	M30 x 1,5 mm

Accessories

P19Y001: ring nut M30x1,5 mm for adapting R298 or R298N valves with M28x1,5 mm threading. Complete with plastic cap for protection and manual regulation/interception (as an alternative to the actuator).

Technical data

- Type of actuator: 0-10 V proportional
- Type of regulation to be used with actuator: KLIMAbus (KPM30/)
- Power supply: 24 Vac/dc 50/60 Hz
- Type of command: automatic
- Propulsion force: 120 N +30 % -20 %
- Maximum stroke: 6,3 mm
- Opening time at maximum speed: 50 sec
- Power consumption: 2,5 VA
- Protection class: IP43
- Storage temperature range: -20÷65 °C with R.H non-condensing
- Operating ambient temperature range: 0÷50 °C with R.H non-condensing
- Electric cable length: 1,5 m (3 x 0,25 mm^2)
- Noise level when operating: < 30 dB(A)
- Ring nut for fixing to valve body: M30x1,5 mm, in brass
- dual color LED (green/red), function status indicator
- Color: White

Materials

- Cover: ABS + PC
- Stem: PA66 - GF30
- Threaded nut: brass UNI EN 1264 - CW614N

Operation

Pressure cycle

When the current is applied, the actuator auto-calibrates in order to carry out a complete cycle. The actuator moves the stem downwards for a complete stroke. Once ZERO position has been reached, the actuator moves the stem according to the input signal. When the input signal increases (for example from 0 V to 10 V), the actuator stem extends when the actuator is configured as Direct Action (DA), or withdraws if the actuator is configured as Reverse Action (RA). When the input signal decreases (from 0 V to 10 V), the actuator stem retracts when the actuator is configured as Direct Action (DA), or extends if the actuator is configured as Reverse Action (RA).

Confirmation of end of stroke

When the input signal is at 100%, every 2 hours the actuator restores the current and the guides the direction of the signal for about 60 seconds to end of the stroke position.

Action	Input	Direction	
Direct action	0...10 V DC	↓	Extension of actuator stem
	10...0 V DC	↑	Retraction of actuator stem
Inverse action	0...10 V DC	↑	Retraction of actuator stem
	10...0 V DC	↓	Extension of actuator stem

Function status indicators

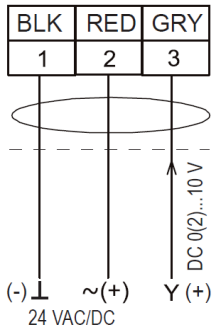
The K281X012 actuator is equipped with a dual color LED (green-red) which supplies information regarding the operational and diagnostic status, as follows:

LED		Meaning
OFF	○	No power
Intermittent green	◐	Moving into position
Intermittent green	◐	Confirmation of end of stroke
Fixed green	●	Position reached
Intermittent red	◐	Cycle
Fixed red	●	4/20 mA or 2/10 Vdc: signal lost

Electrical connections

Warning.
Make sure the power supply voltage is disconnected while the connections are being carried out.

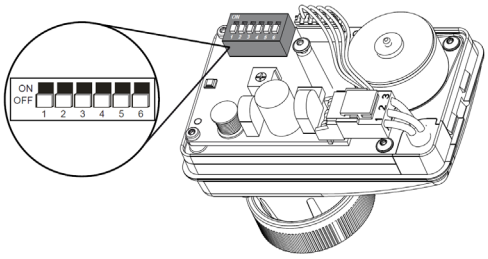
Warning.
Make and check the electrical connections before powering the system. Short circuits or incorrectly connected cables could cause permanent damage to the electrical components of the actuator.

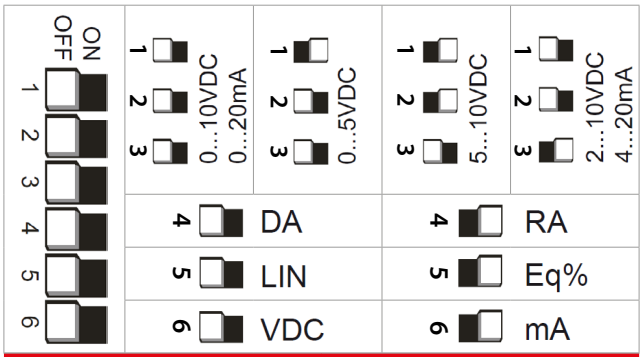


Conductor color	Function
Black	Supply voltage 24 Vac/dc;
Red	
Grey	Up/down contact 0-10 Vdc

DIP SWITCH settings

All proportional models have 6 DIP SWITCHES which allow the user to configure the actuator. The actuator is supplied by the factory with all DIP SWITCHES in the OFF position.



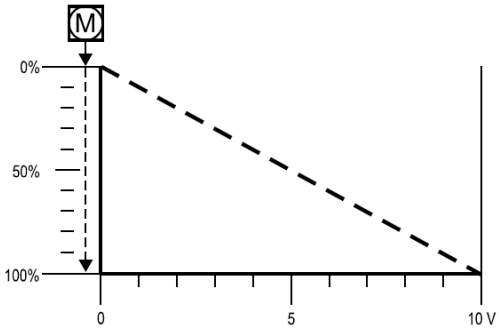


1, 2, 3: CONTROL SIGNAL INTERVAL	4: Action
	5: CURVE
	6: TYPE OF SIGNAL

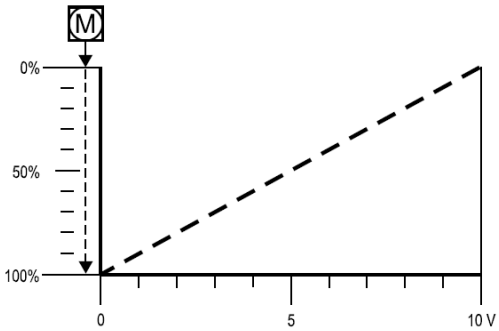
Dip Switch 1 – 2 – 3 – 6
DIP SWITCH 1-2-3 allow the user to change the intervals of the analog input. To move from analog input voltage to an AC current, the DIP SWITCH must be adjusted accordingly.

Dip Switch 4
DIP SWITCH 4 allows the user to change the action of the actuator in relation to the analog input.

• DIP SWITCH 4 OFF (Direct Action – DA)
When the signal increases, the actuator stem extends.



• DIP SWITCH 4 ON (Reverse Action – RA)
When the signal increases, the actuator stem retracts.



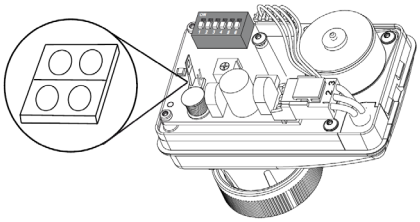
Dip Switch 5
DIP SWITCH 5 allows the user to vary the actuator control features in order to obtain an linear actuator-valve combination or a more or less equal percentage.

• DIP SWITCH 5 OFF (Linear)
Users are advised to use with a linear valve or with an equal percentage control feature.

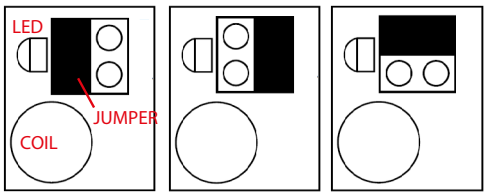
• DIP SWITCH 5 ON (Percentage more or less equal)
Users are advised to use with a quick opening valve or on/off control feature.

JUMPER regulation

All proportional models have a JUMPER which allows the user to change the following parameters:



the actuator is set at 6 mm in the factory, but the stroke can be changed to 3.2 mm or 4.3 mm for convenience.

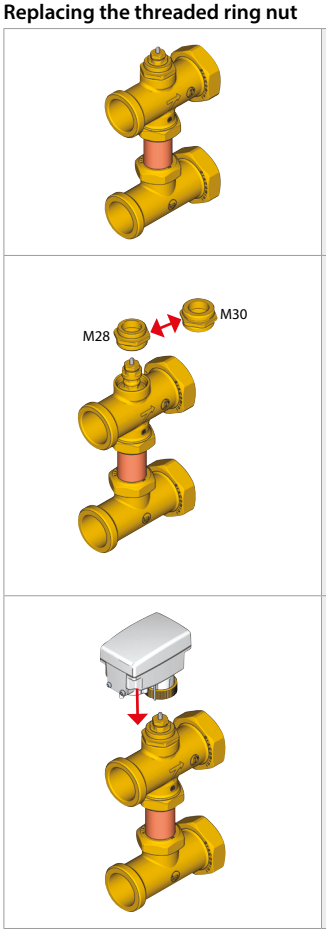


3,2 mm | 4,3 mm | 6 mm Factory settings

Installation

The K281X012 actuator can be fitted on R298 or R298N series mixing valves with bonnet (on valves with M28x1,5 mm ring nut, the M28 threaded ring nut must be replaced with the M30x1,5 mm ring nut).

Replacing the threaded ring nut



1. Remove pressure from the system.

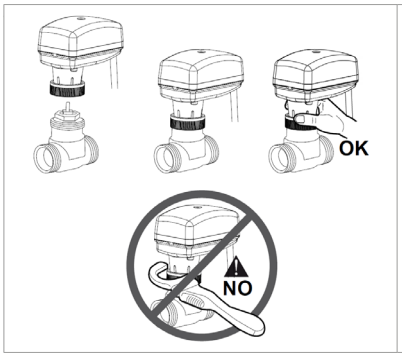
2. Unscrew the M28x1,5 mm ring nut which is pre-mounted on the valve and replace it with the new M30x1,5 mm (P19Y001) ring nut, suitable for installation with actuator K281X012.

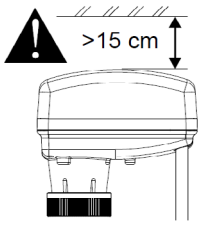
Attention!
Danger to persons.
The removal of the ring nut could trigger leakage from the bonnet in case of residual pressure in the system.

3. Fit the K281X012 actuator, screwing on the M30x1,5 mm ring nut.

Installation phases

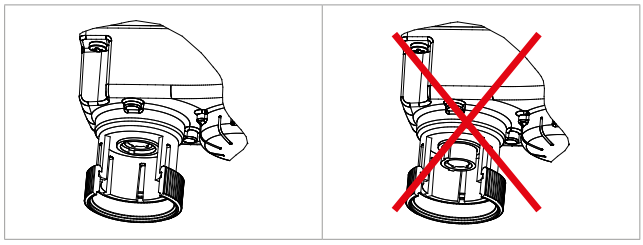
• Remember to fit the valve vertically or with an angle of not more than 90°, in an easily-accessible position.
• Do not fit the actuator upside-down, to avoid drips of water, which could enter the casing and damage the mechanism or motor.
• Do not cover with insulating material.



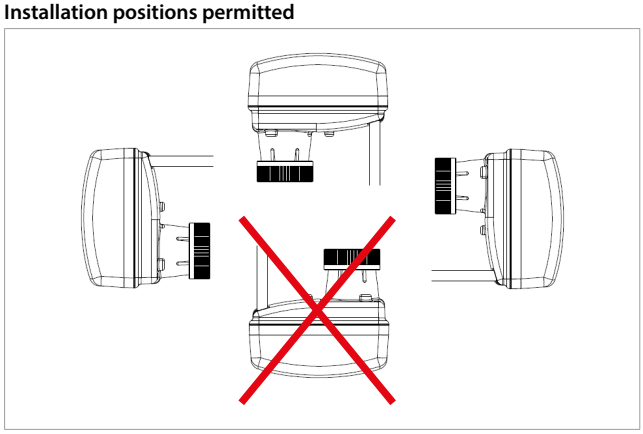


Warning.
Never use the actuator as an assembly lever.

Actuator stem positions



Installation positions permitted

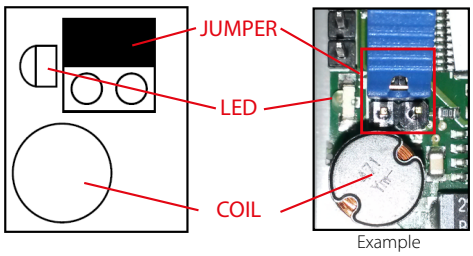


Use of the motor in combination with control units KPM30

When using the motor with control units KPM30 (or with control signal 0-10 V), DIP SWITCHES and JUMPERS must be set according to the following figures.

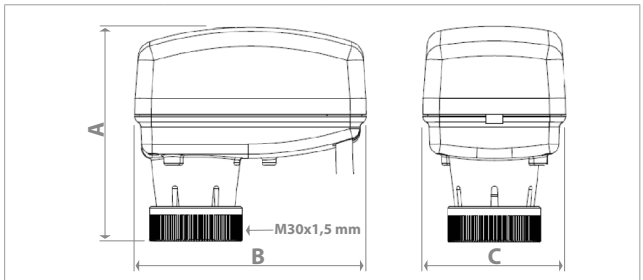
Dip Switches:

Jumpers:



Example

Dimensions



Product code	A [mm]	B [mm]	C [mm]
K281X012	80	80	49

Reference standards

- EC mark
- EMC 2004/108/CE
- Low Voltage Directive 2006/95/EC

Product specifications

K281X012

Proportional actuator, 0-10 V, per controlling R298 or R298N mixing valves. Ring nut for fixing to valve body, M30x1,5 mm type, in brass. 24 Vac/dc power supply 50/60 Hz. Propulsion force 120 N +30 -20 %. Absorption 2,5 VA. Maximum stroke 6,3 mm. Opening time at maximum stroke: 50 sec. Protection class IP43. Environmental operating conditions 0÷50 °C with R.H non-condensing. Storage conditions -20÷65 °C with R.H non-condensing. Dimensions: 80x80x49 mm (LxHxW). EC mark. Complies with the Directive EMC 2004/108/EC and Low Voltage Directive 2006/95/EC. Can be combined with KPM30 electronic control unit and KLIMAbus thermoregulation products.

Additional information
For additional information please check the website: www.giacomini.com or contact the technical service: ☎ +39 0322 923372 🖷 +39 0322 923255 ✉ consulenza.prodotti@giacomini.com
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