

K281X082 (K281-2)



Radiant Systems Energy Management

0..10 V proportional actuator for R206A PICVs

Datasheet
1106EN 06/2025



0..10 V proportional actuator for R206A pressure independent control valves (PICV).

➤ Versions and product codes

PRODUCT CODE	POWER SUPPLY	TYPE	VALVE CONNECTION	FOR USE WITH VALVES
K281X082	24 Vac/dc	Proportional 0..10 V	M30 x 1,5 mm	R206A (DN50)

► Technical data

- Type of actuator: proportional 0..10 V
- Power supply: 24 Vac/dc $\pm 10\%$
- Feedback signal: 2...10 V (2 V direct-action retracted piston, 2 V reverse-action extended piston)
- Max. stroke: see "Fixed stroke setting" table
- Thrust force: 300 N (UNI 9497:1989)
- Opening time at max speed: 5 s/mm
- Emergency return time: 3 s/mm
- Condenser recharging time (for emergency return): ~45 s
- Electric absorption:
 - condenser charge: 12 W
 - in motion: 6 W
 - position preservation: 1.5 W
- Trasformer 24 V sizing: 30 VA
- Protection class: IP54
- Room temperature working range: -5÷55 °C with non-condensing R.H.
- Electric wire length: 5 1,5-m threads (CEI 20-22/II)
- Ring nut for connection to body valve: M30x1,5 mm
- Weight: 400 g
- Manual control: with 3-mm hexagonal wrench

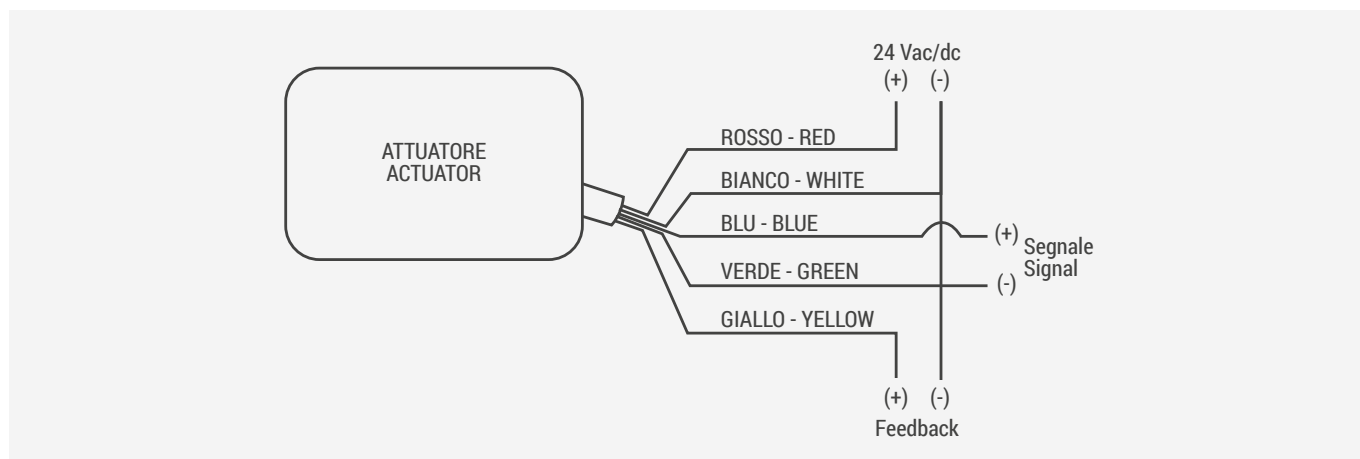
Materials

- Enclosure: self-extinguishing polymeric material
- Threaded ring nut: brass

► Electric connections

▲ WARNINGS.

- Make sure to shut down the power supply before connecting the device.
- Wire the device and check the electric connections before powering the system. Short circuits or improper wiring may permanently damage the electrical components of the actuator.
- Do not touch, try to connect or disconnect the wires with power ON.
- Wiring must comply to the local standards and must be carried out only by qualified operators.
- Keep high and low voltage wires separated.
- Make sure the line voltage complies with the one shown on the device.
- Failure to comply with these instructions may cause injuries or damage the device.



➤ Operation

The K281X082 actuator is a bidirectional actuator with **emergency electronic return**.

The valve stem is activated by a stepper motor and gears optimized for high performance and reduced acoustic emissions.

The actuator features emergency electronic return through a condenser that closes (or opens) the valve moving it back to the set-up position through DIP7 in case of power failure.

It is provided with a force-limiting mechanism which shuts down the motor when reaching 300 N.

It also features 3 alarm leds which operation is described in "LED Operation".

The actuator is a proportional model with the following working ranges 0..10 Vdc, 2...10 Vdc, 0÷5 Vdc, 6÷10 Vdc e 4÷20 mA.

DIP settings and functions

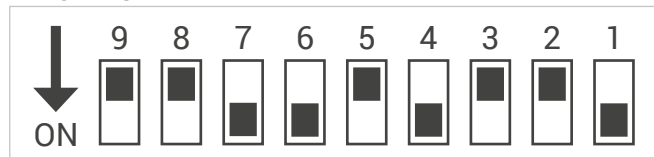
The actuator features a factory-setting 0..10 V control signal, a 4,5-mm fixed stroke, reverse action and emergency return set on DOWN.

To change the settings follow the steps below:

- 1) Remove the screw and open the clear cover as shown.
- 2) Change the position of the DIPs based on the table below.
- 3) The new settings will be implemented at the next shut down/start up cycle.



Factory setting



DIP	ON	OFF
1	Reverse action	Direct action
2	2÷10 / 6÷10 V	0÷10 / 0÷5 V
3	SEQ fields	NORM fields
4	Fixed stroke	Automatic stroke
5	4÷20 mA	Fields under tension
6	Stroke self-calibration/Fixed stroke	Running/Fixed stroke
7	Emergency return UP	Emergency return DOWN
8	Fixed stroke	Fixed stroke
9	Fixed stroke	Fixed stroke

NOTE. The actuator can be combined to stem valves with no spring-return by using the stroke self-calibration function (DIP4 OFF), or to stem valves with spring-return by setting the valve stroke (DIP4 ON).

Stroke self-calibration (only for DIP4 OFF)

This function enables the device to read the max stroke time of the valve to which the actuator is combined so as to position it correctly according to the control signal.

When the actuator is powered, this function can be repeated every time DIP6 turns from OFF to ON and DIP4 is OFF.

Fixed stroke settings (DIP4, 6, 8, 9)

Through DIP4, the stroke can be fixed or set automatically (based on the valve used).

There is no need to use the stroke self-calibration function (DIP6) in case of fixed stroke (DIP4 ON) as DIP6 with DIP8 and DIP9 will be used to select the value of the fixed stroke (see table).

DIP 6	DIP 8	DIP 9	VALVE STROKE [mm]
OFF	OFF	OFF	2,5
OFF	OFF	ON	3
OFF	ON	OFF	3,5
OFF	ON	ON	4
ON	OFF	OFF	4,5
ON	OFF	ON	5
ON	ON	OFF	5,5
ON	ON	ON	6,5

Direct and Reverse Action (DIP1)

By using DIP 1 the actuator can be set on direct action (DIP1 OFF) or reverse action (DIP1 ON).

With direct action and no control signal, the piston is positioned upwards (retracted piston) with a 2-V feedback outlet, while with reverse action and no control signal, the piston is positioned downwards with a 2 V feedback.

Setting up the Control Signal Fields (DIP 2, 3, 5)

DIP2, 3 and 5, 5 enable to set various inlet fields.

When DIP5 is ON, the inlet field is set on 4÷20 mA and there is no need to use DIP2 and 3.

When DIP5 is OFF, the controlled fields are: 0÷10/2÷10 with DIP3 OFF, 0÷5/6÷10 with DIP3 ON.

Initial positioning

This is performed every time the actuator is powered and before implementing the stroke self-calibration function.

Thanks to this operation the actuator can start from a known position and then follow the control signal.

This position depends on the selection of DIP1 (DIP4 OFF).

Sudden-stall function

This function unlocks the stroke in case of locking.

The actuator will be moved in the opposite direction and then perform three attempts to reach the setting position.

If the unlocking fails after the first 3 attempts, the actuator will perform 3 additional attempts after 1 minute.

Feedback outlet (2÷10V)

The actuator features a dedicated outlet to provide a feedback signal for the actuator expected position.

The signal may vary from 2 to 10 V.

During "Self-calibration" and "Initial positioning" the signal will be fixed on 2 V.

During the emergency return phase, the feedback signal will be fixed on 1 V.

Manual control

For manual control, shut off the power, remove the clear cover and insert a 3-mm hexagonal wrench into the front hole, then turn the wrench till the actuator reaches the desired position.

▶ LED Operation

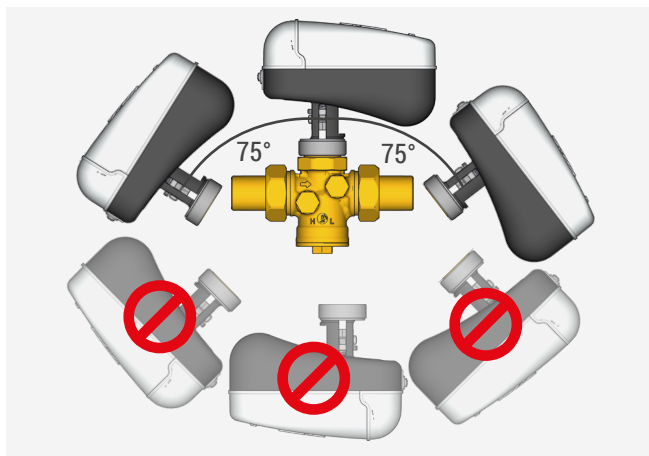
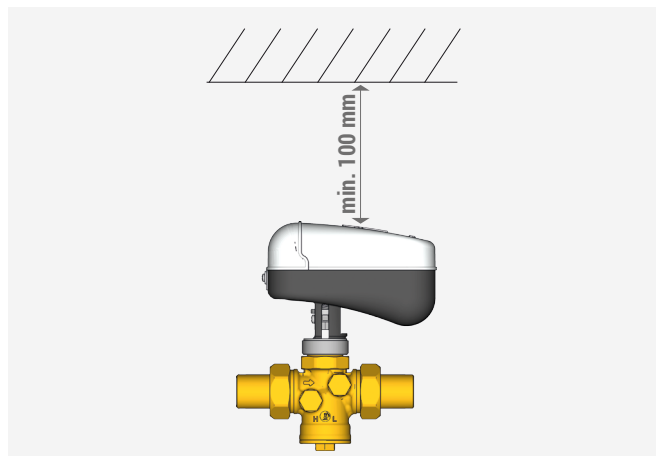
DESCRIPTION	DL1 (red)	DL2 (green)	DL3 (yellow)
Self-calibration phase	Alternated 5 Hz		ON
Initial positioning	Alternated 1 Hz		ON
UP Positioning	OFF	Flashing 1 Hz	ON
UP stroke end	OFF	ON	ON
DOWN Positioning	Flashing 1 Hz	OFF	ON
DOWN stroke end	ON	OFF	ON
Actuator stationary	OFF	OFF	ON
Sudden stall	Simultaneous 5 Hz		ON
Low supply voltage	OFF	OFF	Flashing 1 Hz
High supply voltage	OFF	OFF	Flashing 5 Hz
Stroke below min	Flashing 1 Hz	ON	ON
Stroke above max	ON	Flashing 1 Hz	ON
Extra stroke	Flashing 5 Hz	OFF	ON
Actuator OFF or resetting (low supply voltage) or end of supercap recharge	OFF	OFF	OFF
Emergency return	Simultaneous 1 Hz		OFF
Supercap recharging phase	ON	ON	ON



Installation

⚠ WARNINGS.

- The valve may be installed in any position but the actuator should not be positioned upside down or with the power cable entering from the top (to prevent problems deriving from condensation).
- Do not cover with insulating material.



Installation of K281X082 actuator on R206A valves

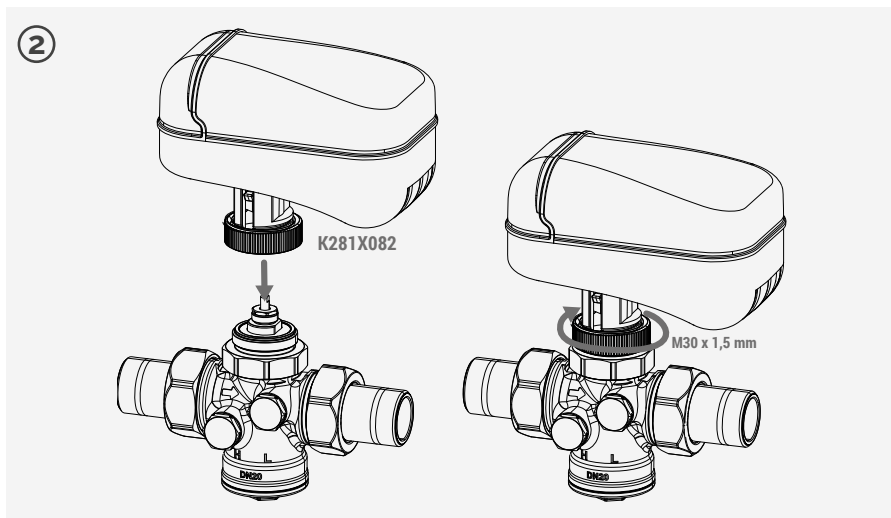
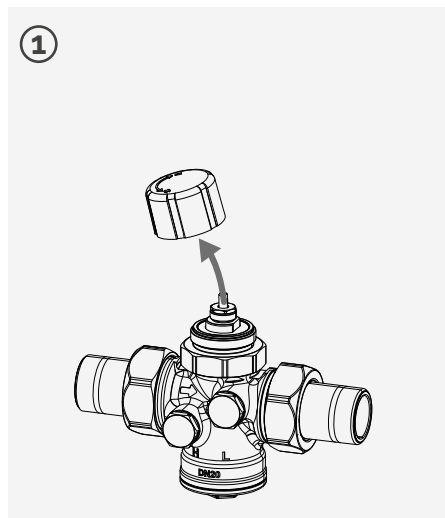
To install the actuator on the R206A valve, follow the steps below:

- 1) Remove the handwheel from the valve;
- 2) Screw the actuator on the valve body with the M30 x 1,5 mm threaded ring nut and carefully wire it following the diagram included with the instructions.

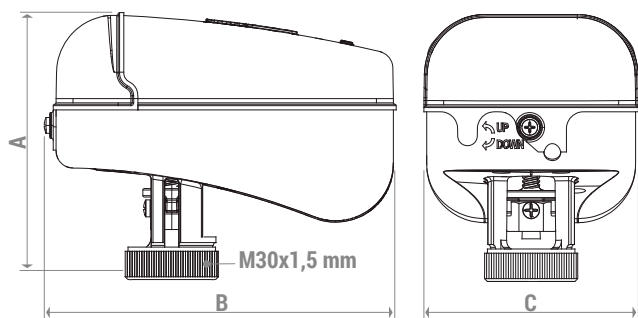


⚙ **NOTE.** Before installing the actuator on the R206A valve, make sure the thrust piston of the actuator is all the way up (factory setting). If positioned differently, the valve bonnet spring must be forced to reach the correct position.

⚠ **WARNINGS.** Actuators with a factory-setting stroke can be used with R206AY103/113/104/105/125 valves. Before installing the actuator on other types of valves, check the its stroke value and the value of the valve on which it will be installed. Set the correct value through the corresponding DIPs.



➤ Dimensions



PRODUCT CODE	A [mm]	B [mm]	C [mm]
K281X082	89	123	76

➤ Reference standards

- CE and UKCA marking
- EMC 2014/30/EU standard
- LVD 2014/35/EU low-voltage standard
- ROHS 2011/65/EU standard

➤ Product specifications

K281X082

0..10 V proportional actuator for R206A pressure independent control valves (PICV). M30 x 1,5 brass ring nut for connection to valve body. Power supply 24 V. Thrust force: 300 N. Trasformer 24 V sizing: 30 VA. Opening time at 5 s/mm max stroke. Protection class IP54. Room temperature working range -5÷55 °C with non-condensing R.H. Dimensions: 89x123x76 mm. Manual control with 3-mm hexagonal wrench. Other values can be set through DIP Switches. CE and UKCA marking Compliance with EMC 2014/30/EU standards, Low Voltage Directive LVD 2014/35/EU, ROHS 2011/65/EU.

⚠ Safety Warning. Installation, commissioning and periodical maintenance of the product must be carried out by qualified operators in compliance with national regulations and/or local standards. A qualified installer must take all required measures, including use of Individual Protection Devices, for his and others' safety. An improper installation may damage people, animals or objects towards which Giacomini S.p.A. may not be held liable.

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