

Fan coil actuator REG-K

Operating instructions



Art. no. 645093

Functional description

The fan coil actuator controls fan convectors (room air conditioning devices).

this type of device typically consists of one or two heat exchangers (heating/cooling, 4- or 2-pipe systems) that are coupled with a multi-level, controllable fan.

The flow-through quantity of the heat exchanger is controlled by electrical valves that are controlled by the fan coil actuator.

Three-point and thermic two-point valve drives can be connected to the device outputs for the valves. The power (24 V AC) is supplied by the device.

There are three floating contact outputs on the device for fans with up to three speed levels.

The fan coil actuator is activated by an external room controller via KNX, which is controlled based on a discrete time PI controller with target/actual value comparison.

In addition, there are inputs for a room temperature sensor (recording the actual temperature) on the fan coil actuator and two floating binary inputs. They can also be used indirectly for window contact and condensation monitoring or other control functions.

All previously mentioned devices-connections are considered "local."

The fan coil actuator has a 230 V mains connection.

The KNX interface of the fan coil actuator enables communication with other KNX devices, as well as the exchange of data with a building conductor system.

In this case, KNX-enabled actuators/controllers can exchange information with the device through data objects.

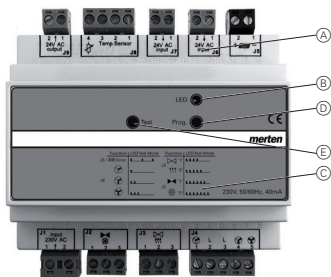
The application program enables valve activation using control commands in percentages. Correct allocation during parameterisation depends on the type of valve.

If the device is operated without a fan, the three floating outputs for the fan can be configured as KNX binary outputs (3 channels). Input objects 33, 34 and 35 are used to switch these outputs. It is also possible to connect a 1 or 2 level fan, and use the remaining outputs as KNX binary outputs.

The EIS types of the objects comply with KNX standards and enable the device to be linked to a visualisation (building conductor system).

Display and operating elements, connections

Figure 1:



(A) Connector with screw terminal for connecting

Terminals Description	Function
J1	Mains connection 2-pole 230 V AC
J2	Valve connection 3-pole
J3	Valve connection 3-pole
J4	Fan 5-pole
J5	KNX bus 2-pole
J6	Binary input signalling contact 2-pole
J7	Binary input signalling contact 2-pole
J8	Binary input temperature sensor 4-pole
J9	Auxiliary voltage 24 V AC 2-pole

(B) LED display, normal operation off,

- Address mode on,
- Test mode flashing

(C) LED Test mode, LED flashes when test key A5 is pressed in the rhythm displayed.

(D) Prog. key switches between Address/Normal modes, for copying the physical address.

(E) Test key for actuating individual functions locally

Installation

The device is installed on DIN rails EN 50022 in distribution boards of the AP and UP installation types. All cable connections are placed on the screw terminals of the connector, and then fitted on the device with the connector audibly clicking into place.

There are 2 installation types available:

1. Snapping the device onto the DIN rail as a complete unit with the connectors, or
2. Removing the connectors from the fan coil actuator, snapping the device onto the DIN rails, and then fitting on the preassembled connector with connected cables.

Installation sequence:

To install the device in the DIN rails, attach the upper edge until you hear it click.

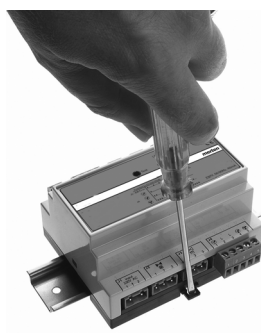
Pull the connector straight out manually or use a screwdriver and tilt.

Prepare the cables according to the technical data listed at "Connections" point and use screw terminals to create firm contact with the connector(s) in the terminal sockets.

Disconnect the connectors. Finally, plug them back into the device in the correctly coloured sockets, observing the mechanical connector coding. You must hear the connectors click into place.

To release the device from the DIN rails, pull the locking bar downward using a screwdriver (Figure 2).

Fig. 2:



Installation and start-up

Start-up

The device is supplied without installed program. The actuator with special local components functions only after the application program has been transferred (via ETS).

After activating the mains voltage, the device is immediately active and the connected valves/fans can be controlled accordingly.

The parameterised application program is transferred via KNX bus using ETS.

EIS type correlation must be observed when parameterising KNX components.

The physical address of the actuator is parameterised with ETS in compliance with the KNX standard.

Installation note

If the fan coil actuator is not installed in a distribution board, but instead is floating between false ceilings, double flooring or in/on heating and cooling devices, use strain relief to make sure that all cables are mechanically secured and free from strain. For safety, security and functional wiring, observe the recommended cable cross-sections according to the technical data.

Reverse polarity on connector J8 will destroy the temperature sensor.

Risk of fatal injury from electrical current. The device may only be installed and connected by skilled electricians. Observe the country-specific regulations. The device may not be opened. In case of defects, ship it to our Service Center.

i The sum of the switched currents per output must not exceed 6 A; cable protection should be applied here.

i The 230 V AC power supply must be secured by a cable protection switch.

Mains failure 230 V:

The valve outputs become de-energised and the relay contacts of the fan outputs open.

When the mains come back, the flow begins according to the selected parameters.

If the installation is restricted to locally-connected equipment, the device runs normally when the current comes back.

EIB bus voltage failure:

The hardware of the device is not designed for direct control of the bus voltage.

Thus, if the control value is not refreshed, an error status is generated; in addition, the device is switched to a configurable control value for heating.

When configuring the relevant KNX devices, also make sure that useful functions are secured when current comes back.

Test functions

The test functions described in this section can be executed with or without an installed application program.

Explanation of the Test mode of flashing LED (B) by pressing test key (E):

When test key (E) is continuously pressed for at least 4 sec., the device switches into test mode. When the key is pressed again, it switches to the next test step. Flashing mode displays the respective active output.

The first test function displayed shows whether the KNX bus cable is connected and the bus coupling unit is able to function.

If the KNX bus is not able to function, this is displayed by regular flashing at a frequency of approx. 0.3 Hz. This test is automatic without having to push a button.

Terminal description	Function	LED Flashing mode
J5	KNX bus error	x.....x.....x...

When test key (E) is continuously pressed for 4 sec. for the first time, the function of fan level I or the first speed level becomes active and is tested.

The output remains closed until the next test key is pressed. If no function is tested within the next minute, the device switches back to the parameterised program automatically. To reactivate Test mode, test key (E) has to be continuously pressed for 4 sec. again. The test begins from the beginning again.

Terminal description	Function	LED Flashing mode
J5	Fan level I on	x.....x.....x...

The next test function is testing the second speed level II of the fan. The output is switched further until a new test function is queried. It is not possible to jump test points (e.g. from J4 = level I to J4 = level III).

Terminal description	Function	LED Flashing mode
J4	Fan level II	x x.....x.....x...

The same principle applies to level III.

Terminal description	Function	LED Flashing mode
J4	Fan level III on	x x x.....x.....x...

For the heating and cooling valve outputs, pressing a key differentiates between valve "on" or "off." This means that the valve output retains its most recent function status.

The following are tested:

Terminal description	Function	LED Flashing mode
J3	Heating valve on	x x x x.....x.....x...
J3	Heating valve off	x x x x x.....x.....x...
J2	Cooling valve on	x x x x x.....x.....x...
J2	Cooling valve off	x x x x x.....x.....x...

Going through the Test mode completely switches all outputs on/off once, and the device automatically switches back to the parameterised program.

Technical data

Power supply

With integrated power supply unit J1, independent of KNX bus voltage, 230 V AC +/-10%, 50/60 Hz power consumption max. 5 VA

Outputs

- 3 floating J4 contacts
Rated voltage 230 V AC +/-10%
Rated current 6A
- 2 semiconductor switches J3 and J2
Rated voltage 24 V AC
Rated current 250 mA
Max. permanent load per output 5 W (Ohmic load)
Cable length 20 m
- 1 auxiliary voltage J9
Designed for binary inputs J6 and J7
24 V AC nominal, 5 mA

Inputs

- 2 binary inputs J6 and J7 for signalling contacts 24 V AC nominal
Cable length 30 m
- KNX bus connection J5
- Temperature sensors J8
Temperature sensor, art. no. 6450 91

Operating elements

- 1 programming button, for toggling Normal mode to Address mode
- 1 test key for locally toggling the individual output functions

Display elements

- 1 LED red for KNX bus voltage control for displaying Normal mode/Address mode, for displaying the output functions through different flashing sequences

Connections

All those per plug-in connector are mechanically coded and have different colours

Terminal	Colour	Function	Insulation strip length	Cable cross-section, single-core (mm ²)	Cable cross-section, finely-stranded (mm ²)
J1	(gr) green	Mains connection 2-pol.(L, N)	7	1.0	1.0 to 1.5
J2	(bl) blue	Valve connection 3-pol.	7	0.75 to 1.0	0.75 to 1.5
J3	(rt) red	Valve connection 3-pol.	7	0.75 to 1.0	0.75 to 1.5
J4	(gr) green	Fan 5-pol.	7	1.0	1.0 to 1.5
J5	(sw) black	EIB 2-pol. red +, black -	7	0.3 to 0.5 (diameter 0.6 to 0.8)	-
J6	(gr) green	Binary input 2-pol. signalling contact	7	0.5 to 0.75	0.5 to 1.5
J7	(gr) green	Binary input 2-pol. signalling contact	7	0.5 to 0.75	0.5 to 1.5
J8	(gr) green	Binary input 4-pol. temperature sensors	7	0.5 to 0.75	0.5 to 1.5
J9	(gr) green	Aux. voltage 2-pol. 24 V AC	7	0.5 to 0.75	0.5 to 1.5

Mechanical data

- Dimensions WxHxD: 105x107x58 mm;
- Serial built-in device
- Weight: 0.4 kg
- Installation: quick-fix to DIN rails EN 50022

Accessories

- Temperature sensor, art. no. 6450 91

Electrical safety

- Dirt and dust level 2
- Type of protection IP 20
- Bus extra-low safety voltage SELV DC 24 V

Environmental conditions

- Operating temperature -5°C to +50°C, not condensing
- Storage/transport temperature -25°C to +70°C

Reliability

- Failure rate 815 fit at 40°C

CE mark

According to EMC guideline, low-voltage guideline (residential/commercial buildings)

Certification

KNX-certified

Connection example:

