FAN COIL CONTROLLER COM-
KNX/EIB
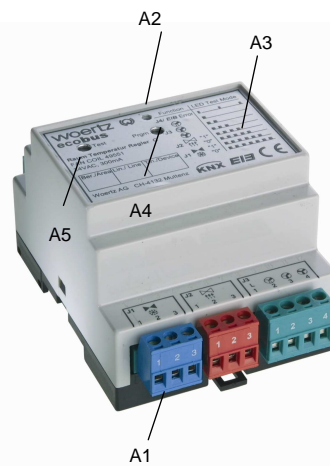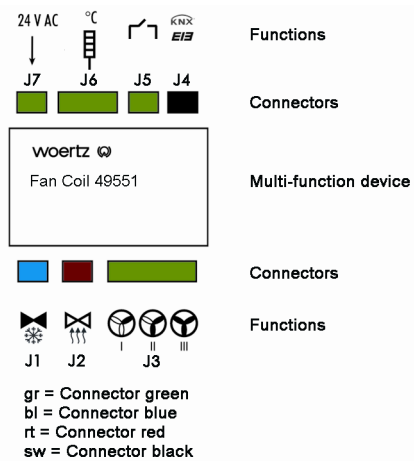

VERSION 49551

INSTALLATION AND OPERATING IN-
STRUCTIONS

(1)

Functions: 24 V AC | °C | KNX EIB

Connectors: J7 | J6 | J5 | J4

Multi-function device: woertz Ⓠ Fan Coil 49551

Connectors

Functions: J1 | J2 | J3

gr = Connector green
bl = Connector blue
rt = Connector red
sw = Connector black

(2)

A2, A3, A4, A5, A1

(3)

(4)

Function	Terminal	Color	Strip insulation (mm)	Cross-section *	
				single-wire mm^2	flexible mm^2
3-pole valve connection	J1	blue (bl)	7	0.75 … 1.0	0.75 … 1.5
3-pole valve connection	J2	red (rt)	7	0.75 … 1.0	0.75 … 1.5
4-pole fan	J3	green (gr)	7	1.0	1.0 … 1.5
2-pole KNX EIB, red +, black -	J4	black (sw)	7	0.3 … 0.5 ($\varnothing$ 0.6 … 0.8)	/
2-pole binary input, signalling contact	J5	geen (gr)	7	0.5 … 0.75	0.5 … 1.5
3-pole binary input, temperature sensor	J6	green (gr)	7	0.5 … 0.75	0.5 … 1.5
Supply voltage 2-pole 24 V AC	J7	green (gr)	7	0.5 … 0.75	0.5 … 1.5

*recommended cross-sections

(5)

Window contact/ Condensed water overflow contact

EIB + -

Temp. sensor
No. 49570/1

L
N
230VAC

Safety transformer
No. 49587

24VAC

Fancoil controller
No. 49551

J4, J5, J6, J7, J3, J2, J1

Fan 230VAC; 3-speed

Heating valves (3-step, 24VAC)

Cooling valves (3-step, 24VAC)

Thermal valves (24VAC)

Thermal valves (24VAC)

OFF ON
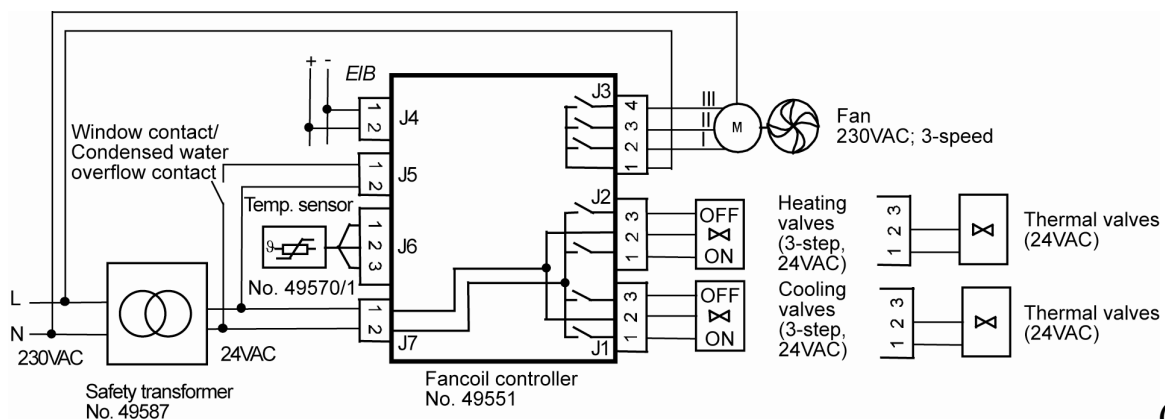
(6)

Installation and operating instructions

Product and functional description

Brief description

The fan coil unit controller 49551 has been developed to control fan convectors. It is also used for the simultaneous control of valves with motor-driven or electrothermal valve types. The system integration is carried out via the KNX/EIB bus cable. Inputs and outputs are connected via connectors. The components are mounted on DIN rail EN 60715 TH 35-7.5/15.

Block diagram of the fan coil unit controller 49551 (see diagram 6)

Individual functional description

The functions that are integrated in this device are required in some room temperature control applications with fan operation.
3 channels are available for controlling the **fan**, each with an isolated contact (relay).

Three fan speeds can be freely selected according to requirements via KNX/EIB e.g.:
OFF, speed I / speed II / speed III, or any possible variant such as: OFF, speed III / speed I / speed II / speed III.
Contacts of the individual speeds (I, II III) are never closed at the same time due to a software-controlled interlock.
The lock-out time and the closing behaviour can be set via the parameters. The corresponding values are based on both the electrical properties and the starting characteristics of the fan.

The **valve output** J1 is intended for the control of cooling valves ❄ (cooling). Both motor-driven and electrothermal valve types can be connected to the terminal. Both types of valves are controlled with an extra-low voltage of 24 V AC. Both PWM (pulse width modulation) and raise/lower valves can be operated at this output.

In the case of the 24 V AC **motor valve drive,** it is necessary for the parameterisation to know in which period the valve is operated with a 100% valve lift.

In the case of the 24 V AC **thermal valve drive,** one or more thermal valves may be connected in parallel to output J1 (J2). The total of the rated currents of the valve drives may not exceed the max. output current. The cyclic time for the PWM can be set between 1 min. and 255 min.. The connecting cable between the controller 49551 and the valves should not be longer than 20 m with a conductor cross-section of 1.5 mm^2.

The **valve output** J1 is intended for the control of heating valves ♨ (heating). This output is identical in terms of the technical values, properties and parameters to the output J1 (see description above).

With the (external) power supply connection (connection J7/24 V AC), the controller becomes independent of the EIB bus voltage. This also means that the device operates independently as its own room temperature controller without an interface to the KNX/EIB communication bus. If the 24 V AC supply voltage fails, the controller 49551 is no longer able to function.
The connection J4 for the **communication bus KNX/EIB** is required in systems used for building management technology and meant for a KNX/EIB bus system.
For security and improved energy management, a potential-free input J5 is provided to which external contacts such as window contacts, dew point detectors etc. can be connected. A 24 V AC external voltage is required for this.

The input J6 is used for the (local) temperature detection.
The temperature sensor 49570/1 is required to record the actual temperature value. Its wires have to be correctly assigned to the terminal J6.
(green = J6/1, white = J6/2, brown = J6/3)

Instead of the local sensor, it is also possible to transmit actual temperature values (from a KNX/EIB room control unit) to the controller via a KNX/EIB communication object.

Test functions can be carried out on the controller itself using a "Test" button (A5), independent of the KNX/EIB connection. The outputs are activated individually by pressing the "Test button". The flashing mode of the programming LED (red) indicates the active output. It is therefore possible to switch ON or OFF successively the 3 fan speeds and valve outputs.
The LED always flashes if the KNX/EIB bus coupler does not function or no bus voltage is present.

Software

The following are available:
Objects: 35
Group addresses: 80
Assignments: 80

The following parameters can be set using the application program *000101 Multifunction controller master* which can be found in *Woertz* product database version A or under http:\www.woertz.ch:
- Recording of actual temperature
- Setpoint temperature values
- Setpoint adjustment
- Valve adjustment
- Fan control
- Security functions
- Group error signal
-

Technical data

- **Woertz Fan Coil unit controller No. 49551**

- **Power supply**
  Via an external power supply unit J1, 24 V AC +/- 10%, 50/60 Hz
  Power consumption max. 1 VA (without valve drive)

- **Outputs**
  - 3 floating contacts J3
    Rated voltage 230 V AC
    Rated current 6A
  - 2 solid-state switching devices J1 and J2
    Rated voltage (24 V AC) equal to power supply
    Rated current 650 mA
    Continuous load per output 15 W (resistive load)
    max. cable length 20 m

- **Inputs**
  1 binary input J5 for signalling contacts 24 V AC nominal
  - max. cable length 30 m
  - EIB bus connection J4
  - Temperature sensor J6

- **Operating elements**
  - 1 programming button for toggling between normal mode and addressing mode
  - 1 test button for local toggling of the individual output functions

- **Display elements**
  1 LED (red)
  - For displaying normal mode/addressing mode
  - For monitoring EIB bus voltage
  - For displaying output functions

- **Connections (Table 5)**
  Plug-type connectors

- **Mechanical data**
  - Housing: plastic
  - Housing colour: grey/black
  - Dimensions WxHxD: 105x107x58 mm; DIN rail mounted device
  - Weight: 0.2 kg
  - Fire load approx. 6000 kJ +/-10%
  - Mounting: snap-on fixing onto DIN rail DIN EN 60715 TH 35-7.5 / DIN EN 60715 TH 35-15

- **Accessories**
  - Room temperature sensor, **No. 49570/1**
  - Safety transformer, **No. 49587, 230VAC/18VA**

- **Electrical safety**
  - Degree of pollution 2
  - Type of protection IP 20
  - Safety extra-low bus voltage SELV DC 24V
  - Electrical safety EN 60950

- **EMC requirements**
  - EN 50090-2-2
  - EN 61000-6-2
  - EN 61326-1997

- **Environmental conditions**
  - Operating temperature: -5^0 C to $+45^0$ C, not condensing
  - Storage/transport temperature: -25^0 C to $+70^0$ C

- **Reliability**
  - Failure rate 815 fit at 40^0 C

- **CE standard**
  In accordance with the EMC guideline and low-voltage guideline (residential/ functional buildings)

- **Approval**
  EIB certified

Terminal assignment, display/operating elements (see diagram 2)

- A1 Connector with screw terminals for the connection of

Terminal assignment	Function
J1	3-pole valve connection
J2	3-pole valve connection
J3	4-pole fan
J4	2-pole KNX EIB
J5	2-pole binary input for signalling contact
J6	3-pole temperature sensor
J7	2-pole supply voltage 24 VAC

- A2 LED display, normal operation off, addressing mode on, test mode flashes

- A3 LED test mode, LED flashes each time the test button A5 is pressed according to the sequence shown

- A4 Learning button toggles between addressing/normal mode for transferring the physical address

- A5 Test button for operation of the test functions

- A6 Labelling field for the physical address

Test functions

The test functions listed below can be performed with or without loaded application program.

If the EIB is not operational (no voltage or incorrect connection), this is indicated by the LED flashing at regular intervals with a frequency of approx. 0.3 Hz. This test is carried out automatically without a push button action.

Terminal assignment	Function	LED flashing mode
J4	EIB error	▯■■▯■

Explanation of the test mode of the flashing LED (A2) when the test button (A5) is pressed:
If the test button (A5) is continually pressed for a minimum of 4 seconds, the device is switched to test mode. When the push button is pressed again, a further test step is carried out. The flashing mode indicates the active output.

When the test button (A5) is pressed for the first time continually for 4 seconds, the func-

tion of fan speed 1, the first speed, is tested.
The output remains closed until the next time the test button is pressed. If there is no test function after approx. 1 min., the device automatically reverts to the set program.
To reactivate the test mode, the test button (A5) must be pressed again for 4 seconds. The test then restarts from the beginning.

Terminal assignment	Function	LED flashing mode
J3/2	Fan speed I on	■▭▭▭▭▭▭▭

The next test function checks speed II of the fan. The output is connected until a new test function is requested. It is not possible to skip through a test step (e.g. from J3 = speed 1 to J3 = speed III).

Terminal assignment	Function	LED flashing mode
J3/3	Fan speed II on	■■▭▭▭▭▭▭

The same applies to fan speed III.

Terminal assignment	Function	LED flashing mode
J3/4	Fan speed III on	■■■▭▭▭▭▭

In the test sequence, the tested heating and cooling valve outputs are tested as follows (see table below):

Terminal assignment	Function	LED flashing mode
J2/1	Heating valve open	■■■▭▭▭▭
J2/3	Heating valve closed	■■■■▭▭▭
J1/1	Cooling valve open	■■■■■▭▭
J1/3	Cooling valve closed	■■■■■■▭

If the test mode has run through once completely, the device automatically reverts to the set program.

Installation and wiring

The device is clipped on to DIN rails EN 60715 TH 35-7.5 / EN 60715 TH 35-15, in flush-mounted or surface-mounted distribution racks. All the connecting wires are led into the screw terminals of the connectors; terminals and connectors are then snapped together.

Mounting of fan coil unit controller No. 49551 (see diagram 3)

Installation sequence
To mount the device on the DIN rail, clip on the upper edge and snap into place.
Remove the connector either manually or use a screwdriver and tilt the device (see picture 3).
Prepare the cables in accordance with the technical data outlined in the section "Connections" and insert them into the sockets of the plug-type connectors.

Putting into service

Before putting the device into service an application program which has been specially designed and parameterized for this use has to be transferred to it (see description of application program).
The test mode can be carried out with no loaded application program (see test functions).

Dismantling (see picture 4)

Disconnect the device from the supply (24 V AC). Remove the interlocking slide on the underside of the device with a screwdriver by tilting the screwdriver in the direction of the arrows. Lift the device from the DIN rail. Remove the connectors (connecting wires included) from the device.

Installation notes

In case the device 49551 is meant for hollow ceilings, double floors or for mounting in heating and cooling units, all the connecting wires have to be mechanically safeguarded via strain relief. The recommended cable cross-sections in Table 5 should be noted to ensure the safety and effectiveness of the wiring.
A short circuit at the connector J4 should be avoided when carrying out the installation with a live circuit. Reverse polarity at the connector J6 will damage the temperature sensor/sensor input.

Warning

The device may not be opened. Any faulty devices should be sent to the relevant point of purchase (see www.woertz.ch).
The device may only be installed and commissioned by an approved electrician or controls engineer. The relevant safety and accident regulations must be observed.
The total of the switched currents may not exceed 6 A per output. Line protection must therefore be provided.

Nov. 2006