TECHNICAL DATA

ABB i-bus® KNX

FCC/S 1.1.2.1

Fan Coil Controller, PWM, MDRC

Device description

The device is a modular installation device (MDRC) in pro*M* design. It is designed for installation in electrical distribution boards and small housings with a 35 mm mounting rail (to EN 60715).

The device is KNX-certified and can be used as a product in a KNX system → EU declaration of conformity.

The device is powered via the bus (ABB i-bus® KNX) and requires no additional auxiliary voltage supply. The connection to the bus is made via a bus connection terminal on the front of the housing. The loads are connected to the outputs using screw terminals → terminal designation on the housing.

The software application Engineering Tool Software (ETS) is used for physical address assignment and parameterization.

Device functions

The following device functions are available for controlling a fan coil unit:

- Controller
- Actuator device

Controller

The internal controller is activated in the function as a controller unit. The controller is used to process the data received at the inputs (actual values) or via the bus (ABB i-bus® KNX) (actual values, setpoints and operating mode changes). The control values are calculated from the data received and transmitted to the outputs.

Actuator device

The internal controller is deactivated in the function as an actuator. The control values for activating the outputs are calculated by an external controller and received via the bus (ABB i-bus® KNX).

Connections

The devices possess the following connections, depending on the product variant:

- 4 inputs for sensors or an analog room control unit (SAF/A or SAR/A)
- 2 valve outputs for activating valve drives (FCC/S 1.4.1.1: 1 valve output)
- 1 fan output
- 1 relay output (FCC/S 1.4.1.1 : no relay output)
- 1 bus connection

The tables below provide an overview of the maximum number of devices that can be connected to the individual product variants.

Fan output

	FCC/S 1.1.1.1	FCC/S 1.1.2.1	FCC/S 1.2.1.1	FCC/S 1.2.2.1	FCC/S 1.3.1.1	FCC/S 1.3.2.1	FCC/S 1.4.1.1	FCC/S 1.5.1.1	FCC/S 1.5.2.1
Discrete speed fans (1 … 3-speeds)	1	1	1	1	–	–	1	–	–
Continuous fans (0 … 10 V)	–	–	–	–	1	1	–	1	1

Relay output 16 A

	FCC/S 1.1.1.1	FCC/S 1.1.2.1	FCC/S 1.2.1.1	FCC/S 1.2.2.1	FCC/S 1.3.1.1	FCC/S 1.3.2.1	FCC/S 1.4.1.1	FCC/S 1.5.1.1	FCC/S 1.5.2.1
Electric heater	1	1	1	1	1	1	–	1	1

Valve outputs

	FCC/S 1.1.1.1	FCC/S 1.1.2.1	FCC/S 1.2.1.1	FCC/S 1.2.2.1	FCC/S 1.3.1.1	FCC/S 1.3.2.1	FCC/S 1.4.1.1	FCC/S 1.5.1.1	FCC/S 1.5.2.1
Thermoelectric valve drives (PWM)	2	2	–	–	–	–	1	2	2
Motor-driven valve drives (3-point)	1	1	–	–	–	–	–	1	1
Magnetic valve drives (open/closed)	2	2	–	–	–	–	1	2	2
Analog valve drives (0 … 10 V)	–	–	2	2	2	2	–	–	–
6-way valve	–	–	1	1	1	1	–	–	–
VAV damper drive	–	–	2	2	2	2	–	–	–

Physical inputs

	FCC/S 1.1.1.1	FCC/S 1.1.2.1	FCC/S 1.2.1.1	FCC/S 1.2.2.1	FCC/S 1.3.1.1	FCC/S 1.3.2.1	FCC/S 1.4.1.1	FCC/S 1.5.1.1	FCC/S 1.5.2.1
Analog room control unit	1	1	1	1	1	1	1	1	1
Binary sensors (floating)	4	4	4	4	4	4	4	4	4
Temperature sensors	4	4	4	4	4	4	4	4	4

Inputs

Function	a	b	c	d
Temperature sensor				
PT100	x	x	x	x
PT1000	x	x	x	x
KT/KTY	x	x	x	x
KT/KT user-defined	x	x	x	x
NTC10k	x	x	x	x
NTC20k	x	x	x	x
NI-1000	x	x	x	x
Analog room control unit	x			
Binary sensor (floating)	x	x	x	x
Dew point sensor (floating)	x	x	x	x
Fill level sensor (floating)	x	x	x	x
Window contact (floating)	x	x	x	x

Outputs

Valve outputs

Function	A	B
Thermoelectric valve drives (PWM)	x	x
Magnetic valve drives (open/closed)	x	x
Motor-driven valve drives (3-point)	open	close
Fault detection (overload/short circuit)	x	x

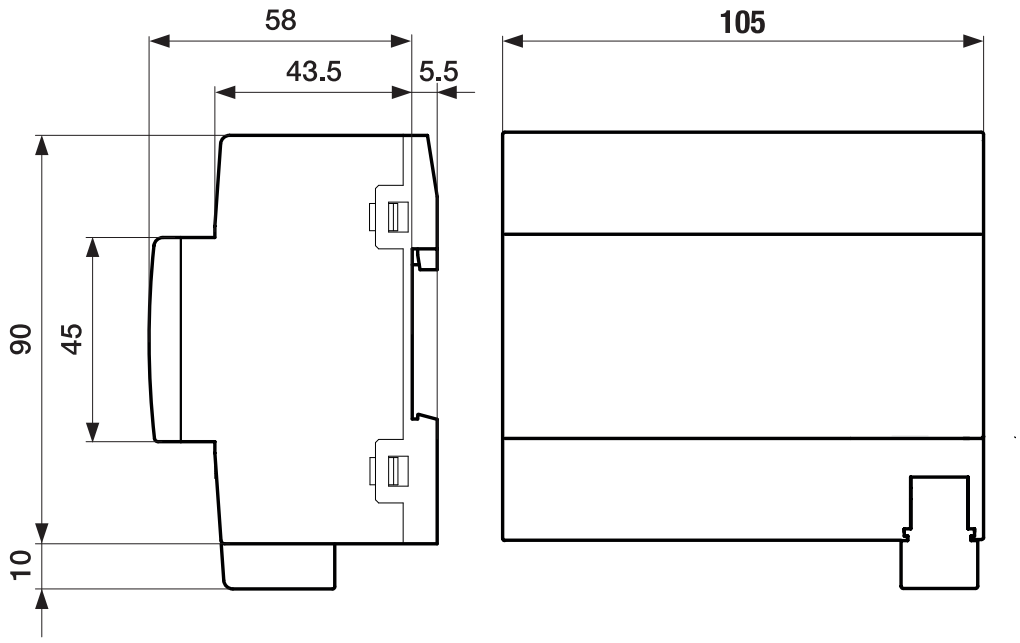
Fan output

Function	Fan output
Number of fan speeds (5 A)	
1	x
2	x
3	x
Changeover switching	x
Step switching	x

Relay output 16 A

Function	Relay output
Use by internal controller for electric heater	x
Use as independent switching output	x
Internal connection to a device input	x

Dimension drawing



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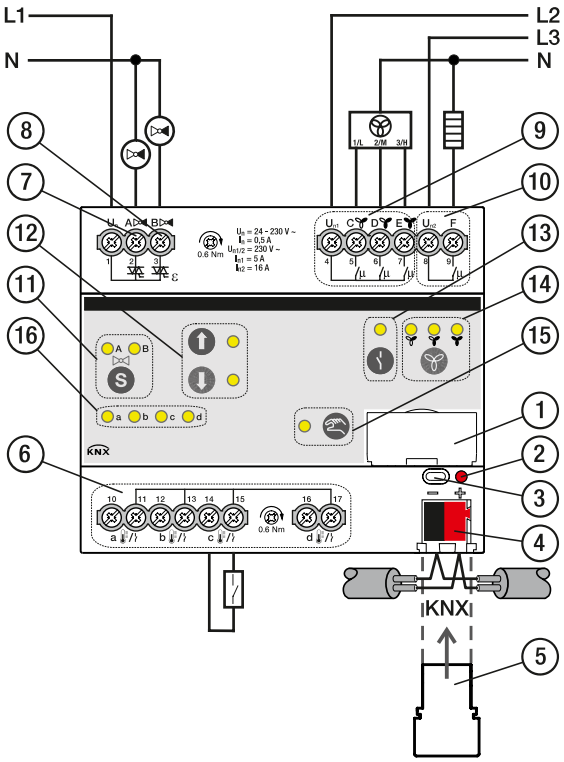
Connection diagram



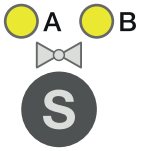
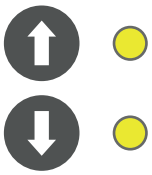
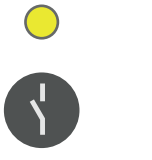
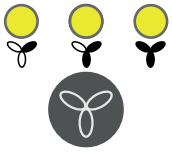
Legend

1 Label carriers
2 *Programming* LED
3 *Programming* button
4 Bus connection terminal
5 Cover cap
7 Valve output
8 Valve output
9 Fan output
10 Auxiliary relay
11 *Switch valve output* button/LED
12 *Valve output open/close* button/LED
13 *Relay output open/close* button/LED
14 *Fan speed switching* button/LED
15 *Manual operation* button/LED
16 *Input* LED
6 Input

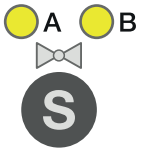
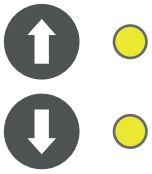
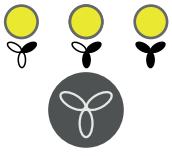
Operating and display elements

Operating control/LED	Description/function	Display
 *Programming* button/LED	Assignment of the physical address	LED On: Device in programming mode

Manual mode

Operating control/LED	Description/function	Display
 *Manual operation* button/LED	Activates the *KNX mode* with a short button push	LED On: *Manual operation* active LED Off: *KNX operation* active
 *Input* LED	Indication according to use of the inputs	Binary sensor: • LED On: Contact closed • LED Off: Contact open Temperature sensor: • LED On: Temperature sensor connected • LED flashing: Fault (cable break/short circuit) Analog control panel: • LED On: Control panel connected • LED flashing: Fault (cable break/short circuit)
 *Switch valve output* button/LED	Switches between valve A and valve B. (If the valve output is deactivated, the valve cannot be selected.)	LED On: Valve selected LED flashing: Fault on the output (e.g. overload/short circuit)
 *Valve output open* button/LED	Sets the maximum valve control value (100 %) Resets the outputs with long button push > 5 s	LED On: Valve control value at 100 % LED flashing: Fault on the output (e.g. overload/short circuit)
 *Valve output close* button/LED	Sets the minimum valve control value (0 %)	LED On: Valve control value at 0 % LED flashing: Fault on the output (e.g. overload/short circuit)
		Both LEDs On: Valve control value between 1 and 99 % Both LEDs flashing: Fault on the output (e.g. overload/short circuit)
 *Relay output open/close* button/LED	Opens/closes the relay	LED On: Relay contact closed LED Off: Relay contact open
 *Fan speed* button/LED	Switches the fan speed in the following sequence: • 0 > 1 > 2 > 3 > 0 > 1… (long button push always switches to 0)	Fan speed during step switching: • 0: all LEDs Off • 1: LED 1 On • 2: LEDs 1 & 2 On • 3: all LEDs On Fan speed during changeover switching: • 0: all LEDs Off • 1: LED 1 On • 2: LED 2 On • 3: LED 3 On

KNX operation

Operating control/LED	Description/function	Display
 *Manual operation* button/LED	Activates the *Manual operation* mode with long button push > 5 s	LED On: *Manual operation* active LED Off: *KNX operation* active LED flashes when button is pushed: *Manual operation* deactivated via ETS
 *Input* LED	Indication according to use of the inputs	Binary sensor: • LED On: Contact closed • LED Off: Contact open Temperature sensor: • LED On: Temperature sensor connected • LED flashing: Fault (cable break/short circuit) Analog control panel: • LED On: Control panel connected • LED flashing: Fault (cable break/short circuit)
 *Switch valve output* button/LED	Switches between valve A and valve B. (If the valve output is deactivated, the valve cannot be selected.)	LED On: Valve selected LED flashing: Fault on the output (e.g. overload/short circuit)
 *Valve output open* button/LED	Button without function	LED On: Valve control value at 100 % LED flashing: Fault on the output (e.g. overload/short circuit)
 *Valve output close* button/LED	Button without function	LED On: Valve control value at 0 % LED flashing: Fault on the output (e.g. overload/short circuit)
		Both LEDs On: Valve control value between 1 and 99 % Both LEDs flashing: Fault on the output (e.g. overload/short circuit)
 *Relay output open/close* button/LED	Button without function	LED On: Relay contact closed LED Off: Relay contact open
 *Fan speed* button/LED	Button without function	Fan speed during step switching: • 0: all LEDs Off • 1: LED 1 On • 2: LEDs 1 & 2 On • 3: all LEDs On Fan speed during changeover switching: • 0: all LEDs Off • 1: LED 1 On • 2: LED 2 On • 3: LED 3 On

General technical data

Device	Dimensions	90 × 105 × 63.5 mm (H x W x D)
	Mounting width in space units	6 modules, 17.5 mm each
	Weight	0.24 kg
	Mounting position	Any
	Mounting variant	35 mm mounting rail
	Design	proM
	Degree of protection	IP 20
	Protection class	II
	Overvoltage category	III
	Pollution degree	2
Materials	Housing	Polycarbonate, Makrolon FR6002, halogen free
Material note	Fire classification	Flammability V-0
Electronics	Rated voltage, bus	30 V DC
	Voltage range, bus	21 … 31 V DC
	Current consumption, bus	< 12 mA
	Power loss, device	≤ 3 W
	Power loss, bus	≤ 0.25 W
	Power loss, relay output 16 A	≤ 1 W
	Power loss, relay output 5 A	≤ 0.6 W
	Power loss, fan outputs	≤ 1.2 W
	Power loss, valve outputs	≤ 1.2 W
	KNX safety extra low voltage	SELV
Connections	Connection type, KNX bus	Plug-in terminal
	Cable diameter, KNX bus	0.6 … 0.8 mm, solid
	Connection type, inputs/outputs	Screw terminal with universal head (PZ 1)
	Pitch	6.35 mm
	Tightening torque, screw terminals	0.5 … 0.6 Nm
	Conductor cross-section, flexible	1 × (0.2 … 4 mm²) / 2 × (0.2 … 2.5 mm²)
	Conductor cross section, rigid	1 × (0.2 … 6 mm²) / 2 × (0.2 … 4 mm²)
	Conductor cross section with wire end ferrule without plastic sleeve	1 × (0.25 … 2.5 mm²)
	Conductor cross section with wire end ferrule with plastic sleeve	1 × (0.25 … 4 mm²)
	Conductor cross section with TWIN wire end ferrule	1 × (0.5 … 2.5 mm²)
	Length, wire end ferrule contact pin	≥ 10 mm
Certificates and declarations	Declaration of conformity CE	→ 2CDK508222S2701
Ambient conditions	Operation	-5 … +45 °C
	Transport	-25 … +70 °C
	Storage	-25 … +55 °C
	Humidity	≤ 95 %
	Condensation allowed	No
	Atmospheric pressure	≥ 80 kPa (corresponds to air pressure at 2,000 m above sea level)

Inputs

Rated values	Number of inputs	4
	Inputs for analog room control unit	1 (input a)
Contact scanning	Scanning current	≤ 1 mA
	Scanning voltage	≤ 12 V DC
Resistance	Selection	User-defined
	PT 1.000	2-conductor technology
	PT100	2-conductor technology
	KT	1k
	KTY	2k
	NI	1k
	NTC	10k, 20k
Cable length	Between sensor and device input, one-way	≤ 100 m

Valve outputs – thermoelectric, PWM

Rated values	Number of outputs	2
	Non-floating	Yes
	Rated voltage U_n	230 V AC
	Voltage range	24 … 230 V AC
	Rated frequency	50/60 Hz
	Rated current I_n	0.5 A
	Continuous current at T_u Up to 20 °C	0.25 A resistive load per output
	Continuous current at T_u Up to 45 °C	0.15 A resistive load per output
	Inrush current at T_u Up to 45 °C	≤ 1.6 A (for 10 s)
		T_u = Ambient temperature
	Minimum load (per output)	1.2 W

Valve outputs – motor-driven, 3-point

Rated values	Number of outputs	1
	Non-floating	Yes
	Rated voltage U_n	230 V AC
	Voltage range	24 … 230 V AC
	Rated frequency	50/60 Hz
	Rated current I_n	0.5 A
	Continuous current at T_u Up to 20 °C	0.25 A resistive load per channel
	Continuous current at T_u Up to 45 °C	0.15 A resistive load per channel
	Inrush current at T_u Up to 45 °C	≤ 1.6 A (for 10 s)
		T_u = Ambient temperature
	Minimum load (per output)	1.2 VA

Fan outputs – relays 5 A

Rated values	Number of outputs	3
	Rated voltage U_n	230 V AC
	Rated current I_n (per output)	5 A
	Rated frequency	50/60 Hz
	Back-up protection	≤ 6 A
	Relay type	Bi-stable
Switching currents	AC-1 operation (cos φ = 0.8)	≤ 5 A
	Switching current at 24 V AC	≥ 0.01 A
	Switching current at 24 V DC (resistive load)	≤ 5 A
	Switching current at 5 V AC	≥ 0.02 A
	Switching current at 12 V AC	≥ 0.01 A
	Switching current at 24 V AC	≥ 0.007 A
Service life	Mechanical service life	≥ 10^7 switching operations
	AC-1 operation (cos φ = 0.8)	≥ 10^5 switching operations
Switching operations	Switching operations per minute when one relay switches	≤ 500

Outputs – relays 16 A

Rated values	Number of outputs	1
	Rated voltage U_n	230 V AC
	Rated current I_n (per output)	16 A
	Rated frequency	50/60 Hz
Switching currents	AC-1 operation (cos φ = 0.8)	≤ 16 A
	AC-3 operation (cos φ = 0.45)	≤ 6 A
	Fluorescent lighting load AX	≤ 6 AX
	Switching current at 24 V DC (resistive load)	≤ 16 A
	Switching current at 5 V AC	≥ 0.1 A
	Switching current at 12 V AC	≥ 0.1 A
	Switching current at 24 V AC	≥ 0.1 A
Service life	Mechanical service life	≥ 3×10^6 switching operations
	AC-1 operation (cos φ = 0.8)	≥ 10^5 switching operations
Switching operations	Switching operations per minute when one relay switches	≤ 500

Device type

Device type	Fan Coil Controller	FCC/S 1.1.2.1
	Application	Fan Coil Unit Controller, PWM/ …
		… = current version number of the application
	Maximum number of group objects	116
	Maximum number of group addresses	255
	Maximum number of assignments	255

Note
Observe software information on the website → www.abb.com/knx.

Ordering details

Description	MW	Type	Order no.	Packaging [pcs.]	Weight (incl. packaging) [kg]
Fan Coil Controller	6	FCC/S 1.1.2.1	2CDG110211R0011	1	0.24

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