

TECHNICAL DATA

# ABB i-bus<sup>®</sup> KNX

## FCC/S 1.1.1.1

### Fan Coil Controller, PWM, MDRC



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## Device description

The device is a modular installation device (MDRC) in *proM* 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.

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## **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<br>1.1.1.1 | FCC/S<br>1.1.2.1 | FCC/S<br>1.2.1.1 | FCC/S<br>1.2.2.1 | FCC/S<br>1.3.1.1 | FCC/S<br>1.3.2.1 | FCC/S<br>1.4.1.1 | FCC/S<br>1.5.1.1 | FCC/S<br>1.5.2.1 |
|---|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| Discrete speed fans<br>(1 ... 3-speeds) | 1                | 1                | 1                | 1                | –                | –                | 1                | –                | –                |
| Continuous fans<br>(0 ... 10 V)         | –                | –                | –                | –                | 1                | 1                | –                | 1                | 1                |

### Relay output 16 A

|                 | FCC/S<br>1.1.1.1 | FCC/S<br>1.1.2.1 | FCC/S<br>1.2.1.1 | FCC/S<br>1.2.2.1 | FCC/S<br>1.3.1.1 | FCC/S<br>1.3.2.1 | FCC/S<br>1.4.1.1 | FCC/S<br>1.5.1.1 | FCC/S<br>1.5.2.1 |
|-----------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| Electric heater | 1                | 1                | 1                | 1                | 1                | 1                | –                | 1                | 1                |

### Valve outputs

|                                     | FCC/S<br>1.1.1.1 | FCC/S<br>1.1.2.1 | FCC/S<br>1.2.1.1 | FCC/S<br>1.2.2.1 | FCC/S<br>1.3.1.1 | FCC/S<br>1.3.2.1 | FCC/S<br>1.4.1.1 | FCC/S<br>1.5.1.1 | FCC/S<br>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<br>1.1.1.1 | FCC/S<br>1.1.2.1 | FCC/S<br>1.2.1.1 | FCC/S<br>1.2.2.1 | FCC/S<br>1.3.1.1 | FCC/S<br>1.3.2.1 | FCC/S<br>1.4.1.1 | FCC/S<br>1.5.1.1 | FCC/S<br>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                |

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## 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 |

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## Outputs

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### 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     |

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### Fan output

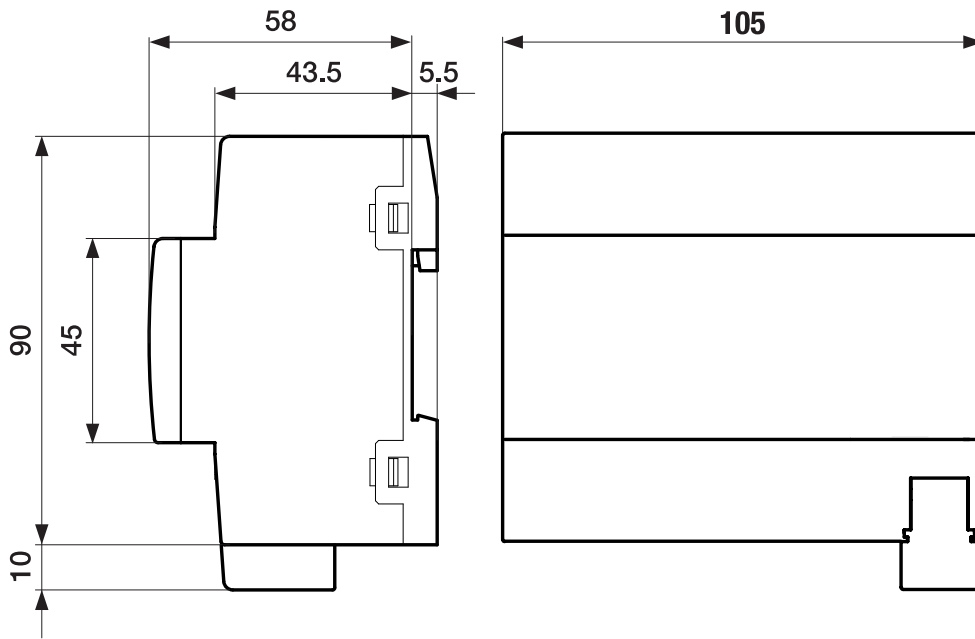
| Function                   | Fan output |
|----------------------------|------------|
| Number of fan speeds (5 A) |            |
| 1                          | x          |
| 2                          | x          |
| 3                          | x          |
| Changeover switching       | x    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

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### Relay output 16 A

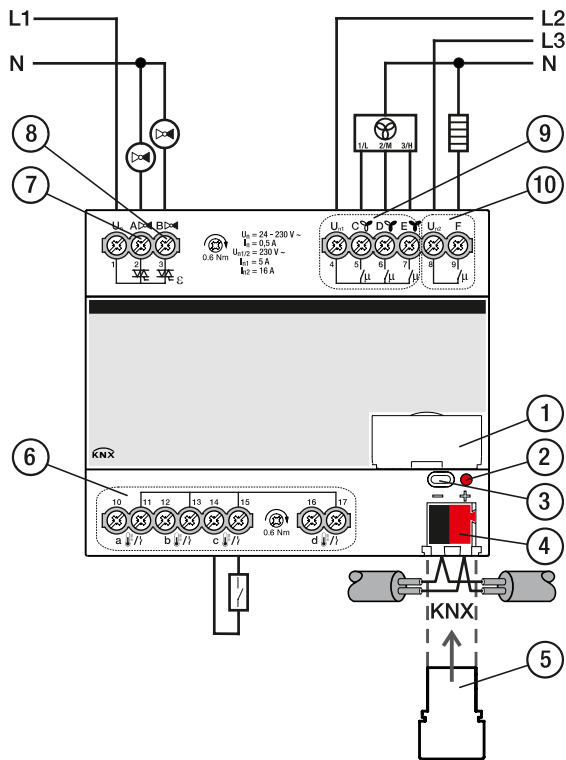
| Function                                       | Relay output |
|--|--------------|
| Use by internal controller for electric heater | x            |
| Use as independent switching output            | x            |
| Internal connection to a device input          | x            |

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Dimension drawing



2CDC072026F0017


**Connection diagram**



**Legend**

- |                             |                    |
|-----------------------------|--------------------|
| 1 Label carriers            | 7 Valve output     |
| 2 <i>Programming</i> LED    | 8 Valve output     |
| 3 <i>Programming</i> button | 9 Fan output       |
| 4 Bus connection terminal   | 10 Auxiliary relay |
| 5 Cover cap                 | 6 Input            |

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**Operating and display elements**

| Operating control/LED   | Description/function               | Display                            |
|---|------------------------------------|------------------------------------|
|  | Assignment of the physical address | LED On: Device in programming mode |
| <i>Programming button/LED</i>   |                                    |                                    |



## General technical data

|                                      |  |   |
|--------------------------------------|--|---|
| <b>Device</b>                        | Dimensions   | 90 × 105 × 63.5 mm (H x W x D)  |
|                                      | Mounting width in space units  | 6 modules, 17.5 mm each   |
|                                      | Weight   | 0.23 kg   |
|                                      | Mounting position  | Any   |
|                                      | Mounting variant   | 35 mm mounting rail   |
|                                      | Design   | proM  |
|                                      | Degree of protection   | IP 20   |
|                                      | Protection class   | II  |
|                                      | Overtoltage category   | III   |
|                                      | Pollution degree   | 2   |
| <b>Materials</b>                     | Housing  | Polycarbonate, Makrolon FR6002, halogen free                          |
| <b>Material note</b>                 | Fire classification  | Flammability V-0  |
| <b>Electronics</b>                   | 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  |
| <b>Connections</b>                   | 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 mm <sup>2</sup> ) / 2 × (0.2 ... 2.5 mm <sup>2</sup> ) |
|                                      | Conductor cross section, rigid                                       | 1 × (0.2 ... 6 mm <sup>2</sup> ) / 2 × (0.2 ... 4 mm <sup>2</sup> )   |
|                                      | Conductor cross section with wire end ferrule without plastic sleeve | 1 × (0.25 ... 2.5 mm <sup>2</sup> )                                   |
|                                      | Conductor cross section with wire end ferrule with plastic sleeve    | 1 × (0.25 ... 4 mm <sup>2</sup> )                                     |
|                                      | Conductor cross section with TWIN wire end ferrule                   | 1 × (0.5 ... 2.5 mm <sup>2</sup> )                                    |
| Length, wire end ferrule contact pin | ≥ 10 mm  |   |
| <b>Certificates and declarations</b> | Declaration of conformity CE   | → 2CDK508221D2701   |
| <b>Ambient conditions</b>            | 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

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

### Valve outputs – thermoelectric, PWM

|                     |   |                                  |
|---------------------|---|----------------------------------|
| <b>Rated values</b> | 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

|                     |   |                                   |
|---------------------|---|-----------------------------------|
| <b>Rated values</b> | 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

|                             |   |  |
|-----------------------------|---|--|
| <b>Rated values</b>         | 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                              |
| <b>Switching currents</b>   | AC-1 operation ( $\cos \varphi = 0.8$ )                 | ≤ 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                              |
| <b>Service life</b>         | Mechanical service life                                 | ≥ 10 <sup>7</sup> switching operations |
|                             | AC-1 operation ( $\cos \varphi = 0.8$ )                 | ≥ 10 <sup>5</sup> switching operations |
| <b>Switching operations</b> | Switching operations per minute when one relay switches | ≤ 500                                  |

## Outputs – relays 16 A

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

## Device type

|             |                                   |   |
|-------------|-----------------------------------|---|
| Device type | Fan Coil Controller               | FCC/S 1.1.1.1   |
|             | Application                       | Fan Coil Unit Controller, PWM/ ...<br>... = current version number of the application |
|             | Maximum number of group objects   | 114   |
|             | Maximum number of group addresses | 255   |
|             | Maximum number of assignments     | 255   |

### Note

Observe software information on the website  
→ [www.abb.com/knx](http://www.abb.com/knx).

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**Ordering details**

| Description         | MW | Type          | Order no.       | Packaging [pcs.] | Weight (incl. packaging) [kg] |
|---------------------|----|---------------|-----------------|------------------|-------------------------------|
| Fan Coil Controller | 6  | FCC/S 1.1.1.1 | 2CDG110210R0011 | 1                | 0.23                          |



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