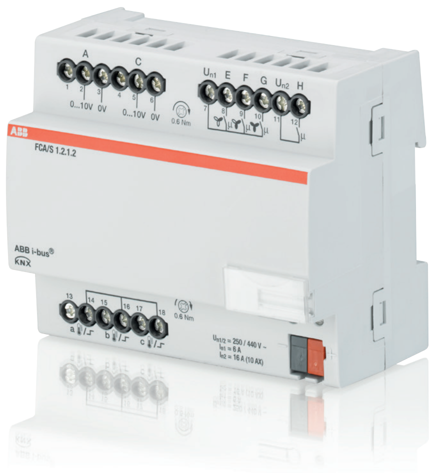
Technical data 2CDC508138D0202

ABB i-bus® KNX
Fan Coil Actuator, 0-10V, MDRC
FCA/S 1.2.1.2, 2CDG110196R0011



Product description

The device is a modular installation device (MDRC) in Pro *M* design. It is intended for installation in distribution boards on 35 mm mounting rails. The assignment of the physical addresses as well as the parameterization is carried out with ETS.

The device is powered via the ABB i-bus® KNX and requires no additional auxiliary voltage supply. The device is ready for operation after connecting the bus voltage.

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Technical data

Supply	Bus voltage	21…32 V DC
	Current consumption, bus	< 12 mA
	Leakage loss, bus	Maximum 250 mW
	Leakage loss, device	Maximum 2 W*
*The maximum power consumption of the device results from the following specifications:	KNX connection	0.25 W
	Relay 16 A	1.0 W
	Relay 6 A	0.6 W
	Analog outputs	0.15 W
Connections	KNX	Via bus connection terminal
	Inputs/Outputs	Via screw terminals
Connection terminals	Screw terminal	Screw terminal with universal head (PZ 1)
		0.2…4 mm² stranded, 2 x (0.2…2.5 mm²)
		0.2…6 mm² single core, 2 x (0.2…4 mm²)
	Ferrules without/with plastic sleeves	Without: 0.25…2.5 mm²
		With: 0.25…4 mm²
	TWIN ferrules	0.5…2.5 mm²
		Contact pin length min. 10 mm
	Tightening torque	Maximum 0.6 Nm
	Grid	6.35
Operating and display elements	Button/LED	For assignment of the physical address
	Button /, LED	For toggling between manual operation/ operation via ABB i-bus® KNX and displays
Protection	IP 20	To DIN EN 60 529
Protection class	II	To DIN EN 61 140
Isolation category	Overvoltage category	III to DIN EN 60 664-1
	Pollution degree	II to DIN EN 60 664-1
KNX safety extra low voltage	SELV 24 V DC	
Temperature range	Operation	-5 °C…+45 °C
	Transport	-25 °C…+70 °C
	Storage	-25 °C…+55 °C
	Temperatures exceeding +45 °C reduce the service life!	
Ambient conditions	Maximum air humidity	93 %, no condensation allowed
Design	Modular installation device (MDRC)	Modular installation device, Pro*M*
	Dimensions	108 x 90 x 64.5 mm (H x W x D)
	Mounting width in space units	6 x 18 mm modules
	Mounting depth	64.5 mm
Mounting	On 35 mm mounting rail	To DIN EN 60 715
Installation position	Any	
Weight	0.3 kg	
Housing/color	Plastic housing, gray	
Approvals	KNX to EN 50 090-1, -2	Certification
CE mark	In accordance with the EMC guideline and low voltage guideline	

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Device type	Application	Max. number of communication objects	Max. number of group addresses	Max. number of assignments
FCA/S 1.2.1.2	Fan Coil Actuator 0-10V/...*	70	254	255

* … = Current version number of the application. **Please refer to the software information on our website for this purpose.**

Note

For a detailed description of the application see *Fan Coil Actuators FCA/S* product manual.
It is available free-of-charge at *www.abb.com/knx*.

ETS and the current version of the device application are required for programming.

The current version of the application is available on the Internet for download at *www.abb.com/knx*. After import into ETS, it appears in the *Catalogs* window under *Manufacturers/ABB/Heating, Ventilation, Air Conditioning/Fan Coil Actuator 0-10V*.

The device does not support the locking function of a KNX device in ETS. If you use a *BCU code* to inhibit access to all the project devices, it has no effect on this device. Data can still be read and programmed.

Outputs valve V1/2 analog

Rated values	Quantity	2, non-isolated, short-circuit proofed
	Control signal	0…10 V DC
	Signal type	Analog
	Output load	> 10 kohms
	Output tolerance	± 10 %
	Current limitation	Up to 1.5 mA

Inputs

Rated values	Quantity	3
Contact scanning		Floating
	Scanning current	1 mA
	Scanning voltage	10 V
Resistance		PT100 2-conductor technology,
		PT1000 2-conductor technology,
		A selection of KT/KTY 1,000/2,000, user defined
	Resolution, accuracy and tolerances	See next page
Cable length	Between sensor and device input	Maximum 30 m, simple

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Resolution and accurancy and tolerances

Please note that the tolerances of the sensors which are used will need to be added to the listed values.

With sensors based on resistance measurement, it is also necessary to consider the cable error.

In the supplied state of the device, the stated accuracies will not be initially achieved. After initial commissioning, the device performs an autonomous calibration of the analogue measurement circuit. This calibration takes about an hour and is performed in the background. It is undertaken regardless of whether or not the device is parameterized and is independent of the connected sensors. The normal function of the device is not affected. After calibration has been completed, the calibration values which have been determined will be stored in the non-volatile memory. Thereafter, the device will achieve this level of accuracy every time it is switched on. If the calibration is interrupted by programming or bus voltage failure, it will recommence every time it is restarted. The ongoing calibration is displayed in the status byte by a 1 in bit 4.

Resistance signals

Sensor signal	Resolution	Accuracy at 25 °C T_u *3	Accuracy at 0…50 °C T_u *3	Accuracy at -20…70 °C T_u *3	Remark
PT100*4	0.01 ohms	±0.15 ohm	±0.2 ohms	±0.25 ohm	0.1 ohm = 0.25 °C
PT1000*4	0.1 ohms	±1.5 ohms	±2.0 ohms	±2.5 ohms	1 ohm = 0.25 °C
KT/KTY 1,000*4	1 ohm	±2.5 ohms	±3.0 ohms	±3.5 ohms	1 ohm = 0.125 °C/at 25 °C
KT/KTY 2,000*4	1 ohm	±5 ohms	±6.0 ohms	±7.0 ohms	1 ohm = 0.064 °C/at 25 °C

*3 in addition to current measured value at ambient temperature (T_u)
*4 incl. cable and sensor errors

PT100

The PT100 is precise and exchangeable but subject to faults in the cables (cable resistance and heating of the cables).
A terminal resistance of just 200 milliohms causes a temperature error of 0.5 °C.

PT1000

The PT1000 responds just like the PT100, but the influences of cable errors are lower by a factor of 10. Use of this sensor is preferred.

KT/KTY

The KT/KTY has a low level of accuracy, can only be exchanged under certain circumstances and can only be used for very simple applications.
Please note that there are different tolerance classes for the sensors in the versions PT100 and PT1000.
The table indicates the individual classes according to IEC 60 751 (date: 2008):

Description	Tolerance
Class AA	0.10 °C + (0.0017 x t)
Class A	0.15 °C + (0.002 x t)
Class B	0.30 °C + (0.005 x t)
Class C	0.60 °C + (0.01 x t)
t = Current temperature	

Example for class B:
At 100 °C, the deviations of the measurement value are reliable up to ± 0.8 °C

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Fan rated current 6 A

Rated values	Number	3 contacts
	U_{n1} rated voltage	250/440 V AC (50/60 Hz)
	I_{n1} rated current (per output)	6 A
Switching currents	AC3* operation (cos φ = 0.45) to DIN EN 60 947-4-1	6 A/230 V
	AC1*operation (cos φ = 0.8) to DIN EN 60 947 4-1	6 A/230 V
	Fluorescent lighting load to DIN EN 60 669-1	6 A/250 V (35 μF)[1)]
	Minimum switching capacity	20 mA/5 V
		10 mA/12 V
		7 mA/24 V
	DC current switching capacity (resistive load)	6 A/24 V=
Service life	Mechanical service life	> 10^7
	Electronic endurance of switching contacts to DIN IEC 60 947-4-1	
	AC1* (240 V/cos φ = 0.8)	> 10^5
	AC3* (240 V/cos φ = 0.45)	> 1.5 x 10^4
	AC5a* (240 V/cos φ = 0.45)	> 1.5 x 10^4
Switching times[2)]	Maximum relay position change per output and minute if only one relay is switched.	2,683

[1)] The maximum inrush current peak may not be exceeded.
[2)] The specifications apply only after the bus voltage has been applied to the device for at least 10 seconds. Typical delay of the relay is approx. 20 ms.

***What do the terms AC1, AC3 and AC5a mean?**
In intelligent installation systems, different switching capacities and performance specifications that are dependent on the special applications, have become established in domestic and industrial installations. These performance specifications are rooted in the respective national and international standards. The tests are defined to simulate typical applications, e.g. motor loads (industrial) or fluorescent lamps (residential).

Specifications AC1 and AC3 are switching performance specifications which have become established in the industrial field.

Typical application:

AC1 – Non-inductive or slightly inductive load, resistive furnaces (relates to switching of ohmic/resistive loads)

AC3 – Squirrel-cage motors: starting, switching off motors during running (relates to (inductive) motor load)

AC5a – Switching of electric discharge lamps

These switching performances are defined in the standard EN 60947-4-1 *Contactors and motor-starters - Electromechanical contactors and motor-starters*.
The standard describes starters and/or contactors that were originally used primarily in industrial applications.

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Fan lamp load 6 A

Lamps	Incandescent lamp load	1,200 W
Fluorescent lamps T5/T8	Uncompensated	800 W
	Parallel compensated	300 W
	DUO circuit	350 W
Low-voltage halogen lamps	Inductive transformer	800 W
	Electronic transformer	1,000 W
	Halogen lamps 230 V	1,000 W
Dulux lamp	Uncompensated	800 W
	Parallel compensated	800 W
Mercury-vapor lamp	Uncompensated	1,000 W
	Parallel compensated	800 W
Switching capacity (switching contact)	Maximum peak inrush-current I_p (150 µs)	200 A
	Maximum peak inrush-current I_p (250 µs)	160 A
	Maximum peak inrush-current I_p (600 µs)	100 A
Number of electronic ballasts (T5/T8, single element)[1)]	18 W (ABB EVG 1 x 18 SF)	10
	24 W (ABB EVG-T5 1 x 24 CY)	10
	36 W (ABB EVG 1 x 36 CF)	7
	58 W (ABB EVG 1 x 58 CF)	5
	80 W (Helvar EL 1 x 80 SC)	3

[1)] For multiple element lamps or other types, the number of electronic ballasts must be determined using the peak inrush current of the ballasts.

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Output, rated current 16 A

Rated values	Quantity	1
	U_{n2} rated voltage	250/440 V AC (50/60 Hz)
	I_{n2} rated current	16 A
Switching currents	AC3* operation (cos φ = 0.45) to DIN EN 60 947-4-1	8 A/230 V
	AC1* operation (cos φ = 0.8) to DIN EN 60 947 4-1	16 A/230 V
	Fluorescent lighting load AX as per EN 60 669-1	16 A/250 V (70 µF)1)
	Minimum switching capacity	100 mA/12 V
		100 mA/24 V
	DC current switching capacity (resistive load)	16 A/24 V=
Service life	Mechanical service life	> 3 x 10^6
	Electronic endurance of switching contacts to DIN IEC 60 947-4-1	
	AC1* (240 V/cos φ = 0.8)	> 10^5
Switching times[2)]	Maximum relay position change per output and minute if only one relay is switched.	313

[1)] The maximum inrush current peak may not be exceeded.
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In intelligent installation systems, different switching capacities and performance specifications that are dependent on the special applications, have become established in domestic and industrial installations. These performance specifications are rooted in the respective national and international standards. The tests are defined to simulate typical applications, e.g. motor loads (industrial) or fluorescent lamps (residential).

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Output, lamp load 16 A

Lamps	Incandescent lamp load	2,500 W
Fluorescent lamps T5/T8	Uncompensated	2,500 W
	Parallel compensated	1,500 W
	DUO circuit	1,500 W
Low-voltage halogen lamps	Inductive transformer	1,200 W
	Electronic transformer	1,500 W
	Halogen lamps 230 V	2,500 W
Dulux lamp	Uncompensated	1,100 W
	Parallel compensated	1,100 W
Mercury-vapor lamp	Uncompensated	2,000 W
	Parallel compensated	2,000 W
Switching capacity (switching contact)	Maximum peak inrush-current I_p (150 µs)	400 A
	Maximum peak inrush-current I_p (250 µs)	320 A
	Maximum peak inrush-current I_p (600 µs)	200 A
Number of electronic ballasts (T5/T8, single element)[1)]	18 W (ABB EVG 1 x 18 SF)	23
	24 W (ABB EVG-T5 1 x 24 CY)	23
	36 W (ABB EVG 1 x 36 CF)	14
	58 W (ABB EVG 1 x 58 CF)	11
	80 W (Helvar EL 1 x 80 SC)	10

[1)] For multiple element lamps or other types the number of electronic ballasts must be determined using the peak inrush current of the ballasts.

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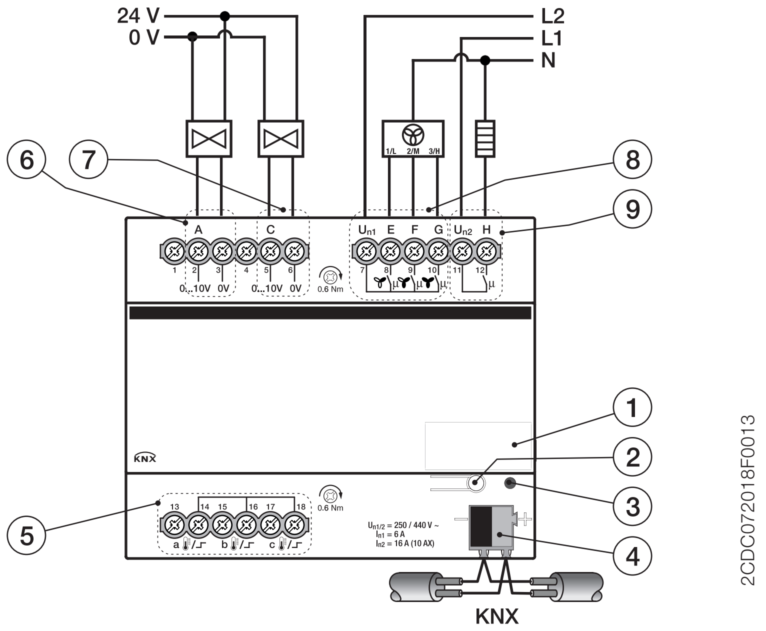
Connection schematic



1	Label carrier
2	*Programming* button
3	*Programming* LED (red)
4	Bus connection terminal
5	Inputs a, b, c
6	Valve V1 (e.g. heating)
7	Valve V2 (e.g. cooling)
8	Fan
9	Output H

Note
Terminals 1 and 4 on the FCA/S 1.2.1.2 are not used internally.

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All outputs can be controlled independently of one another.

The following table provides an overview of the functions possible with the outputs of the Fan Coil Actuator and the application:

Functions of the output	A		C	
General				
- Overload	■		■	
- Parallel operation	■		■	
Valve drives allocated to the Fan Coil unit				
- Analog (0...10 V)	■		■	
- 1 control value/1 valve	■		free	
- 2 control values/1 valve	■		free	
- 2 control values/2 valves	■		■	
Setting facilities for valve drives				
- Analog (0...10 V)				
- Separate heating/cooling	■		■	
- Direction	OPEN/CLOSE		OPEN/CLOSE	

■ = Function is supported
\- = Function is not supported
free = Is available and can be used separately

Functions of the output	E	F	G	H
Switch function				
Normally closed/Normally open contact	■	■	■	■
Time				
Staircase lighting	■	■	■	■
Fan				
Level	1	2	3	-

■ = Function is supported
\- = Function is not supported

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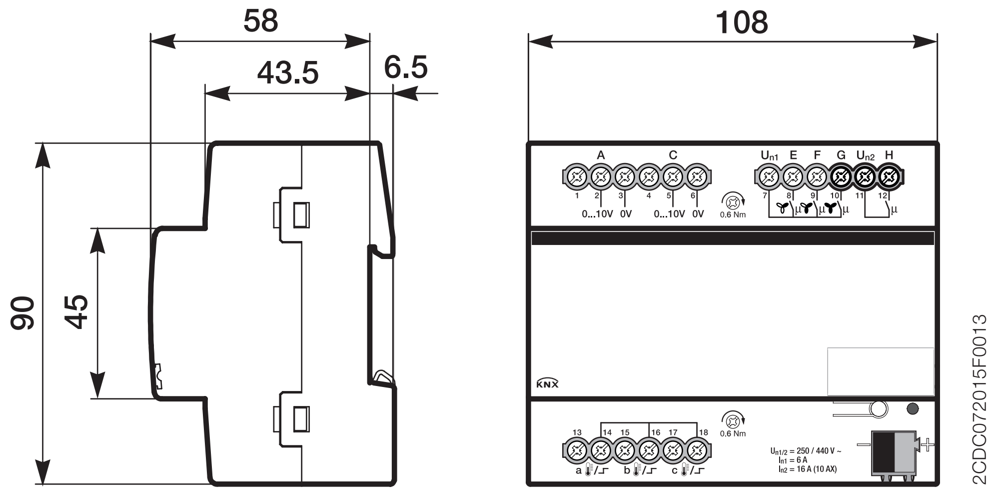
Dimension drawing



Contact

ABB STOTZ-KONTAKT GmbH
Eppelheimer Straße 82
69123 Heidelberg, Germany
Telefon: +49 (0)6221 701 607
Telefax: +49 (0)6221 701 724
E-Mail: knx.marketing@de.abb.com

Further information and local contacts:
www.abb.com/knx

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