

Training ClimaECO, 2020

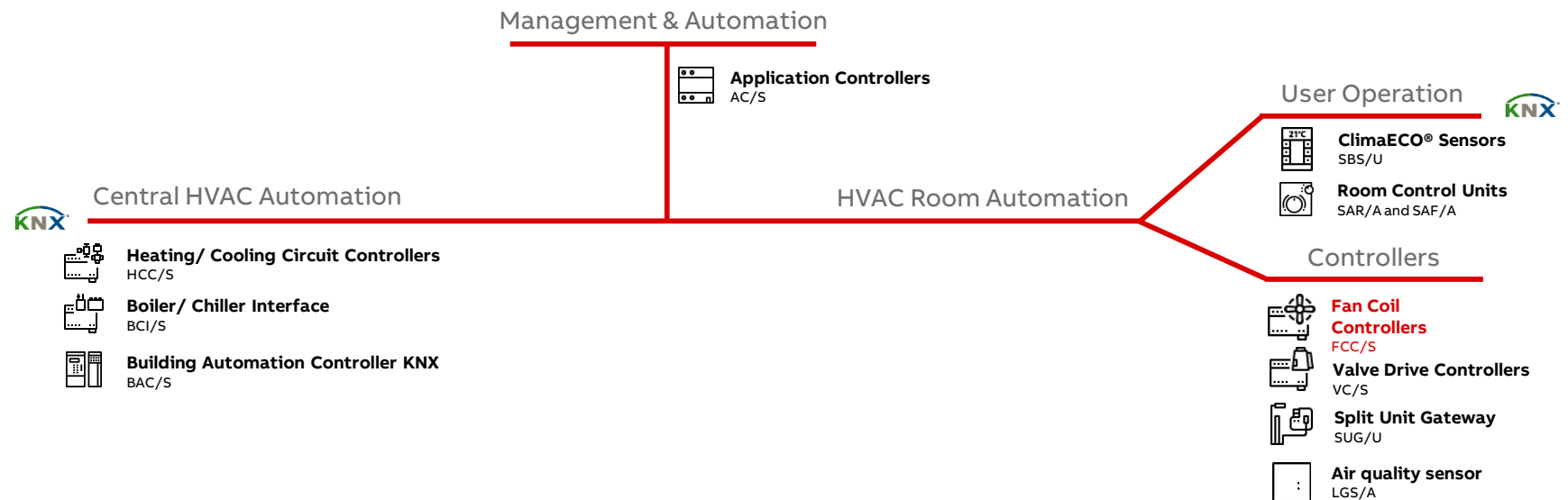
Fan Coil Controller FCC/S 1.x.x.1

ClimaECO

Thorsten Reibel, RCC Europe

Fan Coil Controller FCC/S 1.x.x.1

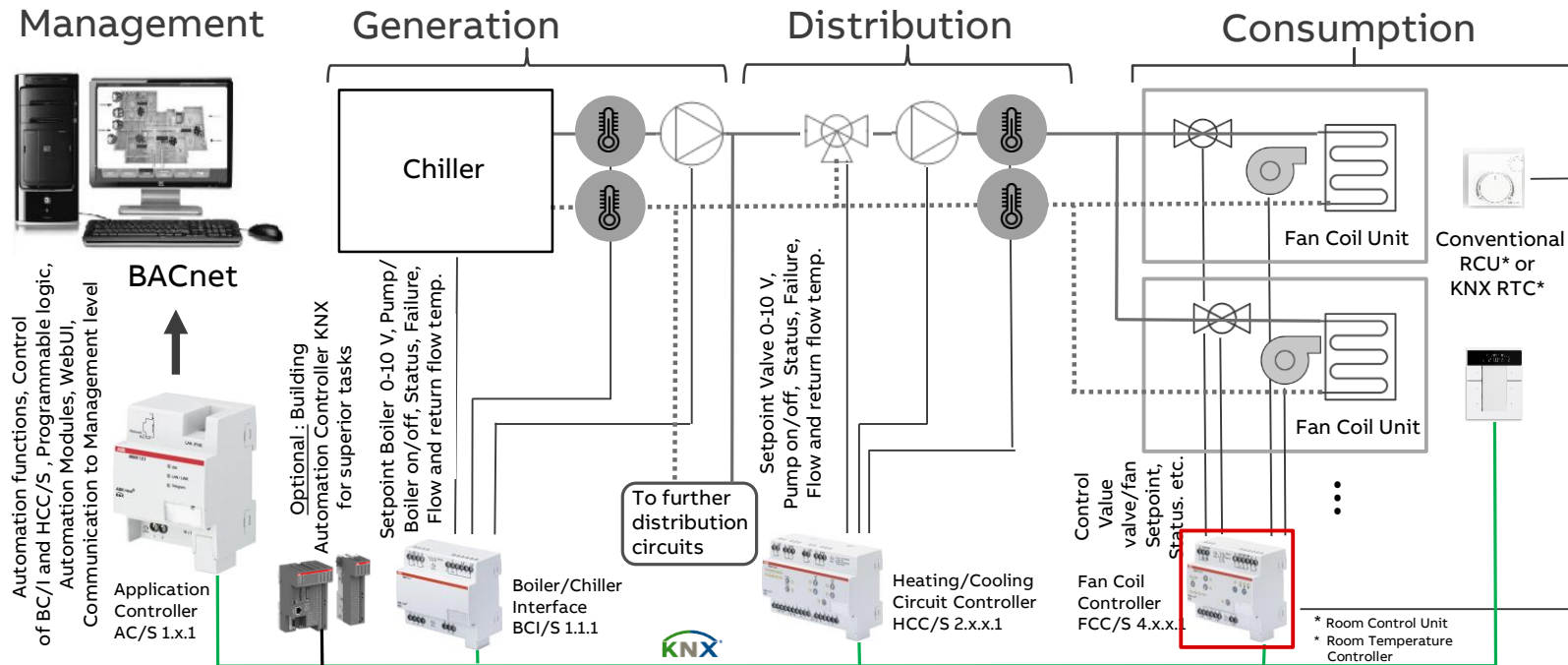
Overview ClimaECO: New Products



A holistic HVAC Building Automation System, over 30 new devices

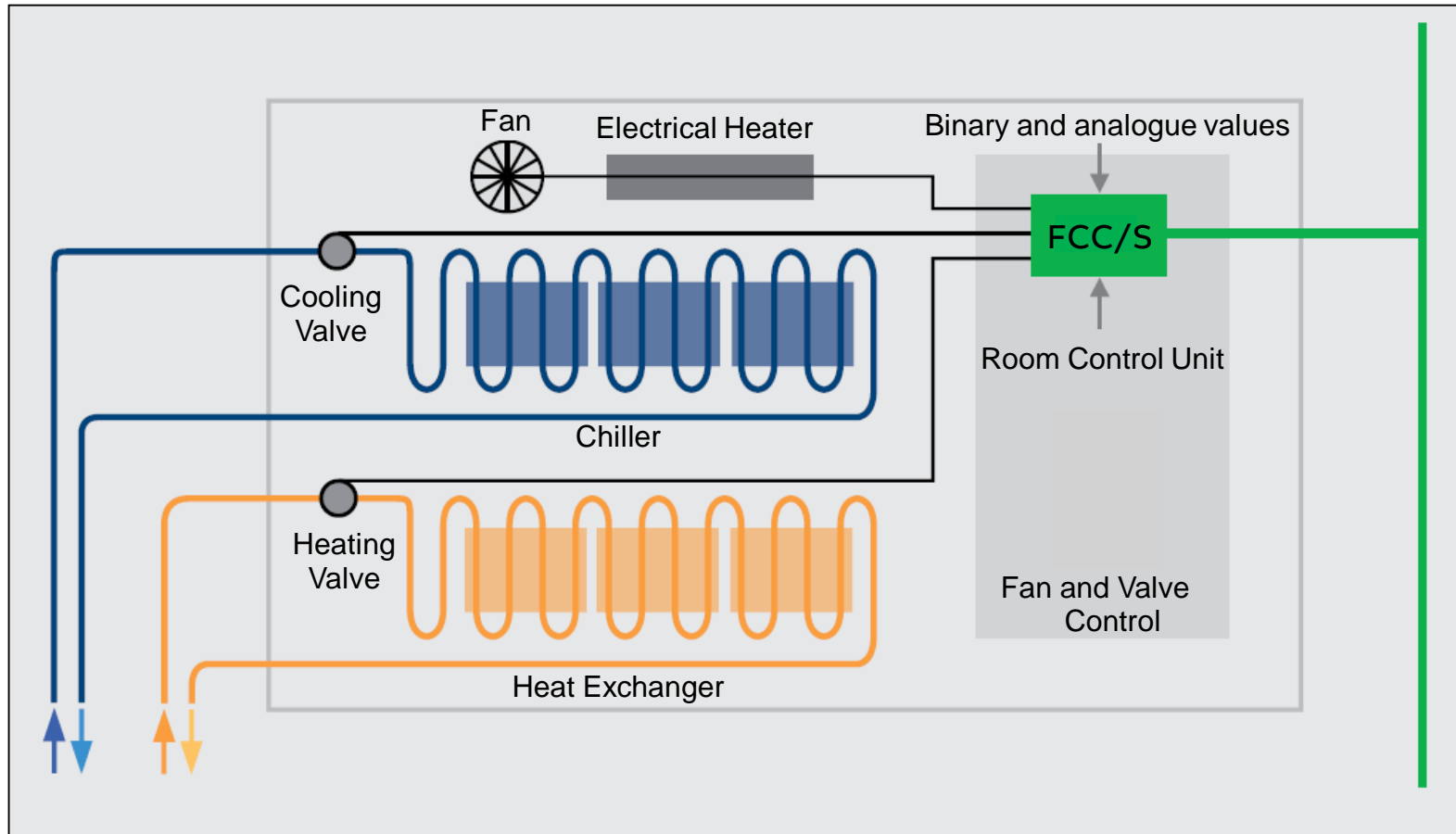
Fan Coil Controller FCC/S 1.x.x.1

Overview ClimaECO: ABB i-bus® KNX HVAC Solutions



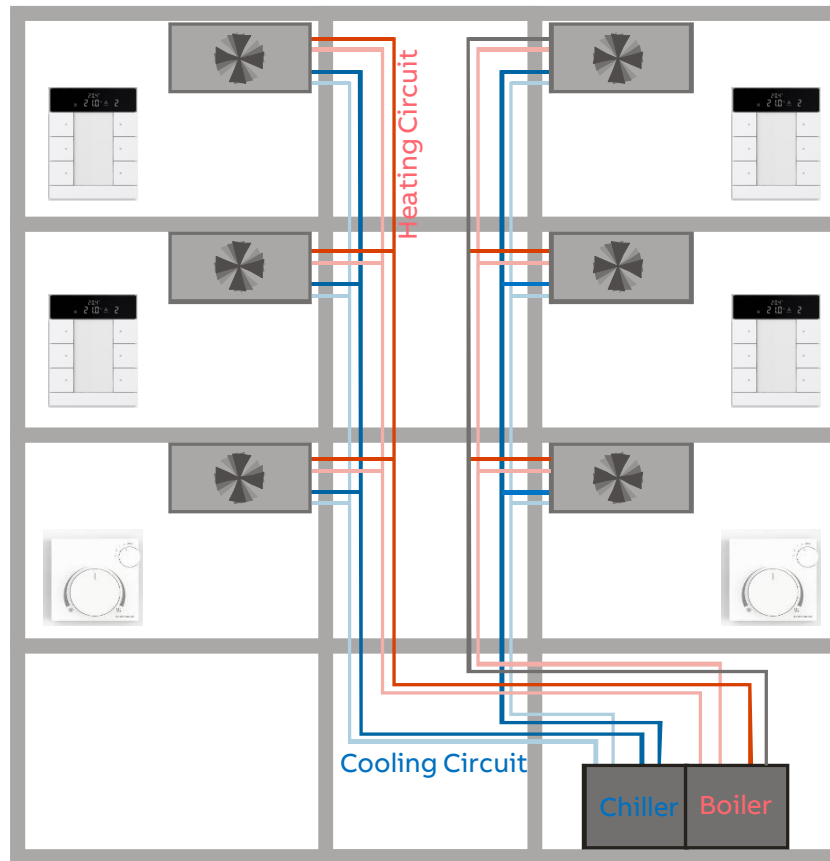
Fan Coil Controller FCC/S 1.x.x.1

Fan Coil Unit in principle (4-pipe System)



Fan Coil Controller FCC/S 1.x.x.1

Fan Coil Unit in principle (4-pipe System)



Fan Coil Controller FCC/S 1.x.x.1

Introduction

Motivation – New Features

- Most comprehensive product family for controlling all kind of Fan Coil Units in the KNX market → 9 Components!
- Electrothermal and motor valve drives
 - 2 electronic outputs
- 0-10 V valve drives
 - 2 x 0-10 V outputs
- 1,2, or 3 step fans
- 0 - 10 V fans **NEW**
- All combinations of digital and analogue fan and valve control **NEW**
- Integrated room temperature controller for conventional room control units (RCU) **NEW**
- Parametrizable as actuator or controller **NEW**



Fan Coil Controller FCC/S 1.x.x.1

Introduction

Motivation – New Features

- With and without manual operation
- 4 inputs for binary and analogue signals (PT100, PT1000, KTY, NTC, NI 1000) and connection of Room Control Unit (RCU) for setpoint and room temperature
- Control of 6-way valves **NEW**
- Control of Ventilation flaps (**Variable Air Volume**) **NEW**
- ABB i-bus tool support
- Keypad for easy and fast manual operation
- Additional relay, e.g. for electrical heater
- Budget variant, one valve output, no switch contact and no manual operation
- Existing Fan Coil Actuators will be replaced



Fan Coil Controller FCC/S 1.x.x.1

Introduction

Motivation – New Features

ETS Application for ETS4 or ETS 5

- Control of 6-way valves (4-pipe system)
 - One 0-10 V output for heating/cooling
- Control of ventilation flaps
 - Control values: 0-10V, 1-10V, 2-10V and 10-0V
- Temperature limitation
 - Allows to limit the temperature of a floor (in case of floor heating) to protect the material and the improve the comfort
- Start-up: Fan level the fan coil unit starts with
 - Level 1,2 or 3 with minimum holding time
- Run-on: Time the fan stays in the current level though a lower level is required
 - Individual time for each level



Fan Coil Controller FCC/S 1.x.x.1

Product Range

Family FCC/S 1.x.x.1



FCC/S 1.1.1.1

3-step Fan, electrothermal valve 2-fold or motor valve drive 1-fold



FCC/S 1.1.2.1

3-step Fan, electrothermal valve 2-fold or motor valve drive 1-fold, manual Op.



FCC/S 1.2.1.1

3-step Fan, Valve 0-10 V



FCC/S 1.2.2.1

3-step Fan, Valve 0-10 V, manual Op.



FCC/S 1.3.1.1

Fan 0-10 V, Valve 0-10 V



FCC/S 1.3.2.1

Fan 0-10 V, Valve 0-10 V, manual Op.



FCC/S 1.5.1.1

Fan 0-10 V, electrothermal valve 2-fold or motor valve drive 1-fold



FCC/S 1.5.2.1

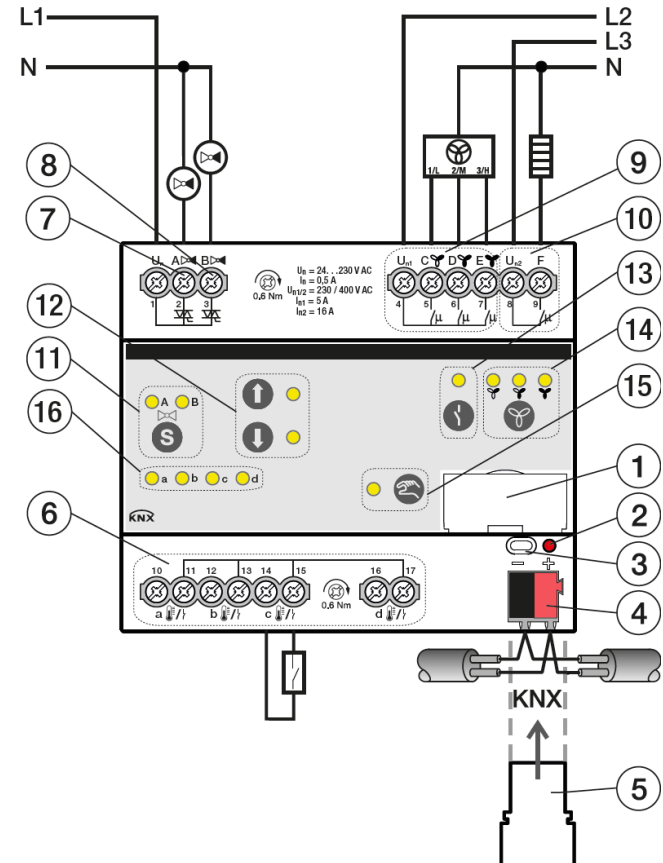
Fan 0-10 V, electrothermal valve 2-fold or motor valve drive 1-fold, manual Op.

Fan Coil Controller FCC/S 1.x.x.1

Product Range

FCC/S 1.1.x.1

1. Label carrier
2. KNX programming button
3. KNX programming LED (red)
4. KNX connection
5. Cover cap
6. Inputs (a, b, c, d)
7. Valve output A
8. Valve output B
9. Fan output
10. Additional Relais
11. Button/LED switch valve output
12. Buttons/LED open/close valve output
13. Button/LED open/close relais output
14. Button/LED switch fan speed
15. Button/LED activate manual operation
16. LED status of inputs

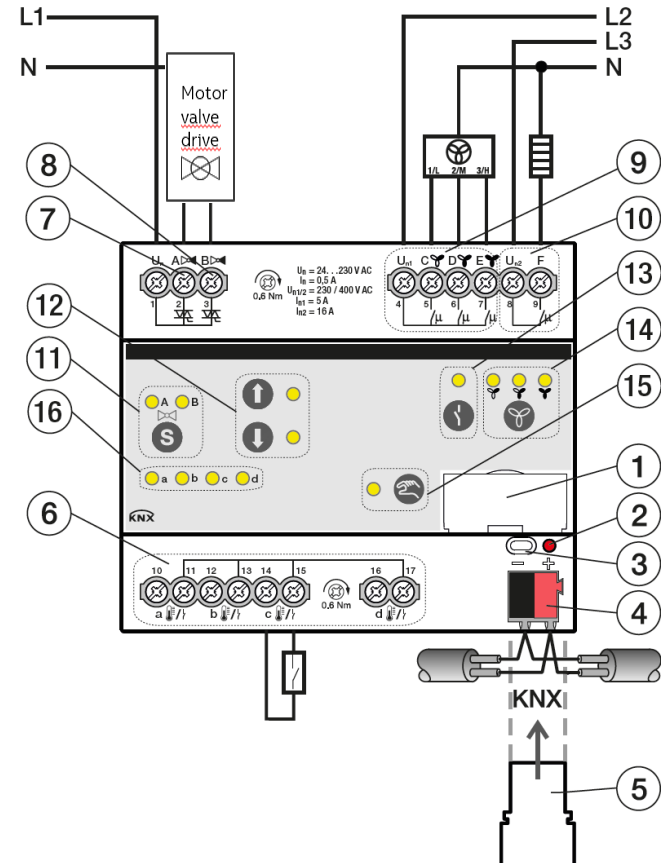


Fan Coil Controller FCC/S 1.x.x.1

Product Range

FCC/S 1.1.x.1

1. Label carrier
2. KNX programming button
3. KNX programming LED (red)
4. KNX connection
5. Cover cap
6. Inputs (a, b, c, d)
7. Valve output A
8. Valve output B
9. Fan output
10. Additional Relais
11. Button/LED switch valve output
12. Buttons/LED open/close valve output
13. Button/LED open/close relais output
14. Button/LED switch fan speed
15. Button/LED activate manual operation
16. LED status of inputs

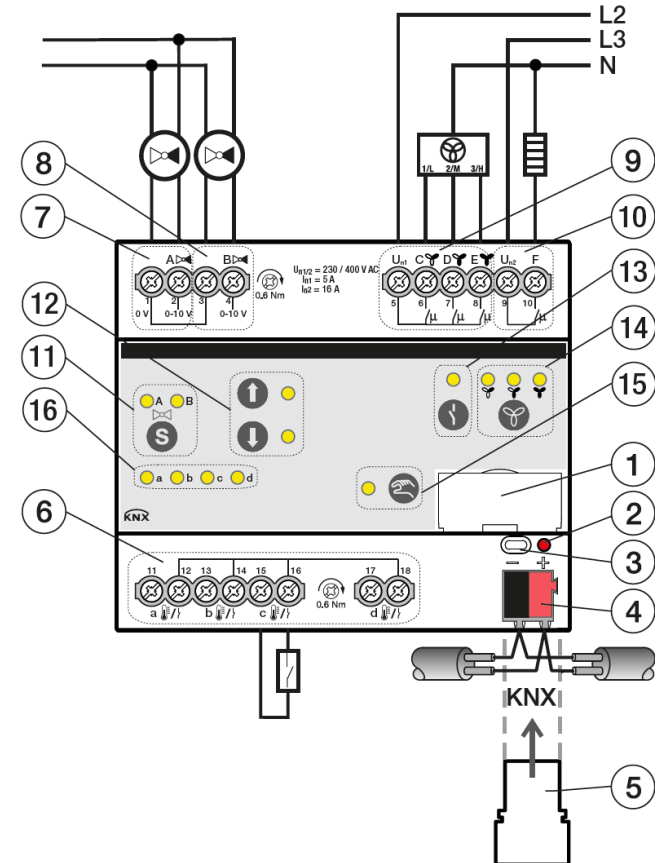


Fan Coil Controller FCC/S 1.x.x.1

Product Range

FCC/S 1.2.x.1

1. Label carrier
2. KNX programming button
3. KNX programming LED (red)
4. KNX connection
5. Cover cap
6. Inputs (a, b, c, d)
7. Valve output A
8. Valve output B
9. Fan output
10. Additional Relais
11. Button/LED switch valve output
12. Buttons/LED open/close valve output
13. Button/LED open/close relais output
14. Button/LED switch fan speed
15. Button/LED activate manual operation
16. LED status of inputs

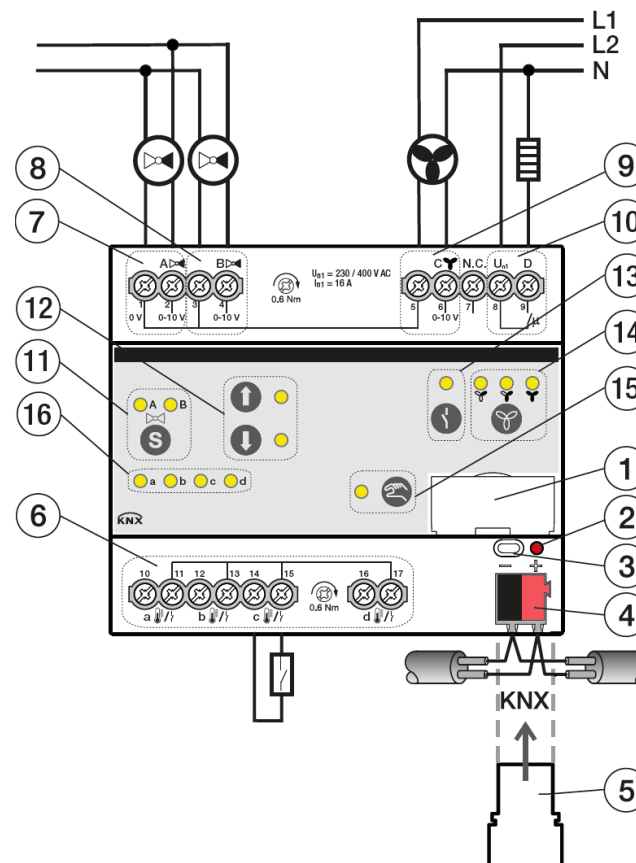


Fan Coil Controller FCC/S 1.x.x.1

Product Range

FCC/S 1.3.x.1

1. Label carrier
2. KNX programming button
3. KNX programming LED (red)
4. KNX connection
5. Cover cap
6. Inputs (a, b, c, d)
7. Valve output A
8. Valve output B
9. Fan output
10. Additional Relais
11. Button/LED switch valve output
12. Buttons/LED open/close valve output
13. Button/LED open/close relais output
14. Button/LED switch fan speed
15. Button/LED activate manual operation
16. LED status of inputs

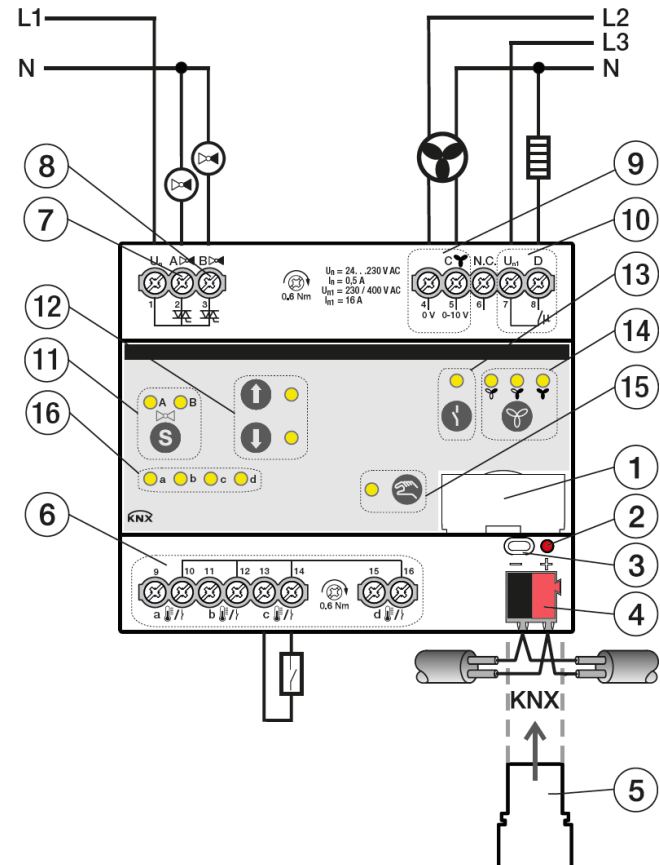


Fan Coil Controller FCC/S 1.x.x.1

Product Range

FCC/S 1.5x.1

1. Label carrier
2. KNX programming button
3. KNX programming LED (red)
4. KNX connection
5. Cover cap
6. Inputs (a, b, c, d)
7. Valve output A
8. Valve output B
9. Fan output
10. Additional Relais
11. Button/LED switch valve output
12. Buttons/LED open/close valve output
13. Button/LED open/close relais output
14. Button/LED switch fan speed
15. Button/LED activate manual operation
16. LED status of inputs

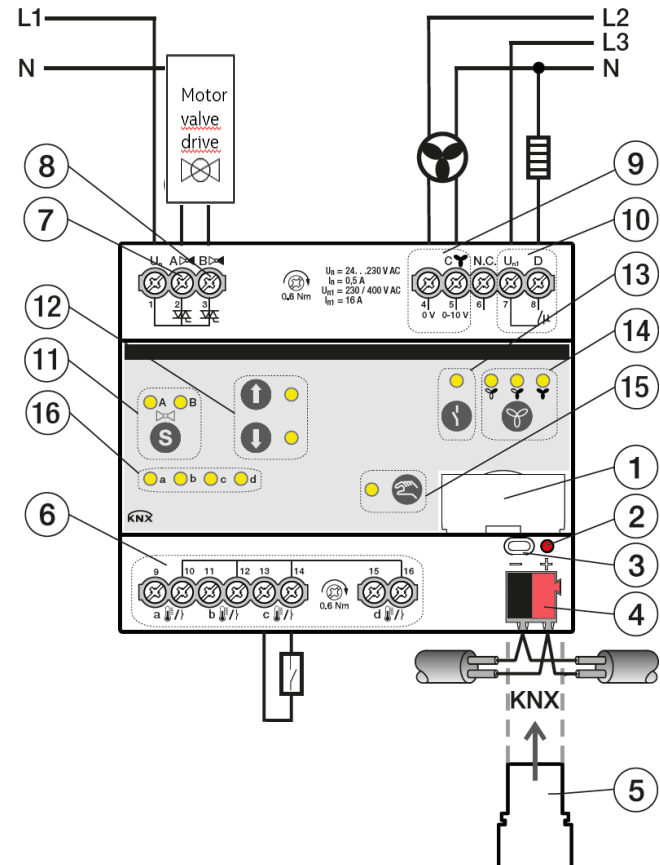


Fan Coil Controller FCC/S 1.x.x.1

Product Range

FCC/S 1.5x.1

1. Label carrier
2. KNX programming button
3. KNX programming LED (red)
4. KNX connection
5. Cover cap
6. Inputs (a, b, c, d)
7. Valve output A
8. Valve output B
9. Fan output
10. Additional Relais
11. Button/LED switch valve output
12. Buttons/LED open/close valve output
13. Button/LED open/close relais output
14. Button/LED switch fan speed
15. Button/LED activate manual operation
16. LED status of inputs

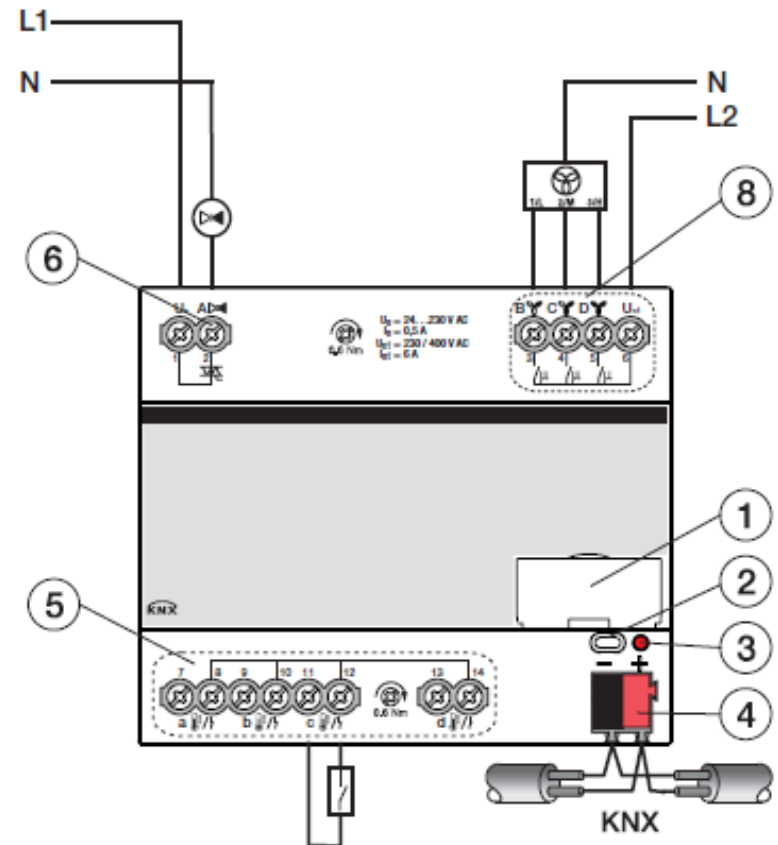


Fan Coil Controller FCC/S 1.x.x.1

Product Range

FCC/S 1.4.1.1 (Budget device)

1. Label carrier
2. KNX programming button
3. KNX programming LED (red)
4. KNX connection
5. Inputs (a, b, c, d)
6. Valve Output
7. Fan output



Fan Coil Controller FCC/S 1.x.x.1

Overview

Family FCC/S 1.x.x.1 – Functional Overview

Function/Device	FCC/S 1.1.x.1	FCC/S 1.2.x.1	FCC/S 1.3.x.1	FCC/S 1.4.1.1	FCC/S 1.5.x.1
Integrated Room temperature controller (unified RTC)	X	X	X	X	X
Valve Control					
PWM	X (2)	-	-	X (1)	X (2)
or motoric	X (1)	-	-	-	X (1)
0-10V	-	X (2)	X (2)	-	
Control of 6-way valves	-	X	X	-	
2-pipe system	X	X	X	X	X
4-pipe system	X	X	X	-	X
3-stage fan (5A)	X	X	-	X	
Continuous fan	-	-	X	-	X
Inputs for sensors	4	4	4	4	4
Inputs for analogue RCU	1	1	1	1	1
Relay output (electrical heater) (16A)	X	X	X	-	X
Module width	6	6	6	6	6
Variant with keypad	X	X	X	-	X
Variant without keypad	X	X	X	X	X

Fan Coil Controller FCC/S 1.x.x.1

Overview

Technical Data

Feature	FCC/S 1.x.x.1
Width	6 Modules
Valve Output (PWM, 3point)	2
Current (20°C, res. load)	0,25 A
Voltage	24 ... 230V AC
Valve Output (0-10V DC)	2
Load	> 10 kOhm
Current (limited)	< 1,5 mA
Relay Output	1
Current (resistive load)	16 A
Fan Output (0-10V DC)	1
Load	> 10 kOhm
Current (limited)	< 1,5 mA
Binary Input	4*
Scanning voltage	12V
Scanning current	1mA
Cable length	< 100m
Analogue Inputs	4*



* 4 analogue or 4 binary inputs

Fan Coil Controller FCC/S 1.x.x.1

Fan Coil Actuator – Fan Coil Controller

Comparison FCA/S – FCC/S

– FCC/S:

- Integrated controller to connect simple and cost efficient Room Control Units
- Control of analogue fan with EC Motor and VAV flaps, both via 0-10 V
- All combinations for fan- and valve control for different Fan Coil Units from the market

– FCA/S:

- 4 electronic outputs
- Relay outputs for fan also as standard switching outputs adjustable
- Staircase time for additional relay
- Valve curve adjustment

– Please note: Fan Coil Actuators FCA/S are phased out!

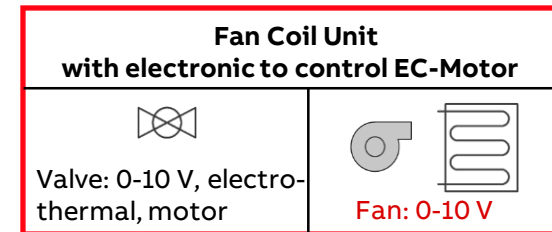


Fan Coil Controller FCC/S 1.x.x.1

Motor for Fan Coil Unit fan speed control

EC Motor

- Standard Fan speed control of fan coil units is a motor with 3 steps
- Control of speed via simple AC-Motors with switchable voltage by means of a transformer
- Fan Coil Units are offered with EC Motor (electronic commutating), also called BLDC Motor (**BrushLess DC** motor)
- Advantage:
 - Continuous speed control via 0-10V signal
 - High efficiency (compared with AC asynchron motor and frequency inverter)
 - No wear (compared with conventional DC motor and brushes)
 - Increase of comfort, efficiency and accuracy for temperature control with Fan Coil Units



FCC/S 1.3.1.1
Fan 0-10 V



FCC/S 1.3.2.1
Fan 0-10 V



FCC/S 1.5.1.1
Fan 0-10 V



FCC/S 1.5.2.1
Fan 0-10 V

[Principle EC-Motor - Video](#)

Fan Coil Controller FCC/S 1.x.x.1

Application example

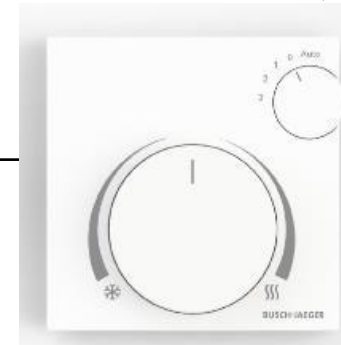
FCC/S linked with Room Control Unit (RCU)

FCC/S 1.x.x.1
Working as **Controller**



Direct link
Set point and room temperature
One way communication

SAF/A
Room Control Units (non KNX)



Fan Coil Controller FCC/S 1.x.x.1

Application Example

Connection FCC/S - RCU

4 wires required

- 2 wires for setpoint input A (mandatory)
 - Input in FCC/S is parametrized as 'used as analogue RCU input'
- 2 wires for room temperature input B, C or D
 - optional, can come also from another sensor, e.g. presence detector
 - ETS parameter of input in FCC/S to be adjusted as temperature sensor
 - Type of temperature sensor NTC, NTC type NTC20

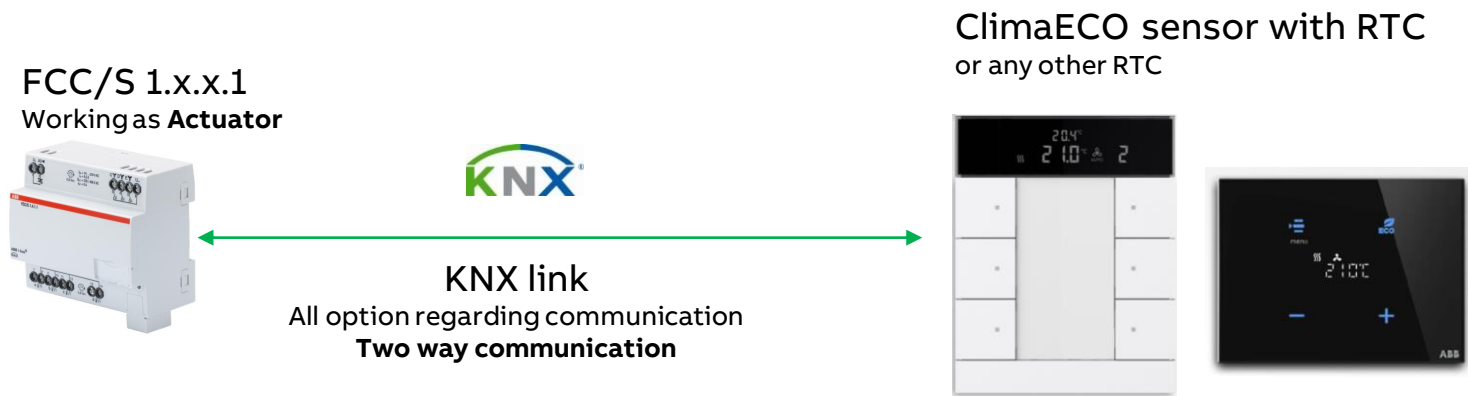
Cost efficient and competitive



Fan Coil Controller FCC/S 1.x.x.1

Application Example

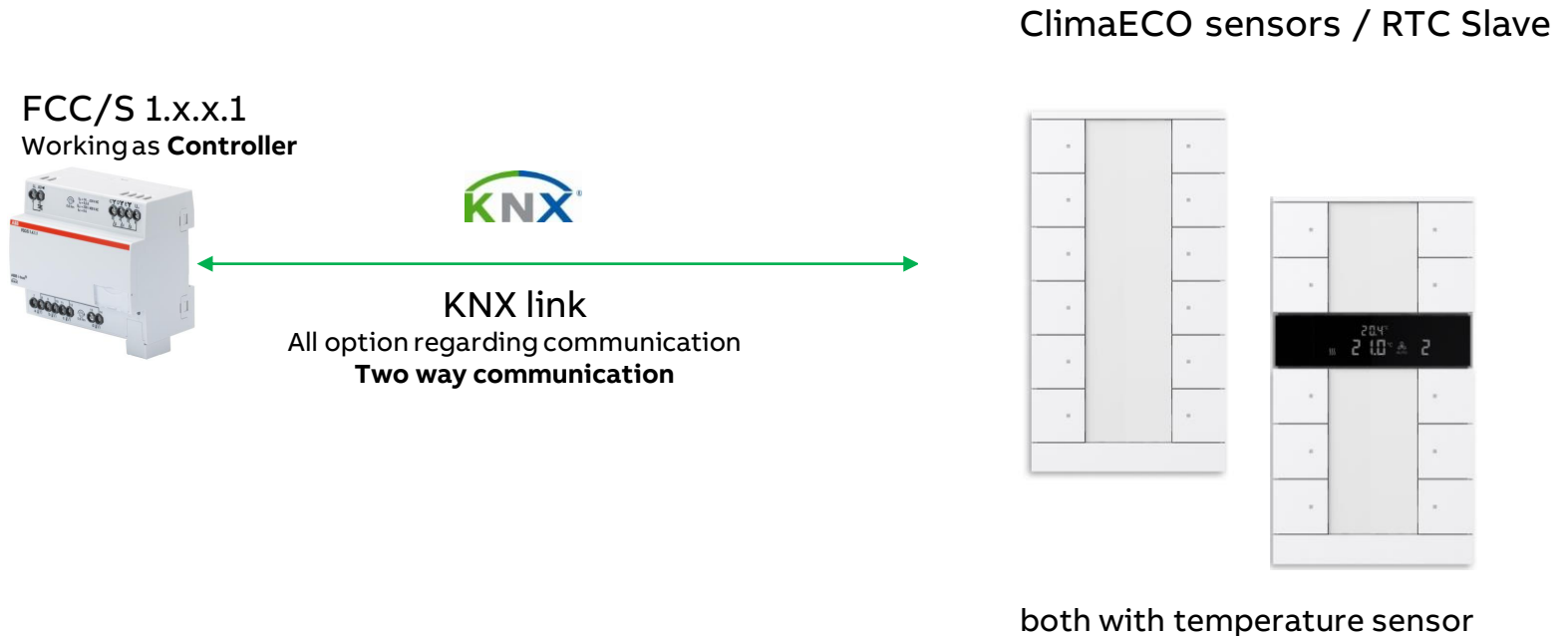
FCC/S linked with KNX Room Temperature Controller (RTC)



Fan Coil Controller FCC/S 1.x.x.1

Application Example

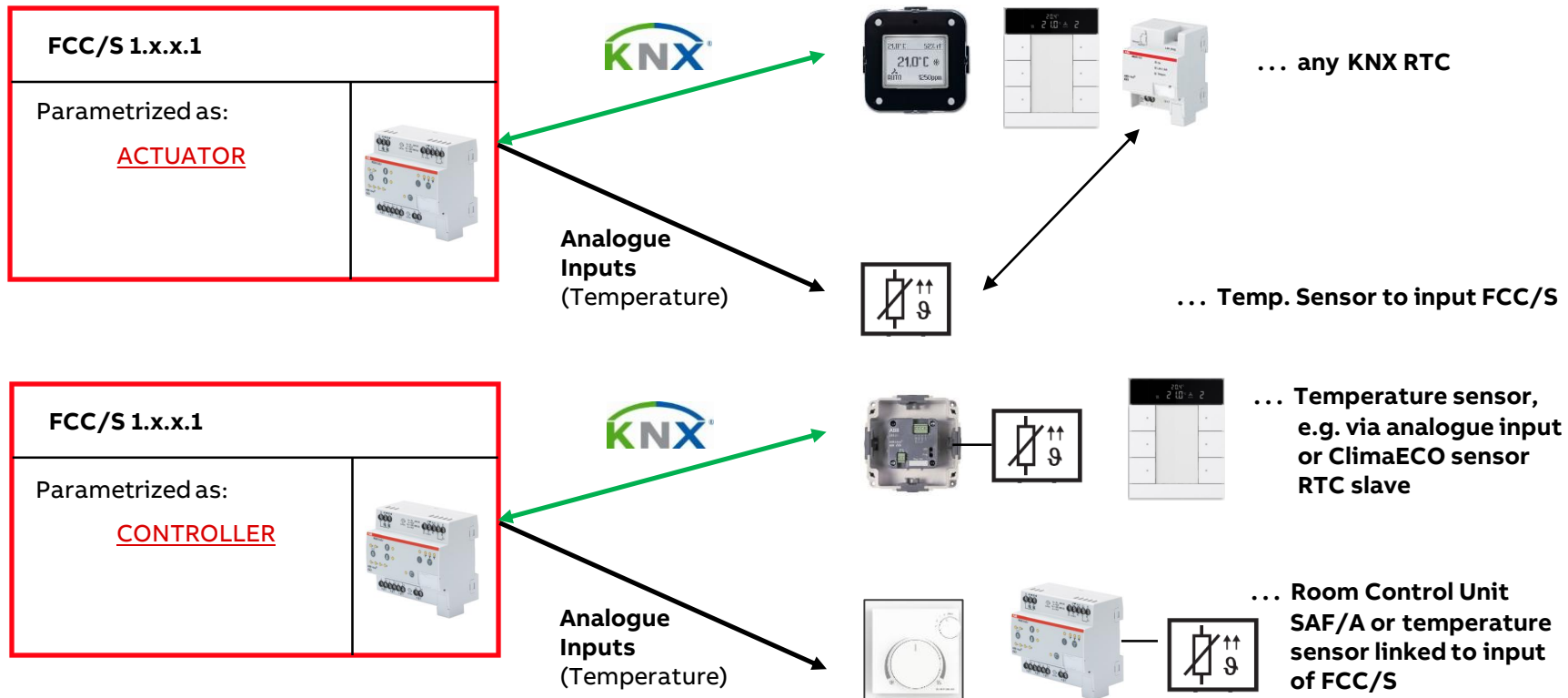
FCC/S linked with ClimaECO sensors with temperature sensor



Fan Coil Controller FCC/S 1.x.x.1

Application Example

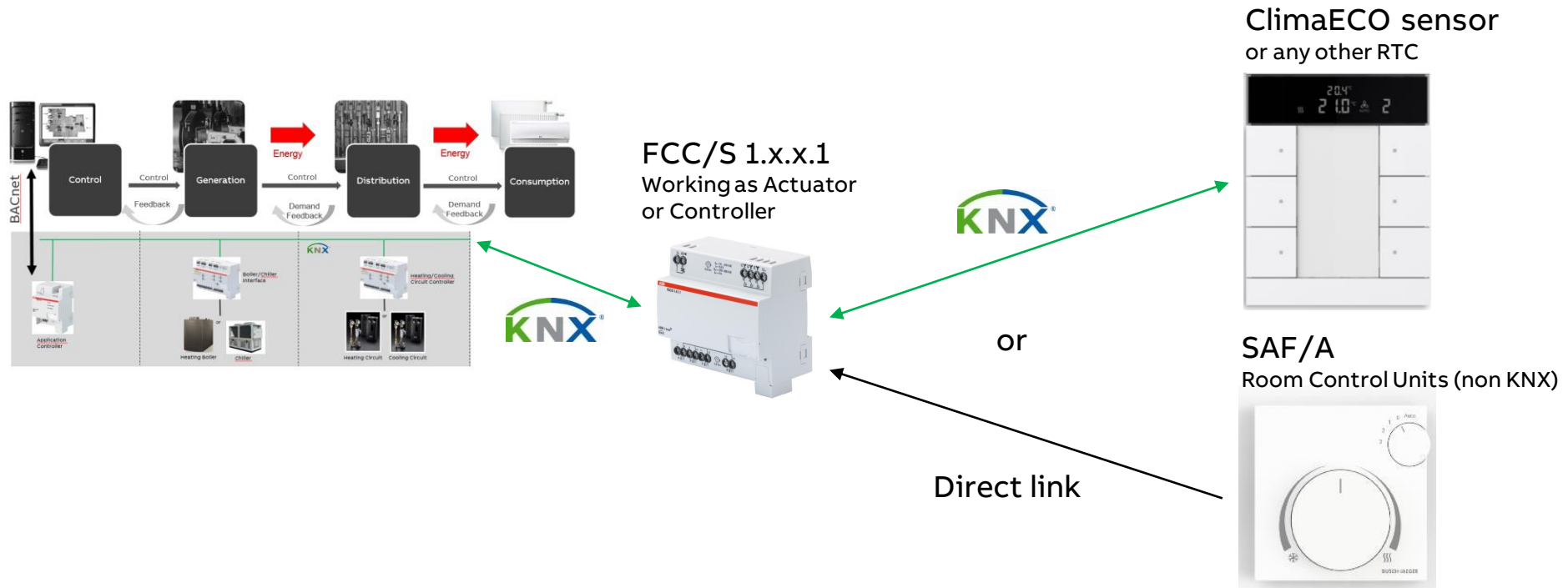
Assignment Controller - Actuator



Fan Coil Controller FCC/S 1.x.x.1

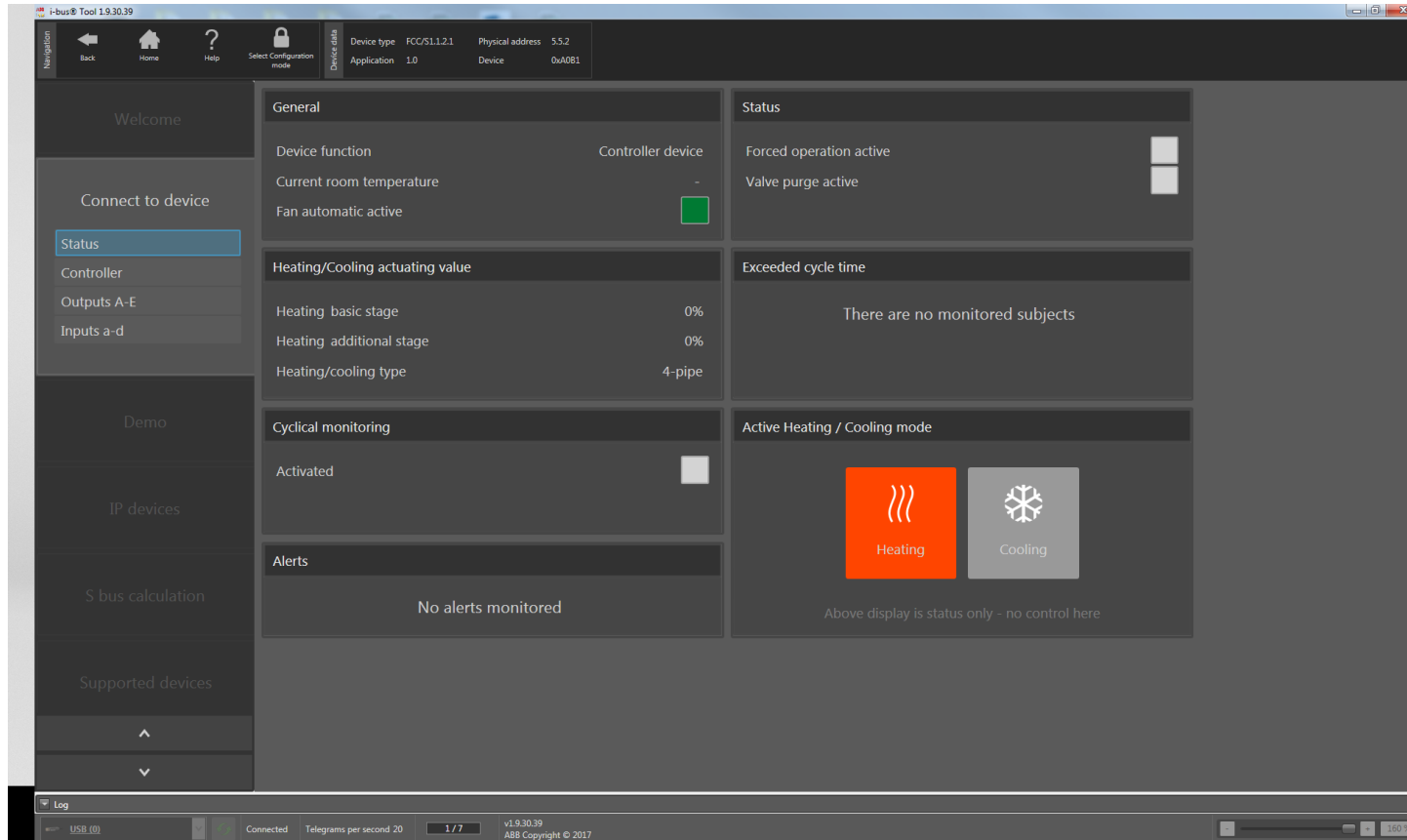
Application example

FCC/S integrated in ClimaECO



Fan Coil Controller FCC/S 1.x.x.1

ABB i-bus tool





Fan Coil Controller FCC/S 1.x.x.1

ABB i-bus tool

Temperature Current room temperature -	Set point temperature Set point temperature <input type="text" value="-"/> <input type="button" value="X"/> <input type="button" value="J"/> Value overwritten <input type="checkbox"/>
Active Heating / Cooling mode <div><div>Heating</div><div>Cooling</div></div> Above display is status only - no control here	Control values P-component <input type="text" value="4,0 °C"/> <input type="button" value="X"/> <input type="button" value="J"/> Value overwritten <input type="checkbox"/> I-component <input type="text" value="100,0 min"/> <input type="button" value="X"/> <input type="button" value="J"/> Value overwritten <input type="checkbox"/>
Current operating mode <div><div>Comfort</div><div>Standby</div><div>Economy</div><div>Protection</div></div> Value overwritten <input type="button" value="X"/> <input type="checkbox"/>	Heating/Cooling actuating value Heating basic stage 0% Heating additional stage 0% Heating/cooling type 4-pipe Parametrized set points Set point definition and adjustment Relative Comfort 21 °C Standby 2 K Economy 4 K

Fan Coil Controller FCC/S 1.x.x.1





ABB i-bus tool

Output A: Thermoelectric valve	Output B: Thermoelectric valve
Actuating value <input type="text" value="0 %"/>	Actuating value <input type="text" value="0 %"/>
Value overwritten <input type="checkbox"/>	Value overwritten <input type="checkbox"/>
Output is used for Heating 	Output is used for Cooling 
Forced operation active <input type="checkbox"/>	Forced operation active <input type="checkbox"/>
Valve purge active <input type="button" value="Purge"/>	Valve purge active <input type="button" value="Purge"/>
Fault (Green: no fault, Red: fault) <input type="button" value="Reset"/>	Fault (Green: no fault, Red: fault) <input type="button" value="Reset"/>

Output C..E: 3-stage fan	Output F
Fan type <input type="text" value="Changeover"/>	Relay <input type="button" value="Open"/> <input type="button" value="Close"/> <input type="button" value="X"/>
Fan stage <input type="button" value="0"/> <input type="button" value="1"/> <input type="button" value="2"/> <input type="button" value="3"/> <input type="button" value="X"/>	Value overwritten <input type="checkbox"/>
Value overwritten <input type="checkbox"/>	Relay is Normally opened
Enabled fan stages <input type="text" value="0,1,2,3"/>	
Limitation <input type="checkbox"/>	
Fault (Green: no fault, Red: fault) <input type="button" value="Reset"/>	
Fan speed <input type="text" value="0 %"/>	

Fan Coil Controller FCC/S 1.x.x.1

ABB i-bus tool

Input a: Window contact Status <input type="button" value="Open"/> <input type="button" value="Close"/> <input type="button" value="X"/> Opened  Value overwritten <input type="checkbox"/> Active when <input type="checkbox"/> Contact opened	Input b: Temperature PT1000 [-30...+110 °C] Fault (Green: no fault, Red: fault)
Input c: Switch sensor Status <input type="button" value="Open"/> <input type="button" value="Close"/> <input type="button" value="X"/> Opened   Value overwritten <input type="checkbox"/>	Input D  Disabled

Fan Coil Controller FCC/S 1.x.x.1

Fan Coil Controller FCC/S

Technical documents

www.abb.com/KNX

→ Product category

→ Heating, Ventilation, Air Conditioning

→ FCC/S

- Product Manual
- Technical datasheet
- Installation and operating instructions
- Specification Text
- ETS Application
- Application Note
- CE declaration of conformity
- . . .

ABB PRODUCT-DETAILS

Detailed information for: FCC/S1.1.1.1


This page contains technical data sheet, documents library and links to offering related to this product. If you require any other information, please contact us using form located at the bottom of the page. [Print...](#) [Print to Pdf...](#)

[Data Sheet](#) [Documentation](#)

FCC/S1.1.1.1

General Information

Extended Product Type:	FCC/S1.1.1.1
Product ID:	2CDG110210R0011
EAN:	4016779011426
Catalog Description:	FCC/S1.1.1.1 FanCoilCtrl,2xPWM,3st
Long Description:	For the control of fan coil units. Via two electronic outputs, two thermoelectric or one motor-driven valve drive can be controlled for heating and cooling. For the fan control the device features three relay outputs. A relay output switches an additional load of up to 16 A, such as



Downloads for Fan Coil Actuators

Available documents: [→ Advanced search](#) [→ Documents in all languages](#)

Show all (15)	Product manual (.PDF) [EN] FCC/S 1.x.x.1 Summary: No summary available English - 2018-06-29 - 8,48 MB PDF
Application note (2)	
CAD outline drawing (2)	
Data sheet (1)	
Declaration of conformity (1)	
Manual (1) >	
Movie (2)	
Operating instruction (1)	

Fan Coil Controller FCC/S 1.x.x.1

Which answer is correct?

Question 1

What is the purpose of a Fan Coil Controller FCC/S 1.x.x.1?

A Control of Fan Coil Units

B Control of 0-10V fans

C Control Split Units

Fan Coil Controller FCC/S 1.x.x.1

Which answer is correct?

Question 1

What is the purpose of a Fan Coil Controller FCC/S 1.x.x.1?

A Control of Fan Coil Units

B Control of 0-10V fans

C Control Split Units

Fan Coil Controller FCC/S 1.x.x.1

Which answer is correct?

Question 2

FCC/S family consists of 9 devices. What are the differences between the individual products you can get?

- A** Either actuator or controller
- B** Either digital or analogue outputs
- C** Either with or without manual operation

Fan Coil Controller FCC/S 1.x.x.1

Which answer is correct?

Question 2

FCC/S family consists of 9 devices. What are the differences between the individual products you can get?

A

Either actuator or controller

B

Either digital or analogue outputs

C

Either with or without manual operation

Fan Coil Controller FCC/S 1.x.x.1

Which answer is correct?

Question 3

What is true? FCC/S devices allow to control directly ...

A ... 6 way valves

B ... Air Handling Units

C ... Chiller

Fan Coil Controller FCC/S 1.x.x.1

Which answer is correct?

Question 3

What is true? FCC/S devices allow to control directly ...

A ... 6 way valves

B ... Air Handling Units

C ... Chiller

Fan Coil Controller FCC/S 1.x.x.1

Which answer is correct?

Question 4

FCC/S can control EC Motors via 0-10V. Why?

- A** For higher accuracy and efficiency
- B** Fan Coil Units with 3 step fan speed are not on the market anymore
- C** It is mandatory to use due to higher efficiency

Fan Coil Controller FCC/S 1.x.x.1

Which answer is correct?

Question 4

FCC/S can control EC Motors via 0-10V. Why?

- ☒ **A** For higher accuracy and efficiency
- ☐ **B** Fan Coil Units with 3 step fan speed are not on the market anymore
- ☐ **C** It is mandatory to use due to higher efficiency

Fan Coil Controller FCC/S 1.x.x.1

Which answer is correct?

Question 5

What is the right statement?

- A** It is not intended to combine any KNX room temperature controller with FCC/S
- B** The Room Control Unit is always necessary for FCC/S
- C** FCC/S needs only the ambient room temperature for room temperature control

Fan Coil Controller FCC/S 1.x.x.1

Which answer is correct?

Question 5

What is the right statement?

- ☐ A It is not intended to combine any KNX room temperature controller with FCC/S
- ☐ B The Room Control Unit is always necessary for FCC/S
- ☒ C FCC/S needs only the ambient room temperature for room temperature control

Fan Coil Controller FCC/S 1.x.x.1

Which answer is correct?

Question 6

How many channels for electrothermal valve drives exist at the relevant FCC/S?

A 1

B 2

C 4

Fan Coil Controller FCC/S 1.x.x.1

Which answer is correct?

Question 6

How many channels for electrothermal valve drives exist at the relevant FCC/S?

A 1

B 2

C 4

Fan Coil Controller FCC/S 1.x.x.1

Which answer is correct?

Question 7

How many channels for motor valve drives exist at the FCC/S with electronic output?

A 1

B 2

C 4

Fan Coil Controller FCC/S 1.x.x.1

Which answer is correct?

Question 7

How many channels for motor valve drives exist at the FCC/S with electronic output?

A 1

B 2

C 4

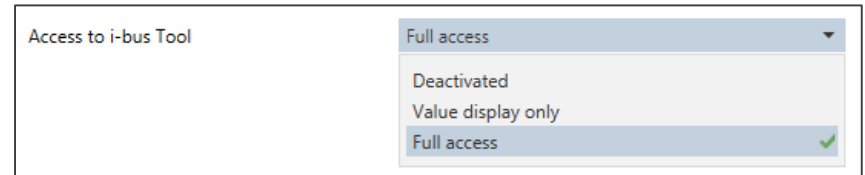
Fan Coil Controller FCC/S 1.x.x.1

ETS

Access i-bus tool

Three options to handle the i-bus tool access

- Deactivated:
 - No operation, no indication
- Display only:
 - No operation, full indication
- Full access:
 - Full operation and indication



Higher security and user friendliness

Fan Coil Controller FCC/S 1.x.x.1

ETS

Controller or Actuator

Device works either as actuator (like FCA/S) or room temperature controller plus actuator

- Part actuator always available
- Function controller:
 - Integrated unified RTC
 - For operation a RTC with display as slave can be used, e.g. ClimaECO sensor

Device function

☒ Controller ☐ Actuator device

The device is used with an internal controller that can control the fan coil unit and other heating/cooling systems in the same room.
KNX analog room control units in Slave mode can be used for operation.

New option and economical solution

Fan Coil Controller FCC/S 1.x.x.1

ETS

Heating and Cooling

Device function actuator

- Fan Coil Unit Control/simple valve control

Device function controller

- Various hardware for heating or cooling adjustable

For cooling Fan Coil Unit and cooling ceiling selectable

By selecting a type of hardware the appropriate way of control is defined (Parameter Temperature Controller/Heating or Cooling stage)

Free configuration preselects PI control, P- and I-value can be changed

Now covering all relevant types on the market

1.1.1 FCC/S1.3.2.1 Fan Coil Controller,0-10V,0-10V>manual operation,MDRC > Application > Application parameters

General	Device function <input type="radio"/> Controller <input checked="" type="radio"/> Actuator device
+ Manual operation	Device used purely as actuator. The device receives its control values from a controller (e.g. an analog room control unit).
- Application	Caution! A change to the parameterization in this section will result in an ETS reset after download
Application parameters	
Device function	Basic-stage heating <input type="radio"/> Deactivated <input checked="" type="radio"/> Fan coil unit
	Basic-stage cooling <input type="radio"/> Deactivated <input checked="" type="radio"/> Fan coil unit
+ Monitoring and safety	Type of heating/cooling system <input type="radio"/> 2-pipe <input checked="" type="radio"/> 4-pipe
	Heating/Cooling changeover Via object only

1.1.1 FCC/S1.3.2.1 Fan Coil Controller,0-10V,0-10V>manual operation,MDRC > Application > Application parameters

General	Device function <input checked="" type="radio"/> Controller <input type="radio"/> Actuator device
+ Manual operation	The device is used with an internal controller that can control the fan coil unit and other heating/cooling systems in the same room. KNX analog room control units in Slave mode can be used for operation.
- Application	Caution! A change to the parameterization in this section will result in an ETS reset after download
Application parameters	
Device function	Basic-stage heating Fan coil unit: Water heating coil
	Additional-stage heating Deactivated
+ Temperature controller	Basic-stage cooling Convector (e.g. radiator)
	Additional-stage cooling Area heating (e.g. floor)
+ Setpoint manager	Type of heating/cooling system Electric heater (in room)
+ Monitoring and safety	Free configuration
	Heating/Cooling changeover Fan coil unit: electric heater (in fan coil unit)
+ Valve A	Fan coil unit: Water heating coil
+ Valve B	Caution! A change to the parameterization in this section will result in an ETS reset after download
+ Fan output	Use 6-way valve <input checked="" type="radio"/> No <input type="radio"/> Yes
+ Relay output	Actuate basic-stage heating via Internal output A (valve)
	Actuate basic-stage cooling via <input checked="" type="radio"/> Internal output B (valve) <input type="radio"/> Group object

Fan Coil Controller FCC/S 1.x.x.1

ETS

Additional Heating- and Cooling stage

Additional stage for heating and cooling can be programmed individually

See unified RTC concept

Example: Cooling ceiling as basic cooling and Fan Coil Unit as additional stage for fast cooling

1.1.1 FCC/S1.3.2.1 Fan Coil Controller,0-10V,0-10V>manual operation,MDRC > Application > Application parameters

General	Device function <input checked="" type="radio"/> Controller <input type="radio"/> Actuator device
+ Manual operation	The device is used with an internal controller that can control the fan coil unit and other heating/cooling systems in the same room. KNX analog room control units in Slave mode can be used for operation.
- Application	Caution! A change to the parameterization in this section will result in an ETS reset after download
Application parameters	
Device function	Basic-stage heating Fan coil unit: Water heating coil
+ Temperature controller	Additional-stage heating Deactivated
+ Setpoint manager	Basic-stage cooling Fan coil unit: Water cooling coil
+ Monitoring and safety	Additional-stage cooling Deactivated
+ Valve A	Type of heating/cooling system Deactivated ✓
	Heating/Cooling changeover Area cooling (e.g. cooling ceiling)
	Free configuration
	Fan coil unit: Water cooling coil

Powerful heating/cooling control

Fan Coil Controller FCC/S 1.x.x.1

ETS

Temperature Controller

Depending on selection of heating/cooling hardware way of control is either fixed or dynamic

Example Heating: Fan Coil Unit with electrical heater → 2-point control with hysteresis

Example cooling: Free configuration → PI continuous with flexible P- and I component

Simplification of adjustment

1.1.1 FCC/S1.3.2.1 Fan Coil Controller,0-10V,0-10V>manual operation,MDRC > Temperature controller > Temperature controller

General	Basic-stage heating control value type	2-point 1-bit (On/Off)
+ Manual operation	Extended settings	<input type="radio"/> No <input checked="" type="radio"/> Yes
- Application	Hysteresis	0.5 K
Application parameters	Send control value cyclically (0 = cyclical sending disabled)	15 Min
Device function	Activate temperature limitation	<input checked="" type="radio"/> No <input type="radio"/> Yes
- Temperature controller		
- Temperature controller		
	Basic-stage heating	

1.1.1 FCC/S1.3.2.1 Fan Coil Controller,0-10V,0-10V>manual operation,MDRC > Temperature controller > Temperature controller

General	Basic-stage heating control value type	PI continuous (0...100%) for Fan Coil
+ Manual operation	P-proportion	4 K
- Application	I-proportion	100 Min
Application parameters	Extended settings	<input type="radio"/> No <input checked="" type="radio"/> Yes
Device function	Control value difference for sending control value	5 %
- Temperature controller	Send control value cyclically (0 = cyclical sending disabled)	15 Min
- Temperature controller	Max. control value	100 %
	Min. control value (basic load)	0 %
	Activate temperature limitation	<input checked="" type="radio"/> No <input type="radio"/> Yes
	Basic-stage heating	

Fan Coil Controller FCC/S 1.x.x.1

ETS

Temperature Controller

Room temperature for controller can be received from:

- From any device connected to analogue input of FCC/S, e.g. RCU SAF/A or connected PT1000
- Via group object: up to two values can be received with weighting
- Via group object and physical device: up to two values via telegram on group object plus one connected temperature sensor with weighting possible

Optimization of control

1.1.1 FCC/S1.3.2.1 Fan Coil Controller,0-10V,0-10V>manual operation,MDRC > Application > Application parameters

General	Device function <input checked="" type="radio"/> Controller <input type="radio"/> Actuator device
+ Manual operation	The device is used with an internal controller that can control the fan coil unit and other heating/cooling systems in the same room. KNX analog room control units in Slave mode can be used for operation.
- Application	
Application parameters	
Device function	Basic-stage heating Electric heater (in room)
- Temperature controller	Additional-stage heating Deactivated
- Temperature controller	Basic-stage cooling Deactivated
- Temperature controller	Caution! A change to the parameterization in this section will result in an ETS reset after download
+ Setpoint manager	Actuate basic-stage heating via <input type="radio"/> Internal relay output <input checked="" type="radio"/> Group object
+ Monitoring and safety	Window status input Deactivated
+ Valve A	Temperature input Note: Configure in 'Input' parameter window
+ Valve B	Via physical device input Via physical device input Via group object Via phys. device input and group object

Temperature input

Note: Configure in 'Input' parameter window

Number of temperature input objects ☐ 1 ☒ 2

Internal measurement weighting 50 %

Weighting of external measurement 1 20 %

Weighting of external measurement 2 30 %

Fan Coil Controller FCC/S 1.x.x.1

ETS

Setpoint Manager

One or two setpoint mode

- One setpoint: Setpoint heating and cooling are the same
 - Differentiation via hysteresis
- Two setpoints: Setpoint heating and cooling are different

All values can be either absolute or relative (based on setpoint heating comfort)

Covering all options also from the past

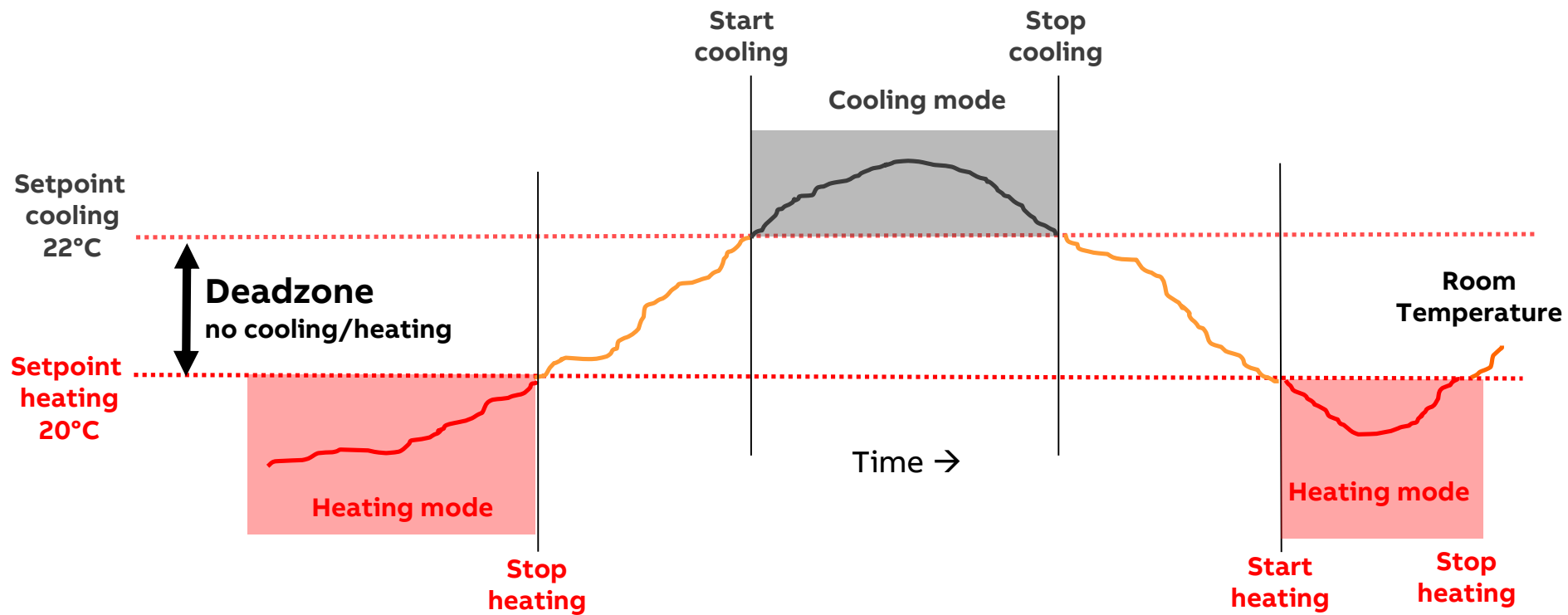
1.1.1 FCC/S1.3.2.1 Fan Coil Controller,0-10V,0-10V>manual operation,MDRC > Setpoint manager > Setpoint manager	
General	Operating modes Comfort, Standby, Economy, Building Protection
+ Manual operation	Operating mode after bus voltage recovery, ETS download and reset Comfort
- Application	Comfort heating setpoint = Comfort cooling setpoint <input type="radio"/> No <input checked="" type="radio"/> Yes
Application parameters	Setpoint specification and adjustment <input checked="" type="radio"/> Absolute <input type="radio"/> Relative
Device function	Hysteresis for Toggle heating/cooling 2 °C
- Temperature controller	Setpoint for Comfort heating and cooling 21 °C
- Temperature controller	Standby heating setpoint 19 °C
Basic-stage heating	Economy heating setpoint 17 °C
Basic-stage cooling	Standby cooling setpoint 27 °C
- Setpoint manager	Economy cooling setpoint 29 °C
Setpoint manager	Setpoint for frost protection (building protection, heating) 7 °C

1.1.1 FCC/S1.3.2.1 Fan Coil Controller,0-10V,0-10V>manual operation,MDRC > Setpoint manager > Setpoint manager	
General	Operating modes Comfort, Standby, Economy, Building Protection
+ Manual operation	Operating mode after bus voltage recovery, ETS download and reset Comfort
- Application	Comfort heating setpoint = Comfort cooling setpoint <input checked="" type="radio"/> No <input type="radio"/> Yes
Application parameters	Setpoint specification and adjustment <input type="radio"/> Absolute <input checked="" type="radio"/> Relative
Device function	Comfort heating setpoint 21 °C
- Temperature controller	Standby heating reduction 2 K
Basic-stage heating	Economy heating reduction 4 K
Basic-stage cooling	Comfort cooling setpoint 22 °C

Fan Coil Controller FCC/S 1.x.x.1

Room Temperature Controller

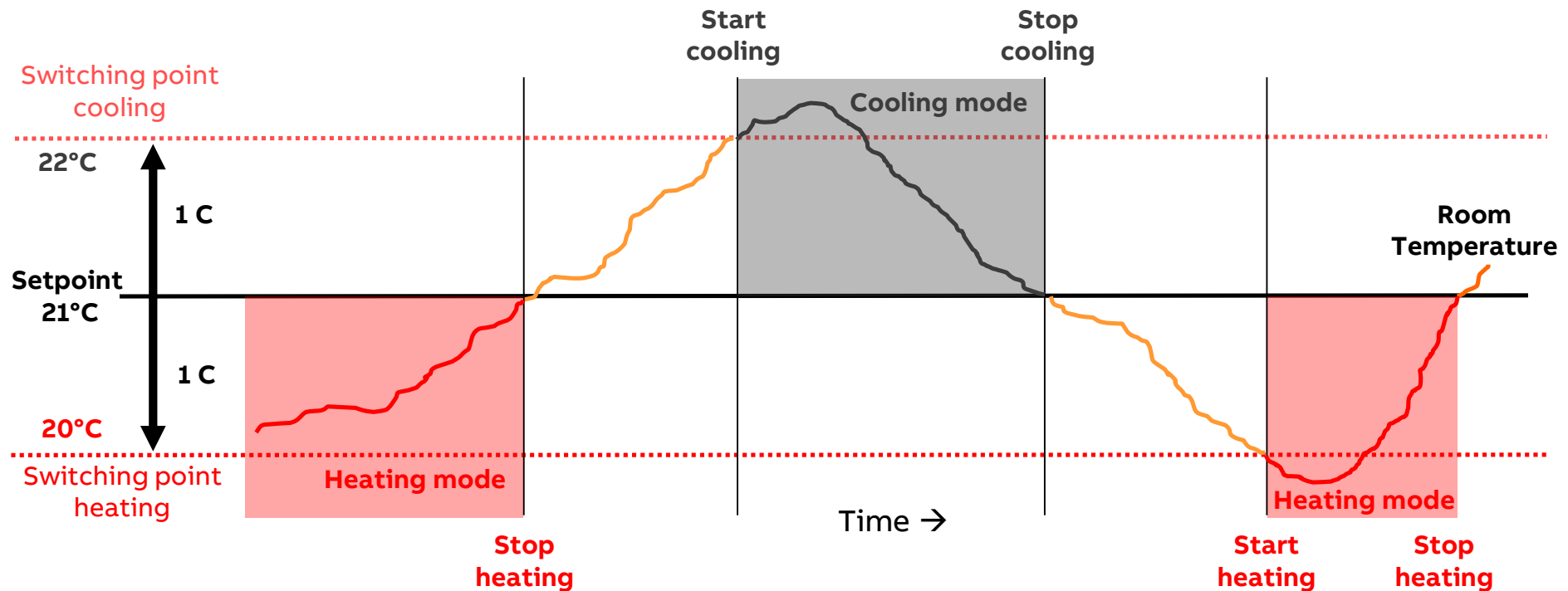
Two Setpoint Mode



Fan Coil Controller FCC/S 1.x.x.1

Room Temperature Controller

One Setpoint Mode



Fan Coil Controller FCC/S 1.x.x.1

ETS

Forced operation

1 bit or 2 bit telegram

Allows to set valve, fan and also relay in defined position, e.g. in case of fault or special situation

Application: Integration of electrical heater via relay output possible (see also slide electrical heater)

- Control value: 0%
- Fan output: Applies control value
- Relay output: On

Individual control

1.1.1 FCC/S1.3.2.1 Fan Coil Controller,0-10V,0-10V>manual operation,MDRC > Monitoring and safety > Monitoring and safety

General	Use forced operation	Forced operation 1-bit; 1 active
+ Manual operation	Control value	80 %
+ Application	Fan output	66 %
+ Temperature controller	Relay output	On
+ Setpoint manager		
- Monitoring and safety	Cyclical monitoring	<input checked="" type="radio"/> Deactivated <input type="radio"/> Activated

[Monitoring and safety](#)

Use forced operation	Forced operation 1 bit; 1 active
Control value	0 %
Fan output	Applies control value
Relay output	On

Fan Coil Controller FCC/S 1.x.x.1

ETS

Forced operation – 1 bit

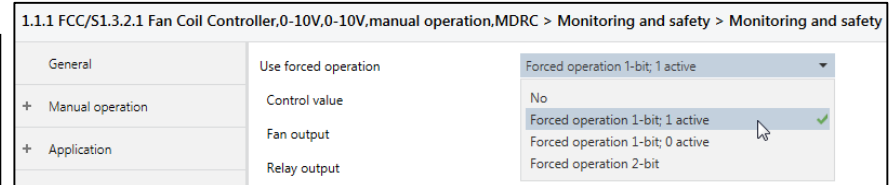
1 bit command (Forced ON) with value '1 or 0' allows to set defined status for valve, fan and relay

- No reaction on telegrams for the related group objects

Forced off allows to have another status for valve, fan and relay

- Telegrams on the related group objects take action

Individual control



Fan Coil Controller FCC/S 1.x.x.1

ETS

Forced operation – 2 bit

2 bit command allows to define 4 different situations, 3 are used here:

- Forced on (value '3'): defined status for valve, fan and relay
- Forced off (value '2'): another defined status for valve, fan and relay
- Release (value '0 or 1'): status for valve, fan and relay depending on telegrams on related group objects

Basically used with touch panel or visualization but not with push button

Individual control

1.1.1 FCC/S1.3.2.1 Fan Coil Controller,0-10V,0-10V>manual operation,MDRC > Monitoring and safety > Monitoring and safety

General	Use forced operation	Forced operation 2-bit
+ Manual operation	Control value for forced operation ON	0 %
+ Application	Fan output for forced operation ON	Unchanged
+ Temperature controller	Relay output for forced operation ON	Unchanged
+ Setpoint manager	Control value for forced operation OFF	0 %
- Monitoring and safety	Fan output for forced operation OFF	Unchanged
	Relay output for forced operation OFF	Unchanged
Monitoring and safety	Cyclical monitoring	<input checked="" type="radio"/> Deactivated <input type="radio"/> Activated

Fan Coil Controller FCC/S 1.x.x.1

ETS

Fan output – analogue output 0-10 V

0-10 V adjustable

Start-up behavior: Switch on at fan speed x % for defined time

Run-on behavior (after switching off) with time in s and fixed 20 % for fan switch off

Fan speed limitations with 3 individually adjustable limits and upper/lower limit (Hysteresis)

Individual control

5.5.3 FCC/S1.3.2.1 Fan Coil Controller, 0-10V, 0-10V, manual operation, MDRC > Fan output > Fan output (0-10V)

General	Fan control minimum output voltage (0% is always 0V)	0	V
+ Manual operation	Maximum output voltage fan control	10	V
+ Application	Enable start-up behavior (switch on from Off to On)	<input type="radio"/> No <input checked="" type="radio"/> Yes	
+ Temperature controller	Switch on at fan speed	30	%
+ Setpoint manager	Minimum holding time at switch-on speed	5	s
+ Monitoring and safety	Enable automatic mode based on control value	Yes	
+ Valve A	Return from manual fan adjustment to automatic mode	Automatic (time)	
+ Valve B	Reset time	01:00:00	h:mm:ss
- Fan output	Run-on behavior when switch-off enabled	<input type="radio"/> No <input checked="" type="radio"/> Yes	
Fan output (0-10V)	Run-on time at fan speed 20%	20	s
+ Relay output	Fan speed limitation	<input type="radio"/> Deactivated <input checked="" type="radio"/> Activated	
+ Setpoint adjustment	Limit 1 lower limit	0	%
+ Input a	Limit 1 upper limit	100	%
+ Input b	Limit 2 lower limit	0	%
+ Input c	Limit 2 upper limit	100	%
+ Input d	Limit 3 lower limit	0	%
	Limit 3 upper limit	100	%

Fan Coil Controller FCC/S 1.x.x.1

ETS

Fan output – digital relay outputs

Number of fan stages up to 3

Changeover/Step switch switch

Thresholds to change the speed with hysteresis

Minimum holding time

Start-up behavior

Run-on behavior

Fan speed limitations

Please note: Different from FCA/S not programmable as normal switch outputs

Individual control

5.5.2 FCC/S1.1.2.1 Fan Coil Controller, PWM, 3-speed, manual operation, MDRC > Fan output > Fan output

General	Number of fan speeds	3
+ Manual operation	Fan mode Important: Observe the technical data for the fan!	<input checked="" type="radio"/> Changeover <input type="radio"/> Step
+ Application	Delay between fan speed switchover	500 ms
+ Temperature controller	Enable automatic mode based on control value	Yes
- Setpoint manager	Threshold value speed 0 <-> 1	1 %
Setpoint manager	Threshold value speed 1 <-> 2	30 %
- Monitoring and safety	Threshold value speed 2 <-> 3	70 %
Monitoring and safety	Threshold values hysteresis	5 %
- Valve A	Minimum holding time at fan speed	5 s
Valve output A	Return from manual fan adjustment to automatic mode	Via group object
+ Valve B	Enable start-up behavior (switch on from Off to On)	<input type="radio"/> No <input checked="" type="radio"/> Yes
- Fan output	Switch on at fan speed	3
Fan output	Minimum holding time at switch-on speed	5 s
+ Relay output	Enable run-on behavior for fan speed reduction	<input type="radio"/> No <input checked="" type="radio"/> Yes
+ Setpoint adjustment	Run-on speed 1	20 s
+ Input a	Run-on speed 2	20 s
+ Input b	Run-on speed 3	20 s
	Fan speed limitation	<input checked="" type="radio"/> Deactivated <input type="radio"/> Activated

Fan Coil Controller FCC/S 1.x.x.1

ETS

Fan output – Changeover/Step switch

Depending on type of Fan Coil Unit to be selected

Changeover switch (default)




- Only the relay contact for the active level is closed
- Time between changeover adjustable




Step switch

- The relay contact for the active level plus lower level is closed

Please note: Step switch adjustment for motor with changeover switch results in short circuit and possible destruction

Individual control

Changeover			
Off	0	0	0
Fan speed 1	1	0	0
Fan speed 2	0	1	0
Fan speed 3	0	0	1

Step			
Off	0	0	0
Fan speed 1	1	0	0
Fan speed 2	1	1	0
Fan speed 3	1	1	1

Fan Coil Controller FCC/S 1.x.x.1

ETS

Fan speed limitation – digital outputs

3 limitations for fan with all options

Limitation 1 with highest priority

Works in automatic and direct mode

Individual control

5.5.2 FCC/S1.1.2.1 Fan Coil Controller, PWM, 3-speed, manual operation, MDRC > Fan output > Fan output

General	Fan mode Important: Observe the technical data for the fan! <input checked="" type="radio"/> Changeover <input type="radio"/> Step
+ Manual operation	Delay between fan speed switchover 500 ms
+ Application	Enable automatic mode based on control value Yes
+ Temperature controller	Threshold value speed 0 <-> 1 1 %
- Setpoint manager	Threshold value speed 1 <-> 2 30 %
Setpoint manager	Threshold value speed 2 <-> 3 70 %
- Monitoring and safety	Threshold values hysteresis 5 %
Monitoring and safety	Minimum holding time at fan speed 5 s
- Valve A	Return from manual fan adjustment to automatic mode Via group object
Valve output A	Enable start-up behavior (switch on from Off to On) <input type="radio"/> No <input checked="" type="radio"/> Yes
+ Valve B	Switch on at fan speed 3
- Fan output	Minimum holding time at switch-on speed 5 s
Fan output	Enable run-on behavior for fan speed reduction
+ Relay output	Run-on speed 1
+ Setpoint adjustment	Run-on speed 2
+ Input a	Run-on speed 3
+ Input b	Fan speed limitation
+ Input c	Limit 1
+ Input d	Limit 2
	Limit 3

Unchanged
Off
Off, 1
Off, 1, 2
Off, 1, 2, 3
1
1, 2
1, 2, 3
2
2, 3
3
Off, 1, 2, 3

Fan Coil Controller FCC/S 1.x.x.1

ETS

Start-up and run-on behavior – dig. out.

Start-up: Fan level the fan coil unit starts with

- Level 1,2 or 3
- Minimum holding time (Duration)

Run-on: Time the fan stays in the current level though a lower level is required

- New: Individual time for each level



Individual control

5.5.2 FCC/S1.1.2.1 Fan Coil Controller, PWM, 3-speed, manual operation, MDRC > Fan output > Fan output

General	Fan mode Important: Observe the technical data for the <input checked="" type="radio"/> Changeover <input type="radio"/> Step fan!
+ Manual operation	Delay between fan speed switchover 500 ms
+ Application	Enable automatic mode based on control value <input checked="" type="radio"/> Yes
+ Temperature controller	Threshold value speed 0 <-> 1 1 %
- Setpoint manager	Threshold value speed 1 <-> 2 30 %
Setpoint manager	Threshold value speed 2 <-> 3 70 %
- Monitoring and safety	Threshold values hysteresis 5 %
Monitoring and safety	Minimum holding time at fan speed 5 s
- Valve A	Return from manual fan adjustment to automatic mode Via group object
Valve output A	Enable start-up behavior (switch on from Off to On) <input type="radio"/> No <input checked="" type="radio"/> Yes
+ Valve B	Switch on at fan speed 3
- Fan output	Minimum holding time at switch-on speed 5 s
Fan output	Enable run-on behavior for fan speed reduction <input type="radio"/> No <input checked="" type="radio"/> Yes
+ Relay output	Run-on speed 1 60 s
+ Setpoint adjustment	Run-on speed 2 30 s
	Run-on speed 3 20 s

Fan Coil Controller FCC/S 1.x.x.1

ETS

Valve – electronic outputs

Two electronic outputs, choice between:

- Thermoelectric (PWM), per valve one output needed
- Motor driven (3-point), per valve two outputs needed
- Open/Close signal (2 step control), per valve one output needed

Manual override with 1 byte object possible

Valve purge with cycle time and adjustable control value to reset

Depending on selection individual parameters

Covering the valves from the market

5.5.2 FCC/S1.1.2.1 Fan Coil Controller, PWM, 3-speed, manual operation, MDRC > Valve A > Valve output A

General	Valve output	Open/Close signal
+ Manual operation	Valve drive operating principle, de-energized	Thermoelectric (PWM)
+ Application	Open if control value greater than or equal to	Motor-driven (3-point)
+ Temperature controller	Valve drive opening/closing time	Open/Close signal
+ Setpoint manager		Deactivated
+ Monitoring and safety		
- Valve A		
Valve output A		
+ Valve B		
+ Fan output		
+ Relay output		

Valve drive opening/closing time: 60 s

Send status values: After a change or on request

Enable manual valve override: ☒ No ☐ Yes

Valve purge: Automatic or triggered by object

Purge cycle in weeks: 4

Reset purge cycle from control value greater than or equal to: 99 %

Send group object "Status Valve purge": No, update only

Fan Coil Controller FCC/S 1.x.x.1

ETS

Valve – 0-10 V output

Two 0-10V outputs

- Voltage range control value adjustable (0-10V, 1-10V, 2-10V, 10-0V)

Manual override with 1 byte object possible

Valve purge with cycle time and adjustable control value to reset

5.5.3 FCC/S1.3.2.1 Fan Coil Controller, 0-10V, 0-10V, manual operation, MDRC > Valve A > Valve output A (0-10V)

General	Valve output	Activated
+ Manual operation	Voltage range valve control value	0 - 10 V
+ Application	Valve drive opening/closing time	0 - 10 V
+ Temperature controller	Send status values	1 - 10 V
+ Setpoint manager	Enable manual valve override	<input type="radio"/> No <input checked="" type="radio"/> Yes
+ Monitoring and safety	Valve purge	Automatic or triggered by object
- Valve A	Purge cycle in weeks	4
Valve output A (0-10V)	Reset purge cycle from control value greater than or equal to	99 %

Covering the valves from the market

Fan Coil Controller FCC/S 1.x.x.1

ETS

VAV output

Devices with 0-10 Valve output can be parametrized to control VAV (Variable Air Volume) with the valve output

NEW

It is in principle a flap in an air duct to control the amount of air in a room

Control values: 0-10V, 1-10V, 2-10V and 10-0V

Please note: Further logic needed for implementation of the solution available in Application Controller AC/S or in Building Automation Controller BAC/S

New option for solutions with VAV

1.1.1 FCC/S1.3.2.1 Fan Coil Controller,0-10V,0-10V,manual operation,MDRC > Valve A > Valve output A (0-10V)

General	Valve output	Use as VAV damper output
+ Manual operation	Voltage range VAV damper control value	0 - 10 V
+ Application	Reaction on bus voltage recovery and ETS download	<input type="radio"/> Unchanged <input checked="" type="radio"/> Select
+ Temperature controller	Control value	40 %
+ Setpoint manager	Send status values	After a change or on request
+ Monitoring and safety		
- Valve A		

Valve output A (0-10V)

Channel - Valve A	Status Control value A	1 byte
Channel - Valve A	Control value VAV damper control A	1 byte

Fan Coil Controller FCC/S 1.x.x.1

ETS

Electrical Heater

Allows to link an electrical heater via relay output of FCC/S

- Parameter ‘Switching of the relay independent of the fan stage’ = **no** avoids running electrical heater without active fan (Risk of overheating and fire)
- If **yes**, the group object switch relay appears
- If **no**, relay is only on in case of running fan and only status object visible

Safe operation with electrical heater

5.5.2 FCC/S1.1.2.1 Fan Coil Controller, PWM, 3-speed, manual operation, MDRC > Application > Application parameters

General	Device function <input checked="" type="radio"/> Controller <input type="radio"/> Actuator device
+ Manual operation	The device is used with an internal controller that can control the fan coil unit and other heating/cooling systems in the same room. KNX room devices in Slave mode can be used for operation.
- Application	Basic heating stage Fan coil unit: electric heater (in fan coil unit)
Application parameters	Additional heating stage Deactivated
Device function	Basic cooling stage Deactivated
+ Temperature controller	Actuate basic heating stage via <input checked="" type="radio"/> Internal relay output <input type="radio"/> Group object
+ Setpoint manager	Switch relay output independently of fan speed (including when fan = 0) <input type="radio"/> No <input checked="" type="radio"/> Yes

Channel - Relay	Status Relay	1 bit
Channel - Relay	Switch Relay	1 bit

Fan Coil Controller FCC/S 1.x.x.1

ETS

Temperature limitation

Allows to limit e.g. the temperature of a floor (in case of floor heating) to protect the material and the improve the comfort

NEW

- Temperature sensor to be connected via internal inputs or by telegram

5.5.2 FCC/S1.1.2.1 Fan Coil Controller, PWM, 3-speed, manual operation, MDRC > Temperature controller > Temperature limitation

General	Basic heating stage control value type	2-point 1-bit (On/Off)
+ Manual operation	Extended settings	<input type="radio"/> No <input checked="" type="radio"/> Yes
– Application	Hysteresis	0.5 K
Application parameters	Send control value cyclically (0 = cyclical sending disabled)	15 Min
Device function	Activate temperature limitation	<input type="radio"/> No <input checked="" type="radio"/> Yes
– Temperature controller	Limit temperature	30 °C
– Temperature controller	Limit temperature hysteresis	1 K
Basic heating stage	Input for temperature limit sensor	Via physical device input a
+ Setpoint manager	Note: Configure in 'Input a' parameter window	Via group object
+ Monitoring and safety		Via physical device input a ✓
		Via physical device input b
		Via physical device input c
		Via physical device input d

Safe and comfortable heating system

Fan Coil Controller FCC/S 1.x.x.1

ETS

Relay output

Simple switch actuator output
Normally open or closed contact
Status

1.1.2 FCC/S1.1.2.1 Fan Coil Controller,PWM,3-speed>manual operation,MDRC > Relay output > Relay output

General	Output is	<input type="radio"/> Deactivated <input checked="" type="radio"/> Activated
+ Manual operation	Output reaction	<input type="radio"/> Normally closed <input checked="" type="radio"/> Normally open
+ Application	Object value Status Relay	<input checked="" type="radio"/> 1 = closed; 0 = open <input type="radio"/> 0 = closed; 1 = open
+ Temperature controller	Send status values	After a change or request ▼
+ Setpoint manager		
+ Monitoring and safety		
+ Valve A		
+ Valve B		
+ Fan output		
- Relay output		

Relay output

Fan Coil Controller FCC/S 1.x.x.1

ETS

4 inputs with various functions

All useful options

- Window contact
- Dew point sensor: Monitoring dew point
- Fill Level sensor: Monitor condensed water tray
- Temperature sensor: e.g. for temperature limitation or room temperature from RCU
- Binary signal input: classical functions
 - On/off/toggle
 - Long/short operation
 - Internal connection with relay output
 - Enable/disable
 - Blocking

Input

Deactivated

Deactivated

Window contact

Dew point sensor

Fill level sensor

Temperature sensor

Binary signal input

1.1.2 FCC/S1.1.2.1 Fan Coil Controller,PWM,3-speed>manual operation,MDRC > Input a > Input a

General	Input	Binary signal input
+ Manual operation	Maximum dead time: 200 ms	
+ Application	Distinction between long and short operation	<input type="radio"/> No <input checked="" type="radio"/> Yes
+ Temperature controller	Short operation: Event 0 Long operation: event 1	
+ Setpoint manager	Input on operation	<input type="radio"/> Contact open <input checked="" type="radio"/> Contact closed
+ Monitoring and safety	Long operation after	1 s
+ Valve A	1-bit group object "Disable input a"	<input type="radio"/> No <input checked="" type="radio"/> Yes
+ Valve B	Reaction on event 0	Off
+ Fan output	Reaction on event 1	On
+ Relay output	Internal connection	<input type="radio"/> No <input checked="" type="radio"/> Relay output
+ Setpoint adjustment	Send status value	<input checked="" type="radio"/> On change <input type="radio"/> On change and cyclically
- Input a	Scan input after download, ETS reset and bus voltage recovery	<input type="radio"/> No <input checked="" type="radio"/> Yes

Input a

Fan Coil Controller FCC/S 1.x.x.1

ETS

Changing Set Values

Set point adjustment via Room Control Unit (RCU)

- Limits to increase/decrease setpoint

Setpoint of RCU automatically linked to input a

5.5.2 FCC/S1.1.2.1 Fan Coil Controller, PWM, 3-speed, manual operation, MDRC > Setpoint adjustment > Setpoint adjustment

General	Connect analog room controller to physical device input a <input type="radio"/> No <input checked="" type="radio"/> Yes
+ Manual operation	
+ Application	Max. setpoint increase <input type="text" value="3"/> K
+ Temperature controller	Maximum setpoint reduction <input type="text" value="3"/> K
+ Setpoint manager	Note: For the temperature sensor used in the room controller, please parametrize the input (b-d) as follows: Temperature sensor -> NTC -> NTC 10-02
+ Monitoring and safety	The setpoint output of the analog room controller (terminal a) must be connected to device input a.
+ Valve A	
+ Valve B	
+ Fan output	
+ Relay output	
- Setpoint adjustment	

Setpoint adjustment

1.1.2 FCC/S1.1.2.1 Fan Coil Controller, PWM, 3-speed, manual operation, MDRC > Input a > Input a

General	Caution: Use the 'Setpoint adjustment' window when deactivating the analog room control unit
+ Manual operation	Input <input type="text" value="Analog room control unit"/>
	Send status value <input checked="" type="radio"/> On change <input type="radio"/> On change and cyclically

Fan Coil Controller FCC/S 1.x.x.1

ETS

Changing Set Values

Setpoint adjustment via KNX

- Limits to increase/decrease setpoint
- Options to reset manual adjustment
- Different data points for setpoint and manual fan adjustment

5.5.2 FCC/S1.1.2.1 Fan Coil Controller, PWM, 3-speed, manual operation, MDRC > Setpoint adjustment > Setpoint adjustment

General	Connect analog room controller to physical device input a <input checked="" type="radio"/> No <input type="radio"/> Yes
+ Manual operation	
+ Application	Max. manual increase in heating mode via KNX <input type="text" value="3"/> K
+ Temperature controller	Max. manual decrease in heating mode via KNX <input type="text" value="3"/> K
+ Setpoint manager	Max. manual increase in cooling mode via KNX <input type="text" value="3"/> K
+ Monitoring and safety	Max. manual decrease in cooling mode via KNX <input type="text" value="3"/> K
+ Valve A	Manual setpoint adjustment via KNX with <input type="text" value="DPT 6.010 (meter pulses)"/>
+ Valve B	
+ Fan output	Manual fan adjustment via KNX with <input checked="" type="radio"/> DPT 5.001 (percentage value) <input type="radio"/> DPT 5.010 (meter pulses)
+ Relay output	Caution: This type of fan adjustment only works with ABB devices that support the new master/slave concept
– Setpoint adjustment	Reset manual adjustment via KNX when base setpoint received <input type="radio"/> No <input checked="" type="radio"/> Yes
– Setpoint adjustment	Reset manual adjustment via KNX when operating mode changes <input type="radio"/> No <input checked="" type="radio"/> Yes
– Input a	Reset manual adjustment via KNX using group object <input type="radio"/> No <input checked="" type="radio"/> Yes
– Input a	
+ Input b	Slave display indicates <input checked="" type="radio"/> Absolute <input type="radio"/> Relative

Fan Coil Controller FCC/S 1.x.x.1

ETS

Changing Set Values

Setpoint adjustment via KNX (Datapoints)

– Three options:

- *DPT 6.010 (meter pulses)*: This is the only viable option if you are using legacy ABB devices
 - *DPT 9.001 (Absolute temperature value)*: This adjusts the setpoint as an absolute temperature
 - *DPT 9.002 (relative temperature value)*: This adjusts the setpoint as a relative temperature
- DPT 9.001 or 9.002 are only supported by the latest version of RTC Master/Slave concept (ClimaECO sensors), others have to use DPT 6.010

5.5.2 FCC/S1.1.2.1 Fan Coil Controller, PWM, 3-speed, manual operation, MDRC > Setpoint adjustment > Setpoint adjustment

General	Connect analog room controller to physical device input a <input checked="" type="radio"/> No <input type="radio"/> Yes
+ Manual operation	
+ Application	Max. manual increase in heating mode via KNX <input type="text" value="3"/> K
+ Temperature controller	Max. manual decrease in heating mode via KNX <input type="text" value="3"/> K
+ Setpoint manager	Max. manual increase in cooling mode via KNX <input type="text" value="3"/> K
+ Monitoring and safety	Max. manual decrease in cooling mode via KNX <input type="text" value="3"/> K
+ Valve A	Manual setpoint adjustment via KNX with DPT 6.010 (meter pulses)
+ Valve B	
+ Fan output	Manual fan adjustment via KNX with <input checked="" type="radio"/> DPT 5.001 (percentage value) <input type="radio"/> DPT 5.010 (meter pulses)
+ Relay output	Caution: This type of fan adjustment only works with ABB devices that support the new master/slave concept
– Setpoint adjustment	Reset manual adjustment via KNX when base setpoint received <input type="radio"/> No <input checked="" type="radio"/> Yes
Setpoint adjustment	Reset manual adjustment via KNX when operating mode changes <input type="radio"/> No <input checked="" type="radio"/> Yes
– Input a	Reset manual adjustment via KNX using group object <input type="radio"/> No <input checked="" type="radio"/> Yes
Input a	
+ Input b	Slave display indicates <input checked="" type="radio"/> Absolute <input type="radio"/> Relative

Fan Coil Controller FCC/S 1.x.x.1

ETS

Changing Set Values

Fan adjustment via KNX (Datapoints)

- Two options:
 - *DPT 5.010 (meter pulses)*: This option sends the fan adjustment as a proprietary value
 - *DPT 5.001 (percentage value)*: sends the fan adjustment as a 0...100% value
- DPT 5.001 is only supported by the latest version of RTC Master/Slave concept (ClimaECO sensors), others have to use DPT 5.010

5.5.2 FCC/S1.1.2.1 Fan Coil Controller, PWM, 3-speed, manual operation, MDRC > Setpoint adjustment > Setpoint adjustment

General	Connect analog room controller to physical device input a <input checked="" type="radio"/> No <input type="radio"/> Yes
+ Manual operation	
+ Application	Max. manual increase in heating mode via KNX <input type="text" value="3"/> K
+ Temperature controller	Max. manual decrease in heating mode via KNX <input type="text" value="3"/> K
+ Setpoint manager	Max. manual increase in cooling mode via KNX <input type="text" value="3"/> K
+ Monitoring and safety	Max. manual decrease in cooling mode via KNX <input type="text" value="3"/> K
+ Valve A	Manual setpoint adjustment via KNX with <input type="text" value="DPT 6.010 (meter pulses)"/>
+ Valve B	
+ Fan output	Manual fan adjustment via KNX with <input checked="" type="radio"/> DPT 5.001 (percentage value) <input type="radio"/> DPT 5.010 (meter pulses)
+ Relay output	Caution: This type of fan adjustment only works with ABB devices that support the new master/slave concept
– Setpoint adjustment	Reset manual adjustment via KNX when base setpoint received <input type="radio"/> No <input checked="" type="radio"/> Yes
– Setpoint adjustment	Reset manual adjustment via KNX when operating mode changes <input type="radio"/> No <input checked="" type="radio"/> Yes
– Input a	Reset manual adjustment via KNX using group object <input type="radio"/> No <input checked="" type="radio"/> Yes
– Input a	
+ Input b	Slave display indicates <input checked="" type="radio"/> Absolute <input type="radio"/> Relative

Fan Coil Controller FCC/S 1.x.x.1

ETS

Manual operation fan

Three options

- 1 bit up (value 1) and down (value 0)
- Three objects for direct fan speed recall
- 1 byte object with value 0,1,2,3 for the speeds
- Please note: Manual operation fan deactivates automatic mode
 - Automatic mode to be activated via group object 'Activate/deactivate fan automation' or via parameter Reset time

All options for all kind of control

Fan output	Return from manual fan adjustment to automatic mode	Via group object
+ Relay output	Enable start-up behavior (switch on from Off to On)	<input checked="" type="radio"/> No <input type="radio"/> Yes
+ Setpoint adjustment	Enable run-on behavior for fan speed reduction	<input checked="" type="radio"/> No <input type="radio"/> Yes
- Input a	Fan speed limitation	<input checked="" type="radio"/> Deactivated <input type="radio"/> Activated
Input a	Switch fan speed via 1-bit objects	Deactivated
+ Input b	Send status values	Deactivated
+ Input c		Switch to active fan speed only using "0" ✓
		Switch off to any 1-bit fan speed using "0"

Channel - Fan	Activate/deactivate fan automation	1 bit
Channel - Fan	Switch speed 1	1 bit
Channel - Fan	Switch speed 2	1 bit
Channel - Fan	Switch speed 3	1 bit
Channel - Fan	Switch fan speed	1 byte
Channel - Fan	Increase/decrease fan speed	1 bit

Fan output	Return from manual fan adjustment to automatic mode	Automatic (time)
+ Relay output	Reset time	01:00:00 hh:mm:ss

Fan Coil Controller FCC/S 1.x.x.1

ETS

6-way valve

Condition for 6-way valve:

- 4-pipe system and water based heating and cooling
- FCC/S with 0-10V valve output

Output A is automatically assigned

In the parameter of valve output A voltage areas for heating/cooling adjustable

Please note: 6-way valve can only be used for controlling the basic heating/cooling stage

Covering the market requirement of 6-way valves

1.1.1 FCC/S1.3.2.1 Fan Coil Controller,0-10V,0-10V,manual operation,MDRC > Application > Application parameters

General	Device function	<input checked="" type="radio"/> Controller <input type="radio"/> Actuator device
+ Manual operation	The device is used with an internal controller that can control the fan coil unit and other heating/cooling systems in the same room. KNX analog room control units in Slave mode can be used for operation.	
- Application	Caution! A change to the parameterization in this section will result in an ETS reset after download	
Application parameters		
Device function	Basic-stage heating	Fan coil unit: Water heating coil
+ Temperature controller	Additional-stage heating	Deactivated
+ Setpoint manager	Basic-stage cooling	Fan coil unit: Water cooling coil
+ Monitoring and safety	Additional-stage cooling	Deactivated
- Valve A	Type of heating/cooling system	<input type="radio"/> 2-pipe <input checked="" type="radio"/> 4-pipe
Valve output A (0-10V)	Heating/Cooling changeover	Automatically
Caution! A change to the parameterization in this section will result in an ETS reset after download		
Use 6-way valve <input type="radio"/> No <input checked="" type="radio"/> Yes		

1.1.1 FCC/S1.3.2.1 Fan Coil Controller,0-10V,0-10V,manual operation,MDRC > Valve A > Valve output A (0-10V)

General	Valve output	Activated
+ Manual operation	Voltage range for cooling	
+ Application	Voltage for maximum cooling	2 V
+ Temperature controller	Voltage for minimum cooling/cooling valve closed	5 V
+ Setpoint manager	Voltage range for heating	
+ Monitoring and safety	Voltage for minimum heating/heating valve closed	7 V
- Valve A	Voltage for maximum heating	10 V
Valve output A (0-10V)	Valve drive opening/closing time	10 s
Send status values		After a change or on request

Fan Coil Controller FCC/S 1.x.x.1

Which answer is correct?

Question 8

What can be done with ABB i-bus Tool together with FCC/S?

- A** Change parameter parametrized in the ETS application
- B** Overwrite values for valve position and fan speed
- C** Change parameter of integrated controller

Fan Coil Controller FCC/S 1.x.x.1

Which answer is correct?

Question 8

What can be done with ABB i-bus Tool together with FCC/S?

- ☐ A Change parameter parametrized in the ETS application
- ☒ B Overwrite values for valve position and fan speed
- ☐ C Change parameter of integrated controller

Fan Coil Controller FCC/S 1.x.x.1

Which answer is correct?

Question 9

The integrated temperature controller of FCC/S has ...

- A** Basic and additional heating/cooling stage
- B** Various control value types and freely programmable PI-Controller
- C** One or two setpoint mode

Fan Coil Controller FCC/S 1.x.x.1

Which answer is correct?

Question 9

The integrated temperature controller of FCC/S has ...

- A** Basic and additional heating/cooling stage
- B** Various control value types and freely programmable PI-Controller
- C** One or two setpoint mode

Fan Coil Controller FCC/S 1.x.x.1

Which answer is correct?

Question 10

Start-up behavior means ...

- A** To affect valve position and fan speed during start-up
- B** To delay the reaction of the Fan Coil Unit after receiving a control value
- C** To run the fan for a certain time on a defined level

Fan Coil Controller FCC/S 1.x.x.1

Which answer is correct?

Question 10

Start-up behavior means ...

- ☐ A To affect valve position and fan speed during start-up
- ☐ B To delay the reaction of the Fan Coil Unit after receiving a control value
- ☒ C To run the fan for a certain time on a defined level

Fan Coil Controller FCC/S 1.x.x.1

Which answer is correct?

Question 11

Run-on behavior means ...

- A** Time the fan stays in the current level though a lower level is required
- B** Time the fan stays in the current level though a higher level is required
- C** Time for a 0-10V controlled fan to run on 20% level in case of switching off the fan

Fan Coil Controller FCC/S 1.x.x.1

Which answer is correct?

Question 11

Run-on behavior means ...

- ☒ **A** Time the fan stays in the current level though a lower level is required
- ☐ **B** Time the fan stays in the current level though a higher level is required
- ☒ **C** Time for a 0-10V controlled fan to run on 20% level in case of switching off the fan

Fan Coil Controller FCC/S 1.x.x.1

Which answer is correct?

Question 12

Inputs of FCC/S are made for ...

- A** ... connecting analogue or binary signals
- B** ... connecting Room Control Unit SAF/A
- C** ... connecting the fan

Fan Coil Controller FCC/S 1.x.x.1

Which answer is correct?

Question 12

Inputs of FCC/S are made for ...

A ... connecting analogue or binary signals

B ... connecting Room Control Unit SAF/A

C ... connecting the fan

Disclaimer

The information in this document is subject to change without notice and should not be construed as a commitment by ABB. ABB assumes no responsibility for any errors that may appear in this document.

In no event shall ABB be liable for direct, indirect, special, incidental or consequential damages of any nature or kind arising from the use of this document, nor shall ABB be liable for incidental or consequential damages arising from use of any software or hardware described in this document.

© Copyright [2019] ABB. All rights reserved.

—

ABB