ABB i-bus® KNX
HCC/S 2.2.2.1
Heating/cooling circuit controller

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Device description

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

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

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

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

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Device functions

The following functions for each channel are available for activating heating/cooling circuits:
- Controller channel
- Actuator channel

The two device channels are independent of each other. It is possible to control two different rooms. As an alternative, it is also possible to activate a double pump by combining both channels (channel bundling).

Controller channel

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

Actuator channel

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

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Connections

The devices possess the following connections:
- 10 inputs for sensors
- 2 valve outputs for activating analog and motor-driven valve drives
- 2 pump outputs
- 1 bus connection

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

Valve outputs

	HCC/S 2.1.X.1	HCC/S 2.2.X.1
Analog valve drives (0 … 10 V)	2	
Motor-driven valve drives (3-point)		2

Pump outputs

	HCC/S 2.1.X.1	HCC/S 2.2.X.1
Pumps, 1-phase	2	2
Double pump, 1-phase	1	1

Physical inputs

	HCC/S 2.1.X.1	HCC/S 2.2.X.1
Binary sensors (floating)	6	6
Temperature sensors	4	4

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Inputs

Function	a	b	c	d	e	f	g	h	i	j
Temperature sensor										
PT100	x	x				x	x			
PT1000	x	x				x	x			
KT/KTY	x	x				x	x			
KT/KTY user-defined	x	x				x	x			
NTC10k	x	x				x	x			
NTC20k	x	x				x	x			
NI-1000	x	x				x	x			
Binary sensor (floating)			x	x	x			x	x	x
Pump status (floating contact)			x					x		
Pump fault (floating contact)				x					x	
Pump repair switch (floating contact)					x					x

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Outputs

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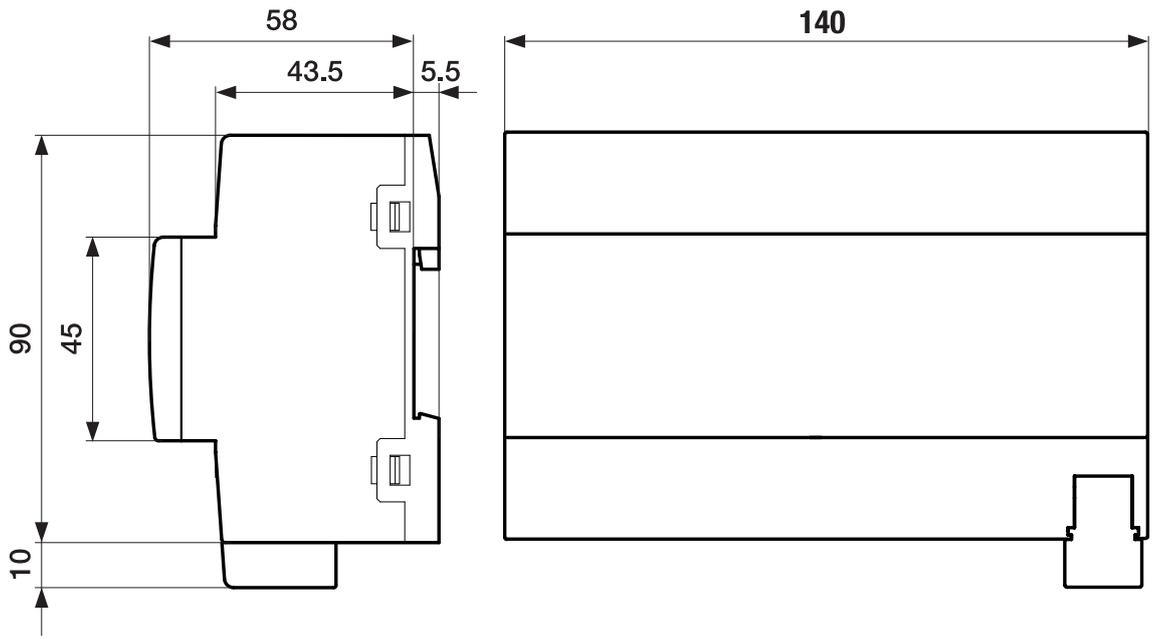## Valve outputs

HCC/S 2.2.X.1

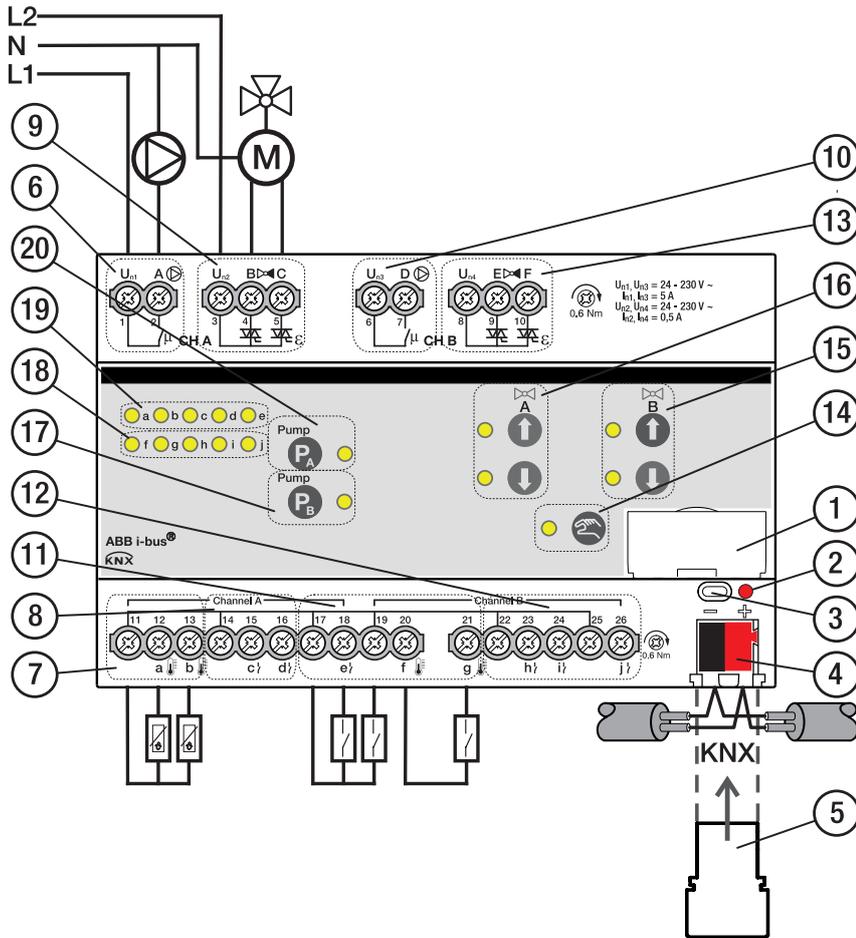| Function	A	B
Motor-driven valve drive (3-point)	open	close
Fault detection (overload/short circuit)	x	x
Automatic closing if pump shut down	x	x

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Pump outputs

Function		A	B
Individual pump			
	Automatic operation	x	x
	Direct operation	x	x
	Automatic switch off on fault	x	x
Double pump			
	Automatic operation	x	
	Direct operation	x	
	Automatic switch off on fault	x	
	Automatic weekly change	x	
	Automatic change on fault	x	

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Dimension drawing

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Connection diagram

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Legend

1	Label carriers	**13**	Valve output channel B
2	*Programming* LED	**14**	*Manual operation* button/LED
3	*Programming* button	**15**	*Valve output open/close channel B* button/LED
4	Bus connection terminal		
5	Cover cap	**16**	*Valve output open/close channel A* button/LED
6	Pump output channel A		
7	Temperature input channel A	**17**	*Pump output open/close channel B* button/LED
8	Binary input channel A		
9	Valve output channel A	**18**	*Input channel B* LED
10	Pump output channel B	**19**	*Input channel A* LED
11	Temperature input channel B	**20**	*Pump output open/close channel A* button/LED
12	Binary input channel B		

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Operating and display elements

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

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Manual mode

Operating control/LED	Description/function	Display
Manual operation button/LED	Activates the *KNX mode* with a short button push	LED On: *Manual operation* active LED Off: *KNX operation* active
a b c d e f g h i j *Input* LED	Indication according to use of the inputs	Binary sensor: • LED On: Contact closed • LED Off: Contact open Temperature sensor: • LED On: Temperature sensor connected • LED flashing: Fault (cable break/short circuit)
Valve output open button/LED	Sets the maximum valve control value (100 %) Resets the output with long button push > 5 s	LED On: Valve control value at 100 % LED flashing: Fault on the output (e.g. overload/short circuit)
Valve output close button/LED	Sets the minimum valve control value (0 %)	LED On: Valve control value at 0 % LED flashing: Fault on the output (e.g. overload/short circuit)
		Both LEDs On: Valve control value between 1 and 99 % Both LEDs flashing: Fault on the output (e.g. overload/short circuit)
Pump P A *Pump output open/close* button/LED	Opens/closes the pump output	LED On: Pump output (relay) closed LED Off: Pump output (relay) open
Pump P A Pump P B	If double pumps are used: Active pump change	LED On: Pump output (relay) closed LED Off: Pump output (relay) open
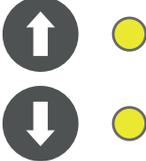
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KNX operation

Operating control/LED	Description/function	Display
Manual operation button/LED	Activates the *Manual operation* mode with long button push > 5 s	LED On: *Manual operation* active LED Off: *KNX operation* active LED flashes when button is pushed: *Manual operation* deactivated via ETS
○ a ○ b ○ c ○ d ○ e ○ f ○ g ○ h ○ i ○ j *Input* LED	Indication according to use of the inputs	Binary sensor: • LED On: Contact closed • LED Off: Contact open Temperature sensor: • LED On: Temperature sensor connected • LED flashing: Fault (cable break/short circuit)
Valve output open button/LED	Button without function	LED On: Valve control value at 100 % LED flashing: Fault on the output (e.g. overload/short circuit)
Valve output close button/LED	Button without function	LED On: Valve control value at 0 % LED flashing: Fault on the output (e.g. overload/short circuit)
↑ ○ ↓ ○		Both LEDs On: Valve control value between 1 and 99 % Both LEDs flashing: Fault on the output (e.g. overload/short circuit)
Pump Pₐ ○ *Pump output open/close* button/LED	Button without function	LED On: Pump output (relay) closed LED Off: Pump output (relay) open
Pump Pₐ ○ Pump P_B ○	Buttons without function	If double pumps are used: LED On: Pump output (relay) closed LED Off: Pump output (relay) open

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General technical data

Device	Dimensions	90 × 140 × 63.5 mm (H x W x D)
	Mounting width in space units	8 modules, 17.5 mm each
	Weight	0.24 kg
	Mounting position	Any
	Mounting variant	35 mm mounting rail
	Design	ProM
	Degree of protection	IP 20
	Protection class	II
	Overvoltage category	III
	Pollution degree	2
Materials	Housing	Polycarbonate, Makrolon FR6002, halogen free
Material note	Fire classification	Flammability V-0
Electronics	Rated voltage, bus	30 V DC
	Voltage range, bus	21 … 32 V DC
	Current consumption, bus	< 12 mA
	Power loss, device	≤ 3 W
	Power loss, bus	≤ 0.25 W
	Power loss, relay output 5 A	≤ 0.6 W
	KNX safety extra low voltage	SELV
Connections	Connection type, KNX bus	Plug-in terminal
	Cable diameter, KNX bus	0.6 … 0.8 mm, solid
	Connection type, inputs/outputs	Screw terminal with universal head (PZ 1)
	Pitch	6.35 mm
	Tightening torque, screw terminals	0.5 … 0.6 Nm
	Conductor cross-section, flexible	1 × (0.2 … 2.5 mm²) / 2 × (0.2 … 2.5 mm²)
	Conductor cross section, rigid	1 × (0.2 … 4 mm²) / 2 × (0.2 … 4 mm²)
	Conductor cross section with wire end ferrule without plastic sleeve	1 × (0.25 … 2.5 mm²)
	Conductor cross section with wire end ferrule with plastic sleeve	1 × (0.25 … 4 mm²)
	Conductor cross section with TWIN wire end ferrule	1 × (0.5 … 2.5 mm²)
	Length, wire end ferrule contact pin	≥ 10 mm
Certificates and declarations	Declaration of conformity CE	→ 2CDK508233D2701
Ambient conditions	Operation	-5 … +45 °C
	Transport	-25 … +70 °C
	Storage	-25 … +55 °C
	Humidity	≤ 95 %
	Condensation allowed	No
	Atmospheric pressure	≥ 80 kPa (corresponds to air pressure at 2,000 m above sea level)

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Inputs - contact scanning

Rated values	Number of inputs	6
Contact scanning	Scanning current	≤ 1 mA
	Scanning voltage	≤ 12 V DC
Cable length	Between sensor and device input, one-way	≤ 100 m

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Inputs - temperature sensor

Rated values	Number of inputs	4
Resistance	Selection	User-defined
	PT 1.000	2-conductor technology
	PT100	2-conductor technology
	KT	1k
	KTY	2k
	NI	1k
	NTC	10k, 20k
Cable length	Between sensor and device input, one-way	≤ 100 m

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Valve outputs – motor-driven

Rated values	Number of outputs	2
	Non-floating	Yes
	Rated voltage U_n	230 V AC
	Voltage range	24 … 230 V AC
	Rated frequency	50/60 Hz
	Rated current I_n	0.5 A
	Continuous current at T_u Up to 20 °C	0.25 A resistive load per 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

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Pump outputs – relays 5 A

Rated values	Number of outputs	2
	Rated voltage U_n	250 V AC
	Rated current I_n (per output)	5 A
	Rated frequency	50/60 Hz
	Back-up protection	≤ 6 A
	Relay type	Bi-stable
Switching currents	AC-1 operation (cos φ = 0.8)	≤ 5 A
	AC-3 operation (cos φ = 0.45)	≤ 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	≥ 0.07 A
Service life	Mechanical service life	≥ 10^7 switching operations
	AC-1 operation (cos φ = 0.8)	≥ 10^6 switching operations
	AC-3 operation (cos φ = 0.45)	≥ 10^6 switching operations
Switching operations	Switching operations per minute when one relay switches	≤ 500

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Device type

Device type	Heating/cooling circuit controller	HCC/S 2.2.2.1
	Application	Heating/Cooling Circuit Controller, 3-point, manual operation, 2f/ …
		… = current version number of the application
	Maximum number of group objects	108
	Maximum number of group addresses	255
	Maximum number of assignments	255

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

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Ordering details

Description	MW	Type	Order no.	Packaging [pcs.]	Weight (incl. packaging) [kg]
Heating/cooling circuit controller	8	HCC/S 2.2.2.1	2CDG110221R0011	1	0.29