



### RDF800KN RDF800KN/NF

## **Touch Screen Flush-mount Room** Thermostats with KNX **Communications**

For 2-pipe, 2-pipe with electrical heater, and 4-pipe fan coil units

For universal applications

For use with compressors in DX type equipment

- KNX bus communications (S-mode and LTE mode)
- · Large display with backlight
- 2P / PI / P control
- Outputs for ON/OFF or 3-position control
- Outputs for 3-speed or 1-speed fan
- 2 multifunctional inputs for keycard contact, external sensor, etc.
- Independent function for window contact and presence detector
- Operating modes: Comfort, Economy and Protection
- Automatic or manual fan speed control
- Automatic or manual heating / cooling changeover
- . Minimum and maximum limitation of room temperature setpoint
- . Control depending on the room or the return air temperature
- Adjustable commissioning and control parameters
- . Commissioning with Synco ACS, ETS4 or via local HMI
- Interoperation into Synco 700
- Integration into Desigo via group (ETS4) or via individual addressing
- Integration into third-party system via group addressing (ETS4)
- AC 230 V operating voltage
- RDF800KN: Mounting on round box, with min 60 mm diameter or recessed square 86 mm box with 60.3 mm fixing centers and min 40 mm depth
- SIEMENS BOILSIEMENS BUIlding Technologies RDF800KN/NF: Mounting on recessed square 86 mm box with 60.3 mm

Room temperature control (heating or cooling) in individual rooms and zones by means of:

- · 2-pipe fan coil units
- · 2-pipe fan coil units with electrical heater
- · 4-pipe fan coil units
- · Chilled /heated ceiling
- Chilled /heated ceiling and electrical heater
- Chilled ceiling and radiator / under floor heating
- Compressors in DX-type equipment
- · Compressors in DX-type equipment with electrical heater

#### The RDF800KN... controls:

- One single or 3-speed fan
- · One or two ON/OFF valve actuators
- One ON/OFF valve actuator and one 1-stage electrical heater
- One 3-position valve actuator
- One 1-stage compressor in DX-type equipment, or one 1-stage compressor with electrical heater

#### Used in systems with:

- Heating or cooling mode
- · Automatic heating/cooling changeover
- Manual heating/cooling changeover
- Heating and cooling mode (such as 4-pipe system)

The room thermostats are delivered with a fixed set of applications. The relevant application is selected and activated during commissioning using one of the following tools:

- Synco ACS
- ETS4
- Local DIP switch and HMI

#### **Functions**

- Room temperature control via built-in temperature sensor or external room temperature / return air temperature sensor
- Changeover between heating and cooling mode (automatically via local sensor or bus, or manually)
- · Selection of applications via DIP switches or commissioning tool
- Selection of operating mode via touch screen
- Temporary Comfort mode extension
- 1- or 3-speed fan control (automatically or manually)
- Display of current room temperature or setpoint in °C and/or °F
- · Minimum and maximum limitation of room temperature setpoint
- · Keylock function: unlock, total lock and setpoint
- 2 multifunctional inputs, freely selectable for:
  - Window contact
  - Presence detector
  - External room temperature or return air temperature sensor
  - Fault input
  - Monitor input for temperature sensor or switch state
  - Sensor for automatic heating / cooling changeover (RDF...)
  - Dew point sensor (RDF...)
  - Electric heater enable (RDF...)
- Advanced fan control function, such as: fan kick, fan start delay, and selectable fan operation (enable, disable or depending on heating or cooling mode)

- Purge function together with 2-port valve in a 2-pipe changeover system
- Reminder to clean fan filters (adjust with P62)
- Floor heating temperature limitation
- · Reload factory settings for commissioning and control parameters
- Wizard function for easy commissioning via HMI
- KNX bus (terminals CE+ and CE-) for communication with Synco or KNX compatible devices
- · Display of time of day via KNX bus
- Display of outdoor temperature via KNX bus on INFO page
- Time scheduling and central control of setpoints via KNX bus
- With a Synco RMx7xx controller, the energy demand signal of the thermostat is used to optimize energy supply

#### **Applications**

The thermostats support the following applications, which can be configured using the DIP switches on the inner side of the thermostat's front panel or a commissioning tool.

Remote configuration

All DIP switches need to be set to **OFF** (factory setting) to select an application via commissioning tool.

NS Bolt SIEMENS Bolt SIEMEN

**Remote configuration**, via commissioning tool (factory setting)

**DIP** switches



• Synco ACS

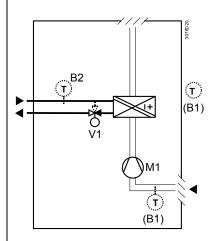
ETS4

#### Applications for fan coil systems

#### Application and output signal, DIP switches, diagram

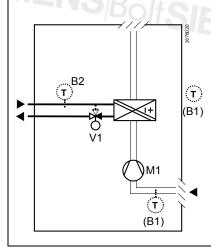
- 2-pipe fan coil unit (heating or cooling)
- ON/OFF
- 2-pipe fan coil unit with el. heater (heating or cooling) ON/OFF

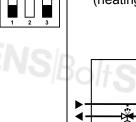


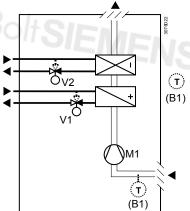


- 2-pipe fan coil unit (heating or cooling)
- 3-position
- ON I
- 4-pipe fan coil unit (heating and cooling)
- ON/OFF









- V1 Heating or heating / cooling valve actuator
- V2 Cooling valve actuator
- E1 Electric heater

- B1 Return air temperature sensor or external room temperature sensor (optional)
- B2 Changeover sensor (optional)
- M1 3- or 1-speed fan

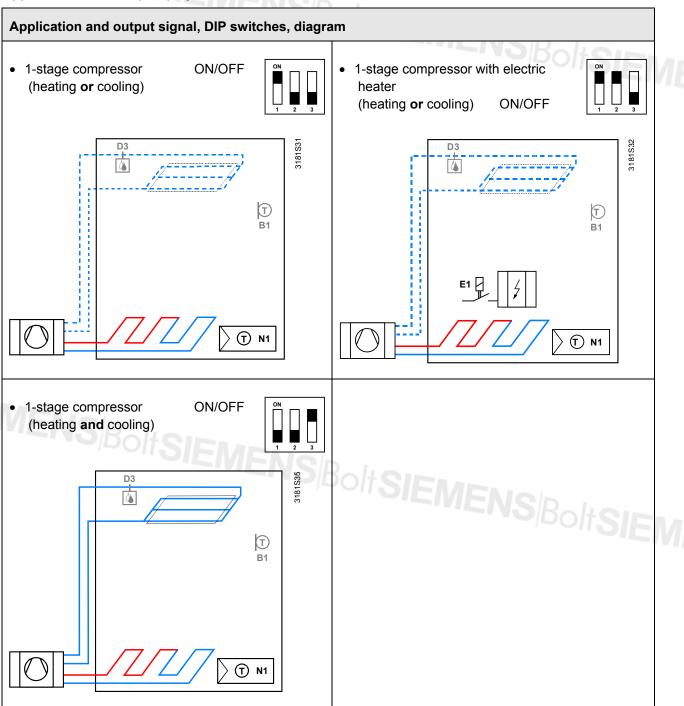
#### **Applications for Universal systems**

#### Application and output signal, DIP switches, diagram · Chilled / heated ceiling ON/OFF Chilled / heated ceiling with electric (heating or cooling) heater ON/OFF (heating **or** cooling) 3191S12 3191S11 D3 4 (T) 4 T N1 **T** N1 · Chilled / heated ceiling 3-position Chilled ceiling and radiator ON/OFF (heating or cooling) (heating and cooling) D3 D3 (T) T О **V1** T N1 (T) N1

- V1 Heating or heating / cooling valve actuator
- V2 Cooling valve actuator
- E1 Electric heater

- B1 Return air temperature sensor or external room temperature sensor (optional)
- B2 Changeover sensor (optional)
- D3 Dewpoint sensor

#### Applications for heat pump systems



- N1 Thermostat
  - Terminal Y1: Heating (H&C) or Heating/Cooling

Terminal Y2: Cooling (H&C)

E1 Electric heater

- B1 Return air temperature sensor or external room temperature sensor (optional)
- D3 Dewpoint sensor

Product no. Stock no.		Operating voltage	C	ontrol out	puts	Suitable for	
		voitage	3-pos	ON/OFF	DC 010 V		
RDF800KN	S55770-T350	AC 230 V	1 <sup>1)</sup>	2 1)		Round conduit box	
RDF800KN/NF 2)	S55770-T335	AC 230 V	1 <sup>1)</sup>	2 1)		Square conduit box	

Selectable: ON/OFF or 3-position

#### **Ordering**

- When ordering, indicate the product number, SSN and name. For example: RDF800KN/NF (S55770-T335) room thermostat RDF800KN (S55770-T350) room thermostat
- A mounting frame must be ordered for RDF800KN/NF installation (See "Accessories").
- · Order valve actuators separately.

#### **Equipment combinations**

T' ODOI!	Type of unit	Product no.	Data sheet
	Cable temperature sensor or changeover sensor, cable length 2.5 m NTC (3 kΩ at 25 °C)	QAH11.1	1840
	Room temperature sensor NTC (3 kΩ at 25 °C)	QAA32	1747
	Cable temperature sensor, cable length 4 m NTC (3 $k\Omega$ at 25 °C)	QAP1030/UFH	1854
	Condensation / Dew point monitor	QXA2601 / QXA2602 / QXA2603 / AQX2604	3302
ON/OFF actuators	Electromotoric ON/OFF actuator	SFA21	4863
	Electromotoric ON/OFF valve and actuator (only available in AP, UAE, SA and IN)	MVI/MXI	4867
	Zone valve actuators (only available in AP, UAE, SA and IN)	SUA	4832
	Thermal actuator (for radiator valve)	STA23	4884
	Thermal actuator (for small valves 2.5 mm)	STP23	4884
SIEMENS Bolt	SIEMENS Bolt SIEME		7 / 20

Mounting frames are not included and must be ordered separately. See "Accessories"

#### 3-position actuators

Type of unit	Product no.	Data sheet
Electrical actuator, 3-position (for radiator valve)	SSA31	4893
Electrical actuator, 3-position (for small valve 2.5 mm)	SSP31	4864
Electrical actuator, 3-position (for small valve 5.5 mm)	SSB31	4891
Electrical actuator, 3-position (for 2- and 3-port valves / VP45)	SSC31	4895
Electrical actuator, 3-position (for small valve 5.5 mm)	SSD31	4861
Electromotoric actuator, 3-position (for small valves 5.5 mm)	SQS35	4573

Note:

For the maximal number of actuators in parallel, refer to information in the data sheets of the selected actuators and to this list, depending on which value is lower:

- Parallel operation of max 6 SS... actuators (3-pos) is possible.
- Parallel operation of max 10 ON/OFF actuators is possible.
- Parallel operation of SQS35 is not possible.

#### **Accessories**

Designation	Product no. / SSN	Data sheet
Changeover mounting kit (50 pcs / package)	ARG86.3	N3009
Plastic mounting spacer for flush mounted thermostats RDF800KN for increasing the headroom in the conduit box by 10mm	ARG70.3	N3009
Conduit box for RDF800KN	ARG71 / S55770-T137	N3009
Single mounting frame *), Ivory White (for RDF800KN/NF only)	ARG800.1 / S55770-T370	
KNX Power supply 160 mA	5WG1 125-1AB02	
KNX Power supply 320 mA	5WG1 125-1AB12	
KNX Power supply 640 mA	5WG1 125-1AB22	

<sup>)</sup> See the dimensions of mounting frame on page 19.

The thermostats consist of the following parts:

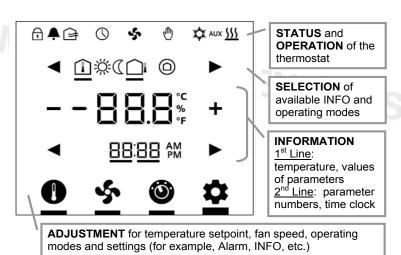
- Front panel with electronics, operating elements and built-in room temperature sensor.
- Mounting base with power electronics.
- Mounting frame is an additional part to complete the installation for RDF800KN/NF.

The rear of the mounting base contains the screw terminals. Slide the front panel in the mounting base and snap on.

# Operation and settings



# SEDISPLAY SBOKSE



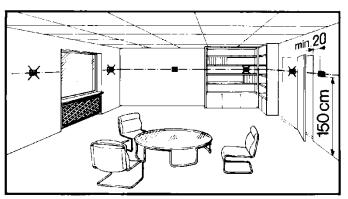
Statu	ıs symbols:		
lacktriangle	Key lock	(3)	Manual override
<b>,</b>	Alarm / Service reminder	☆	Cooling active
()	Scheduler via bus	<u>ss</u>	Heating active
Ş	FAN ACTIVE	AUX	Auxiliary heat active
Sele	ction symbols:		
	Indoor temperature	Ä	Comfort mode
	Outdoor temperature	(	Economy mode
		(	Protection mode

Operational icon	s:
+ -	Increment, decrement OR selection
<b>→</b>	Selection OR move to next items
	Temperature OR parameter values, and etc.
88:88 AW	Time clock (12 / 24 hour), parameter number OR password, and etc.
0	Setpoint mode (temperature only)
\$	Fan mode OR fan speed mode
<b>©</b>	Operating mode
*	Setting mode

See the "Reference documentation", page 15, for information on how to engineer the KNX bus (topology, bus repeaters, etc.) and how to select and dimension connecting cables for supply voltage and field devices.

#### Mounting and installation

Mount the room thermostat on a conduit box. Do not mount on a wall in niches or between bookshelves, behind curtains, above or near heat sources, or exposed to direct solar radiation. Mount about 1.5 m above the floor.



# SIEMENS **Mounting / Dismounting**

- Do not apply excessive force on screws! The deformation of the mounting frame may lead to improper connections and operation of the unit.
- Mount the room thermostat on a clean, dry indoor place without direct airflow from a heating / cooling device, and not expose to drips or splashes water.
- For RDF800KN only, in case of limited space in the conduit box, use the mounting spacer ARG70.3 to increase the headroom by 10mm.
- Before removing the front cover, disconnect the power supply.

#### Wiring













See the User Manual for the installation instructions enclosed with the thermostat.

Comply with local regulations to wire, protection and earth the thermostat.

- The device has no internal fuse for supply lines to fan and actuators. To avoid risk of fire and injury due to short-circuits, the AC 230 V mains supply line must have a circuit breaker with a rated current of no more than 10 A.
- Properly size the cables to the thermostat, fan and valve actuators for AC 230 V mains voltage.
- Use only valve actuators rated for AC 230 V.
- The wiring cross section used for power supply (L, N), fan / relays (Qx) and 230 V outputs (Yx - N) must be adapted to the preceding overload protection elements (max 10A) under all circumstances. Comply under all circumstances with local regulations.
- Cables of SELV inputs X1-M / X2-M: Use cables with min 230 V insulation, as the conduit box carries AC 230 V mains voltage.
- Inputs X1-M or X2-M: Several switches (e.g. window contact) may be connected in parallel. Consider overall maximum contact sensing current for switch rating.
- KNX communication cables (input CE+ / CE-): Use cables with min 230 V insulation, as the conduit box carries AC 230 V mains voltage.
- When a KNX bus power supply is connected on the line with communicating thermostats and Synco controllers, the internal KNX power supply of the Synco controllers must be switched off.
- No cables provided with a metal shield.
- Disconnect from supply before opening the cover.

#### Before power up

Set DIP switches to select the desired application before power up:

- 1. For remote setup via commissioning tools, set all DIP switches to **OFF** (see "Remote configuration" for more details);
- For local setup, set DIP switches to select applications (refer to the following table).

Commissioning method	DIP switches	LCD display	Applications
Remote setup	ON 1 2 3	APP NONE	-
	ON 1 2 3	APP 2P	2-pipe
	ON 1 2 3	APP 2PEH	2-pipe with electric heater
Local setup	ON 1 2 3	APP 4P	4-pipe
	ON 1 2 3	APP 2P3P	2-pipe with 3-position output

After DIP switch setting, complete the installation and power up the thermostat.

Note

As soon as the application is changed, the thermostat reloads the factory setting for all control parameters, except for KNX device and zone addresses!

Wizard

After DIP switches are selected and the thermostat is powered up, the wizard function guides users to configure the basic parameters for normal operation according to the table below.

Touch ◀ / ▶ to advance / return to any parameter;

Touch + / - to change value.

	LCD display	Parameter	Range	Factory setting
	- { +	Control sequence	0: Heating only 1: Cooling only 2: Manual changeover 3: Auto changeover 4: Heating and Cooling	2-pipe = 1 4-pipe = 4
	- { +	User operating mode profile	1: comfort > protection 2: comfort > economy > protection	1
	- [] +	Selection of °C or °F	0: °C 1: °F	0
	-   +	Standard display	0: Room temperature 1: Setpoint	0
	- G +	Display info line (2 <sup>nd</sup> line of LCD display)	0: (No display) 3: Time of day (12h) via bus 4: Time of day (24h) via bus	0
SIEMENS Bolts	-	Fan Stage in Deadzone (Comfort mode)	0: Fan OFF 1: Fan speed 1 Heat / Cool 2: Fan speed 1 Cool only	0

SIEMENSBOL					
	LCD	display	Parameter	Range	Factory setting
	-	<b>3 +</b>   P38 ▶	Functionality of X1	0: No function 1: Ext / Return Temp (AI) 2: H/C changeover (AI/DI) 3: Window open detect (DI)	
	-	{ +   P40 ▶	Functionality of X2	4: Dew point sensor (DI) 5: Enable electr. Heater (DI) 6: Fault input (DI) 7: Monitor input (Digital) 8: Monitor input (Temp) 10: Presence detection (DI)	1
		∏ <b>∏</b> +	Operating action of X1	Normal Open (NO)	Normal Open
		∏ <b>∏ +</b>	Operating action of X2	Normal Close (NC)	(NO)
	•	EU9	-	End of wizard	-

If more details are required about parameters, refer to basic documentation P3174.

#### Reset

To re-load factory settings for all parameters, set parameter P71 to **ON**. Restart the thermostat after reset, all LCD segments flash, indicating that the reset is correct. 3 seconds later, the thermostat is ready for commissioning by qualified HVAC staff.

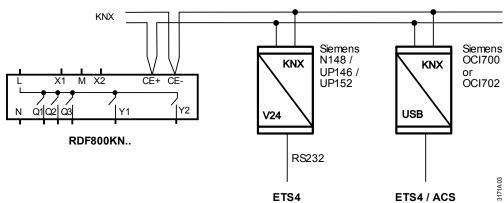
#### **Applications**

The room thermostats are delivered with a fixed set of applications. Select and activate the relevant application during commissioning using one of the following tools:

- Local DIP switch and HMI
- Synco ACS
- ETS4

#### **Connect tool**

Connect the Synco ACS or ETS4 tools to the KNX bus cable at any point for commissioning:



ACS and ETS4 require an interface:

- RS232 KNX interface (such as Siemens N148 / UP146 / UP152)
- OCI700 USB KNX interface

An external KNX bus power supply is required if an RDF800KN... is connected directly to a tool (ACS or ETS4) via KNX interface.

Note:

#### **Control parameters**

The thermostat's control parameters can be set to ensure optimum performance of the entire system (refer to basic documentation P3174).

The parameters can be adjusted using

- Local HMI
- Synco ACS
- ETS4

For commissioning via local HMI, refer to user manual B3174... for setting the passwords.

#### Control sequence

 The control sequence may need to be set via parameter P01 depending on the application. The factory setting for the 2-pipe application is "Cooling only"; and "Heating and Cooling" for the 4-pipe application.

# Compressor-based application

 When the thermostat is used with a compressor, adjust the minimum output ontime (parameter P48) and off-time (parameter P49) for Y1 / Y2 to avoid damaging the compressor or shortening its life due to frequent switching.

#### Calibrate sensor

 Recalibrate the temperature sensor if the room temperature displayed on the thermostat does not match the room temperature measured (after min. 1 hour of operation). To do this, change parameter P05.

# Setpoint and range limitation

 We recommend to review the setpoints and setpoint ranges (parameters P08...P12) and change them as needed to achieve maximum comfort and save energy.

#### **Programming mode**

The programming mode helps identify the thermostat in the KNX network during commissioning.

Touch and hold for more than 5 seconds to activate programming mode, which is indicated on the display with **Pr09**. Programming mode remains active until thermostat identification is complete.

# Assign KNX device address

Assign device address (P81) via HMI, ACS or ETS4.

With device address set to 255, the communication is deactivated (no exchange of process data).

# Assign KNX group addresses

Use ETS4 to assign the KNX group addresses of the RDF communication objects.

#### **KNX** serial number

Each device has a unique KNX serial number inside the front panel. An additional sticker with the same KNX serial number is enclosed in the packaging box. This sticker is intended for installers for documentation purposes.

#### **Disposal**



The devices are considered electronics devices for disposal in terms of European Directive 2012/19/EU and may not be disposed of as domestic waste.

- Dispose of the device via the channels provided for this purpose.
- Comply with all local and currently applicable laws and regulations.

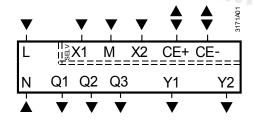
#### Technical data

Power supply	Rated voltage Overvoltage category		AC 230 V III
	Frequency		50/60 Hz
	Power consumption		Max. 6.0 VA / 2.1 W
Caution 🔨	No internal fuse!		
	External preliminary protection with max C	10 A circuit	breaker required in all cases.
Outputs	Fan control Q1, Q2, Q3-N		AC 230 V
	Rating min, max resistive (inductive)		Min. 5 mA, Max. 5(2) A
Note!	Fans must NOT be connected in parallel Connect one fan directly, for additional far relay for each speed.		
	Control output Y1-N / Y2-N (NO)		AC 230 V
	Rating Min, Max resistive (inductive)		Min. 5 mA, Max. 5(2) A
	Max. total load current through terminal "L	" (Qx+Yx)	Max. 7 A
Caution 🛆	No internal fuse!		
	External preliminary protection with max C	10 A circuit	breakers in the supply line
	required in all cases.		11 7
nputs	Multifunctional input X1-M / X2-M		
	Temperature sensor input:		
	Туре		See "Equipment combinations"
	Temperature range		049 °C
	Cable length		Max. 80 m
	Digital input:	0.1.4.11.410.410	
	Operating action	Selectable (NO / NC)	
	Contact sensing	il E Mai	SELV DC 05 V / Max. 5 mA
	Parallel connection of several ther	mostats for	Max. 20 thermostats per
	one switch	05117	switch
	Insulation against mains voltage (	SELV)	4 kV, reinforced insulation
	Function of inputs:		Selectable
	External temperature sensor, heating/c	cooling	X1: P38
	changeover sensor, window contact, pedetection, dewpoint monitor contact, er		X2: P40
	electrical heater contact, fault contact,	monitoring	
KNX bus	Interface type		KNV TD1 64
VINV DUS	Interface type		KNX, TP1-64 (electrically isolated)
	Bus current		5 mA
	Bus topology: See KNX manual (see "Refe	erence docu	
Operational data	Switching differential, adjustable		·
operational data	Heating mode	(P30)	2 K (0.56K)
	Cooling mode	(P31)	1 K (0.56K)
	Setpoint setting and range	(* • • )	(6.5
	∵. ∵ Comfort	(P08)	21 °C (540 °C)
	C Economy	` '	15 °C / 30°C (OFF, 540 °C)
	•	(P11-P12)	8 °C / OFF (OFF, 540 °C)
	© Protection	(P65-P66)	Selectable 08, 10
	Milititunctional innut Y1/Y2		
	Multifunctional input X1/X2	(D38)	
	Input X1 default value Input X2 default value	(P38) (P40)	3 (Window contact) 1 (External temperature

		Built-in room temperature sensor	
		Measuring range	049 °C
		Accuracy at 25 °C	< ± 0.5 K
		Temperature calibration range	± 3.0 K
		Settings and display resolution	1 3.0 K
			0.5 °C
		Setpoints	0.5 °C
	_1	Current temperature value displayed	-
Environment	aı	Operation	As per IEC 60721-3-3
conditions		Climatic conditions	Class 3K5
		Temperature	050 °C
		Humidity	<95 % r.h.
		Transport	As per IEC 60721-3-2
		Climatic conditions	Class 2K3
		Temperature	–2565 °C
		Humidity	<95 % r.h.
		Mechanical conditions	Class 2M2
		Storage	As per IEC 60721-3-1
		Climatic conditions	Class 1K3
		Temperature	–2565 °C
		Humidity	<95 % r.h.
Standards ar	nd	EU Conformity (CE)	8000078258_xx <sup>*)</sup>
directives		Electronic control type	2.B (micro-disconnection on
			operation)
		RCM conformity to EMC emission standard	AS/NZS 61000-6-3
		Safety class	II as per EN 60730
		Pollution class	Normal
		Degree of protection of housing	IP 30 as per EN 60529
Environment	al	The product environmental declaration E3174en co	entains data on environmentally
compatibility	ai	compatible product design and assessments (RoHs	
compatibility		composition, packaging, environmental benefit, dis	
			· VIIIII
General		Connection terminals	Solid wires or prepared
			stranded wires
			1 x 0.41.5 mm <sup>2</sup> or
			2 x for KNX cables/sensor
		Minimal wiring cross section on	Min 1.5 mm <sup>2</sup>
		L, N, Q1, Q2, Q3, Y1, Y2	
		Housing front color	Ivory White
		Weight without / with packaging	0.155 kg / 0.255 kg
		*) The documents can be downloaded from	

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#### **Connection terminals**



L, N Operating voltage AC 230 V Q1

Control output "Fan speed 1 AC 230 V" Control output "Fan speed 2 AC 230 V"

Control output "Fan speed 3 AC 230 V"

Control output "Valve" AC 230 V (N.O., for normally closed valves), output for compressor or output for

electrical heater

X1, X2 Multifunctional input for temperature sensor (such as

QAH11.1) or potential-free switch

Factory setting:

- X1 = Window contact

- X2 = External sensor

(function can be selected via parameter P38 / P40)

Μ Measuring neutral for sensor and switch

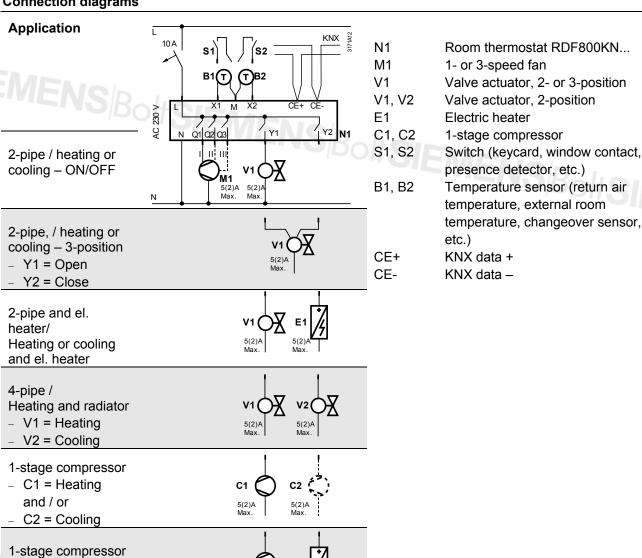
CE+ KNX data + CE-KNX data -

Q2

Q3

Y1,Y2

#### **Connection diagrams**

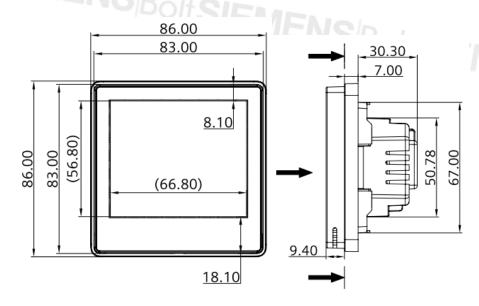


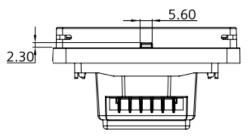
and electric heater

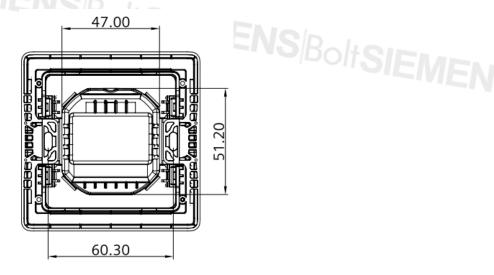
C1

5(2)A Max

RDF800KN/NF for square conduit boxes only

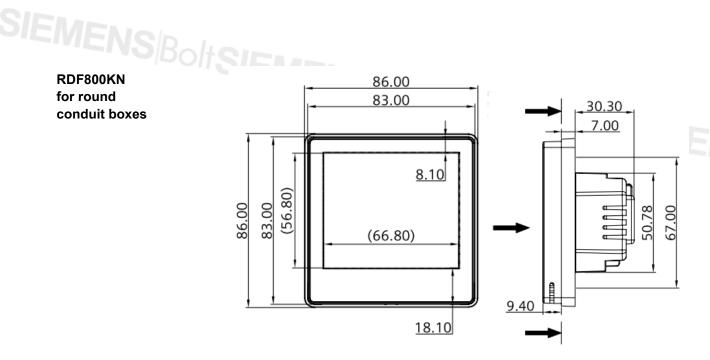


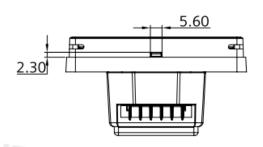


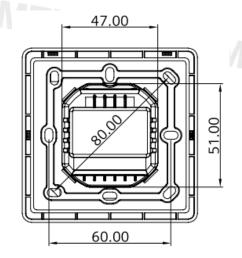


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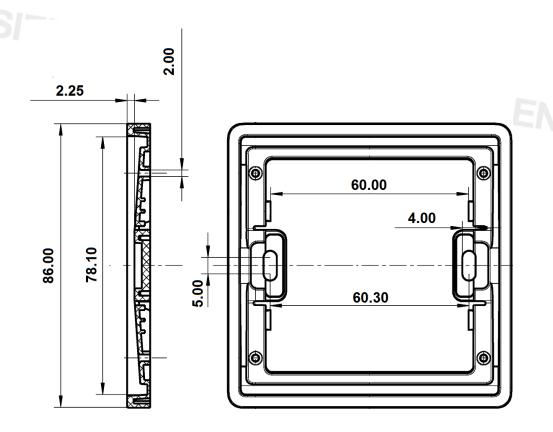
for round conduit boxes







ARG800.1 single mounting frame for RDF800KN/NF



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Subject to change