



WIDE VARIETY AND HIGH ENERGY EFFICIENCY

실내 온도조절기 (Room Thermostats)

Siemens has a complete thermostat portfolio, ranging from simple mechanical & digital room thermostats for basic room climate control, to advanced KNX communicating thermostats for integration into building automation systems.

더 알아보기



SIEMENS

Siemens Smart Infrastructure combines the real and digital worlds across energy systems, buildings and industries, enhancing the way people live and work and significantly improving efficiency and sustainability



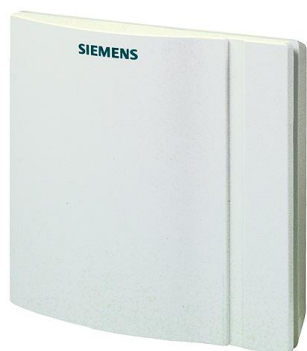
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Room Thermostat

RAA11

Tamperproof for heating only **or** cooling only

Two-position control
Switching voltage AC 24...250 V

Use

The RAA11 room thermostat is used in heating only or cooling only systems to maintain the selected room temperature where a tamperproof housing is needed.

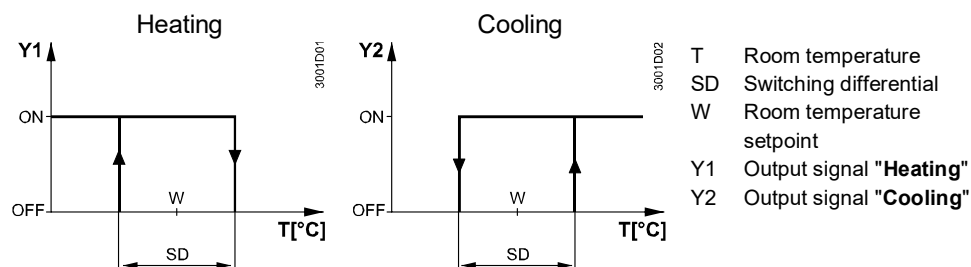
Typical use:

- Schools
- Public buildings
- Storage rooms
- Maintenance rooms

Functions

The RAA11 room thermostat has separate outputs for heating only and cooling only. If the room temperature falls below the selected setpoint, the heating contact will close. If the room temperature exceeds the selected setpoint, the cooling contact will close.

Function diagrams



Equipment combinations

Type of unit	Type reference	Data sheet ¹⁾
Motoric on/off actuator	SFA21...	4863
Thermal actuator (for radiator valve)	STA21...	4893
Thermal actuator (for small valve 2,5 mm)	STP21...	4878

¹⁾ The documents can be downloaded from <http://siemens.com/bt/download>.

Accessories

Description	Type reference
Adapter plate 120 x 120 mm for 4" x 4" conduit boxes	ARG70
Adapter plate 96 x 120 mm for 2" x 4" conduit boxes	ARG70.1
Adapter plate for surface wiring 112x130 mm	ARG70.2

Technical design

Key features of the RAA11 room thermostat:

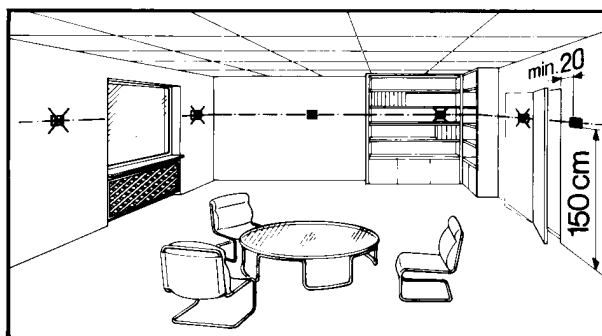
- Two-position control
- Gas-filled diaphragm
- No external adjustment facility

Notes

Mounting, installation and commissioning

The thermostat should be located where the air temperature can be sensed as accurately as possible, without getting adversely affected by direct solar radiation or other heat or refrigeration sources.

Mounting height is about 1.5 m above the floor.



The unit can be fitted to most commercially available recessed conduit boxes or directly on the wall.



AC 250 V

Only authorised personnel may open the unit to perform service.

The unit must be isolated from the mains supply before opening.

When installing the unit, fix the baseplate first, then hook on the thermostat body and make the electrical connections. Then fit the cover and secure it also refer to separate mounting instructions.

The thermostat must be mounted on a flat wall.

The local electrical regulations must be complied with.

If there are thermostatic radiator valves in the reference room, set them to their fully open position.



Warning!

No internal line protection for supply lines to external consumers (Y1, Y2)

Risk of fire and injury due to short-circuits!

- Adapt the line diameters as per local regulations to the rated value of the installed overcurrent protection device.

Maintenance

The room thermostat is maintenance-free.

Mechanical design

The diaphragm is filled with environmentally friendly gas.

The thermostat housing is made of plastic.

Ordering

Type (ASN)	Part number (SSN)	Description
RAA11	S55770-T219	Room thermostat RAA11

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

Switching capacity	
Voltage	AC 24...250 V
Current	0.2...6(2.5) A
Frequency	50 or 60 Hz



No internal fuse

External preliminary protection with max. C 10 A circuit breaker in the supply line required under all circumstances

Screw terminals for	2 x 1.5 mm ² (min. 0.5 mm ²)
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Operational data

Switching differential SD	≤1K
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Setpoint setting range	8...30 °C
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Environmental conditions

Operation	to IEC 60721-3-3
Climatic conditions	Class 3K5
Temperature	0...+50 °C
Humidity	<95 % r.h.
Pollution degree	normal, to EN 60730-1

Transport / Storage	to IEC 60721-3-2
Climatic conditions	Class 2K3/1K3
Temperature	-20...+50 °C
Humidity	<95 % r.h.
Mechanical conditions	Class 2M2

Industry standards

EU Conformity (CE)	CE1T3561xx ^{*)}
RCM Conformity	CE1T3561en_C1 ^{*)}

Environmental Compatibility

The product environmental declaration CE1E3561 ^{*)} contains data on environmentally compatible product design and assessments (RoHS compliance, materials composition, packaging, environmental benefit, disposal).

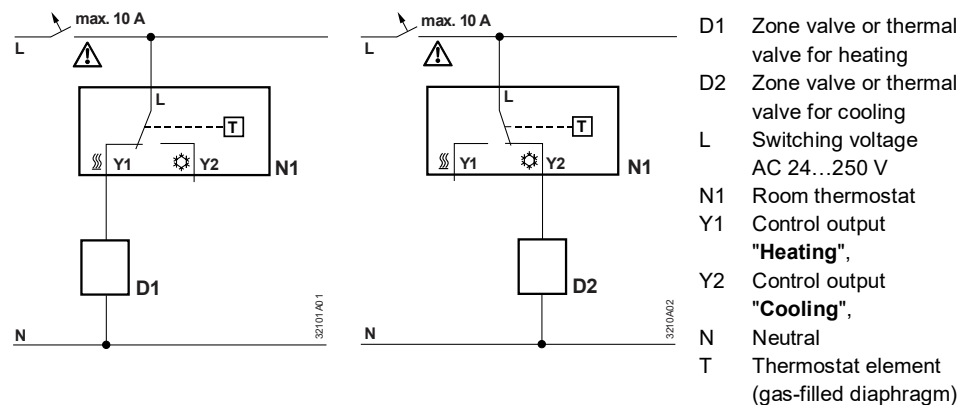
Safety standard	II to EN 60730-1
Degree of protection of housing	IP30 to EN 60529

Weight	0.14 kg
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Colour	white, NCS S 0502-G (RAL 9003)
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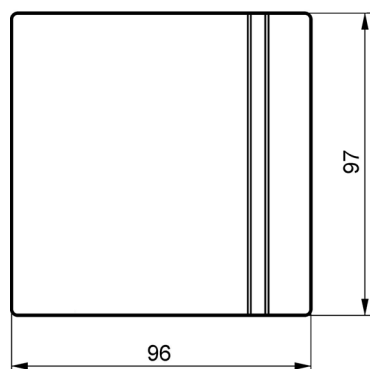
*) The documents can be downloaded from <http://siemens.com/bt/download>.

Connection diagrams

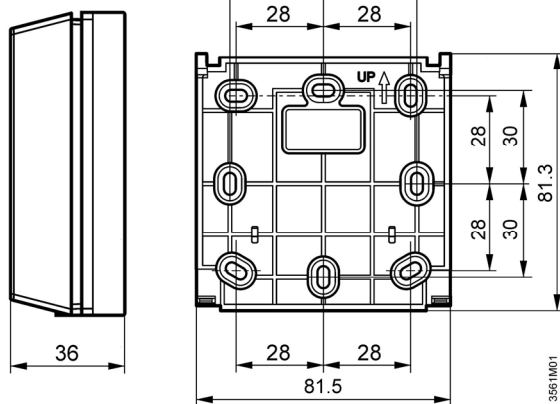


Dimensions

Room thermostat



Base plate



Remarks

Heating:

Because of the unavoidable self heating effects of the electrical current, any loads of more than 3 Amperes connected to the unit can influence the control behavior and temperature accuracy in a negative way.

Cooling:

Because of the unavoidable self heating effects of the electrical current, any loads of more than 1 Amperes connected to the unit can influence the control behavior and temperature accuracy in a negative way.



Room thermostat

RAA21...

Adjustable for heating only **or** cooling only

-
- **2-position control**
 - **Switching voltage AC 24...250 V**

Use

The RAA21.. room thermostat is used in heating only or cooling only systems to maintain the selected room temperature.

Typical use:

- Residential buildings
- Light industrial buildings

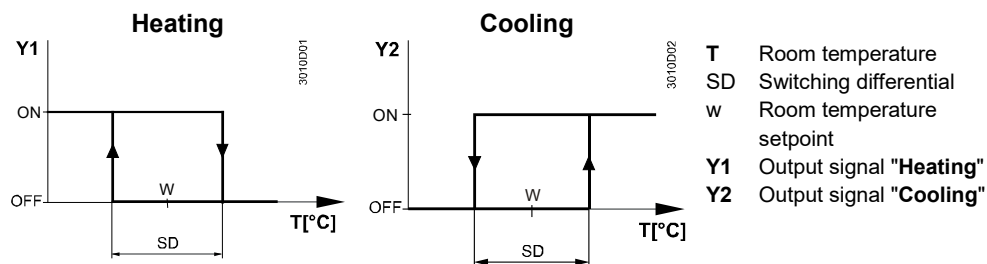
In conjunction with

- zone valves or thermal valves
- gas or oil burners
- fans
- pumps

Functions

The RAA21.. room thermostat has separate outputs for heating only and cooling only. If the room temperature falls below the selected setpoint, the heating contact will close. If the room temperature exceeds the selected setpoint, the cooling contact will close.

Function diagrams



Type summary

Functionality	Product no. (ASN)
Room thermostat for heating or cooling mode Switching voltage AC 24...250 V	RAA21

Equipment combinations

Description	Product no. (ASN)	Data sheet ^{*)}
Motoric on / off actuator	SFA21...	4863
Thermal actuator (for radiator valves)	STA21...	4893
Thermal actuator (for small valves 2.5 mm)	STP21...	4878

^{*)} The documents can be downloaded from <http://siemens.com/bt/download>.

Accessories

Description	Product no. (ASN)
Adapter plate 120 x 120 mm for 4 x 4" conduit boxes	ARG70
Adapter plate 96 x 120 mm for 2 x 4" conduit boxes	ARG70.1
Adapter plate for surface wiring 112 x 130 mm	ARG70.2

Technical design

Key features of the RAA21.. room thermostat:

- 2-position control
- Gas-filled diaphragm

Adjustments

The required temperature setpoint is selected with the setting knob on the front of the thermostat.

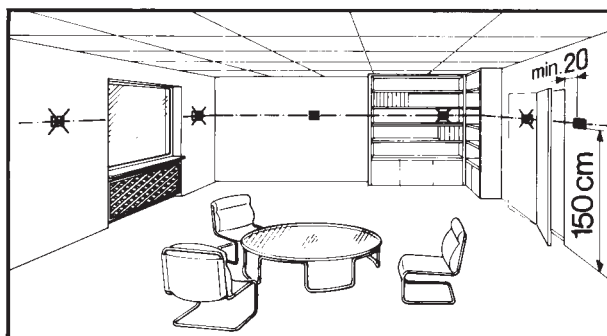
The setpoint setting range can be mechanically limited by means of setpoint limiters under the unit cover.

Notes

Mounting, installation and commissioning

The thermostat should be located where the room temperature can be acquired as accurately as possible, without getting adversely affected by direct solar radiation or other heat or refrigeration sources.

Mounting height is about 1.5 m above the floor.



The thermostat can be fitted to most commercially available recessed conduit boxes or directly on the wall.

Only authorized personnel may open the unit to perform service.

The unit must be isolated from the mains supply before opening.

When installing the unit, fix the base plate first, then hook on the thermostat body and make the electrical connections. Then, fit the cover and secure it (also refer to separate mounting instructions).

The thermostat must be mounted on a flat wall.

The local electrical regulations must be complied with.

If there are thermostatic radiator valves in the reference room, set them to their fully open position.



AC 24...250 V



Warning!

No internal line protection for supply lines to external consumers (Y1, Y2)

Risk of fire and injury due to short-circuits!

- Adapt the line diameters as per local regulations to the rated value of the installed overcurrent protection device.

Maintenance

Mechanical design

The room thermostat is maintenance-free.

The diaphragm is filled with environment-friendly gas.

The housing is made of plastic.

Ordering

Type (ASN)	Part number (SSN)	Description
RAA21	S55770-T220	Room thermostat RAA21



Disposal



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

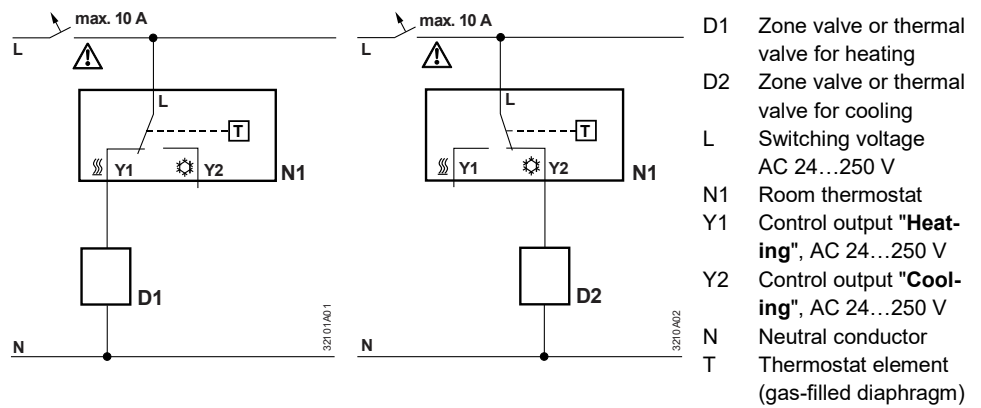
- Dispose of the device via the channels provided for this purpose
- Comply with all local and currently applicable laws and regulations.

Technical data

Power		Switching capacity	
		Voltage	AC 24...250 V
		Current	0.2...6(2.5) A
		Frequency	50 or 60 Hz
Operational data	No internal fuse		
	External preliminary protection with max. C 10 A circuit breaker in the supply line required under all circumstances		
	Screw terminals for		2 x 1.5 mm ² (min. 0.5 mm ²)
	Switching differential SD		≤1 K
Environmental conditions	Setpoint setting range		8...30 °C
	Operation		To IEC 60721-3-3
	Climatic conditions		Class 3K5
	Temperature		0...50 °C
	Humidity		<95% r.h.
	Pollution degree		Normal, to EN 60730-1
Industry standards	Transport / storage		To IEC 60721-3-2
	Climatic conditions		Class 2K3 / 1K3
	Temperature		-20...50 °C
	Humidity		<95% r.h.
	Mechanical conditions		Class 2M2
	EU Conformity (CE)		CE1T3561xx ^{*)}
Environmental compatibility	RCM Conformity		CE1T3561en_C1 ^{*)}
	Safety standard		II to EN 60730-1
	Degree of protection of housing		IP30 to EN 60529
Mechanical design	The product environmental declaration CE1E3561 ^{*)} contains data on environmentally compatible product design and assessments (RoHS compliance, materials composition, packaging, environmental benefit, disposal).		
	Weight		0.14 kg (RAA21)
	Color		White, NCS S 0502-G (RAL 9003)

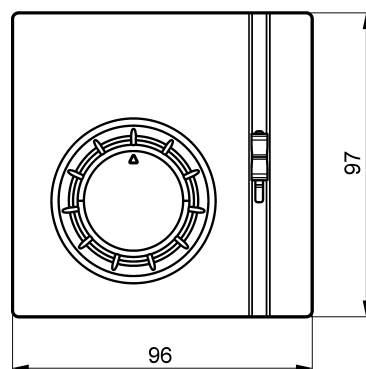
^{*)} The documents can be downloaded from <http://siemens.com/bt/download>.

Connection diagrams

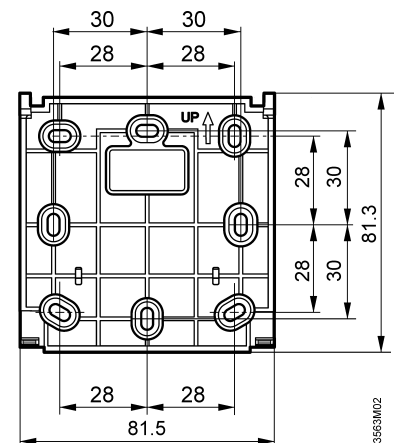


Dimensions

Room thermostat



Base plate



Remarks

Heating:

Because of the unavoidable self heating effects of the electrical current, any loads of more than 3 Amperes connected to the unit can influence the control behavior and temperature accuracy in a negative way.

Cooling:

Because of the unavoidable self heating effects of the electrical current, any loads of more than 1 Amperes connected to the unit can influence the control behavior and temperature accuracy in a negative way.



RAA31



RAA31.16



RAA31.26

Room Thermostats

RAA31..

Adjustable room thermostat for heating only **or** cooling only systems

- Room thermostat with manual ON/OFF switch
- Two-position control
- Switching voltage AC 24...250 V

Use

The RAA31.. room thermostat is used in heating only or cooling only systems to maintain the selected room temperature.

Typical use:

- Residential buildings
- Light industrial buildings

In conjunction with

- zone valves, thermal valves
- gas or oil burners
- fans
- pumps

Functions

The front of the unit carries an ON/OFF switch.

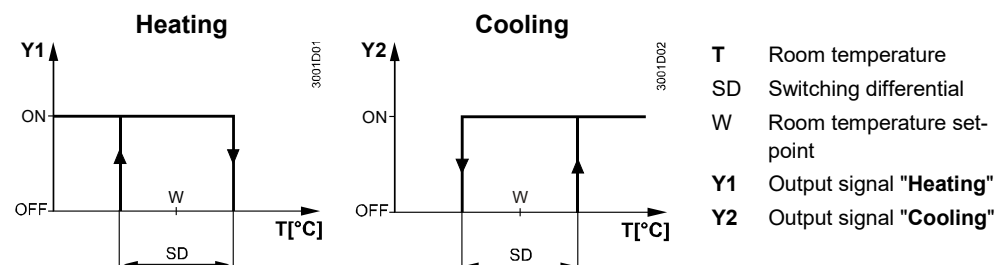
OFF

In the OFF position, the input voltage is physically separated from the output voltage.

ON

The RAA31.. room thermostat has separate outputs for heating only and cooling only. If the room temperature falls below the selected setpoint, the heating contact will close. If the room temperature exceeds the selected setpoint, the cooling contact will close.

Function diagrams



Type summary

Functionality	Order number (ASN)
Thermostat for heating or cooling application with ON/OFF switch Operating voltage AC 24...250 V	RAA31
Thermostat for heating or cooling application with ON/OFF switch and operation mode indication (LED) Operating voltage AC 230 V + /-10 %.	RAA31.16
Thermostat for heating or cooling application with ON/OFF switch and operation mode indication (LED) and independent ON/OFF switch Operating voltage AC 230 V + /-10 %.	RAA31.26

Equipment combinations

Type of unit	Type reference	Data sheet ¹⁾
Motoric on/off actuator	SFA21...	4863
Electric actuator (for small valves)	SFP21...	4865
Thermal actuator (for radiator valve)	STA21...	4877
Thermal actuator (for small valve 2.5 mm)	STP21...	4878

¹⁾ The documents can be downloaded from <http://siemens.com/bt/download>.

Accessories

Description	Type reference
Adapter plate 120 x 120 mm for 4" x 4" conduit boxes	ARG70
Adapter plate 96 x 120 mm for 2" x 4" conduit boxes	ARG70.1
Adapter plate for surface wiring 112 x 130 mm	ARG70.2

Technical design

Key features of the RAA31.. room thermostat:

- Two-position control
- Manual ON/OFF switch
- Gas-filled diaphragm

Adjustments

The required temperature is selected by a setpoint adjuster on the front of the thermostat.

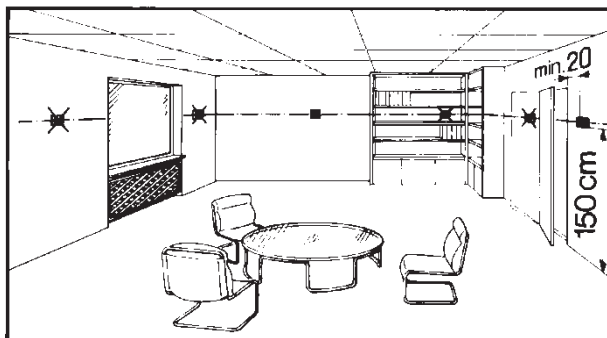
The setpoint setting range can be mechanically limited by means of setpoint limiter under the cover.

Notes

Mounting, installation and commissioning

The room thermostat should be located where the air temperature can be sensed as accurately as possible, without getting adversely affected by direct solar radiation or other heat or refrigeration sources.

Mounting height is about 1.5 m above the floor.



The unit can be fitted to most commercially available recessed conduit boxes or directly on the wall.

 **Warning:**
AC 24...250 V!

Only authorised personnel may open the unit to perform service.

The unit must be isolated from the mains supply before opening.

When installing the unit, fix the base plate first then hook on the thermostat body and make the electrical connections. Then fit the cover and secure it (also refer to separate mounting instructions).

The thermostat must be mounted on a flat wall.

The local electrical regulations must be complied with.

If there are thermostatic radiator valves in the reference room, set them to their fully open position.



Warning!

No internal line protection for supply lines to external consumers (Y1, Y2)

Risk of fire and injury due to short-circuits!

- Adapt the line diameters as per local regulations to the rated value of the installed overcurrent protection device.

Maintenance

The room thermostat is maintenance-free.

Mechanical design

The diaphragm is filled with environmentally friendly gas.

The thermostat housing is made of plastic.

Ordering

Type (ASN)	Part number (SSN)	Description
RAA31	S55770-T221	Room thermostat RAA31
RAA31.16	S55770-T222	Room thermostat RAA31.16
RAA31.26	S55770-T223	Room thermostat RAA31.26

Disposal



The devices are considered electronics devices for disposal in term 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



Switching capacity

Voltage

- RAA31...
- RAA31.16 and 31.26

AC 24...250 V / 50 or 60 Hz

AC 230 V +/-10 %

Power consumption of each LED

0.5 VA (Only RAA31.16 and RAA31.26)

Current

0.2...6 (2.5) A

Frequency

50 or 60 Hz



No internal fuse

External preliminary protection with max. C 10 A circuit breaker in the supply line required under all circumstances

Screw terminals for 2 x 1.5 mm² (min. 0.5 mm²)

Operational data

Switching differential SD

≤1 K

Setpoint setting range

8...30 °C

Environmental conditions

Operation

to IEC 60721-3-3

Climatic conditions

Class 3K5

Temperature

0...50 °C

Humidity

<95 % r.h.

Pollution degree

Normal, to EN 60730-1

Transport / storage

to IEC 60721-3-2

Climatic conditions

Class 2K3/1K3

Temperature

-20...50 °C

Humidity

<95 % r.h.

Mechanical conditions

Class 2M2

Industry standards

EU Conformity (CE)

CE1T3561xx ¹⁾

RCM Conformity

CE1T3561en_C1 ¹⁾

Safety standard

II to EN 60730-1

Degree of protection of housing

IP30 to EN 60529

Environmental compatibility

The product environmental declarations CE1E3015, CE1E3561 ¹⁾ contain data on environmentally compatible product design and assessments (RoHS compliance, materials composition, packaging, environmental benefit, disposal).

Mechanical design

Weight

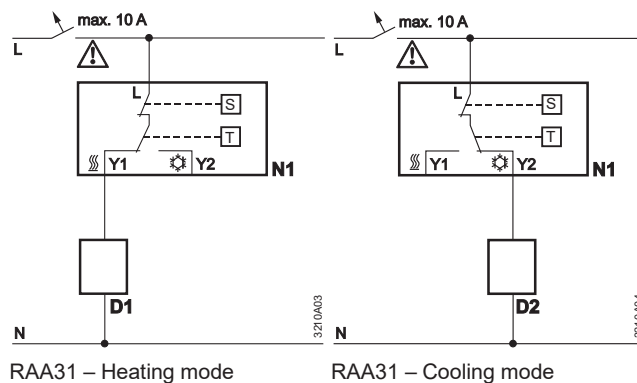
0.14 kg

Colour of top cover

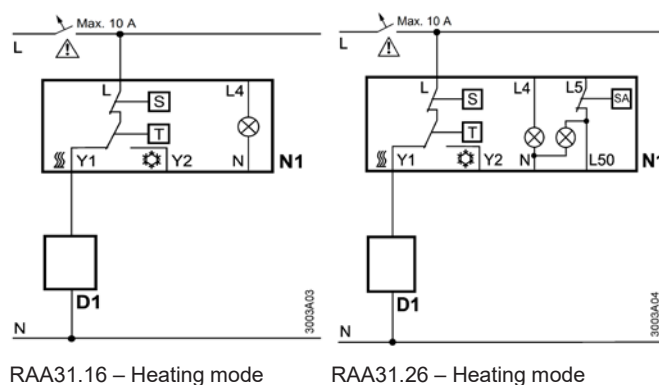
white, NCS 50502-G (RAL 9003)

¹⁾ The documents can be downloaded from <http://siemens.com/bt/download>.

Connection diagrams



- D1 Zone valve or thermal valve for **heating**
- D2 Zone valve or thermal valve for **cooling**
- L Switching voltage
AC 24...250 V (RAA31 only)
AC 230 V
(RAA31.16 / 26/ only)
- N1 Room thermostat
- S ON/OFF switch
- Y1 Control output "**Heating**",
AC 24...250 V (RAA31 only)
AC 230 V
(RAA31.16 / 26 only)
- Y2 Control output "**Cooling**",
AC 24...250 V (RAA31 only)
AC 230 V
(RAA31.16 / 26 only)
- N Neutral
- T Thermostat element
(gas-filled diaphragm)

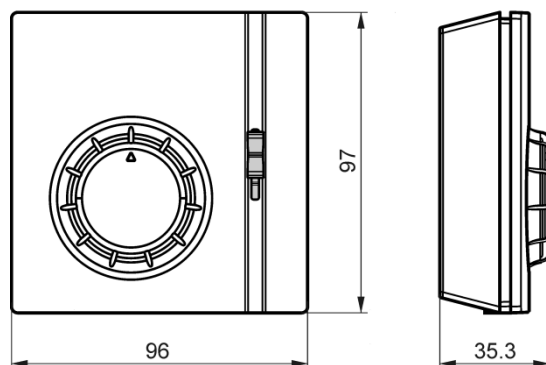


- L4, L5 Input AC 230 V
- L50 Output
- SA Auxiliary switch

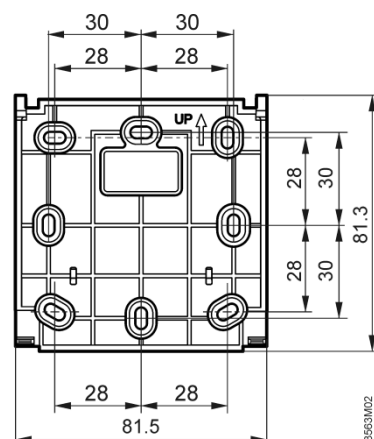
Dimensions

RAA31 and
RAA31.16

Room thermostat

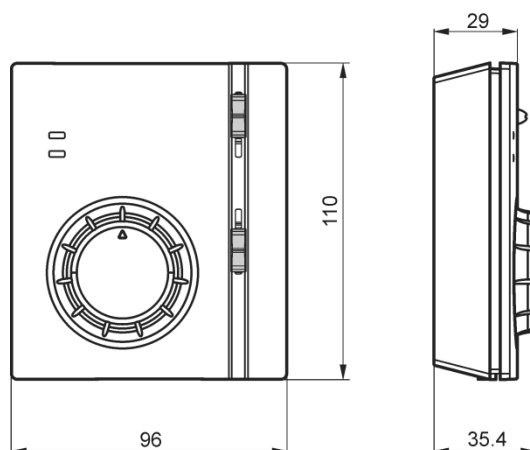


Base plate

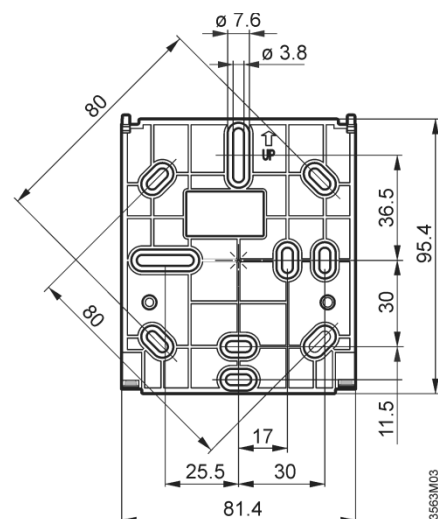


RAA31.26

Room thermostat



Base plate



Remarks

Heating:

Because of the unavoidable self heating effects of the electrical current, any loads of more than 3 Amperes connected to the unit can influence the control behavior and temperature accuracy in a negative way.

Cooling:

Because of the unavoidable self heating effects of the electrical current, any loads of more than 1 Amperes connected to the unit can influence the control behavior and temperature accuracy in a negative way.



Room Thermostat

RAA41

Adjustable for heating only **or** cooling only

Room thermostat with manual changeover switch for heating or cooling systems

Two-position control

Switching voltage AC 24...250 V

Use

The RAA41 room thermostat is used in heating or cooling systems to maintain the selected room temperature.

Typical use:

- Residential buildings
- Light industrial buildings

In conjunction with

- zone valves
- thermal valves

Functions

OFF

The front of the unit carries a selector with three positions for **Heating / OFF / Cooling**.

In the OFF position, the input voltage is physically separated from the output voltage.

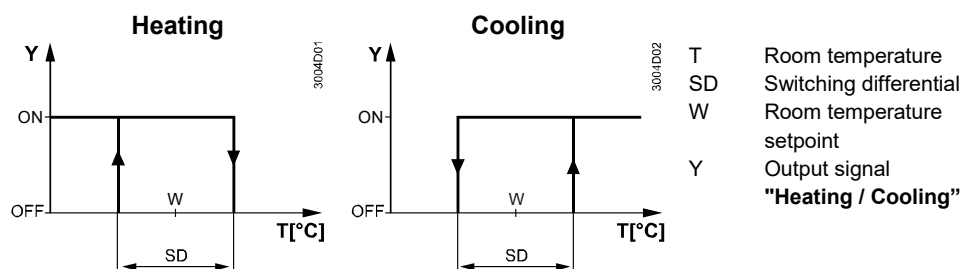
Heating

If the room temperature falls below the selected setpoint, the heating contact will close (cooling contact open). If the room temperature exceeds the selected setpoint, the heating contact will open and the cooling contact will close but remains inactive because the selector is set to "Heating".

Cooling

Action reversed.

Function diagrams



Equipment combinations

Type of unit	Type reference	Data sheet ¹⁾
Motoric on/off actuator	SFA21...	4863
Thermal actuator (for radiator valve)	STA21...	4893
Thermal actuator (for small valve 2,5 mm)	STP21...	4878

¹⁾ The documents can be downloaded from <http://siemens.com/bt/download>.

Accessories

Description	Type reference
Adapter plate 120 x 120 mm for 4" x 4" conduit boxes	ARG70
Adapter plate 96 x 120 mm for 2" x 4" conduit boxes	ARG70.1
Adapter plate for surface wiring 112x130 mm	ARG70.2

Technical design

Key features of the RAA41 room thermostat:

- Two-position control
- Manual switch for Heating / OFF / Cooling
- Gas-filled diaphragm

Adjustments

The required temperature is selected by a setpoint adjuster on the front of the thermostat.

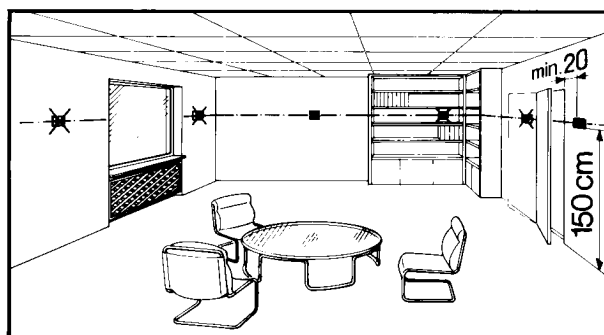
The setpoint setting range can be mechanically limited by means of setpoint limiter under the unit cover.

Notes

Mounting, installation and Commissioning

The room thermostat should be located where the air temperature can be sensed as accurately as possible, without getting adversely affected by direct solar radiation or other heat or refrigeration sources.

Mounting height is about 1.5 m above the floor.



The unit can be fitted to most commercially available recessed conduit boxes or directly on the wall.



Only authorised personnel may open the unit to perform service.
The unit must be isolated from the mains supply before opening.
When installing the unit, fix the base plate first, then hook on the thermostat body and make the electrical connections. Then fit the cover and secure it (also refer to separate mounting instructions).

The thermostat must be mounted on a flat wall.

The local electrical regulations must be complied with.

If there are thermostatic radiator valves in the reference room, set them to their fully open position.



Warning!

No internal line protection for supply lines to external consumers (Y)

Risk of fire and injury due to short-circuits!

- Adapt the line diameters as per local regulations to the rated value of the installed overcurrent protection device.

Maintenance

The room thermostat is maintenance-free.

Mechanical design

The diaphragm is filled with environmentally friendly gas.

The thermostat housing is made of plastic.

Ordering

Type (ASN)	Part number (SSN)	Description
RAA41	S55770-T224	Room thermostat RAA41

Disposal



The devices are considered electronics devices for disposal in term 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

Switching capacity	
Voltage	AC 24...250 V
Current	0.2...6(2.5) A
Frequency	50 or 60 Hz



No internal fuse

External preliminary protection with max. C 10 A circuit breaker in the supply line required under all circumstances

Operational data

Screw terminals for	2 x 1.5 mm ² (min. 0.5 mm ²)
Switching differential SD	≤1 K
Setpoint setting range	8...30 °C

Environmental conditions

Operation	To IEC 60721-3-3
Climatic conditions	Class 3K5
Temperature	0...50 °C
Humidity	<95% r.h.
Pollution degree	Normal, to EN 60730-1
Transport / storage	To IEC 60721-3-2
Climatic conditions	Class 2K3 / 1K3
Temperature	-20...50 °C
Humidity	<95% r.h.
Mechanical conditions	Class 2M2

Industry standards

EU Conformity (CE)	CE1T3561xx ^{*)}
RCM Conformity	CE1T3561en_C1 ^{*)}
Safety standard	II to EN 60730-1
Degree of protection of housing	IP30 to EN 60529

Environmental compatibility

The product environmental declaration CE1E3561¹⁾ contains data on environmentally compatible product design and assessments (RoHS compliance, materials composition, packaging, environmental benefit, disposal).

Mechanical design

Weight

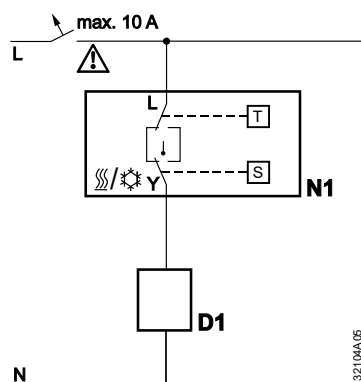
0.14 kg

Color

White, NCS S 0502-G (RAL 9003)

¹⁾ The documents can be downloaded from <http://siemens.com/bt/download>.

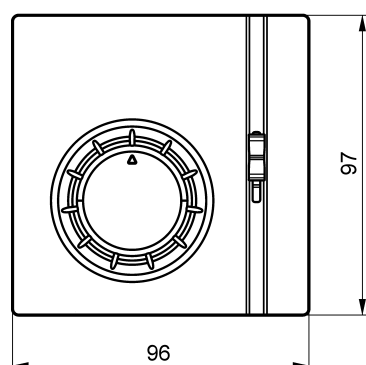
Connection diagrams



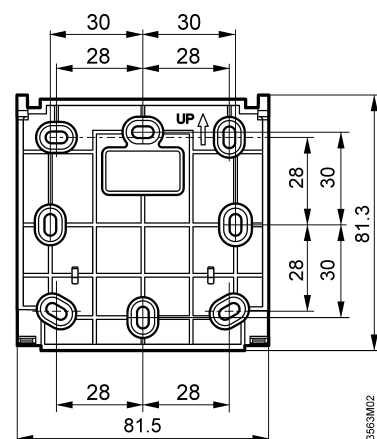
- D1 Zone valve or thermal valve
- L Switching voltage AC 24...250 V
- N1 Room thermostat
- S Selector for Heating / OFF / Cooling
- Y Control output "Heating" or "Cooling", AC 24...250 V
- N Neutral
- T Thermostat element (gas-fillet diaphragm)

Dimensions

Room thermostat



Base plate



Remarks

Heating:

Because of the unavoidable self heating effects of the electrical current, any loads of more than 3 Amperes connected to the unit can influence the control behavior and temperature accuracy in a negative way.

Cooling:

Because of the unavoidable self heating effects of the electrical current, any loads of more than 1 Amperes connected to the unit can influence the control behavior and temperature accuracy in a negative way.



RAB11



RAB11.1

Room thermostats

RAB11..

For 2-pipe fan coils

-
- Room thermostat with manual switch for heating or cooling mode and fan function
 - 2-position control
 - Manual 3-speed fan switch
 - Switching voltage AC 24...250 V
 - Control output ON/OFF

Use

The RAB11.. room thermostat is used in heating or cooling systems to maintain the selected room temperature.



Typical use:


- Commercial buildings
- Residential buildings
- Light industrial buildings

In conjunction with

- zone valves
- thermal valves
- fans

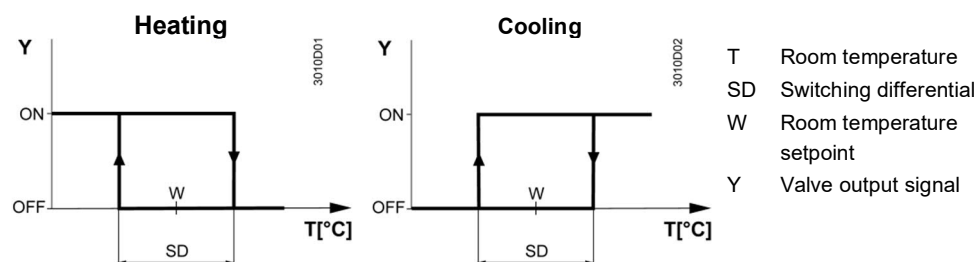
Functions

- Heating** If the room temperature falls below the selected setpoint, the thermostat's heating contact will close.
- Cooling** If the room temperature exceeds the selected setpoint, the thermostat's cooling contact will close.
- Fan speed** There are 2 possibilities to control the fan speed:
- Manually by means of the thermostat's 3-speed fan switch for continuous operation (RAB11 and RAB11.1).
 - Automatically by switching to the selected fan speed via the thermostat for controlled operation. In that case – prior to commissioning – the jumper position corresponding to the thermostat function must be selected. There are 2 choices of jumper positions available on the printed circuit boards of the RAB11 and RAB11.1.
- Jumper SR1  | **Selected fan speed as continuous operation**
 Jumper SR2  Auto | **Fan is switched at the same time as the valve**

Ventilation When the ventilation function  is selected (RAB11.1) with the slide switch on the unit front, the heating and cooling contacts are always open and the fan operates at the selected speed.

Changeover Heating or cooling mode is selected with the switch located on the unit front (RAB11...).

Function diagrams



Type summary

2-pipe fan coil room thermostat for use with 3-speed fan, manual changeover	RAB11
2-pipe fan coil room thermostat for use with 3-speed fan, manual changeover and ventilation function	RAB11.1

Equipment combinations

Type of unit	Product no. (ASN)	Data sheet ¹⁾
Motoric on/off actuator	SFA21..	4863
Thermal actuator (for radiator valves)	STA21..	4893
Thermal actuator (for small valves 2.5 mm)	STP21..	4878
Electromotoric actuator for zone valve VVI46.. (2-position on/off)	SUA21..	4830

¹⁾ The documents can be downloaded from <http://siemens.com/bt/download>.

Accessories

Type of unit	Product no. (ASN)
Adapter plate 120 x 120 mm for 4 x 4" conduit boxes	ARG70
Adapter plate 96 x 120 mm for 2 x 4" conduit boxes	ARG70.1
Adapter plate for surface wiring 112 x 130 mm	ARG70.2

Technical design

Key features of the RAB11.. fan coil room thermostat:

- 2-position control
- Gas-filled diaphragm

Adjustments

The required temperature setpoint is selected with the setting knob on the front of the thermostat.

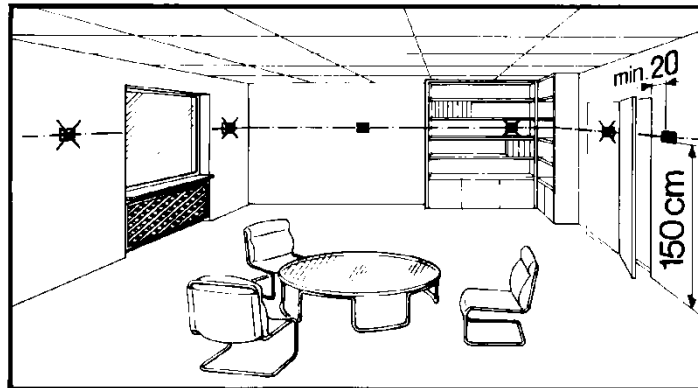
The setpoint setting range can be mechanically limited by means of a setpoint limiter under the unit cover.

Note

Mounting, installation and commissioning

The thermostat should be located where the room temperature can be acquired as accurately as possible, without getting adversely affected by direct solar radiation or other heat or refrigeration sources.

Mounting height is about 1.5 m above the floor.



The thermostat can be fitted to most commercially available recessed conduit boxes or directly on the wall.



Warning: AC 250 V!

Only authorized personnel may open the unit to perform service
The unit must be isolated from the mains supply before opening.

When installing the unit, fix the base plate first, then hook on the thermostat body and make the electrical connections. Then, fit the cover and secure it (also refer to separate mounting instructions).

The thermostat must be mounted on a flat wall.

The local electrical regulations must be complied with.

If there are thermostatic radiator valves in the reference room, set them to their fully open position.



Warning!

No internal line protection for supply lines to external consumers (Q1, Q2, Q3, Y)

Risk of fire and injury due to short-circuits!

- Adapt the line diameters as per local regulations to the rated value of the installed overcurrent protection device.

Maintenance

Mechanical design

The room thermostat is maintenance-free.

The diaphragm is filled with environmentally friendly gas.

The housing is made of plastic.

Ordering

Type (ASN)	Part number (SSN)	Description
RAB11	S55700-T225	Room thermostat RAB11
RAB11.1	S55700-T226	Room thermostat RAB11.1

Disposal



The devices are considered electronics devices for disposal in term 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



Switching capacity control output: Y	
Voltage / frequency	AC 24...250 V / 50 or 60 Hz
Current	0.2...6 (2.5) A
Switching capacity fan: Q1, Q2, Q3	
Voltage / frequency	AC 24...250 V / 50 or 60 Hz
Current RAB11 / RAB11.1	0.2...6 (2.5) A



No internal fuse

External preliminary protection with max. C 10 A circuit breaker in the supply line required under all circumstances

Screw terminals for	2 x 1.5 mm ² (min. 0.5 mm ²)
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Operational data

Switching differential SD	≤1 K
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Setpoint setting range	8...30 °C
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Environmental conditions

Operation	to IEC 60721-3-3
Climatic conditions	Class 3K5
Temperature	0...50 °C
Humidity	<95 % r.h.
Pollution degree	normal, to EN 60730-1

Transport / Storage	to IEC 60721-3-2
Climatic conditions	Class 2K3/1K3
Temperature	-20...50 °C
Humidity	<95 % r.h.
Mechanical conditions	Class 2M2

Industry standards

EU Conformity (CE)	CE1T3015xx ^{*)}
RCM Conformity	CE1T3561en_C1 ^{*)}
Safety standard	II to EN 60730-1
Degree of protection of housing	IP30 to EN 60529

Environmental compatibility

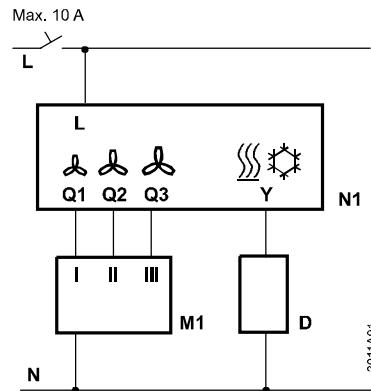
The product environmental declaration CE1E3015en^{*)} contains data on environmentally compatible product design and assessments (RoHS compliance, materials composition, packaging, environmental benefit, disposal).

Mechanical design

Weight	0.14 kg
Colour	white, NCS S 0502-G (RAL 9003)

^{*)} The documents can be downloaded from <http://siemens.com/bt/download>.

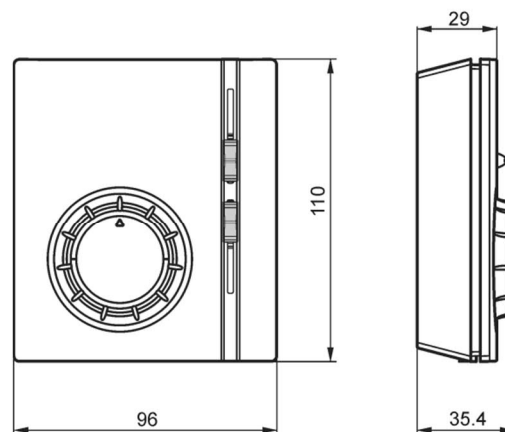
Connection diagram



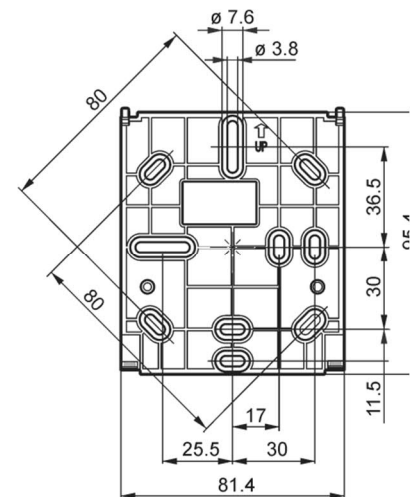
- L Switching voltage AC 24...250 V
- N Neutral conductor
- M1 3-speed fan
- D Thermal valve or zone valve
- N1 Room thermostat RAB11/ RAB11.1
- Q1 Control output
"Fan speed I", AC 24...250 V
- Q2 Control output
"Fan speed II", AC 24...250 V
- Q3 Control output
"Fan speed III", AC 24...250 V
- Y Control output
"Valve actuator **heating/cooling**", AC 24...250 V

Dimensions

Room thermostat



Base plate



Remark

Heating:

Because of the unavoidable self heating effects of the electrical current, any loads of more than 3 Amperes connected to the unit can influence the control behavior and temperature accuracy in a negative way.

Cooling:

Because of the unavoidable self heating effects of the electrical current, any loads of more than 1 Amperes connected to the unit can influence the control behavior and temperature accuracy in a negative way.



RAB21



RAB21.1

Room Thermostats

RAB21..

For two-pipe fan coils

- Room thermostat for heating or cooling
- Changeover function (with external automatic aquastat)
- Two-position control
- Manual three-speed fan switch
- Switching voltage AC 24...250 V
- Control output ON/OFF

Use

The RAB21.. room thermostat is used in heating or cooling systems to maintain the selected room temperature.

Typical use:

- Commercial buildings
- Residential buildings
- Light industrial buildings

In conjunction with

- zone valves and thermal valves
- fans
- aquastats

Functions

Heating

If the room temperature falls below the selected setpoint, the heating contact will close.

Cooling

If the room temperature exceeds the selected setpoint, the cooling contact will be closed.

Fan speed

There are two possibilities to control the fan speed:


- Manually by means of the three-speed fan switch on the thermostat for continuous operation
- Automatically by switching to the select fan speed via the thermostat for controlled operation. In that case – prior to commissioning – the jumper positions corresponding to the functions must be selected. There are three choices of jumper positions available on printed circuit board:

SR1  **Select fan speed as continuous operation**

SR2 **Auto**  **Fan is switched with the cooling valve**

SR3 **Auto**  **Fan is switched with the heating valve**

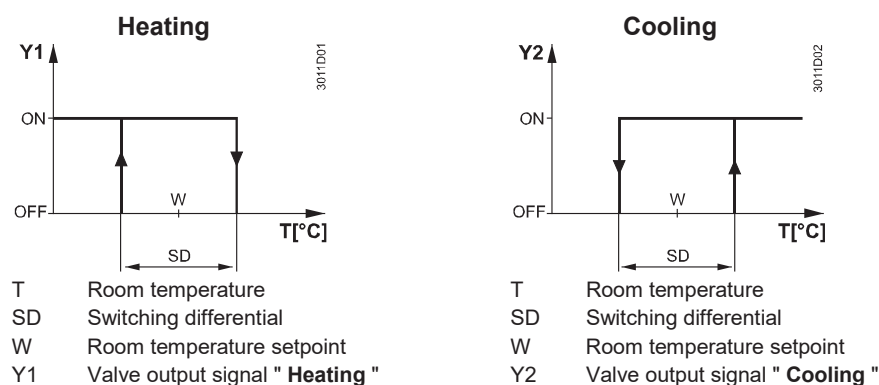
Ventilation

When the ventilation function is selected  (RAB21.1 only) on the front cover of the slide switch, the heating and cooling contacts are always open and the fan operates at the selected speed.

Changeover

If required, heating or cooling can be selected externally (aquastat).

Function diagrams



Type summary

Two-pipe fan coil room thermostat for use with 3-speed fan, external (automatic) changeover	RAB21
Two-pipe fan coil room thermostat for use with 3-speed fan, external (automatic) changeover and ventilation function	RAB21.1

Equipment combinations

Type of unit	Type reference	Data sheet ^{*)}
Motoric on/off actuator	SFA21..	4863
Thermal actuator (for radiator valve)	STA21..	4893
Thermal actuator (for small valve 2.5 mm)	STP21..	4878
Electromotoric actuator for zone valve VVI46.. (2 position on/off)	SUA21..	4830

^{*)} The documents can be downloaded from <http://siemens.com/bt/download>.

Accessories

Description	Type reference
Adapter plate 120 x 120 mm for 4" x 4" conduit boxes	ARG70
Adapter plate 96 x 120 mm for 2" x 4" conduit boxes	ARG70.1
Adapter plate for surface wiring 112x130 mm	ARG70.2

Technical design

Key features of the RAB21.. fan coil room thermostat:

- Two-position control
- Gas-filled diaphragm

Adjustments

The required temperature can be selected by a setpoint adjuster on the front of thermostat.

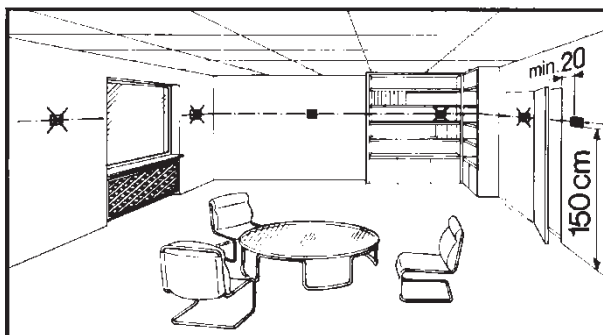
The setpoint setting range can be mechanically limited by means of setpoint limiter under the cover.

Notes

Mounting, installation and commissioning

The thermostat should be located where the air temperature can be sensed as accurately as possible, without getting adversely affected by direct solar radiation or other heat or refrigeration sources.

Mounting height is about 1.5 m above the floor.



The unit can be fitted to most commercially available recessed conduit boxes or directly on the wall.



Warning: AC 250 V!

Only authorised personnel may open the unit to perform service.

The unit must be isolated from the mains supply before opening.

When installing the unit, fix the base plate, first then hook on the thermostat body and make the electrical connections. Then fit the cover and secure it (also refer to separate mounting instructions).

The thermostat must be mounted on a flat wall.

The local electrical regulations must be complied with.

If there are thermostatic radiator valves in the reference room, set them to their fully open position.



Warning!

No internal line protection for supply lines to external consumers (Q1, Q2, Q3, Y1, Y2)

Risk of fire and injury due to short-circuits!

- Adapt the line diameters as per local regulations to the rated value of the installed overcurrent protection device.

Maintenance

The room thermostat is maintenance-free.

Mechanical design

The diaphragm is filled with environmentally friendly gas.
The thermostat housing is made of plastic.

Ordering

Type (ASN)	Part number (SSN)	Description
RAB21	S55770-T227	Room thermostat RAB21
RAB21.1	S55770-T228	Room thermostat RAB21.1

Disposal

The devices are considered electronics devices for disposal in term 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.

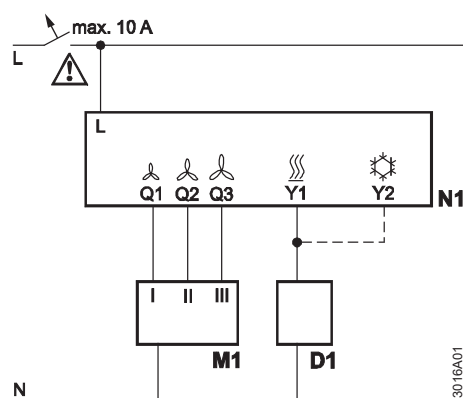
Technical data

Power supply		Switching capacity	
		Voltage	AC 24...250 V
		Current	0.2...6 (2) A
		Frequency	50 or 60 Hz
No internal fuse			
External preliminary protection with max. C 10 A circuit breaker in the supply line required under all circumstances			
		Screw terminals for	2 x 1.5 mm ² (min. 0.5 mm ²)
Operational data	Switching differential SD		≤1 K
	Setpoint setting range		8...30 °C
Environmental conditions	Operation		to IEC 60721-3-3
	Climatic conditions		Class 3K5
	Temperature		0...50 °C
	Humidity		<95 % r.h.
	Pollution degree		normal, to EN 60730-1
	Transport / storage		to IEC 60721-3-2
	Climatic conditions		Class 2K3/1K3
	Temperature		-20...50 °C
	Humidity		<95 % r.h.
	Mechanical conditions		Class 2M2
Industry standards	EU Conformity (CE)		CE1T3015xx ¹⁾
	RCM Conformity		CE1T3561en_C1 ¹⁾
	Safety standard		II to EN 60730-1
	Degree of protection of housing		IP30 to EN 60529
Environmental compatibility	The product environmental declaration CE1E3015 ¹⁾ contains data on environmentally compatible product design and assessments (RoHS compliance, materials composition, packaging, environmental benefit, disposal).		
Mechanical design	Weight		0.14 kg
	Colour		white, NCS S 0502-G (RAL 9003)

¹⁾ The documents can be downloaded from <http://siemens.com/bt/download>.

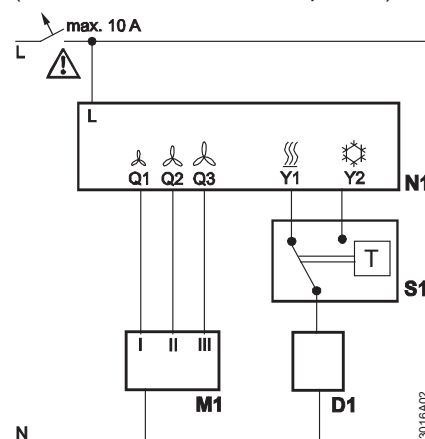
Connection diagrams

Heating or cooling



- D1 Zone valve or thermal valve for **heating or cooling**
L Switching voltage AC 24...250 V
N Neutral
M1 3-speed fan
N1 Room thermostat
Q1 Control output "Fan speed I", AC 24...250 V
Q2 Control output "Fan speed II", AC 24...250 V
Q3 Control output "Fan speed III", AC 24...250 V
Y1 Control output "Valve actuator **heating**", AC 24...250 V
Y2 Control output "Valve actuator **cooling**", AC 24...250 V

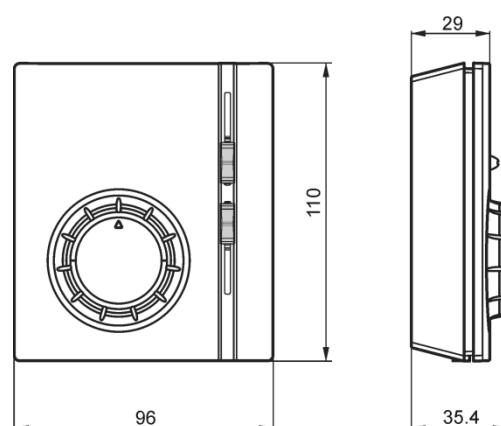
Changeover for heating or cooling (with external automatic aquastat)



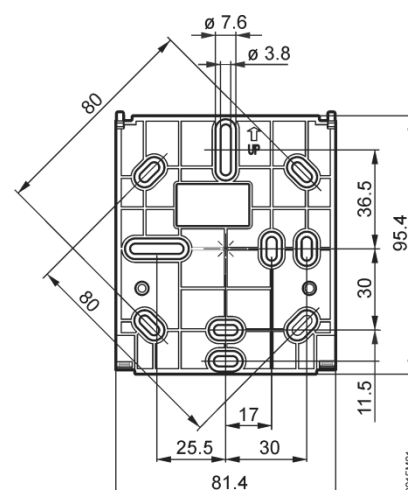
- D1 Zone valve or thermal valve for **heating or cooling** via Aquastat
L Switching voltage AC 24...250 V
N Neutral
M1 3-speed fan
N1 Room thermostat
Q1 Control output "Fan speed I", AC 24...250 V
Q2 Control output "Fan speed II", AC 24...250 V
Q3 Control output "Fan speed III", AC 24...250 V
Y1 Control output "Valve actuator **heating**", AC 24...250 V
Y2 Control output "Valve actuator **cooling**", AC 24...250 V
S1 Aquastat e.g. RYT182

Dimensions

Room thermostat



Base plate



Remarks

Heating:

Because of the unavoidable self heating effects of the electrical current, any loads of more than 3 Amperes connected to the unit can influence the control behavior and temperature accuracy in a negative way.

Cooling:

Because of the unavoidable self heating effects of the electrical current, any loads of more than 1 Amperes connected to the unit can influence the control behavior and temperature accuracy in a negative way.



RAB 31



RAB31.1

Room Thermostats

RAB31..

For four-pipe fan coils

-
- Room thermostat with manual switch for heating or cooling
 - Two-position control
 - Manual three-speed fan switch
 - Switching voltage AC 24...250 V
 - Control output ON/OFF

Use

The room RAB31.. thermostat is used in heating or cooling systems to maintain the selected room temperature.




Typical use:

- Commercial buildings
- Residential buildings
- Light industrial buildings

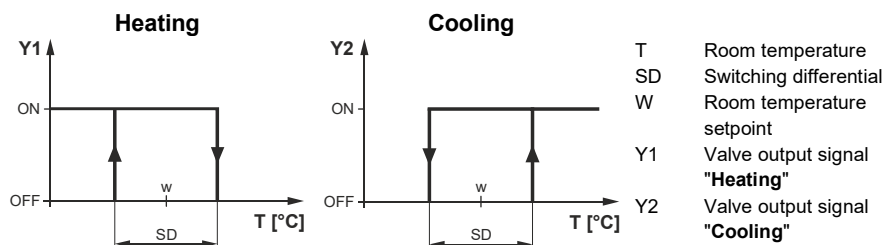
In conjunction with

- zone valves
- thermal valves
- fans

Functions

- Heating** If the room temperature falls below the selected setpoint, the heating contact will close.
- Cooling** If the room temperature exceeds the selected setpoint, the cooling contact will close.
- Fan speed** There are two possibilities to control the fan speed:
- Manually by means of the three - speed fan switch on the thermostat for continuous operation
 - Automatically by switching to the selected fan speed via the thermostat for controlled operation. In that case – prior to commissioning – the jumper positions corresponding to the thermostat function must be selected. There are two choices of jumper positions available on printed circuit board:
- SR1  **Selected fan speed as continuous operation**
- SR2 **Auto**  **Fan is switched at the same time as the cooling or heating valve, depending on the switch position.**
- Ventilation** When the ventilation function  is selected (RAB31.1) on the cover by setting the slide switch, the heating and cooling contacts are always open and the fan operates at the selected speed.
- Changeover** Heating or cooling is selected with a switch located on the front of the thermostat.

Function diagrams



Type summary

Four-pipe fan coil room thermostat for use with 3-speed fan, manual changeover	RAB31
Four-pipe fan coil room thermostat for use with 3-speed fan, manual changeover and ventilation function	RAB31.1

Equipment combinations

Type of unit	Type reference	Data sheet ¹⁾
Motoric on/off actuator	SFA21..	4863
Thermal actuator (for radiator valve)	STA21..	4893
Thermal actuator (for small valve 2,5 mm)	STP21..	4878
Electromotoric actuator for zone valve VV146.. (2 position on / off)	SUA21..	4830

¹⁾ The documents can be downloaded from <http://siemens.com/bt/download>.

Accessories

Description	Type reference
Adapter plate 120 x 120 mm for 4" x 4" conduit boxes	ARG70
Adapter plate 96 x 120 mm for 2" x 4" conduit boxes	ARG70.1
Adapter plate for surface wiring 112x130 mm	ARG70.2

Technical design

Key features of the RAB31.. fan coil room thermostat:

- Two-position control
- Gas-filled diaphragm

Adjustments

The required temperature can be selected by a setpoint adjuster on the front of thermostat.

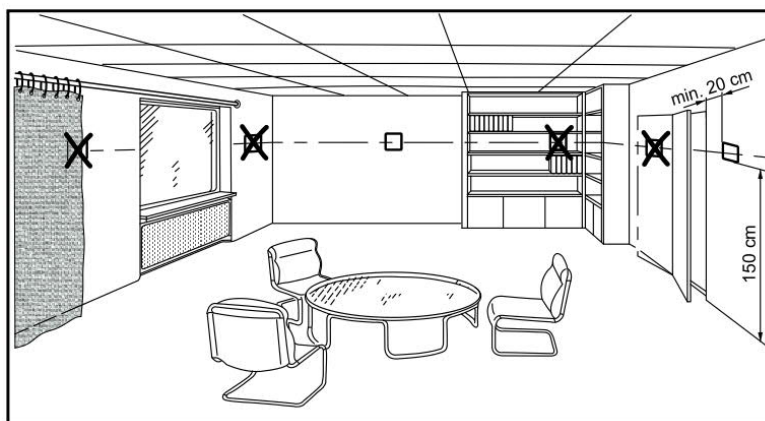
The setpoint setting range can be mechanically limited by means of setpoint limiter under the cover.

Notes

Mounting, installation and commissioning

The thermostat should be located where the air temperature can be sensed as accurately as possible, without getting adversely affected by direct solar radiation or other heat or refrigeration sources.

Mounting height is about 1.5 m above the floor.



The unit can be fitted to most commercially available recessed conduit boxes or directly on the wall.



Warning: AC 250 V!

Only authorised personnel may open the unit to perform service.

The unit must be isolated from the mains supply before opening.

When installing the unit, fix the base plate first then hook on the thermostat body and make the electrical connections. Then fit the cover and secure it (also refer to separate mounting instructions).

The thermostat must be mounted on a flat wall.

The local electrical regulations must be complied with.

If there are thermostatic radiator valves in the reference room, set them to their fully open position.



Warning!

No internal line protection for supply lines to external consumers (Q1, Q2, Q3, Y1, Y2)

Risk of fire and injury due to short-circuits!

- Adapt the line diameters as per local regulations to the rated value of the installed overcurrent protection device.

Maintenance

The room thermostat is maintenance-free.

Mechanical design

The gas bellows is filled with environmentally friendly gas.

The thermostat housing is made of plastic.

Ordering

Type (ASN)	Part number (SSN)	Description
RAB31	S55770-T229	Room thermostat RAB31
RAB31.1	S55770-T230	Room thermostat RAB31.1

Disposal



The device is considered an electronic device for disposal in accordance with the European Guidelines and may not be disposed of as domestic garbage.

- 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



Switching capacity	
Voltage	AC 24...250 V
Current	0.2...6 (2) A
Frequency	50 or 60 Hz



No internal fuse

External preliminary protection with max. C 10 A circuit breaker in the supply line required under all circumstances

Screw terminals for	2 x 1.5 mm ² (min. 0.5 mm ²)
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Operational data

Switching differential SD	≤1 K
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Setpoint setting range	8...30 °C
------------------------	-----------

Environmental conditions

Operation	to IEC 60721-3-3
Climatic conditions	Class 3K5
Temperature	0...+50 °C
Humidity	<95 % r.h.
Pollution degree	normal, to EN 60730-1

Transport / storage	to IEC 60721-3-2
Climatic conditions	Class 2K3/1K3
Temperature	-20...50 °C
Humidity	<95 % r.h.
Mechanical conditions	Class 2M2

Industry standards

EU Conformity (CE)	CE1T3015xx ¹⁾
RCM Conformity	CE1T3561en_C1 ¹⁾
Safety standard	II to EN 60730-1
Degree of protection of housing	IP30 to EN 60529

Environmental
compatibility

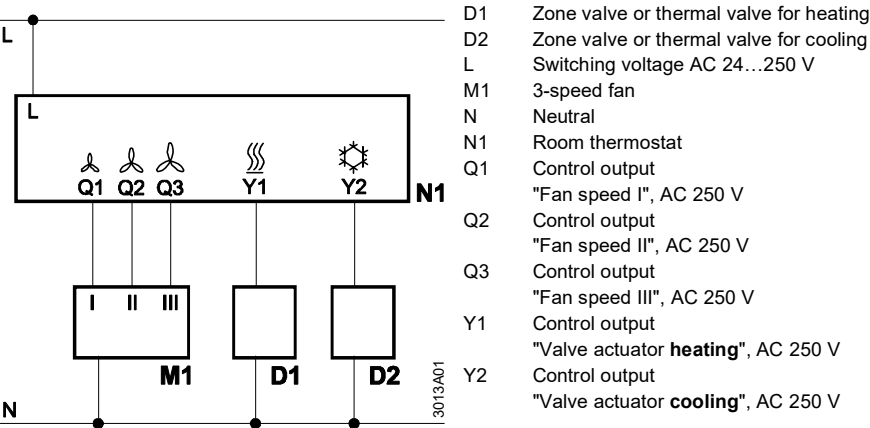
The product environmental declaration CE1E3015¹⁾ contains data on environmentally compatible product design and assessments (RoHS compliance, materials composition, packaging, environmental benefit, disposal).

Mechanical design

Weight	0.14 kg
Colour	white, NCS S 0502-G (RAL 9003)

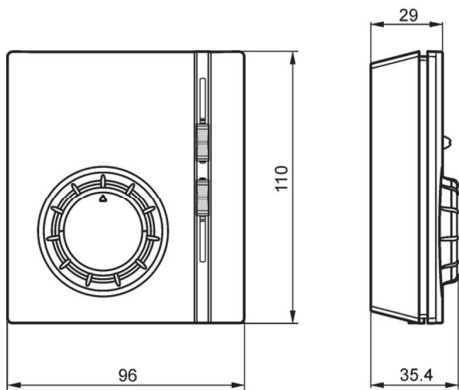
¹⁾ The documents can be downloaded from <http://siemens.com/bt/download>.

Connections diagram

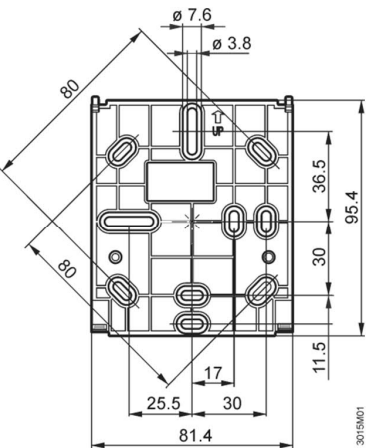


Dimensions

Room thermostat



Base plate



Remarks

Heating:

Because of the unavoidable self heating effects of the electrical current, any loads of more than 3 Amperes connected to the unit can influence the control behavior and temperature accuracy in a negative way.

Cooling:

Because of the unavoidable self heating effects of the electrical current, any loads of more than 1 Amperes connected to the unit can influence the control behavior and temperature accuracy in a negative way.



Fan Speed Switch

RAB91

Simple fan speed switch with three speed-levels (0-I-II-III)

Use

The RAB91 is used in heating or cooling systems to select the fan speed. Typical use can be in commercial, residential or light industrial buildings.

Mechanical design

The unit consists of a base plate and a top cover.
The fan speed can be selected with a 4-position-slider-switch (0-I-II-III).

Accessories

Functionality	Order number (ASN)
Adapterplate 120 x 120 mm for 4" x 4" conduit boxes	ARG70
Adapterplate 96 x 120 mm for 2" x 4" conduit boxes	ARG70.1

Notes



Caution: 250 V!

The unit can be fitted to most commercially available recessed conduit boxes or directly on the wall.

Only authorized personnel may open the unit to perform service.
The unit must be isolated from the mains supply before opening.

When installing the unit, fix the base plate first then hook on the fan speed switch body and make the electrical connections. Then fit the cover and secure it (also refer to separate mounting instructions).

The fan speed switch must be mounted on a flat wall.

The local electrical regulations must be complied with.



Warning!

No internal line protection for supply lines to external consumers (Q1, Q2, Q3)

Risk of fire and injury due to short-circuits!

- Adapt the line diameters as per local regulations to the rated value of the installed overcurrent protection device.

Maintenance

The fan speed switch is maintenance-free. The housing is plastic.

Ordering

Type (ASN)	Part number (SSN)	Description
RAB91	S55770-T231	Room thermostat RAB91

Disposal



The devices are considered electronics devices for disposal in term 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



Switching capacity
Voltage
Current
Frequency

AC 24...250 V
0.2...6(2.5) A
50 or 60 Hz



No internal fuse

External preliminary protection with max. C 10 A circuit breaker in the supply line required under all circumstances

Screw terminals for 2 x 1.5 mm² (min. 0.5 mm²)

Environmental conditions

Operation
Climatic conditions Class 3K5
Temperature -10...+50 °C
Humidity <95 % r.h.
Pollution degree normal, according to EN 60730-1

Transport / Storage
Climatic conditions to IEC 60721-3-2
Class 2K3/1K3
Temperature -20...+50 °C
Humidity <95 % r.h.
Mechanical conditions Class 2M2

Industry standards

EU Conformity (CE) CE1T3015xx^{*)}

RCM Conformity CE1T3561en_C1^{*)}

Safety standard II to EN 60730-1

Degree of protection of housing IP30 to EN 60529

Environmental compatibility

The product environmental declaration CE1E3561^{*)} contains data on environmentally compatible product design and assessments (RoHS compliance, materials composition, packaging, environmental benefit, disposal).

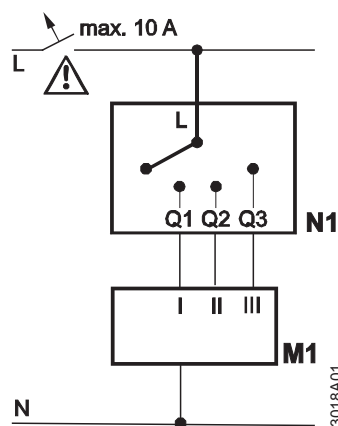
Mechanical design

Weight 0.12 kg

Colour white, NCS S 0502-G (RAL 9003)

^{*)} The documents can be downloaded from <http://siemens.com/bt/download>.

Connection diagram

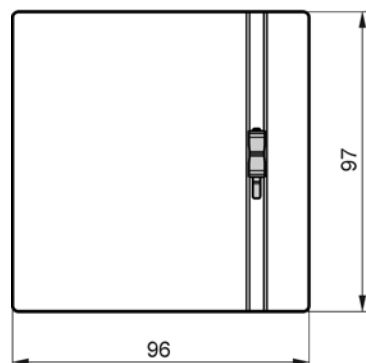


L Switching voltage max. AC 250 V
N Neutral
N1 Fan speed switch
M1 3-speed fan
Q1 Control output fan speed I, AC 250 V
Q2 Control output fan speed II, AC 250 V
Q2 Control output fan speed III, AC 250 V

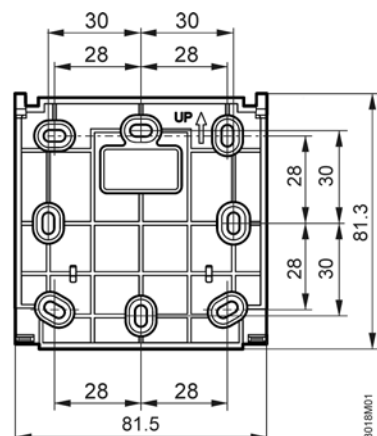
3018A01

Dimensions

Room thermostat



Base plate



Remarks

Heating:

Because of the unavoidable self heating effects of the electrical current, any loads of more than 3 Amperes connected to the unit can influence the control behavior and temperature accuracy in a negative way.

Cooling:

Because of the unavoidable self heating effects of the electrical current, any loads of more than 1 Amperes connected to the unit can influence the control behavior and temperature accuracy in a negative way.



Room Temperature Controllers for two-pipe fan coil units

RCC10...

Output for on / off valve actuator
Outputs for three-speed fan
Control depending on the room or return air temperature (RCC10)
Automatic heating / cooling changeover
Operating modes of RCC10: normal, energy saving and frost protection mode or OFF
Operating modes of RCC10.1: normal and energy saving mode or OFF
Operating mode changeover input for remote control
Function for avoiding damage resulting from moisture (RCC10.1)
Selectable control parameters (RCC10)
Operating voltage AC 230 V

Use

Typical use:

- Control of the room temperature in individual rooms that are heated or cooled with two-pipe fan coil units.
- For opening or closing a valve and for switching a three-speed fan.

Suitable for use in systems with

- automatic heating / cooling changeover
- continuous heating or cooling operation.

Functions

The controller acquires the room temperature with its integrated sensor or external room temperature sensor (QAA32) or external return air temperature sensor (QAH11.1) – if used (optional with the RCC10) – and maintains the setpoint by delivering control commands to the 2-point-valve.

The switching differential with the

- RCC10 is adjustable; it can be 1 or 4 K in heating mode and 0.5 or 2 K in cooling mode
- RCC10.1 is fixed; it is 2 K in heating mode and 1 K in cooling mode

Fan operation

The fan is switched to the selected speed via control output Q1, Q2 or Q3.

When the function “Temperature-dependent fan control” is activated (can be selected with DIP switch no.1), the fan is switched on / off depending on the temperature, that is, together with the valve.

It is switched off by

- leaving the heating or cooling sequence, provided the function “Temperature-dependent fan control” is activated, or
- manually changing to standby (⏻), provided plant conditions do not call for frost protection mode (only with the RCC10), or
- activating an external operating mode changeover switch, provided plant conditions do not call for energy saving or frost protection mode (only with the RCC10), or
- turning the controller's power supply off.

Heating and cooling mode

ON

The heating or cooling valve receives the **OPEN** command via control output Y11 when

1. the measured room temperature lies by half the switching differential below the setpoint (heating mode) or above the setpoint (cooling mode), and
2. the valve has been fully closed for more than one minute.

OFF

The heating or cooling valve receives the **CLOSE** command via control output Y11 when

1. the measured room temperature lies by half the switching differential above the setpoint (heating mode) or below the setpoint (cooling mode), and
2. the valve has been fully open for more than one minute.

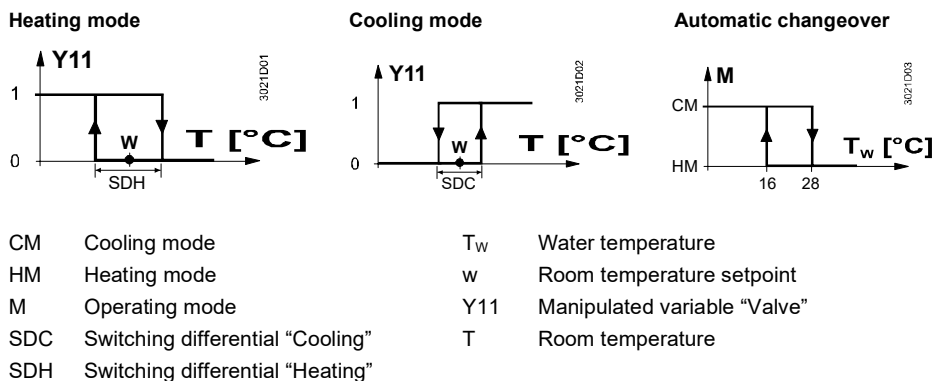
Note: control output Y12 delivers a control command which is inverted to the control command at output Y11 and can be used for normally open valves

Return air temperature

The RCC10 provides control either depending on the measured room temperature or depending on the fan coil unit's return air temperature. Changeover is automatic if a QAH11.1 cable temperature sensor is connected.

Automatic changeover

The water temperature acquired by the changeover sensor (QAH11.1 + ARG86.3) is used by the controller to switch from heating to cooling mode, or vice versa. When the water temperature lies above 28 °C, the controller switches to heating mode, below 16 °C it switches to cooling mode. If, immediately after switching on, the water temperature lies between the 2 changeover points, the controller will start in heating mode. The water temperature is measured at minute-intervals and the operational status updated.



Purging function

The task of the changeover sensor is to initiate the change from heating to cooling mode even if the two-port valves are shut down for a longer period of time. To ensure this function, the valves are opened for one minute at 2-hour intervals during off hours. (Note: this function is not effective when using thermal actuators)

Energy saver

The room temperature setpoint can be limited in increments of 1 K by making use of the minimum and maximum limitation facility. Arbitrary setpoint readjustments can thus be prevented.

Operating modes

The following operating modes are available:

Normal operation

Heating or cooling mode with automatic changeover and with manually selected fan speed III, II or I. In normal operation, the controller maintains the adjusted setpoint.

Frost protection mode (only with the RCC10)

The frost protection function is activated only when DIP switch no.4 is set to OFF. Frost protection mode can be activated either

- by manually switching to standby (⏻).
- by activating the external operating mode changeover switch, provided DIP switch no.2 is set to OFF

If the room temperature falls below 8 °C, the controller will automatically switch to frost protection mode. In that case, the heating valve opens and the fan operates at the selected speed. If the operating mode selector is in position standby (⏻), the fan will operate at speed I. The room temperature is maintained at a setpoint of 8 °C and the setpoint adjusted by the user will be ignored.

If frost protection mode is locked (DIP switch no.4 in position ON), standby is locked also, which means that the controller will not switch to standby but to OFF:

Energy saving mode

In energy saving mode, the setpoint of heating is 16 °C and the setpoint of cooling 28 °C, independent of the position of the setpoint knob. This operating mode will be activated when input D1 for operating mode changeover is active and DIP switch no.2 is set to ON.

Avoiding damage resulting from moisture

(only with the RCC10.1)

Operating mode changeover switch

To avoid damage due to moisture in very warm or humid climatic zones resulting from lack of air circulation in energy saving mode, the fan will not be switched off when selecting the function "Temperature-independent fan control" (with DIP switch no.1)

A changeover switch can be connected to status input D1-GND. When the switch closes its contact (caused by an open window, for instance), the operating mode will change from normal operation to energy saving mode (provided DIP switch no.2 is set to ON), or from normal operation to standby (provided DIP switch no.2 is set to OFF). If the room temperature falls below 8 °C and if DIP switch no.3 is set to OFF, frost protection mode will become active.

The operating action of the switch (N.C. or N.O.) can be selected.

Type summary

Type reference	Features
RCC10	With input for return air temperature sensor
RCC10.1 *)	Without input for return air temperature sensor, without frost protection function

*) Type is not orderable any more

Ordering

When ordering, please give name and type reference.

The QAH11.1 temperature sensor (can be used as a return air temperature or changeover sensor), the changeover sensor mounting kit and the valves are to be ordered as separate items.

Equipment combinations

Type of unit	Type reference	Data sheet ^{*)}
Temperature sensor	QAH11.1	1840
Room sensor	QAA32	1747
Changeover mounting kit	ARG86.3	1840
Motoric on/off actuator	SFA21...	4863
Thermal actuator (for radiator valve)	STA21...	4893
Thermal actuator (for small valve 2,5 mm)	STP21...	4878

*) The documents can be downloaded from <http://siemens.com/bt/download>.

Mechanical design

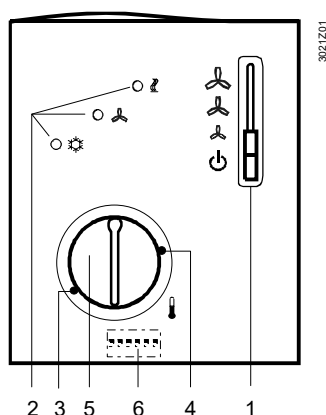
The unit consists of two parts:

- A plastic housing which accommodates the electronics, the operating elements and the built-in room temperature sensor
- A mounting base


The housing engages in the mounting base and snaps on.

The base carries the screw terminals. The DIP switches are located at the rear of the housing.

Setting and operating elements



Legend

1. Operating mode selector
(standby , heating or cooling mode with manual selection of fan speed)
2. LEDs for indicating heating mode, cooling mode and fan operation
3. Setting facility for minimum setpoint limitation
(in increments of 1 K)
4. Setting facility for maximum setpoint limitation
(in increments of 1 K)
5. Room temperature setpoint knob

6 Set of DIP switches

DIP switch no.	Meaning	Position ON	Position OFF
1	Fan control	Fan control is temperature-dependent in all operating modes	Fan control in normal operation (and in energy saving mode with the RCC10.1) is temperature independent ¹⁾
2	Operating mode changeover via external switch	Changeover between normal operation and energy saving mode	Changeover between normal operation and standby ¹⁾
3 ²⁾	Operating action of switch for external operating mode changeover	Changeover activated when contact of switch is closed (N.O.) ¹⁾	Changeover activated when contact of switch is open (N.C.)
4 ²⁾	Standby	Frost protection function not enabled	Frost protection function enabled ¹⁾
5 ²⁾	Switching differential	1 K in heating mode ¹⁾ 0.5 K in cooling mode ¹⁾	4 K in heating mode 2 K in cooling mode

1) Factory setting

2) Only with the RCC10

The RCC10.1 comes with the following fixed settings:

- Switching differential in heating mode: 2 K
- Switching differential in cooling mode: 1 K
- Standby: OFF, no frost protection
- Operating action of switch for external operating mode changeover: N.O.

Accessories

Description	Type reference
Adapter plate 120 x 120 mm for 4" x 4" conduit boxes	ARG70
Adapter plate 96 x 120 mm for 2" x 4" conduit boxes	ARG70.1
Adapter plate for surface wiring 112x130 mm	ARG70.2

In systems with automatic changeover, the temperature sensor can be replaced by an external switch for manual changeover.

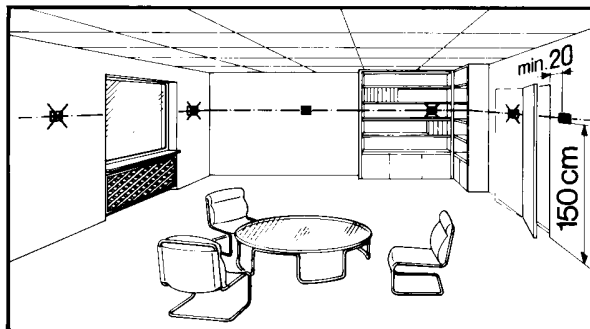
In systems with continuous heating operation, no sensor will be connected to the controller's input.

With continuous cooling operation, the controller input (B2–M) must be bridged.

Mounting, installation and commissioning notes

Mounting location: on a wall or inside the fan coil unit. Not in niches or bookshelves, not behind curtains, above or near heat sources and not exposed to direct solar radiation.

Mounting height is about 1.5 m above the floor. The connecting wires can be run to the controller from a recessed conduit box.



Check the settings of the DIP switches no.1 through no.5 (with the RCC10) and of no.1 and no.2 (with the RCC10.1) and change them, if required. If setpoint limitation is required, use the minimum and maximum limitation facility (energy saver). After applying power, the controller makes a reset during which the fan LED flashes, indicating that the reset has been correctly made. This takes about 3 seconds. Then, the controller will be ready to operate.

- Prior to fitting the changeover sensor, thermal conductive paste must be applied to the location on the pipe where the sensor is placed
- The cables used must satisfy the insulation requirements with regard to mains potential
- Sensor inputs B1–M and B2–M carry mains potential. If the sensor's cables must be extended, the cables used must be suited for mains voltage

Warning!

No internal line protection for supply lines to external consumers (Q1, Q2, Q3, Y11, Y12)

Risk of fire and injury due to short-circuits!

- Adapt the line diameters as per local regulations to the rated value of the installed overcurrent protection device.

The controller is supplied with Mounting Instructions.

Disposal



The device is considered an electronic device for disposal in accordance with European Directive and may not be disposed of as domestic waste.

- Use only designated channels for disposing the devices.
- Comply with all local and currently applicable laws and regulations.

Technical data

 Power supply

Operating voltage	AC 230 V + 10/-15 %
Frequency	50/60 Hz
Power consumption	
RCC10	max. 8 VA
RCC10.1	max. 6 VA



No internal fuse

External preliminary protection with max. C 10 A circuit breaker in the supply line required under all circumstances

Control outputs Q1, Q2, Q3	AC 230 V
Rating	max. 600 VA
Control output Y11 (N.O. contact)	AC 230 V
Rating	max. 300 VA
Control output Y12 (N.C. contact)	AC 230 V
Rating	max. 300 VA
Signal input B1 for return air sensor	QAH11.1, Safety class II NTC resistor 3kΩ at 25°C
Signal input B2 for changeover-sensor	QAH11.1, Safety class II NTC resistor 3kΩ at 25°C




Status input D1 and GND

Contact sensing	SELV DC 6-15V / 3-6 mA
Insulation against mains	4 kV, extra insulation
Operating action	
With the RCC10	selectable (N.O. / N.C.)
With the RCC10.1	(N.O.)

Perm. cable length with copper cable 1.5 mm²
for connection to terminals B1, B2 and D1

80 m

Operational data

Setpoint setting range	8...30 °C
Max. control deviation at 25 °C	max. ±0.7 K
Switching differential in heating mode SDH (selectable)	1 K or 4 K
Switching differential in cooling mode SDC (selectable)	0.5 K or 2 K
Setpoint «Energy saving mode  », heating	16 °C
Setpoint «Energy saving mode  », cooling	28 °C
Setpoint «Standby  »	8 °C

Environmental conditions

Operation

Climatic conditions	to IEC 60721-3-3
Temperature	class 3K5
Humidity	0...+50 °C <95 % r.h.

Transport

Climatic conditions	to IEC 60721-3-2
Temperature	class 2K3
Humidity	-25...+70 °C <95 % r.h.
Mechanical conditions	class 2M2

Storage

Climatic conditions	to IEC 60721-3-1
Temperature	class 1K3
Humidity	-25...+70 °C <95 % r.h.

Norms and standards

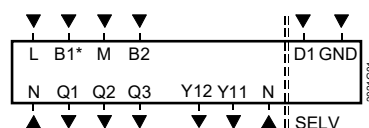
EU Conformity (CE)	CE1T3020xx *)
RCM Conformity	CE1T3020en C1*)
Safety class	II to EN 60 730-1

Environmental
compatibility

General

Pollution class	normal
Degree of protection of housing	IP 30 to EN 60 529
*) The documents can be downloaded from http://siemens.com/bt/download .	
The product environmental declaration CE1E3020 ^{*)} contains data on environmentally compatible product design and assessments (RoHS compliance, materials composition, packaging, environmental benefit, disposal).	
Connection terminals	Use solid wires or prepared stranded wires. 2 x 0.4-1.5 mm ² or 1 x 2.5 mm ²
Weight	0.25 kg
Colour of housing front	white, NCS S 0502-G (RAL9003)
*) The documents can be downloaded from http://siemens.com/bt/download .	

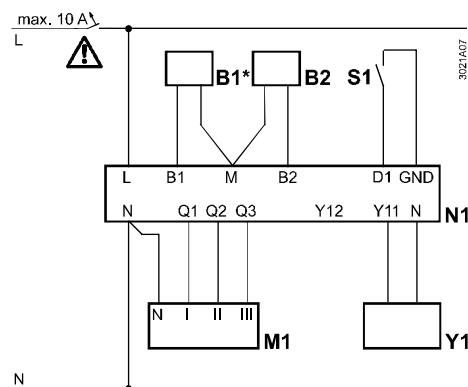
Connection terminals



- L, N Operating voltage AC 230 V
- B1* Status input "Return air temperature sensor"
- M Measuring neutral "Return air temperature sensor"
- B2 Status input "Changeover sensor"
- D1, GND Status input for potential-free operating mode changeover switch
(operating action can be selected)
- Q1 Control output "Fan speed I" AC 230 V
- Q2 Control output "Fan speed II" AC 230 V
- Q3 Control output "Fan speed III" AC 230 V
- Y11 Control output "Valve" AC 230 V
(N.O. contact, for N.C. valves)
- Y12 Control output "Valve" AC 230 V
(N.C. contact, for N.O. valves)

* Only with the RCC10

Connection diagrams

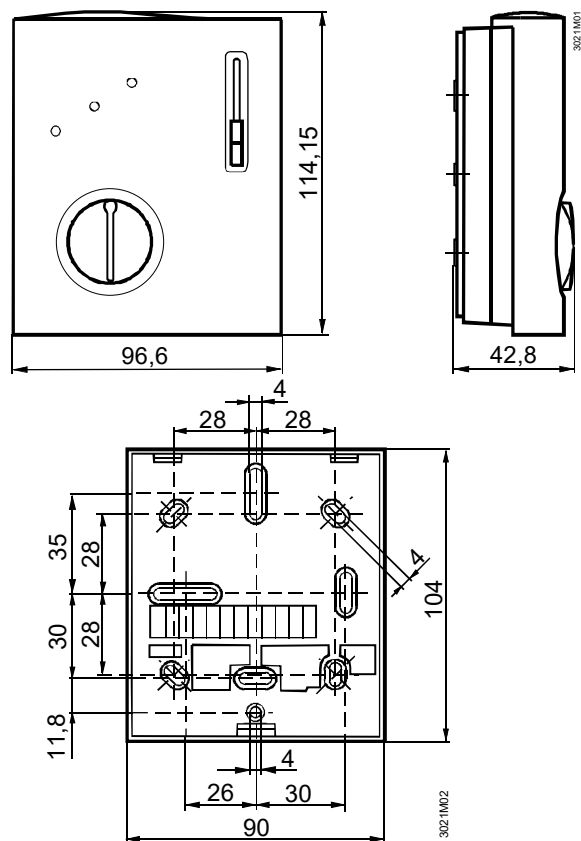


- B1* Return air temperature sensor (QAH11.1)
- B2 Changeover sensor
(QAH11.1 temperature sensor + ARG86.3 changeover mounting kit)
- M1 Three-speed fan
- N1 RCC10 / RCC10.1 room temperature controller
- S1 External operating mode changeover switch
- Y1 MVE... / MXE... zone valve

* Only with the RCC10

Dimensions

Unit/baseplate





Room Temperature Controller

RCC20

for two-pipe fan coil units with electrical heater

Outputs for on / off valve actuator and electrical heater

Output for three-speed fan

Control depending on the room or return air temperature

Automatic heating / cooling changeover

Operating modes: normal, energy saving and frost protection mode or OFF

Operating mode changeover input for remote control

Selectable control parameters

Operating voltage AC 230 V

Use

Typical use:

- Control of the room temperature in individual rooms that are heated or cooled with two-pipe fan coil units equipped with an electrical heater.
- For opening or closing a valve
- for switching an electrical heater
- for switching a three-speed fan.

Functions

The controller acquires the room temperature with its integrated sensor or external room temperature sensor (QAA32) or external return air temperature sensor (QAH11.1) – if used – and maintains the setpoint by delivering control commands to the 2-point-valve. The switching differential can be 1 or 4 K in heating mode and 0.5 or 2 K in cooling mode.

Fan operation

The fan is switched to the selected speed via control output Q1, Q2 or Q3.

When the function "Temperature-dependent fan control" is activated (can be selected with DIP switch no.1), the fan is switched on / off depending on the temperature, that is, together with the valve.

It is switched off by

- leaving the heating or cooling sequence, provided the function "Temperature-dependent fan control" is activated, or
- manually changing to standby (⏻), provided plant conditions do not call for frost protection mode, or
- activating an external operating mode changeover switch, provided plant conditions do not call for energy saving or frost protection mode, or
- by turning the controller's power supply off.

Note

To avoid overtemperatures of the electrical heater or to prevent the thermal cutout from responding, the fan will overrun for 30 seconds when the electrical heater is switched off. During that period of time, the fan LED flashes.



In the event of failure, the RCC20 cannot protect the electric heater against over-temperatures. For this reason, the electric heater must be equipped with a separate safety device (thermal cutout).

Heating and cooling mode

ON

The heating or cooling valve receives the **OPEN** command via control output Y11 when

1. the measured room temperature lies by half the switching differential below the setpoint (heating mode) or above the setpoint (cooling mode), and
2. the valve has been fully closed for more than one minute.

OFF

The heating or cooling valve receives the **CLOSE** command via control output Y11 when

1. the measured room temperature lies by half the switching differential above the setpoint (heating mode) or below the setpoint (cooling mode), and
2. the valve has been fully open for more than one minute.

Note: control output Y12 delivers a control command which is inverted to the control command at output Y11 and can be used for normally open valves

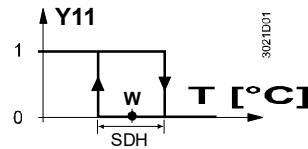
Return air temperature

The RCC20 provides control either depending on to the measured room temperature or depending on the fan coil unit's return air temperature. Changeover is automatic if a QAH11.1 cable temperature sensor is used.

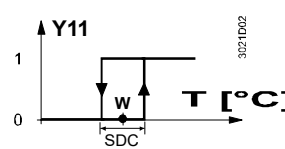
Automatic changeover

The water temperature acquired by the changeover sensor (QAH11.1 + ARG86.3) is used by the controller to switch from heating to cooling mode, or vice versa. When the water temperature lies above 28 °C, the controller switches to heating mode, below 16 °C it switches to cooling mode. If, immediately after switching on, the water temperature lies between the 2 changeover points, the controller will start in heating mode. The water temperature is measured at minute-intervals and the operational status updated.

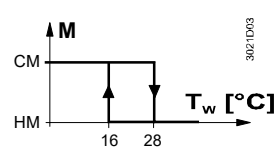
Heating mode



Cooling mode



Automatic changeover



CM	Cooling mode	T_w	Water temperature
HM	Heating mode	w	Room temperature setpoint
M	Operating mode	Y11	Manipulated variable "Valve"
SDC	Switching differential "Cooling"	T	Room temperature
SDH	Switching differential "Heating"		

Purging function

The task of the changeover sensor is to initiate the change from heating to cooling mode even if the two-port valves are shut down for a longer period of time. To ensure this function, the valves are opened for one minute at 2-hour intervals during off hours. (Note: this function is not active when using thermal actuators).

Electric heating operation, active in the heating sequence

In addition to hot water heating operation, the electrical heater receives an **ON** command via Y21 when

- the measured room temperature is $x \leq w - w_D - \frac{1}{2} \text{SDH}$, and
- the electrical heater has been switched off for more than one minute.

The **OFF** command for the electrical heater is given when

- the measured room temperature is $x \geq w - w_D + \frac{1}{2} \text{SDH}$, and
- the electrical heater has been switched on for more than one minute.

When two heating sequences are selected, the two outputs cannot be switched ON the same time. Two outputs must be switched ON separately with at least 1 minute delay. In case of set-point change, the two heaters are allowed to switch OFF together.

Electric heating operation, active in the cooling sequence

For this operation, DIL switch no.8 must be set to **ON** (factory setting).

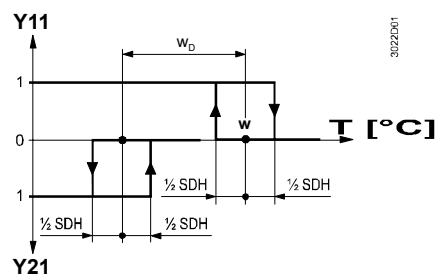
The electrical heater receives the ON command via control output Y21 when

- the measured room temperature lies by half the switching differential below the adjusted setpoint, and
- the electrical heater has been switched off for more than one minute.

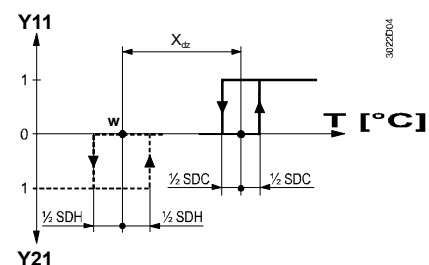
The **OFF** command for the electrical heater is given when

- the measured room temperature lies by half the switching differential above the adjusted setpoint, and
- the electrical heater has been switched on for more than one minute.

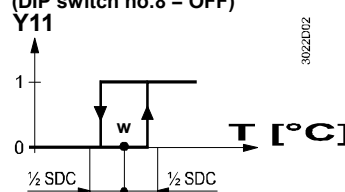
Heating mode (hot water plus electric)



Cooling mode with optional electric heating sequence (DIP switch no.8 = ON)



Cooling mode (chilled water) (DIP switch no.8 = OFF)



T[°C]	Room temperature	w	Room temperature setpoint
Y11	Manipulated variable«Valve»	Y21	Manipulated variable «Electric heating»
SDH	Switching differential "Heating"	w _D	Setpoint differential
Xdz	Dead zone	SDC	Switching differential "Cooling"

Energy saver

The room temperature setpoint can be limited in increments of 1 K by making use of the minimum and maximum limitation facility. Arbitrary setpoint readjustments can thus be presented.

Operating modes

	The following operating modes are available:
Normal operation	Heating or cooling mode with automatic changeover and with manually selected fan speed III, II or I. In normal operation, the controller maintains the adjusted setpoint.
Frost protection mode	<p>The frost protection function is activated only when DIP switch no.4 is set to OFF. Frost protection mode can be activated either</p> <ul style="list-style-type: none"> • by manually switching to standby (⏻). • by activating the external operating mode changeover switch, provided DIP switch 2 is set to OFF <p>If the room temperature falls below 8 °C, the controller will automatically switch to frost protection mode. In that case, the heating valve opens and the fan operates at the selected speed. If the selector is in position standby (⏻), the fan will operate at speed I. The room temperature is maintained at a setpoint of 8 °C and the setpoint adjusted by the user will be ignored.</p> <p>If frost protection operation is locked (DIP switch no. 4 in position ON), standby is locked also, which means that the controller will not switch to standby but to OFF.</p>
<i>Note</i>	In frost protection mode, the electrical heater is always enabled, independent of the position of DIL switch no.8 (behaviour of electrical heater in cooling mode).
Energy saving mode	In energy saving mode, the setpoint of heating is 16°C and the setpoint of cooling 28 °C, independent of the position of the setpoint knob. This operating mode will be activated when input D1 for operating mode changeover is active and DIP switch no.2 is set to ON.
Operating mode changeover switch	<p>A changeover switch can be connected to status input D1–GND. When the switch closes its contact (caused by an open window, for instance), the operating mode will change from normal operation to energy saving mode (provided DIP switch no.2 is set to ON), or from normal operation to standby (provided DIP switch no.2 is set to OFF). If the room temperature falls below 8 °C and if DIP switch no.4 is set to OFF, frost protection mode will become active.</p> <p>The operating action of the switch (N.C. or N.O) can be selected.</p>

Ordering

When ordering, please give name and type reference.

The QAH11.1 temperature sensor (can be used as a return air temperature or changeover sensor), the changeover mounting kit and the zone valve are to be ordered as separate items.

Equipment combinations

Type of unit	Type reference	Data sheet ^{*)}
Temperature sensor	QAH11.1	1840
Room sensor	QAA32	1747
Changeover mounting kit	ARG86.3	1840
Motric on/off actuator	SFA21...	4863
Thermal actuator (for radiator valve)	STA21...	4893
Thermal actuator (for small valve 2,5 mm)	STP21...	4878

*) The documents can be downloaded from <http://siemens.com/bt/download>.

Mechanical design

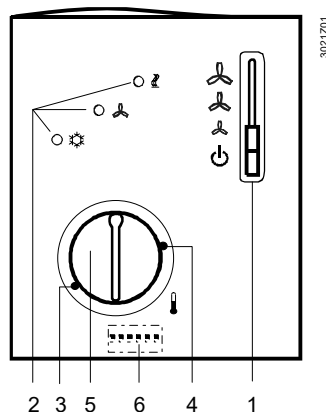
The unit consists of two parts:

- A plastic housing which accommodates the electronics, the operating elements and the built-in room temperature sensor
- A mounting base

The housing engages in the mounting base and snaps on.

The base carries the screw terminals; the DIP switches are located at the rear of the housing.

Setting and operating elements



Legend

1. Operating mode selector
(standby, heating or cooling mode with manual selection of fan speed)
2. LEDs for indicating heating mode, cooling mode and fan operation
3. Setting facility for minimum setpoint limitation (in increments of 1 K)
4. Setting facility for maximum setpoint limitation (in increments of 1 K)
5. Room temperature setpoint knob

6 Set of DIP switches

DIP switch no.	Meaning	Position ON	Position OFF
1	Fan control	Fan control is temperature-dependent in all operating modes	Fan control in normal operation is temperature-independent ¹⁾
2	Operating mode changeover via an external switch	Changeover between normal operation and energy saving mode	Changeover between normal operation and standby ¹⁾
3	Operating action of switch for external operating mode changeover	Changeover activated when contact of switch is closed (N.O.) ¹⁾	Changeover activated when contact of switch is open (N.C.)
4	Standby	Frost protection function not enabled	Frost protection function enabled ¹⁾

5	Switching differential	1 K in heating mode ¹⁾ 0.5 K in cooling mode ¹⁾	4 K in heating mode 2 K in cooling mode
6	Dead zone in normal operation	2 K ¹⁾	5 K
7	Setpoint differential	2 K ¹⁾	4 K
8	Electrical heater	Active in cooling mode ¹⁾	Inactive in cooling mode

1) Factory setting

Accessories

Description	Type reference
Adapter plate 120 x 120 mm for 4" x 4" conduit boxes	ARG70
Adapter plate 96 x 120 mm for 2" x 4" conduit boxes	ARG70.1
Adapter plate for surface wiring 112x130 mm	ARG70.2

Engineering notes

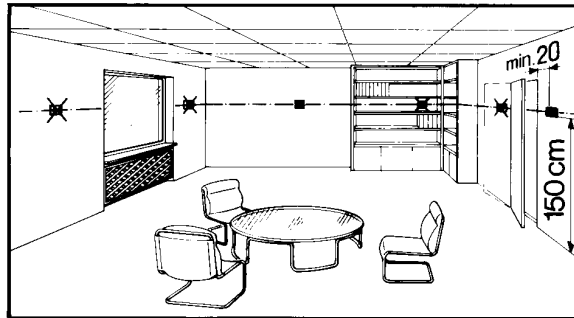
Mounting, installation and commissioning notes

In system without automatic changeover, the temperature sensor can be replaced by an external switch for manual changeover.

In system with continuous heating operation, no sensor will be connected to the controller's input.

With continuous cooling operation, the controller input (B2–M) must be bridged.

Mounting location: on a wall or inside the fan coil unit. Not in niches or bookshelves, not behind curtains, above or near heat sources and not exposed to direct solar radiation. Mounting height is about 1.5 m above the floor. The connecting wires can be run to the controller from a recessed conduit box.



Check the settings of the DIL switches no.1 through no.8 and change them, if required. If setpoint limitation is required, use the minimum and maximum limitation facility (energy saver).

After applying power, the controller makes a reset during which the fan LED flashes indicating that the reset has been correctly made. This takes about 3 seconds. Then, the LED stops flashing and the controller will be ready to operate.

- Prior to fitting the changeover sensor, thermal conductive paste must be applied to the location on the pipe where the sensor is placed
- The cables used must satisfy the insulation requirements with regard to mains potential
- Sensor inputs B1–M and B2–M carry mains potential. If the sensor's cables must be extended, the cables used must be suited for mains voltage



Warning!

No internal line protection for supply lines to external consumers (Q1, Q2, Q3, Y11, Y12, Y21)

Risk of fire and injury due to short-circuits!

- Adapt the line diameters as per local regulations to the rated value of the installed overcurrent protection device.

The controller is supplied with Mounting Instructions.

Disposal



The device is considered an electronic device for disposal in accordance with European Directive and may not be disposed of as domestic waste.

- Use only designated channels for disposing the devices.
- Comply with all local and currently applicable laws and regulations.

Technical data

 Power supply

Operating voltage	AC 230 V +10/-15 %
Frequency	50/60 Hz
Power consumption	max. 8 VA



No internal fuse




External preliminary protection with max. C 10 A circuit breaker in the supply line required under all circumstances

Control outputs Q1, Q2, Q3	AC 230 V
Rating	max. 600 VA
Control output Y11 (N.O. contact)	AC 230 V
Rating	max. 300 VA
Control output Y12 (N.C. contact)	AC 230 V
Rating	max. 300 VA
Control output Y21 (N.O. contact)	AC 230 V
Rating	max. 1250 VA
Signal input B1 for return air sensor	QAH11.1, Safety class II NTC resistor 3kΩ at 25°C
Signal input B2 for changeover-sensor	QAH11.1, Safety class II NTC resistor 3kΩ at 25°C

Status input D1 and GND	
Contact sensing	SELV DC 6-15V / 3-6 mA
Insulation against mains	4 kV, extra insulation

Perm. cable length with copper cable 1.5 mm ² for connection to terminals B1, B2 and D1	80 m
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Operational data

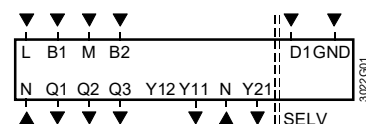
Setpoint setting range	8...30 °C
Max. control deviation at 25 °C	max. ±0.7 K
Switching differential in heating mode SDH (selectable)	1 K or 4 K
Switching differential in cooling mode SDC (selectable)	0.5 K or 2 K
Dead zone Xdz in normal operation	2 K or 5 K
Setpoint «Energy saving mode  », heating	16 °C
Setpoint «Energy saving mode  », cooling	28 °C
Setpoint «Standby  »	8 °C

Environmental conditions

Operation	to IEC 60721-3-3
Climatic conditions	class 3K5
Temperature	0...+50 °C
Humidity	<95 % r.h.
Transport	to IEC 60721-3-2
Climatic conditions	class 2K3
Temperature	-25...+70 °C
Humidity	<95 % r. h..
Mechanical conditions	class 2M2

Norms and standards	Storage	to IEC 60721-3-1
	Climatic conditions	class 1K3
	Temperature	–25...+70 °C
	Humidity	<95 % r. h..
	EU Conformity (CE)	CE1T3020xx *)
Environmental compatibility	RCM Conformity	CE1T3020en_C1 *)
	Safety class	II to EN 60 730-1
	Pollution class	normal
General	Degree of protection of housing	IP30 to EN 60 529
	The product environmental declaration CE1E3020*) contains data on environmentally compatible product design and assessments (RoHS compliance, materials composition, packaging, environmental benefit, disposal).	
General	Connection terminals	Use solid wires or prepared stranded wires. 2 x 0.4-1.5 mm ² or 1 x 2.5 mm ²
	Weight	0.23 kg
	Colour of housing front	white, NCS S 0502-G (RAL9003)
	*) The documents can be downloaded from http://siemens.com/bt/download .	

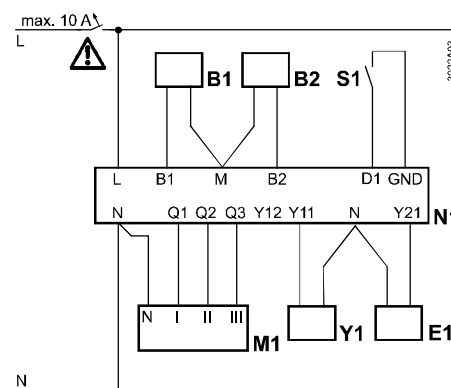
Connection terminals



L, N	Operating voltage AC 230 V
B1	Status input "Return air temperature sensor"
M	Measuring neutral "Return air temperature sensor and changeover sensor"
B2	Status input "Changeover sensor"

D1, GND	Status input for potential-free operating mode changeover switch (operating action can be selected)
Q1	Control output "Fan speed I" AC 230 V
Q2	Control output "Fan speed II" AC 230 V
Q3	Control output "Fan speed III" AC 230 V
Y11	Control output "Valve" AC 230 V (N.O. contact, for N.C. valves)
Y12	Control output "Valve" AC 230 V (N.C. contact, for N.O. valves)
Y21	Control output "Electric heating" AC 230 V

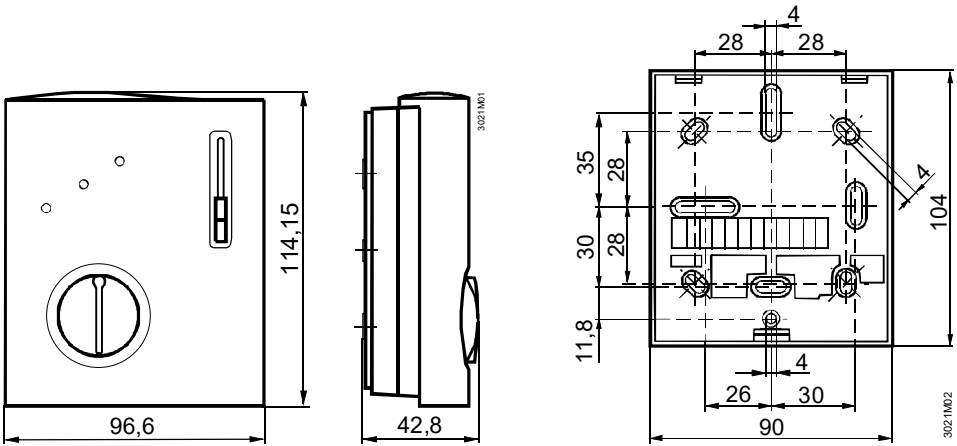
Connection diagram



B1	Return air temperature sensor (QAH11.1)
B2	Changeover sensor (QAH11.1 temperature sensor + ARG863.3 changeover mounting kit)
E1	Electrical heater
M1	Three-speed fan
N1	RCC20 room temperature controller
S1	External operating mode changeover switch
Y1	MVE..., MXE... zone valve

Dimensions

Unit/baseplate





Room Temperature Controller

for four-pipe fan coil units

RCC30

Outputs for on / off valve actuators
Outputs for three-speed fan
Control depending on room or return air temperature
Operating modes: normal, energy saving and frost protection or OFF
Operating mode changeover input for remote control
Selectable control parameters
Operating voltage AC 230 V

Use

Typical use:

- Control of the room temperature in individual rooms that are heated or cooled with four-pipe fan coil units.
- For opening or closing a valve
- for switching a three-speed fan.

Functions

The controller acquires the room temperature with its integrated sensor or external room temperature sensor (QAA32) or external return air temperature sensor (QAH11.1) - if used - and maintains the setpoint by delivering control commands to the 2-point-valve.

The switching differential is adjustable. It can be 1 or 4 K in heating mode and 0.5 or 2 K in cooling mode.

Fan operation

The fan is switched to the selected speed via control output Q1, Q2 or Q3.

When the function "Temperature-dependent fan control" is activated (can be selected with DIP switch no.1), the fan is switched on / off depending on the temperature, that is, together with the valve.

It is switched off by

- leaving the heating or cooling sequence, provided the function "Temperature-dependent fan control " is activated, or
- manually changing to standby (⏸), provided plant conditions do not call for frost protection mode, or
- activating an external operating mode changeover switch, provided plant conditions do not call for energy saving or frost protection mode, or
- turning the controller's power supply off.

Heating mode

ON

The heating valve receives the **OPEN** command via control output Y11 when

1. the measured room temperature lies by half the switching differential below the setpoint, and
2. the heating valve has been fully closed for more than one minute.

OFF

The heating valve receives the **CLOSE** command via control output Y11 when

1. the measured room temperature lies by half the switching differential above the setpoint, and
2. the heating valve has been fully open for more than one minute.

Cooling mode

ON

The cooling valve receives the **OPEN** command via control output Y21 when

1. the measured room temperature lies by half the switching differential plus the dead zone above the setpoint ($x \geq w + x_{dz} + \frac{1}{2} SDC$) and
2. the cooling valve has been closed for more than one minute.

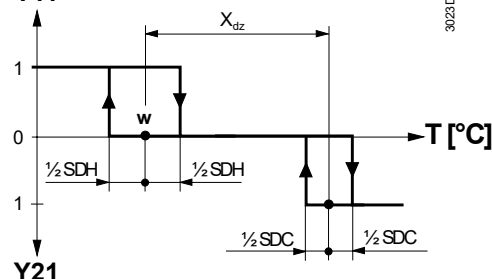
OFF

The cooling valve receives the **CLOSE** command via control output Y21 when

1. the measured room temperature lies by half the switching differential plus the dead zone below the setpoint ($x > w + x_{dz} - \frac{1}{2} SDC$) and
2. the cooling valve has been open for more than one minute.

Heating / cooling mode

Y11



T	Room temperature
SDH	Switching differential "Heating"
SDC	Switching differential "Cooling"
X_{dz}	Dead zone
w	Room temperature setpoint
Y11	Manipulated variable "Heating valve"
Y21	Manipulated variable "Cooling valve"

Return air temperature

The RCC30 provides control either depending on the measured room temperature or depending on the fan coil unit's return air temperature. Changeover is automatic if a QAH11.1 cable temperature sensor is connected to the device.

Energy saver The room temperature setpoint can be limited in increments of 1 K by making use of the minimum and maximum limitation facility. Arbitrary setpoint readjustments can thus be prevented.

Operating modes

The following operating modes are available:

Normal operation Heating or cooling mode with automatic changeover and with manually selected fan speed III, II or I. In normal operation, the controller maintains the adjusted setpoint in heating mode and, in cooling mode, a temperature level represented by the setpoint plus the dead zone.

Frost protection mode The frost protection function is activated only when DIP switch no.4 is set to OFF. Frost protection mode can be activated either

- by manually switching to standby (⏻)
- by activating the external operating mode changeover switch, provided DIP switch no.2 is set to OFF

If the room temperature falls below 8 °C, the controller will automatically switch to frost protection mode. In that case, the heating valve opens and the fan operates at the selected speed. If the operating mode selector is in position standby (⏻), the fan will operate at speed I. The room temperature is maintained at a setpoint of 8 °C and the setpoint adjusted by the user will be ignored.

If frost protection mode is locked (DIP switch no.4 in position ON), standby is locked also, which means that the controller will not switch to standby but to OFF.

Energy saving mode In energy saving mode, the setpoint of heating is 16 °C and the setpoint of cooling 28 °C, independent of the position of the setpoint knob. This operating mode will be activated when input D1 for operating mode changeover is active and DIP switch no.2 is set to ON.

Operating mode changeover switch A changeover switch can be connected to status input D1-GND. When the switch closes its contact (caused by an open window, for instance), the operating mode will change from normal operation to energy saving mode (provided DIP switch no.2 is set to ON), or from normal operation to standby (provided DIP switch no.2 is set to OFF). If the room temperature falls below 8 °C and if DIP switch no.4 is set to OFF, frost protection mode will become active.

The operating action of the switch (N.C. or N.O.) can be selected.

Ordering

When ordering, please give name and type reference.

The QAH11.1 temperature sensor (used as a return air temperature sensor) and zone valves are to be ordered as separate items.

Equipment combinations

Type of unit	Type reference	Data sheet ^{*)}
Temperature sensor	QAH11.1	1840
Room sensor	QAA32	1747
Motoric on/off actuator	SFA21...	4863
Thermal actuator (for radiator valve)	STA21...	4893
Thermal actuator (for small valve 2,5 mm)	STP21...	4878

^{*)} The documents can be downloaded from <http://siemens.com/bt/download>.

The unit consists of two parts:

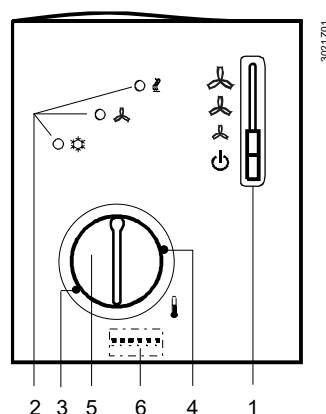
- A plastic housing which accommodates the electronics, the operating elements and the built-in room temperature sensor
- A mounting base

The housing engages in the mounting base and snaps on.

The base carries the screw terminals.

The DIP switches are located at the rear of the housing.

Setting and operating elements



Legend

1. Operating mode selector
(standby (⏻), heating or cooling mode with manual selection of fan speed)
2. LEDs for indicating heating mode, cooling mode and fan operation
3. Setting facility for minimum setpoint limitation
(in increments of 1 K)
4. Setting facility for maximum setpoint limitation
(in increments of 1 K)
5. Room temperature setpoint knob

6. Set of DIP switches

DIP switch no.	Meaning	Position ON	Position OFF
1	Fan control	Fan control is temperature-dependent in all operating modes	Fan control in normal operation is temperature-independent ¹⁾
2	Operating mode changeover via external switch	Changeover between normal operation and energy saving mode	Changeover between normal operation and standby ¹⁾
3	Operating action of switch for external operating mode changeover	Changeover activated when contact of switch is closed (N.O.) ¹⁾	Changeover activated when contact of switch is open (N.C.)
4	Standby	Frost protection function not enabled	Frost protection function enabled ¹⁾
5	Switching differential	1 K in heating mode ¹⁾ 0.5 K in cooling mode ¹⁾	4 K in heating mode 2 K in cooling mode
6	Dead zone in normal operation	2 K ¹⁾	5 K

1) Factory setting

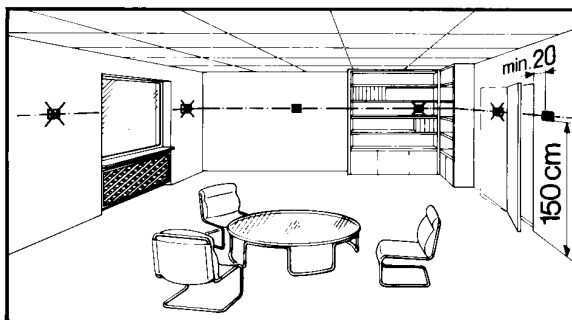
Accessories

Description	Type reference
Adapter plate 120 x 120 mm for 4" x 4" conduit boxes	ARG70
Adapter plate 96 x 120 mm for 2" x 4" conduit boxes	ARG70.1
Adapter plate for surface wiring 112x130 mm	ARG70.2

Engineering notes

Mounting, installation and commissioning notes

Mounting location: on the wall or inside the fan coil unit. Not in niches or bookshelves, not behind curtains, above or near heat sources and not exposed to direct solar radiation. Mounting height is about 1.5 m above the floor. The connecting wires can be run to the controller from a recessed conduit box.



Check the settings of the DIP switches no.1 through no.6 and change them if required. If setpoint limitation is required, use the minimum and maximum limitation facility (energy saver).

After applying power, the controller makes a reset during which the fan LED flashes, indicating that the reset has been correctly made. This takes about 3 seconds. Then, the controller will be ready to operate and the LED stops flashing,



- The cables used must satisfy the insulation requirements with regard to mains potential.
- Sensor input B1-M carries mains potential. If the sensor's cables must be extended, the cables used must be suited for mains voltage



Warning!

No internal line protection for supply lines to external consumers (Q1, Q2, Q3, Y11, Y12)

Risk of fire and injury due to short-circuits!

- Adapt the line diameters as per local regulations to the rated value of the installed overcurrent protection device.

The controller is supplied with Mounting Instructions.


Disposal



The device is considered an electronic device for disposal in accordance with the European Guidelines and may not be disposed of as domestic garbage.

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

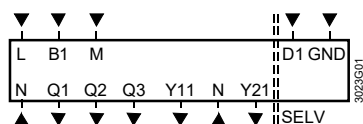
Technical data

Power supply	Operating voltage	AC 230 V + 10/-15 %
	Frequency	50/60 Hz
	Power consumption	max. 8 VA
	No internal fuse	
Operational data	External preliminary protection with max. C 10 A circuit breaker in the supply line required under all circumstances	
	Control outputs Q1, Q2, Q3	AC 230 V
	Rating	max. 600 VA
	Control output Y11, Y21 (N.O. contacts)	AC 230 V
	Rating	max. 300 VA
	Signal input B1 for return air sensor	QAH11.1, Safety class II NTC resistor 3kΩ at 25°C
	Status input D1 and GND	
	Contact sensing	SELV DC 6-15 V / 3-6 mA
	Insulation against mains	4 kV
	Perm. cable length with copper cable 1.5 mm ² for connection to terminals B1, B2 and D1	80 m
	Setpoint setting range	8...30 °C
	Max. control deviation at 25 °C	max. ±0.7 K
	Switching differential in heating mode SDH (selectable)	1 K or 4 K
	Switching differential in cooling mode SDC (selectable)	0.5 K or 2 K
	Dead zone in normal operation	2 K or 5 K
Environmental conditions	Setpoint «Energy saving mode ☺», heating	16 °C
	Setpoint «Energy saving mode ☺», cooling	28 °C
	Setpoint «Standby ☹»	8 °C
	Operation	to IEC 60721-3-3
	Climatic conditions	class 3K5
	Temperature	0...+50 °C
	Humidity	<95 % r.h.
	Transport	to IEC 60721-3-2
	Climatic conditions	class 2K3
	Temperature	-25...+70 °C
	Humidity	<95 % r.h.
	Mechanical conditions	class 2M2
	Storage	to IEC 60721-3-1
	Climatic conditions	class 1K3
	Temperature	-25...+70 °C
	Humidity	<95 % r.h.
Norms and standards	EU Conformity (CE)	CE1T3020xx *)
	RCM Conformity	CE1T3020en_C1 *)
	Safety class	II to EN 60 730-1
	Pollution class	normal
	Degree of protection of housing	IP30 to EN 60 529
Environmental compatibility	The product environmental declaration CE1E3020*) contains data on environmentally compatible product design and assessments (RoHS compliance, materials composition, packaging, environmental benefit, disposal).	

*) The documents can be downloaded from <http://siemens.com/bt/download>.

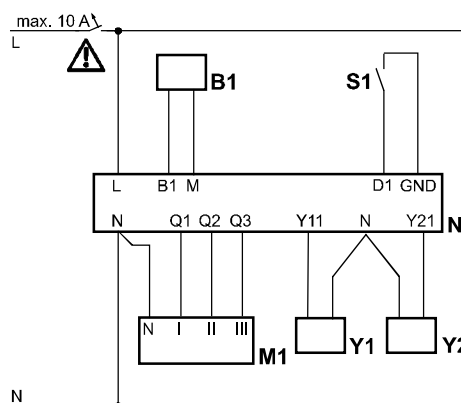
General	Connection terminals	Use solid wires or prepared stranded wires. 2 x 0.4-1.5 mm ² or 1 x 2.5 mm ²
	Weight	0.23 kg
	Colour of housing front	White, NCS S 0502-G (RAL9003)

Connection terminals



L, N	Operating voltage AC 230 V
B1	Status input "Return air temperature sensor"
M	Measuring neutral "Return air temperature sensor"
D1, GND	Status input for potential-free operating mode changeover switch (operating action can be selected)
Q1	Control output "Fan speed I", AC 230 V
Q2	Control output "Fan speed II", AC 230 V
Q3	Control output "Fan speed III", AC 230 V
Y11	Control output "Valve", AC 230 V
Y21	Control output "Valve", AC 230 V

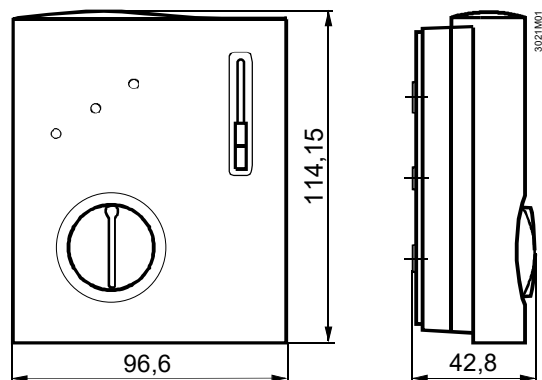
Connection diagram



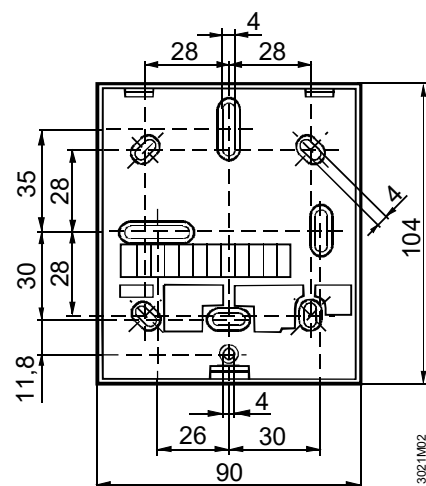
B1	Return air temperature sensor (QAH11.1)
M1	Three-speed fan
N1	RCC30 room temperature controller
S1	External operating mode changeover switch
Y1	Zone valve MVE.../ MXE... for heating mode
Y2	Zone valve MVE.../ MXE... for cooling mode

Dimensions

unit



baseplate





RCU10



RCU10.1

Room Temperature Controllers

for heating and cooling systems

RCU10...

Choice of two-position or modulating PI control
 ON / OFF or PWM outputs for heating and cooling
 Operating modes: normal operation, energy saving and standby
 Operating mode selector (RCU10.1)
 Operating mode changeover input for remote control
 Operating voltage AC 230 V

Use

Control of the room temperature in individual rooms of ventilation or air conditioning plants that are heated or cooled with radiators, chilled ceilings, etc.

For the control of the following pieces of equipment:

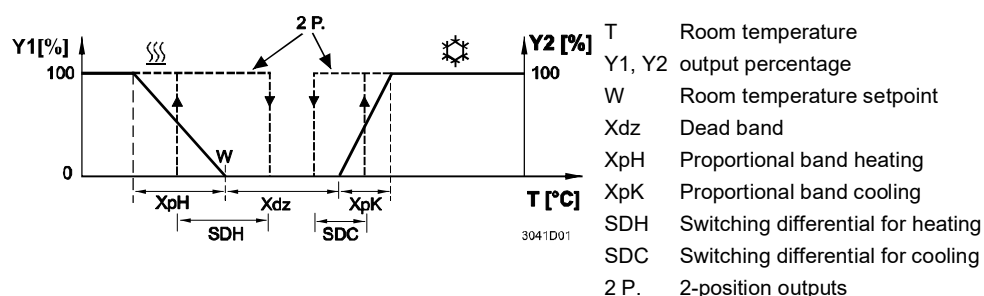
- Thermic or electric valve actuators
- Damper actuators
- Electric heaters

Functions

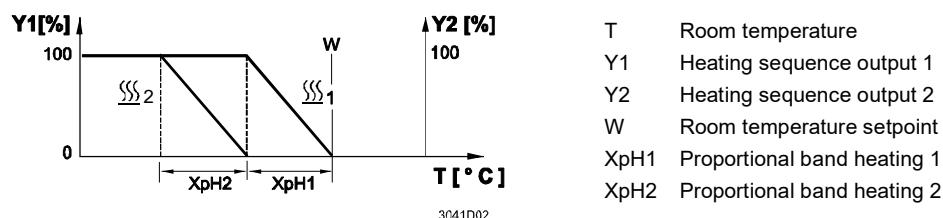
The controller acquires the room temperature with its integrated sensor and maintains the setpoint by delivering control commands. It is possible to choose PI control with PWM actuating commands or two-position control with ON / OFF actuating commands.

The proportional band or the switching differential can be 1 or 4 K in heating mode and 0.5 or 2 K in cooling mode (selectable). The integration time cannot be adjusted and is 10 minutes. The operating sequence "Heating – cooling or heating – heating" can be selected with DIP switch no. 7.

Function diagram "Heating-cooling"

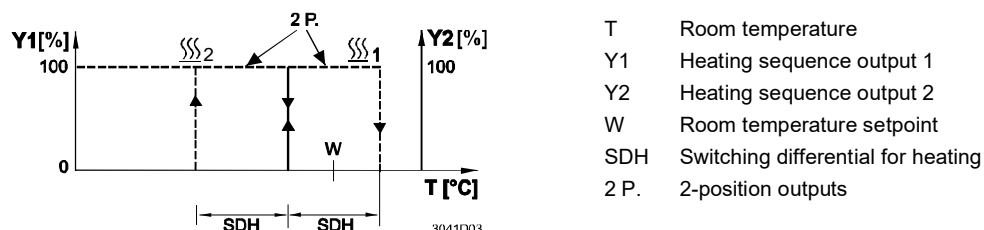


Function diagram "Heating-heating" with PWM output



When two heating sequences are selected, the two outputs cannot be switched ON at the same time. Two outputs are switched ON separately with at least 10 seconds delay. In case of set-point change, the two heaters are allowed to switch OFF together.

Function diagram "Heating-heating" with 2 position output



Pulse width modulation

If actuating signal "Pulse width modulation" (PWM) is selected with DIP switches no. 5 and no. 6, the output is activated and deactivated for a certain period of time, proportional to the calculated manipulated variable and following an interval.

The interval of the PWM actuating signal can be selected as follows:

Heating and cooling (DIP switch 7 on position ON)

Y1 interval can be selected with DIP switch 8 and is either 240 s or 90 s.

Y2 interval is 240 s and cannot be changed.

Heating 2-stage (DIP switch 7 on position OFF)

Y1 interval is 240 s and cannot be changed.

Y2 interval can be selected with DIP switch 8 and is either 240 s or 90 s.

Note Output Y1 (heating): when used in connection with thermic actuators, the selected interval should be 240 seconds. When using electric heaters, it should be 90 seconds.

Caution When used in connection with electric valve actuators, DIP switches no. 5 and no. 6 must be set to ON for two-position control.

PWM actuating signals may never be used for driving electric actuators!

Energy saver The room temperature setpoint can be limited in increments of 1 K by making use of the minimum and maximum limitation facility. Arbitrary setpoint readjustments can thus be prevented.

Operating modes

	The following operating modes are available:
Normal operation	Normal operation is activated when the operating mode selector is set to “☀” (RCU 10.1) and the external operating mode changeover switch is not activated. In normal operation, the controller maintains the adjusted setpoint.
Frost protection mode	<p>Frost protection mode can be activated either</p> <ul style="list-style-type: none"> by manually switching to standby (⏻) (RCU10.1) by activating the external operating mode changeover switch, provided DIP switch no. 1 is set to OFF <p>If the room temperature falls below 8 °C, the controller will automatically switch to frost protection mode. In that case, the heating valve opens and the room temperature is maintained at a setpoint of 8 °C. The setpoint adjusted by the user will be ignored.</p>
Energy saving mode	<p>Energy saving mode can be activated either</p> <ul style="list-style-type: none"> by manually switching to energy saving mode “☾” (RCU10.1). by activating the external operating mode changeover switch, provided DIP switch no. 1 is set to ON <p>In energy saving mode, the setpoint of heating is 16 °C and the setpoint of cooling 28 °C, independent of the position of the setpoint knob.</p>
Operating mode changeover switch	<p>A changeover switch can be connected to status input D1–GND. When the switch activates (caused by an open window, for instance), the operating mode will change from normal operation or standby to energy saving mode (provided DIP switch no. 1 is set to ON), or from normal operation or energy saving mode to standby (provided DIP switch no. 1 is set to OFF).</p> <p>The operating action of the switch (N.C. or N.O.) can be selected.</p>

Type summary

Type reference	Features
RCU10	Without operating mode selector
RCU10.1 *)	With operating mode selector

*) Type is not orderable any more

Ordering

When ordering, please give name and type reference, e.g. room temperature controller RCU10.
Valve and air damper actuators are to be ordered as separate items.

Equipment combinations

Type of unit	Type reference	Data sheet ¹⁾
Motoric on/off actuator	SFA21...	4863
Thermal actuator (for radiator valve)	STA21...	4893
Thermal actuator (for small valve 2,5 mm)	STP21...	4878
Air damper actuators	GCA32...1	4613

*) The documents can be downloaded from <http://siemens.com/bt/download>.

Mechanical design

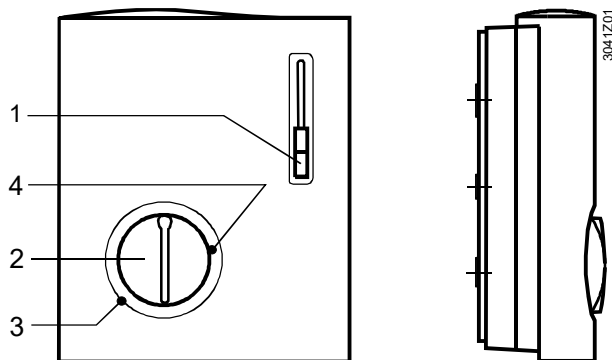
The unit consists of two parts:

- A plastic housing which accommodates the electronics, the operating elements and the built-in room temperature sensor
- A mounting base

The housing engages in the mounting base and snaps on.

The base carries the screw terminals. The DIP switches are located at the rear of the unit.

Setting and operating elements



Legend

- 1 Operating mode selector (RCU10.1)
(normal operation, energy saving mode and standby)
- 2 Room temperature setpoint knob
- 3 Setting facility for minimum setpoint limitation
(in increments of 1 K)
- 4 Setting facility for maximum setpoint limitation
(in increments of 1 K)

Set of DIP switches

DIP switch no.	Meaning	Position ON	Position OFF
1	Operating mode changeover via external switch	Changeover from normal operation or standby to energy saving mode	Changeover from normal operation or energy saving to standby ¹⁾
2	Operating action of switch for external operating mode changeover	Changeover activated when contact of switch is closed (N.O.) ¹⁾	Changeover activated when contact of switch is open (N.C.)
3	Switching different or P-band	1 K in heating mode 0.5 K in cooling mode	4 K in heating mode ¹⁾ 2 K in cooling mode ¹⁾
4	Dead zone in normal operation	2 K ¹⁾	5 K
5	Signal output Y1 (heating)	ON / OFF ¹⁾	PWM
6	Signal output Y2 (heating or cooling)	ON / OFF ¹⁾	PWM

7	Operating action of output Y2	Cooling ¹⁾	Heating
8	PWM signal interval for outputs heating and cooling (DIP switch 7 set on position ON) Y1 (heating) Y2 (cooling) PWM signal interval for outputs heating 2-stage (DIP switch set on position OFF) Y1 (heating) Y2 (heating)	240 s ¹⁾ 240 s (not selectable) 240 s (not selectable) 240 s ¹⁾	90 s 90 s

1) Factory setting

Accessories

Description	Type reference
Adapter plate 120 x 120 mm for 4" x 4" conduit boxes	ARG70
Adapter plate 96 x 120 mm for 2" x 4" conduit boxes	ARG70.1
Adapter plate for surface wiring 112x130 mm	ARG70.2

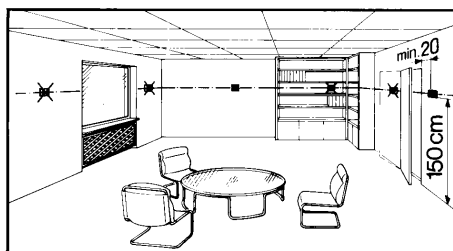
Notes

Check the settings of DIP switches no. 1 through no. 8 and change them, if required. If setpoint limitation is required, use the minimum and maximum limitation facility (energy saver).

After applying power, the controller makes a reset, which takes about 3 seconds. Then, it will be ready to operate.

The controller is supplied with Mounting Instructions.

Mounting location: on a wall of the room to be conditioned. Not in niches or bookshelves, not behind curtains, above or near heat sources and not exposed to direct solar radiation. Mounting height is about 1.5 m above the floor. The connecting wires can be run to the controller from a recessed conduit box.



Caution AC 230 V

Mounting, installation and commissioning

Only authorized personnel may open the controller.

When mounting the unit, fix the baseplate first. Then, make the electrical connections and fit and secure the cover.

The controller must be mounted on a flat wall and in compliance with local regulations. If there are thermostatic radiator valves in the reference room, they must be set to their fully open position.



The cables used must satisfy the insulation requirements with regard to mains potential.

**Warning!****No internal line protection for supply lines to external consumers (Y1, Y2)**

Risk of fire and injury due to short-circuits!

- Adapt the line diameters as per local regulations to the rated value of the installed overcurrent protection device.

Maintenance

The room controller is maintenance-free.

Disposal

The device is considered an electronic device for disposal in accordance with European Directive and may not be disposed of as domestic waste.

- Use only designated channels for disposing the devices.
- Comply with all local and currently applicable laws and regulations.




Technical data**Power supply**

Operating voltage	AC 230 V +10 %, -15 %
Frequency	50/60 Hz
Power consumption	
RCU10	max. 16 VA
RCU10.1	max. 6 VA

**No internal fuse**

External preliminary protection with max. C 10 A circuit breaker in the supply line required under all circumstances

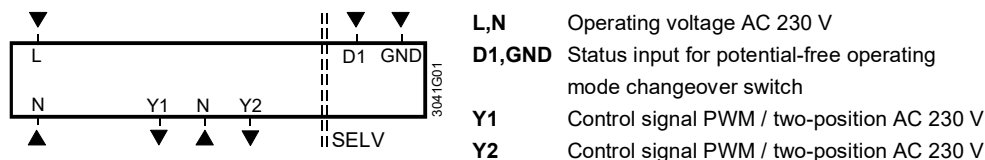
Functional data

Setpoint setting range	8...30 °C
Max. control deviation at 25 °C	max. ±0.7 K
Switching differential heating SDH or P-band (selectable)	1 K or 4 K
Switching differential cooling SDC or P-band (selectable)	0,5 K or 2 K
Dead zone X_{dz} in normal operation (selectable)	2 K or 5 K
Setpoint «Energy saving mode  », heating	16 °C
Setpoint «Energy saving mode  », cooling	28 °C
Setpoint «Standby  »	8 °C
Integration time T_n	10 min
Control outputs Y1, Y2	PWM or ON / OFF
Voltage	AC 230 V +10 % - 15 %
Current	0.02...1 A
Cycle time PWM (selectable for Y1)	240 s or 90 s
Status input D1 and GND	
Contact sensing	SELV DC 6-15 V / 3-6 mA
Insulation against mains	4 kV
Perm. cable length with copper cable 1.5 mm ² for status input D1	80 m
Operation	
Climatic conditions	to IEC 60721-3-3 class 3K5
Temperature	0...+50 °C
Humidity	<95 % r.h.
Transport	to IEC 60721-3-2
Climatic conditions	class 2K3
Temperature	-25...+70 °C

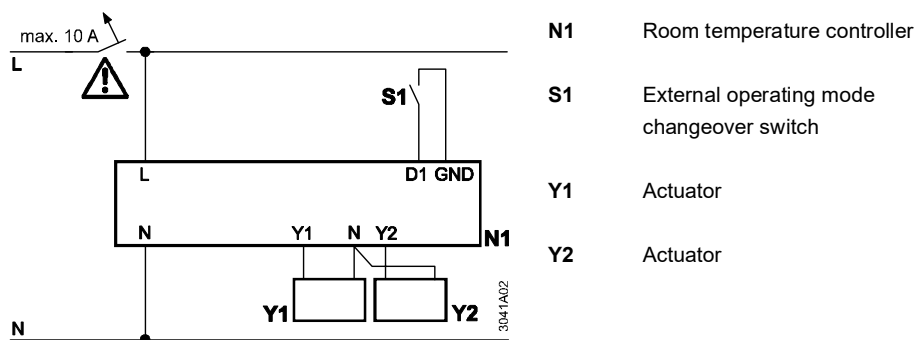
Environmental conditions

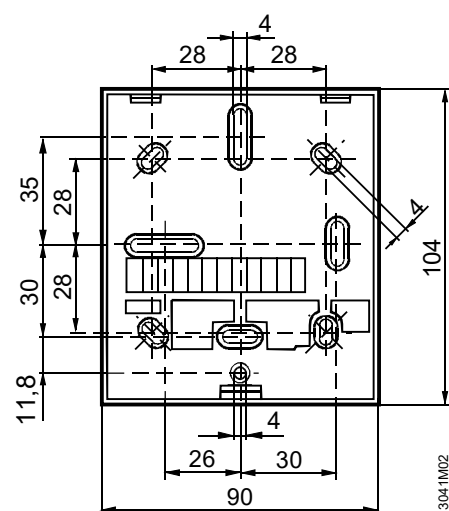
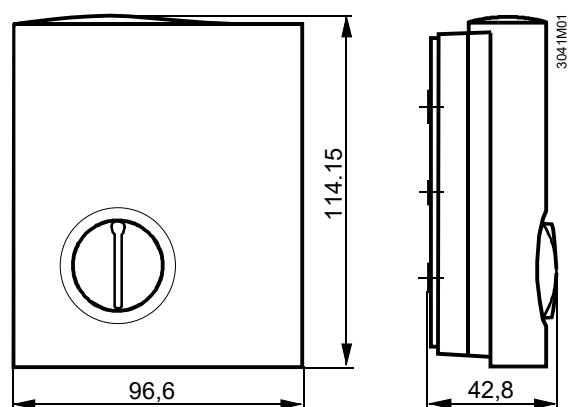
Norms and standards	Humidity	<95 % r.h.
	Mechanical conditions	class 2M2
	EU Conformity (CE)	CE1T3040xx *)
	RCM Conformity	CE1T3040en_C1 *)
	Degree of protection of housing	IP30 EN 60 529
	Safety class	II to EN 60 730-1
Environmental compatibility	Pollution class	normal
	The product environmental declaration CE1E3040*) contains data on environmentally compatible product design and assessments (RoHS compliance, materials composition, packaging, environmental benefit, disposal).	
Eco design and labelling directives	Based on EU Regulation 813/2013 (Eco design directive) and 811/2013 (Labelling directive) concerning space heaters, combination heaters, the following classes apply:	
	<ul style="list-style-type: none"> - Application with On/Off operation of a heater Class I value 1% - PWM (TPI) room thermostat, for use with On/Off output heaters Class IV value 2% 	
General	Connection terminals for	Use solid wires or prepared stranded wires. 2 x 1.5 mm ² or 1 x 2.5 mm ²
	Weight	
	RCU10	0.23 kg
	RCU10.1	0.25 kg
	Colour of housing front	white, NCSS0502-G (RAL 9003)
	*) The documents can be downloaded from http://siemens.com/bt/download .	

Connection terminals



Connection diagram







RCU15

Room Temperature Controllers for heating and cooling systems

RCU15

Choice of two-position or modulating PI control
ON / OFF or PWM outputs for heating and cooling
Control depending on room- or return air temperature
Operating modes: normal operation, energy saving and standby
Operating mode changeover input for remote control
Operating voltage AC 24 V

Use

Control of the room temperature in individual rooms of ventilation or air conditioning plants that are heated or cooled with radiators, chilled ceilings, etc.

For the control of the following pieces of equipment:

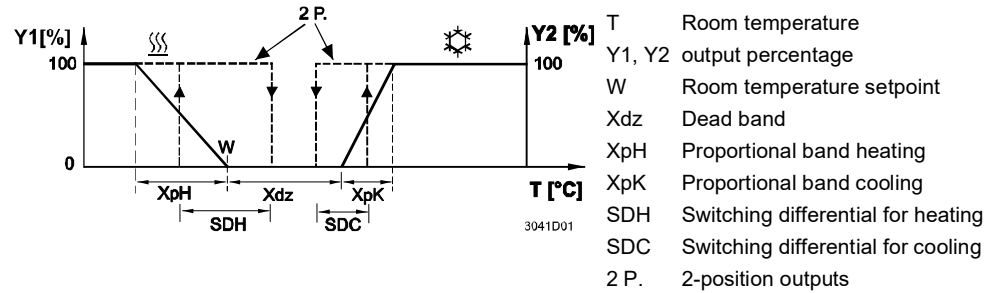
- Thermic valve actuators
- Damper actuators

Functions

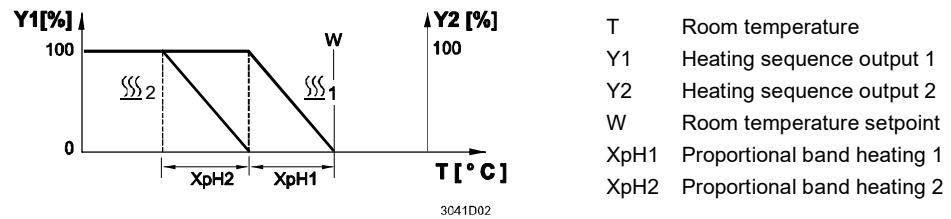
The controller acquires the room temperature with its integrated sensor or external room temperature sensor (QAA32) or return air temperature sensor (QAH11.1) - if used - and maintains the setpoint by delivering control commands. It is possible to choose PI control with PWM actuating commands or two-position control with ON / OFF actuating commands.

The proportional band or the switching differential can be 1 or 4 K in heating mode and 0.5 or 2 K in cooling mode (selectable). The integration time cannot be adjusted and is 10 minutes. The operating sequence “Heating – cooling or heating – heating” can be selected with DIP switch no. 7.

Function diagram “Heating-cooling”

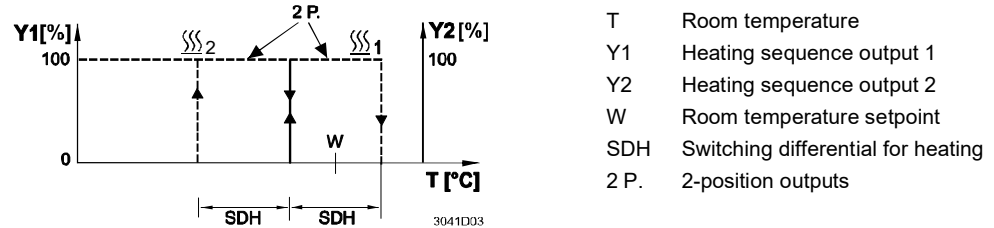


Function diagram “Heating-heating” with PWM output



When two heating sequences are selected, the two outputs cannot be switched ON at the same time. Two outputs are switched ON separately with at least 10 seconds delay. In case of set-point change, the two heaters are allowed to switch OFF together.

Function diagram “Heating-heating” with 2 position output



Pulse width modulation

If actuating signal “Pulse width modulation” (PWM) is selected with DIP switches no. 5 and no. 6, the output is activated and deactivated for a certain period of time, proportional to the calculated manipulated variable and following an interval.

The interval of the PWM actuating signal can be selected as follows:

Heating and cooling (DIP switch 7 on position ON)

Y1 interval can be selected with DIP switch 8 and is either 240 s or 90 s.

Y2 interval is 240 s and cannot be changed.

Heating 2-stage (DIP switch 7 on position OFF)

Y1 interval is 240 s and cannot be changed.

Y2 interval can be selected with DIP switch 8 and is either 240 s or 90 s.

Note

Output Y1 (heating): when used in connection with thermic actuators, the selected interval should be 240 seconds. When using electric heaters, it should be 90 seconds.

Caution

When used in connection with electric valve actuators, DIP switches no. 5 and no. 6 must be set to ON for two-position control.

PWM actuating signals may never be used for driving electric actuators!

Return air temperature or external room temperature

The RCU15 provides control depending on the temperature acquired either by its integrated sensor, external room sensor or return air temperature sensor in the fan coil unit. Changeover is automatic if a QAH11.1 cable temperature sensor or external room temperature sensor QAA32 is connected to the device.

Energy saver

The room temperature setpoint can be limited in increments of 1 K by making use of the minimum and maximum limitation facility. Arbitrary setpoint readjustments can thus be prevented.

Operating modes

	The following operating modes are available:
Normal operation	Normal operation is activated when the external operating mode changeover switch is not activated. In normal operation, the controller maintains the adjusted setpoint.
Frost protection mode	<p>Frost protection mode can be activated using the external operating mode changeover switch, provided DIP switch no. 1 is set to OFF</p> <p>If the room temperature falls below 8 °C, the controller will automatically switch to frost protection mode. In that case, the heating valve opens and the room temperature is maintained at a setpoint of 8 °C. The setpoint adjusted by the user will be ignored.</p>
Energy saving mode	<p>Energy saving mode can be activated using the external operating mode changeover switch, provided DIP switch no. 1 is set to ON</p> <p>In energy saving mode, the setpoint of heating is 16 °C and the setpoint of cooling 28 °C, independent of the position of the setpoint knob.</p>
Operating mode changeover switch	<p>A changeover switch can be connected to status input D1–GND. When the switch activates (caused by an open window, for instance), the operating mode will change from normal operation or standby to energy saving mode (provided DIP switch no. 1 is set to ON), or from normal operation or energy saving mode to standby (provided DIP switch no. 1 is set to OFF).</p> <p>The operating action of the switch (N.C. or N.O.) can be selected.</p>

Ordering

When ordering, please give name and type reference, e.g. room temperature controller RCU15.

Valve and air damper actuators are to be ordered as separate items.

Equipment combinations

Type of unit	Type reference	Data sheet ^{*)}
Temperature sensor	QAH11.1	1840
Room sensor	QAA32	1747
Motoric on/off actuator (not suitable for PWM mode)	SFA71...	4863
Thermal actuator (radiator valve)	STA71...	4877
Thermal actuator (small valve 2,5 mm)	STP71...	4878
Air damper actuators	GCA12...1	4613

^{*)} The documents can be downloaded from <http://siemens.com/bt/download>.

Mechanical design

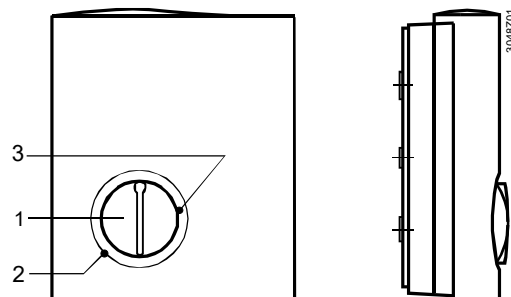
The unit consists of two parts:

- A plastic housing which accommodates the electronics, the operating elements and the built-in room temperature sensor
- A mounting base

The housing engages in the mounting base and snaps on.

The base carries the screw terminals. The DIP switches are located at the rear of the housing.

Setting and operating elements



Legend

- 1 Room temperature setpoint knob
- 2 Setting facility for minimum setpoint limitation (in increments of 1 K)
- 3 Setting facility for maximum setpoint limitation (in increments of 1 K)

Set of DIP switches

DIP switch no.	Meaning	Position ON	Position OFF
1	Operating mode changeover via external switch	Changeover from normal operation or standby to energy saving mode	Changeover from normal operation or energy saving to standby ¹⁾
2	Operating action of switch for external operating mode changeover	Changeover activated when contact of switch is closed (N.O.) ¹⁾	Changeover activated when contact of switch is open (N.C.)
3	Switching different or P-band	1 K in heating mode 0.5 K in cooling mode	4 K in heating mode ¹⁾ 2 K in cooling mode ¹⁾
4	Dead zone in normal operation	2 K ¹⁾	5 K
5	Signal output Y1 (heating)	ON / OFF ¹⁾	PWM
6	Signal output Y2 (heating or cooling)	ON / OFF ¹⁾	PWM
7	Operating action of output Y2	Cooling ¹⁾	Heating
8	PWM signal interval for outputs heating and cooling (DIP switch 7 set on position ON) Y1 (heating) Y2 (cooling) PWM signal interval for outputs heating 2 stage (DIP switch set on position OFF) Y1 (heating) Y2 (heating)	240 s ¹⁾ 240 s (not selectable) 240 s (not selectable) 240 s ¹⁾	90 s 90 s

¹⁾ Factory setting

Accessories

Description	Type reference
Adapter plate 120 x 120 mm for 4" x 4" conduit boxes	ARG70
Adapter plate 96 x 120 mm for 2" x 4" conduit boxes	ARG70.1
Adapter plate for surface wiring 112x130 mm	ARG70.2

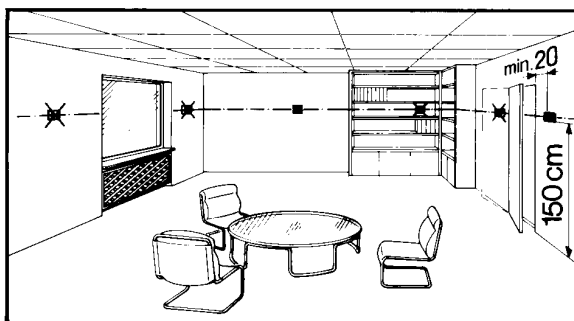
Notes

Check the settings of DIP switches no. 1 through no. 8 and change them, if required. If setpoint limitation is required, use the minimum and maximum limitation facility (energy saver).

After applying power, the controller makes a reset, which takes about 3 seconds. Then, it will be ready to operate.

The controller is supplied with Mounting Instructions.

Mounting location: on a wall of the room to be conditioned. Not in niches or bookshelves, not behind curtains, above or near heat sources and not exposed to direct solar radiation. Mounting height is about 1.5 m above the floor. The connecting wires can be run to the controller from a recessed conduit box.



Only authorized personnel may open the controller.

Mounting, installation and commissioning

When mounting the unit, fix the baseplate first. Then, make the electrical connections and fit and secure the cover.

The controller must be mounted on a flat wall and in compliance with local regulations. If there are thermostatic radiator valves in the reference room, they must be set to their fully open position.



Warning!

No internal line protection for supply lines to external consumers (Y1, Y2)

Risk of fire and injury due to short-circuits!

- Adapt the line diameters as per local regulations to the rated value of the installed overcurrent protection device.

Maintenance

The room controller is maintenance-free.





Disposal



The device is considered an electronic device for disposal in accordance with European Directive and may not be disposed of as domestic waste.

- Use only designated channels for disposing the devices.
- Comply with all local and currently applicable laws and regulations.

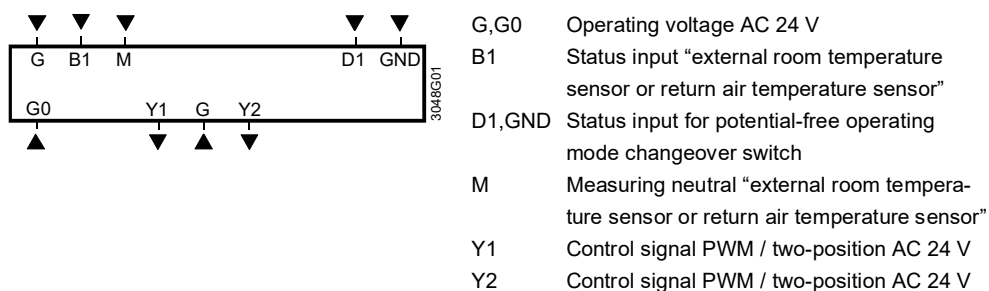
Technical data

Power supply	Operating voltage	AC 24 V ± 20 %	
	Frequency	50/60 Hz	
	No internal fuse		
	External preliminary protection with max. C 10 A circuit breaker in the supply line required under all circumstances		
Functional data	Power consumption	max. 1.2 VA	
	Setpoint setting range	8...30 °C	
	Max. control deviation at 25 °C	max. ±0.7 K	
	Switching differential heating SDH or P-band (selectable)	1 K or 4 K	
	Switching differential cooling SDC or P-band (selectable)	0,5 K or 2 K	
	Dead zone X _{dz} in normal operation (selectable)	2 K or 5 K	
	Setpoint «Energy saving mode  », heating	16 °C	
	Setpoint «Energy saving mode  », cooling	28 °C	
	Setpoint «Standby  »	8 °C	
	Integration time T _n	10 min	
	Control outputs Y1, Y2	PWM or ON / OFF	
	Voltage	AC 24 V ± 20 %	
	Current	0.02...1 A	
	Cycle time PWM (selectable for Y1)	240 s or 90 s	
	Signal input B1 for return air sensor	QAH11.1, safety class II NTC resistor 3 kΩ at 25 °C	
	Status input D1 and GND		
	Contact sensing	DC 6-15 V / 3-6 mA	
	Perm. cable length with copper cable 1.5 mm ² for connection to terminals B1 and D1	80 m	
Environmental conditions	Operation	to IEC 60721-3-3	
	Climatic conditions	class 3K5	
	Temperature	0...+50 °C	
	Humidity	<95 % r.h.	
	Transport	to IEC 60721-3-2	
	Climatic conditions	class 2K3	
	Temperature	-25...+70 °C	
	Humidity	<95 % r.h.	
Norms and standards	Mechanical conditions	class 2M2	
	EU Conformity (CE)	CE1T3040xx ^{*)}	
	RCM Conformity	CE1T3040en_C1 ^{*)}	
	Degree of protection of housing	IP30 EN 60 529	
	Safety class	III to EN 60 730-1	
	Pollution class	Normal	
Environmental compatibility	The product environmental declaration CE1E3040 ^{*)} contains data on environmentally compatible product design and assessments (RoHS compliance, materials composition, packaging, environmental benefit, disposal).		
Eco design and labelling directives	Based on EU Regulation 813/2013 (Eco design directive) and 811/2013 (Labelling directive) concerning space heaters, combination heaters, the following classes apply:		
	- Application with On/Off operation of a heater	Class I	value 1%
	- PWM (TPI) room thermostat, for use with On/Off output heaters	Class IV	value 2%

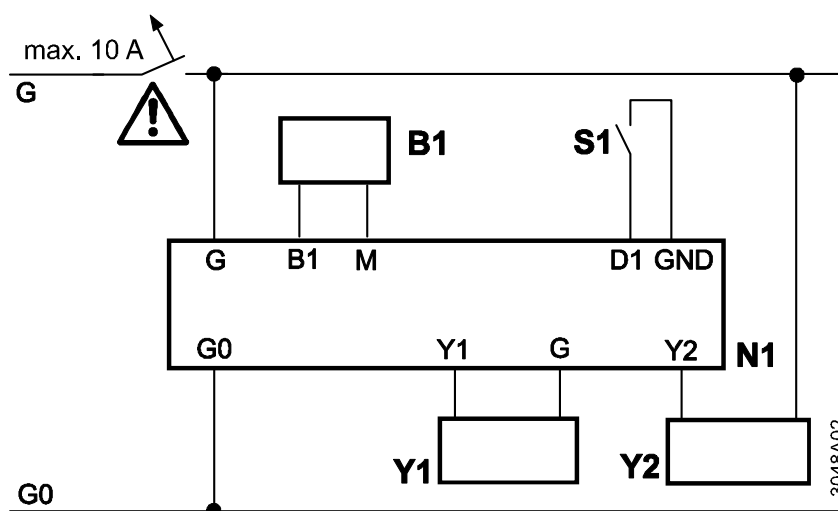
General

Connection terminals for	Use solid wires or prepared stranded wires. 2 x 1.5 mm ² or 1 x 2.5 mm ²
Weight RCU15	0.23 kg
Colour of housing front	white, NCSS0502-G (RAL 9003)
*) The documents can be downloaded from http://siemens.com/bt/download	

Connection terminals



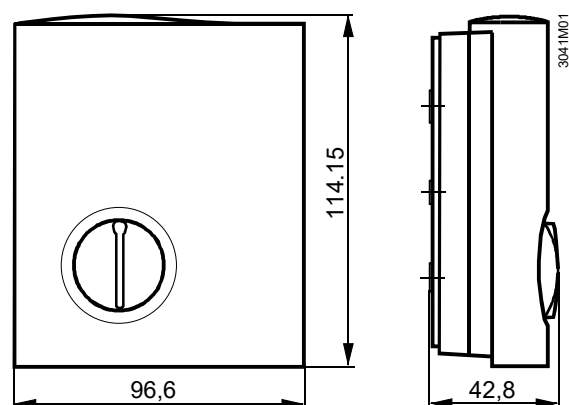
Connection diagram



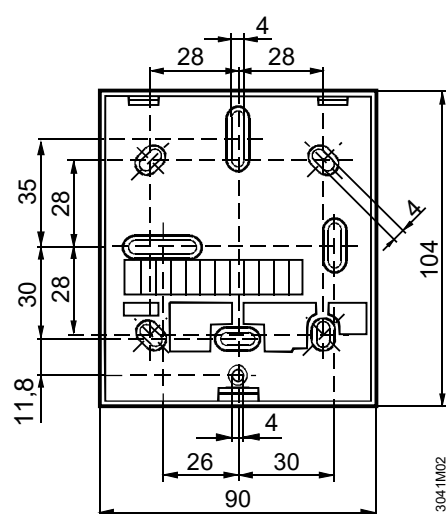
- B1** External room temperature sensor (QAA32) or return air temperature sensor (QAH11.1)
- N1** Room temperature controller
- S1** External operating mode changeover switch
- Y1** Actuator
- Y2** Actuator

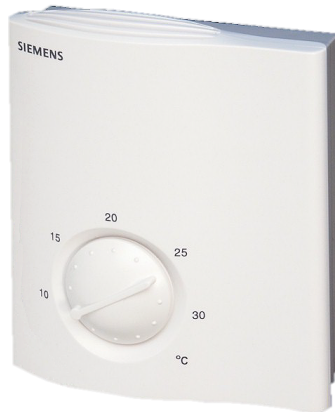
Dimensions

Controller



Baseplate





Synco™ 100

Room Temperature Controller

RLA162

with 2 outputs DC 0...10 V

Room temperature controller for basic ventilation, air conditioning and heating plants. Compact design with 2 analog control outputs DC 0...10 V for heating and/or cooling.

Use

Plant types:

- Small ventilation or air conditioning plants with own air handling section
- Small heating plants
- Heating section of larger ventilation or air conditioning plants
- Ventilation zones of ventilation or air conditioning plants with central air handling

Building types:

- Small residential buildings
- Non-residential buildings of all types
- Apartments with a suitable reference room
- Individual rooms (e.g. conference rooms, training centers)
- Devices that can be controlled:
 - Heating valve actuators
 - Cooling valve actuators
 - Air damper actuators
 - Current valves of electric air heater batteries

Functions

- Main function**
- Control of the room temperature through modulating control of the actuating device on the water- or air-side with selectable operating action of the control signals for heating only or cooling only or heating and cooling
- Other functions**
- Outside temperature compensation
 - Minimum limitation of the supply air temperature
 - Setpoint changeover via external contact
 - Test mode as a commissioning aid

Ordering

When ordering, please give the type reference **RLA162**

Equipment combinations

Actuators and controls must meet the following specification:

- Control input: modulating, DC 0...10 V
- Operating voltage: AC 24 V

For auxiliary functions, the following products can be used:

<i>Type of unit</i>	<i>Type ref.</i>	<i>Data Sheet</i>
Air duct temperature controller (as a minimum limiter)	RLM162	N3332
Outside sensor (for outside temperature compensation)	QAC22	N1811

Technical design

Temperature control

- Application
- 1-stage heating
 - 1-stage cooling
 - 2-stage heating
 - 1-stage heating and 1-stage cooling

Settings

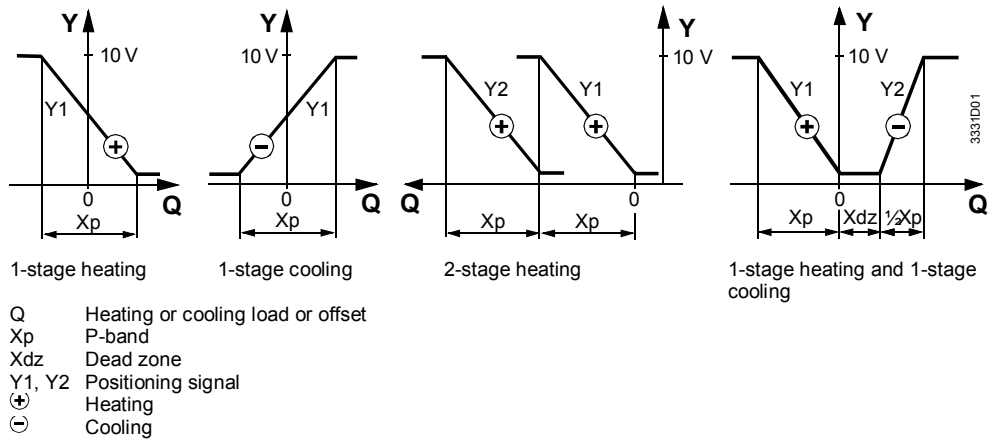
The following settings are required:

- Room temperature setpoint: to be adjusted with the setting knob which can be accessed by the user
- Operating action: the 2 control outputs Y1 and Y2 can act as follows:
 - 1-stage heating: control output Y2 is not used
 - 1-stage cooling: control output Y2 is not used
 - 2-stage heating: both control outputs have the same operating action and operate in sequence
 - 1-stage heating and 1-stage cooling: the control outputs have opposed operating actions; the dead zone is fixed at 1.5 K
- Control mode: P or PI; with PI mode, the integrated action time is fixed at 600 seconds
- P-band: the P-band of control output Y1 is adjustable.
For Y2, the following applies:
 - With operating action **Heating**, the P-band of Y2 is identical to the P-band of Y1
 - With operating action **Cooling**, the P-band of Y2 is 50 % of the P-band of Y1

Control

The RLA162 temperature controller compares the room temperature acquired by the sensor (integrated in the controller) with the setpoint. If there is a deviation, the controller generates a DC 0...10 V control signal to adjust the regulating unit(s) between 0...100 %.

In P-mode, the output is proportional to the offset, in PI mode the output is proportional to the heating or cooling load.



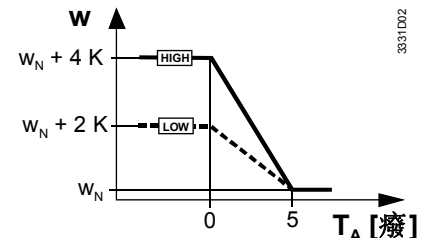
Outside temperature compensation

When using an outside sensor, the current setpoint will be shifted depending on the outside temperature. A choice of 2 ranges is available: LOW or HIGH. Within the selected range, compensation is based on fixed values. Depending on the operating action, compensation operates as follows:

Winter compensation

Winter compensation (**operating action Heating**):

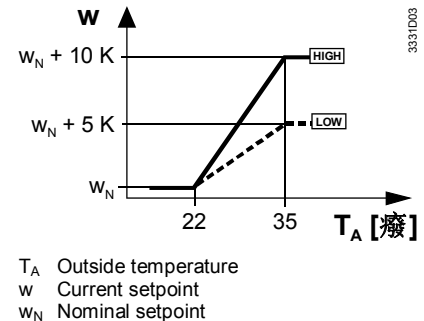
If the outside temperature falls from 5 °C to 0 °C, the setpoint will be continuously raised by 2 K (LOW) or 4 K (HIGH). Below an outside temperature of 0 °C, the temperature increase will be kept constant



Summer compensation

Summer compensation (**operating action Cooling**):

If the outside temperature rises from 22 °C to 35 °C, the setpoint will be continuously raised by 5 K (LOW) or 10 K (HIGH). Above an outside temperature of 35 °C, the temperature increase will be kept constant



Setpoint changeover

Changeover of the nominal setpoint can be accomplished by closing an external potential-free contact across terminals D1–GND, aimed at saving energy.

- Operating action **Heating**: the nominal setpoint will be **lowered**
- Operating action **Cooling**: the nominal setpoint will be **raised**

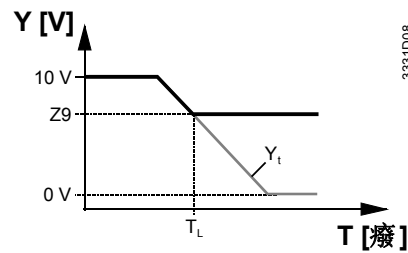
Examples:

- Night setback; changeover provided by a time switch
- Setback during non-occupancy times; changeover provided by a presence detector

A **potentiometer** is provided to set the temperature by which the nominal setpoint shall be lowered or raised. This setting is not accessible by the user.

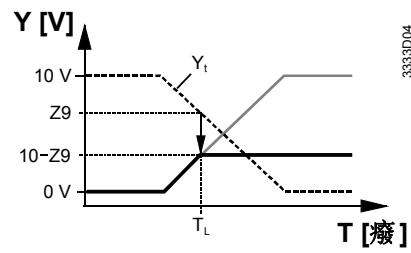
Minimum limitation of the supply air temperature

Minimum limitation of the supply air temperature is accomplished by using an air duct temperature controller RLM162. In this case, the RLM162 delivers its control signal of DC 0...10 V to terminal Z9 of the RLA162. If there are significant heat gains in the reference room, minimum limitation prevents the supply air temperature from falling below a certain level.



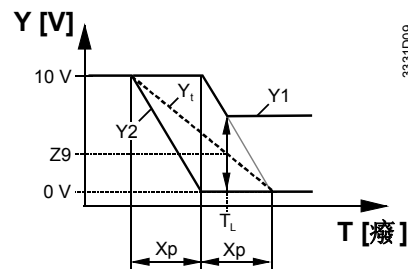
1-stage heating

Minimum limitation of the controlled temperature



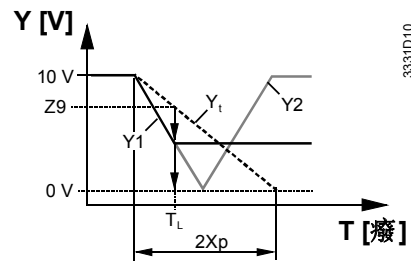
1-stage cooling

Minimum limitation of the controlled temperature through maximum limitation of the output for cooling



2-stage heating

Minimum limitation, acting on Y1 and Y2



1-stage heating and 1-stage cooling

Minimum limitation, acting on Y1 and Y2

T Controlled temperature
 T_L Limit temperature
 X_p P-band
 Y Positioning signal of controller
 Y_t Simulated positioning signal
 $Z9$ Signal delivered by the limiter to terminal Z9

Test mode

In test mode, the control is switched off. The setpoint setting knob acts as a positioning unit to manually drive the actuating device (or both actuating devices) to any position required. The positioning range in test mode is configured to match the selected operating mode. The test mode is indicated by an LED.

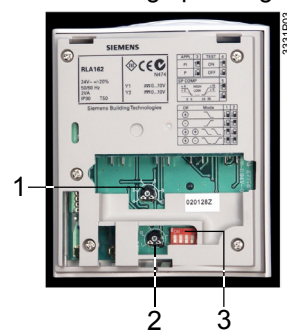
Mechanical design

The controller consists of mounting base and plastic housing.

The front carries the setting knob; the mounting base carries the screw terminals and is suited for direct wall mounting or for mounting on a recessed conduit box.

The controller electronics, all internal operating elements and the internal room temperature sensor are located at the rear of the unit.

The following operating elements are provided:



- 1 Setting potentiometer for the setpoint increase or decrease
- 2 Setting potentiometer for the P-band
- 3 Block of DIP switches
- 4 Setting knob for the setpoint

All functions are selected via the DIP switch block which comprises 5 switches:

Function	1	2	3	4	5	Action
Operating mode	<input type="checkbox"/>	<input type="checkbox"/>				Heating and cooling in sequence
	<input type="checkbox"/>	<input type="checkbox"/>				2-stage heating
	<input type="checkbox"/>	<input type="checkbox"/>				1-stage cooling
	<input type="checkbox"/>	<input type="checkbox"/>				1-stage heating
Control mode			<input type="checkbox"/>			PI (integral action time 600 s)
			<input type="checkbox"/>			P
Test mode				<input type="checkbox"/>		Test mode
				<input type="checkbox"/>		Normal operation
Outside temperature compensation					<input type="checkbox"/>	HIGH
					<input type="checkbox"/>	LOW

Engineering notes

In the event of a power failure, the actuating device will automatically close or be driven into the neutral position.

The controller is supplied complete with Mounting and Installation Instructions.

Mounting notes

The controller must be fitted on a flat wall. The connecting wires can be run to the controller from a recessed conduit box. Ensure that the local safety regulations are complied with. A suitable mounting location is the inner wall of the space to be heated and/or cooled. Not in niches or shelves, not behind curtains, not above or near heat sources and not exposed to direct solar radiation. Mounting height about 1.5 m above the floor. To mount the controller, fit the mounting base first. After the electrical connections are made, engage the housing in the base and snap it on.

Commissioning notes

To check the control wiring, the controller can be switched into test mode so that the response of the actuating device can be checked.

If the control is instable, increase the proportional band; if it is too slow, decrease the proportional band.

If the reference room is equipped with thermostatic radiator valves, they must be set to their fully open position and then fixed.

Disposal



The device is considered electrical and electronic equipment for disposal in terms of the applicable European Directive and may not be disposed of as domestic garbage.

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

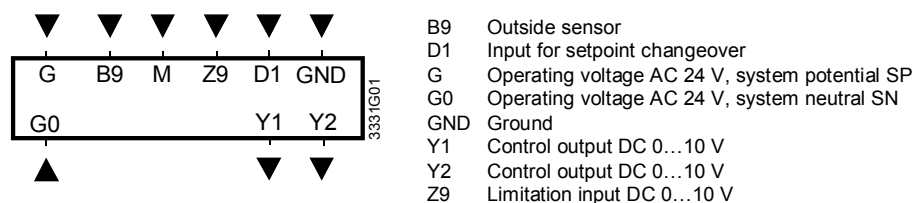
Technical data

Power supply

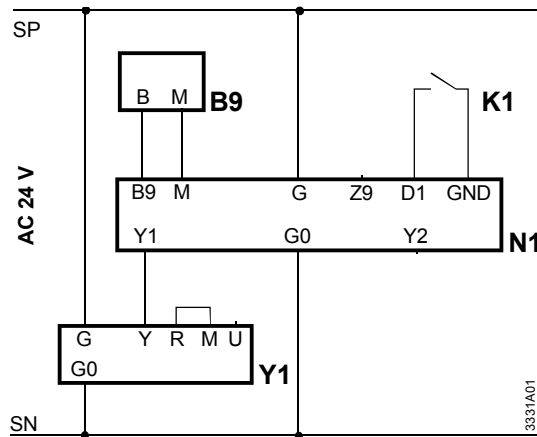
Operating voltage	AC 24 V $\pm 20\%$
Frequency	50 / 60 Hz
Power consumption	max. 2 VA

Functional data	Setting range nominal setpoint	8...30 °C
	Setting range setpoint changeover	0...10 K
	P-band	1...50 K
	Integral action time with PI control	600 s
	Dead zone with heating and cooling in sequence	1.5 K
	Control outputs Y1, Y2	
	Voltage	DC 0...10 V, continuous
	Current	max. 1 mA
	Max. cable length copper cable 1.5 mm ²	
	For signal input B9	80 m
Environmental conditions	For switching input D1	80 m
	Contact sensing (input D1–M)	DC 6...15 V, 3...6 mA
	Operation	
	Climatic conditions	to IEC 721-3-3, class 3K5
	Temperature	0...+50 °C
	Humidity	<95 % r.h.
	Transport	
	Climatic conditions	to IEC 721-3-2, class 2K3
	Temperature	–25...+70 °C
	Humidity	<95 % r.h.
Norms and standards	Mechanical conditions	class 2M2
	EU Conformity (CE)	CE1T3330xx *)
	RCM Conformity	CE1T3330en_C1*)
	Product standards	
	Automatic electrical controls for household and similar use	EN 60 730-1 and EN 60 730-2-9
	Electromagnetic compatibility	
	Emissions	EN 50081-1
	Immunity	EN 50082-1
	Degree of protection	IP 30 EN 60 529
	Safety class	II to EN 60 730
General	Degree of contamination	normal
	Connection terminals for solid wires or stranded wires	2 × 1.5 mm ² or 1 × 2.5 mm ²
	Weight	0.25 kg
*) The documents can be downloaded from http://siemens.com/bt/download .		

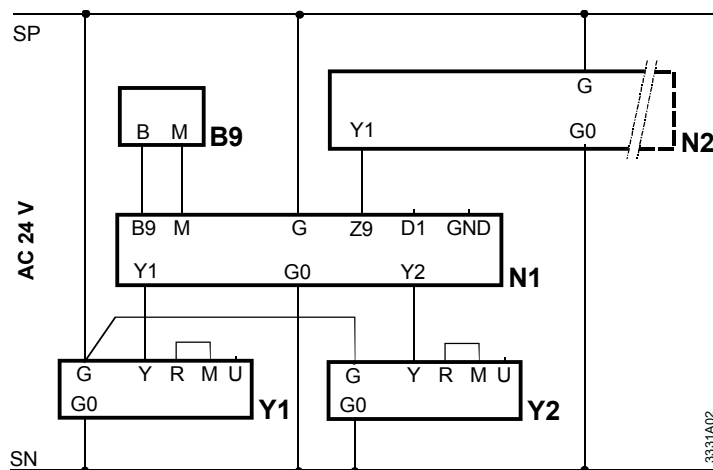
Connection terminals



Connection diagrams



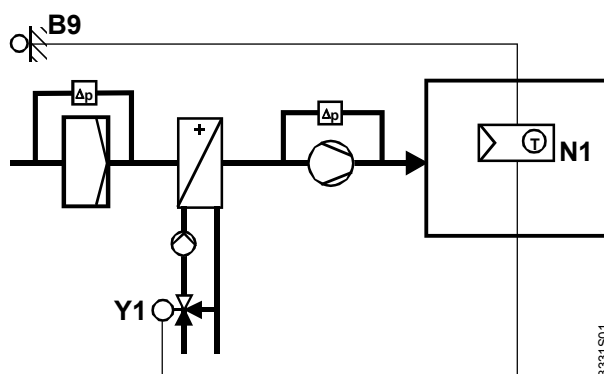
Room temperature control with outside temperature compensation and setpoint change-over



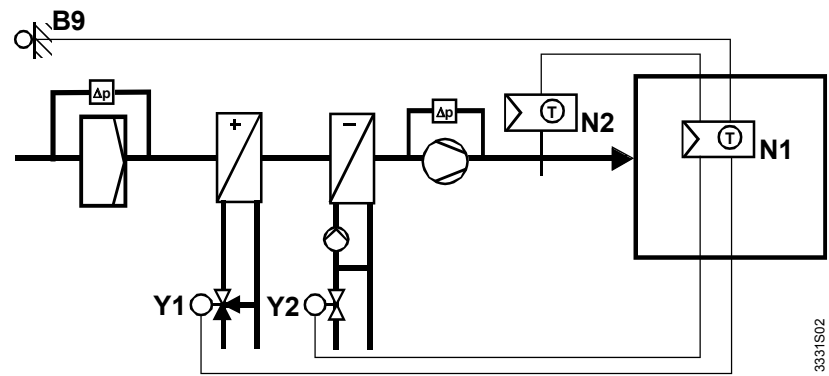
Room temperature control with heating and cooling, outside temperature compensation and minimum limitation of the supply air temperature

- B9 Outside sensor QAC22
- K1 External switch (e.g. of a time switch)
- N1 Room temperature controller RLA162
- N2 Air duct temperature controller RLM162 (as a limiter)
- Y1 Heating valve actuator
- Y2 Cooling valve actuator

Application examples



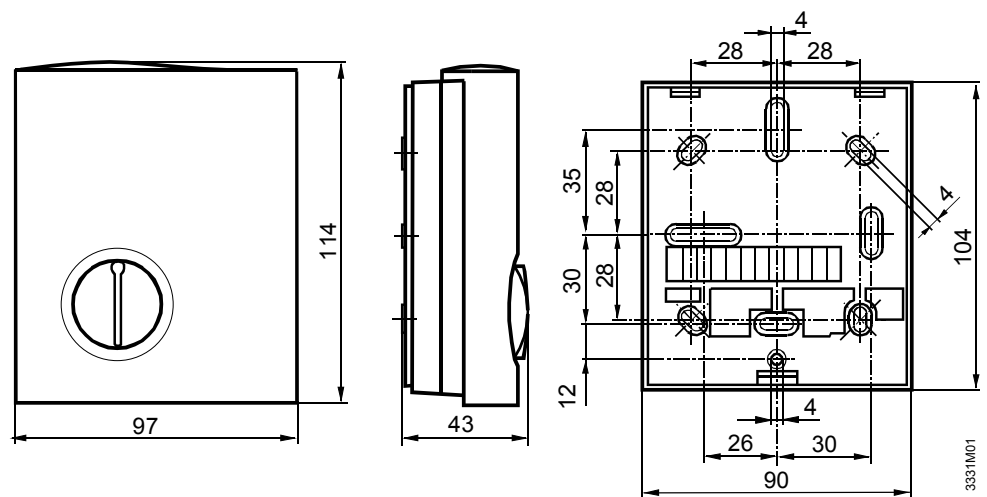
Room temperature control through control of the heating valve, with outside temperature compensation



Room temperature control through control of the heating and cooling valve, with outside temperature compensation and limitation of the supply air temperature

- B9 Outside sensor QAC22
N1 Room temperature controller RLA162
N2 Air duct temperature controller RLM162
Y1 Heating valve
Y2 Cooling valve

Dimensions



Dimensions in mm



Room thermostats with LCD RDD100..

for heating systems

- Room temperature control
- Comfort, Economy and Protection mode
- 2-position control with On/Off control output
- Adjustable commissioning and control parameters
- Mains-powered AC 230 V (RDD100) or battery-powered DC 3 V (RDD100.1)

Use

The RDD100.. is used to control the room temperature in heating systems.

Typical applications:

- Apartments
- Commercial spaces
- Schools

For the control of the following pieces of equipment:

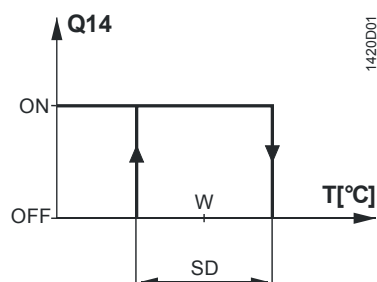
- Thermal valves or zone valves
- Gas or oil boilers
- Fans
- Pumps

Functions

- Room temperature control via built-in sensor
- Selection of operating mode with operating mode touch key
- Display of current room temperature or set point in °C or °F
- Touchkey lock (manually)
- Setpoint lock
- Reloading factory settings for commissioning and control parameters

Temperature control

The RDD100.. acquires the room temperature with its built-in sensor and maintains the set point by delivering control commands. The switching differential is 1 K.



T Room temperature
SD Switching differential
W Room temperature setpoint
Q14 Output signal for heating

Type summary

Product No.	Stock No.	Features
RDD100	S55770-T275	Mains-powered AC 230 V
RDD100.1	S55770-T276	Battery-powered DC 3 V








Ordering

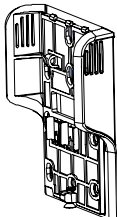
- When ordering, please indicate product No. / stock No. and description.
- Example:

Product No.	Stock No.	Description
RDD100	S55770-T275	Room thermostat

Valve actuators must be ordered separately.

Equipment combinations

Description		Product No.	Data Sheet
Electromotoric actuator		SFA21..	4863
Electrothermal actuator (for radiator valves)		STA23..	4884
Electrothermal actuator (for small valves 2.5 mm)		STP23..	4884
Damper actuator		GDB..	4634
Damper actuator		GSD..	4603
Damper actuator		GQD..	4604
Rotary damper actuator		GXD..	4622

Description		Product No.	Mounting Instruction
Adapter plate (for China 86 conduit box, BS4662 UK conduit box)		ARG70.4	A6V10563479

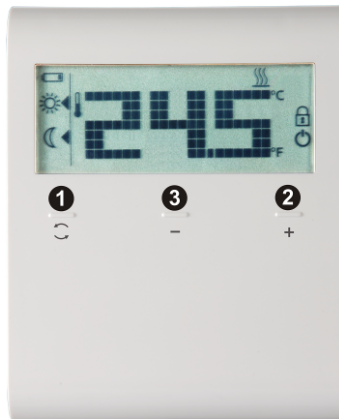
Mechanical design

The room thermostat consists of 2 parts:

- Plastic housing which accommodates the electronics, the operating elements, and the room temperature sensor
- Mounting plate with screw terminals

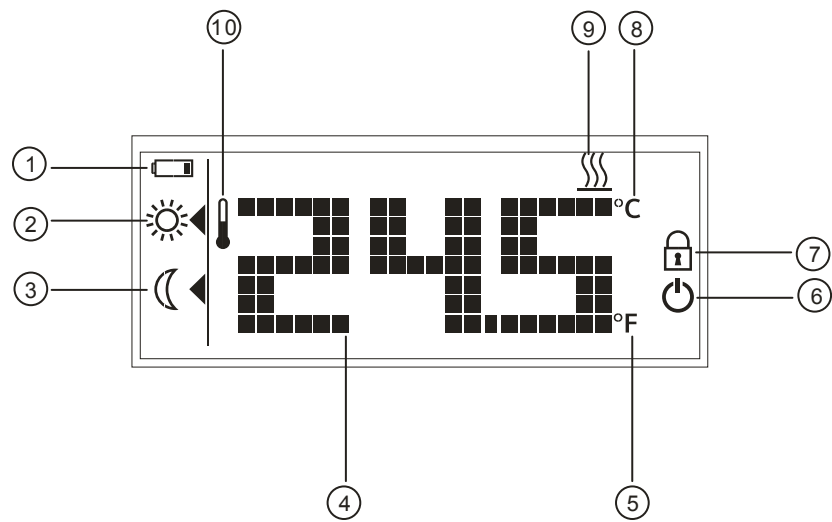
The housing engages in the mounting plate and is secured with a screw.











Operation and settings



- 1) Operating mode touchkey
- 2) Touchkey for increasing a value
- 3) Touchkey for decreasing a value

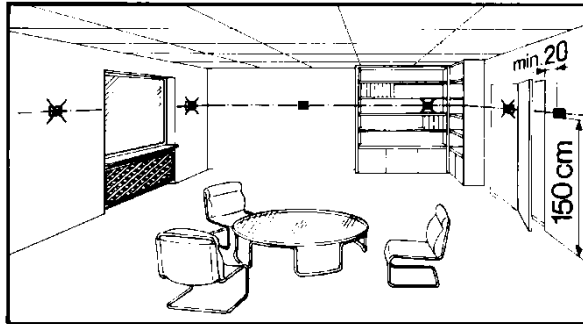
Display



#	Symbol	Description	#	Symbol	Description
1		Indicating that batteries need to be replaced (only with battery-powered version)	6		Protection mode (protection mode icon can be enabled via parameter settings).
2		Comfort mode	7		Touchkey lock activated
3		Economy mode	8		Room temperature in degrees Celsius
4		Display of room temperature, setpoint, etc.	9		Heating On
5		Room temperature in degrees Fahrenheit	10		Current room temperature

Mounting and installation notes

Do not mount the thermostat in niches or bookshelves, not behind curtains, not above or near heat sources, and not exposed to direct solar radiation. Mount about 1.5 m above the floor.



Mounting



- Mount the thermostat in a clean and dry location without direct air flow from heating/cooling equipment, and not exposed to drip or splash water
- Note: When RDD100.. is equipped with either China 86 conduit box or BS4662 UK conduit box, ARG70.4 adapter plate is suggested to provide a better fitting installation.

Wiring

See Mounting Instructions M1420 enclosed with the thermostat.



- Ensure that wiring, protection and earthing comply with local regulations
- Correctly size the cables to the thermostat and the valve actuators
- Use only valve actuators rated for AC 24...230 V

Warning!

No internal line protection for supply lines to external consumers.

Risk of fire and injury due to short-circuits!



- Adapt the line diameters as per local regulations to the rated value of the installed overcurrent protection device.
- The AC 230 V mains supply line must have a circuit breaker with a rated current of no more than 10 A
- Disconnect from power supply before removing the unit from its mounting plate

Commissioning notes

Commissioning

After power is applied, the thermostat carries out a reset during which all LCD segments flash, indicating that the reset was made correctly. After the reset, the thermostat is ready for commissioning by qualified HVAC personnel.

The control parameters of the thermostat can be set to ensure optimum performance of the entire system. Please refer to Operating Instructions CB1B1420, section "Do you want to change parameters?".

Sensor calibration

If the temperature on the display does not agree with the room temperature effectively measured, the temperature sensor can be recalibrated. For that purpose, adjust parameter P04.

Setpoint and setpoint lock

We recommend to review the setpoint range and setpoint lock (for public areas) using parameters P05...P08 and change them as needed to achieve maximum comfort and energy savings.


Touchpad scanning rate

Since the thermostat uses touch technology and to minimize battery power consumption, a parameter P21 (adjustable from 0.25 to 1.5 seconds) is implemented for the user to adjust. This function is only valid for the battery-powered version and the default value is 1 second.


This means that when, for a certain time, the user does not touch the touchpad, the unit operates in power saving mode and the touchpad is running at a scanning rate of 1 second.

(From the calculation – assuming 4 operations per day on the thermostat, the estimated 1-second scanning rate results in a battery life of 1 year. If the user increases the scanning rate, the batteries' life is extended.)

Change of batteries (only with battery-powered version)

If the battery symbol  appears, the batteries are almost exhausted and should be replaced. Use alkaline batteries type AAA.


Operating notes

The RDD100.. provides Comfort, Economy and Protection mode. The difference between Comfort and Economy mode is only the room temperature setpoint. The changeover between Comfort, Economy and Protection mode is made by pressing touch key .


Comfort mode

When Comfort mode is activated, symbol  appears on the display. The setpoint (20 °C) can be readjusted by pressing touchkeys + and –.

Economy mode

When Economy mode is activated, symbol  appears on the display. The setpoint (16 °C) can be readjusted by pressing touchkeys + and –.

Protection mode

If the temperature falls below 5 °C, the unit automatically activates the heating output. The symbol  appears only, if the icon is enabled via parameter settings.

Maintenance notes


The thermostats are maintenance-free.


Disposal



The device is considered an electronic device for disposal in terms of the European Directive 2012/19/EU and may not be disposed of as domestic garbage.

- Dispose of the device through channels provided for this purpose.
- Comply with all local and currently applicable laws and regulations.
- Dispose of empty batteries in designated collection points.

	⚠ WARNING
	<p>Risk of explosion due to fire or short-circuit, even if the batteries are empty</p> <p>Risk of injuries from by flying parts</p> <ul style="list-style-type: none"> • Do not allow the batteries to come into contact with water. • Do not charge the batteries. • Do not damage or destroy the batteries. • Do not heat the batteries to more than 85 °C.

	⚠ WARNING
	<p>Electrolyte leakage</p> <p>Chemical burns</p> <ul style="list-style-type: none"> • Only grasp damaged batteries using suitable protective gloves. • If electrolyte comes into contact with eyes, immediately rinse eyes with plenty of water. Consult a doctor.

Observe the following:

- Only replace batteries with batteries of the same type and from the same manufacturer.
- Observe the polarities (+/-).
- The batteries must be new and free from damage.
- Do not mixed new batteries with used batteries.
- Store, transport, and dispose of the batteries in accordance with local regulations, guidelines, and laws. Also observe information from the battery manufacturer.

Technical data



Power supply

Operating voltage	
• RDD100 at L - N	AC 230 V +10/-15%
• RDD100.1	DC 3 V (2 x 1.5 V alkaline batteries AAA)
Frequency (RDD100)	50 Hz
Power consumption (RDD100)	4 VA

For battery life (RDD100.1), see below (alkaline batteries type AAA).

Battery life calculation is based on the touchpad scanning rate during idle time (assuming a user presses 4 touchkeys per day):

Scanning rate 0.25 s	196 days battery life
Scanning rate 0.50 s	278 days battery life
Scanning rate 1.00 s	353 days battery life
Scanning rate 1.50 s	388 days battery life

Control inputs

Control input Q11-Nx (Com)	
Rating RDD100	(AC 24...230 V) Max. 5(2) A Min. 8 mA
Rating RDD100.1	(AC 24...230 V) Max. 5(2) A Min. 8 mA

Control outputs

Control output Q12-Nx (NC contact)	
Rating RDD100	(AC 24...230 V) Max. 5(2) A Min. 8 mA
Rating RDD100.1	(AC 24...230 V) Max. 5(2) A Min. 8 mA
Control output Q14-Nx (NO contact)	
Rating RDD100	(AC 24...230 V) Max. 5(2) A Min. 8 mA
Rating RDD100.1	(AC 24...230 V) Max. 5(2) A Min. 8 mA



No internal fuse.

External preliminary protection with max. C 10 A circuit breaker in the supply lines required under all circumstances.

External protection for incoming cable

Circuit breaker	Max. 10 A
Circuit breaker tripping characteristic	Type B, C or D to EN 60898 and EN 60947
Switching differential SD	1 K
Comfort mode	20 °C (5...35 °C)
Economy mode	16 °C (5...35 °C)

Function data

Built-in room temperature sensor	
Setpoint setting range	5...35 °C (Comfort/Economy mode)
Accuracy at 25 °C	< ±0.5 K
Temperature calibration range	±3.0 K
Resolution of settings and displays	
Setpoints	0.5 °C
Temperature value displays	0.5 °C

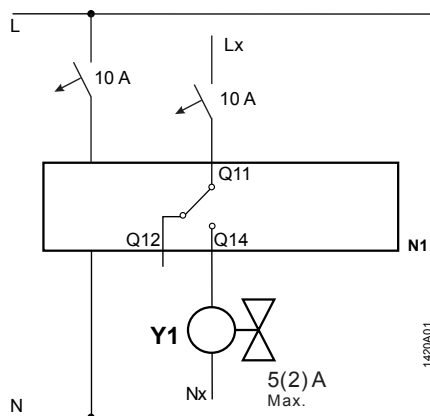
Environmental conditions

Operation	As per IEC 60721-3-3
Climatic conditions	Class 3K5
Temperature	0...50 °C
Humidity	<95% r.h.
Transport	As per IEC 60721-3-2
Climatic conditions	Class 2K3
Temperature	-25...60 °C
Humidity	<95% r.h.
Mechanical conditions	Class 2M2

Norms and standards	Storage	As per IEC 60721-3-1
	Climatic conditions	Class 1K3
	Temperature	-25...60 °C
	Humidity	<95% r.h.
	EU Conformity (CE)	A6V11399487 ^{*)}
Environmental compatibility	RCM Conformity	A6V11399489 ^{*)}
	Safety class	II as per EN 60730-1, EN 60730-2-9
	Pollution class	II as per EN 60730-1
	Degree of protection of housing	IP30 as per EN 60529
	The product environmental declaration CE1E1420xx ^{*)} contains data on environmentally compatible product design and assessments (RoHS compliance, materials composition, packaging, environmental benefit, disposal).	
Eco design and labeling directives	Based on EU Regulation 813/2013(Eco design directive) and 811/213 (Labeling directive) concerning space heaters, combination heaters, the following classes apply:	
	- Application with On/Off operation of a heater	Class I value 1.0%
General	Connection terminals for	Solid wires or prepared stranded wires 2 x 1.5 mm ² or 1 x 2.5 mm ² (Min. 0.5 mm ²)
	Weight	0.134 kg
	Color of housing front	RAL9003

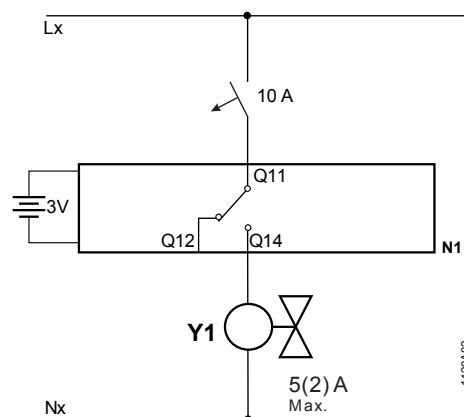
^{*)} The documents can be downloaded from <http://siemens.com/bt/download>.

Connection diagrams



RDD100

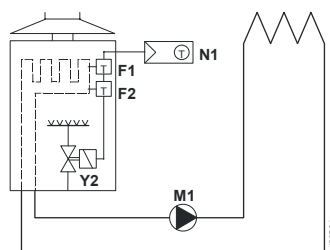
N1	Room thermostat
Y1	Valve actuator
L	Live, AC 230 V
N	Neutral conductor, AC 230 V



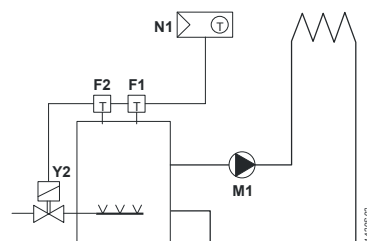
RDD100.1

Lx	Live, AC 24...230 V
Q11, Q12	NC contact (for NO valves)
Q11, Q14	NO contact (for NC valves)
Nx	Neutral conductor, AC 24...230 V

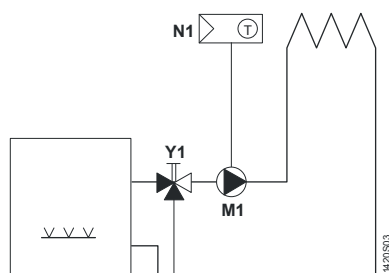
Appication examples



Room thermostat with direct control of a gas-fired wall-hung boiler



Room thermostat with direct control of a gas-fired floor-standing boiler



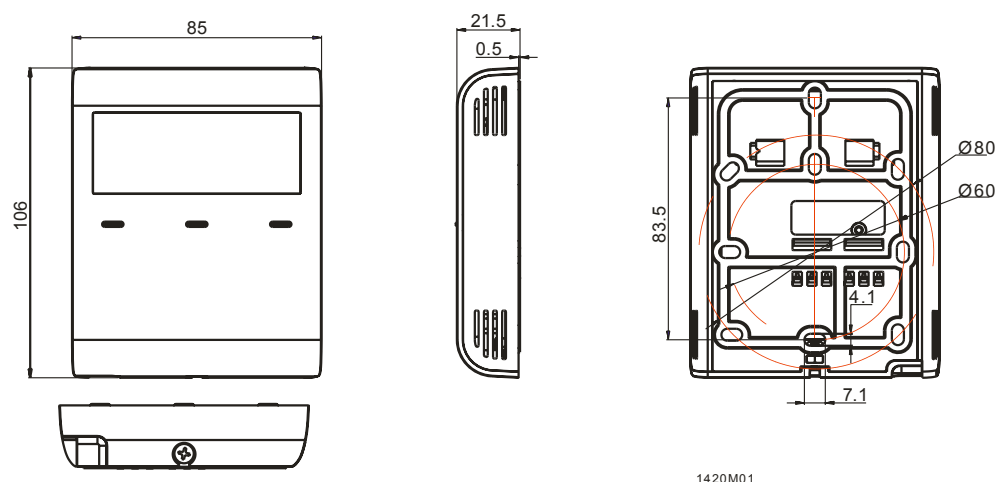
Room thermostat with direct control of a heating circuit pump (precontrol by manual mixing valve)

F1	Thermal reset limit thermostat
F2	Safety limit thermostat
M1	Circulating pump

N1	RDD100.. room thermostat
Y1	Mixing valve with manual adjustment
Y2	Magnetic valve

Dimensions

All dimensions in mm



Remarks

Heating:

Because of the unavoidable self heating effects of the electrical current, any loads of more than 3 Amperes connected to the unit can influence the control behavior and temperature accuracy in a negative way.



Room thermostat with independent DHW control

**RDD100.1
DHW**

for heating systems

- Room temperature control
- 2-position control with ON/OFF control output
- Independent On/Off control of DHW
- Comfort, Economy and Protection mode
- Adjustable commissioning and control parameters
- Battery-powered DC 3 V (2 x 1.5 V AAA)

Use

The RDD100.1DHW is used to control the room temperature in heating systems with independent control of DHW.

Typical applications:

- Apartments

For the control of the following plant components and of DHW:

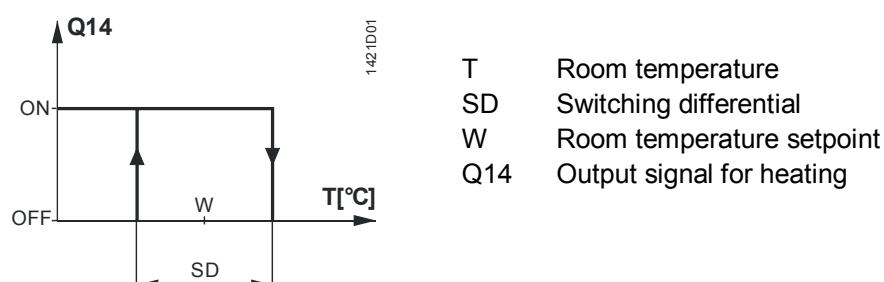
- Thermal valves or zone valves
- Gas or oil boilers
- Fans
- Pumps
- Heat exchanger
- Continuous-flow water heater
- Small water heating systems

Functions

- Room temperature control via built-in temperature sensor
- Selection of operating mode with operating mode touchkey
- Display of current room temperature or setpoint in °C or °F
- Touchkey lock (manually)
- Setpoint lock
- Reloading factory settings for commissioning and control parameters
- Independent DHW

Temperature control

The unit acquires the room temperature with its built-in sensor and maintains the setpoint by delivering control commands. The switching differential is 1 K.



Type summary

Product No.	Stock No.	Features
RDD100.1DHW	S55770-T277	DHW room thermostat Battery-powered DC 3 V

Ordering

- When ordering, please indicate product No. / stock No. and description.
- Example:

Product No.	Stock No.	Description
RDD100.1DHW	S55770-T277	DHW room thermostat

Valve actuators must be ordered separately!

Equipment combinations

Description		Product No.	Data Sheet
Electromotoric actuator		SFA21..	4863
Electrothermal actuator (for radiator valves)		STA23..	4884
Electrothermal actuator (for small valves 2.5 mm)		STP23..	4884
Electromotoric actuator for zone valves VVI46..		SUA21..	4830
Damper actuator		GDB..	4634
Damper actuator		GSD..	4603
Damper actuator		GQD..	4604
Rotary damper actuator		GXD..	4622

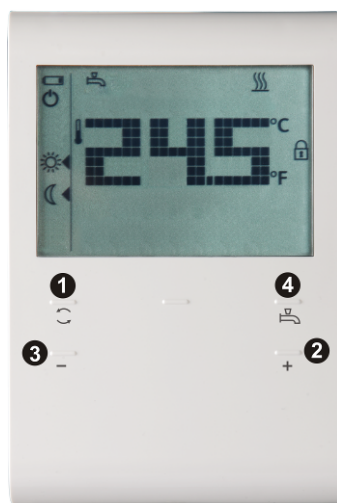
Mechanical design

The room thermostat consists of 2 parts:

- Plastic housing which accommodates the electronics, the operating elements and the room temperature sensor
- Mounting plate with screw terminals

The housing engages in the mounting plate and is secured with a screw.

Operation and settings



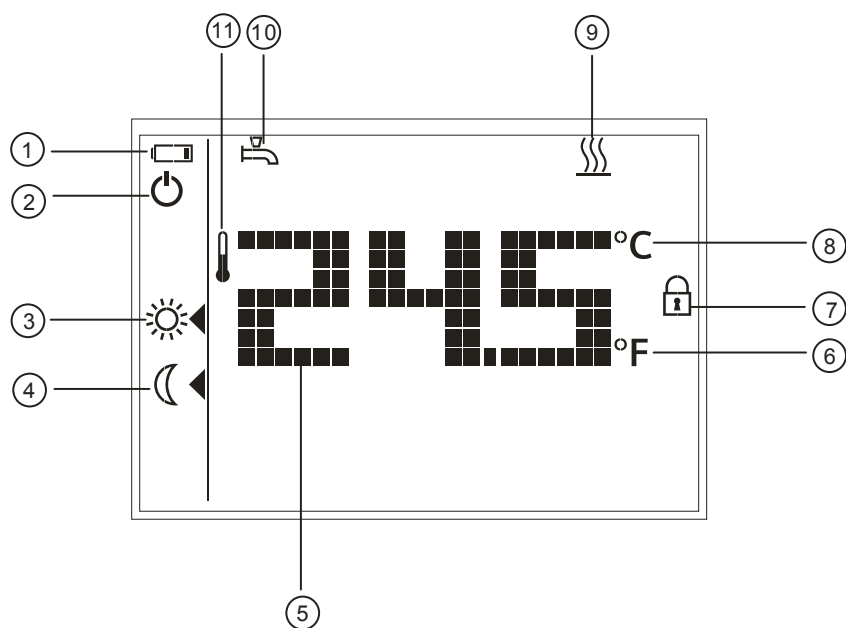
1) Operating mode touchkey \









2) Touchkey for increasing a value

3) Touchkey for decreasing a value

4) DHW switch On/Off touchkey

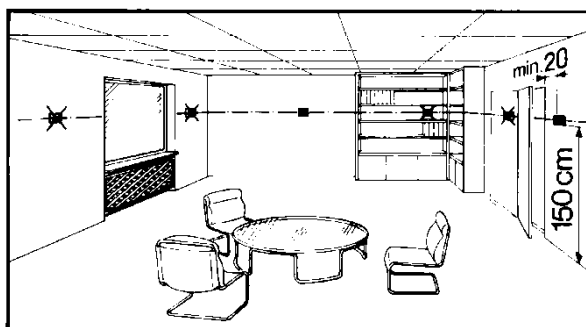
Display



#	Symbol	Description	#	Symbol	Description
1		Indicating that batteries need to be replaced	6	°F	Room temperature in degrees Fahrenheit
2		Protection mode (protection mode symbol can be enabled via parameter settings)	7		Touchkey lock activated
3		Comfort mode	8	°C	Room temperature in degrees Celsius
4		Economy mode	9		Heating On
5	24.5	Display of room temperature, setpoint, etc.	10		DHW On
			11		Current room temperature

Mounting and installation notes

Do not mount the thermostat in niches or bookshelves, not behind curtains, not above or near heat sources, and not exposed to direct solar radiation. Mount about 1.5 m above the floor.



Mounting



- Mount the thermostat in a clean and dry location without direct air flow from a heating/cooling equipment, and not exposed to drip or splash water

Wiring

See the Mounting Instructions M1429 enclosed with the thermostat.



- Ensure that wiring, protection and earthing comply with local regulations
- Correctly size the cables to the thermostat and the valve actuators
- Use only valve actuators rated for AC 24...230 V

Warning!

No internal line protection for supply lines to external consumers.

Risk of fire and injury due to short-circuits!



- Adapt the line diameters as per local regulations to the rated value of the installed overcurrent protection device.



- The AC 230 V mains supply line must have a circuit breaker with a rated current of no more than 10 A



- Disconnect from power supply before removing the unit from its mounting plate

Commissioning notes

Commissioning

After power is applied, the thermostat carries out a reset during which all LCD segments flash, indicating that reset was made correctly. After the reset, the thermostat is ready for commissioning by qualified HVAC personnel.

The control parameters of the thermostat can be set to ensure optimum performance of the entire system. Please refer to Operating Instructions CB1B1421, section "Do you want to change parameters?".

Sensor calibration

If the temperature on the display does not agree with the room temperature effectively measured, the temperature sensor can be recalibrated. For that purpose, adjust parameter P04.

Setpoint and setpoint lock

We recommend to review the setpoint range and setpoint lock (for public areas) using parameters P05...P08 and change them as needed to achieve maximum comfort and energy savings.

Touchpad scanning rate


Since the thermostat uses touch technology and to minimize battery power consumption, a parameter P21 (adjustable from 0.25 to 1.5 seconds) is

implemented for the user to adjust. This function is only valid for the battery-powered version and the default value is 1 second.


This means that when, for a certain time, the user does not touch the touchpad, the unit operates in power saving mode and the touchpad is running at a scanning rate of 1 second.

(From the calculation – assuming 4 operations per day on the thermostat, the estimated 1-second scanning rate results in a battery life of 1 year. If the user increases the scanning rate, the batteries' life is extended.)

Change of batteries

If the battery symbol  appears, the batteries are almost exhausted and should be replaced. Use alkaline batteries type AAA.


Operating notes

The RDD100.1DHW provides Comfort, Economy and Protection mode. The difference between Comfort and Economy mode is only the room temperature setpoint. The changeover between Comfort, Economy and Protection mode is made by pressing touchkey .


Comfort mode

When Comfort mode is activated, symbol  appears on the display. The setpoint (20 °C) can be readjusted by pressing touchkeys + and –.

Economy mode

When Economy mode is activated, symbol  appears on the display. The setpoint (16 °C) can be readjusted by pressing touchkeys + and –.

Protection mode

If the temperature falls below 5 °C, the unit automatically activates the heating output. The symbol  appears only, if the icon is enabled via parameter settings.

DHW

When this DHW function is activated, symbol  appears on LCD.

Maintenance notes



The thermostats are maintenance-free.



Disposal



The device is considered an electronic device for disposal in terms of the European Directive 2012/19/EU and may not be disposed of as domestic garbage.

- Dispose of the device through channels provided for this purpose.
- Comply with all local and currently applicable laws and regulations.
- Dispose of empty batteries in designated collection points.

	 WARNING
	<p>Risk of explosion due to fire or short-circuit, even if the batteries are empty</p> <p>Risk of injuries from by flying parts</p> <ul style="list-style-type: none"> • Do not allow the batteries to come into contact with water. • Do not charge the batteries. • Do not damage or destroy the batteries. • Do not heat the batteries to more than 85 °C.

	 WARNING
	<p>Electrolyte leakage</p> <p>Chemical burns</p> <ul style="list-style-type: none"> • Only grasp damaged batteries using suitable protective gloves. • If electrolyte comes into contact with eyes, immediately rinse eyes with plenty of water. Consult a doctor.

Observe the following:

- Only replace batteries with batteries of the same type and from the same manufacturer.
- Observe the polarities (+/-).
- The batteries must be new and free from damage.
- Do not mixed new batteries with used batteries.
- Store, transport, and dispose of the batteries in accordance with local regulations, guidelines, and laws. Also observe information from the battery manufacturer.

Technical data



Power supply

Operating voltage	
• RDD100.1DHW	DC 3 V (2 x 1.5 V alkaline batteries AAA)

For battery life (RDD100.1DHW), see below (alkaline batteries type AAA).

Battery life calculation is based on the touchpad scanning rate during idle time (assuming a user presses 4 touchkeys per day):

Scanning rate 0.25 s	193 days battery life
Scanning rate 0.50 s	273 days battery life
Scanning rate 1.00 s	345 days battery life
Scanning rate 1.50 s	378 days battery life

Control inputs

Control input Q11-Nx (Com)	(AC 24...230 V)	Max. 5(2) A	Min. 8 mA
Control input Q21-Nx (Com)	(AC 24...230 V)	Max. 5(2) A	Min. 8 mA

Control outputs

Heating valve or wall-hung boiler			
Control output Q12-Nx (NC contact)	(AC 24...230 V)	Max. 5(2) A	Min. 8 mA
Control output Q14-Nx (NO contact)	(AC 24...230 V)	Max. 5(2) A	Min. 8 mA



DHW heating equipment

Control output Q22-Nx (NC contact)	(AC 24...230 V)	Max. 5(2) A	Min. 8 mA
Control output Q24-Nx (NO contact)	(AC 24...230 V)	Max. 5(2) A	Min. 8 mA

No internal fuse.

External preliminary protection with max. C 10 A circuit breaker in the supply lines required under all circumstances.

External protection for incoming cable

Circuit breaker	Max. 10 A
Circuit breaker tripping characteristic	Type B, C or D to EN 60898 and EN 60947

Function data

Switching differential SD	1 K
Comfort mode	20 °C (5...35 °C)
Economy mode	16 °C (5...35 °C)

Built-in room temperature sensor

Setpoint setting range	5...35 °C (Comfort/Economy mode)
Accuracy at 25 °C	< ±0.5 K
Temperature calibration range	±3.0 K

Resolution of settings and displays

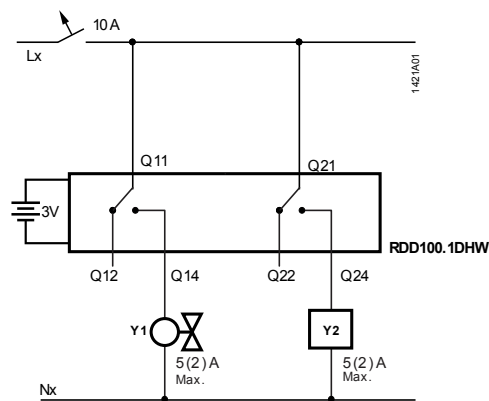
Setpoints	0.5 °C
Temperature value displays	0.5 °C

Environmental conditions

Operation	As per IEC 60721-3-3
Climatic conditions	Class 3K5
Temperature	0...50 °C
Humidity	<95% r.h.
Transport	As per IEC 60721-3-2
Climatic conditions	Class 2K3
Temperature	-25...60 °C
Humidity	<95% r.h.
Mechanical conditions	Class 2M2
Storage	As per IEC 60721-3-1
Climatic conditions	Class 1K3
Temperature	-25...60 °C
Humidity	<95% r.h.

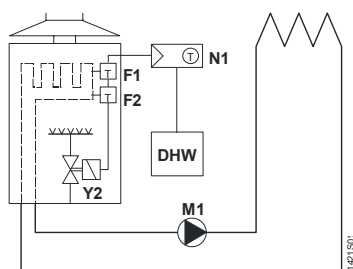
Norms and standards	EU Conformity (CE)	A6V11399487 ^{*)}
	RCM conformity	A6V11399489 ^{*)}
	Safety class	II as per EN 60730-1, EN 60730-2-9
	Pollution class	II as per EN 60730-1
	Degree of protection of housing	IP30 as per EN 60529
Environmental compatibility	The product environmental declaration CE1E1420xx ^{*)} contains data on environmentally compatible product design and assessments (RoHS compliance, materials composition, packaging, environmental benefit, disposal).	
Eco design and labelling directives	Based on EU Regulation 813/2013 (Eco design directive) and 811/2013 (Labelling directive) concerning space heaters, combination heaters, the following classes apply:	
	Application with On/Off operation of a heater	Class I value 1.0%
General	Connection terminals for	Solid wires or prepared stranded wires 2 x 1.5 mm ² or 1 x 2.5 mm ² (Min. 0.5 mm ²)
	Weight	0.167 kg
	Color of housing front	RAL9003
	*) The documents can be downloaded from http://siemens.com/bt/download .	

Connection diagrams

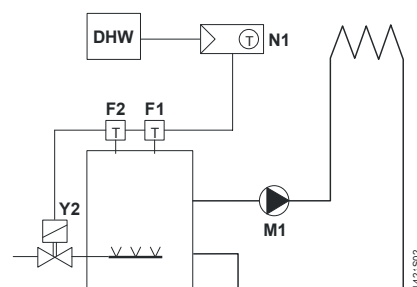


Legend	Lx	Live, AC 24...230 V
	Nx	Neutral conductor, AC 24...230 V
	Y1	Heating valve or wall-hung boiler
	Y2	DHW heating equipment

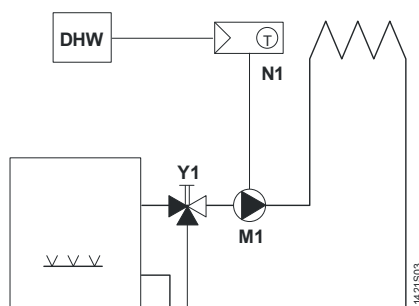
Appication examples



Room thermostat with direct control of a gas-fired wall-hung boiler with independent control of DHW



Room thermostat with direct control of a gas-fired floor-standing boiler with independent control of DHW

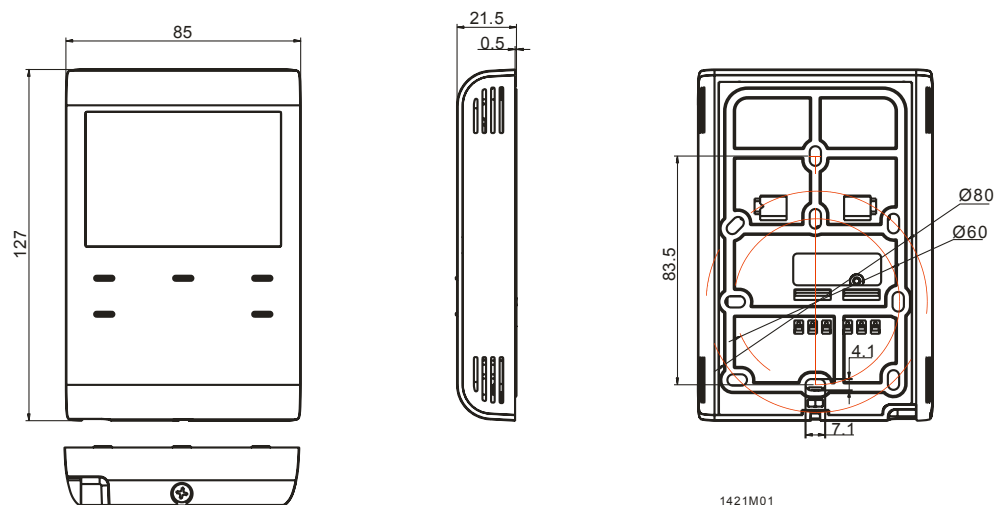


- F1 Thermal reset limit thermostat
- F2 Safety limit thermostat
- M1 Circulating pump
- N1 RDD100.1DHW room thermostat
- Y1 Mixing 3-port valve with manual adjustment
- Y2 Magnetic valve
- DHW DHW heating equipment

Room thermostat with direct control of a heating circuit pump (precontrol by manual mixing valve) with independent control of DHW

Dimensions

All dimensions in mm



Remarks

Heating:

Because of the unavoidable self heating effects of the electrical current, any loads of more than 3 Amperes connected to the unit can influence the control behavior and temperature accuracy in a negative way.



RDD100.1RF



RCR100RF

Wireless room thermostat with LCD

RDD100.1RFS

for heating systems

-
- Room temperature control
 - Comfort, Economy and Protection mode
 - 2-position control with On/Off control output
 - Adjustable commissioning and control parameters
 - Battery-powered room thermostat DC 3 V (RDD100.1RF)
 - Mains-powered receiver AC 230 V (RCR100RF)

Use

The RDD100.1RFS is used to control the room temperature in heating systems.

Typical applications:

- Apartments
- Commercial spaces
- Schools

For the control of the following pieces of equipment:

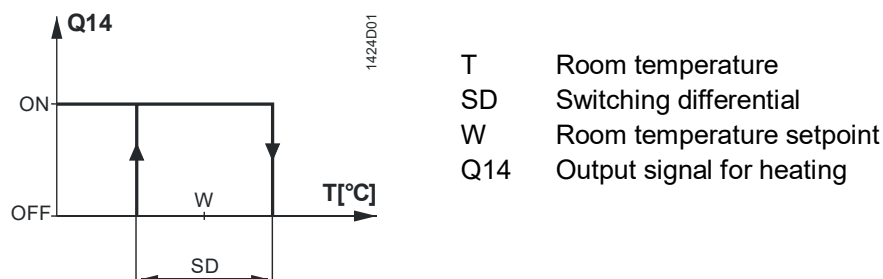
- Thermal valves or zone valves
- Gas or oil boilers
- Fans
- Pumps

Functions

- Room temperature control via built-in temperature sensor
- Selection of operating mode with touchkey
- Display of current room temperature or setpoint in °C or °F
- Touchkey lock (manually)
- Setpoint lock
- Reloading factory settings for commissioning and control parameters
- Standalone wireless transmitter and receiver
- Wireless operating frequency 433 MHz

Temperature control

The RDD100.1RFS acquires the room temperature with its built-in sensor and maintains the setpoint by delivering control commands. The switching differential is 1 K.



Type summary

Product No.	Stock No.	Features
RDD100.1RF	S55770-T319	Battery-powered room thermostat DC 3 V
RCR100RF	S55770-T418	Receiver AC 230 V








Ordering

When ordering, please indicate product No. / stock No. and description.

Product No.	Stock No.	Description
RDD100.1RFS	S55770-T281	Set consisting of room thermostat and receiver

Valve actuators must be ordered separately.

Equipment combinations

Description		Product No.	Data Sheet
Electromotoric actuators		SFA21..	4863
Electrothermal actuators (for radiator valves)		STA23..	4884
Electrothermal actuators (for small valves 2.5 mm)		STP23..	4884
Damper actuators		GDB..	4634
Damper actuators		GSD..	4603
Damper actuators		GQD..	4604
Rotary damper actuators		GXD..	4622

Mechanical design

The room thermostat consists of 3 parts:

- Plastic housing which accommodates the electronics, the operating elements and the room temperature sensor
- Mounting plate with screw terminals
- Table stand

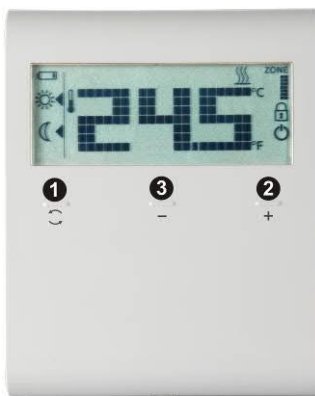
The housing engages in the mounting plate and is secured with a screw.
The optional table stand snaps onto the rear of the mounting plate.

The RCR100RF receiver consists of 2 parts:

- Plastic housing which accommodates the electronics
- Mounting plate with screw terminals

Operation and settings

RDD100.1RF



1) Touchkey for operating mode

2) Touchkey for increasing a value

3) Touchkey for decreasing a value

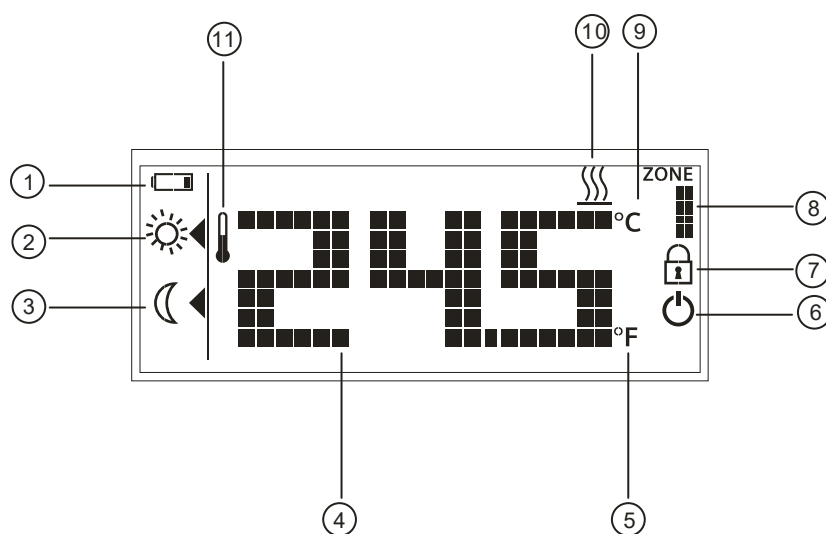
RCR100RF



1) LED for indication of operating state

2) LEARN button (or override)

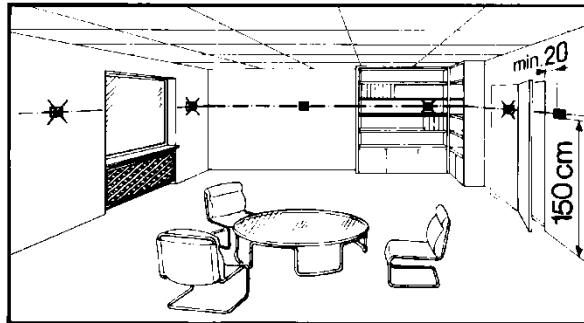
Display



#	Symbol	Description	#	Symbol	Description
1		Indicating that batteries need to be replaced	7		Touchkey lock activated
2		Comfort mode	8		Display of zone (default is 1)
3		Economy mode	9		Room temperature in degrees Celsius
4		Display of room temperature, setpoint, etc.	10		Heating On
5		Room temperature in degrees Fahrenheit	11		Current room temperature
6		Protection mode (Protection mode icon can be enabled via parameter settings)			

Mounting and installation notes

Do not mount the thermostat in niches or bookshelves, not behind curtains, not above or near heat sources, and not exposed to direct solar radiation. Mount it about 1.5 m above the floor.



Mounting



- Mount the room thermostat in a clean and dry location without direct air flow from heating/cooling equipment, and not exposed to drip or splash water
- Install the receiver close to the controlled unit if possible
- Choose the location to ensure largely interference-free reception. When mounting the receiver, observe the following:
 - Do not mount in a control panel
 - Do not mount on metallic surfaces
 - Do not mount near electrical cables and equipment such as PCs, TVs, microwaves, etc.
 - Do not mount near larger metallic structures or constructional elements with fine metal meshes such as special glass or special concrete

Wiring

See Mounting Instructions CB1M1439xx enclosed with the thermostat.



- Ensure that wiring, protection and earthing comply with local regulations
- Correctly size the cables to the thermostat and the valve actuators
- Use only valve actuators rated for AC 24... 230 V
- If the thermostat cannot accommodate all cables, power must be fed to the system via an external terminal block

Warning!


No internal line protection for supply lines to external consumers.

Risk of fire and injury due to short-circuits!



- Adapt the line diameters as per local regulations to the rated value of the installed overcurrent protection device.
- The AC 230 V mains supply line must have a circuit breaker with a rated current of no more than 10 A
- Disconnect from power supply before removing the unit from its mounting plate
- Make sure the receiver is not connected to power during wiring


Commissioning notes

Commissioning	<p>After power is applied, the thermostat carries out a reset during which all LCD segments flash, indicating that the reset is correctly made. After the reset, the thermostat is ready for commissioning by qualified HVAC personnel.</p> <p>The control parameters of the thermostat can be set to ensure optimum performance of the entire system (refer to Operating Instructions CB1B1424en, section "Do you want to change parameters?").</p>
Sensor calibration	<p>If the temperature shown on the display does not agree with the room temperature effectively measured, the temperature sensor can be recalibrated. For that purpose, adjust parameter P04.</p>
Setpoint and setpoint lock	<p>We recommend to review the setpoint setting range and setpoint lock (for public spaces) using parameters P05...P08 and change them as needed to achieve maximum comfort and energy savings.</p>
Touchpad scanning rate	<p>Since the thermostat uses touch technology and to minimize battery power consumption, a parameter P21 (adjustable from 0.25 to 1.5 seconds) is implemented for the user to adjust.</p> <p>This means that when, for a certain time, the user does not touch the touchpad, the unit operates in power saving mode and the touchpad is running at a scanning rate of 1 second.</p> <p>(From the calculation – assuming 4 operations per day on the thermostat, the estimated 1-second scanning rate results in a battery life of 1 year. If the user increases the scanning rate, the batteries' life is extended.)</p>
Change of batteries	<p>If the battery symbol  appears, the batteries are almost exhausted and should be replaced. Use alkaline batteries type AAA.</p>
LED indication on RCR100RF	<p>For the pairing process between transmitter and receiver, refer to Operating Instructions CB1B1424en, section "Do you want to pair transmitter and receiver?". The table below describes the behavior of the RCR100RF:</p>

State of receiver	State of LED
Power up (or reset)	The red and green LEDs flash alternately for 5 seconds and then change to constantly red. Note: If the receiver was programmed before, it will immediately change to constantly red.
Learning mode Successful learning mode	The red and green LEDs flash alternately. If learning was successful, the green LED will flash for 10 minutes.
Signal ok and output status change	The green LED is lit. If the output state changes, the green LED flashes for 3 seconds and then changes back to constantly green.
Fails to receive wireless data	If the RCR100RF fails to receive wireless data, the red LED will start to flash after 125 minutes. If the RCR100RF signal is recovered, it will resume the previous LED state.


Override via the RCR100RF

The receiver provides an override function (boiler test, emergency operation). It allows the installer to override the relay to be permanently energized, regardless of the wireless data received.

To activate the override function, press and hold the  button for at least 10 seconds and release. The LED is constantly green and off once every 5 seconds, indicating that the override function is enabled.

To disable the override function, press the  button once.


Operating notes

The RDD100.1RF provides Comfort, Economy and Protection mode. The difference between Comfort and Economy mode is only the room temperature setpoint. The changeover between Comfort, Economy and Protection mode is made by pressing touchkey .


Comfort mode

When Comfort mode is activated, symbol  appears on the display. The setpoint (20 °C) can be readjusted by pressing touchkeys + and –.

Economy mode

When Economy mode is activated, symbol  appears on the display. The setpoint (16 °C) can be readjusted by pressing touchkeys + and –.

Protection mode

If the temperature falls below 5 °C, the thermostat automatically activates the heating output. Symbol  appears only if the icon is enabled via parameter settings.

Maintenance notes


Thermostat and receiver are maintenance-free.


Disposal



The device is considered electrical and electronic equipment for disposal in terms of the applicable European Directive and may not be disposed of as domestic garbage.

- Dispose of the device through channels provided for this purpose.
- Comply with all local and currently applicable laws and regulations.
- Dispose of empty batteries in designated collection points.


	⚠ WARNING
	<p>Risk of explosion due to fire or short-circuit, even if the batteries are empty</p> <p>Risk of injuries from by flying parts</p> <ul style="list-style-type: none"> • Do not allow the batteries to come into contact with water. • Do not charge the batteries. • Do not damage or destroy the batteries. • Do not heat the batteries to more than 85 °C.

	⚠ WARNING
	<p>Electrolyte leakage</p> <p>Chemical burns</p> <ul style="list-style-type: none"> • Only grasp damaged batteries using suitable protective gloves. • If electrolyte comes into contact with eyes, immediately rinse eyes with plenty of water. Consult a doctor.

Observe the following:





- Only replace batteries with batteries of the same type and from the same manufacturer.
 - Observe the polarities (+/-).
 - The batteries must be new and free from damage.
 - Do not mixed new batteries with used batteries.
 - Store, transport, and dispose of the batteries in accordance with local regulations, guidelines, and laws.
- Also observe information from the battery manufacturer.

Technical data of RDD100.1RF

 Power supply	Operating voltage	DC 3 V (2 x 1.5 V alkaline batteries AAA)		
	For battery life (RDD100.1RF), see below (alkaline batteries type AAA). Battery life calculation is based on the touchpad scanning rate during idle time (assuming a user presses 4 touchkeys per day):			
	Scanning rate 0.25 s	311 days battery life		
	Scanning rate 0.5 s	322 days battery life		
	Scanning rate 1 s (default)	357 days battery life		
Function data	Scanning rate 1.5 s	377 days battery life		
	Switching differential SD	1 K		
	Comfort mode	20 °C (5...35 °C)		
	Economy mode	16 °C (5...35 °C)		
	Built-in room temperature sensor			
	Setpoint setting range	5...35 °C (Comfort/Economy mode)		
	Accuracy at 25 °C	<±0.5 K		
	Temperature calibration range	±3.0 K		
	Resolution of settings and displays			
	Setpoints	0.5 °C		
Environmental conditions	Temperature value displays	0.5 °C		
	Operation	As per IEC 60721-3-3		
	Climatic conditions	Class 3K5		
	Temperature	0...50 °C		
	Humidity	<95% r.h.		
	Transport	As per IEC 60721-3-2		
	Climatic conditions	Class 2K3		
	Temperature	-25...60 °C		
	Humidity	<95% r.h.		
	Mechanical conditions	Class 2M2		
	Storage	As per IEC 60721-3-1		
	Climatic conditions	Class 1K3		
	Temperature	-25...60 °C		
	Humidity	<95% r.h.		
Standards and directives	EU Conformity (CE)	CE1T1420xx ^{*)}		
	RCM conformity	CE1T1420en_C1 ^{*)}		
	Safety class	II as per EN 60730-1, EN 60730-2-9		
	Pollution class	II as per EN 60730-1		
	Degree of protection of housing	IP30 as per EN 60529		
Environmental compatibility	The product environmental declaration CE1E1420xx ^{*)} contains data on environmentally compatible product design and assessments (RoHS compliance, materials composition, packaging, environmental benefit, disposal).			
Eco design and labelling directives	Based on EU Regulation 813/2013 (Eco design directive) and 811/2013 (Labelling directive) concerning space heaters, combination heaters, the following classes apply:			
	- Application with On/Off operation of a heater	Class I	value 1%	
General	Connection terminals for	Solid wires or prepared stranded wires 2 x 1.5 mm ² or 1 x 2.5 mm ² (Min. 0.5 mm ²)		
	Weight	0.152 kg		
	Color of housing front	RAL9003		

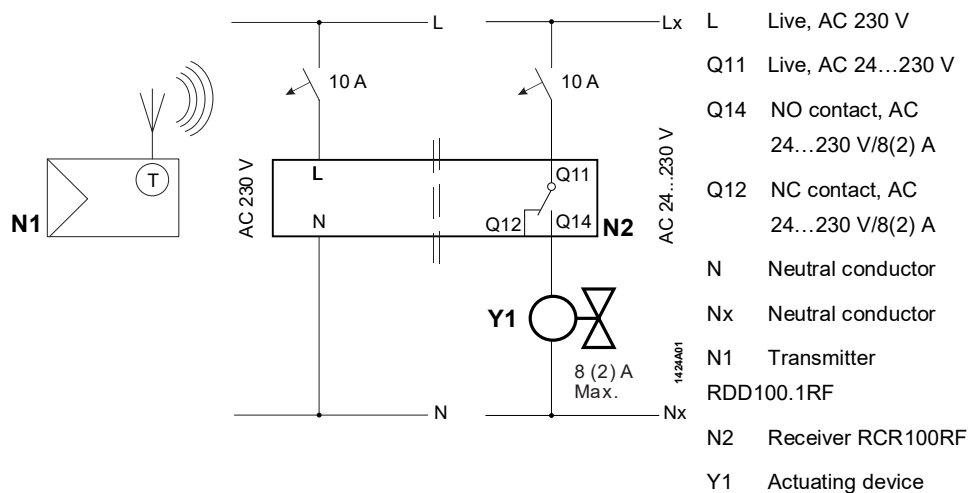
*) The documents can be downloaded from <http://siemens.com/bt/download>.

Technical data of RCR100RF

 Power supply	Operating voltage	AC 230 V +10%/-15%
	Power	<10 VA
	Frequency	48...63 Hz
	Switching capacity of relays	
	Voltage	AC 24...230 V
 Switching outputs (Q11, Q12, Q14)	Current	8(2) A
	Switching voltage	Max. AC 230 V Min. AC 24 V
	Switching current	Max. 8 A res., 2 A ind.
	At AC 230 V	Min. 200 mA
	No internal fuse.	
	External preliminary protection with max. C 10 A circuit breaker in the supply lines required under all circumstances.	
	External protection for incoming cable	
	Circuit breaker	Max. 10 A
	Circuit breaker tripping characteristic	Type B, C or D to EN 60898 and EN 60947
	Contact life at AC 230 V	Guide value:
	At 8 A res.	1 x 10 ⁵ cycles
	Insulating strength	
	Between relay contacts and coil	AC 5,000 V
	Between relay contacts (same pole)	AC 1,000 V
	Electrical connections	
Environmental conditions	Connection terminals	Screw terminals
	For solid wires	2 x 1.5 mm ²
	For stranded wires	1 x 2.5 mm ² (Min. 0.5 mm ²)
	Operation	As per IEC 60721-3-3
	Climatic conditions	Class 3K5
	Temperature	0...50 °C
	Humidity	<95% r.h.
	Transport	As per IEC 60721-3-2
	Climatic conditions	Class 2K3
	Temperature	-25...60 °C
	Humidity	<95% r.h.
	Mechanical conditions	Class 2M2
	Storage	As per IEC 60721-3-1
	Climatic conditions	Class 1K3
	Temperature	-25...60 °C
	Humidity	<95% r.h.
Standards and directives	EU Conformity (CE)	CE1T1420xx ^{*)}
	 conformity to	
	EMC emission standard	AS/NZS 4251.1:1999
	Safety class	II as per EN 60730-1, EN 60730-2-9
	Pollution class	II as per EN 60730
Environmental compatibility	Degree of protection of housing	IP30 as per EN 60529
	The product environmental declaration CE1E1420xx ^{*)} contains data on environmentally compatible product design and assessments (RoHS compliance, materials composition, packaging, environmental benefit, disposal).	
	Color of housing front	RAL9003
General	Weight	0.152 kg
	Color of housing front	RAL9003

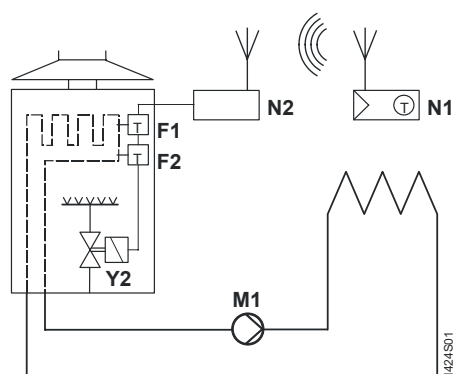
*) The documents can be downloaded from <http://siemens.com/bt/download>.

Connection diagrams

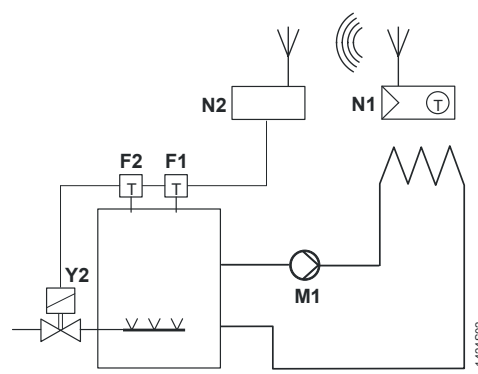


⚠ L – N AC 230 V/Lx – Nx AC 24...230 V

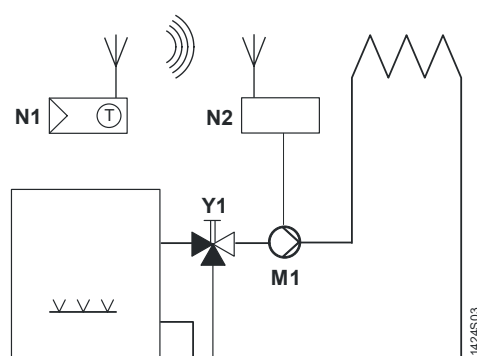
Application examples



Wireless room thermostat with receiver, control of a gas-fired wall-hung boiler



Wireless room thermostat with receiver, control of a gas-fired floor-standing boiler



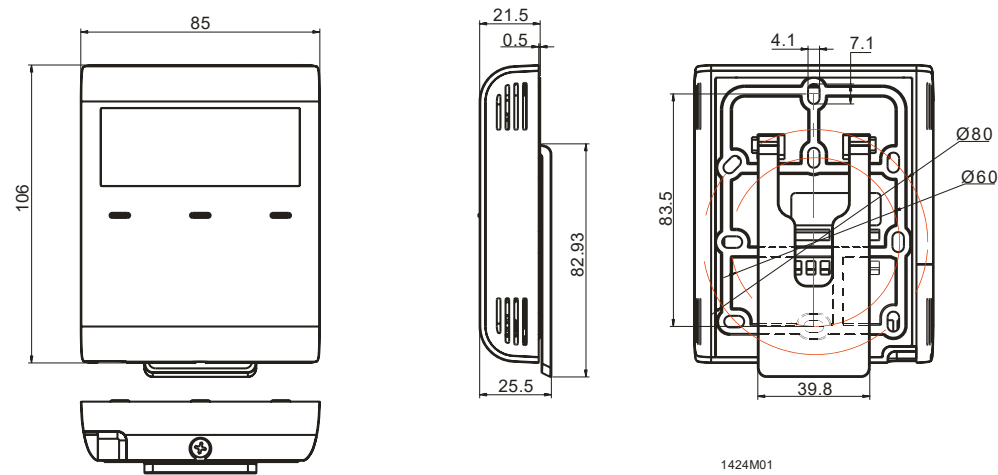
Wireless room thermostat with receiver, control of a heating circuit pump (precontrol by manual mixing valve)

- F1 Thermal reset limit thermostat
- F2 Safety limit thermostat
- M1 Circulating pump
- N1 RDD100.1RF room thermostat
- N2 RCR100RF receiver
- Y1 3-port valve with manual adjustment
- Y2 Magnetic valve

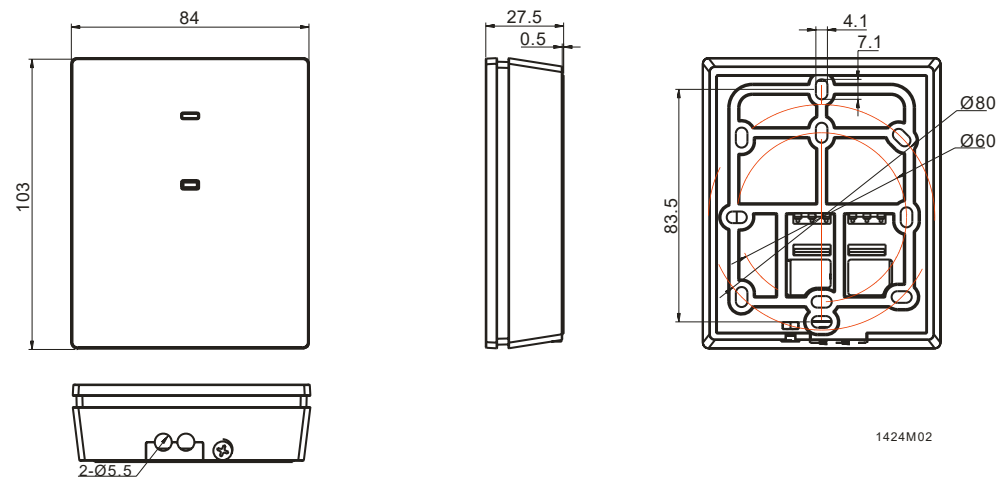
Dimensions

Dimensions in mm

Room thermostat RDD100.1RF



Receiver RCR100RF





Room thermostat with Auto Timer, Option External Input RDE100..

for heating systems

- Room temperature control
- 2-position / TPI control with On/Off output for heating
- Optimum Start / Stop
- Comfort, Economy, Auto timer and Protection mode
- Auto time switch
- Adjustable commissioning and control parameters
- Mains-powered AC 230 V (RDE100) or battery-powered DC 3 V (RDE100.1)
- Multifunction input (RDE100.1 only) for external floor sensor, keycard contact, etc.

Use

The RDE100.. is used to control the room temperature in heating systems.

Typical applications:

- Apartments
- Commercial spaces
- Schools

For the control of the following pieces of equipment:

- Thermal valves or zone valves
- Gas or oil boilers
- Fans
- Pumps

- Floor Heating

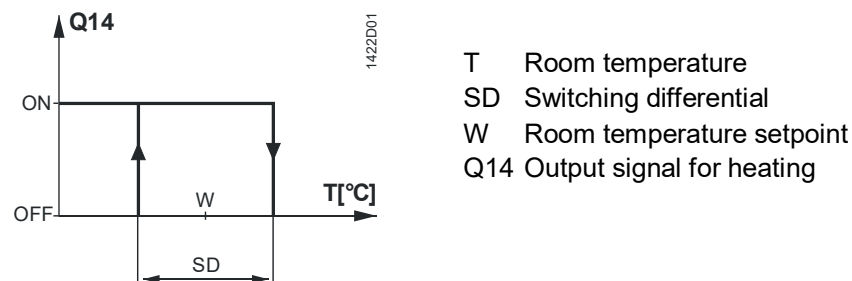
Functions

- Room temperature control via built-in sensor or external input
- Selection of operating mode with operating mode touchkey
- Setting auto time switch (individual day, 7 day or 5-2 day)
- Display of current room temperature or setpoint in °C or °F
- Touchkey lock (manually)
- Setpoint lock
- Periodic pump run
- Optimum start / stop
- Comfort temperature limitation by Economy setpoint locked
- Reloading factory settings for commissioning and control parameters
- One multifunctional input (RDE100.1 only) freely selectable for:
 - Floor Heating temperature limitation function
 - Operating mode switchover contact (keycard, window contact, etc.)

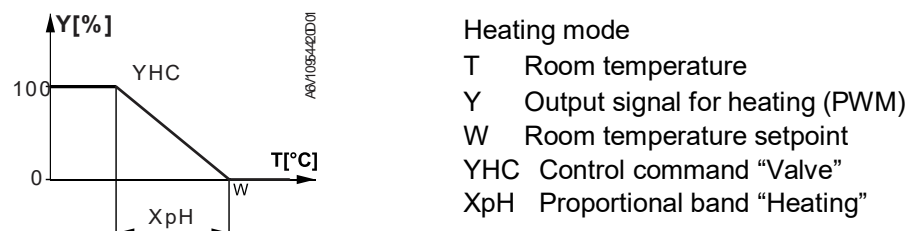
Temperature control

RDE100.. comprises of both 2-position and TPI temperature controls, which can be configured by parameter P78 (Control behavior).

2-position control algorithm is to switch on and off the heating system within a switching differential according to comparison between setpoint setting and the measured room temperature.



TPI (Time proportional Integral) control algorithm is to periodically switch on and off the heating system. The period time and pulse length of the control signal (PWM) are determined by the setpoint and the measured room temperature.



Floor heating limitation function (RDE100.1 only)

The factory setting for this function is Off (disabled) and must be set to "On" if floor heating is used.

The external floor temperature sensor is connected to input X1, **⏚** and acquires the floor temperature. If the floor temperature exceeds the parameterized temperature limit xx °C (P14 = 1, P15 = 1, P16 = xx °C), the heating valve is fully closed until the floor temperature returns to a level below the parameterized limit. Typical application is rooms (dry floor).

If the application does not require floor heating temperature limitation but instead uses the external sensor as a source for both room temperature display and control, the parameters will have to be set as follows: P14 = 1, P15 = 0. A typical application is the bathroom (wet floor) where a constant floor temperature is required.

It is not recommended to have **only** an internal built-in room sensor for floor heating since there is a potential risk of overheating.

Typical application: Maximum temperature limitation for under floor heating systems

Operating mode switchover function

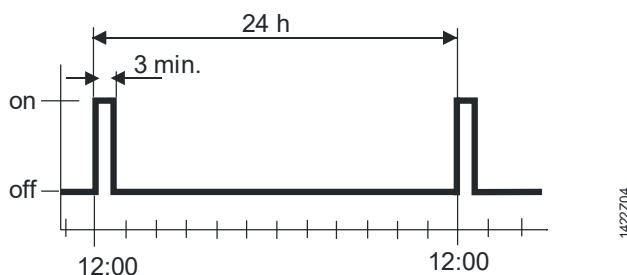
This function allows keycard application, please refer to the section “Operating notes, Economy mode”.

Periodic pump run function

Can only be used when circulating pump or valve is controlled!

This function protects the pump or valve against seizing during longer off periods. Periodic pump run is activated for 3 minutes every 24 hours at 12:00.

Parameter	Pump status
P12 = 0 (Default)	Pump run off
P12 = 1	Pump run on



Optimum start control

The purpose of optimum start control is to reach a temperature level 0.25 K below the Comfort setpoint when occupancy according to the time program starts in Auto timer mode. For that purpose, the heating circuit must be switched on at an earlier point in time. The extent of forward shift depends primarily on the outside temperature.

The maximum forward shift on time can be adjusted by parameter P89. A Forward shift on maximum "0" means the function is disabled.

Parameter	Range	Factory setting
Forward shift on max (P89)	0, 0.5,...24 h	0

Optimum stop control

Optimum stop control switches off the heating circuit at the earliest possible point in time so that the room temperature will lay 0.5 K below the Comfort setpoint when the time switch changes from Comfort mode to Economy mode in Auto timer mode. The early shut down maximum time can be adjusted by parameter P90. Early shut down maximum "0" means the function is disabled.

Parameter	Range	Factory setting
Early shutdown max (P90)	0, 0.5,...6 h	0

Control behavior (P78)

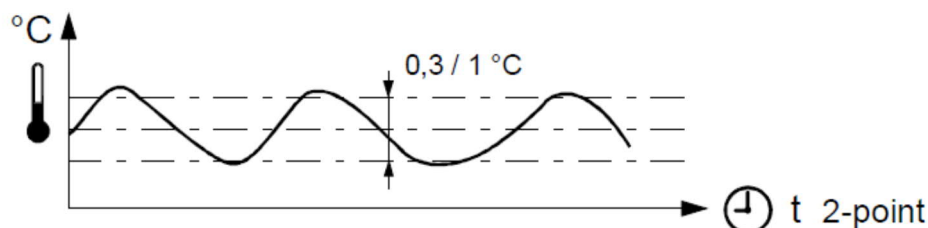
The new control algorithm of RDE100.. family offers a choice of control actions that can be configured via parameter **P78**. This means that optimum control can be selected for every type of application (**factory setting "TPI slow"**).

2-position, 1 K

2-Position controller with 1 [K] switching hysteresis

2-position, 0.3 K

- 2-Position controller with 0.3 [K] switching hysteresis.
- For general control situations. Provides a better comfort than 1 [K] switching hysteresis.
- Can also be used for difficult control situations.



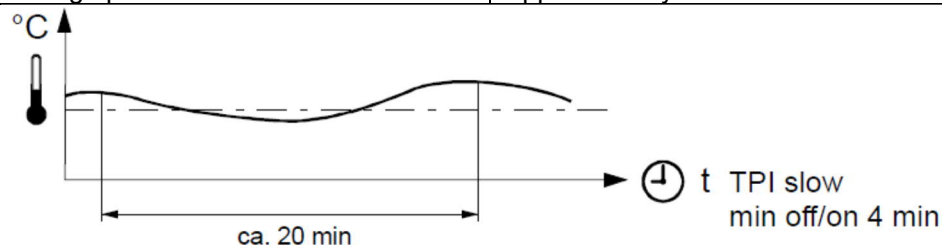
TPI slow

TPI control behavior for slow heating systems that require longer minimum On times and limited numbers of switching cycles per hour.

Typical applications:

- Floor heating systems, oil fired boilers
- Can also be used for all other types of heating applications. (Alternative setting)

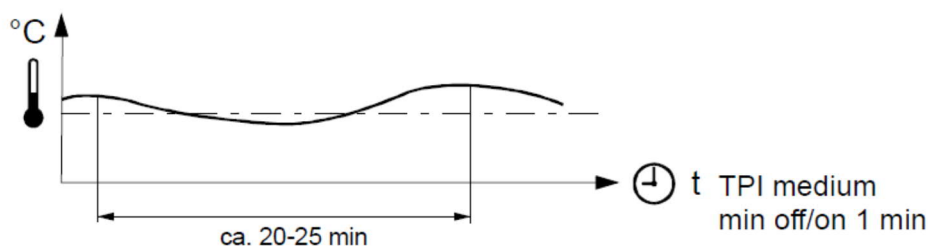
Minimum switching on / off time	> 4 minutes
Average period time	Approximately 20 minutes



TPI medium

TPI control behavior for general heating applications such as radiator systems, thermal actuators, ...

Minimum switching on / off time	> 1 minute
Average period time	Approximately 20-25 minutes



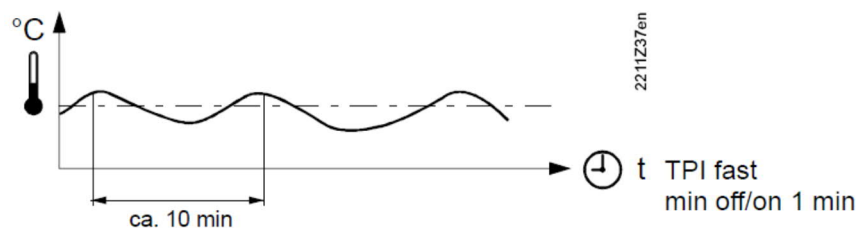
TPI fast

TPI control behavior for fast heating systems that tolerate a high number of switching cycles.

Typical applications: electric heaters, gas boilers, fast thermal actuators

Minimum switching on / off time	> 1 minute
Average period time	Approximately 10 minutes

⚠ Do not use TPI fast for oil boilers or electro mechanical actuators!



Type summary

Product No.	Stock No.	Features
RDE100	S55770-T278	Mains-powered AC 230 V
RDE100.1	S55770-T279	Battery-powered DC 3 V










Ordering

- When ordering, please indicate product No. / stock No. and description.
- Example:

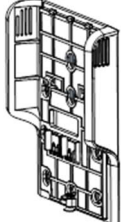
Product No.	Stock No.	Description
RDE100	S55770-T278	Room thermostat

Valve actuators/external sensor must be ordered separately.

Equipment combinations

Description		Product No.	Data Sheet *)	Use with the type of Temperature Control
Electromotoric actuator		SFA21..	4863	2-Position & TPI slow
Electrothermal actuator (for radiator valves)		STA23..	4884	2-Position & All TPI
Electrothermal actuator (for small valves 2.5 mm)		STP23..	4884	2-Position & All TPI
Damper actuator		GDB..	4634	2-Position & TPI slow
Damper actuator		GSD..	4603	2-Position & TPI slow
Damper actuator		GQD..	4604	2-Position & TPI slow
Rotary damper actuator		GXD..	4622	2-Position & TPI slow
Cable temperature sensor		QAH11.1	1840	N/A
Room temperature sensor		QAA32 ..	1747	N/A

*) The documents can be downloaded from <http://siemens.com/bt/download>.

Description		Product No.	Mounting Instruction *)
Adapter plate (for China 86 conduit box, BS4662 UK conduit box)		ARG70.5	A6V10563479

*) The documents can be downloaded from <http://siemens.com/bt/download>.

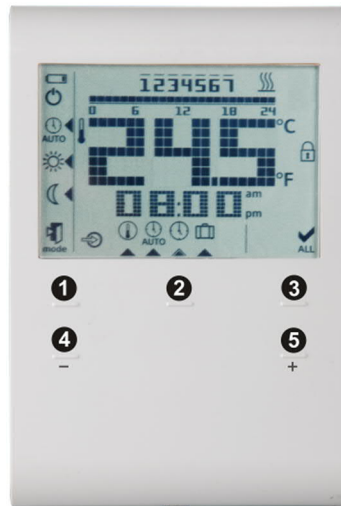
Mechanical design

The room thermostat consists 2 parts:

- Plastic housing which accommodates the electronics, the operating elements and the room temperature sensor
- Mounting plate with screw terminals

The housing engages in the mounting plate and is secured with a screw.

Operation and settings



1) Operating mode touch key

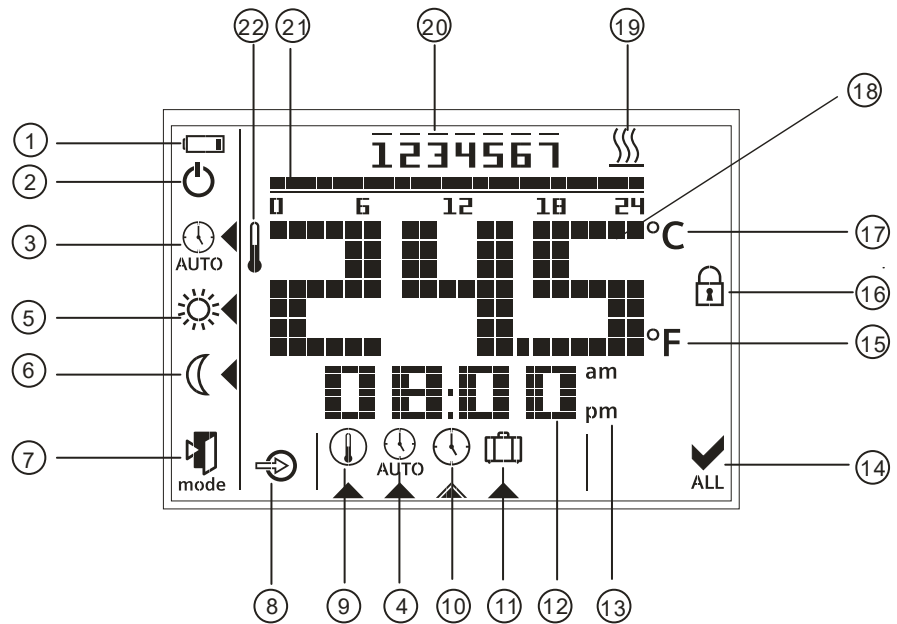
2) Set

3) Ok

4) Touch key for decreasing a value

5) Touch key for increasing a value

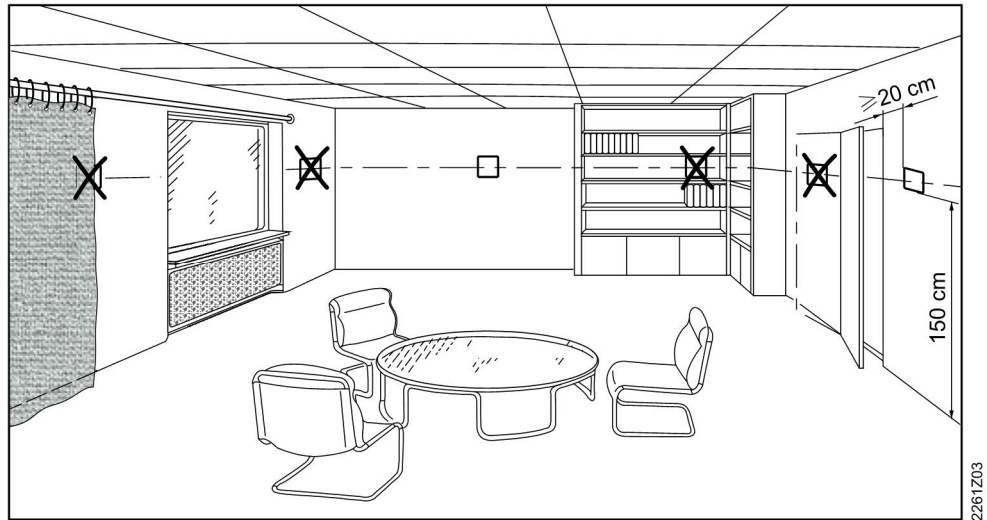
Display



#	Symbol	Description	#	Symbol	Description
1		Indicating that batteries need to be replaced (only with battery-powered version RDE100.1)	12		Display of time
2		Protection mode (protection mode symbol can be enabled via parameter settings)	13	am pm	Morning: 12-hour format Afternoon: 12-hour format
3		Auto timer mode	14	 ALL	Confirmation
4	AUTO	View and set auto time switch	15	°F	Room temperature in degrees Fahrenheit
5		Comfort mode	16		Touch key lock activated
6		Economy mode	17	°C	Room temperature in degrees Celsius
7	 mode	Escape	18	24.5	Display of room temperature, set point, etc.
8		External input enabled (RDE100.1 only)	19		Heating On
9		Permanent set point setting	20	1 2 3 4 5 6 7	Weekday 1 = Monday 7 = Sunday
10		Day and time setting	21		Timer bar
11		Holiday mode setting	22		Current room temperature

Mounting and installation notes

Do not mount the thermostat in niches or bookshelves, not behind curtains, not above or near heat sources, and not exposed to direct solar radiation. Mount about 1.5 m above the floor.



Mounting



- Mount the thermostat in a clean and dry location without direct air flow from a heating/cooling equipment, and not exposed to drip or splash water
- Note: When RDE100.. is equipped with either China 86 conduit box or BS4662 UK conduit box, ARG70.5 adapter plate is suggested to provide a better fitting installation.

Wiring

See Mounting Instructions M1429 enclosed with the thermostat.



- Ensure that wiring, protection and earthing comply with local regulations



- Correctly size the cables to the thermostat and the valve actuators



- Use only valve actuators rated for AC 24...230 V



Warning!

No internal line protection for supply lines to external consumers.

Risk of fire and injury due to short-circuits!



- Adapt the line diameters as per local regulations to the rated value of the installed overcurrent protection device



- The AC 230 V mains supply line must have a circuit breaker with a rated current of no more than 10 A



- Disconnect from power supply before removing the unit from its mounting plate



- External Inputs X1, \perp may carry mains potential. Sensor cables or window contact must carefully install before powering up the thermostat

Commissioning notes

Commissioning	<p>After power is applied, the thermostat carries out a reset during which all LCD segments flash, indicating that the reset was made correctly. After the reset, the thermostat is ready for commissioning by qualified HVAC personnel.</p> <p>The control parameters of the thermostat can be set to ensure optimum performance of the entire system. Please refer to Operating Instructions CB1B1422, section "Do you want to change parameters?".</p>
Sensor calibration	<p>If the temperature on the display does not agree with the room temperature effectively measured, the temperature sensor can be recalibrated. For that purpose, adjust parameter P04.</p>
Setpoint lock	<p>We recommend reviewing the setpoint lock (for public areas) in parameters P06 and P08 and changing them as needed. If the Economy setpoint is locked then the Comfort temperature setpoint can not be set lower than the locked Economy setpoint.</p>
Touchpad scanning rate	<p>Since the thermostat uses touch technology and to minimize battery power consumption, a parameter P21 (adjustable from 0.25 to 1.5 seconds) is implemented for the user to adjust. This function is only valid for the battery-powered version and the default value is 1 second.</p> <p>This means that when, for a certain time, the user does not touch the touchpad, the unit operates in power saving mode and the touchpad is running at a scanning rate of 1 second.</p> <p>(From the calculation – assuming 4 operations per day on the thermostat, the estimated 1-second scanning rate results in a battery life of 1 year. If the user increases the scanning rate, the batteries' life is extended.)</p>
X1 external input	<p>Different parameter setting of X1 external input is described below:</p> <p>Parameter P14=0 (No Input) is a default setting, which provides no external input function.</p> <p>Digital input</p> <p>An external contact can switch the thermostat from any operating mode to Economy.</p> <p>Typical applications: Window contact Key card application</p> <p>Set parameter P14 = 2 (X1 External input = Digital Input) and adapt parameter P17 (Window contact = Normally Open / Closed) accordingly.</p> <p>External sensor (used for controlling)</p> <p>The measured external sensor temperature is displayed and used for calculating heating demand instead of temperature detected by thermostat built-in internal sensor. In case of problems with the external sensor, the thermostat uses the internal sensor instead.</p> <p>Typical applications: External room temperature sensor Floor heating temperature control bath room</p>

Setting parameter P14 = 1 (X1 External input = External Sensor) and parameter P15 = 0 (Temperature limitation = Off)


Notes for floor heating temperature control:

- External safety thermostat is needed to prevent overheating of certain floor heating systems!
- Use of "Comfort setpoint lock" function (Parameter P06) is recommended.

External sensor for Floor heating application with temperature limitation

Refer to Floor Heating application section above when setting parameter P14 = 1 (X1 External input = External Sensor) and parameter P15 = 1 (Temperature limitation = On). Parameter P16 now allows to limit the maximum temperature.


Change of batteries (only with battery- powered version RDE100.1)

If the battery symbol  appears, the batteries are almost exhausted and should be replaced. Use alkaline batteries type AAA.


Operating notes


The RDE100.. provides Comfort, Economy, Auto timer and Protection mode. The difference between Comfort and Economy mode is only the room temperature setpoint. The changeover between Comfort, Economy and Protection mode is made either automatically by the auto time switch or by pressing touchkey **mode**.

Comfort mode


When Comfort mode is activated, symbol  appears on the display. The setpoint (20 °C) can be readjusted by pressing touchkeys **+** and **-**.

Economy mode

When Economy mode is activated, symbol  appears on the display. The setpoint (16 °C) can be readjusted by pressing touchkeys **+** and **-**.

In **RDE100.1**, a window contact feature is that a user can connect a window contact to the input X1, . Depending on whether the window contact is configured to Normally Open or Normally Close (Parameter P14 = 2, Parameter P17 = 0 or 1), a change in this status will automatically switch the thermostat from any modes to Economy mode. This feature is good for public area. The factory setting for this function is Off (disabled).

Protection mode

If the temperature falls below 5 °C, the unit automatically activates the heating output. The symbol  appears only, if the icon is enabled via parameter settings.


Time switch AUTO

When Auto timer mode is enabled, the changeover between the operating modes (Comfort and Economy mode) will take place automatically. There are three options for time switch setting: individual day, 7 day or 5-2 day. You can select Comfort or Economy mode in every 15 minutes interval of the day. The 0:00 to 24:00 hour time bar will allow you to set the mode throughout the selected day(s).

Default value	Day/s	Comfort mode	Economy mode
	Mo (1) – Fr (5)	6:00 – 8:00 hr 17:00 – 22:00 hr	22:00 – 6:00 hr 8:00 – 17:00 hr
	Sa (6) – Su (7)	7:00 – 22:00 hr	22:00 – 7:00 hr

Please refer to Operating Instructions CB1B1422, section "Do you want to enter your own time switch?"

Holiday mode

When holiday mode is activated, symbol  appears on the display. The set point (12 °C) and the number of days a user is away can be readjusted by pressing touch keys + and –.

Parameters

Changing the parameters by the following steps:

- Press + and – simultaneously for 5 seconds
- Release them and parameter "P01" is displayed on the bottom segment
- Press + or – to scroll to the parameter that needs to be adjusted
- Press **ok** to select this parameter
- Press + or – to adjust the value
- Press **ok** to confirm the adjusted value
- Press mode to exit the parameters without saving or wait for the program to exit automatically

Parameter list

Parameter no.	Description	Setting range (default)
P01	Time format	1 = 24:00 hours (default) 2 = 12:00 AM/PM
P02	Selection of °C or °F	1 = °C (default) 2 = °F
P03	Standard temperature display	1 = room temperature (default) 2 = setpoint
P04	Temperature sensor calibration	-3...3 °C Step 0.5 °C (-6...6 °F, step 1 °F) Default: 0 °C
P06	Comfort setpoint lock	0 = OFF (default) 1 = ON → locked according to setting in permanent temperature setpoint
P08	Economy setpoint lock	0 = OFF (default) 1 = ON → locked according to setting in permanent temperature setpoint
P09	Buzzer	0 = OFF 1 = ON (default)
P10	Show frost protection icon	0 = OFF (default) 1 = ON
P11	Time switch type for auto timer	0 = Individual Days (default) 1 = All 7 days 2 = 5/2 days
P12	Periodic pump run	0 = OFF (default) 1 = ON

P14	X1 External input (only for RDE100.1)	0 = No input 1 = External sensor 2 = Digital Input
P15	Temperature limitation (only for RDE100.1)	0 = OFF (default) 1 = ON
P16	Max limitation temperature for underfloor heating (only for RDE100.1)	25...60 °C, step 1 °C or 77...140 °F, step 1 °F Default: 30 °C
P17	Window contact features (only for RDE 100.1)	0 = Normally Open Contact (default) 1 = Normally Closed Contact
P21	Button scanning rate for the capacitive buttons (RDE100.1 only) Note: a shorter scanning rate means shorter battery life.	0.2 = 0.25 s 0.5 = 0.5 s 1.0 = 1.0 s (default) 1.5 = 1.5 s
P22	Reload factory settings	0 = OFF (default) 1 = reload
P23	Software version information	No adjustment possible
P78	Control behavior	0 = On/Off, 1.0 K 1 = On/Off, 0.3 K 2 = TPI fast 3 = TPI medium 4 = TPI slow (default)
P89	Forward shift on max	0, 0.5,...24 h Default: 0 h
P90	Early shutdown max	0, 0.5,...6 h Default: 0 h

Maintenance notes

The thermostats are maintenance-free.

Disposal



The device is considered electrical and electronic equipment for disposal in terms of the applicable European Directive and may not be disposed of as domestic garbage.

- Dispose of the device through channels provided for this purpose.
- Comply with all local and currently applicable laws and regulations.
- Dispose of empty batteries in designated collection points.



⚠ WARNING

Risk of explosion due to fire or short-circuit, even if the batteries are empty

Risk of injuries from by flying parts

- Do not allow the batteries to come into contact with water.
- Do not charge the batteries.
- Do not damage or destroy the batteries.
- Do not heat the batteries to more than 85 °C.



⚠ WARNING

Electrolyte leakage

Chemical burns

- Only grasp damaged batteries using suitable protective gloves.
- If electrolyte comes into contact with eyes, immediately rinse eyes with plenty of water. Consult a doctor.



Observe the following:

- Only replace batteries with batteries of the same type and from the same manufacturer.
 - Observe the polarities (+/-).
 - The batteries must be new and free from damage.
 - Do not mixed new batteries with used batteries.
 - Store, transport, and dispose of the batteries in accordance with local regulations, guidelines, and laws.
- Also observe information from the battery manufacturer.

Warranty

The technical data given for these applications is valid only in conjunction with the Siemens actuators as detailed under «Equipment combinations», page 4.
Use with third-party actuators invalidates any warranty offered by Siemens Building Technologies HVAC Products.

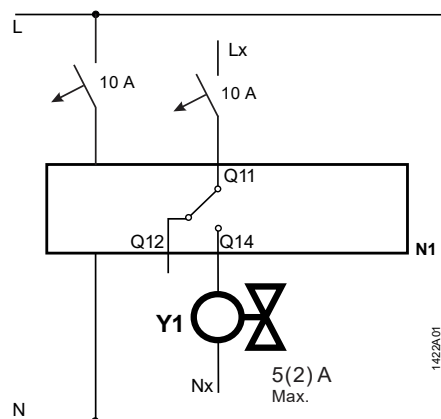
Technical data

 Power supply	Operating voltage	AC 230 V +10/-15%		
	• RDE100 at L - N	50 Hz		
	Frequency	8.5 VA / 1 W		
	Power consumption			
	• RDE100.1	DC 3 V (2 x 1.5 V alkaline batteries AAA)		
	For battery life (RDE100.1), see below (alkaline batteries type AAA). Battery life calculation is based on the touchpad scanning rate during idle time (assuming a user presses 4 touch keys per day with default TPI Slow control):			
	Scanning rate 0.25 s	0.7 year battery life		
	Scanning rate 0.50 s	1.0 year battery life		
	Scanning rate 1.00 s	1.2 year battery life		
	Scanning rate 1.50 s	1.3 year battery life		
Control inputs	Control input Q11-Nx (Com)			
External sensor (RDE100.1 only)	• Rating RDE100	(AC 24...230 V)	Max. 5(2) A	Min. 8 mA
	• Rating RDE100.1	(AC 24...230 V)	Max. 5(2) A	Min. 8 mA
	External sensor			
	'X1' - '⊥' (Reference)	NTC3K/QAH11.1/QAA32		
Control outputs	Or			
	Digital On/Off			
	'X1' - '⊥' (Reference)	On/Off switch		
	Control output Q12-Nx (NC contact)			
	Rating RDE100	(AC 24...230 V)	Max. 5(2) A	Min. 8 mA
	Rating RDE100.1	(AC 24...230 V)	Max. 5(2) A	Min. 8 mA
	Control output Q14-Nx (NO contact)			
	Rating RDE100	(AC 24...230 V)	Max. 5(2) A	Min. 8 mA
	Rating RDE100.1	(AC 24...230 V)	Max. 5(2) A	Min. 8 mA
	No internal fuse.			
	External preliminary protection with max. C 10 A circuit breaker in the supply lines required under all circumstances.			
	External protection for incoming cable			
	Circuit breaker	Max. 10 A		
	Circuit breaker tripping characteristic	Type B, C or D to EN 60898 and EN 60947		
Function data	Comfort mode	20 °C (5...35 °C)		
	Economy mode	16 °C (5...35 °C)		
	Holiday mode	12 °C (5...35 °C) (Standalone)		
	Built-in room temperature sensor			
	Setpoint setting range	5...35 °C (Comfort/Economy mode)		
	Accuracy at 25 °C	< ±0.5 K		
	Temperature calibration range	±3.0 K		
	Resolution of settings and displays			
	Setpoints	0.5 °C		
	Temperature value displays	0.5 °C		

Environmental conditions	Operation	As per IEC 60721-3-3	
	Climatic conditions	Class 3K5	
	Temperature	0...50 °C	
	Humidity	<95% r.h.	
	Transport	As per IEC 60721-3-2	
	Climatic conditions	Class 2K3	
	Temperature	-25...65 °C	
	Humidity	<95% r.h.	
	Mechanical conditions	Class 2M2	
	Storage	As per IEC 60721-3-1	
	Climatic conditions	Class 1K3	
	Temperature	-25...65 °C	
Humidity	<95% r.h.		
Norms and standards	EU Conformity (CE)	A6V11399487 *)	
	RCM conformity	A6V11399489 *)	
	Safety class	II as per EN 60730-1, EN 60730-2-9	
	Pollution class	II as per EN 60730-1	
	Degree of protection of housing	IP30 as per EN 60529	
Environmental compatibility	The product environmental declaration CE1E1420xx *) contains data on environmentally compatible product design and assessments (RoHS compliance, materials composition, packaging, environmental benefit, disposal).		
eu.bac	Meets the requirements for eu.bac certification		
	See product list at: http://www.eubaccert.eu/licences-by-criteria.asp		
	RDE100.1 (license 217734, 217735)	Energy Efficiency Label	Control accuracy [K]
	Water Heating System (thermal actuator, On/Off)	A	0.5
	Water Floor Heating Systems (thermal actuator, On/Off)	-	0.6
Eco design and labelling directives	Based on EU Regulation 813/2013 (Eco design directive) and 811/2013 (Labelling directive) concerning space heaters, combination heaters, the following classes apply:		
	- Application with On/Off operation Class I of a heater	value 1%	
	- TPI (PWM) room thermostat, for use with On/Off output heaters	Class IV value 2%	
General	Connection terminals for	Solid wires or prepared stranded wires 2 x 1.5 mm ² or 1 x 2.5 mm ² (Min. 0.5 mm ²)	
	Weight	0.166 kg	
	Color of housing front	RAL9003	

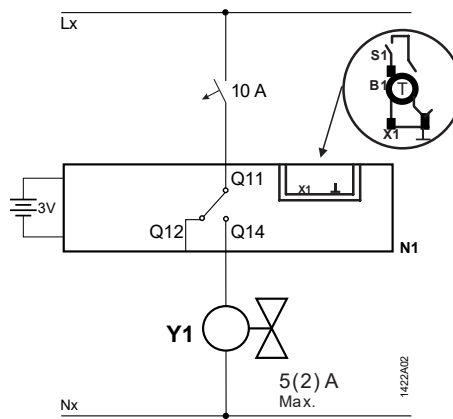
*) The documents can be downloaded from <http://siemens.com/bt/download>.

Connection diagrams



RDE100

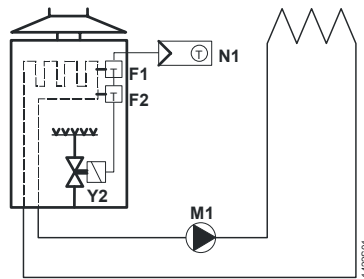
- N1 Room thermostat
- Y1 Valve actuator
- L Live, AC 230 V
- N Neutral conductor, AC 230 V



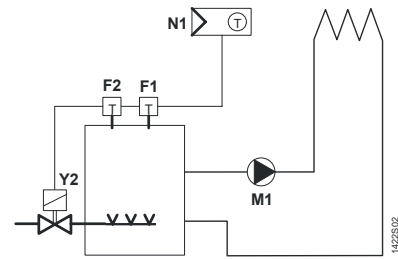
RDE100.1

- Lx Live, AC 24 ... 230 V
- Q11, Q12 NC contact (for NO valves)
- Q11, Q14 NO contact (for NC valves)
- Nx Neutral conductor, AC 24...230 V
- X1 External input signal
- \perp Measuring neutral for external input
- B1 Temperature sensor (Floor temperature limit)
- S1 Switch (keycard, window contact)

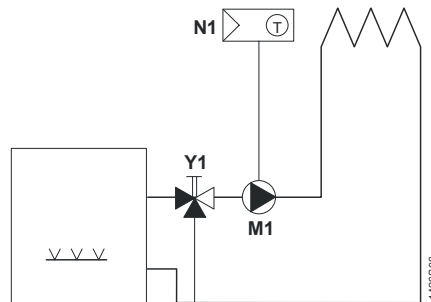
Application examples



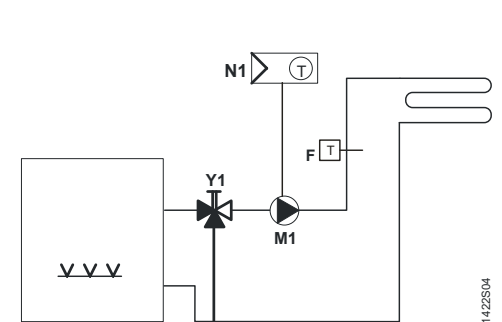
Room thermostat with direct control of a gas-fired wall-hung boiler



Room thermostat with direct control of a gas-fired floor-standing boiler



Room thermostat with direct control of a heating circuit pump (precontrol by manual mixing valve)



Room thermostat with direct control of hydronic floor heating system

F1 Thermal reset limit thermostat
F2 Safety limit thermostat
M1 Circulating pump

N1 RDE100.. room thermostat
Y1 Mixing 3-port valve with manual adjustment
Y2 Magnetic valve

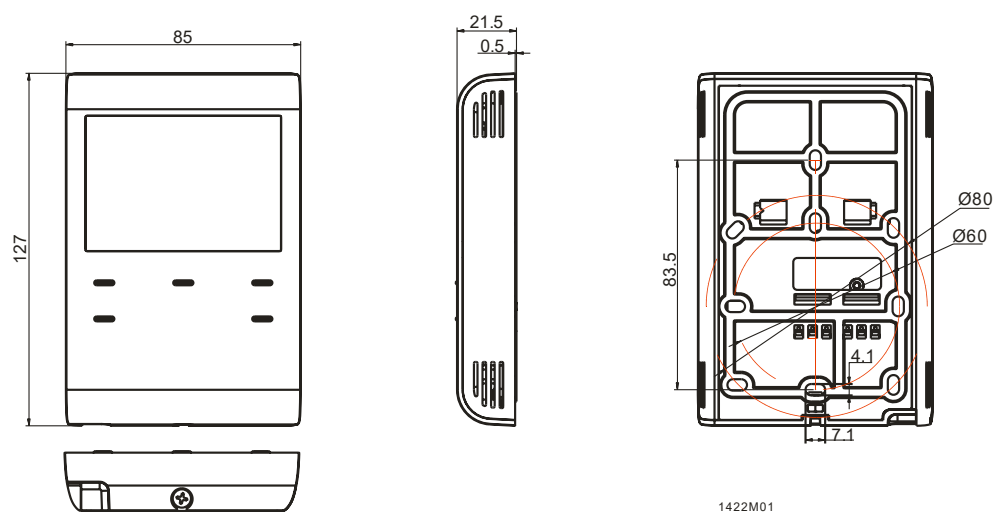
Remarks

Heating:

Because of the unavoidable self heating effects of the electrical current, any loads of more than 3 Amperes connected to the unit can influence the control behavior and temperature accuracy in a negative way.

Dimensions

All dimensions in mm





Room thermostat with Auto Timer, independent DHW RDE100.1 DHW

for heating systems

- Room temperature control
- 2-position / TPI control with On/Off output for heating
- Optimum Start / Stop
- Comfort, Economy, Auto timer and Protection mode
- Independent On/Auto/Off control of DHW
- Auto time switch
- Adjustable commissioning and control parameters
- Battery-powered DC 3 V (2 x 1.5 V AAA)

Use

The RDE100.1DHW is used to control the room temperature in heating systems with independent control of DHW.

Typical applications:

- Residential apartments

For the control of the following plant components and of DHW:

- Thermal valves or zone valves
- Gas or oil boilers
- Fans
- Pumps
- Heat exchanger
- Continuous-flow water heater
- Small water heating systems

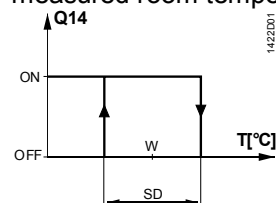
Functions

- Room temperature control via built-in sensor
- Selection of operating mode with operating mode touchkey
- Setting auto time switch (individual day, 7 day or 5-2 day)
- Display of current room temperature or setpoint in °C or °F
- Touchkey lock (manually)
- Setpoint lock
- Periodic pump run
- Optimum start / stop
- Comfort temperature limitation by Economy setpoint locked
- Reloading factory settings for commissioning and control parameters
- Independent DHW and its auto time switch (individual day, 7 day or 5-2 day)

Temperature control

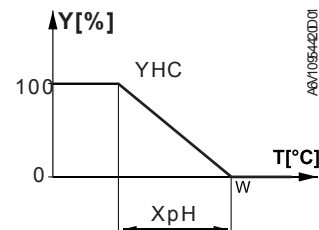
RDE100.. comprises of both 2-position and TPI temperature controls, which can be configured by parameter P78 (Control Behavior).

2-position control algorithm is to switch on and off the heating system within a switching differential according to comparison between setpoint setting and the measured room temperature.



T Room temperature
SD Switching differential
W Room temperature setpoint
Q14 Output signal for heating

TPI (Time proportional Integral) control algorithm is to periodically switch on and off the heating system. The period time and pulse length of the control signal (PWM) are determined by the setpoint and the measured room temperature.



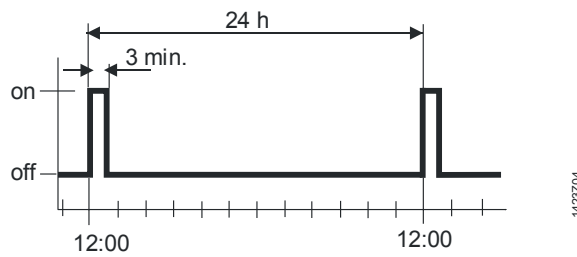
Heating mode
T Room temperature
Y Output signal for heating (PWM)
W Room temperature setpoint
YHC Control command "Valve"
XpH Proportional band "Heating"

Periodic pump run function

Can only be used when circulating pump or valve is controlled!

This function protects the pump or valve against seizing during longer off periods. Periodic pump run is activated for 3 minutes every 24 hours at 12:00.

Parameter	Pump status
P12 = 0 (Default)	Pump run off
P12 = 1	Pump run on



Optimum start control

The purpose of optimum start control is to reach a temperature level 0.25 K below the Comfort setpoint when occupancy according to the time program starts in Auto timer mode. For that purpose, the heating circuit must be switched on at an earlier point in time. The extent of forward shift depends primarily on the outside temperature.

The maximum forward shift on time can be adjusted by parameter P89. A Forward shift on maximum "0" means the function is disabled.

Parameter	Range	Factory setting
Forward shift on max (P89)	0, 0.5,...24 h	0

Optimum stop control

Optimum stop control switches off the heating circuit at the earliest possible point in time so that the room temperature will lay 0.5 K below the Comfort setpoint when the time switch changes from Comfort mode to Economy mode in Auto timer mode. The early shut down maximum time can be adjusted by parameter P90. Early shut down maximum "0" means the function is disabled.

Parameter	Range	Factory setting
Early shutdown max (P90)	0, 0.5,...6 h	0

Control behavior (P78)

2-position, 1 K

2-Position controller with 1 [K] switching hysteresis

2-position, 0.3 K

- 2-Position controller with 0.3 [K] switching hysteresis.
- For general control situations. Provides a better comfort than 1 [K] switching hysteresis.
- Can also be used for difficult control situations.

TPI slow

TPI control behavior for slow heating systems that require longer minimum On times and limited numbers of switching cycles per hour.

Typical applications:

- Floor heating systems, oil fired boilers
- Can also be used for all other types of heating applications. (Alternative setting)

Minimum switching on / off time	> 4 minutes
Average period time	Approximately 20 minutes

TPI medium

TPI control behavior for general heating applications such as radiator systems, thermal actuators, ...

Minimum switching on / off time	> 1 minute
Average period time	Approximately 20-25 minutes

TPI fast

TPI control behavior for fast heating systems that tolerate a high number of switching cycles.

Typical applications: electric heaters, gas boilers, fast thermal actuators

Minimum switching on / off time	> 1 minute
Average period time	Approximately 10 minutes

 Do not use TPI fast for oil boilers or electro mechanical actuators!

Type summary

Product No.	Stock No.	Features
RDE100.1DHW	S55770-T280	Battery-powered DC 3 V









Ordering

- When ordering, please indicate product No. / stock No. and description.
- Example:

Product No.	Stock No.	Description
RDE100.1DHW	S55770-T280	DHW room thermostat

Valve actuators must be ordered separately!

Equipment combinations

Description		Product No.	Data Sheet *)	Use with the type of Temperature Control
Electromotoric actuator		SFA21..	4863	2-Position & TPI slow
Electrothermal actuator (for radiator valves)		STA23..	4884	2-Position & All TPI
Electrothermal actuator (for small valves 2.5 mm)		STP23..	4884	2-Position & All TPI
Electromotoric actuator for zone valves VV146..		SUA21..	4830	2-Position
Damper actuator		GDB..	4634	2-Position & TPI slow
Damper actuator		GSD..	4603	2-Position & TPI slow
Damper actuator		GQD..	4604	2-Position & TPI slow
Rotary damper actuator		GXD..	4622	2-Position & TPI slow

*) The documents can be downloaded from <http://siemens.com/bt/download>.

Mechanical design

The room thermostat consists of 2 parts:

- Plastic housing which accommodates the electronics, the operating elements and the room temperature sensor
- Mounting plate with screw terminals

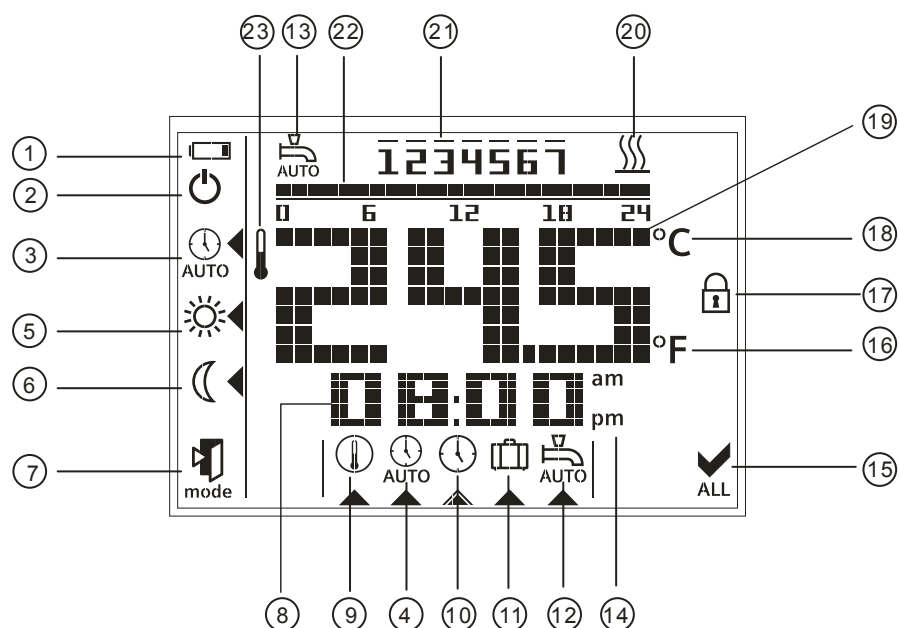
The housing engages in the mounting plate and is secured with a screw.

Operation and settings











- 1) Operating mode touchkey
- 2) Set
- 3) Ok
- 4) Touchkey for decreasing a value
- 5) Touchkey for increasing a value
- 6) DHW switch On/Auto/Off touchkey

Display

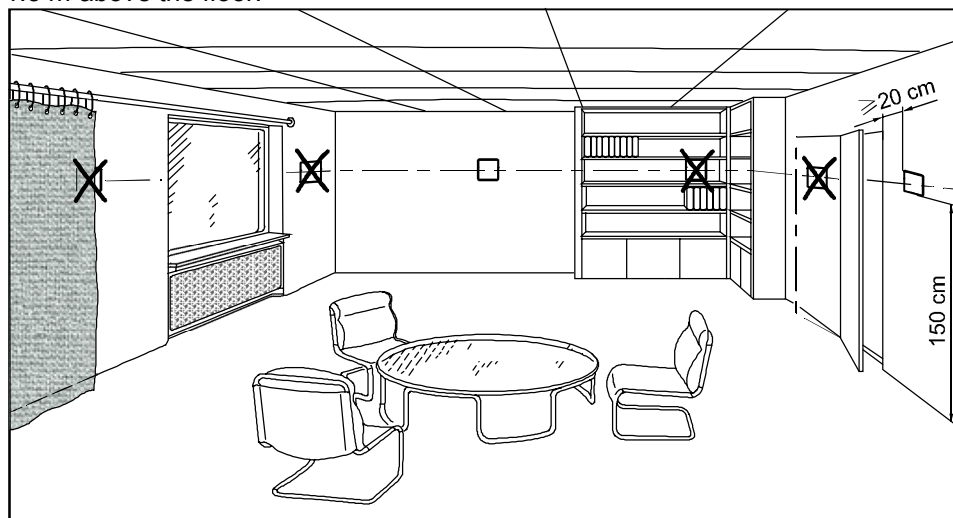


#	Symbol	Description	#	Symbol	Description
1		Indicating that batteries need to be replaced	12		View and set DHW auto time switch
2		Protection mode (protection mode symbol can be enabled via parameter settings).	13		DHW auto time switch activated
3		Auto timer mode	14	am pm	Morning: 12-hour format Afternoon: 12-hour format
4		View and set auto time switch	15		Confirmation
5		Comfort mode	16	°F	Room temperature in degrees Fahrenheit
6		Economy mode	17		Touchkey lock activated

#	Symbol	Description	#	Symbol	Description
7		Escape	18	°C	Room temperature in degrees Celsius
8		Display of time	19	24.5	Display of room temperature, setpoint, and etc.
9		Permanent setpoint setting	20		Heating On
10		Day and time setting	21	1 2 3 4 5 6 7	Weekday 1 = Monday 7 = Sunday
11		Holiday mode setting	22		Timer bar (Alternative use as DHW timer bar)
			23		Current room temperature

Mounting and installation notes

Do not mount the thermostat in niches or bookshelves, not behind curtains, not above or near heat sources, and not exposed to direct solar radiation. Mount about 1.5 m above the floor.



Mounting



- Mount the thermostat in a clean and dry location without direct air flow from a heating/cooling equipment, and not exposed to drip or splash water
See the Mounting Instructions M1429 enclosed with the thermostat.

Wiring



- Ensure that wiring, protection and earthing comply with local regulations
- Correctly size the cables to the thermostat and the valve actuators
- Use only valve actuators rated for AC 24...230 V

Warning!


No internal line protection for supply lines to external consumers.

Risk of fire and injury due to short-circuits!











- Adapt the line diameters as per local regulations to the rated value of the installed overcurrent protection device.
- The AC 230 V mains supply line must have a circuit breaker with a rated current of no more than 10 A
- Disconnect from power supply before removing the unit from its mounting plate

Commissioning notes

Commissioning	<p>After power is applied, the thermostat carries out a reset during which all LCD segments flash, indicating that the reset was made correctly. After the reset, the thermostat is ready for commissioning by qualified HVAC personnel.</p> <p>The control parameters of the thermostat can be set to ensure optimum performance of the entire system. Please refer to Operating Instructions CB1B1423, section "Do you want to change parameters?".</p>
Sensor calibration	<p>If the temperature on the display does not agree with the room temperature effectively measured, the temperature sensor can be recalibrated. For that purpose, adjust parameter P04.</p>
Setpoint lock	<p>We recommend reviewing the setpoint lock (for public areas) in parameters P06 and P08 and changing them as needed. If the Economy setpoint is locked then the Comfort temperature setpoint can not be set lower than the locked Economy setpoint.</p>
Touchpad scanning rate	<p>Since the thermostat uses touch technology and to minimize battery power consumption, a parameter P21 (adjustable from 0.25 to 1.5 seconds) is implemented for the user to adjust. This function is only valid for the battery-powered version and the default value is 1 second.</p> <p>This means that when, for a certain time, the user does not touch the touchpad, the unit operates in power saving mode and the touchpad is running at a scanning rate of 1 second.</p> <p>(From the calculation – assuming 4 operations per day on the thermostat, the estimated 1-second scanning rate results in a battery life of 1 year. If the user increases the scanning rate, the batteries' life is extended.)</p>
Change of batteries	<p>If the battery symbol  appears, the batteries are almost exhausted and should be replaced. Use alkaline batteries type AAA.</p>

Operating notes

	<p>The RDE100.1DHW provides Comfort, Economy, Auto timer and Protection mode. The difference between Comfort and Economy mode is only the room temperature setpoint. The changeover between Comfort, Economy and Protection mode is made either automatically by the auto time switch or by pressing touchkey mode.</p>
Comfort mode 	<p>When Comfort mode is activated, symbol  appears on the display. The setpoint (20 °C) can be readjusted by pressing touchkeys + and –.</p>
Economy mode 	<p>When Economy mode is activated, symbol  appears on the display. The setpoint (16 °C) can be readjusted by pressing touchkeys + and –.</p>
Protection mode 	<p>If the temperature falls below 5 °C, the unit automatically activates the heating output. The symbol  appears only, if the icon is enabled via parameter settings.</p>
Holiday mode 	<p>When holiday mode is activated, symbol  appears on the display. The setpoint (12 °C) and the number of days a user is away can be readjusted by pressing touchkeys + and –.</p>

Time switch





When Auto timer mode is enabled, the changeover between the operating modes (Comfort and Economy mode) will take place automatically. There are three options for time switch setting: individual day, 7 day or 5-2 day. You can select Comfort or Economy mode in every 15 minutes interval of the day. The 0:00 to 24:00 hour time bar will allow you to set the mode throughout the selected day(s).

Factory default for 7-day Time switch

Default value	Day/s	Comfort mode	Economy mode
	Mo (1) – Fr (5)	6:00 – 8:00 hr 17:00 – 22:00 hr	22:00 – 6:00 hr 8:00 – 17:00 hr
	Sa (6) – Su (7)	7:00 – 22:00 hr	22:00 – 7:00 hr

Please refer to Operating Instructions CB1B1423, section "Do you want to enter your own Time switch?".

DHW and DHW auto timer function

Press  to switch on DHW heating. Press this  touchkey again, DHW will be in the auto status, this  symbol will be shown. Press this  touchkey one more time, DHW heating will be switched off and no symbol will be shown.

Please refer to Operating Instructions CB1B1423, section "Do you want to activate DHW control?".

During auto status, the DHW will switch according to the DHW time switch set. DHW can be selected on or off in every 15 minutes interval of the day. The 0:00 to 24:00 hour time bar will allow you to set DHW on or off throughout the selected day(s).

Factory default for 7-day Time switch for DHW

Default value	Day/s	DHW control ON	DHW control OFF
	Mo (1) – Fr (5)	6:00 – 8:00 hr 17:00 – 22:00 hr	22:00 – 6:00 hr 8:00 – 17:00 hr
	Sa (6) – Su (7)	7:00 – 22:00 hr	22:00 – 7:00 hr

Please refer to Operating Instructions CB1B1423, section "Do you want to enter your own Time switch for DHW control?".

Parameters

Changing the parameters by the following steps:

- Press **+** and **–** simultaneously for 5 seconds
- Release them and parameter "P01" is displayed on the bottom segment
- Press **+** or **–** to scroll to the parameter that needs to be adjusted
- Press **ok** to select this parameter
- Press **+** or **–** to adjust the value
- Press **ok** to confirm the adjusted value
- Press mode to exit the parameters without saving or wait for the program to exit automatically

Parameter list

Parameter no.	Description	Setting range (default)
P01	Time format	1 = 24:00 hours (default) 2 = 12:00 AM/PM
P02	Selection of °C or °F	1 = °C (default) 2 = °F
P03	Standard temperature display	1 = room temperature (default) 2 = setpoint

P04	Temperature sensor calibration	-3...3 °C Step 0.5 °C (-6...6 °F, step 1 °F) Default: 0 °C
P06	Comfort setpoint lock	0 = OFF (default) 1 = ON → locked according to setting in permanent temperature setpoint
P08	Economy setpoint lock	0 = OFF (default) 1 = ON → locked according to setting in permanent temperature setpoint
P09	Buzzer	0 = OFF 1 = ON (default)
P10	Show frost protection icon	0 = OFF (default) 1 = ON
P11	Time switch type for auto timer and DHW	0 = Individual Days (default) 1 = All 7 days 2 = 5/2 days
P12	Periodic pump run	0 = OFF (default) 1 = ON
P13	DHW timer bar timeout	0 = no DHW bar 1 = 1 minute (default) 2 = 2 minutes Adjustable range 0 to 15 minutes
P21	Button scanning rate for the capacitive buttons Note: a higher scanning rate means shorter battery life.	0.2 = 0.25 s 0.5 = 0.5 s 1.0 = 1.0 s (default) 1.5 = 1.5 s
P22	Reload factory settings	0 = OFF (default) 1 = reload
P23	Software version information	No adjustment possible
P78	Control behavior	0 = On/Off, 1.0 K 1 = On/Off, 0.3 K 2 = TPI fast 3 = TPI medium 4 = TPI slow (default)
P89	Forward shift on max	0, 0.5,...24 h Default: 0 h
P90	Early shutdown max	0, 0.5,...6 h Default: 0 h

Maintenance notes

The thermostats are maintenance-free.

Disposal



The device is considered an electronic device for disposal in terms of the European Directive 2012/19/EU and may not be disposed of as domestic garbage.

- Dispose of the device through channels provided for this purpose.
- Comply with all local and currently applicable laws and regulations.
- Dispose of empty batteries in designated collection points.



WARNING

Risk of explosion due to fire or short-circuit, even if the batteries are empty

Risk of injuries from by flying parts

- Do not allow the batteries to come into contact with water.
- Do not charge the batteries.
- Do not damage or destroy the batteries.
- Do not heat the batteries to more than 85 °C.



WARNING

Electrolyte leakage




Chemical burns

- Only grasp damaged batteries using suitable protective gloves.
- If electrolyte comes into contact with eyes, immediately rinse eyes with plenty of water. Consult a doctor.

Observe the following:

- Only replace batteries with batteries of the same type and from the same manufacturer.
- Observe the polarities (+/-).
- The batteries must be new and free from damage.
- Do not mixed new batteries with used batteries.
- Store, transport, and dispose of the batteries in accordance with local regulations, guidelines, and laws. Also observe information from the battery manufacturer.

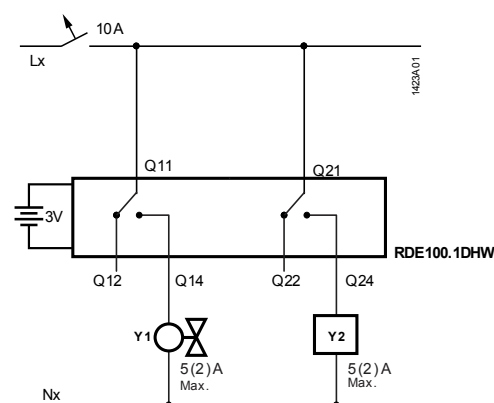
Technical data

	Power supply	Operating voltage			
		• RDE100.1DHW		DC 3 V (2 x 1.5 V alkaline batteries AAA)	
		For battery life (RDE100.1DHW), see below (alkaline batteries type AAA). Battery life calculation is based on the touchpad scanning rate during idle time (assuming a user presses 4 touchkeys per day with default TPI Slow control):			
		Scanning rate 0.25 s	0.7 year battery life		
		Scanning rate 0.50 s	1.0 year battery life		
		Scanning rate 1.00 s	1.2 year battery life		
		Scanning rate 1.50 s	1.3 year battery life		
	Control inputs	Control input Q11-Nx (Com)	(AC 24...230 V)	Max. 5(2) A	Min. 8 mA
		Control input Q21-Nx (Com)	(AC 24...230 V)	Max. 5(2) A	Min. 8 mA
	Control outputs	Heating valve or wall-hung boiler			
		Control output Q12-Nx (NC contact)	(AC 24...230 V)	Max. 5(2) A	Min. 8 mA
		Control output Q14-Nx (NO contact)	(AC 24...230 V)	Max. 5(2) A	Min. 8 mA
		DHW heating equipment			
		Control output Q22-Nx (NC contact)	(AC 24...230 V)	Max. 5(2) A	Min. 8 mA
		Control output Q24-Nx (NO contact)	(AC 24...230 V)	Max. 5(2) A	Min. 8 mA
		No internal fuse.			
		External preliminary protection with max. C 10 A circuit breaker in the supply lines required under all circumstances.			
		External protection for incoming cable			
		Circuit breaker	Max. 10 A		
		Circuit breaker tripping characteristic	Type B, C or D to EN 60898 and EN 60947		
	Function data	Comfort mode	20 °C (5...35 °C)		
		Economy mode	16 °C (5...35 °C)		
	Holiday mode	12 °C (5...35 °C) (Standalone)			
		Built-in room temperature sensor			
		Setpoint setting range	5...35 °C (Comfort/Economy mode)		
		Accuracy at 25 °C	< ±0.5 K		
		Temperature calibration range	±3.0 K		
		Resolution of settings and displays			
		Setpoints	0.5 °C		
		Temperature value displays	0.5 °C		
	Environmental conditions	Operation	As per IEC 60721-3-3		
		Climatic conditions	Class 3K5		
		Temperature	0...50 °C		
	Humidity	<95% r.h.			
		Transport			
		Climatic conditions	Class 2K3		
		Temperature	-25...65 °C		
		Humidity	<95% r.h.		
		Mechanical conditions	Class 2M2		
		Storage			
		Climatic conditions	Class 1K3		
		Temperature	-25...65 °C		
		Humidity	<95% r.h.		

Norms and standards	EU Conformity (CE)	A6V11399487 ^{*)}
	RCM conformity	A6V11399489 ^{*)}
	Safety class	II as per EN 60730-1, EN 60730-2-9
	Pollution class	II as per EN 60730-1
	Degree of protection of housing	IP30 as per EN 60529
Environmental compatibility	The product environmental declaration CE1E1420xx ^{*)} contains data on environmentally compatible product design and assessments (RoHS compliance, materials composition, packaging, environmental benefit, disposal).	
Eco design and labelling directives	Based on EU Regulation 813/2013 (Eco design directive) and 811/2013 (Labelling directive) concerning space heaters, combination heaters, the following classes apply:	
	- Application with On/Off operation of a heater	Class I value 1%
	- TPI (PWM) room thermostat, for use with On/Off output heaters	Class IV value 2%
General	Connection terminals for	Solid wires or prepared stranded wires 2 x 1.5 mm ² or 1 x 2.5 mm ² (Min. 0.5 mm ²)
	Weight	0.167 kg
	Color of housing front	RAL9003

^{*)} The documents can be downloaded from <http://siemens.com/bt/download>.

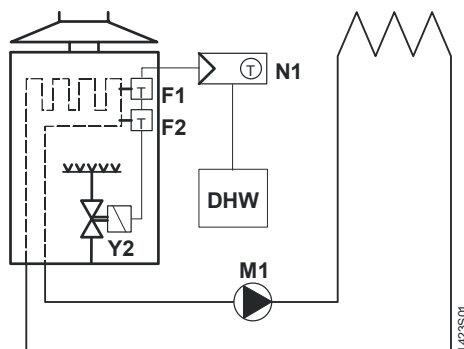
Connection diagrams



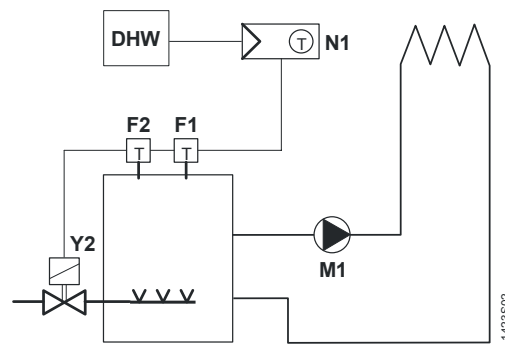
Legend

Lx	Live, AC 24...230 V
Nx	Neutral conductor, AC 24...230 V
Y1	Heating valve or wall-hung boiler
Y2	DHW heating equipment

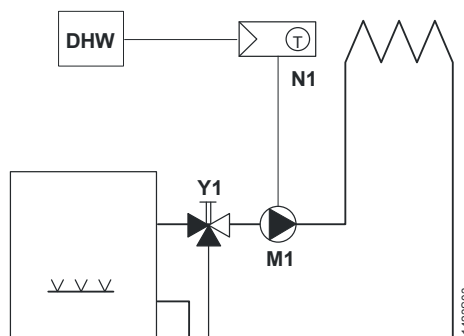
Application examples



Room thermostat with direct control of a gas-fired wall-hung boiler and independent control of DHW



Room thermostat with direct control of a gas-fired floor-standing boiler and independent control of DHW



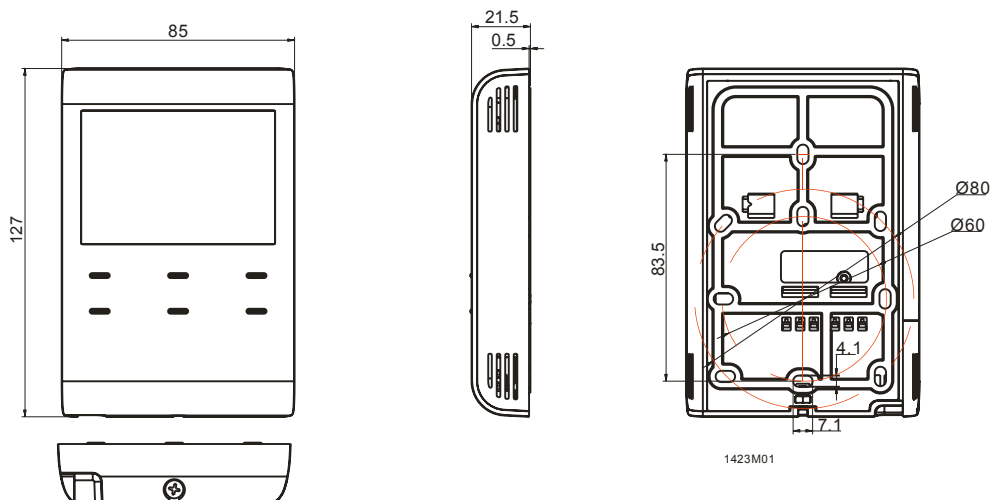
Room thermostat with direct control of a heating circuit pump (precontrol by manual mixing valve) and independent control of DHW

Legend

- F1 Thermal reset limit thermostat
- F2 Safety limit thermostat
- M1 Circulating pump
- N1 RDE100.1DHW room thermostat
- Y1 Mixing 3-port valve with manual adjustment
- Y2 Magnetic valve
- DHW DHW heating equipment

Dimensions

All dimensions in mm



Remarks

Heating:

Because of the unavoidable self heating effects of the electrical current, any loads of more than 3 Amperes connected to the unit can influence the control behavior and temperature accuracy in a negative way.



RDE100.1RF



RCR100RF

Wireless room thermostat with auto timer

RDE100.1RFS

for heating systems

-
- Room temperature control
 - 2-position / TPI control with On/Off output for heating
 - Optimum Start / Stop
 - Comfort, Economy, Auto Timer and Protection mode
 - Auto Timer
 - Adjustable commissioning and control parameters
 - Battery-powered room thermostat DC 3 V (RDE100.1RF)
 - Mains-powered receiver AC 230 V (RCR100RF)
 - Multifunction input for external floor sensor, keycard contact, etc.

Use

The RDE100.1RFS is used to control the room temperature in heating systems.

Typical applications:

- Apartments
- Commercial spaces
- Schools

For the control of the following pieces of equipment:

- Thermal valves or zone valves
- Gas or oil boilers
- Fans
- Pumps
- Floor heating systems

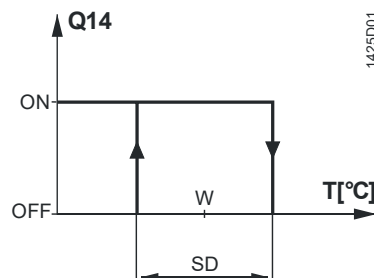
Functions

- Room temperature control via built-in sensor or external input
- Operating mode switchover contact (keycard, window contact, etc.)
- One multifunctional input freely selectable for floor heating temperature limitation function
- Selection of operating mode via touchkey
- Setting time switches (individual days, 7 days, or days 5-2)
- Display of current room temperature or setpoint in °C or °F
- Touchkey lock (manually)
- Setpoint lock
- Periodic pump run
- Optimum start / stop
- Comfort temperature limitation by Economy setpoint locked
- Reloading factory settings for commissioning and control parameters
- Standalone wireless transmitter and receiver
- Wireless operating frequency 433 MHz

Temperature control

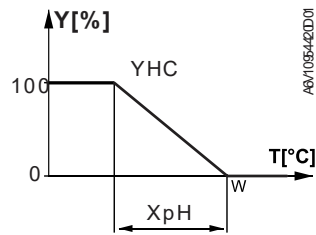
RDE100.. comprises of both 2-position and TPI temperature controls, which can be configured by parameter P78 (Control Behavior).

2-position control algorithm is to switch on and off the heating system within a switching differential according to comparison between setpoint setting and the measured room temperature.



T	Room temperature
SD	Switching differential
W	Room temperature setpoint
Q14	Output signal for heating

TPI (Time proportional Integral) control algorithm is to periodically switch on and off the heating system. The period time and pulse length of the control signal (PWM) are determined by the setpoint and the measured room temperature.



Heating mode

- T Room temperature
- Y Output signal for heating (PWM)
- W Room temperature setpoint
- YHC Control command "Valve"
- X_{pH} Proportional band "Heating"

Floor heating application

The factory setting for this function is Off (disabled) and must be set to "On" if floor heating is used.

The external floor temperature sensor is connected to input X1, \perp and acquires the floor temperature. If the floor temperature exceeds the parameterized temperature limit xx °C (P14 = 1, P15 = 1, P16 = xx °C), the heating valve is fully closed until the floor temperature returns to a level below the parameterized limit. Typical application is rooms (dry floor).

If the application does not require floor heating temperature limitation but instead uses the external sensor as a source for both room temperature display and control, the parameters will have to be set as follows: P14 = 1, P15 = 0. A typical application is the bathroom (wet floor) where a constant floor temperature is required.

It is not recommended to have **only** an internal built-in room sensor for floor heating since there is a potential risk of overheating.

Typical application: Maximum temperature limitation for under floor heating systems

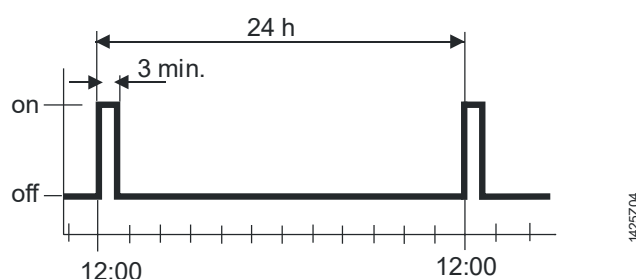
Operating mode changeover function

This function offers the keycard application (refer to the section "Operating notes", "Economy mode").

Periodic pump or valve kick

This function can only be used when a circulating pump or valve is controlled! It protects the pump or valve against seizing during longer off periods. The pump or valve kick is activated for 3 minutes every 24 hours at 12:00.

Parameter	Pump state
P12 = 0 (default)	Off
P12 = 1	On



Optimum start control

The purpose of optimum start control is to reach a temperature level 0.25 K below the Comfort setpoint when occupancy according to the time program starts in Auto timer mode. For that purpose, the heating circuit must be switched on at an earlier point in time. The extent of forward shift depends primarily on the outside temperature.

The maximum forward shift on time can be adjusted by parameter P89. A Forward shift on maximum "0" means the function is disabled.

Parameter	Range	Factory setting
Forward shift on max (P89)	0, 0.5,...24 h	0

Optimum stop control

Optimum stop control switches off the heating circuit at the earliest possible point in time so that the room temperature will lay 0.5 K below the Comfort setpoint when the time switch changes from Comfort mode to Economy mode in Auto timer mode. The early shut down maximum time can be adjusted by parameter P90. Early shut down maximum "0" means the function is disabled.

Parameter	Range	Factory setting
Early shutdown max (P90)	0, 0.5,...6 h	0

Control behavior (P78)

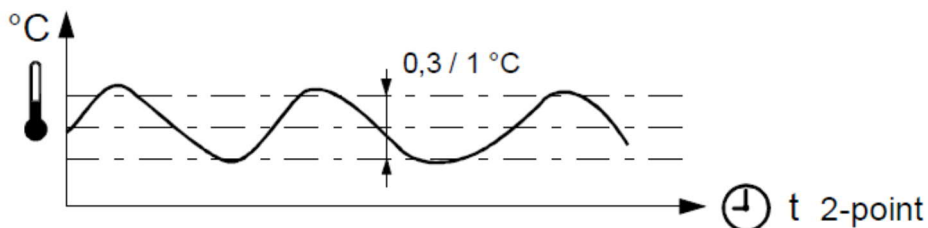
The new control algorithm of RDE100.. family offers a choice of control actions that can be configured via parameter **P78**. This means that optimum control can be selected for every type of application (**factory setting "TPI slow"**).

2-position, 1 K

2-Position controller with 1 [K] switching hysteresis

2-position, 0.3 K

- 2-Position controller with 0.3 [K] switching hysteresis.
- For general control situations. Provides a better comfort than 1 [K] switching hysteresis.
- Can also be used for difficult control situations.



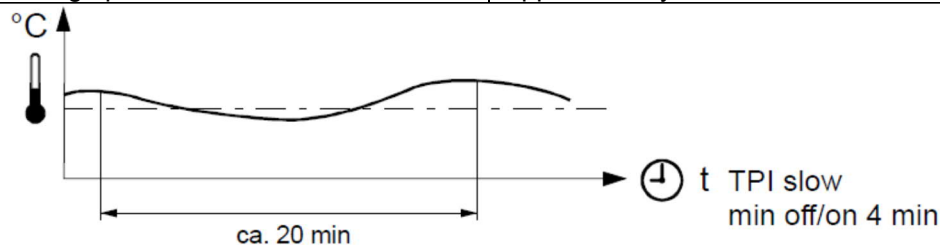
TPI slow

TPI control behavior for slow heating systems that require longer minimum On times and limited numbers of switching cycles per hour.

Typical applications:

- Floor heating systems, oil fired boilers
- Can also be used for all other types of heating applications. (Alternative setting)

Minimum switching on / off time	> 4 minutes
Average period time	Approximately 20 minutes

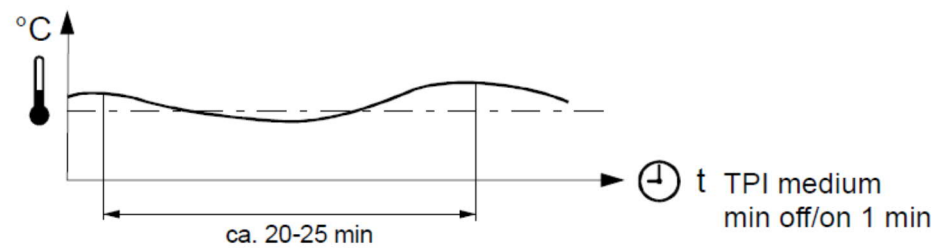


TPI medium

TPI control behavior for general heating applications such as radiator systems, thermal actuators, ...

Minimum switching on / off time	> 1 minute
---------------------------------	------------

Average period time	Approximately 20-25 minutes
---------------------	-----------------------------



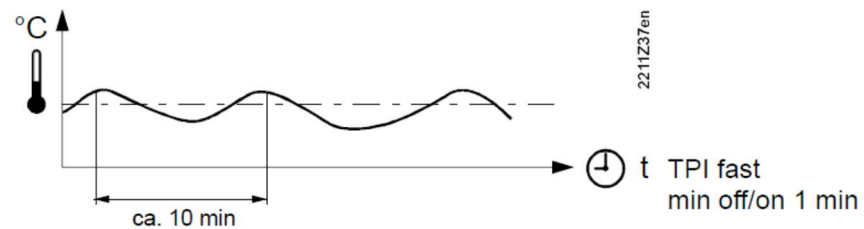
TPI fast

TPI control behavior for fast heating systems that tolerate a high number of switching cycles.

Typical applications: electric heaters, gas boilers, fast thermal actuators

Minimum switching on / off time	> 1 minute
Average period time	Approximately 10 minutes

⚠ Do not use TPI fast for oil boilers or electro mechanical actuators!



Type summary

Product No.	Stock No.	Features
RDE100.1RF	S55770-T320	Battery-powered room thermostat DC 3 V
RCR100RF	S55770-T418	Receiver AC 230 V










Ordering

When ordering, please indicate product No. / stock No. and description.

Product No.	Stock No.	Description
RDE100.1RFS	S55770-T282	Set consisting of room thermostat and receiver

Valve actuators/external sensor must be ordered separately.

Equipment combinations

Description		Product No.	Data Sheet *)	Use with the type of Temperature Control
Electromotoric actuators		SFA21..	4863	2-Position & TPI slow
Electrothermal actuators (for radiator valves)		STA23..	4884	2-Position & All TPI
Electrothermal actuators (for small valves 2.5 mm)		STP23..	4884	2-Position & All TPI
Damper actuators		GDB..	4634	2-Position & TPI slow
Damper actuators		GSD..	4603	2-Position & TPI slow
Damper actuators		GQD..	4604	2-Position & TPI slow
Rotary damper actuators		GXD..	4622	2-Position & TPI slow
Cable temperature sensor		QAH11.1	1840	N/A
Room temperature sensors		QAA32 ..	1747	N/A

*) The documents can be downloaded from <http://siemens.com/bt/download>.

Mechanical design

The room thermostat consists of 3 parts:

- Plastic housing which accommodates the electronics, the operating elements and the room temperature sensor
- Mounting plate with screw terminals
- Table stand

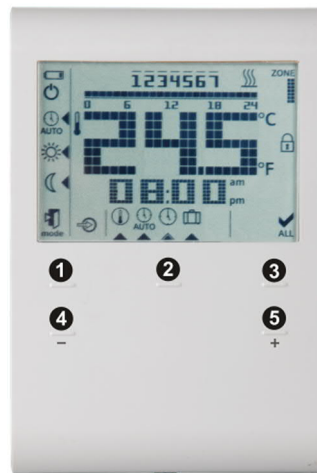
The housing engages in the mounting plate and is secured with a screw. The optional table stand snaps onto the rear of the mounting plate.

The RCR100RF receiver consists of 2 parts:

- Plastic housing which accommodates the electronics
- Mounting plate with screw terminals

Operation and settings

RDE100.1RF



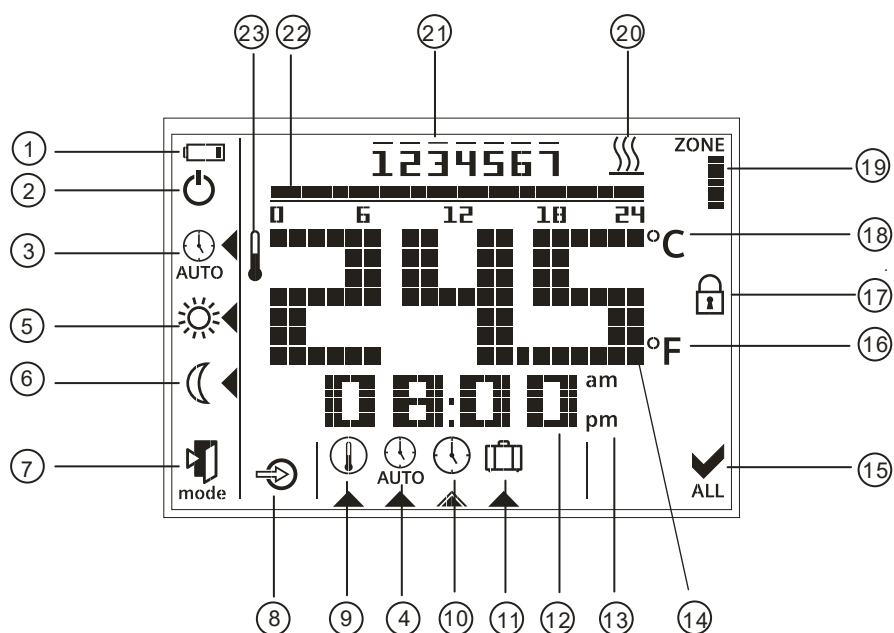
- 1) Touchkey for operating mode
- 2) Settings
- 3) Ok
- 4) Touchkey for decreasing a value
- 5) Touchkey for increasing a value

RCR100RF



- 1) LED for indication of operating state
- 2) LEARN button (or override)

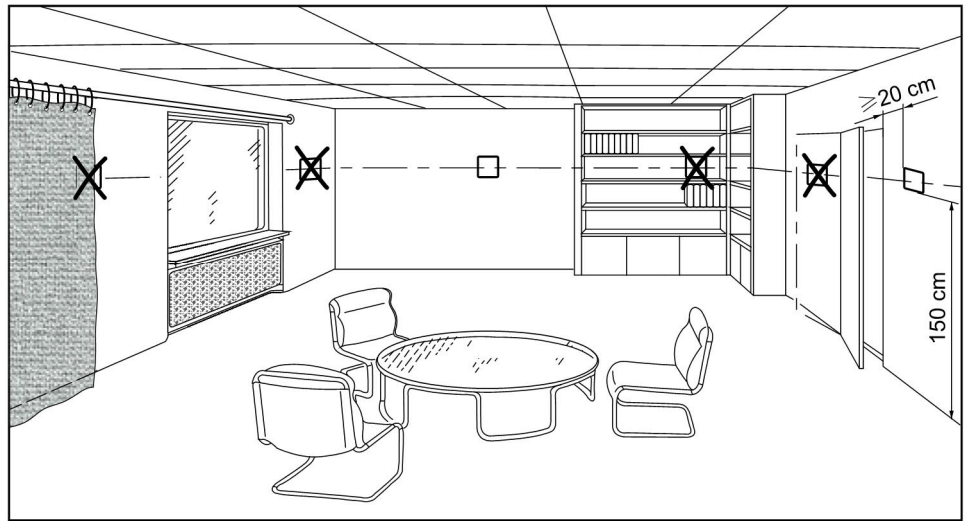
Display



#	Symbol	Description	#	Symbol	Description
1		Indicating that batteries need to be replaced	13	am pm	Morning: 12-hour format Afternoon: 12-hour format
2		Protection mode (Protection mode symbol can be enabled via parameter settings)	14		Display of room temperature, setpoint, etc.
3		Auto Timer mode	15		Confirmation
4	AUTO	View and set time switches	16	°F	Room temperature in degrees Fahrenheit
5		Comfort mode	17		Touchkey lock activated
6		Economy mode	18	°C	Room temperature in degrees Celsius
7		Escape	19	ZONE 	Display of zone (default is 1)
8		External input enabled	20		Heating On
9		Adjustment of setpoint	21	1234567	Weekday 1 = Monday Weekday 7 = Sunday
10		Setting of weekday and time of day	22		Timer bar
11		Setting of Holiday mode	23		Current room temperature
12		Display of time of day			

Mounting and installation notes

Do not mount the thermostat in niches or bookshelves, not behind curtains, not above or near heat sources, and not exposed to direct solar radiation. Mount it about 1.5 m above the floor.



Mounting



- Mount the room thermostat in a clean and dry location without direct air flow from heating/cooling equipment, and not exposed to drip or splash water
- Install the receiver close to the controlled unit if possible
- Choose the location to ensure largely interference-free reception. When mounting the receiver, observe the following:
 - Do not mount in a control panel
 - Do not mount on metallic surfaces
 - Do not mount near electrical cables and equipment such as PCs, TVs, microwaves, etc.
 - Do not mount near larger metallic structures or constructional elements with fine metal meshes such as special glass or special concrete

Wiring

See Mounting Instructions CB1M1439xx enclosed with the thermostat.



- Ensure that wiring, protection and earthing comply with local regulations
- Correctly size the cables to the thermostat and the valve actuators
- Use only valve actuators rated for AC 24... 230 V
- If the thermostat cannot accommodate all cables, power must be fed to the system via an external terminal block



Warning!

No internal line protection for supply lines to external consumers.

Risk of fire and injury due to short-circuits!



- Adapt the line diameters as per local regulations to the rated value of the installed overcurrent protection device.



- The AC 230 V mains supply line must have a circuit breaker with a rated current of no more than 10 A



- Disconnect from power supply before removing the unit from its mounting plate



- External inputs X1, \perp may carry mains potential. Sensor cables or window contact must be carefully installed before applying power to the thermostat



- Make sure the receiver is not connected to power during wiring

Commissioning notes

Commissioning	<p>After power is applied, the thermostat carries out a reset during which all LCD segments flash, indicating that the reset is correctly made. After the reset, the thermostat is ready for commissioning by qualified HVAC personnel.</p> <p>The control parameters of the thermostat can be set to ensure optimum performance of the entire system (refer to Operating Instructions CB1B1425en, section "Do you want to change parameters?").</p>
Sensor calibration	<p>If the temperature shown on the display does not agree with the room temperature effectively measured, the temperature sensor can be recalibrated. For that purpose, adjust parameter P04.</p>
Setpoint lock	<p>We recommend to review the setpoint lock (for public spaces) using parameters P06 and P08 and change them as needed. If the Economy setpoint is locked then the Comfort temperature setpoint can not be set lower than the locked Economy setpoint.</p>
Touchpad scanning rate	<p>Since the thermostat uses touch technology and to minimize battery power consumption, parameter P21 (adjustable from 0.25 to 1.5 seconds) is implemented for the user to adjust.</p> <p>This means that when, for a certain time, the user does not touch the touchpad, the unit operates in power saving mode and the touchpad is running at a scanning rate of 1 second.</p> <p>(From the calculation – assuming 4 operations per day on the thermostat, the estimated 1-second scanning rate results in a battery life of 1 year. If the user increases the scanning rate, the batteries' life is extended.</p>
X1 external input	<p>Different parameter setting of X1 external input is described below:</p> <p>Parameter P14=0 (No Input) is a default setting, which provides no external input function.</p> <p>Digital input</p> <p>An external contact can switch the thermostat from any operating mode to Economy.</p> <p>Typical applications: Window contact Key card application</p> <p>Set parameter P14 = 2 (X1 External input = Digital Input) and adapt parameter P17 (Window contact = Normally Open / Closed) accordingly.</p> <p>External sensor (used for controlling)</p> <p>The measured external sensor temperature is displayed and used for calculating heating demand instead of temperature detected by thermostat built-in internal sensor. In case of problems with the external sensor, the thermostat uses the internal sensor instead.</p> <p>Typical applications: External room temperature sensor Floor heating temperature control bath room</p>

Setting parameter P14 = 1 (X1 External input = External Sensor) and parameter P15 = 0 (Temperature limitation = Off)


Notes for floor heating temperature control:

- External safety thermostat is needed to prevent overheating of certain floor heating systems!
- Use of "Comfort setpoint lock" function (Parameter P06) is recommended.

External sensor for Floor heating application with temperature limitation

Refer to Floor Heating application section above when setting parameter P14 = 1 (X1 External input = External Sensor) and parameter P15 = 1 (Temperature limitation = On). Parameter P16 now allows to limit the maximum temperature.

Change of batteries

If the battery symbol  appears, the batteries are almost exhausted and should be replaced. Use alkaline batteries type AAA.


LED indication on RCR100RF

For the pairing process between transmitter and receiver, refer to Operating Instructions CB1B1425en, section "Do you want to pair transmitter and receiver?". The table below describes the behavior of the RCR100RF:

State of receiver	State of LED
Power up (or reset)	The red and green LEDs flash alternately for 5 seconds and then change to constantly red. Note: If the receiver was programmed before, it will immediately change to constantly red.
Learning mode Successful learning mode	The red and green LEDs flash alternately. If learning was successful, the green LED will flash for 10 minutes.
Signal ok and output status change	The green LED is lit. If the output state changes, the green LED flashes for 3 seconds and then changes back to constantly green.
Fails to receive wireless data	If the RCR100RF fails to receive wireless data, the red LED will start to flash after 125 minutes. If the RCR100RF signal is recovered, it will resume the previous LED state.

Override via the RCR100RF

The receiver provides an override function (boiler test, emergency operation). It allows the installer to override the relay to be permanently energized, regardless of the wireless data received.

To activate the override function, press and hold the  button for at least 10 seconds and release. The LED is constantly green and off once every 5 seconds, indicating that the override function is enabled.

To disable the override function, press the  button once.

Operating notes


The RDE100.1RF provides Comfort, Economy, Auto Timer and Protection mode. The difference between Comfort and Economy mode is only the room temperature setpoint. The changeover between Comfort, Economy and Protection mode is made either automatically by the time switch or by pressing the touchkey for the operating mode.

Comfort mode ☀


When Comfort mode is activated, symbol ☀ appears on the display. The setpoint (20 °C) can be readjusted by pressing touchkeys + and –.

Economy mode ☹

When Economy mode is activated, symbol ☹ appears on the display. The setpoint (16 °C) can be readjusted by pressing touchkeys + and –.

With the RDE100.1RF, the user can connect a window contact to input X1, . Depending on whether the window contact is configured for NO or NC (P14 = 2, P17 = 0 or 1), a change in this state will automatically switch the thermostat from any operating mode to Economy. This feature is suited for public spaces. The factory setting is Off (disabled).

Protection mode

If the temperature falls below 5 °C, the unit automatically activates the heating output. Symbol  appears only if the icon is enabled via parameter settings.


Auto Timer AUTO

When Auto Timer mode is enabled, the changeover between the operating modes (Comfort and Economy) takes place automatically. There are 3 options for time switch settings: Individual days, 7 days, or days 5-2. You can select Comfort or Economy mode at 15-minute intervals of the day. The 0:00 to 24:00 hour time bar allows you to set the operating mode throughout the selected day(s).

Default value	Day/s	Comfort mode	Economy mode
	Mo (1) – Fr (5)	6:00 – 8:00 hr 17:00 – 22:00 hr	22:00 – 6:00 hr 8:00 – 17:00 hr
	Sa (6) – Su (7)	7:00 – 22:00 hr	22:00 – 7:00 hr

Refer to Operating Instructions CB1B1425, section "Do you want to enter your own time switch?".

Holiday mode

When Holiday mode is activated, symbol  appears on the display. The setpoint (12 °C) and the number of days a user is absent can be adjusted by pressing touchkeys + and –.

Parameters

Changing the parameters by the following steps:

- Press + and – simultaneously for 5 seconds
- Release them and parameter "P01" is displayed on the bottom segment
- Press + or – to scroll to the parameter that needs to be adjusted
- Press **ok** to select this parameter
- Press + or – to adjust the value
- Press **ok** to confirm the adjusted value
- Press mode to exit the parameters without saving or wait for the program to exit automatically

Parameter list

Parameter no.	Description	Setting range (default)
P01	Time format	1 = 24:00 hours (default) 2 = 12:00 AM/PM
P02	Selection of °C or °F	1 = °C (default) 2 = °F

P03	Standard temperature display	1 = room temperature (default) 2 = setpoint
P04	Temperature sensor calibration	-3...3 °C Step 0.5 °C (-6...6 °F, step 1 °F) Default: 0 °C
P06	Comfort setpoint lock	0 = OFF (default) 1 = ON → locked according to setting in permanent temperature setpoint
P08	Economy setpoint lock	0 = OFF (default) 1 = ON → locked according to setting in permanent temperature setpoint
P09	Buzzer	0 = OFF 1 = ON (default)
P10	Show frost protection icon	0 = OFF (default) 1 = ON
P11	Time switch type for auto timer	0 = Individual Days (default) 1 = All 7 days 2 = 5/2 days
P12	Periodic pump run	0 = OFF (default) 1 = ON
P14	X1 External input	0 = No input (default) 1 = External sensor 2 = Digital Input
P15	Temperature limitation	0 = OFF (default) 1 = ON
P16	Max limitation temperature for underfloor heating	25...60 °C, step 1 °C or 77...140 °F, step 1 °F Default: 30 °C
P17	Window contact	0 = Normally Open Contact (default) 1 = Normally Closed Contact
P19	Sequence number of room unit	0 = no display of zone (RF off) 1 = zone number 1 (for standard RF) (default) 6 = zone number 6
P20	RF learn	0 = OFF (default) 1 = ON
P21	Button scanning rate for the capacitive buttons Note: a shorter scanning rate means shorter battery life.	0.2 = 0.25 s 0.5 = 0.5 s 1.0 = 1.0 s (default) 1.5 = 1.5 s
P22	Reload factory settings	0 = OFF (default) 1 = reload
P23	Software version information	No adjustment possible
P78	Control behavior	0 = On/Off, 1.0 K

		1 = On/Off, 0.3 K 2 = TPI fast 3 = TPI medium 4 = TPI slow (default)
P89	Forward shift on max	0, 0.5,...24 h Default: 0 h
P90	Early shutdown max	0, 0.5,...6 h Default: 0 h

Maintenance note

Thermostat and receiver are maintenance-free.

Disposal



The device is considered electrical and electronic equipment for disposal in terms of the applicable European Directive and may not be disposed of as domestic garbage.

- Dispose of the device through channels provided for this purpose.
- Comply with all local and currently applicable laws and regulations.
- Dispose of empty batteries in designated collection points.


	⚠ WARNING
	Risk of explosion due to fire or short-circuit, even if the batteries are empty Risk of injuries from by flying parts <ul style="list-style-type: none"> • Do not allow the batteries to come into contact with water. • Do not charge the batteries. • Do not damage or destroy the batteries. • Do not heat the batteries to more than 85 °C.

	⚠ WARNING
	Electrolyte leakage Chemical burns <ul style="list-style-type: none"> • Only grasp damaged batteries using suitable protective gloves. • If electrolyte comes into contact with eyes, immediately rinse eyes with plenty of water. Consult a doctor.

Observe the following:

- Only replace batteries with batteries of the same type and from the same manufacturer.
 - Observe the polarities (+/-).
 - The batteries must be new and free from damage.
 - Do not mixed new batteries with used batteries.
 - Store, transport, and dispose of the batteries in accordance with local regulations, guidelines, and laws.
- Also observe information from the battery manufacturer.

Technical data of RDE100.1RF

 Power supply	Operating voltage	DC 3 V (2 x 1.5 V alkaline batteries AAA)
	RDE100.1RF	
	For battery life (RDE100.1RF), see below (alkaline batteries type AAA). Battery life calculation is based on the touchpad scanning rate during idle time (assuming a user presses 4 touchkeys per day with default TPI Slow control):	
	Scanning rate 0.25 s	1.1 year battery life
	Scanning rate 0.5 s	1.1 year battery life
External sensor	Scanning rate 1 s (default)	1.3 year battery life
	Scanning rate 1.5 s	1.3 year battery life
	External sensor (RDE100.1RF)	
	'X1' - '⊥' (reference)	QAH11.1 (NTC 3K) / QAA32
	Temperature range	0...60 °C
Function data	Cable length	Max. 80 m
	or	
	Digital On/Off	
	'X1' - '⊥' (reference)	On/Off switch
	Comfort mode	20 °C (5...35 °C)
Environmental conditions	Economy mode	16 °C (5...35 °C)
	Holiday mode	12 °C (5...35 °C) (standalone)
	Built-in room temperature sensor	
	Setpoint setting range	5...35 °C (Comfort/Economy mode)
	Accuracy at 25 °C	< ±0.5 K
Standards and directives	Temperature calibration range	±3.0 K
	Resolution of settings and displays	
	Setpoints	0.5 °C
	Temperature value displays	0.5 °C
	Operation	As per IEC 60721-3-3
Environmental compatibility	Climatic conditions	Class 3K5
	Temperature	0...50 °C
	Humidity	<95% r.h.
	Transport	As per IEC 60721-3-2
	Climatic conditions	Class 2K3
Standards and directives	Temperature	-25...65 °C
	Humidity	<95% r.h.
	Mechanical conditions	Class 2M2
	Storage	As per IEC 60721-3-1
	Climatic conditions	Class 1K3
Standards and directives	Temperature	-25...65 °C
	Humidity	<95% r.h.
	EU Conformity (CE)	CE1T1420xx ^{*)}
	RCM conformity	CE1T1420en_C1 ^{*)}
	Safety class	II as per EN 60730-1, EN 60730-2-9
Standards and directives	Pollution class	II as per EN 60730-1
	Degree of protection of housing	IP30 as per EN 60529
	The product environmental declaration CE1E1420xx ^{*)} contains data on environmentally compatible product design and assessments (RoHS compliance, materials composition, packaging, environmental benefit, disposal).	

eu.bac



Eco design and labelling directives

Meets the requirements for eu.bac certification

See product list at: <http://www.eubaccert.eu/licences-by-criteria.asp>

RDE100.1RF (license 217736, 217737)	Energy Efficiency Label	Control accuracy [K]
Water Heating System (thermal actuator, On/Off)	A	0.5
Water Floor Heating Systems (thermal actuator, On/Off)	-	0.6

Based on EU Regulation 813/2013 (Eco design directive) and 811/2013 (Labelling directive) concerning space heaters, combination heaters, the following classes apply:

- Application with On/Off operation of a heater Class I value 1%
- TPI (PWM) room thermostat, for use with On/Off output heater Class IV value 2%

General

Connection terminals for	Solid wires or prepared stranded wires 2 x 1.5 mm ² or 1 x 2.5 mm ² (Min. 0.5 mm ²)
Weight	0.179 kg
Color of housing front	RAL9003

*) The documents can be downloaded from <http://siemens.com/bt/download>.

Technical data of RCR100RF



Power supply

Operating voltage	AC 230 V +10/-15%
Power	<10 VA
Frequency	48...63 Hz
Switching capacity of relays	
Voltage	AC 24...230 V
Current	8 (2) A



Switching outputs (Q11, Q12, Q14)

Switching voltage	Max. AC 230 V Min. AC 24 V
Switching current	Max. 8 A res., 2 A ind.
At AC 230 V	Min. 200 mA



No internal fuse.

External preliminary protection with max. C 10 A circuit breaker in the supply lines required under all circumstances.

External protection for incoming cable

Circuit breaker	Max. 10 A
Circuit breaker tripping characteristic	Type B, C or D to EN 60898 and EN 60947
Contact life at AC 230 V	Guide value:
At 8 A res.	1 x 10 ⁵ cycles

Insulating strength

Between relay contacts and coil	AC 5,000 V
Between relay contacts (same pole)	AC 1,000 V

Electrical connections

Connection terminals	Screw terminals
For solid wires	2 x 1.5 mm ²
For stranded wires	1 x 2.5 mm ² (Min. 0.5 mm ²)

Environmental conditions

Operation	As per IEC 60721-3-3
Climatic conditions	Class 3K5
Temperature	0...50 °C
Humidity	<95% r.h.

Standards and directives	Transport	As per IEC 60721-3-2
	Climatic conditions	Class 2K3
	Temperature	-25...65 °C
	Humidity	<95% r.h.
	Mechanical conditions	Class 2M2
	Storage	As per IEC 60721-3-1
	Climatic conditions	Class 1K3
	Temperature	-25...65 °C
	Humidity	<95% r.h.
	EU Conformity (CE)	CB1T1420xx ^{*)}
Standards and directives	RCM conformity	CE1T1420en_C1*)
	Safety class	II as per EN 60730-1, EN 60730-2-9
	Pollution class	II as per EN 60730-1
	Degree of protection of housing	IP30 as per EN 60529

Environmental compatibility

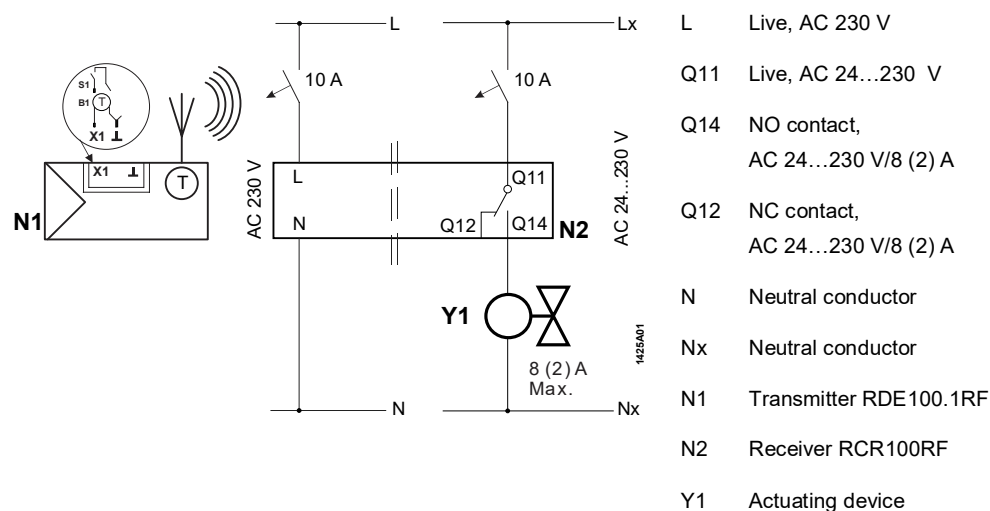
The product environmental declaration CE1E1420xx ^{*)} contains data on environmentally compatible product design and assessments (RoHS compliance, materials composition, packaging, environmental benefit, disposal).

General

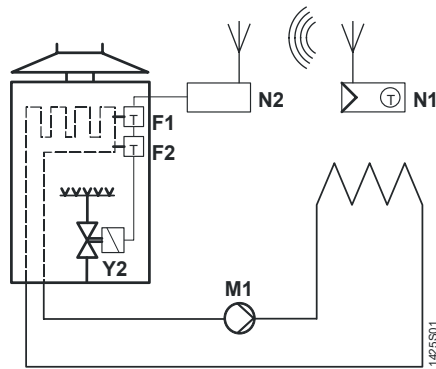
Weight	0.152 kg
Color of housing front	RAL9003

^{*)} The documents can be downloaded from <http://siemens.com/bt/download>.

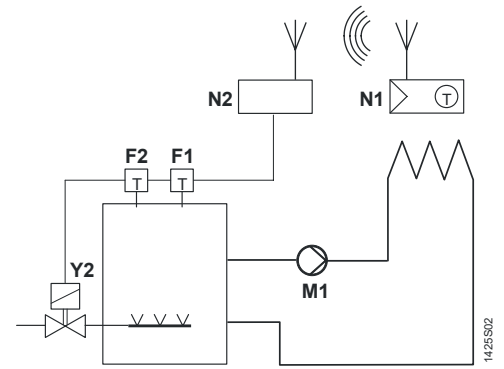
Connection diagrams



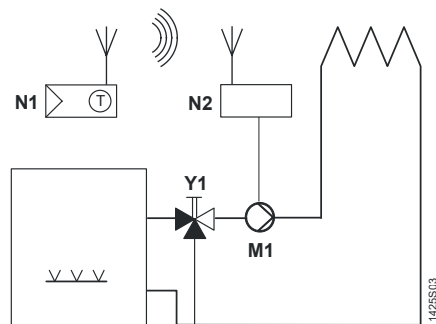
⚠ L – N AC 230 V / Lx – Nx AC 24...230 V



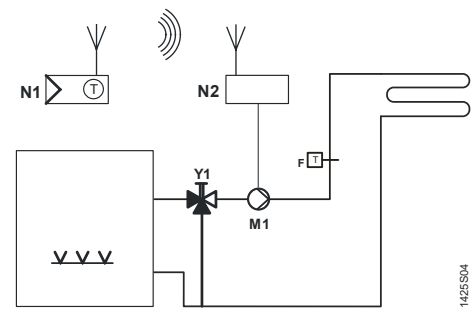
Room thermostat with direct control of a gas-fired wall-hung boiler



Room thermostat with direct control of a gas-fired floor-standing boiler



Room thermostat with direct control of a heating circuit pump (precontrol by manual mixing valve)

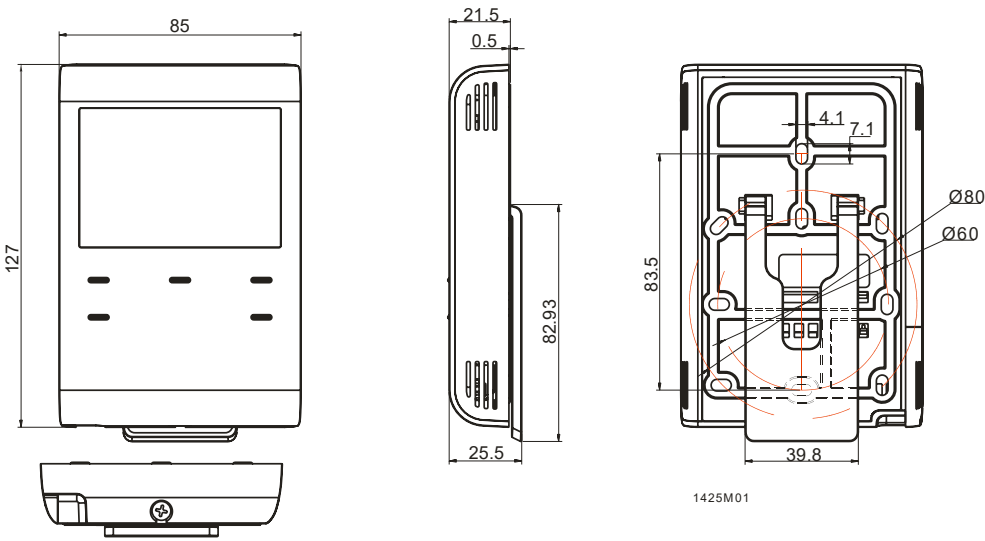


Room thermostat with direct control of a hydronic floor heating system

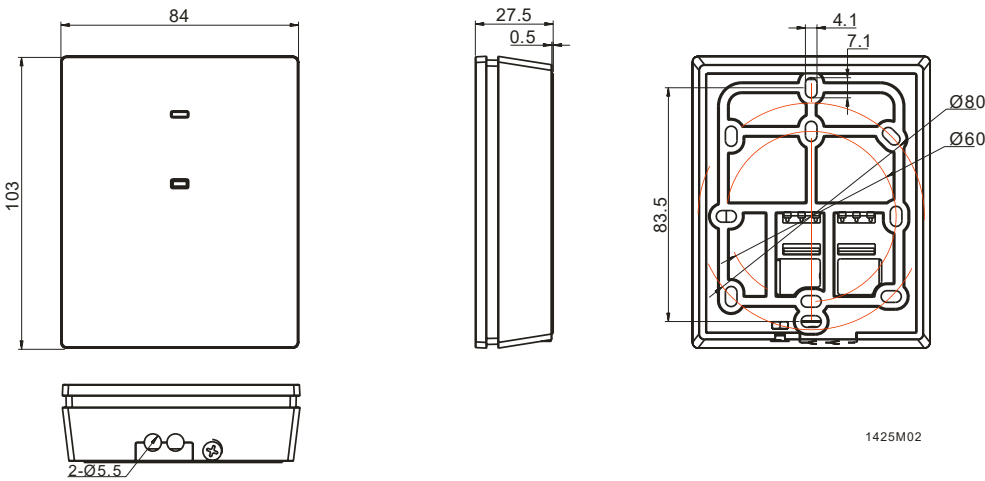
- F1 Thermal reset limit thermostat
- F2 Safety limit thermostat
- M1 Circulating pump
- N1 RDE100.1RF room thermostat
- Y1 3-port valve with manual adjustment
- Y2 Magnetic valve

Dimensions

Dimensions in mm Room thermostat RDE100.1RF



Receiver RCR100RF





RDF110
RDF110/IR



RDF110.2
RDF110.2/IR

Room Temperature Controllers with LCD

RDF110...

for 2-pipe fan coil units

for compressors in DX type equipment

Output for on / off valve actuator or 1-stage compressor

3-speed fan control: Automatic or manual

Adjustable commissioning and control parameters

Optional display of room temperature or setpoint

Minimum and maximum setpoint limitation

Operating voltage AC 230 V

Additional features of RDF110

Automatic heating / cooling changeover

Operating modes: Normal operation, Economy (Energy saving) and Protection (Standby)

Input for heating / cooling changeover or return air temperature sensor

Potential-free input for operating mode changeover (key card contact, etc.)

Function for avoiding damage resulting from moisture

Additional features of RDF110.2

Manual heating / cooling changeover

Operating modes: Normal operation, Protection (Standby)

Optional

Infrared remote control (RDF110/IR, RDF110.2/IR)

Use

For controlling the room temperature in individual rooms and zones that are

- heated or cooled with 2-pipe fan coil units
- cooled with a single compressor in DX type equipment


The controller controls

- a 3-speed fan
- either a valve actuator in a 2-pipe system, or
- a 1-stage compressor in DX type equipment

Suitable for use in systems with

- automatic heating / cooling changeover (RDF110)
- continuous heating or cooling mode (RDF110)
- manual heating / cooling changeover (RDF110.2)

Functions

- Changeover between heating and cooling mode is either automatic by a QAH11.1 changeover cable temperature sensor or manually
- Maintenance of room temperature either with integrated temperature sensor or external room / return air temperature sensor (only with RDF110 and RDF110/IR)
- Selection of operating mode with an external changeover switch (only with RDF110 and RDF110/IR) or with the operating mode button  on the controller
- 3-speed fan control (automatic or manual)
- Output for 2-position (on / off) valve actuator or 1-stage compressor
- Optional with infrared remote control (only with RDF110.../IR)



Controller

Temperature control

The controller acquires the room temperature via its built-in sensor and maintains the setpoint by delivering 2-position valve control commands or compressor output commands. With the RDF110, an external room temperature sensor (QAA32) or external return air temperature sensor (QAH11.1) can be used instead. The switching differential is 2 K in heating mode and 1 K in cooling mode (adjustable via parameters P08 and P09).

Display

The display shows the acquired room / return air temperature or the setpoint of the current operating mode. This can be selected via parameter P18. Factory setting is display of the current room temperature.



The heating  and cooling  symbols on the display show the status of the fan coil. This means that the symbols are also shown while the controller operates in the neutral zone.

If required, room temperature and setpoint can also be displayed in °F in place of °C by changing parameter P17.

Operating modes


Normal operation

The following operating modes are available:


In Normal operation, the controller maintains the setpoint, which can be adjusted via the   buttons. The fan can be set to automatic or manual fan speed: Low, medium or high.


Tip!

The setpoint setting range can be limited to a minimum (P05) and maximum (P06). This helps prevent the waste of energy, thus saving costs.

Economy (Energy saving) mode 
(only with RDF110 and RDF110/IR)

When external operating mode changeover is activated, the controller switches to Economy (Energy saving) mode. In this operating mode, the relevant setpoints of heating or cooling are maintained. These setpoints can be adjusted via control parameters P01 and P02. The default fan speed in Economy (Energy saving) mode is automatic fan.

Protection (Standby)


When the controller is in Protection (Standby) mode , the relevant setpoints of heating or cooling are maintained. These setpoints can be adjusted via control parameters P03 and P04. Factory setting of both setpoints is OFF, which means that the controller is not activated when in Protection (Standby) mode.

Avoiding damage due to moisture
(only with RDF110 and RDF110/IR)

To avoid damage due to moisture in very warm and humid climatic zones resulting from lack of air circulation in Economy (Energy saving) mode, the fan can be kept running all the time (e.g. in hotel rooms during unoccupied periods), when setting parameter P20 to "ON in dead zone". In this case, the fan keeps running at minimum fan speed 1.

Control sequences

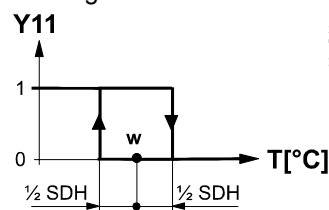
Water-based fan coil application

Used in conjunction with a valve, either for heating / cooling with changeover, heating only or cooling only.

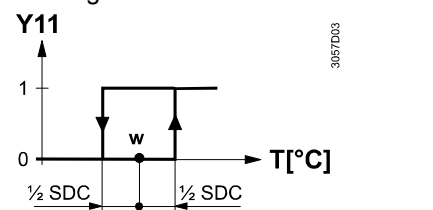
Compressor-based application

Used in conjunction with a 1-stage compressor for cooling only or heating only.

Heating mode



Cooling mode



T[°C] Room temperature
W Room temperature setpoint
Y11 Control output "Valve" or "Compressor"

SDH Switching differential "Heating"
SDC Switching differential "Cooling"

ON

The valve or compressor receives the **OPEN** command via control output Y11 when

1. the acquired room temperature lies by half the switching differential below the setpoint (heating mode) or above the setpoint (cooling mode), and
2. control output Y11 was not energized for more than the "Minimum output off time" (factory setting 1 minute, adjustable via parameter P16)

OFF

The valve or compressor receives the **CLOSE** command via control output Y11 when


1. the acquired room temperature lies by half the switching differential above the setpoint (heating mode) or below the setpoint (cooling mode), and
2. control output Y11 was energized for more than the "Minimum output on time"; (factory setting 1 minute, adjustable by parameter P15)

Note:

Control output Y12 delivers a control command which is inverted to the control command at output Y11 and which can be used for normally open valves.

Heating / cooling mode

With the RDF110, the changeover between cooling and heating takes place either automatically via a heating / cooling changeover sensor or a remote changeover switch. If the controller was set to "Cooling only" or "Heating only", changeover will not be possible (parameter P22, factory setting "Cooling only").

With the RDF110.2, when pressing the heating / cooling changeover button , the controller will change from heating to cooling, or vice versa.

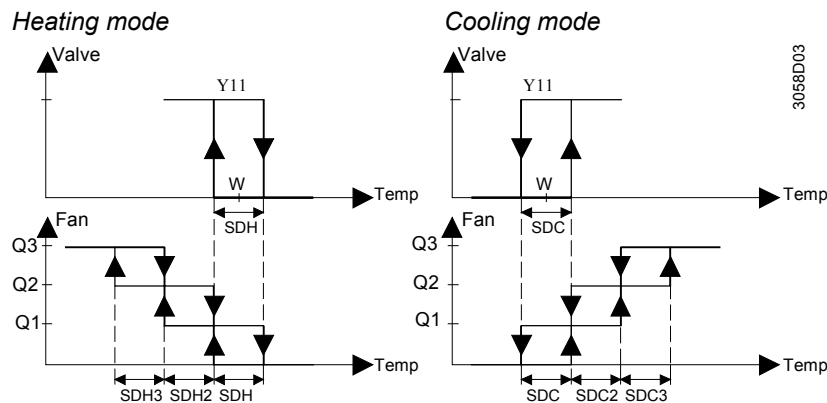
Minimum output on time / off time Y11

The minimum output on time and off time of Y11 can be adjusted from 1...10 minutes via parameters P15 and P16. Factory setting is 1 minute. In this case, any readjustment of the setpoint or of heating / cooling mode changeover will be used immediately for computing the output status and output Y11 may not hold the minimum on / off time of 1 minute.

If parameter P15 or P16 is set to a level above 1 minute, the minimum on / off time of Y11 will be maintained as set, even if the setpoint or changeover mode has been readjusted.

Fan operation

The fan operates either in automatic mode or at the selected speed when using manual mode. In automatic mode, the fan speed depends on the setpoint and the current room temperature. When the room temperature reaches the setpoint, the control valve will close and the fan switch off. Temperature-dependent fan control (see diagram below). The individual switching differentials of the fan speeds can be adjusted via control parameters P08 – P13.



Ventilation always on

If desired, fan control can be set to "Temperature-independent", which means that ventilation is always on, even within the dead zone, using at least fan speed 1. This can be selected individually for Normal operation using parameter P21 and for Economy (Energy saving) mode using parameter P20 (also refer to "Avoiding damage due to moisture").

Dwelling time

In automatic mode, a dwelling time of 2 minutes (factory setting) is active. The fan maintains that speed for at least 2 minutes before it switches to the next speed. This dwelling time can be adjusted from 1...5 minutes using parameter P14.

Fan start

When the fan starts from standstill, it starts with fan speed 3 for 1 second in order to guarantee a safe fan motor start (to overcome inertia and friction).

External sensor input B1-M



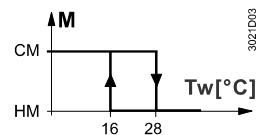
With the RDF110, a return air / external room temperature sensor or heating / cooling changeover sensor can be connected to terminal B1-M. The function of this sensor input is determined by parameter P22.

Sensor input B1-M is not galvanically separated from the AC 230 V mains supply. Therefore, only a cable temperature sensor and wiring with sufficient insulation must be used.

Automatic heating / cooling changeover

When P22 is set to “Automatic H/C changeover”, the sensor input acts to ensure automatic heating / cooling changeover. The water temperature acquired by the changeover sensor (QAH11.1 + ARG86.3) is used to switch from heating to cooling mode, or vice versa. When the water temperature lies above 28 °C (parameter P24), the controller switches to heating mode; below 16 °C (parameter P23), it switches to cooling mode. If, immediately after switching on, the water temperature lies between the 2 changeover points, the controller will start in heating mode. The water temperature is acquired at 30-second intervals and the operating state is updated.

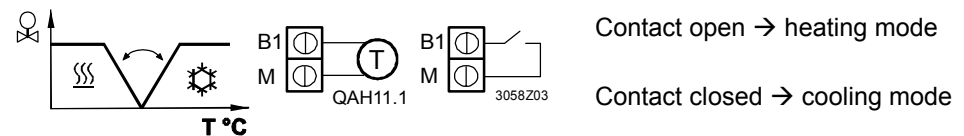
Automatic H / C changeover



M Operating mode CM Cooling mode
T_w Water temperature HM Heating mode

Remote heating / cooling changeover

The QAH11.1 cable temperature sensor for automatic heating / cooling changeover can be replaced by an external switch (suited for mains voltage) for manual remote changeover:



With parameter P99 (diagnostic value), automatic heating / cooling changeover can be checked.

External room or return air temperature sensor

When parameter P22 is set to “Cooling only” or “Heating only”, sensor input B1-M can be used to connect an external room temperature (QAA32) or a return air temperature sensor (QAH11.1). Changeover is automatic if a sensor is detected at the sensor input. With parameter P98 (diagnostic value), the sensor status can be checked.

Summary B1-M and P22

The following table summarizes the relation between parameter P22, the external sensor B1-M and variables which the controller uses for maintaining the temperature:

Parameter P22	Variables: The controller....	No sensor at B1-M	QAH11.1/QAA32 at B1-M
Heating only	is in H/C mode	Heating	Heating
	controls according to	Internal sensor	Sensor at B1
Cooling only	is in H/C mode	Cooling	Cooling
	controls according to	Internal sensor	Sensor at B1
Automatic H/C changeover	is in H/C mode	Heating	depending on the temperature of sensor B1-M
	controls according to	Internal sensor	Internal sensor

External operating mode changeover D1-GND

With the RDF110, a potential-free operating mode changeover switch (window switch, key card contact, etc.) can be connected to status input D1-GND. No additional power supply is required for detecting the position of the external switch.

When the switch closes due to an open window, or unoccupied hotel room for instance, the operating mode will change to Economy (Energy saving). During this external operating mode changeover, neither the setpoint nor the control parameter nor fan mode can be changed. When pressing the setpoint or fan mode buttons, ECO will flash on the display, indicating that the operating mode is overridden from a remote location.

The operating action of the switch (N.C. or N.O.) can be selected via parameter P19.

Error handling

Temperature out of range

When the room temperature is out of the measuring range, which means above 49 °C or below 0 °C, the display shows the limiting temperature in flashing figures, e.g. "0 °C" or "49 °C".

If the current setpoint is not OFF (see parameters 1 – 4), the controller is in heating mode and the temperature is below 0 °C, output Y11 will be energized. In all other cases, Y11 is deenergized. When the temperature returns to the measuring range, the controller will resume Normal operation.

External sensor failure

In case of an external sensor failure (short-circuit or open-circuit), the controller will immediately switch back to the internal sensor to ensure control.

Should both the external and internal sensor fail, the display will flash "Err" to call the user's attention.

Infrared remote control

The RDF110/IR and RDF110.2/IR have an infrared receiver built in. Together with the IRA210 infrared remote control, the following operations can be performed from a remote location:






- Selection of operating mode: Protection (Standby) / Normal operation
- Adjustment of setpoint in Normal operation
- Selection of fan mode: Automatic or manual fan speed

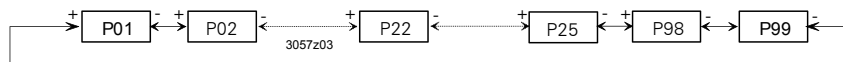
Using parameter P25, infrared remote control can be disabled.







With the RDF110 and RDF110.2, a number of control parameters can be readjusted to optimize the control performance. These parameters can also be set during operation without opening the unit. In the event of a power failure, all control parameter settings will be maintained.

Parameter settings

The parameters can be changed as follows:

1. Set the controller to Protection (Standby) (⏻).
2. Press buttons  and  simultaneously for 3 seconds. Release them and, within 2 seconds, press button  again for 3 seconds. Then, the display will show "P01".
3. Select the required parameter by repeatedly pressing buttons  and .






4. By pressing buttons  and  simultaneously, the current value of the selected parameter appears, which can be changed by repeatedly pressing buttons  or .
5. By pressing buttons  and  simultaneously again or 5 seconds after the last press of a button, the last parameter will be displayed again.
6. If you wish to display and change additional parameters, repeat steps 3 through 5.
7. 10 seconds after the last display or setting, all changes will be stored and the controller returns to Protection (Standby).

Note:

Parameters not used by the RDF110.2 are not available and cannot be displayed.

Parameter reset

The factory setting of the control parameters can be reloaded as follows:

1. Set the controller to Protection (Standby) (⏻).
2. Press buttons  and  simultaneously for 3 seconds. Release them and, within 2 seconds, press operating mode selector button  2 times.

Then, the display will show "888" during the reloading process.

Control parameters of the RDF110 and RDF110.2

Parameter	Meaning	Setting range	Factory setting
P01	Setpoint of heating in Economy (Energy saving) mode (Wheat _{Eco})	OFF, 5 °C...Wcool _{Eco}	16 °C ¹⁾
P02	Setpoint of cooling in Economy (Energy saving) mode (Wcool _{Eco})	OFF, Wheat _{Eco} ...40 °C	28 °C ¹⁾
P03	Setpoint of heating in Protection (Standby) (⏻) (Wheat _{Stb})	OFF, 5 °C...Wcool _{Stb}	OFF
P04	Setpoint of cooling in Protection (Standby) (⏻) (Wcool _{Stb})	OFF, Wheat _{Stb} ...40 °C	OFF
P05	Minimum setpoint limitation in Normal operation (Wmin _{Comf})	5 °C...Wmax _{Comf}	5 °C
P06	Maximum setpoint limitation in Normal operation (Wmax _{Comf})	Wmin _{Comf} ...40 °C	35 °C
P07	Sensor calibration	-3...+3 K	0 K
P08	Switching differential heating mode SDH	0.5...+4K	2 K
P09	Switching differential cooling mode SDC	0.5...+4K	1 K
P10	Switching differential fan speed 2 in heating mode SDH2	0.5...+4K	1 K
P11	Switching differential fan speed 2 in cooling mode SDC2	0.5...+4K	1 K
P12	Switching differential fan speed 3 in heating mode SDH3	0.5...+4K	1 K
P13	Switching differential fan speed 3 in cooling mode SDC3	0.5...+4K	1 K
P14	Dwelling time of auto fan speeds	1...5 minutes	2 min
P15	Minimum output on time (Y11)	1...10 minutes	1 min
P16	Minimum output off time (Y11)	1...10 minutes	1 min
P17	Selection of °C or °F	°C or °F	°C
P18	Display of temperature or setpoint	OFF: Setpoint ON: Room (or return air) temperature	ON
P19	Operating action of remote changeover input	0: Normally open (N.O) 1: Normally closed (N.C.)	0 ¹⁾
P20	Fan control in Economy (Energy saving) mode	OFF in dead zone ON in dead zone	OFF ¹⁾
P21	Fan control in Normal operation	OFF in dead zone ON in dead zone	OFF
P22	Heating / cooling mode	0: Heating only 1: Cooling only 2: Automatic H/C changeover	1: Cooling only ¹⁾
P23	Heating / cooling changeover switching point cooling	10...25 °C	16 °C ¹⁾
P24	Heating / cooling changeover switching point heating	27...40 °C	28 °C ¹⁾
P25	Infrared receiver (only with RDF.../IR)	0: Disabled 1: Enabled	1
P98	Active temperature sensor	0: Internal sensor 1: External sensor	Diagnostic value ¹⁾
P99	Value of current heating / cooling changeover temperature reading and indication of current mode	100 = input open → ∞ mode 0...49 °C = cur. temp. value 00 = input bridged → * mode OFF= not commissioned as automatic H/C changeover	Diagnostic value ¹⁾

1) Not available with RDF110.2

Type summary

Type	Features
RDF110	With input for automatic heating / cooling changeover or return air temperature sensor With input for operating mode changeover
RDF110.2	With manual heating / cooling changeover Without input for sensor Without input for operating mode changeover
RDF110/IR *)	Same as RDF110 plus infrared remote control
RDF110.2/IR *)	Same as RDF110.2 plus infrared remote control

*) Type is not orderable any more

Equipment combinations

Type of unit	Type	Data Sheet ^{*)}
Infrared remote control	IRA210	-
Cable temperature sensor	QAH11.1	1840
Room sensor	QAA32	1747
Changeover mounting kit	ARG86.3	1840
Electromotoric on / off valve and actuator	MVI.../MXI...	4867
Electromotoric on / off actuator	SFA21...	4863
Thermal actuator (for radiator valve)	STA21...	4893
Thermal actuator (for small valves 2.5 mm)	STP21...	4878
Zone valve actuators (only available in AP, UAE, SA and IN)	SUA...	4830

*) The documents can be downloaded from <http://siemens.com/bt/download>.

Accessories

Description	Type
Adapter plate 120 x 120 mm for 4" x 4" conduit boxes	ARG70
Adapter plate 96 x 120 mm for 2" x 4" conduit boxes	ARG70.1
Adapter plate for surface wiring 112 x 130 mm	ARG70.2

Ordering

When ordering, please provide name and type:

E.g. **room temperature controller RDF110**

The **IRA210** infrared remote control is to be ordered as a separate item

The **QAH11.1** can be used as a return air temperature or automatic heating / cooling changeover sensor. In case it is used as a changeover sensor, the **ARG86.3** changeover sensor mounting kit is to be ordered as a separate item.

Valve actuators are to be ordered as separate items.

Mechanical design

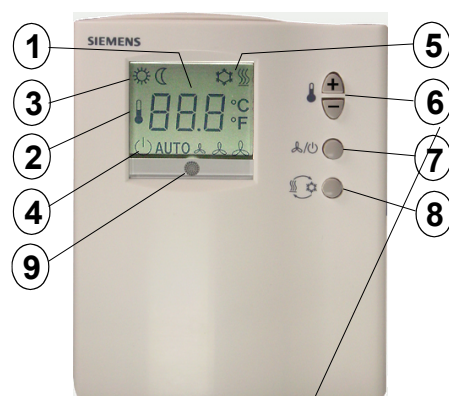
The controller consists of two parts:

- Plastic housing which accommodates the electronics, the operating elements and the built-in room temperature sensor
- Mounting base










The housing engages in the mounting base and snaps on.

The base carries the screw terminals.

Setting and operating elements

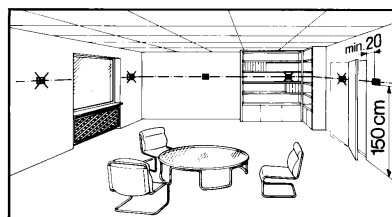


Legend

- 1 Display of the room temperature, setpoints and control parameters
- 2  Symbol used when displaying the current room temperature
- 3 Operating mode
 -  Normal operation
 -  Economy (Energy saving) mode
- 4 Protection (Standby) / fan mode status
 -  Protection (Standby) mode
 - AUTO** Auto fan active
 -  fan speed low, medium, high
- 5  in cooling mode
 in heating mode
- 6 Buttons for adjusting the setpoints and the control parameters
- 7 Button for changing fan operation and Protection (Standby) ()
- 8 Manual heating / cooling changeover () (only with RDF110.2)
- 9 Infrared receiver (only with RDF110.../IR)

Mounting and installation

The room controller can be mounted on a wall or inside the fan coil unit. The mounting location on a wall should not be in niches or bookshelves, not behind curtains, above or near heat sources and not exposed to direct solar radiation. Mounting height is about 1.5 m above the floor.



The controller can be fitted on a recessed conduit box.

When using a heating / cooling changeover sensor, then, before fitting the sensor, thermal conductive paste must be applied to the location on the pipe where the sensor is placed.

Wiring



Also refer to the Mounting Instructions B3057 enclosed with the controller.

- Wiring, protection and earthing must be installed in compliance with local regulations. It must be made certain that safety extra low-voltage lines (SELV circuit) are clearly separated from AC 230 V mains voltage cable
- The cables to the controller, external sensor, fan and valves carry AC 230 V mains voltage and must be appropriate sized
- Only sensors and valves rated for AC 230 V may be used
- The AC 230 V mains supply line must have a circuit breaker with a rated current of no more than C 10 A

Warning!

No internal line protection for supply lines to external consumers (Q1, Q2, Q3, Y11, Y12)

Risk of fire and injury due to short-circuits!

- Adapt the line diameters as per local regulations to the rated value of the installed overcurrent protection device.
- Maximum 10 changeover contact inputs B1-M can be connected in parallel if an external switch is used in place of a changeover sensor. The switch must be suited for AC 230 V. The cable length must not exceed 80 m overall
- Maximum 10 operating mode changeover contact inputs D1-GND can be connected in parallel. The cable length must not exceed 80 m overall



Commissioning

After applying power, the controller makes a reset during which all LCD segments flash, indicating that the reset has been correctly made. This takes about 3 seconds. Then, the controller is ready for commissioning by qualified HVAC staff. The control parameters of the controller can be set to ensure optimum performance of the whole system (also refer to "Setting the control parameters").

Heating / cooling mode

- Only with RDF110: Depending on the application, the heating / cooling mode needs to be set via parameter P22. Factory setting is "Cooling only". When using the "Automatic heating / cooling changeover" function, P22 must be set to "Automatic H/C changeover".

Note: When P22 is set to "Automatic H/C changeover", the built-in sensor is used for acquiring the room temperature

Compressor-based application

- If the controller is used in conjunction with a compressor, the minimum output on time (parameter P15) and off time (parameter P16) of Y11 must be adjusted in order not to harm the life time of the compressor

Calibrating the sensor

- If the room temperature displayed by the controller does not accord with the room temperature effectively measured, the temperature sensor can be recalibrated. In that case, parameter P07 must be changed

Setpoint and range limitation

- For comfort and energy saving reasons, it is suggested to review the setpoints and setpoint ranges (parameters P01...P06) and, if necessary, to change them accordingly

Diagnostic values

- Only with RDF110: Parameters P98 and P99 are diagnostic values and help check the system. With P98, the status of the active temperature sensor is shown and, with P99, the status of the heating / cooling changeover sensor

Disposal



The device is considered an electronic device for disposal in terms of the European Directive 2012/19/EU and may not be disposed of as domestic garbage.

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

Technical data

Power supply

Operating voltage	AC 230 V + 10/-15 %
Frequency	50/60 Hz
Power consumption	max. 8 VA



No internal fuse

External preliminary protection with max. C 10 A circuit breaker in the supply line required under all circumstances

Outputs

Fan control Q1, Q2, Q3-N	AC 230 V
Rating	5 mA...4(2)A
Control output Y11-N (N.O.) / Y12-N (N.C.)	AC 230 V
Rating	5 mA...4(2)A

Inputs

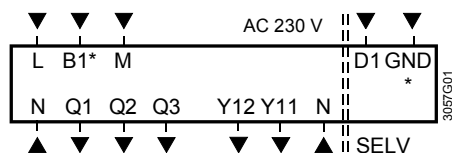


Changeover or external room temperature sensor B1-M	
Temperature sensor	QAH11.1, safety class II
Voltage against earth	AC 230 V
Cable length	max. 80 m (min. 1.5 mm ²)
Status input D1 and GND	
Contact sensing	SELV DC 6...15 V / 3...6 mA
Insulation against mains	4 kV, reinforced insulation
Operating action	selectable (N.O. / N.C.)
Cable length	max. 80 m (min. 1.5 mm ²)
Infrared receiver (only with RDF110.../IR)	
Transmission distance	≤ 7.5 m

Operational data	Orientation angle	≤ ± 30 °
	Switching differential, adjustable from 0.5..4 K	
	Heating mode (factory setting)	2 K
	Cooling mode (factory setting)	1 K
	Setpoint setting range	
	☀ Normal operation	5...40 °C
	☾ Economy (Energy saving) (only with RDF110)	OFF, 5...40 °C
	⏻ Protection (Standby)	OFF, 5...40 °C
	Factory setting of setpoints	
	☀ Normal operation	20 °C
Environmental conditions	☾ Economy (Energy saving) in heating / cooling mode	16 °C / 28 °C
	⏻ Protection (Standby) (heating and cooling mode)	OFF
	Built-in room temperature sensor	
	Measuring range	0...49 °C
	Accuracy at 25 °C	< ± 0.5 K
	Temperature calibration range	± 3.0 K
	Resolution of settings and display	
	Setpoints	0.5 °C
	Current temperature value displayed	0.5 °C
	Operation	to IEC 60721-3-3
Norms and standards	Climatic conditions	class 3K5
	Temperature	0...+50 °C
	Humidity	<95 % r.h.
	Transport	to IEC 60721-3-2
	Climatic conditions	class 2K3
	Temperature	–25...+60 °C
	Humidity	<95 % r.h.
	Mechanical conditions	class 2M2
	Storage	to IEC 60721-3-1
	Climatic conditions	class 1K3
General	Temperature	–25...+60 °C
	Humidity	<95 % r.h.
	EU Conformity (CE)	CE1T3057xx ^{*)}
	RCM Conformity	CE1T3057en_C1 ^{*)}
	Devices of safety class	II to EN 60730-1
	Pollution class	normal
	Degree of protection of housing	IP 30 to EN 60 529
	Connection terminals	solid wires or prepared stranded wires 2 x 0.4-1.5 mm ² or 1 x 2.5 mm ²
	Weight	0.28 kg
	Color of housing front	white, NCS S 0502-G (RAL 9003)

*) The documents can be downloaded from <http://siemens.com/bt/download>.

Connection terminals



L, N Operating voltage AC 230 V

B1* Changeover (QAH11.1+ ARG86.3) or external room temperature sensor (QAH11.1 / QAA32)

M Measuring neutral for sensor

D1, GND* Status input for potential-free operating mode changeover switch

Q1 Control output "Fan speed 1 AC 230 V

Q2 Control output "Fan speed 2 AC 230 V

Q3 Control output "Fan speed 3 AC 230 V

Y11 Control output "Valve" AC 230 V (N.O., for normally closed valves) or output for compressor

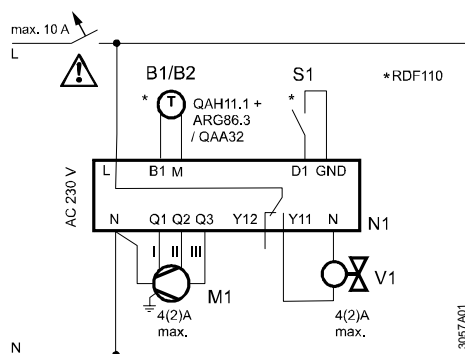
Y12 Control output "Valve" AC 230 V (N.C., for normally open valves)

* Only with RDF110 or RDF110/IR

Connection diagrams

Application:

2-pipe fan coil units



B1* Return air temperature sensor (QAH11.1) or external room temperature sensor (QAA32)

B2* Changeover sensor (temperature sensor QAH11.1 + changeover mounting kit ARG86.3)

M1 3-speed fan

N1 Room temperature controller RDF110...

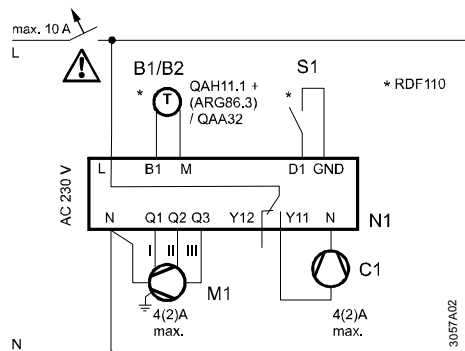
S1* External operating mode changeover switch

V1 Zone valve

* Only with RDF110 or RDF110/IR

Application:

**Compressor
in DX type equipment**



B1* Return air temperature sensor (QAH11.1) or external room temperature sensor (QAA32)

B2* Changeover sensor (temperature sensor QAH11.1 + changeover mounting kit ARG86.3)

M1 3-speed fan

N1 Room temperature controller RDF110..

S1* External operating mode changeover switch

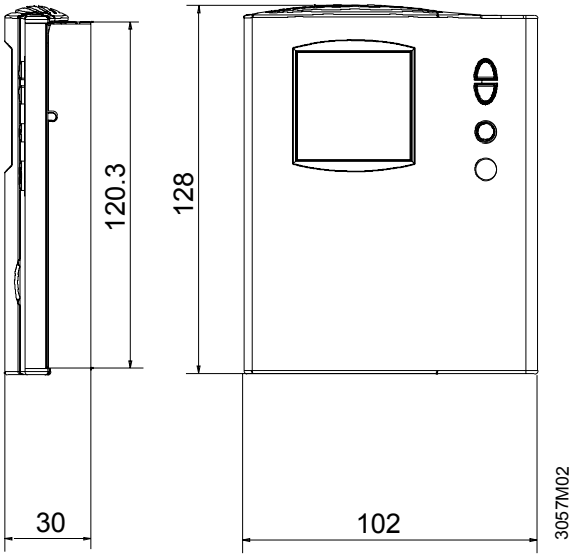
C1 Compressor

* Only with RDF110 or RDF110/IR

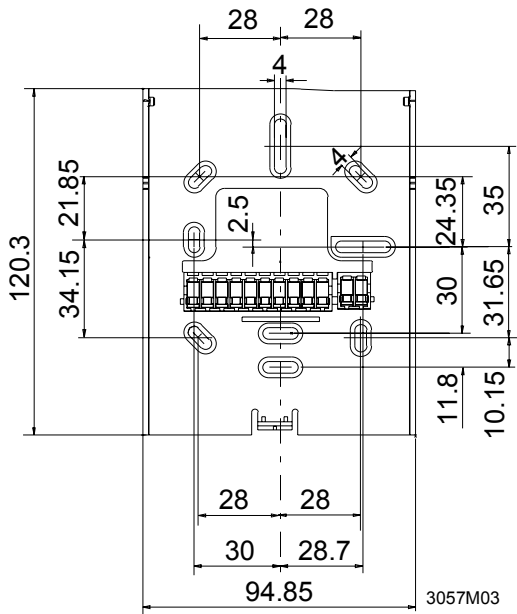
Note: For compressor application, RDF110 or RDF110/IR is recommended

Dimensions

Controller



Mounting base





RDF310.2/MM

Flush-mounted Room Thermostat

RDF310.2/MM

for 2-pipe fan coil units

-
- Output for on/off valve or 3-wire on/off valve actuator
 - 3-speed fan control: Automatic or manual
 - Manual heating/cooling changeover or continuous Cooling only / Heating only
 - Operating modes: Comfort, Protection
 - Adjustable commissioning and control parameters
 - Optional display of room temperature or setpoint
 - Minimum and maximum setpoint limitation
 - Display temperature in increments of 0.5 °C
 - Operating voltage AC 230 V
 - Mounting on recessed square conduit box, fixing centres 60.3 mm
 - User and parameter settings can be retained or restored with power loss

Use

For controlling the room temperature in individual rooms and zones that are...

- heated or cooled with 2-pipe fan coil units

The thermostat controls...

- a 3-speed fan
- an on/off valve actuator in a 2-pipe system

Suitable for use in systems with...

- continuous heating or cooling mode
- manual heating/cooling changeover

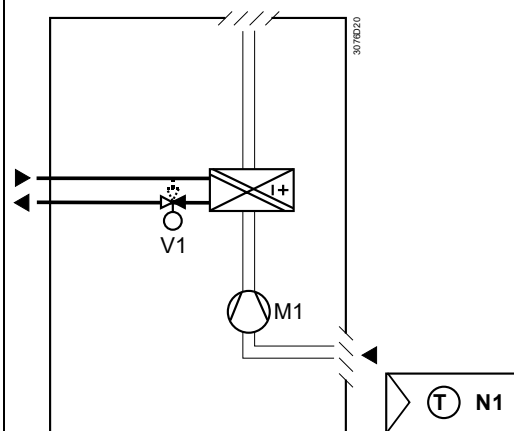
Functions

- Manual changeover between heating and cooling mode
- Maintenance of room temperature with integrated internal temperature sensor
- Selection of operating mode with the operating mode button $\frac{\phi}{\lambda}$ on the thermostat
- 3-speed fan control (automatic or manual)
- Output for 2-position (on/off) valve or 3-wire (on/off) valve actuator

Applications

Application and output signal, diagram

- **2-pipe fan coil unit** ON/OFF (heating **or** cooling)



V1 Heating/cooling valve actuator
N1 Thermostat

M1 3-speed fan

Operation





Temperature control

The thermostat acquires the room temperature via its built-in sensor and maintains the setpoint by delivering 2-position valve control commands.

The switching differential is 1 K in heating mode and 1 K in cooling mode (adjustable via parameters P08 and P09).

Display

The display shows the acquired room temperature or the setpoint of the current operating mode. This can be selected via parameter P18. Factory setting is display of the current room temperature.

The heating symbol  or the cooling symbol  displays to indicate the output status of the relays connected to the fan coil. This means that the symbol does not display when the thermostat operates in the neutral zone. If the thermostat is under manual heating or cooling changeover, the heating symbol  or the cooling symbol  displays permanently to indicate the control sequence, i.e. heating or cooling. This means that the symbol displays when the thermostat operates in the neutral zone.

If required, room temperature and setpoint can also be displayed in °F in place of °C by changing parameter P17.

Operating modes

The following operating modes are available:


Comfort Mode

In Comfort mode, the thermostat maintains the setpoint, which can be adjusted via the + and - buttons. The fan can be set to automatic or manual fan speed: Low, medium or high.

Tip!

The setpoint setting range can be limited to a minimum (P05) and maximum (P06). This helps prevent the waste of energy, and saving costs.

Protection Mode

When the thermostat is in Protection mode , the relevant setpoints of heating or cooling are maintained. These setpoints can be adjusted via control parameters P03 and P04. Factory setting of both setpoints is OFF, indicating the thermostat is not activated when in Protection mode.

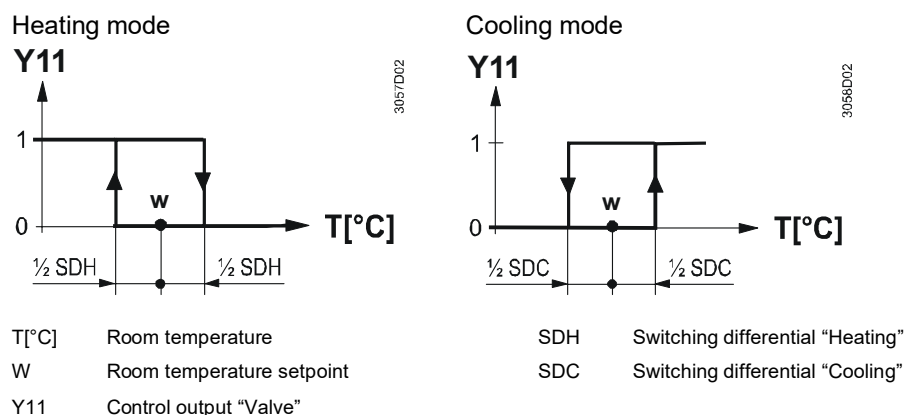
Avoiding damage due to moisture

To avoid damage due to moisture in very warm and humid climatic zones resulting from lack of air circulation in Comfort mode, the fan can be kept running all the time (e.g. in apartments or shops during unoccupied periods), when setting parameter P21 "ON in dead zone". In this case, the fan keeps running at minimum fan speed 1 in the neutral zone.

Control sequences

Water-based fan coil application

Used in conjunction with a valve, either for heating/cooling with changeover, or heating only, cooling only.



ON

The valve receives the **OPEN** command via control output Y11 when

- the acquired room temperature lies by half the switching differential below the setpoint (heating mode) or above the setpoint (cooling mode), and
- control output Y11 was not energized for more than the "Minimum output off time" (factory setting 1 minute)

OFF

The valve receives the **CLOSE** command via control output Y11 when

- the acquired room temperature lies by half the switching differential above the setpoint (heating mode) or below the setpoint (cooling mode), and
- control output Y11 was energized for more than the "Minimum output on time"; (factory setting 1 minute)

Note:

Control output Y12 delivers a control command which is inverted to the control command at output Y11 and which can be used for normally open valves.

Heating/cooling mode

When you press the heating/cooling changeover button , the thermostat changes from heating to cooling, or vice versa.

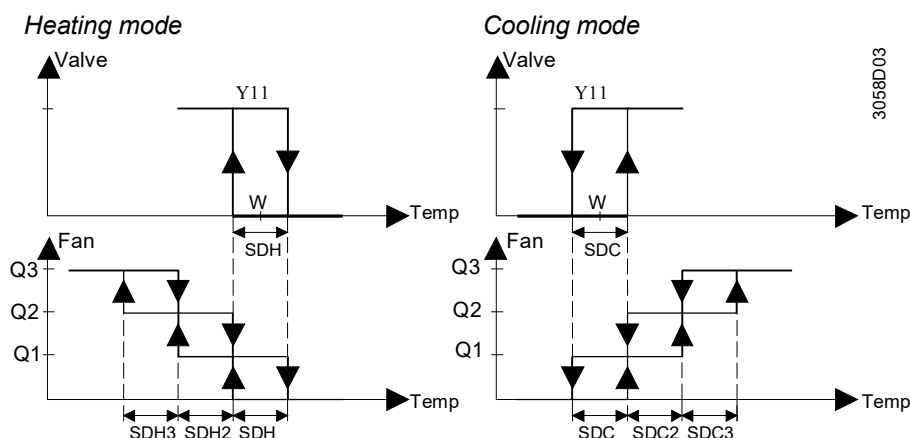
If the thermostat is set to "Cooling only" or "Heating only" via P22, the manual changeover function on the button is not available (the factory setting of parameter P22 is "manual changeover"). Instead, "NOP" flashes on the display, indicating continuous cooling or heating is set respectively.

Minimum output on/off time Y11 and Y12

The minimum output on/off time of Y11 and Y12 is fixed at 1 minute. It means that any readjustment of the setpoint or of Heating/Cooling Mode changeover lasts for 1 minute before Y11 and Y12 react.

The fan operates either in automatic mode or at the selected speed when using manual mode. In automatic mode, the fan speed depends on the setpoint and the current room temperature. When the room temperature reaches the setpoint, the control valve is closed and the fan either remains in fan speed 1 or switches off (parameter P21, factory setting: fan speed 1 in dead zone).

In "Temperature-dependent" fan control the fan switches off (please see diagram below). The individual switching differentials of the fan speed 1 (Q1 only) can be adjusted via control parameters P08 – P09. The individual switching differentials of the fan speed 2 and 3 (Q2 and Q3) are fixed at 1K.



3056D03

Ventilation always on

If desired, fan control can be set to "Temperature-independent", which means that ventilation is always on, even within the dead zone, using at least fan speed 1. This can be selected individually for Comfort mode via parameter P21; also refer to "Avoiding damage due to moisture" on page 3).

Dwelling time

In automatic mode, a dwelling time of 2 minutes (factory setting) is active. The fan maintains that speed for at least 2 minutes before it switches to the next speed. This dwelling time can be adjusted from 1...5 minutes via parameter P14.

Fan start

Whenever the fan starts from standstill, it starts with speed 3 for 1 second in order to guarantee a safe fan motor starts (to overcome inertia and friction).

Error handling

Temperature out of range


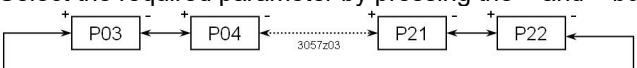
When the room temperature is out of the measuring range, which means above 49 °C or below 0 °C, the display shows the limiting temperature in flashing figures, e.g. "0 °C" or "49 °C".

If the current setpoint is not OFF (see parameter P03) and the thermostat is in heating mode, when the temperature is below 0 °C, output Y11 is energized. In all other cases, output Y11 is de-energized until the temperature returns to the measuring range, and then the thermostat resumes Comfort mode.

Control parameters



To optimize the control performance, you can use local HMI to adjust a number of control parameters. Proceed as follows to change the control parameter.

Parameter settings

1. Set the thermostat to Protection mode .
2. Press and hold the + and – buttons simultaneously for 3 seconds. Release them and, within 2 seconds, press and hold the + button again for 3 seconds. Then, **P03** displays.
3. Select the required parameter by pressing the + and – buttons:

4. Press the + and – buttons simultaneously. The current value of the selected parameter displays on the screen. Press the + or – button to change the value.
5. You can either press the + and – buttons simultaneously to confirm the change or wait for 5 seconds to have the change saved automatically.
6. Repeat steps 3 through 5 to change more parameters.
7. 10 seconds after the last display or setting, all changes are saved and the thermostat returns to Protection mode.



Parameter reset

Reload the factory setting of the control parameters as follows:

1. Set the thermostat to Protection mode .
2. Press the + and – buttons simultaneously for 3 seconds. Release them and, within 2 seconds, press the  button twice.






Then **888** displays during the reloading process.

Control parameters

Parameter	Meaning	Setting range	Factory setting
P03	Setpoint of heating in Protection Mode  (Wheat _{Stb})	OFF, 5 °C...Wcool _{Stb}	8 °C
P04	Setpoint of cooling in Protection Mode  (Wcool _{Stb})	OFF, Wheat _{Stb} ...40 °C	OFF
P05	Minimum setpoint limitation in Comfort Mode (Wmin _{Norm})	5 °C...Wmax _{Norm}	5 °C
P06	Maximum setpoint limitation in Comfort Mode (Wmax _{Normf})	Wmin _{Norm} ...40 °C	35 °C
P07	Sensor calibration	-3...3 K	0 K
P08	Switching differential heating mode SDH	0.5...4 K	1 K
P09	Switching differential cooling mode SDC	0.5...4 K	1 K
P14	Dwelling time of auto fan speeds	1...5 min	2 min
P17	Selection of °C or °F	°C or °F	°C
P18	Display of temperature or setpoint	OFF: Setpoint ON: Room (or return air) temperature	ON
P21	Fan control in Comfort mode	OFF in dead zone ON in dead zone	ON
P22	Heating/cooling mode	0: Heating only 1: Cooling only 3: Manual H/C changeover	3: Manual

Equipment combinations

ON/OFF actuators

Type of unit		Product no.	Data sheet
Electromotoric ON/OFF actuator		SFA21...	4863
Electromotoric ON/OFF valve and actuator (only available in AP, UAE, SA and IN)		MVI.../MXI...	A6V11251892
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

Ordering

When ordering, please indicate the product name, product number and SSN number:
(e.g. **room thermostat, RDF310.2/MM, S55770-T187**)

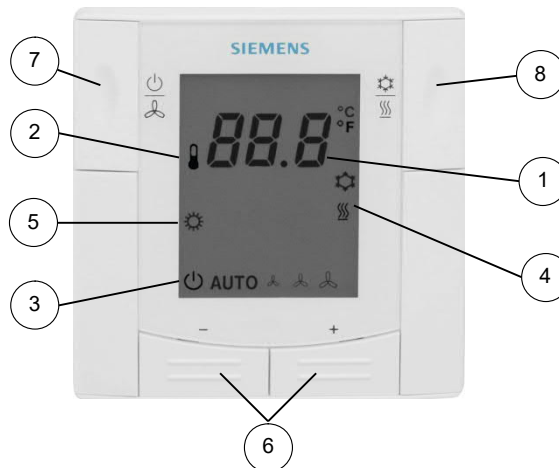
Valve actuators should be ordered separately.

The thermostat consists of two parts:

- Front panel which accommodates the electronics, the operating elements and the built-in room temperature sensor
- Mounting base with the power electronics

The mounting base carries on the rear side the screw terminals. It fits on a square conduit box with fixing centres 60.3mm. The front panel engages in the mounting base and snaps on.

Setting and operating elements

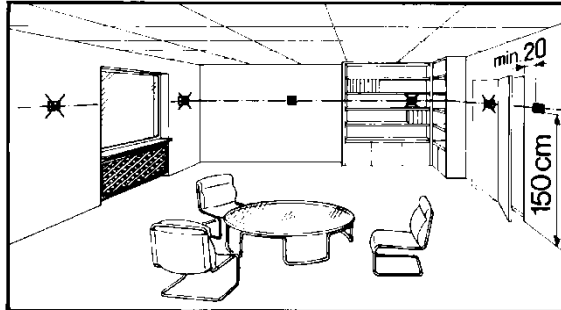


Legend

- 1 Display of the room temperature, setpoints and control parameters
- 2 Symbol used when displaying the current room temperature
- 3 Protection mode / fan mode status
 Protection mode
AUTO Auto fan active
 Fan speed low, medium, high
- 4 output is energized (auto mode) / manual cooling mode (manual mode)
 output is energized (auto mode) / manual heating mode (manual mode)
- 5 Comfort mode
- 6 Buttons for adjusting the setpoints and control parameters
- 7 Button for changing fan operation and Protection mode ()
- 8 Manual heating/cooling changeover ()

Mounting and installation

The thermostat can be mounted on a recessed square conduit box with fixing centres of 60.3 mm. The mounting location on a wall should not be in niches or bookshelves, not behind curtains, above or near heat sources and wind outlet or inlet, and not exposed to direct solar radiation. Mounting height is about 1.5 m above the floor.



Wiring



Please also refer to the Mounting Instructions M3066... enclosed with the thermostat.

- Wiring, protection and earthing must be installed in compliance with local regulations.

Warning!

No internal line protection for supply lines to external consumers (Q1, Q2, Q3, Y11, Y12)

Risk of fire and injury due to short-circuits!

- Adapt the line diameters as per local regulations to the rated value of the installed overcurrent protection device.
- The AC 230 V mains supply line must have an external circuit breaker with a rated current of no more than 10 A.
- Only valves rated for AC 230 V may be used.
- Disconnect from supply before opening the cover



Commissioning

After applying power, the thermostat makes a reset during which all LCD segments flash, indicating that the reset has been correctly made. This takes about 3 seconds. Then, the thermostat is ready for commissioning by qualified HVAC staff. The control parameters of the thermostat can be set to ensure optimum performance of the entire system (please also refer to "[Parameter settings](#)").

Heating/cooling mode

- Set the heating/cooling mode via parameter P22 depending on the application. Factory setting is "Manual heat/cool changeover". Set P22 accordingly in "Cooling only" or "Heating only" mode.

Calibrating the sensor

- When the room temperature displays on the thermostat does not match the room temperature effectively measured, you can recalibrate the temperature sensor via parameter P07.

Setpoint and range limitation

- For comfort and energy saving reasons, it is suggested to review the setpoints and setpoint ranges (parameters P03...P06), if necessary, to change them accordingly.








Disposal



The device is considered electrical and electronic equipment for disposal in terms of the applicable European Directive and may not be disposed of as domestic garbage.

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

Technical data

 Power supply	Operating voltage	AC 230 V + 10/-15%
	Frequency	50/60 Hz
	Power consumption	Max. 4 VA
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	5 mA...4(2) A
	Control output Y11-N (N.O.) / Y12-N (N.C.)	AC 230 V
	Rating	5 mA...4(2) A
Operational data	Switching differential	
	Heating mode	0.5...4 K (factory setting: 1 K)
	Cooling mode	0.5...4 K (factory setting: 1 K)
	Setpoint setting range	
	 Comfort mode	5...40 °C
	 Protection mode	OFF, 5...40 °C
	Factory setting of setpoints	
	 Comfort mode	20 °C
	 Protection (heating and cooling) mode	OFF
	Built-in room temperature sensor	
	Measuring range	0...49 °C
	Accuracy at 25 °C	<±0.5 K
	Temperature calibration range	±3.0 K
	Resolution of settings and display	
Environmental conditions	Temperature setpoints	0.5 °C
	Current temperature value displayed	0.5 °C
	Storage	to IEC 60721-3-1
	Climatic conditions	class 1K3
	Transport	to IEC 60721-3-2
	Climatic conditions	class 2K3
Norms and standards	Operation	to IEC 60721-3-3
	Climatic conditions	class 3K5 ¹⁾
	EU Conformity (CE)	CB1T3066xx ^{*)}
	 RCM conformity	AS/NZS 61000-6-3:2007
	Electronic control type	2.B (micro-disconnection on operation)
	Devices of safety class	II as per EN 60730-1
Environmental conditions	Pollution class	II as per EN 60730-1
	Degree of protection of housing	IP 30 as per EN 60529
	Housing flammability class according to UL94	V-0
	The product environmental declaration CB1E3066en ^{*)} contains data on environmentally compatible product design and assessments (RoHS compliance, materials composition, packaging, environmental benefit, disposal).	

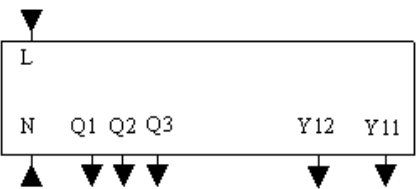
General

Connection terminals	solid wires or prepared stranded wires 1 x 0.4-1.5 mm ²
Weight	0.17 kg
Color of housing front	white, RAL 9003

*) The documents can be downloaded from <http://siemens.com/bt/download>.

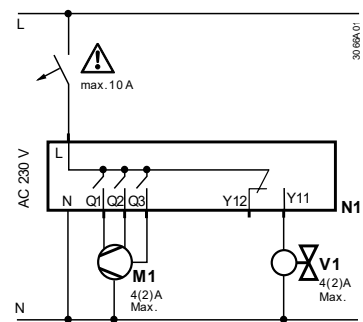
1) No condensation is allowed.

Connection terminals

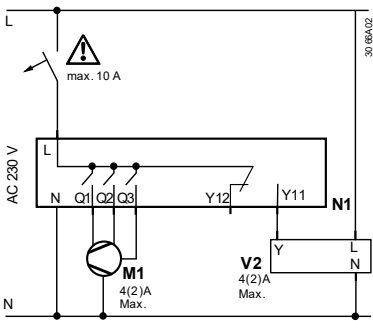


L, N	Operating voltage AC 230 V
Q1	Control output "Fan speed 1 AC 230 V
Q2	Control output "Fan speed 2 AC 230 V
Q3	Control output "Fan speed 3 AC 230 V
Y11	Control output "Valve" AC 230 V (N.O.)
Y12	Control output "Valve" AC 230 V (N.C.)

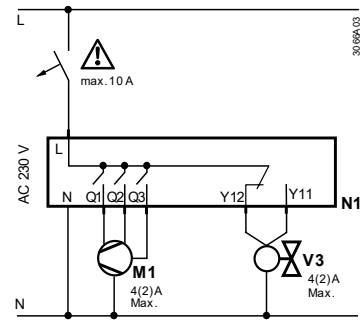
Connection diagrams



N1	RDF310.2/MM
V1	On/off valve AC 230 V
M1	3-speed fan

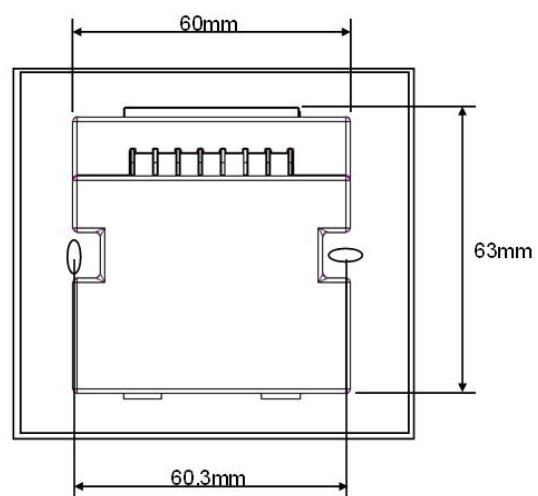
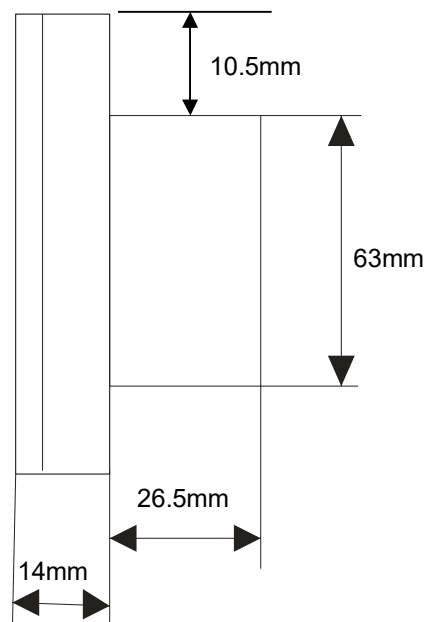
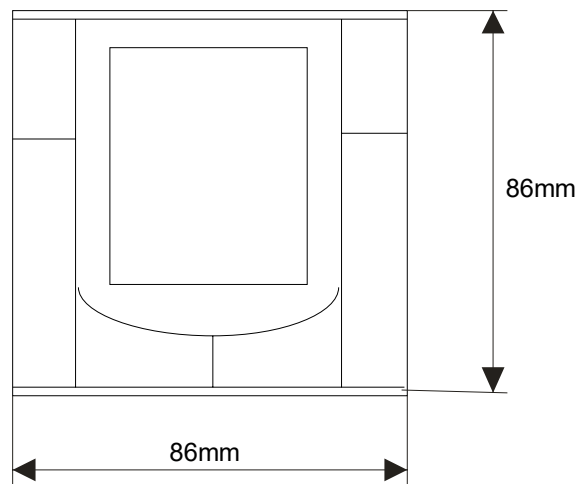


N1	RDF310.2/MM
V2	Electromotoric actuator, e.g. SUA21/1
M1	3-speed fan



N1	RDF310.2/MM
V3	3-wire on/off (SPDT) zone valve
M1	3-speed fan

Dimensions





Fan coil room thermostat

For 2-pipe and 4-pipe fan coil units

RDF510

RDF530

- LCD backlit display
- Keylock function
- Display either room temperature or setpoint
- Comfort and Protection (Off) operating modes
- Automatic or manual heating/cooling changeover
- Automatic or manual 3-speed fan control
- Fan and heating/cooling changeover symbol display (enable / disable)
- Fan and heating/cooling changeover functions (enable / disable)
- Selectable fan operation in deadzone
- Timer with delay Off function: preset or user selection from 1 to 23 hours
- Minimum and maximum setpoint limitation
- Return to previous operating mode, Protection or Comfort upon power down
- Internal sensor calibration
- Adjustable commissioning and control parameters
- Fit into 86x86 conduit boxes
- Three standard color variants are available: reference color codes are SILVER (Cool Grey 4C), GOLD (Gold 453C), BLACK (Pantone Black 7C)
- Customization is available

Use

To control the room temperature in individual rooms and zones that are:

- Heated or cooled with 2-pipe fan coil units (RDF510)
- Heated or/and cooled with 4-pipe fan coil units (RDF530)

The thermostats control:

- One 3-speed fan
- One or two on/off valve actuators

Functions

- Maintenance of room temperature via built-in temperature sensor
- Control sequence H/C selection (P01) or H/C manual changeover via button (P01=2)
- Operating mode selection via button
- Display either room temperature value or setpoint value (P06)
- Internal sensor calibration (P05)
- 3-speed fan control, automatic or manual mode selection via button
- Minimum and maximum setpoint limitation (P09&P10)
- Full or partial keylock (P14)
- Fan speed low or off in deadzone (P15)
- Display symbol and fan function of fan (P91)
- Display symbol and function of heating/cooling (P92)
- Reload factory settings for commissioning and control parameters (P71)
- On/Off output for 2-position valve or 3-wire (SPDT) valve actuator

Note: 3-wire valve is for RDF510 only

Advanced functions

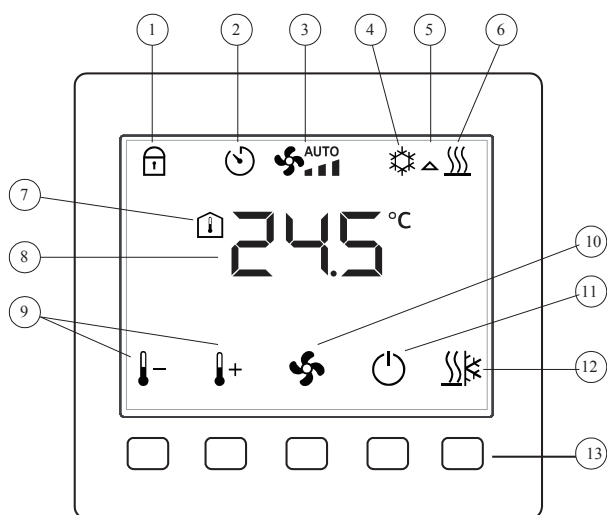
- Timer with delay Off (P28)
- Fan minimum On-time (P59)
- Operating mode settings upon power down (P27)

Mechanical design

The thermostat consists of two parts:

- One LCD display and five key buttons on the user interface.
- One mounting plate for fitting onto a square conduit box with 60.3 mm fixed meters.

Operating and setting elements



- | | |
|--------------------------------|---|
| 1. Keylock activated | 8. Temperature value |
| 2. Timer with delay Off mode | 9. Temperature setpoint adjustment |
| 3. Auto fan, fan speed 1, 2, 3 | 10. Fan mode selection |
| 4. Cooling mode selected | 11. Operating mode selection: On, Off, timer with delay Off |
| 5. Valve output energized | 12. Manual heating/cooling changeover |
| 6. Heating mode selected | 13. 5 key buttons to adjust setpoints (access control parameters), fan modes, operating modes, heating/cooling changeover |
| 7. Room temperature | |

Type summary

Ordering






Type	Stock number	Designation
RDF510	S55770-T382	Room thermostat (White) in single pack of 1 unit
RDF510/BP	S55770-T383	Room thermostat (White) in bulk pack of 20 units
RDF510/BP.VS	S55770-T403	Room thermostat (Silver) in bulk pack of 20 units
RDF510/BP.VB	S55770-T404	Room thermostat (Black) in bulk pack of 20 units
RDF510/BP.VG	S55770-T405	Room thermostat (Gold) in bulk pack of 20 units
RDF530	S55770-T384	Room thermostat (White) in single pack of 1 unit
RDF530/BP	S55770-T385	Room thermostat (White) in bulk pack of 20 units
RDF530/BP.VS	S55770-T423	Room thermostat (Silver) in bulk pack of 20 units
RDF530/BP.VB	S55770-T417	Room thermostat (Black) in bulk pack of 20 units
RDF530/BP.VG	S55770-T424	Room thermostat (Gold) in bulk pack of 20 units

Delivery

Order valve actuators separately.

Equipment combinations

On/Off actuators

Type of units		Product number	Data sheet*)
Electromotive ON/OFF valve and actuator (only available in AP, UAE, SA and IN)		MVI.../MXI...	A6V11251892
Electromotive ON/OFF actuator		SFA21...	N4863
Thermal actuator (for radiator valve) AC 230 V, NO		STA23...	N4884
Thermal actuator AC 230 V (for small valves 2.5 mm), NC		STP23...	N4884
Zone valve actuators (only available in AP, UAE, SA and IN)		SUA...	N4832

*) All documents can be downloaded from <https://www.downloads.siemens.com/download-center/>.



Product documentation

Title	Document ID
Mounting and operating instructions	A6V10889954
CE declarations	A6V101090515
Environmental declarations	A5W00085405A

All the documents can be downloaded from <https://www.downloads.siemens.com/download-center/>.

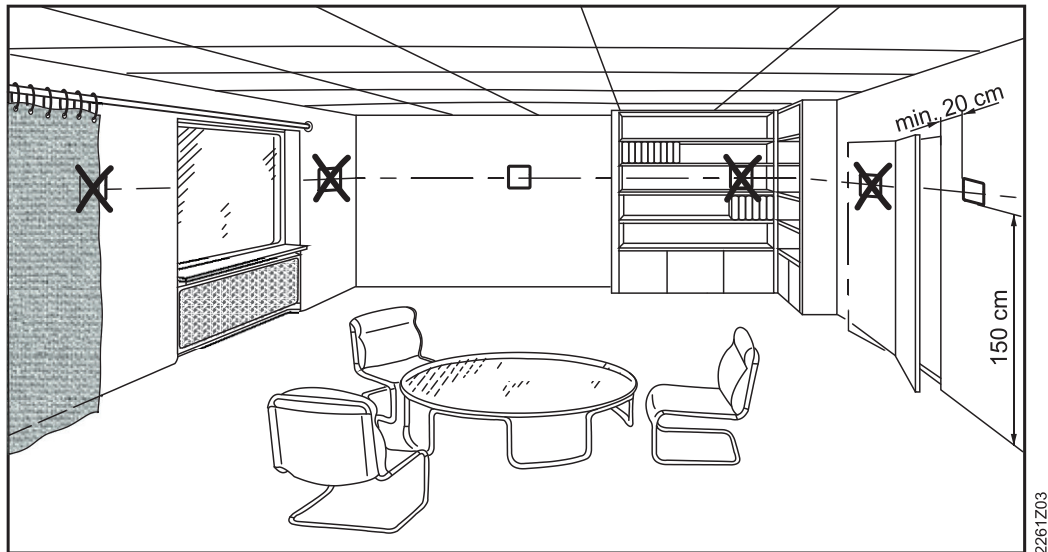
Notes

Security

 CAUTION	
	<p>National safety regulations</p> <p>Failure to comply with national safety regulations may result in personal injury and property damage</p> <ul style="list-style-type: none"> Observe any national provisions and comply with the appropriate safety regulations.

Mounting

Do not wall-mount in niches or bookshelves, behind curtains, above or near heat sources, wind outlets or inlets, and do not expose to direct solar radiation. Mount about 1.5 m above the floor.



A mounting plate is provided for fitting onto a square conduit box with 60.3 mm fixed centers. A conduit box of at least 35-40 mm in depth to accommodate all wire connections is recommended.

After installing the mounting plate, wire all terminals of the thermostat. Secure the unit to the mounting plate as described in the installation and operating instructions (Document ID: A6V10889954) enclosed with the thermostat.

WARNING



Wire, protect and earth in compliance with local regulations. Current loading is limited by a standard slow-blow 6.3 A fuse (replaceable).

Risk of fire and injury due to short-circuits!

- Adapt the line diameters as per local regulations to the rated value of the installed overcurrent protection device.
- The AC 230 V mains supply line must have an external circuit breaker with a rated current of no more than 10 A.
- The maximum current loading (including fan and valves) is 5 A.
- Use only valve actuators rated for AC 230 V.
- Disconnect from supply before removing the unit from its mounting plate.
- Do not connect more than one fan coil unit to the Qs output of the thermostat.
- Do not connect terminal Y12 to either L or N.
- Do not use terminal Y12 as AC 230 V power supply.

Commissioning After powering up, the thermostat resets and all LCD segments light up for about 3 seconds. Afterwards, the room temperature is displayed (factory setting) and the unit is ready for commissioning by qualified HVAC staff.

The thermostat's control parameters can be adjusted to ensure optimum performance of the entire system (see "Parameter settings").

Surge protection at power-up

When the thermostats are powered up, LCD display and key buttons work normally except all valve and fan outputs, e.g., Q1, Q2, Q3, Y1, Y2, Y12, Y14.

The outputs of thermostats start up at random to protect the mains from overload. It may take up to two minutes *) before all outputs of thermostats work properly.

Note:

*) If the room thermostat uses the mains supply from a hotel Room Control Unit (RCU), less startup time (e.g. < 3 seconds) is more suitable for this type of hotel applications. Please add a special note to request for RDF510/RDF530 products with firmware revision D or above.

Sensor calibration

The thermostat has an internal sensor for accurate temperature display. If the temperature display is influenced by its installation location, calibrate the sensor via parameter P05 to adjust the readings.

Setpoint and range limitation

For comfort and energy saving reasons, we suggest to review the setpoints and setpoint ranges (parameters P09, P10, P65 and P66) and change them as needed.

Manual heating/cooling changeover

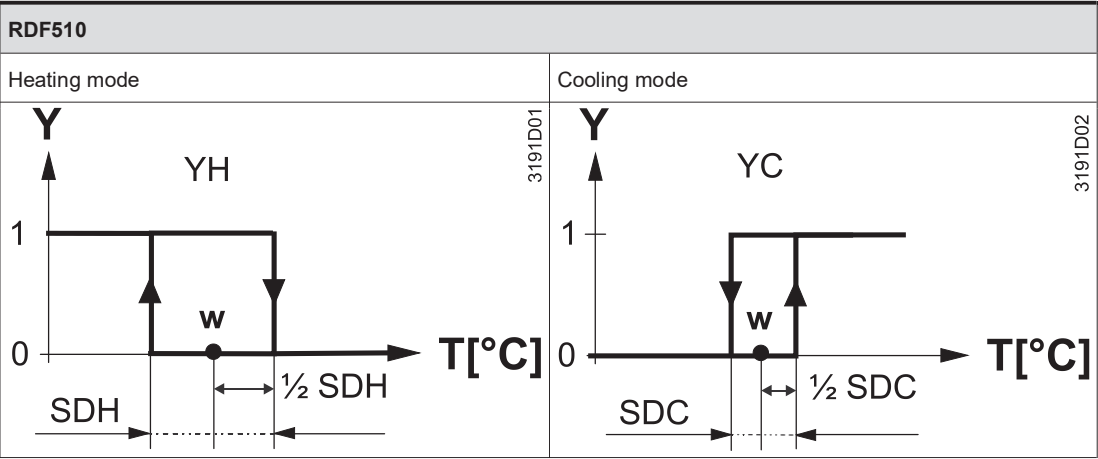
If the thermostat is enabled for "H/C changeover manual" via parameter P01=2 (factory setting for RDF510), press the "H/C changeover" button to display the currently selected control sequence on the LCD. Press again to change the control sequence. The newly selected control sequence is displayed and executed after the thermostat returns to On mode.

If the thermostat is set to "Cooling only" or "Heating only" via parameter P01, the manual changeover function is not available. Press the "H/C Changeover" button to display only the current control sequence on the LCD.

Control sequences

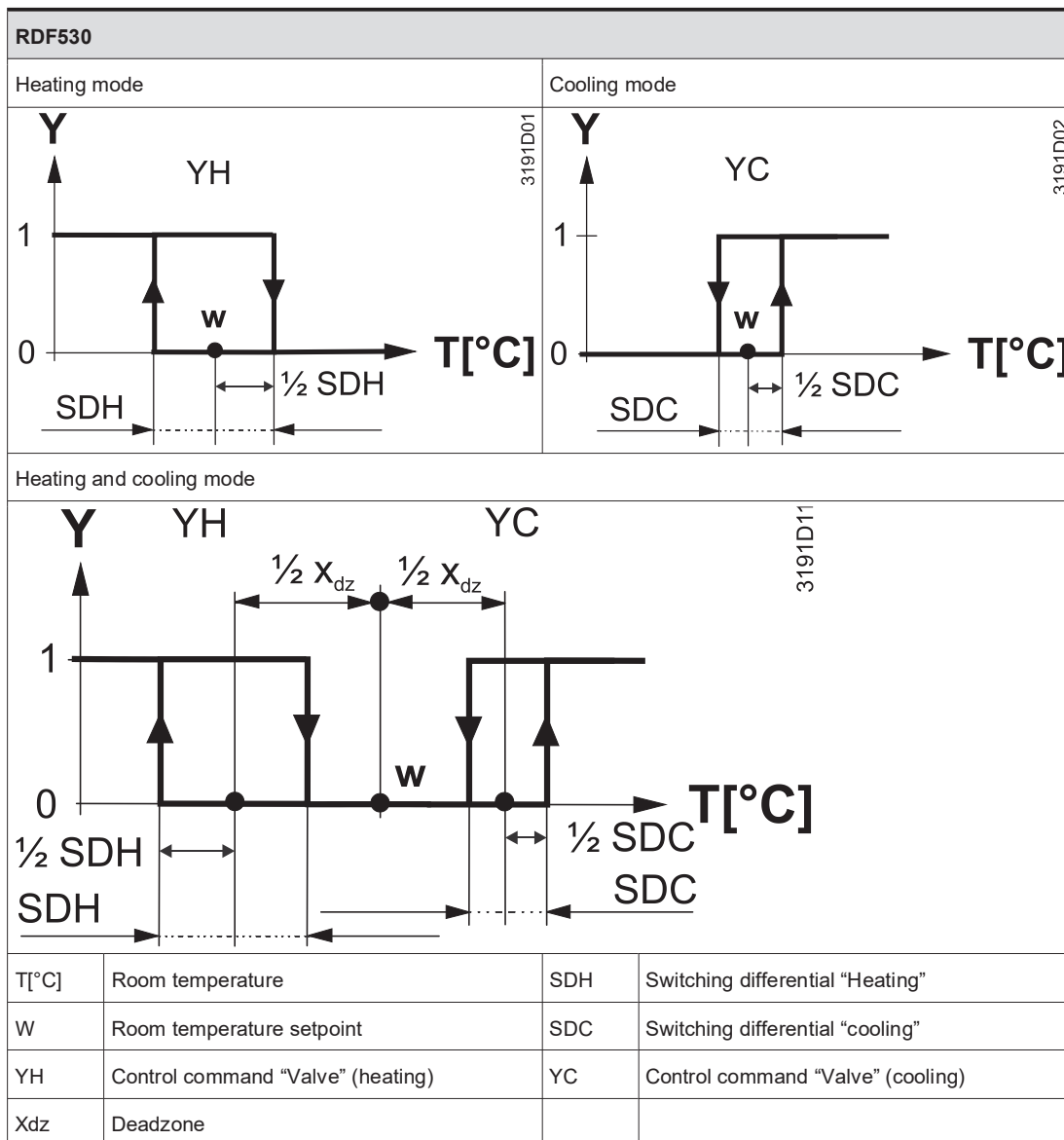
On/Off control

On 2-pipe applications, the thermostat controls an On/Off valve in heating/cooling mode with manual changeover (P01 = 2, factory set).



RDF510			
T[°C]	Room temperature	SDH	Switching differential "Heating"
W	Room temperature setpoint	SDC	Switching differential "Cooling"
YH	Control command "Valve" (heating)	YC	Control command "Valve" (cooling)

On 4-pipe applications, the thermostat controls two On/Off valves in heating and cooling mode (P01=4, factory set), or heating/cooling mode (P01=2) by manual changeover.



On/Off control signal

The valve receives the On command via control output Y14 (Y1 and Y2 on RDF530) when:

1. The acquired room temperature is below the setpoint (for heating mode) or above the setpoint (for cooling mode), and
2. The control output was not energized for more than the "Minimum output off time" (factory setting 1 minute)

The valve receives the Off command when:

1. The acquired room temperature is above the setpoint (for heating mode) or below the setpoint (for cooling mode), and

- The control output was energized for more than the “Minimum output on time”; (factory setting 1 minute)

Note:

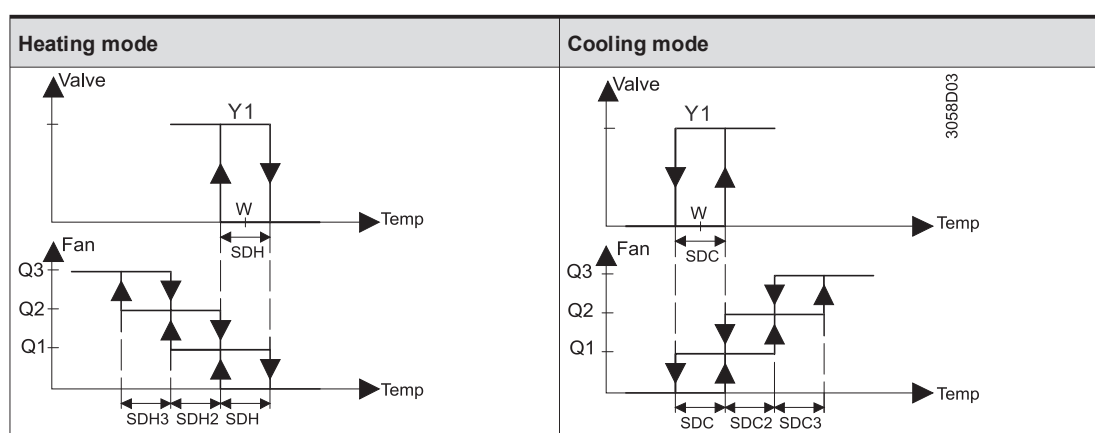
- Control output Y12 delivers a control command which is inverted to the control command at output Y14 that can be used for normally open valves.
- Valve output can respond immediately and does not consider minimum On/Off time if users manually adjust the setpoint via local HMI.

Fan operation

The fan operates either in automatic mode or at the selected speed in manual mode.

In automatic mode, the fan speed depends on the setpoint and the current room temperature. When the room temperature reaches the setpoint, the control valve is closed and the fan either remains in fan speed 1 (P15=1) or switches off (P15=0).

In “Temperature-dependent” fan control, the fan switches off (see diagram below). The individual switching differentials of the fan speed 1, 2, 3 (Q1, Q2 and Q3) can be adjusted via control parameters P30 and P31.



Ventilation always on

If desired, fan control can be set to “Temperature-independent”, which means that ventilation is always on, even within the dead zone, using at least fan speed 1(P15 = 1, factory set).

See “Avoiding damage due to moisture” for more information.

Fan minimum On-time

In automatic mode, a dwelling time of 2 minutes (factory setting) is active. The fan maintains that speed for at least 2 minutes before it switches to the next speed. This dwelling time can be adjusted from 1...6 minutes via parameter P59.

Fan On-time is set to minimum 2 minutes before the fan is turned off. This prevents the fan from being frequently switched between the On and Off states. The maximum duration is 6 minutes.

Fan start

When the fan starts from standstill, it starts at speed 3 for 1 second to guarantee safe fan motor start (to overcome inertia and friction).

Error handling

Temperature out of range

Factory setting of the heating/cooling setpoint in Protection mode is Off, i.e. overheating/frost protection is disabled.

In this case, when the room temperature is out of range, i.e. above 49 °C or below 0 °C, the temperature displays and flashes at “0 °C” or “49 °C”, and the thermostat continues to work.

Sensor error

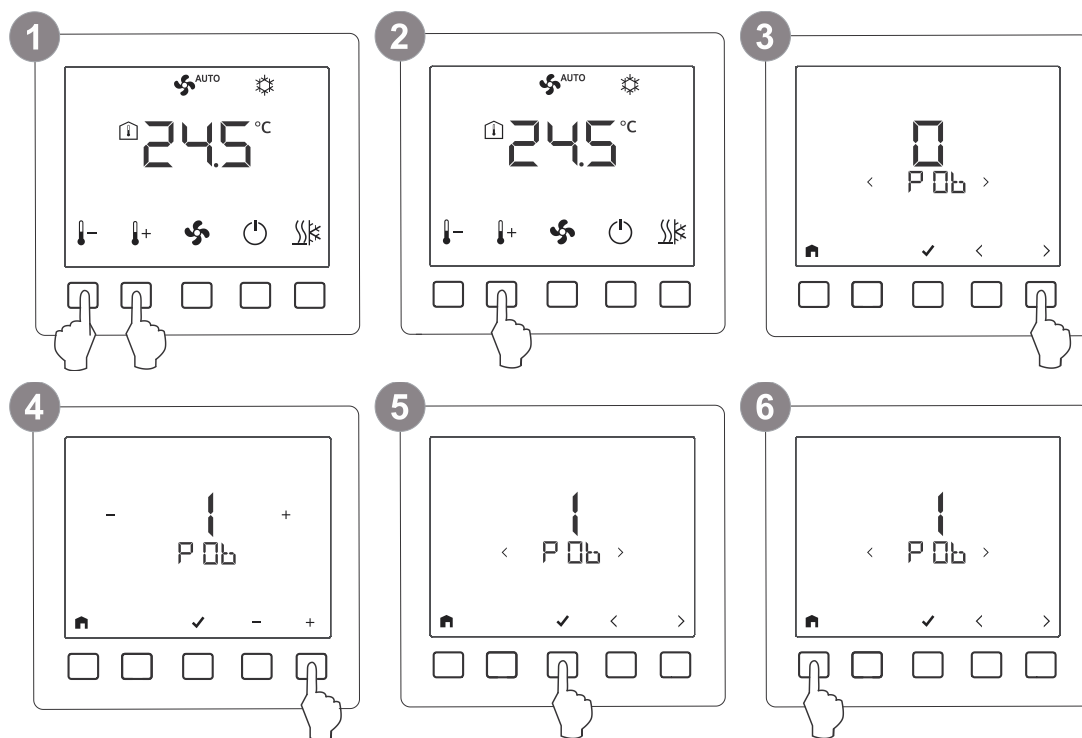
When the internal sensor is not working properly, “Er1” is displayed.

Control parameters

Parameter settings

To optimize control performance, use the local HMI to adjust a number of control parameters. All control parameter settings are retained after power down.

Proceed as follows to change the control parameters:



- 1 Press and hold down the + and - buttons simultaneously for more than 3 seconds.
- 2 Release the buttons, and within 2 seconds, press and hold down the + button for 3 seconds.
P01 is displayed.
- 3 Press < or > to access the desired parameter and press the ✓ button.
The current value of the selected parameter is displayed.
- 4 Press the + or - button to change the value.
- 5 Press the ✓ button to confirm the change, and repeat steps 3 to 5 to change more parameters.
- 6 Press 🏠 to exit the parameter setting mode.

Reload factory setting

- Select parameter P71 and set it to On.
- The factory settings of the control parameters are reloaded.
 - “- - -” is displayed on the screen while reloading.

Control parameters

Parameter	Description	Factory setting	Setting range
P01	Control sequence	RDF510 = 2 RDF530 = 4	0:= Heating only 1:= Cooling only 2:= H/C changeover manual 4:= Heating and cooling (RDF530) Note: RDF510: 0, 1, 2 RDF530: 2, 4
P05	Sensor calibration	0 K	-5...+5 K
P06	Standard temperature display	0	0:= Room temperature 1:= Setpoint
P09	Minimum setpoint in Comfort mode	5 °C	5...40 °C
P10	Maximum setpoint in Comfort mode	35 °C	5...40 °C
P14	Keylock function	0	0:= No lock 1:= Full lock 2:= Partial lock
P15	Fan control deadzone in Comfort mode	1	0:= Fan off 1:= Fan speed 1 in heating or cooling mode
P27	Operating mode settings upon power down	0	0:= Return to previous operating mode or user settings 1:= Protection mode 2:= Comfort mode
P28	Timer with delay Off	0	0:= Users to set on-time duration 1 to 23:= Preset with a fixed on-time in hours
P30	Switching differential in heating mode	1 K	0.5 ... 6 K
P31	Switching differential in cooling mode	1 K	0.5 ... 6 K
P33	Deadzone in Comfort mode	2 K	0.5 ... 5 K (RDF530)
P59	Fan minimum On-time (dwelling time)	2 minutes	1...6 minutes
P65	Protection heating setpoint	8 °C	OFF, 5 °C... $W_{cool_{pro}}$; $W_{cool_{pro}}=40^{\circ}\text{C}$ max.
P66	Protection cooling setpoint	OFF	OFF, $W_{heat_{pro}}...40^{\circ}\text{C}$; $W_{heat_{pro}}=5^{\circ}\text{C}$ min.
P71	Reload factory setting	OFF	OFF:= Disable ON:= Reload start "---" is displayed for 3 seconds while reloading
P91 ¹⁾	Fan symbol display and function controls - associated key button function is disabled	RDF510 = 1 RDF530 = 1	0: disable display 1: enable display
P92 ¹⁾	H/C changeover symbol display and function controls - associated key button function is disabled	RDF510 = 1 RDF530 = 1	0: disable display 1: enable display

Notes:

¹⁾ For RDF510/RDF530:

- If P91 = 0 is selected, P15, P59 will not be accessible by users;
- If P92 = 0 is selected,
 - RDF510: P01 = 0 or 1, while the factory setting of P01 is 1 instead.
 - RDF530: P01 = 4 only

Operation

Temperature control

The thermostat acquires the room temperature via its built-in sensor and maintains the setpoint by delivering 2-position valve control commands.

The switching differential is 1 K in heating mode and 1 K in cooling mode (adjustable via parameters P30 and P31).

Display

The display shows the current room temperature or the setpoint of the current operating mode (adjustable via parameter P06). Factory setting is to display the current room temperature.

The heating symbol  or the cooling symbol  indicates the selected control sequence. The triangle symbol indicates the relay output connected to the fan coil unit is energized.

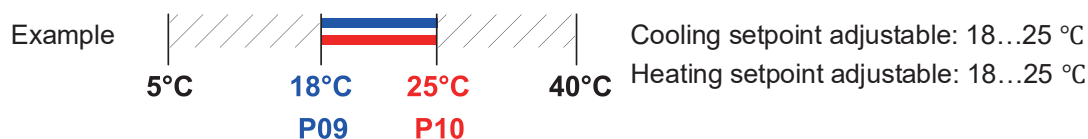
Setpoint adjustment and limitations

The factory setting for the Comfort basic setpoint is 21 °C. The Comfort setpoint can be adjusted via the +/- buttons. For comfort or energy saving purposes, the setpoint setting range is limited to minimum (P09) and maximum (P10).

P09 < P10 (comfort concept)

If the minimum setpoint (P09) is set lower than the maximum setpoint (P10), both heating and cooling setpoints are adjustable between these two limits. The customer sets the desired setpoint and the thermostat controls the room temperature accordingly.

For 4-pipe applications, the selected Comfort setpoint is in the middle of the deadzone (P33). The unit stops to energize the heating/cooling outputs as soon as the room temperature reaches the deadzone.



P09 ≥ P10 (energy saving concept)

If the minimum limit P09 is set higher than maximum limit P10, then:

- The setting range of cooling setpoint is P09...40 °C in place of 5...40 °C.
- The setting range of heating setpoint is 5 °C...P10 in place of 5...40 °C.

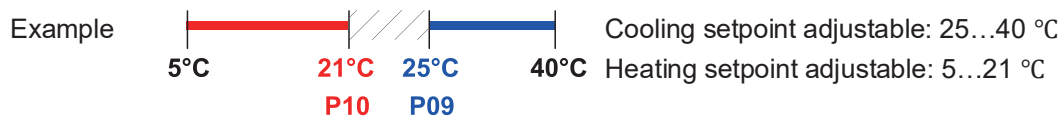
As a result, the maximum heating setpoint and the minimum cooling setpoint can be limited, thus saving energy and lowering costs.

For 4-pipe applications:

The thermostat runs with the setpoint of the active sequence:

- In heating mode, the heating setpoint is active and adjustable via buttons.
- In cooling mode, the cooling setpoint is active and adjustable via buttons.

Switching from heating to cooling setpoint and vice-versa occurs when the room temperature reaches the adjusted limitation (P09 or P10) of the inactive sequence. e.g. the thermostat is in heating sequence and runs on the heating setpoint. When the room temperature reaches P09, the thermostat switches to cooling mode and runs on the cooling setpoint, provided the room temperature does not drop below P10.



Keylock

Keylock can be activated or deactivated via parameter P14 when the thermostat is in Comfort and Protection mode.

Either full lock (P14=1) or partial lock (P14=2) can be selected. All buttons are disabled if full lock is set. On partial lock, only setpoints can be adjusted.

Operating modes

The following operating modes are available:

Comfort mode

In Comfort mode, the thermostat maintains the setpoint, which can be adjusted via the + and - buttons. The fan can be set to automatic or manual fan speed: Low, medium or high.



To save energy, the setpoint setting range has a minimum (P09) and maximum limitation (P10).

Protection mode

When the thermostat is in Protection mode, the related setpoints of heating or cooling setpoints are maintained. They can be adjusted via control parameters P65 and P66. The factory setting for P66 is OFF, indicating the thermostat is not active in Protection (cooling) mode.

Timer with delay Off mode

In timer with delay Off mode, the timer starts counting down according to the hour selected (via parameter P28) after the thermostat is turned ON. When the timer expires, the thermostat automatically turns OFF.

1. Activation of timer with delay Off mode

Timer with delay Off mode can be activated in two ways:

a) Parameter P28 = 0 (factory setting)

When P28 = 0, the delay timer is not active when the thermostat is powered up.

To activate the delay timer mode, please press and hold the button for more than 3 seconds.

b) Parameter P28 ≠ 0

When P28 ≠ 0, the delay timer is active in normal mode whenever the thermostat is turned on.

2. Setting of timer with delay Off mode

Refer to the Parameter settings.

3. Cancellation of timer with delay Off mode

Cancel by setting the timer to 0 hour.



Operating mode setting upon power down

If the thermostat is disconnected from AC 230 V power supply and then reconnected, the thermostat returns to the previous operating mode or user settings if P27=0, remains in Protection (Off) mode if P27=1, or remains in Comfort mode if P27=2.

Avoiding damage due to moisture

To avoid damage due to moisture in very warm and humid climates resulting from lack of air circulation in Comfort mode, the fan can be kept running at all times (e.g. in apartments or shops during unoccupied periods) when setting parameter P15 "ON in deadzone". In this case, the fan continues to run at minimum fan speed 1 in the neutral zone.

Disposal

 	<p>The device is considered an electronic device for disposal in accordance with European Directive and may not be disposed of as domestic waste.</p> <ul style="list-style-type: none">• Use only designated channels for disposing the devices.• Comply with all local and currently applicable laws and regulations.
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Warranty

Technical data on specific applications are valid only together with Siemens products listed under "Equipment combinations". Siemens rejects any and all warranties in the event that third-party products are used.

Technical data

Power supply	
Operating voltage	AC 230 V (+10%, -15%)
Frequency	50/60 Hz
Power consumption	Max. 12 VA

Internal fuse (replaceable)	
Fuse type	SLOW-BLOW
Size	dia. 5.2x20 mm
Voltage rating	250 V
Current rating	6.3 A

Outputs	
Valve output (RDF510) Y12 (N.C.)/Y14 (N.O.) Rating	AC 230 V 5 mA...4(2) A
Valve output (RDF530) Y1 (N.O.) /Y2 (N.O.) Rating	AC 230 V 5 mA...4(2) A
Fan output (3-speed fan) Q1, Q2, Q3 Rating	AC 230 V 5 mA...4(2) A

Operational data	
Switching differential - Heating mode - Cooling mode	0.5...6 K (factory setting: 1 K) 0.5...6 K (factory setting: 1 K)
Setpoint setting range (see note below) - Comfort mode - Protection mode	5...40 °C OFF, 5...40 °C
Built-in room temperature sensor - Measuring range - Accuracy at 25 °C - Temperature calibration range	0...50 °C < ±0.5 K - 5.0...+5.0 K
Resolution of settings and display - Temperature setpoints - Current temperature value displayed	0.5 °C 0.5 °C

Note: The standard range is 5...40 °C. Customization is available upon request (e.g. 0...50 °C).

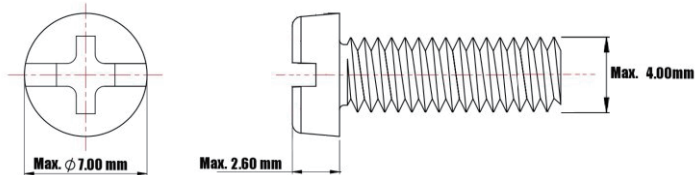
Ambient conditions and protection classification	
Safety class	II as per EN 60730-1
Pollution class	II as per EN 60730-1
Degree of protection of housing	IP30 as per EN 60529
Climatic ambient conditions - Storage as per EN 60721-3-1 - Transport as per EN 60721-3-2 - Operation as per EN 60721-3-3	- Class 1K3 - Class 2K3 - Class 3K5 ¹⁾

1) No condensation is allowed.

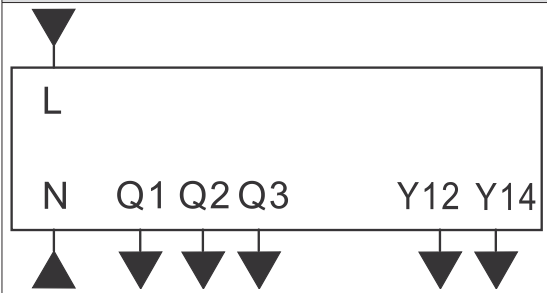
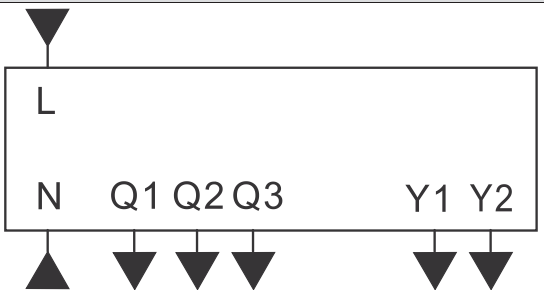
Standards, directives and approvals	
EU conformity (CE)	A6V101090515
Environmental compatibility	The product environmental declaration (A5W00085405A) contains data on environmentally compatible product design and assessments (RoHS compliance, materials composition, packaging, environmental benefit, disposal).

All documentations can be downloaded from
<https://www.downloads.siemens.com/download-center/>.

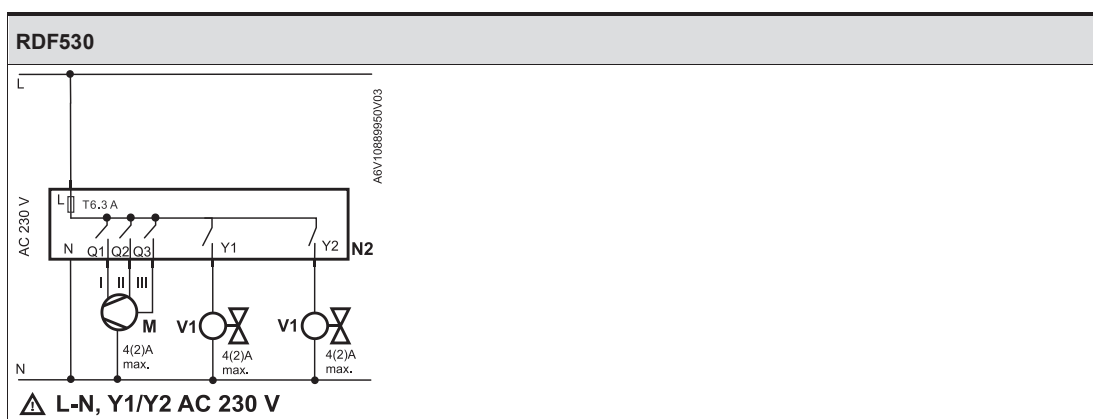
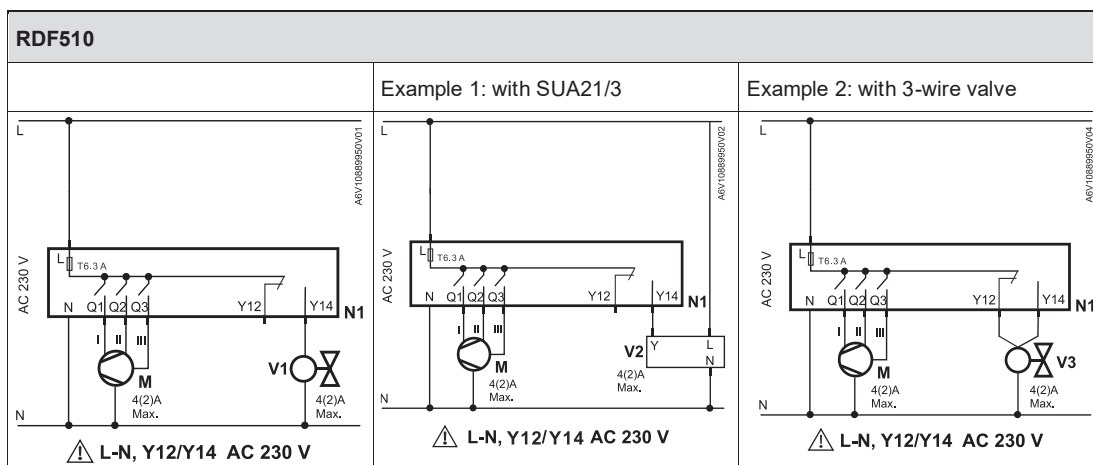
General	
Connection terminals	Solid wires or prepared stranded wires: 1x0.4-1.5 mm ²
Weight	Mounting frame: 20 g RDF510 unit with mounting frame: 160 g RDF530 unit with mounting frame: 165 g
Color of front housing	White, RAL 9003 Silver, Cool Grey 4C Gold, Gold 453C Black, Pantone black 7C

Mounting screws	
	

Connection
terminals

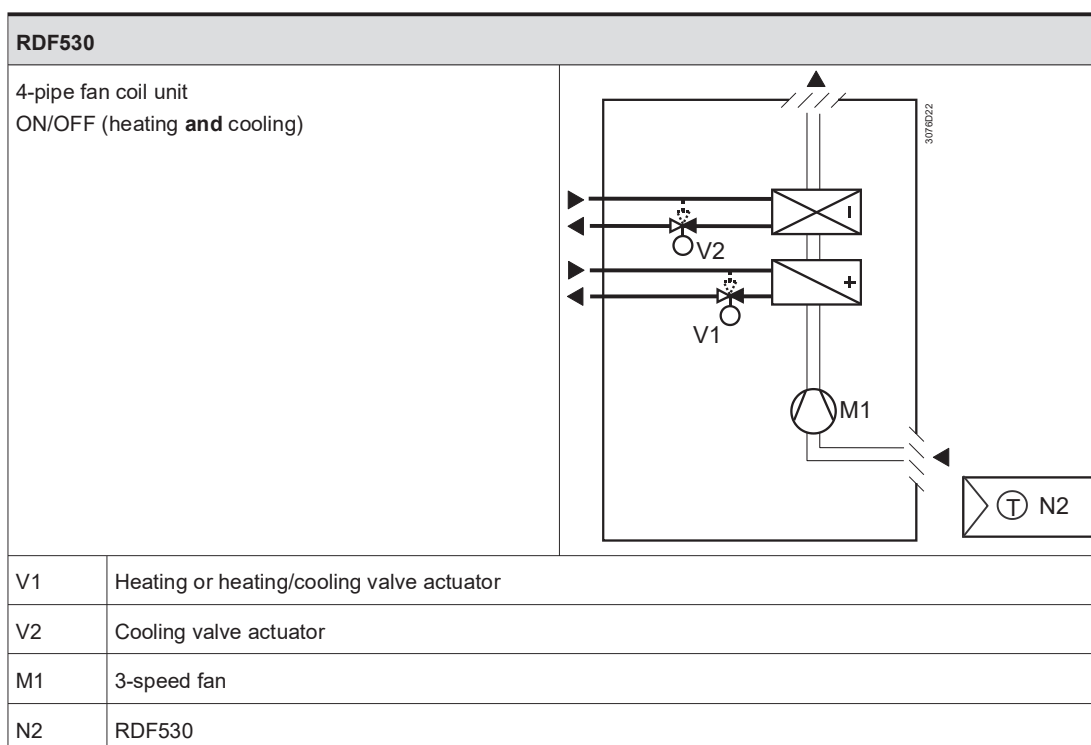
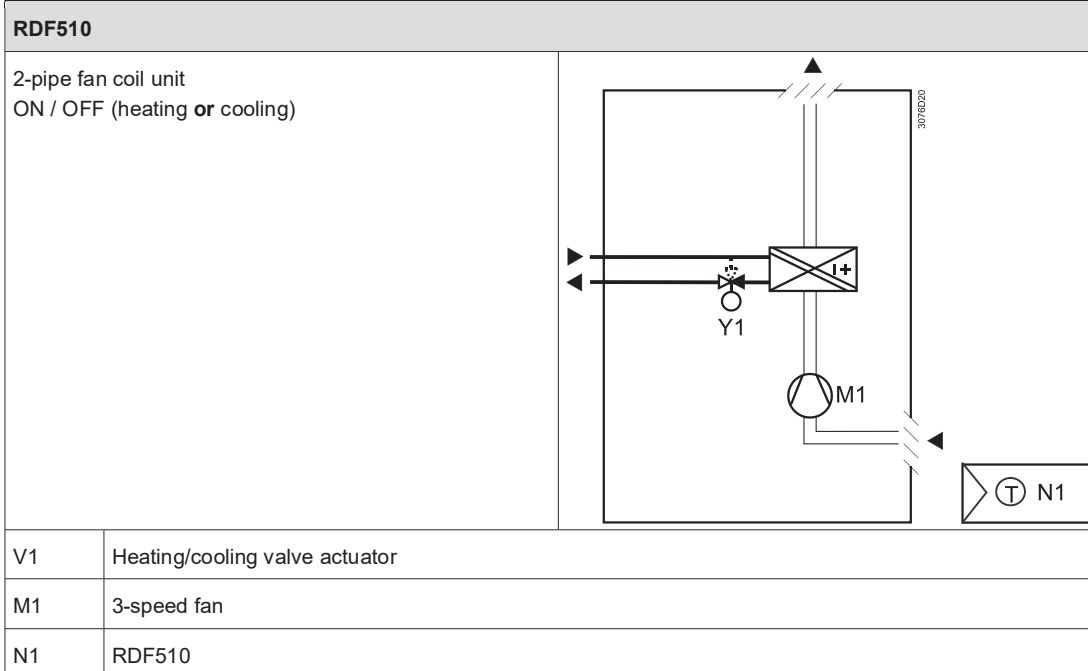
RDF510		RDF530	
			
L, N	AC 230 V power supply, mains and neutral		
Q1	Output, fan speed 1, AC 230 V		
Q2	Output, fan speed 2, AC 230 V		
Q3	Output, fan speed 3, AC 230 V		
Y12	Output "Valve", AC 230 V (NC)		
Y14	Output "Valve", AC 230 V (NO)		
Y1	Output "Valve", AC 230 V (NO)		
Y2	Output "Valve" AC 230 V (NO)		

Connection diagrams



N1	RDF510
N2	RDF530
L, N	AC 230 V power supply, mains and neutral
Q1, Q2, Q3	SPST relay outputs for fan speed, low(Q1), medium(Q2), high(Q3)
M	3-speed fan motor
V1	On/Off valve
V2	On/Off valve: Siemens SUA21/3
V3	ON/Off valve: third party 3-wire valve
Y1, Y2	SPST relay output, normally open
Y12	SPDT relay output, normally closed
Y14	SPDT relay output, normally open
T 6.3 A	Internal fuse (6.3 A), replaceable

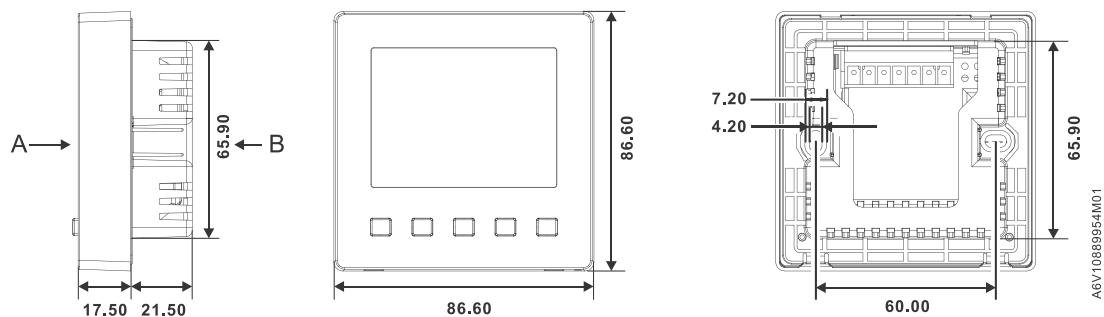
Application examples



Dimensions

Dimensions in mm

View A View B



Above are the dimensions for the thermostat and its mounting plate.



Flush-mounted room thermostat

RDU340

- for CAV / VAV heating and cooling systems
- for AHU systems
- for universal heating and cooling systems

-
- **Modulating PI control**
 - **Control depending on the room or the return air temperature**
 - **Output for a DC 0...10 V actuator and AC 230 V electric heater (ON/OFF)**
 - **Automatic or manual heating/cooling changeover**
 - **Operating modes: Comfort, Economy and Protection**
 - **Two multifunctional inputs for keycard contact, external sensor, etc.**
 - **Adjustable commissioning and control parameters**
 - **Minimum and maximum setpoint limitation**
 - **Adjustable minimum and maximum limitation for air flow signal DC 0...10 V**
 - **Output signal inversion as an option (DC 0...10 V → DC 10...0 V)**
 - **Mounting on recessed square conduit box, 60.3 mm fixing centers**
 - **AC 24 V operating voltage**
 - **User and parameter settings can be retained or restored with power loss**

Use

Control of the room temperature in individual rooms of ventilation or air conditioning plants that are:

- Heated or cooled by single duct.
- Heated or cooled by single duct with electric heater.

The RDU340 is suitable for use with VAV systems in connection with the VAV compact controllers types G...B181.1E/3.

The RDU340 can also be used as an AHU temperature controller in connection with valve actuators, as well as for universal heating and cooling applications with DC 0...10 V actuators.

The RDU340 controls

- One DC 0...10 V actuator
- One DC 0...10 V actuator and AC 230V 1-stage electric heater

Use in systems with:



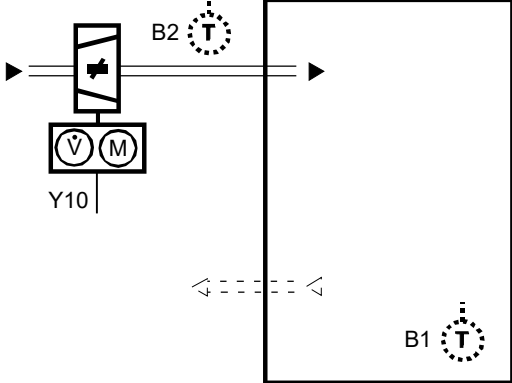


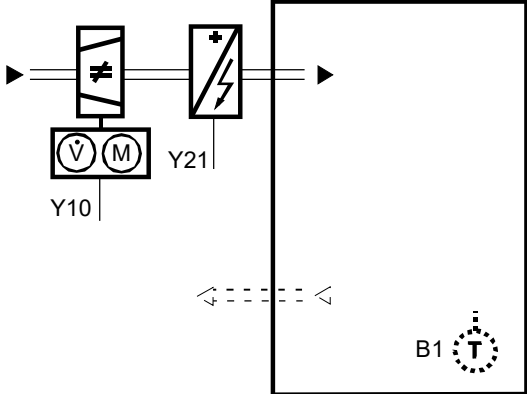
- Heating or cooling mode
- Automatic heating/cooling changeover
- Manual heating/cooling changeover
- Heating and cooling single duct (single duct with electric heater)

Functions

- Maintain room temperature via built-in temperature sensor or external room temperature / return air temperature sensor
- Automatic or manual changeover between heating and cooling mode
- Select applications via DIP switches
- Select operating mode via the operating mode button on the thermostat
- Display current room temperature or setpoint in °C and/or °F.
- Minimum and maximum setpoint limitation
- Key lock (automatic and manual)
- Two multifunctional inputs, freely selectable for:
 - Operating mode switchover contact (key card)
 - Automatic heating/cooling changeover sensor
 - External room temperature or return air temperature sensor
 - Dewpoint sensor.
 - Electric heater enable
 - Alarm input
- Minimum and maximum limitation of air flow signal DC 0...10 V
- Reload factory settings for commissioning and control parameters

Applications

Prior to snapping the front panel to the base, use the DIP switches on the inner side of the front panel to commission the thermostat's applications and the behavior of the output signal.

Application and output signal, DIP switches, diagram	
<p>Single duct, Heating or cooling Modulating, DC 0...10 V output signal normal (Factory setting)</p> 	<p>Single duct, Heating or cooling Modulating, DC 0...10 V output signal inverted</p> 
	
<p>Single duct with electrical heater, Cooling and heating, with auxiliary heater Modulating, DC 0...10 V output signal normal Note: on-off electrical heater</p> 	<p>Single duct with electrical heater, Cooling and heating, with auxiliary heater DC 0...10 V output signal inverted Note: on-off electrical heater</p> 
	

V1 Heating or heating / cooling valve actuator

B1 Return air temperature sensor or external room temperature sensor (optional)

E1 Electric heater

B2 Changeover sensor (optional)















Note During startup, the thermostat reloads the control parameter factory settings after each DIP switch settings change.

Type summary

Product no.	Operating voltage	Control output			Backlit LCD	Infrared receiver	Housing color
		3-pos	on/off	DC 0...10 V			
RDU340	AC 24 V	--	✓	✓			white

Equipment combinations

DC 0...10 V actuator

Designation		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
Electrical actuator, DC 0...10 V (for radiator valve)		SSA61...	4893
Electrical actuator, DC 0...10 V (for 2- and 3-port valves / V...P45)		SSC61...	4895
Electrical actuator, DC 0...10 V (for small valve 2.5 mm)		SSP61...	4864
Electrical actuator, DC 0...10 V (for small valves 5.5 mm)		SSB61...	4891
Electrical actuator, DC 0...10 V (for CombiValves VPI45)		SSD61...	4861
Electromotoric actuator, DC 0...10 V (for valves 5.5 mm)		SQS65...	4573
Electrothermal actuator, AC 24 V, NC, DC 0...10 V, 2 m (for radiator valves and small valve 2.5 mm)		STA63	4884
Electrothermal actuator, AC 24 V, NO, DC 0...10 V, 2 m (for radiator valves and small valve 2.5 mm)		STP63	4884
DC 0...10 V damper / valve actuator		GQD161...	4605
		GDB161...	4634
		GLB161...	
		GMA161...	4614
		GEB161...	4621
		GCA161...	4613
		GBB161...	4626
		GIB161...	

VAV compact controller		GDB181.1E/3	3544
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*) The documents can be downloaded from <http://siemens.com/bt/download>.

Accessories

Designation	Product no.	Data Sheet ^{*)}
Changeover mounting kit (50 pcs/package)	ARG86.3	N3009
Plastic mounting spacer for flush mounted thermostats for increasing the headroom in the conduit box by 10 mm	ARG70.3	N3009
Conduit box for flush mounted thermostat	ARG71 / S55770-T137	N3009

*) The documents can be downloaded from <http://siemens.com/bt/download>.

Ordering

When ordering, indicate both product number and designation:

E.g. **RDU340 room thermostat**

Order valve actuators separately.

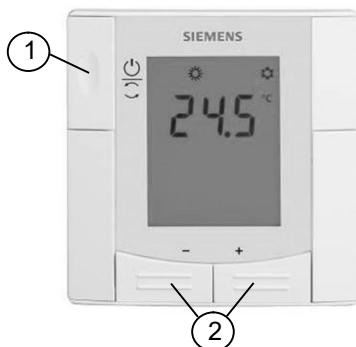
Mechanical design

The thermostat consists of 2 parts:

- Front panel accommodating the electronics, operating elements and built-in room temperature sensor.
- Mounting base with the power electronics.

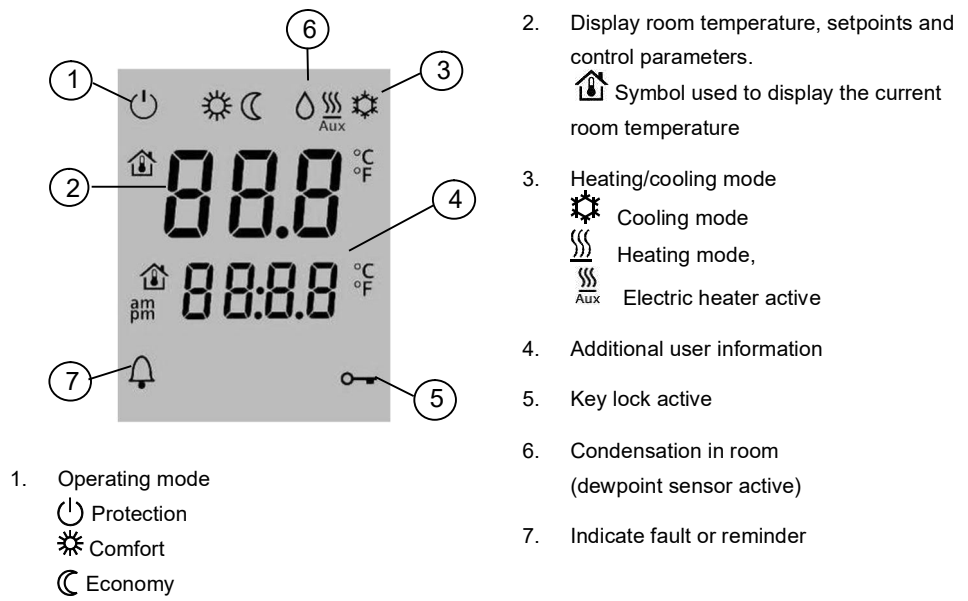
The rear of the mounting base contains the screw terminals. The base fits on a square conduit box with 60.3 mm fixing centers. Slide the front panel in the mounting base and snap on.

Operation and settings



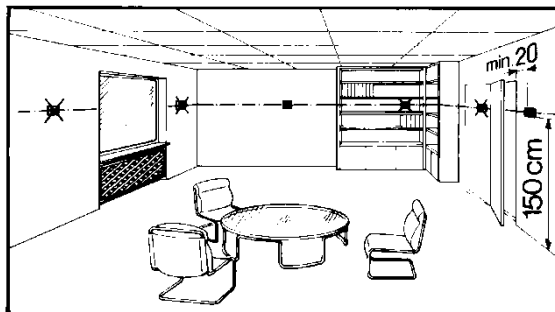
1. Operating mode selector / Protection
2. Adjust setpoint and control parameters

Display



Mounting and installation

Mount the room thermostat on a recessed square conduit box with 60.3mm fixing centers. Do not mount on a wall in niches or bookshelves, behind curtains, above or near heat sources, or exposed to direct solar radiation. Mount about 1.5 m above the floor.



Mounting



- Devices must be mounted on clean, dry indoor place without direct airflow from a heating / cooling device, and not be exposed to dripping or splashing
- In case of limited space in the conduit box use the mounting bracket ARG70.3 to increase the headroom by 10 mm

Wiring



See the mounting instructions M3078 enclosed with the thermostat.

- Comply with local regulations to wire, protection and earth the thermostat.
- The power supply line must have a circuit breaker with a rated current of no more than 10 A. For US installations use Class 2 rated power supplies.

Warning!

No internal line protection for supply lines to external consumers (Y10, Y21)

Risk of fire and injury due to short-circuits!

- Adapt the line diameters as per local regulations to the rated value of the installed overcurrent protection device.
- Isolate the cables of SELV inputs X1-M/X2-M if the conduit box carries AC 230 V mains voltage.
- Inputs X1-M or X2-M of different units (e.g. summer/winter switch) may be connected in parallel with an external switch. Consider overall maximum contact sensing current for switch rating.
- No metal conduits
- No cables provided with a metal shield
- Disconnect from supply before opening the cover



Commissioning

Set the thermostat application via the DIP switches before snapping the front panel on the mounting base.

After power is applied, the thermostat carries out a reset during which all LCD segments flash indicating that the reset was correct. After the reset, which takes about 3 seconds, the thermostat is ready for commissioning by qualified HVAC staff. The control parameters of the thermostat can be set to ensure optimum performance of the entire system (see basic documentation P3078).

Note

After powerfail the thermostat restarts in the same mode as before.

Control sequence	<ul style="list-style-type: none"> The control sequence may need to be set via parameter P01 depending on the application. The factory setting for the single duct application is "Cooling only".
Calibrate sensor	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> We recommend to review the setpoints and setpoint ranges (parameters P08...P12) and change them as needed to achieve maximum comfort and save energy.

Disposal






The device is considered electrical and electronic equipment for disposal in terms of the applicable European Directive and may not be disposed of as domestic garbage.

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

Technical data

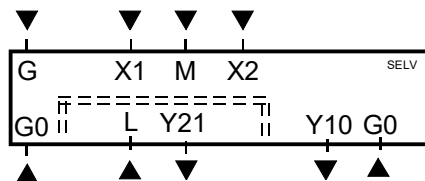
⚠ Power supply	Operating voltage	SELV AC 24 V \pm 20% or AC 24 V class 2 (UL)
	Rated voltage	AC 24 V
	Frequency	50/60 Hz
	Power consumption	Max. 8 VA
	External supply line protection (EU)	Circuit breaker max. 10 A Characteristic B, C, D according to EN 60898 or Power source with current limitation of max. 10 A
⚠ Warning	No internal fuse External preliminary protection with max. C 10 A circuit breaker required in all cases	
Outputs	Control output Y10-G0	SELV DC 0...10 V
	Resolution	39 mV
	Current	Max. \pm 1 mA
	Control output Y21-L (N.O.)	AC 230 V
	Rating	5 mA...5(2) A
⚠ Warning	No internal fuse External preliminary protection with max. C 10 A circuit breaker in the supply line required under all circumstances	
Inputs	Multifunctional input X1-M/X2-M	
	Temperature sensor input: Type	NTC (3 k Ω at 25 °C)
	Digital input: Operating action	Selectable (N.O./N.C.)
	Contact sensing	SELV DC 0...5 V/max 5 mA
	Insulation against mains voltage (SELV)	4 kV, reinforced insulation
	Function input:	Selectable
	External temperature sensor, heating/cooling changeover sensor, operating mode switchover contact, dewpoint monitor contact, enable electric heater contact, alarm contact	X1: P38 X2: P40

Operational data	Switching differential, adjustable				
	Heating mode	(P30)	2 K (0.5...6K)		
	Cooling mode	(P31)	1 K (0.5...6K)		
	Setpoint setting and range				
	 Comfort	(P08)	21°C	(5...40 °C)	
	 Economy	(P11-P12)	15°C/30°C	(OFF, 5...40 °C)	
	 Protection	(P65-P66)	8°C/OFF	(OFF, 5...40 °C)	
	Multifunctional input X1/X2		Selectable 0...6		
	Input X1	Factory setting = 3 (P38)		Operating mode switchover	
	Input X2	Factory setting = 2 (P40)		Heat/cool changeover sensor	
	Built-in room temperature sensor				
	Measuring range		0...49 °C		
	Accuracy at 25 °C		< ± 0.5 K		
	Temperature calibration range		± 3.0 K		
	Settings and display resolution				
	Setpoints		0.5 °C		
	Current temperature value displayed		0.5 °C		
	Environmental conditions	Storage		As per IEC 60721-3-1	
		Climatic conditions		Class 1K3	
Transport		As per IEC 60721-3-2			
Climatic conditions		Class 2K3			
Operation		As per IEC 60721-3-3			
Climatic conditions		Class 3K5 ¹⁾			
Standards and directives	EU Conformity (CE)		CE1T3076_1 ¹⁾		
	RCM Conformity		CE1T3076_1en_C1 ¹⁾		
	Protective class		II as per EN 60730-1		
	Pollution class		Normal		
	Degree of protection of housing		IP 30 to EN 60529		
	Housing flammability class according to UL94		V-0		
Environmental compatibility	The product environmental declaration CE1E3076_1 ¹⁾ contains data on environmentally compatible product design and assessments (RoHS compliance, materials composition, packaging, environmental benefit, disposal).				
General	Connection terminals		Solid wires or prepared stranded wires		
			1 x 0.4...1.5 mm ²		
	Housing front color		RAL 9003 white		
	Weight		0.220 kg		

*) The documents can be downloaded from <http://siemens.com/bt/download>.

1) No condensation is allowed.

Connection terminals



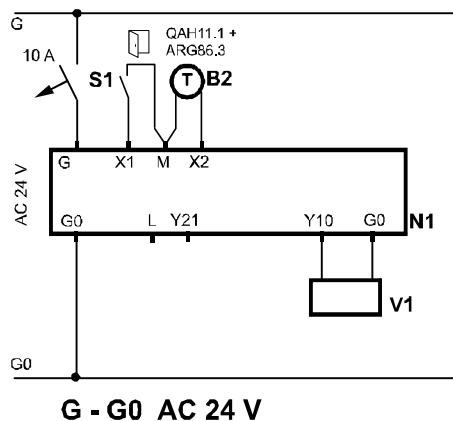
G, G0	Operating voltage thermostat AC 24 V
L	Operating voltage for electric heater AC 230 V
Y21	Control output for electric heater
Y10	Control output for DC 0...10 V actuator
X1, X2	Multifunctional input for temperature sensor (e.g. QAH11.1) or switch
M	Measuring neutral for sensor and switch

Connection diagrams

Application:

Single duct in VAV/CAV

Heating or cooling for universal or AHU

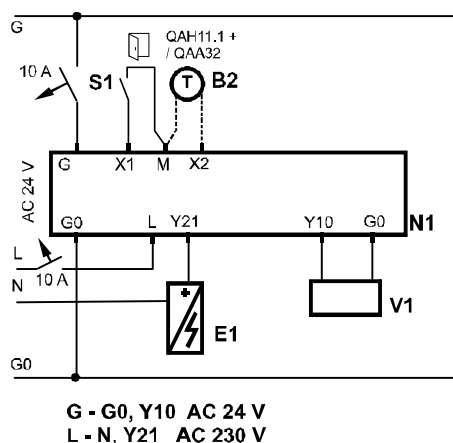


N1	Room thermostat RDU340
V1	VAV / CAV system, DC 0...10V actuator for heating or cooling
S1	Operating mode switch-over contact (e.g. key card)
B2	Heat/cool changeover sensor

Application:

Single duct with electric heater in VAV/CAV

Heating and cooling with electric heater for universal or AHU



N1	Room thermostat RDU340
V1	VAV / CAV system, DC 0...10V actuator for heating or cooling
E1	Electric heater
S1	Operating mode switch-over contact (e.g. key card)
B2	Heat/cool changeover sensor



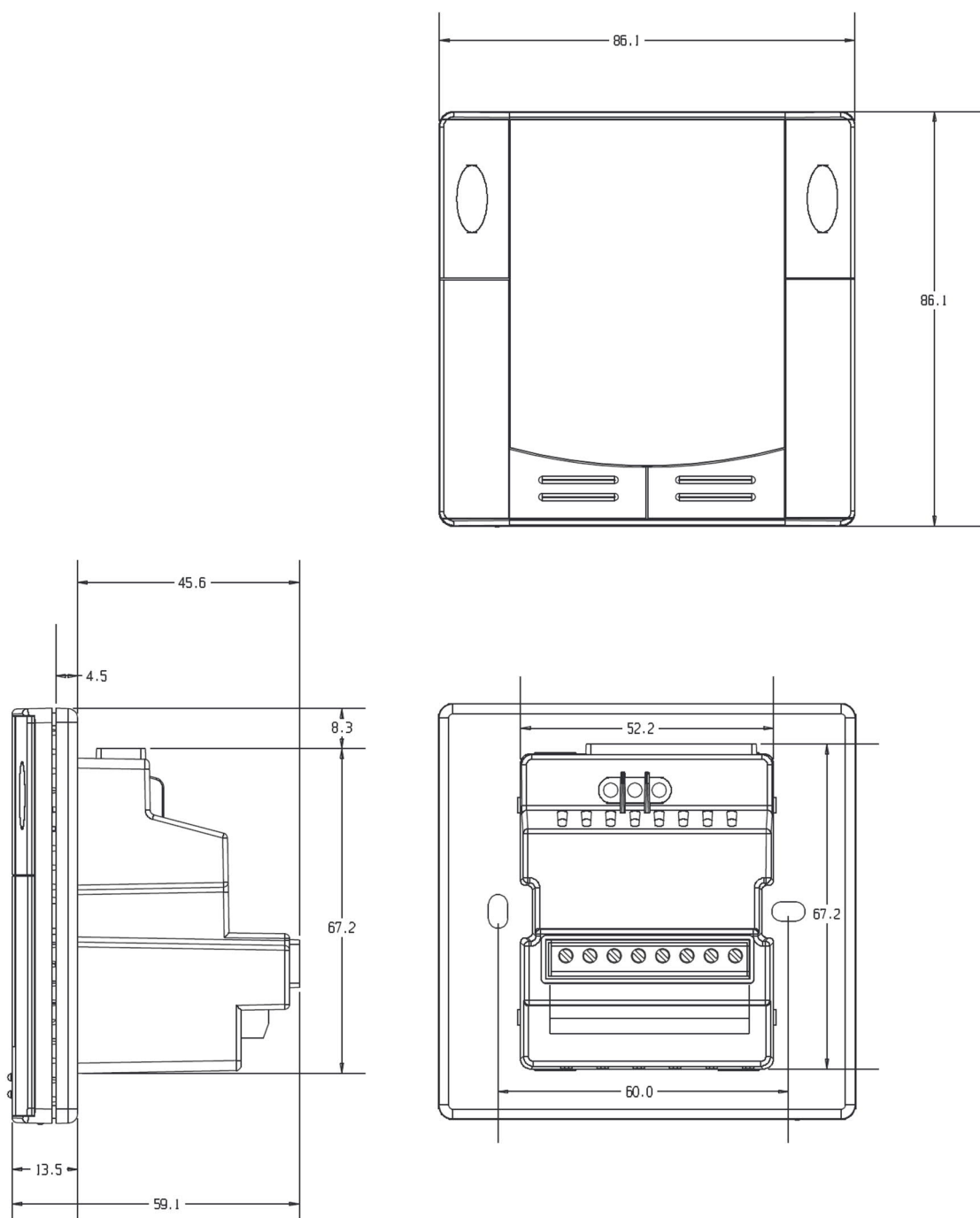
Warning

For US installations use Class 2 rated power supplies.

For other installations use circuit breakers with rated current of no more than 10 A.

Dimensions

Dimensions in mm





Touch screen flush-mount standalone room thermostats

RDF800
RDF800/NF

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

-
- Touch screen
 - 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, presence detector (standard presence and hotel presence)
 - 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
 - AC 230 V operating voltage
 - RDF800: 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
 - RDF800/NF: Mounting on recessed square 86 mm box with 60.3 mm fixing centers and min 40 mm depth, requires additional mounting frame

Use

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 room thermostats are delivered with a fixed set of applications. The relevant application is selected:

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 manually)
- Selection of applications via DIP switches
- Selection of operating mode via touch screen
- 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:
 - External room temperature or return air temperature sensor
 - Sensor for automatic heating / cooling changeover (RDF...)
 - Window contact
 - Dew point sensor (RDF...)
 - Electric heater enable (RDF...)
 - **Fault input**
 - Presence detector
- 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

Note: The functional descriptions for the thermostat can be referred to the basic documentation P3174.

Applications

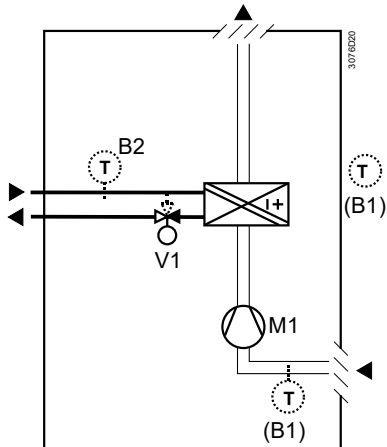
The thermostats support the following applications, which can be configured using the DIP switches on the inner side of the thermostat's front panel.

Applications for fan coil systems

Application and output signal, DIP switches, diagram

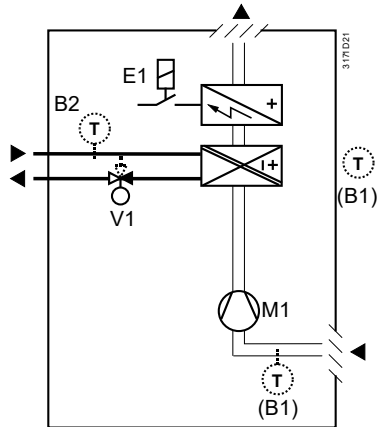
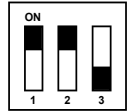
- **2-pipe fan coil unit**
(heating **or** cooling)

ON/OFF



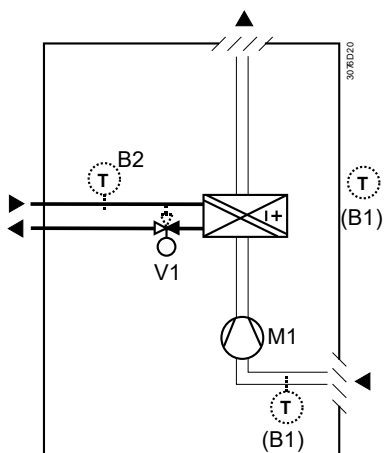
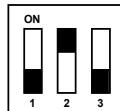
- **2-pipe fan coil unit with el. heater**
(heating **or** cooling)

ON/OFF



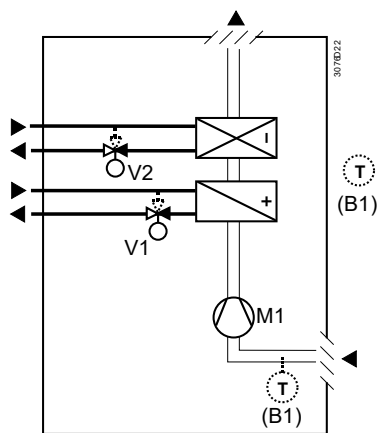
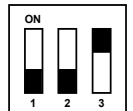
- **2-pipe fan coil unit**
(heating **or** cooling)

3-position



- **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)

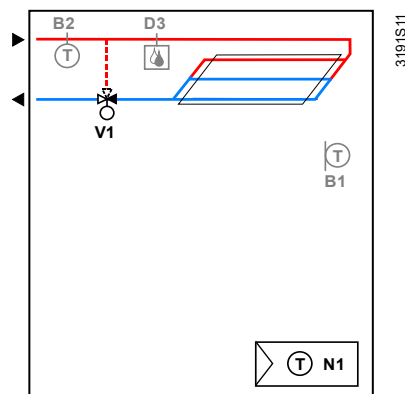
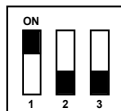
M1 3- or 1-speed fan

Applications for Universal systems

Application and output signal, DIP switches, diagram

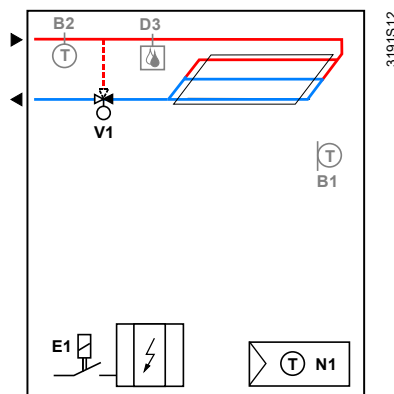
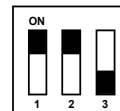
- Chilled / heated ceiling (heating **or** cooling)

ON/OFF



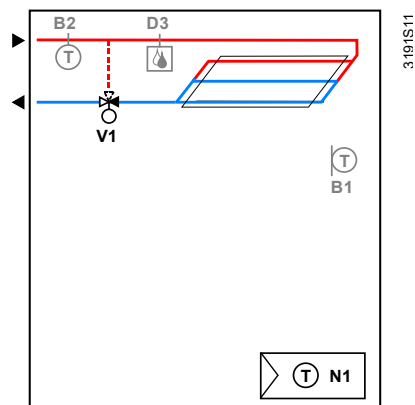
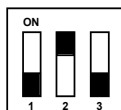
- Chilled / heated ceiling with electric heater (heating **or** cooling)

ON/OFF



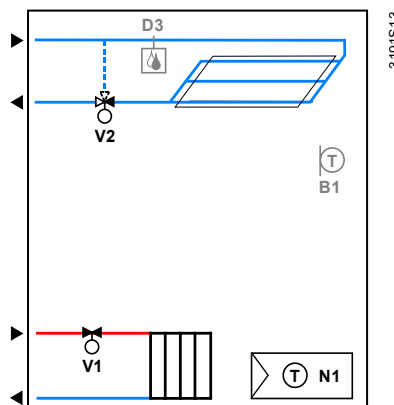
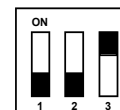
- Chilled / heated ceiling (heating **or** cooling)

3-position



- Chilled ceiling and radiator (heating **and** cooling)

ON/OFF



V1 Heating or heating / cooling valve actuator

V2 Cooling valve actuator

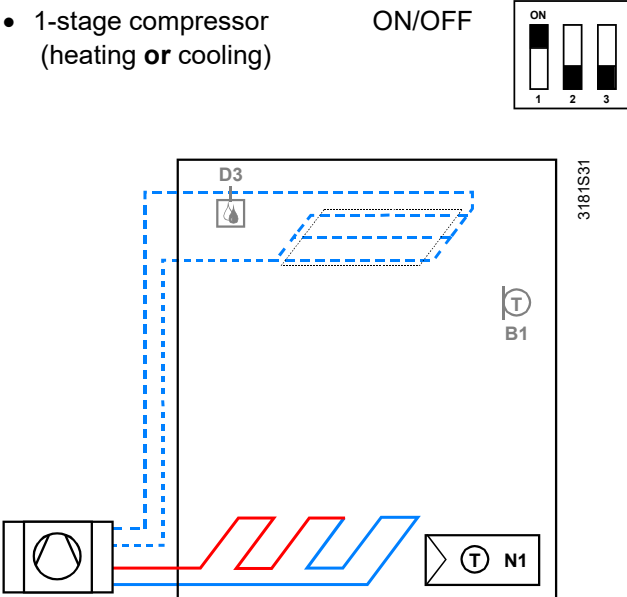
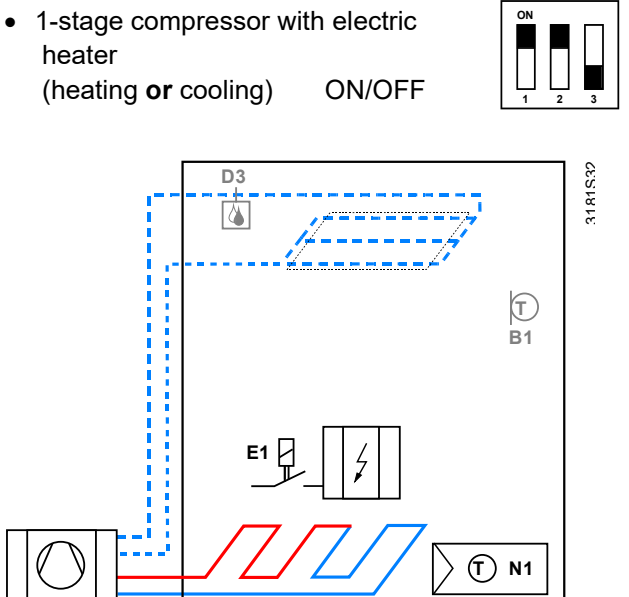
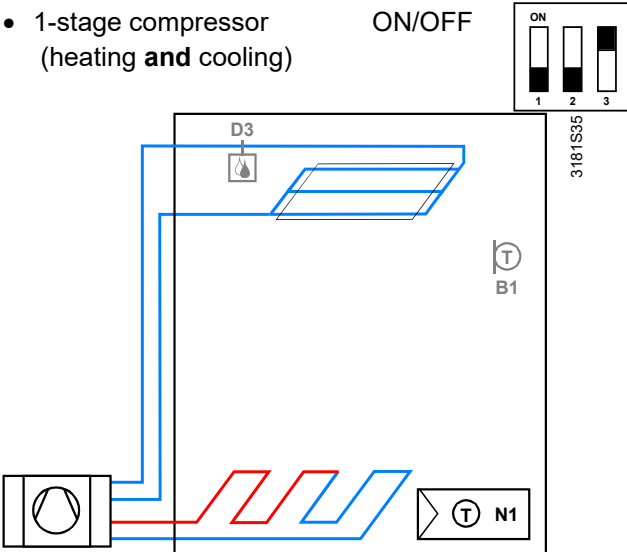
E1 Electric heater

B1 Return air temperature sensor or external room temperature sensor (optional)

B2 Changeover sensor (optional)

D3 Dewpoint sensor

Applications for heat pump systems

Application and output signal, DIP switches, diagram	
<ul style="list-style-type: none"> 1-stage compressor (heating or cooling) <p>ON/OFF</p> 	<ul style="list-style-type: none"> 1-stage compressor with electric heater (heating or cooling) <p>ON/OFF</p> 
<ul style="list-style-type: none"> 1-stage compressor (heating and cooling) <p>ON/OFF</p> 	

N1 Thermostat

E1 Electric heater

B1 Return air temperature sensor or external room temperature sensor (optional)

D3 Dewpoint sensor

Type summary

Product no.	Stock no.	Application	Operating voltage	Control outputs			Suitable for
				3-pos	ON/OFF		
RDF800	S55770-T396	Fan coil, universal heat pump	AC 230 V	1 ¹⁾	2 ¹⁾		Round or square conduit boxes
RDF800/NF ²⁾	S55770-T397	Fan coil, universal heat pump	AC 230 V	1 ¹⁾	2 ¹⁾		Square conduit boxes ²⁾










¹⁾ Selectable: ON/OFF or 3-position according to applications.

²⁾ Mounting frames are not included and must be ordered separately. See "Accessories"







Ordering

- When ordering, indicate the product number, SSN and name.
For example: **RDF800/NF (S55770-T397) room thermostat**
RDF800 (S55770-T396) room thermostat
- A mounting frame must be ordered for RDF800/NF installation (See "Accessories").
- Order valve actuators separately.

Equipment combinations


	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 kΩ 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...	A6V11251892
	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

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 / V...P45)		SSC31...	4895
Electrical actuator, 3-position (for small valve 5.5 mm)		SSD31...	4861
Electromotoric actuator, 3-position (for small valves 5.5 mm)		SAS31...	4581

- 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.

Accessories

Designation		Product no. / SSN	Data sheet
Changeover mounting kit (50 pcs / package)		ARG86.3	N3009
Single mounting frame, Ivory White (for RDF800/NF only)		ARG800.1 / S55770-T370	--

Mechanical design

The thermostats consist of the following parts:

- Front panel with electronics, operating elements and built-in room temperature sensor.
- Mounting base with power electronics.
- Additional mounting frame is required for RDF800/NF to complete the installation while RDF800 unit comes with its own mounting frame.

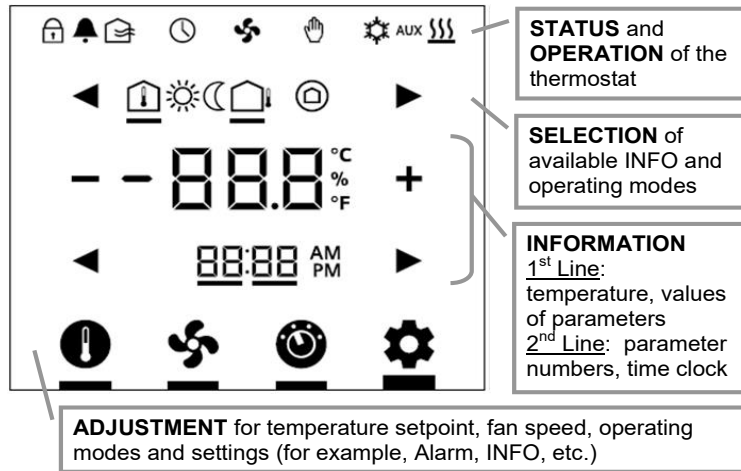
The rear of the mounting base contains the screw terminals.

Slide the front panel in the mounting base and snap on.

Operation and settings



Display



Status symbols:







	Key lock		Manual override
	Alarm / Service reminder		Cooling active
	Scheduler via bus (not valid for standalone versions)		Heating active
	FAN ACTIVE		Auxiliary heat active

Selection symbols:

	Indoor temperature		Comfort mode
	Outdoor temperature (not valid for standalone versions)		Economy mode
			Protection mode

Operational icons:

	Increment, decrement OR selection
	Selection OR move to next items
	Temperature OR parameter values, and etc.
	Parameter number OR password, and etc.
	Time clock (12 / 24 hour) (not valid for standalone versions)
	Setpoint mode (temperature only)
	Fan mode OR fan speed mode
	Operating mode
	Setting mode


Operations	Function
Touch 	to select setpoint mode; adjust temperature value using +/-.
Touch 	to select fan mode; adjust fan speed using +/-.
Touch 	to select operating mode; select ON/ECO/OFF using +/-.
Touch 	to select the INFO screen, display room using ◀/▶ if available.
	to select the desired H/C control sequence using +/- if manual H/C changeover (P01 = 2) is selected.
	to display alarms if the  icon is displayed; use ◀/▶ icon to select different alarms for viewing.
Touch  for 5 seconds	to select parameter mode (Service/Expert level).

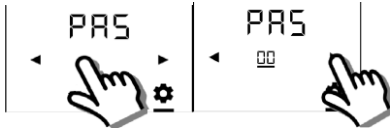
Setting parameters using the local HMI

Wake up the thermostat by touching the screen display.

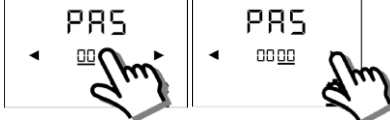
Entering the Service level

Factory setting for the Service level password is **00 00**.

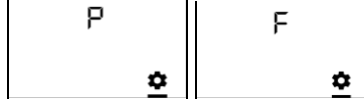
1. Touch and hold down the  icon for 5 seconds. Then set the first 2-digit number to **00** using **◀/▶**.



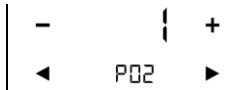
2. Touch the last 2-digit number and set it to **00** using **◀/▶**.



3. After 3 seconds, **P** (successful login) or **F** (fail to login) is displayed.



4. If the login failed, reenter the correct password as per step 1 above. After successful login, the first parameter is displayed as shown in the following example:



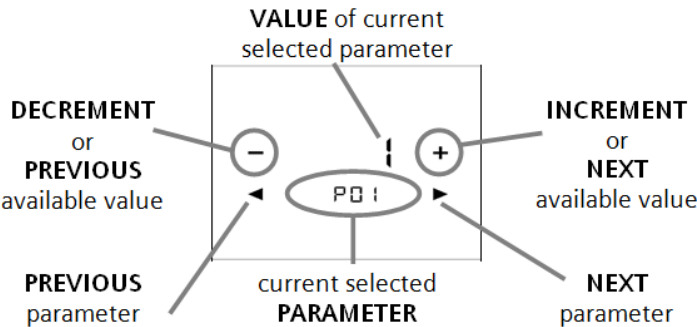
- Notes:**
- Touch any icon to exit.
 - Touch **◀/▶** to select any parameter and **+/-** to adjust values.
 - When reaching **END**, touch **END** to exit.

Entering the Expert level

Follow the same steps for entering the Expert level.
Factory setting for Expert level password is **99 99**.

Configuring parameters

After entering the correct password, the screen displays as follows. Touch **◀/▶** to advance or return to the desired parameter and use **+/-** to select the desired available value.



Resetting parameters

The factory setting for the control parameters can be reloaded using P71, by setting the value to **ON**.

Service level parameters

Parameter	Name	Factory setting	Range	RDF800..	Dependencies
	Service level				
P01	Control sequence	2-pipe: 1 = cooling only 4-pipe: 4 = heating and cooling	0 = heating only 1 = cooling only 2 = H/C changeover manual 3 = H/C changeover auto 4 = heating and cooling	✓	
P02	Operation using room op selector	1	1 = Comfort – Protection 2 = Comfort - Economy – Protection	✓	
P04	Unit	0	0 = °C 1 = °F	✓	
P05	Measured value correction (for built-in/external sensor)	0 K	– 5...+5 K	✓	
P06	Standard display	0	0 = room temperature 1 = setpoint	✓	
P08	Comfort basic setpoint	21 °C	5...40 °C	✓	
P09	Comfort setpoint minimum	5 °C	5...40 °C	✓	
P10	Comfort setpoint maximum	35 °C	5...40 °C	✓	
P11	Economy heating setpoint	15 °C	OFF, 5...WCoolEco; WCoolEco = 40 °C max.	✓	
P12	Economy cooling setpoint	30 °C	OFF, WHeatEco...40 °C; WHeatEco = 5 °C min.	✓	
P13	Electric heater when cooling	ON	ON: Enabled OFF: Disabled	✓	
P14	"Screen lock" function	0	0: Unlock 1: Lock 2: Setpoint adjustable	✓	
P15	Fan stage in dead zone (Comfort)	0	0 = disabled 1 = low speed (Heat and Cool) 2 = low speed (Cooling only)	✓	
P16	Buzzer function	ON	ON: Enabled OFF: Disabled	✓	

Note: Parameter display depends on the selected application and function.





Expert level parameters with diagnostics and test

Parameter	Name	Factory setting	Range	RDF800..	Dependencies
	Expert level				
P30	Heat P-band Xp/switching differential	2 K	0.5...6 K	✓	
P31	Cool P-band Xp/switching differential	1 K	0.5...6 K	✓	
P33	Dead zone Comfort mode	2 K	0.5...5 K	✓	Appl.)
P34	Setpoint differential	2 K	0.5...5 K	✓	Appl.)

Parameter	Name	Factory setting	Range	RDF800..	Dependencies
	Expert level				
P35	Integral action time T _n	45 min	0...120 min	✓	P46
P36	H/C changeover switching point cooling	16 °C	10...25 °C	✓	P38, P40
P37	H/C changeover switching point heating	28 °C	27...40 °C	✓	P38, P40
P38	Input X1	3 = window contact	0 = --- (no function) 1 = room temp ext. sensor/ return air temp (AI) 2 = H/C changeover (AI/DI) 3 = window contact (DI) 4 = dew point sensor (DI) 5 = enable electric heater (DI) 6 = fault input (DI) 10 = presence detector (DI)	✓	P40
P39	Normal position input X1	0 (NO.)	0 = NO. (Normally Open) 1 = NC. (Normally Closed)	✓	P38
P40	Input X2	1 = ext. sensor	0 = --- (no function) 1 = room temp ext. sensor/ return air temp (AI) 2 = H/C changeover (AI/DI) 3 = window contact (DI) 4 = dew point sensor (DI) 5 = enable electric heater (DI) 6 = fault input (DI) 10 = presence detector (DI)	✓	P38
P41	Normal position input X2	0 (NO.)	0 = NO. (Normally Open) 1 = NC. (Normally Closed)	✓	P40
P44	Actuator running time Y1/Y2	150 s	20...300 s	✓	P46
P45	Power of electric heater on Y2 (for adaptive temperature compensation)	0.0 kW	0.0...1.2 kW	✓	
P46	Output Y1/Y2	ON/OFF (1)	0 = 3-position 1 = ON/OFF	✓	Appl.
P48	ON time minimum 2-pos output	1 min.	1...20 min	✓	P46
P49	OFF time minimum 2-pos output	1 min.	1...20 min	✓	
P50	Purge time	OFF	OFF: Not active 1...5 min: Active with selected duration	✓	P38,
P51	Flow temp limit floor heating	OFF	OFF, 10...50 °C	✓	P38, P40
P52	Fan control	1	0 = disabled 1 = enabled 2 = heating only 3 = cooling only	✓	
P53	Fan speeds	3-speed	1 = 1-speed 2 = 3-speed	✓	P52
P54	Fan overrun time	60 s	0...360 s	✓	P52, Appl.
P55	Fan speed switching point high	100%	80...100%	✓	P52, P53
P56	Fan speed switching point med	65%	30...75%	✓	P52, P53
P57	Fan speed switching point low	10%	1...15%	✓	P52, P53
P58	Fan kick start	ON	ON: Enabled OFF: Disabled	✓	P52
P59	On time minimum fan	2 min	1...6 min	✓	P52

Parameter	Name	Factory setting	Range	RDF800..	Dependencies
	Expert level				
P60	Periodic fan kick Comfort	OFF	0...89 min, OFF(90)	✓	P52
P61	Periodic fan kick Eco	OFF	0...359 min, OFF(360)	✓	P52
P62	Service filter	OFF (0)	OFF, 100...9900 h	✓	P52
P65	Protection heating setpoint	8 °C	OFF, 5...WCoolProt; WCoolProt = 40 °C max.	✓	
P66	Protection cooling setpoint	OFF	OFF, WHeatProt... 40; WHeatProt = 5°C min.	✓	
P67	Fan start delay	0 s	0...360 s	✓	P52, P46
P69	Temporary Comfort setpoint	OFF	OFF = disabled ON = enabled	✓	
P71	Restore factory setting	OFF	OFF = disabled ON = reload start	✓	
P77	Presence Detector Mode	1: Standard Presence Mode	1: Standard Presence Mode 2: Hotel Presence Mode	✓	P38, P40

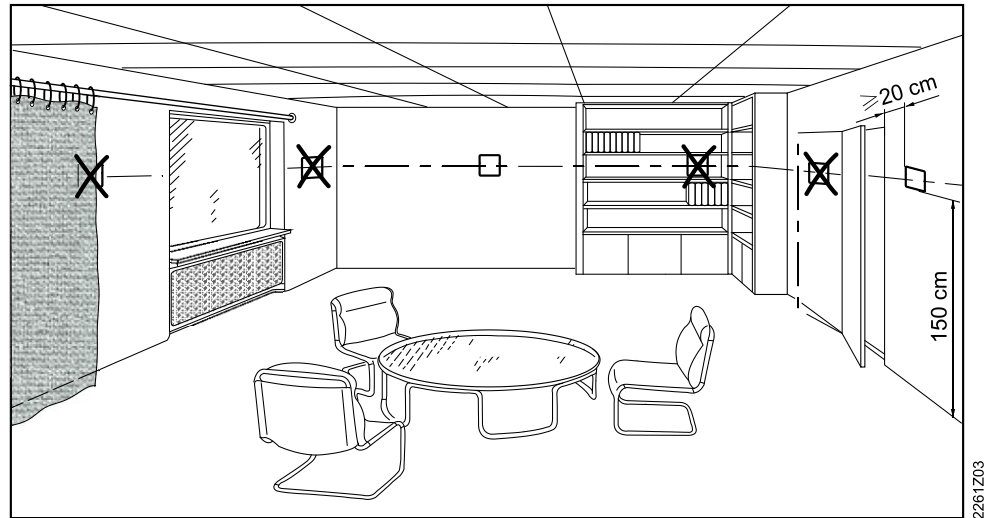
) Appl. = applications

Parameter	Name	Range	RDF800..	Dependencies
	Diagnostics and test			
d01	Application number	NONE = (no application) 2P = 2-pipe 2P3P = 2-pipe 3-position 2PEH = 2-pipe with electric heater 4P = 4-pipe	✓	
d02	X1 state	0 = not activated (for DI) 1 = activated (DI) 0...49 °C = current temp. value (for AI) 00  = H/C input shorted 100  = H/C input open	✓	
d03	X2 state	0 = not activated (for DI) 1 = activated (DI) 0...49 °C = current temp. value (for AI) 00  = H/C input shorted 100  = H/C input open	✓	
d05	Test mode for checking the Y1/Y2 actuator's running direction ³⁾	"---" = no signal on outputs Y1 and Y2 OPE = output Y1 forced opening CLO = output Y2 forced closing	✓	P46
d07	Software version	Ux.xx	✓	

³⁾ This parameter can only be quit when the setting is back at "---"
Press buttons + and – simultaneously to escape.

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.



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.
- 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.

WARNING

Wire, protect and earth in compliance with local regulations.

Risk of fire and injury due to short-circuits!





- Adapt the line diameters as per local regulations to the rated value of the installed overcurrent protection device.
- The AC 230 V mains supply line must have an external circuit breaker with a rated current of no more than 10 A.
- The maximum current loading (including fan and valves) is 10 A.
- Use only valve actuators rated for AC 230 V.
- Disconnect from supply before removing the unit from its mounting plate.
- Do not connect more than one fan coil unit to the Qs output of the thermostat.
- Do not connect terminal Y1 or Y2 to either L or N.
- Do not use terminal Y1 or Y2 as AC 230 V power supply.
- Use cables with min 230 V insulation for both SELV inputs X1-M / X2-M since the conduit box carries AC 230 V mains voltage.
- Several switches (e.g. window contact) may be connected in parallel for both inputs X1-M / X2-M. However, overall maximum contact sensing current for switch rating must be considered.



Commissioning notes

Before power up

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

Commissioning method	DIP switches	LCD display	Applications
Local setup		APP 2P	2-pipe
		APP 2PEH	2-pipe with electric heater
		APP 4P	4-pipe
		APP 2P3P	2-pipe with 3-position output

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

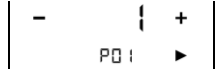
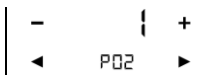
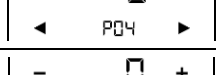

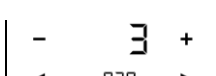
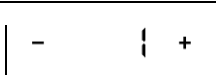

Notes: Other DIP switch position will have no effect, i.e. NONE will be shown on LCD display when the unit is powered up if selected .
As soon as the application is changed, the thermostat reloads the factory setting for all control parameters.

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
	Fan Stage in Deadzone (Comfort mode)	0: Fan OFF 1: Fan speed 1 Heat / Cool 2: Fan speed 1 Cool only	0
	Functionality of X1	0: --- No function 1: Ext / Return Temp (AI) 2: H/C changeover (AI/DI) 3: Window open detect (DI) 4: Dew point sensor (DI)	3
	Functionality of X2	5: Enable electr. Heater (DI) 6: Fault input (DI) 10: Presence detection (DI)	1

LCD display	Parameter	Range	Factory setting
<div> <div>-</div> <div>NO</div> <div>+</div> <div>◀</div> <div>P39</div> <div>▶</div> </div>	Operating action of X1	Normal Open (NO) Normal Close (NC)	Normal Open (NO)
<div> <div>-</div> <div>NO</div> <div>+</div> <div>◀</div> <div>P41</div> <div>▶</div> </div>	Operating action of X2		
<div> <div>◀</div> <div>END</div> </div>	-	End of wizard	-

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

Reset

To re-load the factory settings for all parameters, set the 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.

Compressor-based application



- When the thermostat is used with a compressor, adjust the minimum output on-time (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.

Notes: The functional descriptions for the thermostat can be referred to basic documentation (P3174).

Operation


Room temperature out of range

When the room temperature is out of the measuring range (that is, above 49 °C or below 0 °C), - - - will be displayed.



In addition, the heating output is activated if the current setpoint is not set to "OFF", the thermostat is in heating mode and the temperature is below 0 °C.

For all other cases, no output is activated.

The thermostat resumes Comfort mode after the temperature returns to the measuring range.

The following pages can be displayed by touching the  icon, depending on priority: alarm/service reminder, manual H/C changeover, basic Information about room.

Alarm/Service reminder

If any alarm is displayed (), touch the  icon to check the alarm or service reminder.


If there is more than one alarm, use ◀/▶ to browse through all active alarms.



The following table describes the detail information for all alarms and services.

Alarm/service	Display	Error code	Type
Condensation	Con	4930	Fault
Ext fault input 1	AL1	9001	Fault
Ext fault input 2	AL2	9002	Fault
Clean filter reminder (+/- to remove reminder)	FIL	3911	Service
Internal sensor error	Er1		Fault
EEPROM error	Er2		Fault
Floor heating sensor error	Er3		Fault

Heating/cooling manual changeover

If manual heating/cooling changeover is set using P01 = 2, touch the  icon once or twice (depending on the alarms) to select heating or cooling mode.

The selected control sequence will start in three seconds.










Disposal



The device is considered electrical and electronic equipment for disposal in terms of the applicable European Directive and may not be disposed of as domestic garbage.

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

Technical data

 Power supply	Rated voltage	AC 230 V
	Overvoltage category	III
Caution 	Frequency	50/60 Hz
	Power consumption	Max. 6.0 VA / 2.1 W
Outputs	No internal fuse! External preliminary protection with max C 10 A circuit breaker required in all cases.	
	Fan control Q1, Q2, Q3-N	AC 230 V
 Note!	Rating min, max resistive (inductive)	Min. 5 mA, Max. 5(2) A
	Fans must NOT be connected in parallel! Connect one fan directly, for additional fans, one relay for each speed.	
Caution 	Control output Y1-N / Y2-N (NO)	AC 230 V
	Rating Min, Max resistive (inductive)	Min. 5 mA, Max. 5(2) A
Inputs	Max. total load current through terminal "L" (Qx+Yx)	Max. 7 A
	No internal fuse! External preliminary protection with max C 10 A circuit breakers in the supply line required in all cases.	
Operational data	Multifunctional input X1-M / X2-M	
	Temperature sensor input:	
	Type	See "Equipment combinations"
	Temperature range	0...49 °C
	Cable length	Max. 80 m
	Digital input:	
	Operating action	Selectable (NO / NC)
	Contact sensing	SELV DC 0...5 V / Max. 5 mA
	Parallel connection of several thermostats for one switch	Max. 20 thermostats per switch
	Insulation against mains voltage (SELV)	4 kV, reinforced insulation
	Function of inputs:	Selectable
	External temperature sensor, heating/cooling	X1: P38
	changeover sensor, window contact, presence	X2: P40
	detection, dewpoint monitor contact, enable	
	electrical heater contact, fault contact	
	Switching differential, adjustable	
	Heating mode (P30)	2 K (0.5...6K)
	Cooling mode (P31)	1 K (0.5...6K)
	Setpoint setting and range	
	 Comfort (P08)	21 °C (5...40 °C)
	 Economy (P11-P12)	15 °C / 30°C (OFF, 5...40 °C)
	 Protection (P65-P66)	8 °C / OFF (OFF, 5...40 °C)
	Multifunctional input X1/X2	Selectable 0...8, 10
	Input X1 default value (P38)	3 (Window contact)
	Input X2 default value (P40)	1 (External temperature sensor)

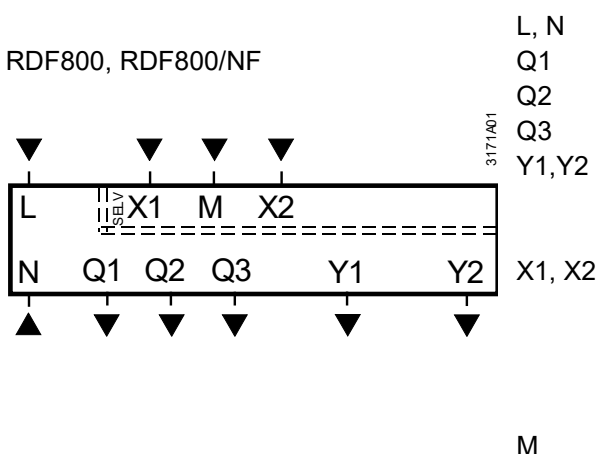
Environmental conditions	Built-in room temperature sensor	
	Measuring range	0...49 °C
	Accuracy at 25 °C	< ± 0.5 K
	Temperature calibration range	± 3.0 K
	Settings and display resolution	
	Setpoints	0.5 °C
	Current temperature value displayed	0.5 °C
	Storage	
	Climatic conditions	As per IEC 60721-3-1 Class 1K3
	Transport	As per IEC 60721-3-2 Class 2K3
Standards and directives	Operation	As per IEC 60721-3-3 Class 3K5 ¹⁾
	EU Conformity (CE)	A6V11174840 ^{*)}
	RCM conformity to EMC emission standard	A6V11174927 ^{*)}
	Safety class	II as per EN 60730
	Pollution class	Normal
	Degree of protection of housing	IP 30 as per EN 60529
	Housing flammability class according to UL94	V-0
Environmental compatibility	The product environmental declaration A6V11171690 ^{*)} contains data on environmentally compatible product design and assessments (RoHS compliance, materials composition, packaging, environmental benefit, disposal).	
General	Connection terminals	Solid wires or prepared stranded wires 1 x 0.4...1.5 mm ² Min 1.5 mm ²
	Minimal wiring cross section on 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 <http://siemens.com/bt/download>.

¹⁾ No condensation is allowed.

Connection terminals

RDF800, RDF800/NF

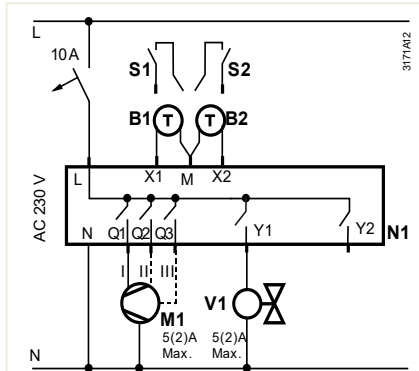


L, N	Operating voltage AC 230 V
Q1	Control output "Fan speed 1 AC 230 V"
Q2	Control output "Fan speed 2 AC 230 V"
Q3	Control output "Fan speed 3 AC 230 V"
Y1, Y2	Control output "Valve" AC 230 V (N.O., for normally closed valves), output for compressor or output for electrical heater
X1, X2	Multifunctional 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)
M	Measuring neutral for sensor and switch

Connection diagrams

Application

2-pipe / heating or cooling – ON/OFF

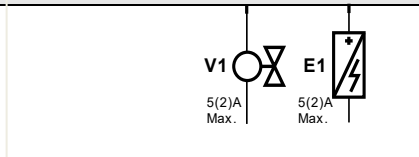


- N1 Room thermostat RDF800...
- M1 1- or 3-speed fan
- V1 Valve actuator, 2- or 3-position
- V1, V2 Valve actuator, 2-position
- E1 Electric heater
- C1, C2 1-stage compressor
- S1, S2 Switch (keycard, window contact, presence detector, etc.)
- B1, B2 Temperature sensor (return air temperature, external room temperature, changeover sensor, etc.)
- X1, X2 Inputs

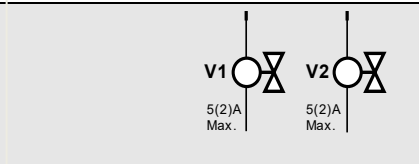
2-pipe, / heating or cooling – 3-position
– Y1 = Open
– Y2 = Close



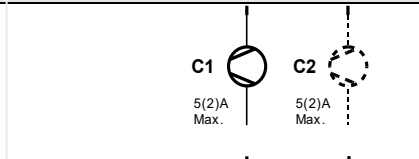
2-pipe and el. heater/
Heating or cooling and el. heater



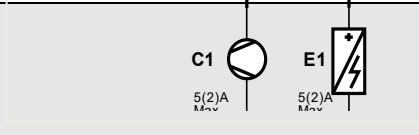
4-pipe /
Heating and radiator
– V1 = Heating
– V2 = Cooling



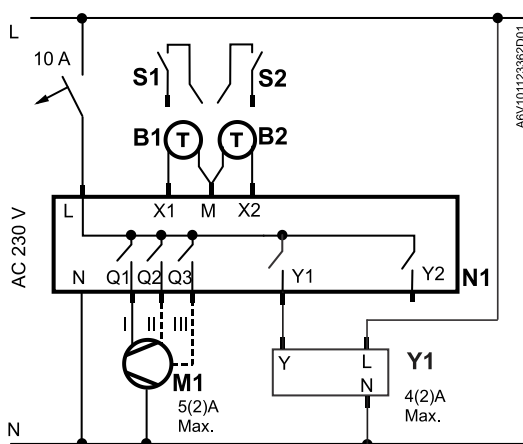
1-stage compressor
– C1 = Heating and / or
– C2 = Cooling



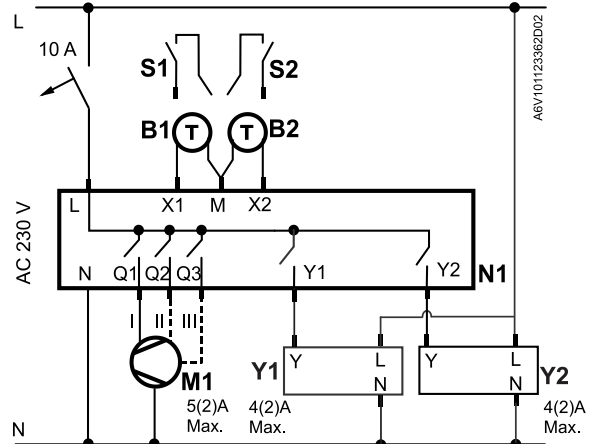
1-stage compressor and electric heater



Example1: With SUA21/3
2-pipe fan coil application

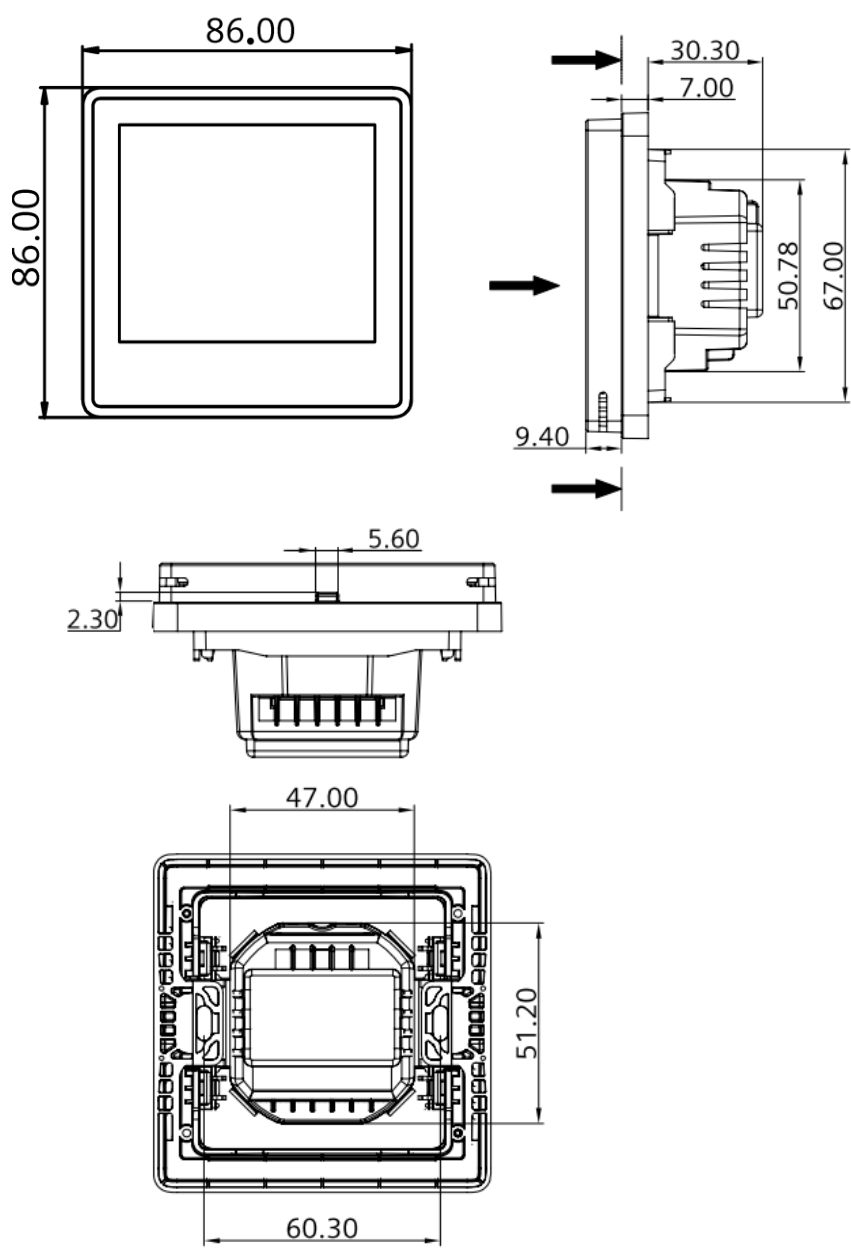


Example2: With SUA21/3
4-pipe fan coil application

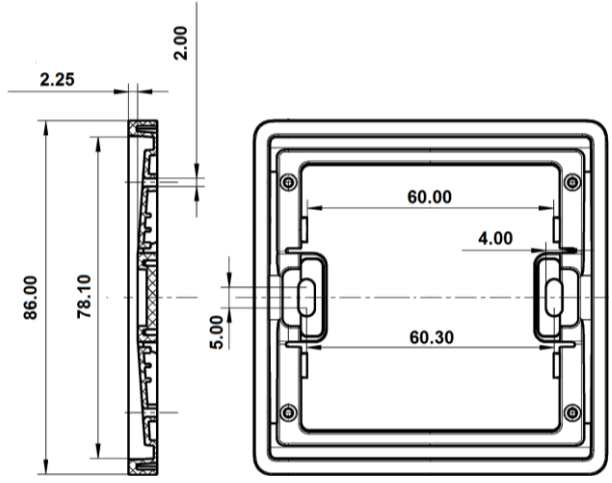


Dimensions (mm)

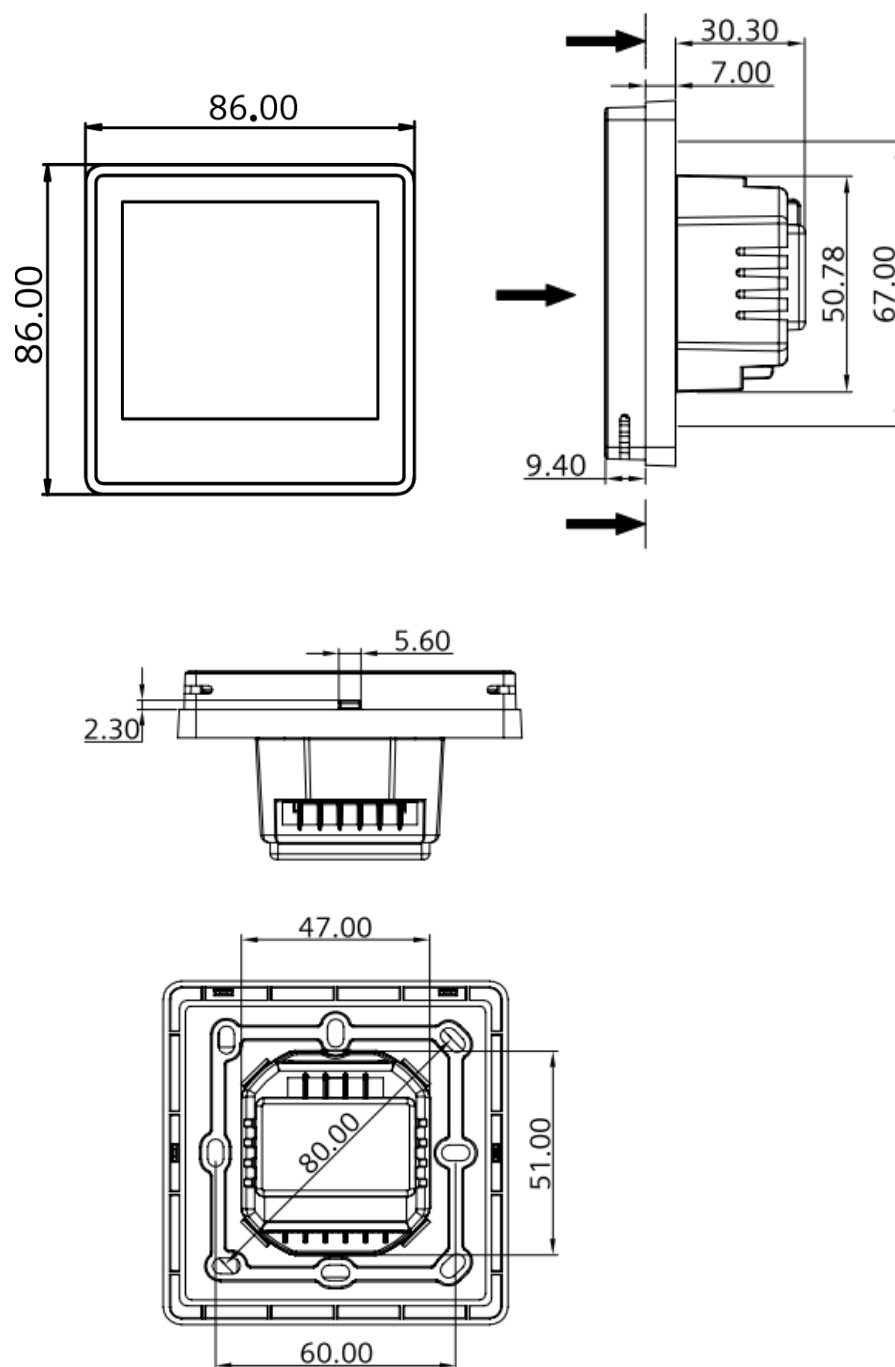
RDF800/NF
for square conduit
boxes only



ARG800.1 Single
Mounting Frame for
RDF800/NF



RDF800
for round
conduit boxes





RDF800KN, RDF800KN/NF



RDF800KN/VB

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

RDF800KN RDF800KN/VB RDF800KN/NF

- 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, ETS5 or via local HMI
- Interoperation into Synco 700
- Integration into Desigo via group (ETS5) or via individual addressing
- Integration into third-party system via group addressing (ETS5)
- AC 230 V operating voltage
- RDF800KN, RDF800KN/VB: 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
- RDF800KN/NF: Mounting on recessed square 86 mm box with 60.3 mm fixing centers and min 40 mm depth, requires additional mounting frame

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
- ETS5
- 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.

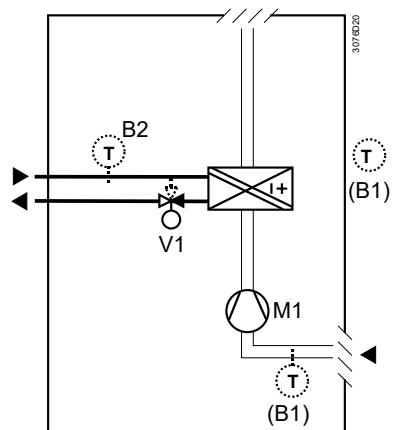
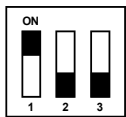
Remote configuration , via commissioning tool (factory setting) <ul style="list-style-type: none"> • Synco ACS • ETS5 	DIP switches 
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Applications for fan coil systems

Application and output signal, DIP switches, diagram

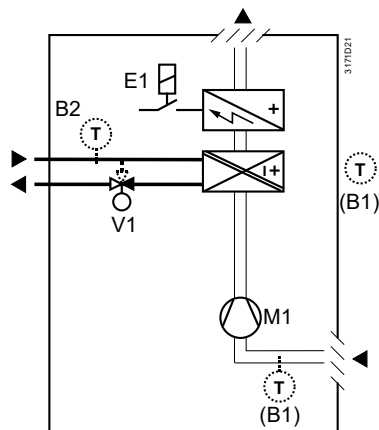
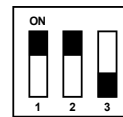
- **2-pipe fan coil unit**
(heating or cooling)

ON/OFF



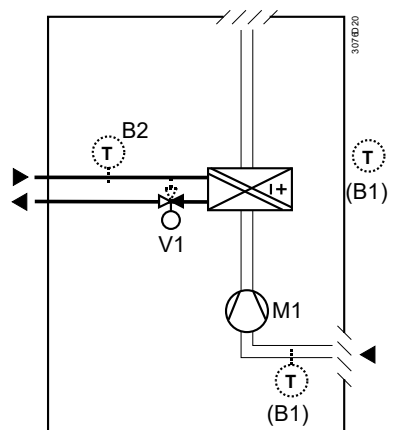
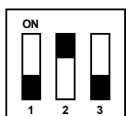
- **2-pipe fan coil unit with el. heater**
(heating or cooling)

ON/OFF



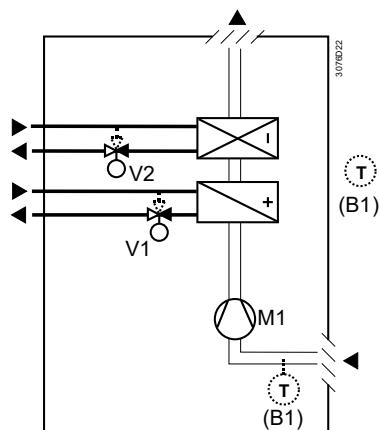
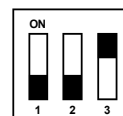
- **2-pipe fan coil unit**
(heating or cooling)

3-position



- **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)

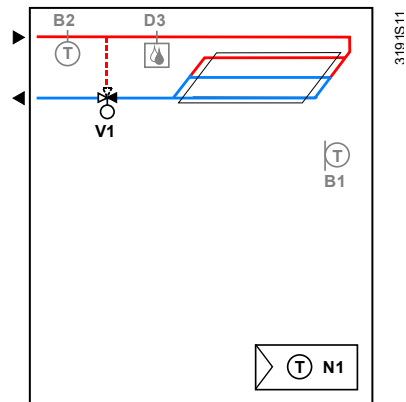
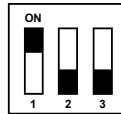
M1 3- or 1-speed fan

Applications for Universal systems

Application and output signal, DIP switches, diagram

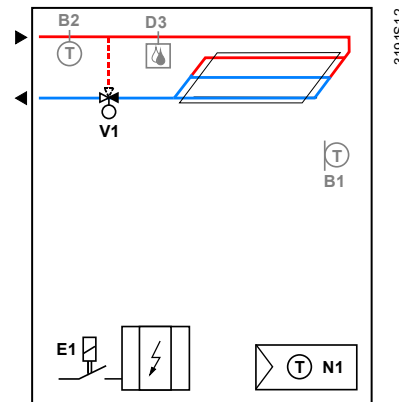
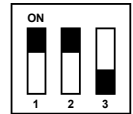
- Chilled / heated ceiling
(heating **or** cooling)

ON/OFF
ON/OFF



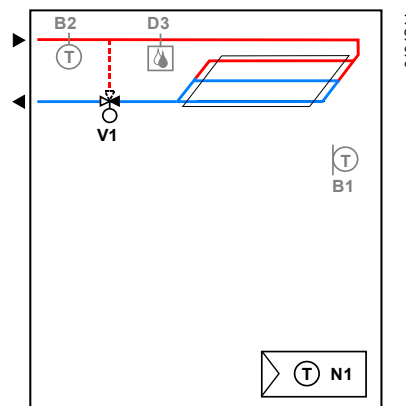
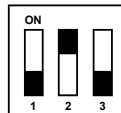
- Chilled / heated ceiling with electric heater
(heating **or** cooling)

ON/OFF



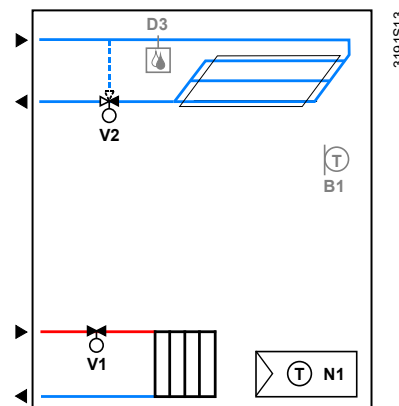
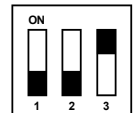
- Chilled / heated ceiling
(heating **or** cooling)

3-position



- Chilled ceiling and radiator
(heating **and** cooling)

ON/OFF



V1 Heating or heating / cooling valve actuator

V2 Cooling valve actuator

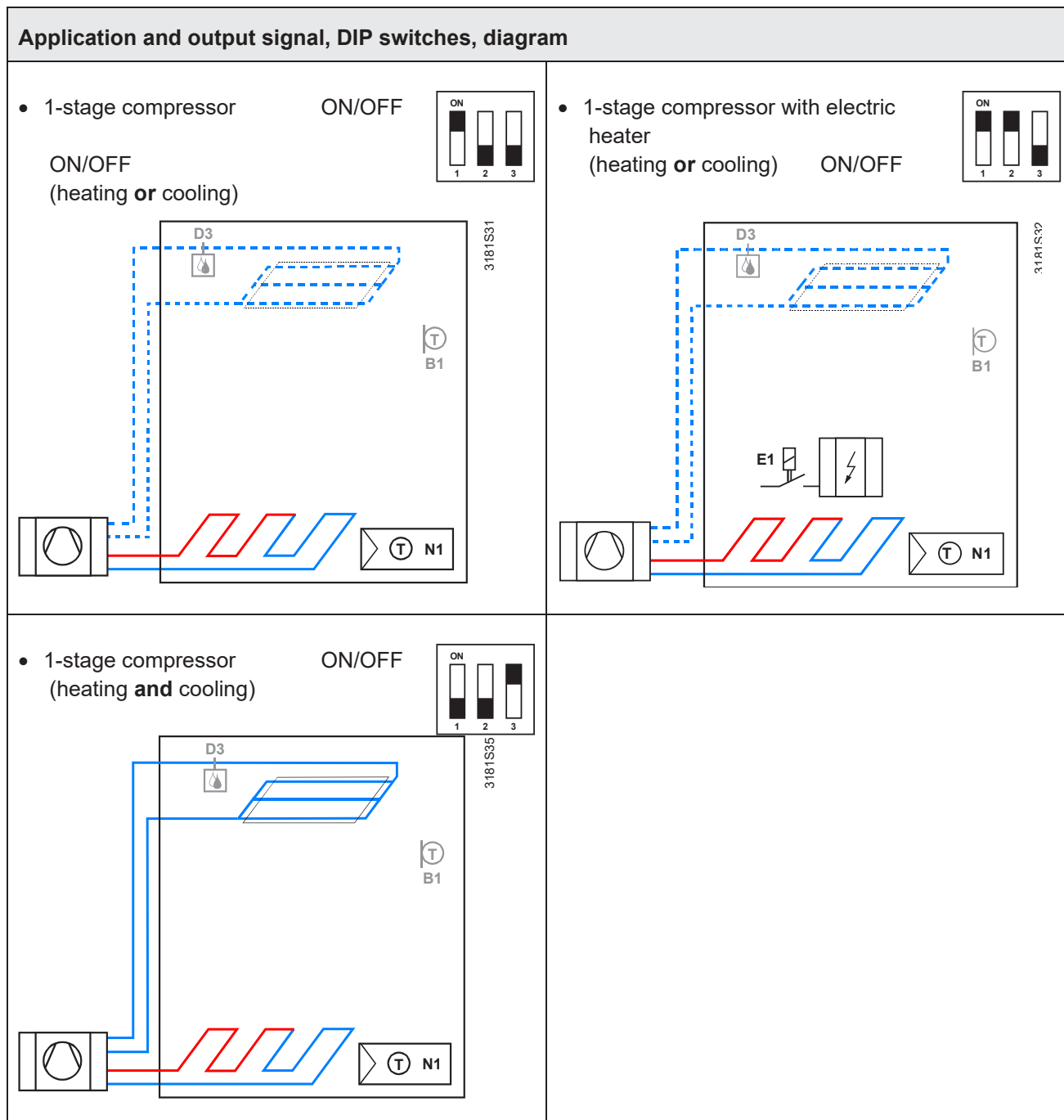
E1 Electric heater

B1 Return air temperature sensor or external room temperature sensor (optional)

B2 Changeover sensor (optional)

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

Type summary

Product no.	Stock no.	Operating voltage	Control outputs		Suitable conduit box	Color
			3-pos	ON/OFF		
RDF800KN	S55770-T350	AC 230 V	1 ¹⁾	2 ¹⁾	Round conduit box	White
RDF800KN/NF ²⁾	S55770-T335	AC 230 V	1 ¹⁾	2 ¹⁾	Square conduit box ²⁾	White
RDF800KN/VB	S55770-T429	AC 230 V	1 ¹⁾	2 ¹⁾	Round conduit box	Black

¹⁾ Selectable: ON/OFF or 3-position










²⁾ Mounting frames are not included and must be ordered separately. See "Accessories"

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

ON/OFF actuators


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 kΩ at 25 °C)		QAP1030/UFH	1854
Condensation monitor		QXA2100/ QXA2101	A6V10741072
Electromotoric ON/OFF actuator		SFA21...	4863
Electromotoric ON/OFF valve and actuator (only available in AP, UAE, SA and IN)		MVI.../MXI...	A6V11251892
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

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 / V...P45)		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, RDF800KN/VB for increasing the headroom in the conduit box by 10mm		ARG70.3	N3009
Conduit box for RDF800KN, RDF800KN/VB		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	--

^{*)} See the dimensions of mounting frame on page 19.

Mechanical design

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.

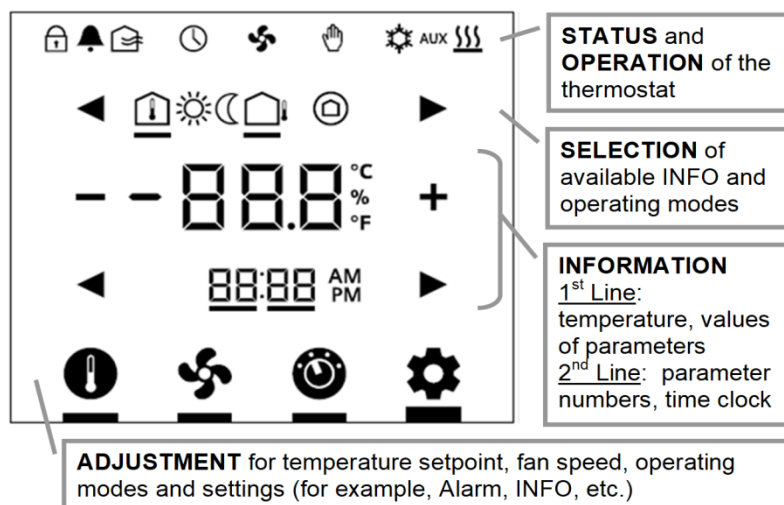
The rear of the mounting base contains the screw terminals.

Slide the front panel in the mounting base and snap on.

Operation and settings



Display



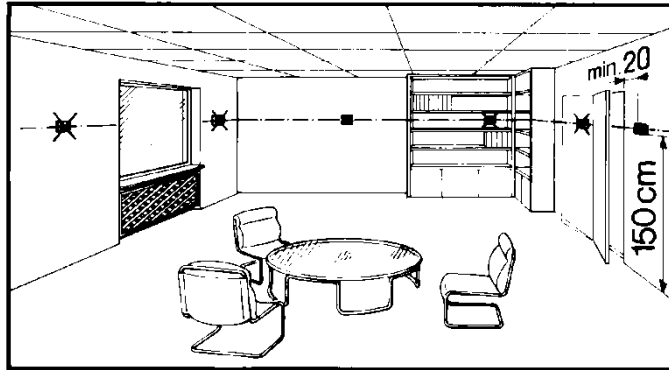
Status symbols:			
	Key lock		Manual override
	Alarm / Service reminder		Cooling active
	Scheduler via bus		Heating active
	FAN ACTIVE	AUX	Auxiliary heat active
Selection symbols:			
	Indoor temperature		Comfort mode
	Outdoor temperature		Economy mode
			Protection mode

Operational icons:	
	Increment, decrement OR selection
	Selection OR move to next items
	Temperature OR parameter values, and etc.
	Time clock (12 / 24 hour), parameter number OR password, and etc.
	Setpoint mode (temperature only)
	Fan mode OR fan speed mode
	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.



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, RDF800KN/VB 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.

Commissioning notes

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);
2. For local setup, set DIP switches to select applications (refer to the following table).

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

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

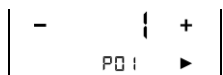





Note: As soon as the application is changed, the thermostat reloads the factory setting for all control parameters, except for KNX device and zone addresses!

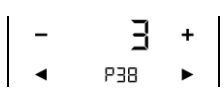
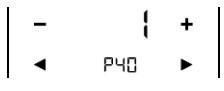
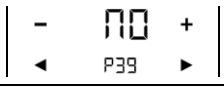
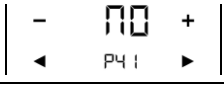

Wizard

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
	Display info line (2 nd line of LCD display)	0: --- (No display) 3: Time of day (12h) via bus 4: Time of day (24h) via bus	0
	Fan Stage in Deadzone (Comfort mode)	0: Fan OFF 1: Fan speed 1 Heat / Cool 2: Fan speed 1 Cool only	0

LCD display	Parameter	Range	Factory setting
	Functionality of X1	0: --- No function 1: Ext / Return Temp (AI) 2: H/C changeover (AI/DI) 3: Window open detect (DI) 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)	3
	Functionality of X2		1
	Operating action of X1	Normal Open (NO) Normal Close (NC)	Normal Open (NO)
	Operating action of X2		
	-	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 manually after reset, and then the thermostat is ready for commissioning by qualified HVAC staff.

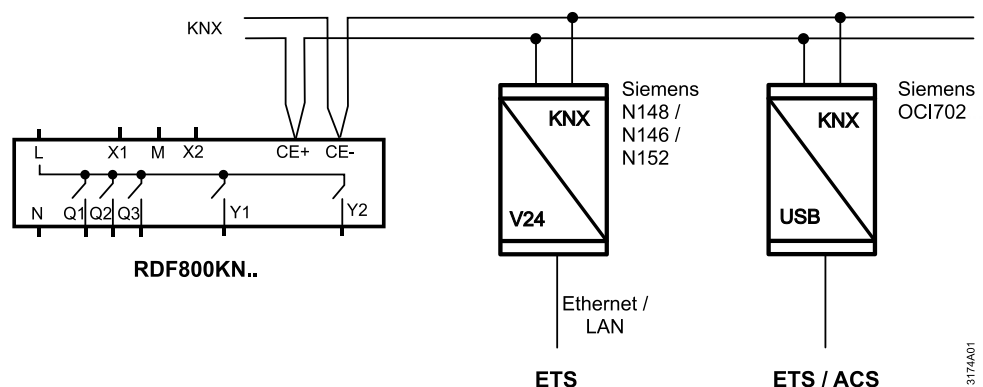
Applications

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
- ETS5

Connect tool

Connect the Synco ACS or ETS5 tools to the KNX bus cable at any point for commissioning:



ACS and ETS5 require an interface:

- Ethernet/LAN KNX interface (such as Siemens N148 / N146 / N152)
- OCI702 USB - KNX interface

Note: An external KNX bus power supply is required if an RDF800KN... is connected directly to a tool (ACS or ETS5) via KNX interface.

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
- ETS5

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 on-time (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 ETS5.

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

Assign KNX group addresses

Use ETS5 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 device is considered electrical and electronic equipment for disposal in terms of the applicable European Directive and may not be disposed of as domestic garbage.

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

Technical data

 Power supply	Rated voltage	AC 230 V
	Overvoltage category	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 fans, one 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.	
Inputs	Multifunctional input X1-M / X2-M	
	Temperature sensor input:	
	Type	See "Equipment combinations"
	Temperature range	0...49 °C
	Cable length	Max. 80 m
	Digital input:	
	Operating action	Selectable (NO / NC)
	Contact sensing	SELV DC 0...5 V / Max. 5 mA
	Parallel connection of several thermostats for one switch	Max. 20 thermostats per switch
	Insulation against mains voltage (SELV)	4 kV, reinforced insulation
KNX bus	Function of inputs:	
	External temperature sensor, heating/cooling changeover sensor, window contact, presence detection, dewpoint monitor contact, enable electrical heater contact, fault contact, monitoring input	Selectable X1: P38 X2: P40
	Interface type	KNX, TP1-64 (electrically isolated)
	Bus current	5 mA
	Bus topology: See KNX manual (see "Reference documentation")	
	Switching differential, adjustable	
	Heating mode (P30)	2 K (0.5...6K)
	Cooling mode (P31)	1 K (0.5...6K)
	Setpoint setting and range	
	 Comfort (P08)	21 °C (5...40 °C)
Operational data	 Economy (P11-P12)	15 °C / 30°C (OFF, 5...40 °C)
	 Protection (P65-P66)	8 °C / OFF (OFF, 5...40 °C)
	Multifunctional input X1/X2	
	Input X1 default value (P38)	Selectable 0...8, 10 3 (Window contact)
	Input X2 default value (P40)	1 (External temperature sensor)

Environmental conditions	Built-in room temperature sensor	
	Measuring range	0...49 °C
	Accuracy at 25 °C	< ± 0.5 K
	Temperature calibration range	± 3.0 K
	Settings and display resolution	
	Setpoints	0.5 °C
	Current temperature value displayed	0.5 °C
	Storage	As per IEC 60721-3-1
	Climatic conditions	Class 1K3
	Transport	As per IEC 60721-3-2
Standards and directives	Climatic conditions	Class 2K3
	Operation	As per IEC 60721-3-3
	Climatic conditions	Class 3K5 ¹⁾
	EU Conformity (CE)	8000078258 ^{*)}
	RCM	A5W00007436 ^{*)}
	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
Environmental compatibility	Housing flammability class according to UL94	V-0
	The product environmental declaration CB1E3174en ^{*)} (RDF800KN..., RDD810KN/NF), A5W00085843A ^{*)} (RDF800KN/VB) contains data on environmentally compatible product design and assessments (RoHS compliance, materials composition, packaging, environmental benefit, disposal).	
General	Connection terminals	Solid wires or prepared stranded wires 1 x 0.4...1.5 mm ² or 2 x for KNX cables/sensor Min 1.5 mm ²
	Minimal wiring cross section on L, N, Q1, Q2, Q3, Y1, Y2	
	Housing front color	RAL 9001 white RAL 9004 black
	Weight without / with packaging	0.155 kg / 0.255 kg

^{*)} The documents can be downloaded from <http://siemens.com/bt/download>.

¹⁾ No condensation is allowed.

Reference

documentation

Synco

Desigo

Handbook for Home and Building Control - Basic Principles

(https://my.knx.org/shop/product?language=en&product_type_category=books&product_type=handbook)

CE1P3127 Communication via the KNX bus for Synco 700, 900 and RXB/RXL

Basic documentation

CM1Y9775 Desigo RXB integration – S-mode

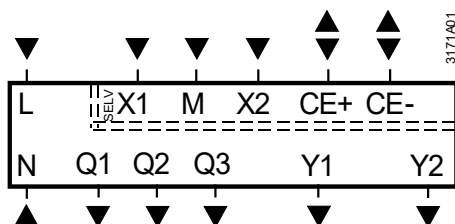
CM1Y9776 Desigo RXB / RXL integration – individual addressing

CM1Y9777 Third-party integration

CM1Y9778 Synco integration

CM1Y9779 Working with ETS

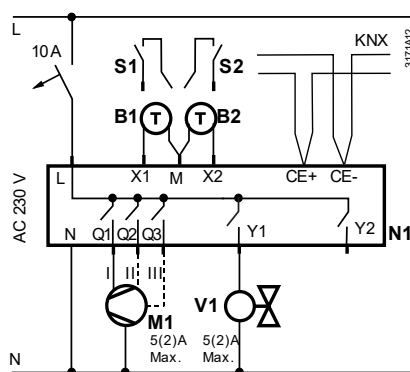
Connection terminals



L, N	Operating voltage AC 230 V
Q1	Control output "Fan speed 1 AC 230 V"
Q2	Control output "Fan speed 2 AC 230 V"
Q3	Control output "Fan speed 3 AC 230 V"
Y1, Y2	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)
M	Measuring neutral for sensor and switch
CE+	KNX data +
CE-	KNX data -

Connection diagrams

Application



N1	Room thermostat RDF800KN...
M1	1- or 3-speed fan
V1	Valve actuator, 2- or 3-position
V1, V2	Valve actuator, 2-position
E1	Electric heater
C1, C2	1-stage compressor
S1, S2	Switch (keycard, window contact, presence detector, etc.)
B1, B2	Temperature sensor (return air temperature, external room temperature, changeover sensor, etc.)
CE+	KNX data +
CE-	KNX data -

2-pipe / heating or cooling – ON/OFF

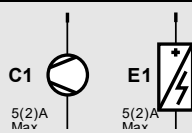
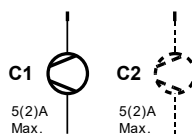
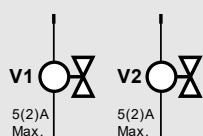
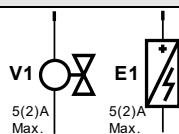
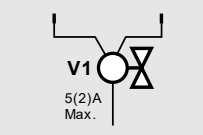
2-pipe, / heating or cooling – 3-position
– Y1 = Open
– Y2 = Close

2-pipe and el. heater/
Heating or cooling and el. heater

4-pipe /
Heating and radiator
– V1 = Heating
– V2 = Cooling

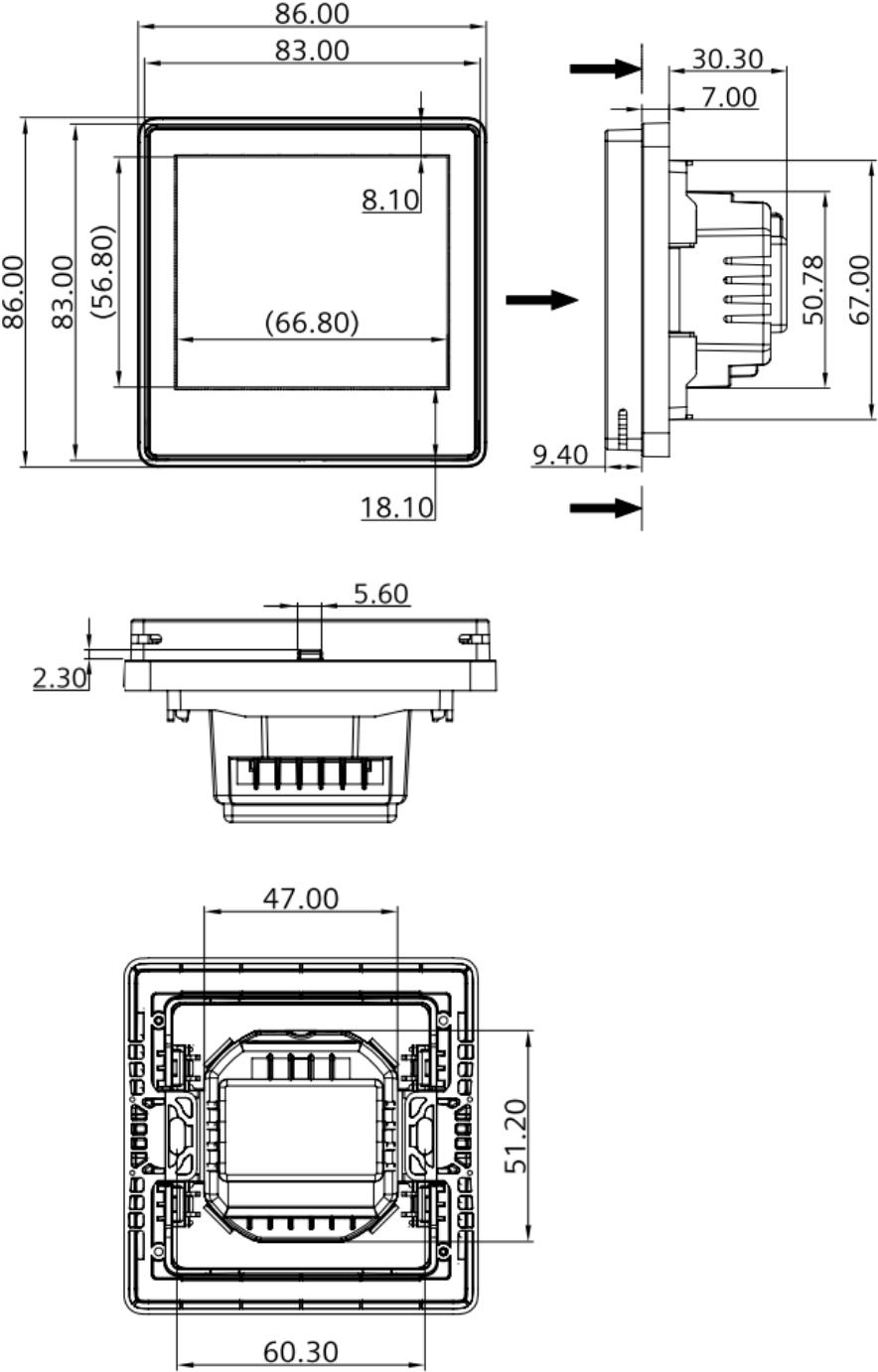
1-stage compressor
– C1 = Heating and / or
– C2 = Cooling

1-stage compressor and electric heater

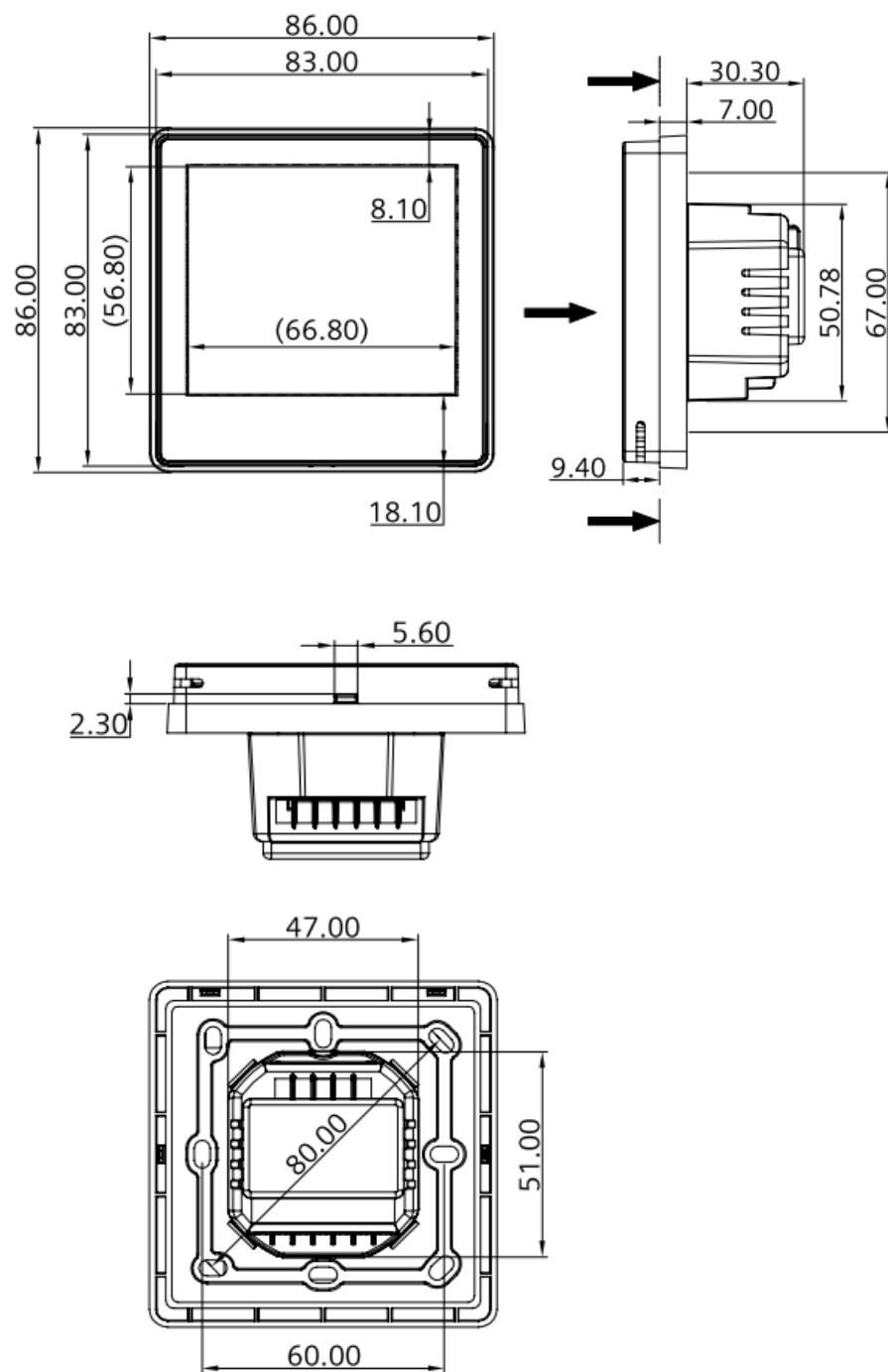


Dimensions (mm)

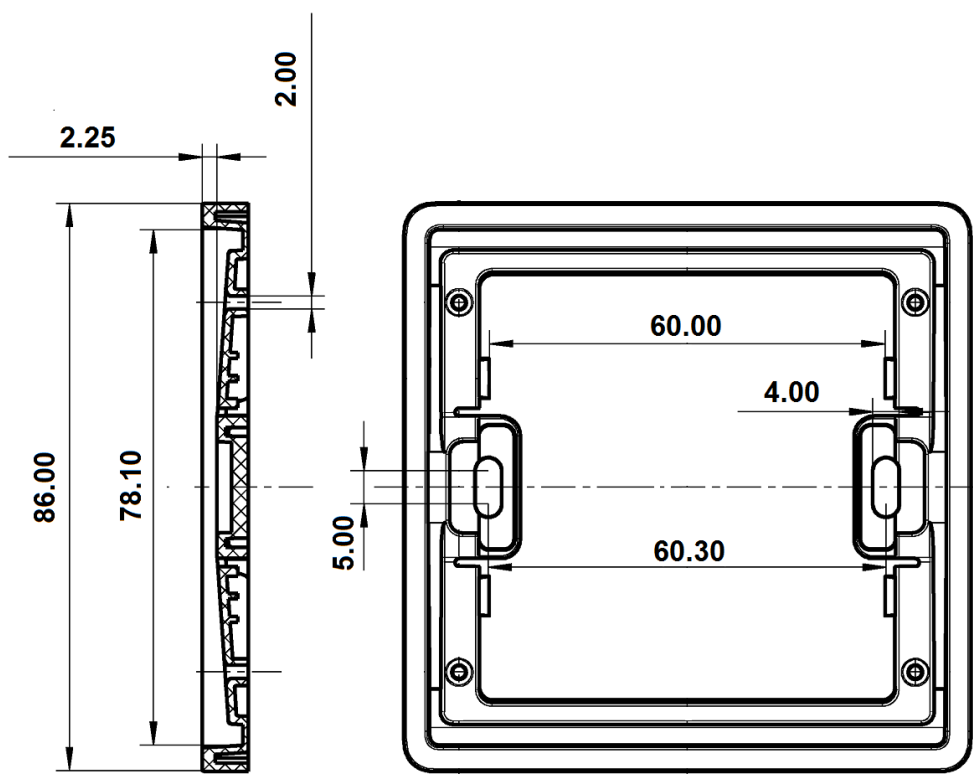
RDF800KN/NF
for square conduit
boxes only



**RDF800KN,
RDF800KN/VB
for round
conduit boxes**



ARG800.1 single
mounting frame for
RDF800KN/NF





Room thermostats with KNX communications

RDG100KN
RDG160KN
RDG165KN

- For fan coil unit applications
- For universal applications
- For use with compressor in DX type equipment

-
- **KNX bus communication (S-mode and LTE mode)**
 - **Backlit display**
 - **2P/PI/P control**
 - **Outputs for On/Off, PWM, 3-position or DC 0...10 V control**
 - **Outputs for 3-speed, 1-speed, or DC (DC 0...10 V) fan**
 - **3 multifunctional inputs for keycard contact, external sensor, etc.**
 - **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**
 - **Selectable relay output functions (RDG16..KN)**
 - **Built-in humidity sensor and humidity control (RDG165KN)**
 - **Adjustable commissioning and control parameters**
 - **Commissioning with Synco ACS, ETS or via local HMI**
 - **Integration into Synco**
 - **Integration into Desigo via group addressing (ETS) or via individual addressing**
 - **Integration into third-party system via group addressing (ETS)**
 - **Operating voltage:**
 - RDG100KN: AC 230 V**
 - RDG16..KN: AC 24 V**

The RDG1.. KNX room thermostats are designed for use with the following types of system:

Fan coil units via On/Off or modulating/DC control outputs:

- 2-pipe system
- 2-pipe system with electric heater
- 2-pipe system and radiator/floor heating
- 4-pipe system
- 4-pipe system with electric heater (RDG100KN)
- 2-stage heating or cooling system
- 4-pipe system with combi valve (PICV) and a 6-port ball valve as changeover (RDG160KN SW version \geq V2.04, Index J)

Chilled/heated ceilings (or radiators) via On/Off or modulating/DC control outputs:

- Chilled/heated ceiling
- Chilled/heated ceiling with electric heater
- Chilled/heated ceiling and radiator/floor heating
- Chilled ceiling and radiator/floor heating
- Chilled/heated ceiling, 2-stage cooling or heating
- Chilled/heated ceiling with 6-port ball valve (RDG160KN version \geq V1.14)
- Chilled/heated ceiling with PICV valve and a 6-port ball valve as changeover (RDG160KN version \geq V1.14)

Compressor applications via On/Off control (RDG16..KN):

- Heating or cooling, compressors in DX-type equipment
- Heating or cooling, compressors in DX-type equipment with electric heater
- Heating or cooling, compressors in DX-type equipment
- 2-stage heating or cooling, compressors in DX-type equipment

The RDG100KN controls...

- One 1-speed or 3-speed fan
- One or two On/Off, PWM, or 3-position valve actuators
- One valve actuator and one electric heater/radiator

The RDG16..KN controls...

- One 1-speed, 3-speed or DC 0...10 V fan
- One or two On/Off valve actuators, electric heater, or radiator with DC fan
- One or two DC valve actuators, electric heater, or radiator with DC fan
- One or two DC valve actuators, electric heater, or radiator with 1-speed or 3-speed fan
- One On/Off valve actuator, one DC valve actuator with DC fan
- 1-stage or 2-stage compressor in DX-type equipment, with electric heater/radiator

Used in systems with:

- Heating or cooling mode
- Automatic heating/cooling changeover
- Manual heating/cooling changeover
- Heating and cooling mode (e.g. 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
- ETS
- Local DIP switch and HMI

- Room temperature control via built-in temperature sensor or external room temperature/return air temperature sensor
- Minimum/maximum humidity control by shifting temperature setpoint and releasing contact for dehumidifier/humidifier (RDG165KN)
- Changeover between heating and cooling mode (automatic via local sensor or bus, or manually)
- Selection of applications via DIP switches or commissioning tool (ACS, ETS)
- Parameters download with commissioning tool (ACS, ETS)
- Selection of operating modes via operating mode button
- Temporary Comfort mode extension
- 1-speed, 3-speed or DC 0...10 V fan control (automatically or manually)
- Display of current room temperature or setpoint in °C or °F
- Minimum and maximum limitation of room temperature setpoint
- Button lock (automatically or manually)
- 3 multifunctional inputs, selectable for:
 - Operating mode switchover contact (keycard, window contact, etc.)
 - Window contact switches operating mode to Protection (RDG16..KN)
 - Presence detector switches operating mode to Comfort (RDG16..KN)
 - Sensor for automatic heating/cooling changeover
 - External room temperature or return air temperature sensor
 - Dewpoint sensor
 - Electric heater enable
 - Fault input
 - Monitor input for temperature sensor or switch status
 - Supply air temperature sensor (RDG16..KN)
- Advanced fan control function, e.g. fan kick, fan start delay, selectable fan operation (enable, disable or depending on heating/cooling mode)
- Purge function together with 2-port valve
- Reminder to clean fan filters (P62)
- Floor heating temperature limitation
- Minimum and maximum supply air temperature limitation (RDG16..KN)
- Interworking with AQR and QMX sensor for room humidity and room temperature measurement (RDG165KN)
- Interworking with QMX room operator units for room humidity, room temperature and operating commands for fan, operating mode and setpoints (RDG165KN)
- Swap function for 2-pipe and 2-stage application by switching the 1st stage heating to the 2nd stage cooling (RDG165KN)
- Enabling fan output only in the 2nd stage (RDG165KN)
- Control 6-port ball valve for chilled and heated ceiling, DC 0...10 V, DC 2...10 V and inverted signals DC 10...0V, DC 10...2 V (RDG160KN)
- Control 6-port ball valve as changeover (on/off – open/close signal) and combi valve (PICV) DC 0...10V for
 - Chilled and heated ceiling (RDG160KN)
 - Fan coil application (RDG160KN SW version ≥ 2.04)
- Control of 6-port ball valve via KNX S-mode objects (RDG160KN)
- Flow limitation function for combi valve (PICV) in heating mode (RDG160KN SW version ≥ 2.04)
- Selectable relay functions (RDG16..KN):
 - Switching off external equipment during Protection mode
 - Switching on external equipment (e.g. pump) during heating/cooling mode
 - Output status heating/cooling sequence
 - Dehumidification/humidification control output (RDG165KN)
- Reload factory settings for commissioning and control parameters
- KNX bus (terminals CE+ and CE-) for communication with Synco or KNX compatible devices
- Display of outside temperature or time of day via KNX bus

- Time scheduling and central control of setpoints via KNX bus
- Control of Economy setpoints via KNX bus (RDG16..KN)
- Energy supply optimization via energy demand signal with a Synco RMB795B central control unit
- Master/slave KNX S-Mode (RDG160KN SW version ≥ 2.04)

Applications

The RDG1..KN room thermostats support the following applications, which can be configured using the DIP switches at the rear of the unit or a commissioning tool.

Remote configuration

Set DIP switches 1...3 to OFF (remote configuration, factory setting) to select an application via commissioning tool.

Remote configuration, via commissioning tool (factory setting)	DIP switches
<ul style="list-style-type: none"> • Synco ACS • ETS 	
	<div style="display: flex; justify-content: space-around;"> <div>ON</div> <div>OFF</div> </div> <div style="display: flex; justify-content: space-around;"> <div>1</div> <div>2</div> <div>3</div> <div>4</div> <div>5</div> </div>

Notes **RDG100KN**

- Use P46/P47 to change the control output from On/Off (factory setting) to PWM
- Use DIP switches 4 and 5 to change the control output from On/Off to 3-position

RDG16..KN

- Use P46/P47 to change the valve actuator output from DC (factory setting) to On/Off
- Use DIP switch 4 to change the fan output from DC (factory setting) to 3-speed

Applications for fan coil systems

Applications, DIP setting, control outputs		
<ul style="list-style-type: none"> 2-pipe fan coil unit <p>Using RDG100KN, RDG16..KN</p>	<ul style="list-style-type: none"> 2-pipe fan coil unit and electric heater <p>Using RDG100KN, RDG16..KN</p>	<ul style="list-style-type: none"> 2-pipe fan coil unit and radiator/floor heating <p>Using RDG100KN, RDG16..KN</p>
<ul style="list-style-type: none"> 2-pipe/2-stage fan coil unit <p>Using RDG100KN, RDG16..KN</p>	<ul style="list-style-type: none"> 4-pipe fan coil unit <p>Using RDG100KN, RDG16..KN</p>	<ul style="list-style-type: none"> 4-pipe fan coil unit and electric heater <p>Using RDG100KN</p>
<ul style="list-style-type: none"> 4-pipe fan coil unit with PICV and 6-port ball valve as change over <p>Using RDG160KN (version ≥ V2.04)</p>		

YHC..	Heating/cooling valve actuator	M1	1-speed or 3-speed fan
YH	Heating valve actuator	B1	Return air temperature sensor or external room temperature sensor (optional)
YC	Cooling valve actuator		
YE	Electric heater	B2	Changeover sensor (optional)

Product no.	Control outputs	Fan
RDG100KN	On/Off, PWM, 3-position	3-speed, 1-speed
RDG16..KN	DC 0...10 V	3-speed, 1-speed, DC 0...10 V
	On/Off	DC 0...10 V

Applications for Universal systems

Applications, DIP setting, control outputs								
<div><div><div>• Chilled/heated ceiling</div><div><div><div>ON</div><div>OFF</div></div><div><div>1</div><div>2</div><div>3</div><div>4</div><div>5</div></div></div><div><div>3191S11</div></div></div><div>Using RDG100KN, RDG16..KN</div></div>	<div><div><div>• Chilled/heated ceiling and electric heater</div><div><div><div>ON</div><div>OFF</div></div><div><div>1</div><div>2</div><div>3</div><div>4</div><div>5</div></div></div><div><div>3191S12</div></div></div><div>Using RDG100KN, RDG16..KN</div></div>	<div><div><div>• Chilled/heated ceiling and radiator/ floor heating</div><div><div><div>ON</div><div>OFF</div></div><div><div>1</div><div>2</div><div>3</div><div>4</div><div>5</div></div></div><div><div>3191S14</div></div></div><div>Using RDG100KN, RDG16..KN</div></div>						
<div><div><div>• 2-stage chilled/ heated ceiling</div><div><div><div>ON</div><div>OFF</div></div><div><div>1</div><div>2</div><div>3</div><div>4</div><div>5</div></div></div><div><div>3191S15</div></div></div><div>Using RDG100KN, RDG16..KN</div></div>	<div><div><div>• Chilled ceiling and radiator</div><div><div><div>ON</div><div>OFF</div></div><div><div>1</div><div>2</div><div>3</div><div>4</div><div>5</div></div></div><div><div>3191S13</div></div></div><div>Using RDG100KN, RDG16..KN</div></div>	<div><div><div>• Chilled and heated ceiling control with 6- port ball valve</div><div><div><div>ON</div><div>OFF</div></div><div><div>1</div><div>2</div><div>3</div><div>4</div><div>5</div></div></div><div><div>P01=5</div><div>3191S16</div></div></div><div>Using RDG160KN (version ≥ V1.14)</div></div>						
<div><div><div>• Chilled and heated ceiling control with PICV and 6-port ball valve as change over</div><div><div><div>ON</div><div>OFF</div></div><div><div>1</div><div>2</div><div>3</div><div>4</div><div>5</div></div></div><div><div>P01=6</div><div>3191S17</div></div></div><div>Using RDG160KN (version ≥ V1.14)</div></div>	<div><div>YHC.. Heating/cooling valve actuator</div><div>YH Heating valve actuator</div><div>YC Cooling valve actuator</div><div>YE Electric heater</div><div>D3 Dewpoint sensor</div><div>M1 1-speed or 3-speed fan</div><div>B1 Return air temperature sensor or external room temperature sensor (optional)</div><div>B2 Changeover sensor (optional)</div></div> <table><tr><th>Product no.</th><th>Control outputs</th></tr><tr><td>RDG100KN</td><td>On/Off, PWM, 3-position</td></tr><tr><td>RDG16..KN</td><td>On/Off, DC 0...10 V</td></tr></table>		Product no.	Control outputs	RDG100KN	On/Off, PWM, 3-position	RDG16..KN	On/Off, DC 0...10 V
Product no.	Control outputs							
RDG100KN	On/Off, PWM, 3-position							
RDG16..KN	On/Off, DC 0...10 V							

Applications for heat pump systems (RDG16..KN)

Applications, DIP setting, control outputs

• Heated or cooled with compressors

ON

OFF

1

2

3

4

5

3181S31

D3

B1

N1

Using RDG16..KN

• Heated or cooled with compressors, with electric heater

ON

OFF

1

2

3

4

5

3181S32

D3

B1

YE

N1

Using RDG16..KN

• Heated and cooled with compressors

ON

OFF

1

2

3

4

5

3181S35

D3

B1

N1

Using RDG16..KN

• 2-stage heated or cooled with compressors

ON

OFF

1

2

3

4

5

3181S36

D3

B1

2

N1

Using RDG16..KN

N1 Thermostat
Output Y10/Q1: Heating or heating/cooling
Output Y20/Q2: Cooling only (heating/cooling)
YE Electric heater

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

Product no.	Control outputs	Fan
RDG16..KN	On/Off, DC 0...10 V	Disabled, DC 0...10 V

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Type summary

Product no.	Stock no.	Features								
		Operating voltage	Number of control outputs				Fan		Humidity	Backlit LCD
			On/Off	PWM	3-pos.	DC	3-speed	DC		
RDG100KN	S55770-T163	AC 230 V	3 ¹⁾	2 ¹⁾	2 ¹⁾		✓			✓
RDG160KN	S55770-T297	AC 24 V	2 ²⁾			2 ²⁾		✓		✓
						2	✓ ³⁾			
RDG165KN	S55770-T347	AC 24 V	2 ²⁾			2 ²⁾		✓	✓	✓
						2	✓ ³⁾		✓ ⁴⁾	













¹⁾ Selectable: On/Off, PWM or 3-position (triac outputs)

²⁾ On/Off or DC control signal








³⁾ 3-speed fan selectable only via DC control outputs

⁴⁾ Release contact dehumidifier via external DC – On/Off converter










Equipment combinations

	Description		Product no.	Data Sheet*)
	Cable temperature 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
	Condensation monitor		QXA21..	A6V10741072
	Flush-mount KNX room sensor (Base and front module)		AQR2570N.. AQR2532NNW AQR2533NNW AQR2535NNW	1411
	Wall-mounted KNX sensors		QMX3.P30 QMX3.P70	1602
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..	A6V11251892
	Zone valve actuator (only available in AP, UAE, SA and IN)		SUA..	4832
On/Off and PWM actuators ¹⁾	Thermal actuator (for radiator valves) AC 230 V, NO		STA23.. ¹⁾	4884
	Thermal actuator (for radiator valves) AC 24 V, NO		STA73.. ¹⁾	4884
	Thermal actuator AC 230 V (for small valves 2.5 mm), NC		STP23.. ¹⁾	4884
	Thermal actuator AC 24 V (for small valves 2.5 mm), NC		STP73.. ¹⁾	4884

3-position actuators

Electrical actuator, 3-position (for radiator valves)		SSA31..	4893
Electrical actuator, 3-position (for 2- and 3-port valves/V..P45)		SSC31	4895
Electrical actuator, 3-position (for small valves 2.5 mm)		SSP31..	4864
Electrical actuator, 3-position (for small valves 5.5 mm)		SSB31..	4891
Electrical actuator, 3-position (for small valve 5 mm)		SSD31..	4861
Electromotoric actuator, 3-position (for valves 5.5 mm)		SAS31..	4581
Rotary actuators for ball valves 3-position		GDB331.9E	4657

DC 0...10 V actuators

Electrical actuator, DC 0...10 V (for radiator valves)		SSA61..	4893
Electrical actuator, DC 0...10 V (for 2- and 3-port valves/V..P45)		SSC61..	4895
Electrical actuator, DC 0...10 V (for small valves 2.5 mm)		SSP61..	4864
Electrical actuator, DC 0...10 V (for small valves 5.5 mm)		SSB61..	4891
Electromotoric actuator, DC 0...10 V (for valves 5.5 mm)		SAS61..	4581
Electrothermal actuator, AC 24 V, NC, DC 0...10 V, 1 m		STA63	4884
Electrothermal actuator, AC 24 V, NO, DC 0...10 V, 1 m		STP63	4884
Rotary actuators for ball valves AC 24 V, DC 0...10 V		GDB161.9E	4657
Rotary actuators for ball valves KNX S-Mode		GDB111.9E/KN	A6V1072 5318

*) The documents can be downloaded from <http://siemens.com/bt/download>.

¹⁾ With PWM control, it is not possible to ensure exact parallel running of 2 or more thermal actuators. If several fan-coil systems are controlled by the same room thermostat, preference should be given to motorized actuators with On/Off or 3-position control.

Note

For more information about parallel operation and the maximum number of actuators that can be used, refer to the Data Sheets of the selected type of actuator and the following list:

Maximum number of actuators in parallel on the RDG100KN:

- 6 SS..31.. actuators (3-position)
- 4 ST..23.. if used with On/Off control signal
- 10 SFA.., SUA.., MVI.., MXI.. On/Off actuators
- Parallel operation of SAS31 is not available
- GDB331.9E

Maximum number of actuators in parallel on the RDG16..KN:

- 10 SS..61.. actuators (DC)
- 10 ST..23/63/73.. actuators (DC or On/Off)
- 10 SFA.., SUA.., MVI.., MXI.. On/Off actuators
- 10 SAS61.. actuators (DC)
- 10 GDB161.9E

Accessories

Description	Product/stock no.	Data Sheet
KNX power supply 160 mA (Siemens BT LV)	5WG1 125-1AB02	--
KNX power supply 320 mA (Siemens BT LV)	5WG1 125-1AB12	--
KNX power supply 640 mA (Siemens BT LV)	5WG1 125-1AB22	--

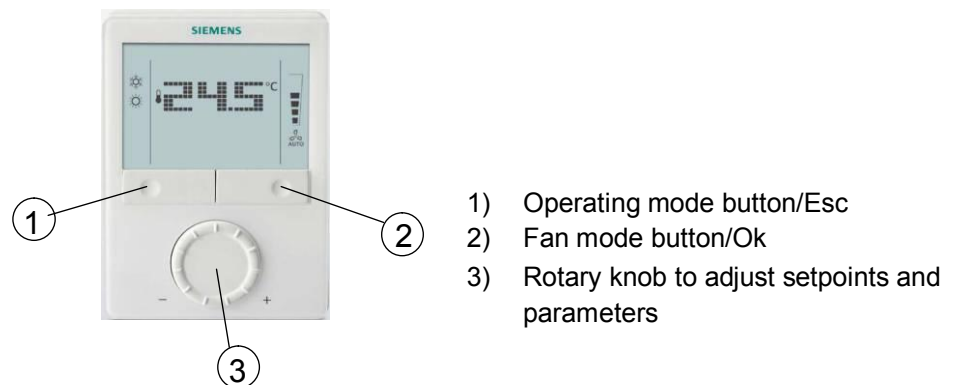
Mechanical design

The room thermostat consists of two parts:

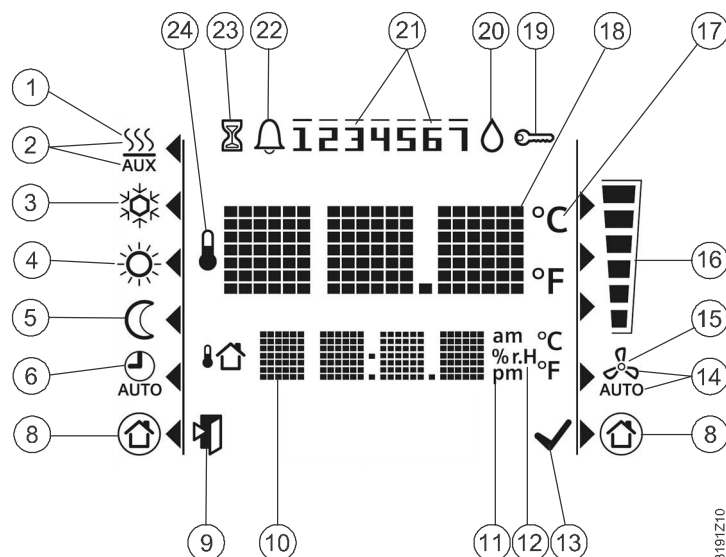
- Plastic housing with electronics, operating elements and room temperature sensor
- Mounting plate with the screw terminals

The housing engages in the mounting plate and is secured with 2 screws.

Operation and settings



Display

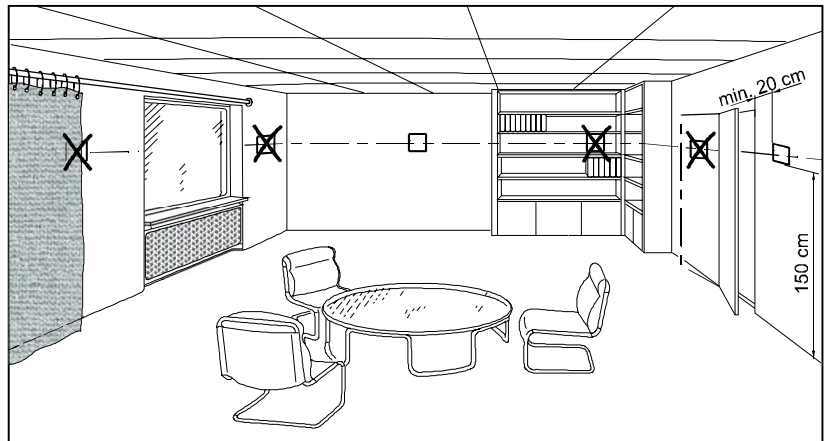


#	Symbol	Description	#	Symbol	Description
1		Heating mode	15		Manual fan
2		Heating mode, electric heater active	16		Fan speed I
3		Cooling mode			Fan speed II
4		Comfort mode			Fan speed III
5		Economy mode	17		Degrees Celsius Degrees Fahrenheit
6		Auto timer mode according to schedule (via bus)	18		Digits for room temperature and setpoint display
8		Protection mode	19		Button lock
9		Escape	20		Condensation in room (dewpoint sensor active) or humidity control active
10		Additional user information, such as outside temperature, or time of day from KNX bus, or relative humidity (RDG165KN only) Selectable via parameters	21		Weekday 1...7 from KNX bus 1 = Monday/7 = Sunday
11		Morning: 12-hour format Afternoon: 12-hour format	22		Fault
12		Relative humidity (RDG165KN only)	23		"Temporary timer" function; visible-displays when operating mode is temporarily extended (extended presence or absence)
13		Confirmation of parameters	24		Indicates that room temperature is displayed
14		Automatic fan			

See the "Reference documentation" on page 19 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

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



Mounting



- Mount the room thermostat on a clean, dry indoor place without direct airflow from a heating/cooling device, and not exposed to drips or splash water. See Mounting Instructions M3191, M3191.1 or M3191.2 enclosed with the thermostat.

Wiring



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

Warning!

No internal line protection for supply lines to external consumers (Q1, Q2, Q3, Yx or Yxx)!

Risk of fire and injury due to short-circuits!

- Adapt the line diameters as per local regulations to the rated value of the installed overcurrent protection device
- The AC 230 V mains supply line must have an external 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
- Inputs X1-M, X2-M or D1-GND: several switches (e.g. summer/winter switch) may be connected in parallel. Consider overall maximum contact sensing current for switch rating
- Inputs X1-M and X2-M carry mains potential (RDG100KN only). Sensor cables must be suited for AC 230 V mains voltage
- Selectable relay function (RDG16..KN): Follow instructions in Basic Documentation P3191 to connect external equipment to the relay outputs
- Isolate the cables of input D1-GND and KNX communication input CE+/CE- for AC 230 V if the conduit box carries AC 230 V mains voltage
- Disconnect from power supply before removing from the mounting plate
- If a KNX bus power supply is connected to the line with communicating thermostats and Synco controller, the internal KNX power supply of the Synco controllers must be switched off



Commissioning notes

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 switches and HMI
- Synco ACS
 - Version 5.11 or higher (for RDG1..0KN)
 - Version 8.32 or higher (for RDG165KN)
- ETS4 or higher versions

DIP switches

Set the DIP switches before snapping the thermostat to the mounting plate, if you want to select an application via DIP switches.

Set all DIP switches to OFF (remote configuration) if you want to select an application via commissioning tool.

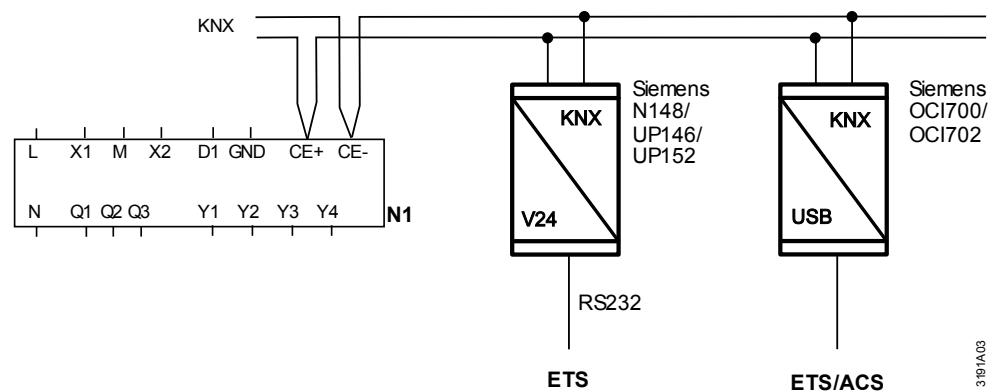
After power is applied, the thermostat resets and all LCD segments flash, indicating that the reset was correct. After the reset, which takes about 3 seconds, the thermostat is ready for commissioning by qualified HVAC staff.

If all DIP switches are OFF, **NO APPL** displays, indicating that application commissioning via a tool is required.

Note Each time the application is changed, the thermostat reloads the factory setting for all control parameters, except for KNX device and zone addresses!

Connect tools

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



ACS and ETS require an interface:

- RS232 KNX interface (e.g. Siemens N148/UP146/UP152)
- OCI700, OCI702 USB- KNX interface

Note An external KNX bus power supply is required if an RDG1..KN is connected directly to a tool (ACS or ETS) via KNX interface.

Control parameters

The thermostat's control parameters can be set to ensure optimum performance of the entire system (see basic documentation P3191).

The parameters can be adjusted using

- Local HMI
- Synco ACS
- ETS

Control sequence

- Set the control sequence via parameter P01 depending on the application. The factory setting is as follows:

Application	Factory setting P01
2-pipe and chilled/heated ceiling, and 2-stage	1 = cooling only
4-pipe, chilled ceiling and radiator	4 = heating and cooling

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 (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.

Press both the left and right buttons simultaneously for 6 seconds to activate programming mode, which is indicated on the display with **PrO9**.

Programming mode remains active until thermostat identification is complete.

Assign KNX device address

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

Set the device address to 255, and then the communication is deactivated (no exchange of process data).

Assign KNX group addresses

Use ETS to assign the KNX group addresses of the thermostat's communication objects.

KNX serial number

Each device has a unique KNX serial number at the rear.

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 device is considered electrical and electronic equipment for disposal in terms of the applicable European Directive and may not be disposed of as domestic garbage.

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

Technical data

RDG100KN

 Power supply

Rated voltage AC 230 V
Frequency 50/60 Hz
Power consumption Max. 8 VA/1 W



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) 5 mA...5(4) A



No internal fuse!

External preliminary protection with max. C 10 A circuit breaker in the supply line required under all circumstances



Note!

Do NOT connect fans in parallel!

Connect one fan directly, for additional fans, one relay for each speed.

Control outputs Solid state (triacs)
Y1, Y2, Y3, Y4-N AC 230 V, 8 mA...1 A
Power limitation 3 A fast microfuse, cannot be exchanged

Inputs


Multifunctional inputs

X1-M/X2-M

Temperature sensor input

Type QAH11.1 (NTC)
Temperature range 0...49 °C
Cable length Max. 80 m

Digital input

Operating action Selectable (NO/NC)
Contact sensing DC 0...5 V, max. 5 mA
Parallel connection of several thermostats for one switch Max. 20 thermostats per switch. **Do not mix with D1!**
Insulation against mains N/A, mains potential 

D1-GND

Operating action Selectable (NO/NC)
Contact sensing SELV DC 6...15 V, 3...6 mA
Parallel connection of several thermostats for one switch Max. 20 thermostats per switch.
Do not mix with X1/X2!
Insulation against mains 3.75 kV, reinforced insulation

Function of inputs

Selectable

External temperature sensor, heating/cooling X1: P38
changeover sensor, operating mode switchover X2: P40
contact, dewpoint monitor contact, enable electric D1: P42
heater contact, fault contact, monitoring input

RDG16..KN

 Power supply

Rated voltage AC 24 V
DC 24 V: Make sure to connect G to + and G0 to -
Frequency 50/60 Hz
Power consumption Max. 2 VA/2 W



No internal fuse!

External preliminary protection with max. C 10 A circuit breaker required in all cases.

Outputs

Q1/Q2/Q3/L-N (relay) AC 24...230 V

Use for 3-speed fan control

Rating min, max resistive (inductive) 5 mA...5(4) A

 Note!

Do NOT connect fans in parallel!

Connect one fan directly, for additional fans, one relay for each speed.

Use for actuator control (Q1, Q2)

Q1 - rating min, max resistive/inductive 5 mA...1 A

Q2 - rating min, max resistive/inductive 5 mA...5(4) A

Max total load current Q1+Q2+Q3 5 A

Use for external equipment (Q1, Q2, Q3)

Rating min, max resistive/inductive Qx 5 mA...1 A

Max total load current Q1+Q2+Q3 2 A



No internal fuse!

External preliminary protection with max. C 10 A circuit breaker in the supply line required under all circumstances

ECM fan control Y50-G0 SELV DC 0...10 V,
Max. ±5 mA

Actuator control Y10-G0/Y20-G0 (G) SELV DC 0...10 V,
Max. ±1 mA

Inputs

Multifunctional inputs SELV

X1-M/X2-M

Temperature sensor input

Type QAH11.1 (NTC)

Temperature range 0...49 °C

Cable length Max. 80 m

Digital input

Operating action Selectable (NO/NC)

Contact sensing DC 0...5 V, max. 5 mA

Parallel connection of several thermostats for one switch Max. 20 thermostats per switch

D1-GND

Operating action Selectable (NO/NC)

Contact sensing DC 6...15 V, 3...6 mA

Parallel connection of several thermostats for one switch Max. 20 thermostats per switch.

Function of inputs

Selectable

External room temperature sensor, heating/cooling X1: P38

changeover sensor, operating mode switchover X2: P40



contact, dewpoint monitor contact, enable electric D1: P42

heater contact, fault contact, monitoring input,

supply air temperature

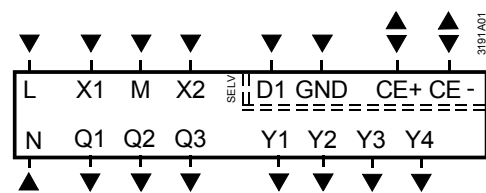
RDG100KN, RDG16..KN

KNX bus	Interface type	KNX, TP1-64 (electrically isolated)
	Bus current (RDG160KN ≥ Index J RDG165KN ≥ Index F) RDG100KN ≥ Index J) Older versions	5 mA 20 mA
Operational data	Bus topology: See KNX manual ("Reference documentation" on page 19)	
	Switching differential, adjustable	
	Heating mode	(P30) 2 K (0.5...6 K)
	Cooling mode	(P31) 1 K (0.5...6 K)
	Setpoint setting and setpoint range	
	☀ Comfort mode	(P08) 21 °C (5...40 °C)
	Ⓢ Economy mode	(P11-P12) 15 °C/30 °C (OFF, 5..40 °C)
	Ⓢ Protection mode	(P65-P66) 8 °C/OFF (OFF, 5..40 °C)
	Multifunctional inputs X1/X2/D1	Selectable (0...8)
	Input X1 default value	(P38) 1 (ext. temperature sensor, room or return air)
	Input X2 default value	(P40) 0 (no function)
	Input D1 default value	(P42) 3 (Operating mode switchover)
	Built-in room temperature sensor	
	Measuring range	0...49 °C
	Accuracy at 25 °C	< ± 0.5 K
	Temperature calibration range	± 3.0 K
Environmental conditions	Built-in humidity sensor (RDG165KN)	
	Measuring range	10...90 %
	Accuracy (after calibration via P23)	< 5%
	Humidity calibration range	± 10%
	Settings and display resolution	
	Setpoints	0.5 °C
	Current temperature value displayed	0.5 °C
	Operation	IEC 60721-3-3
	Climatic conditions	Class 3K5
	Temperature	0...50 °C
	Humidity	<95% r.h.
	Transport	IEC 60721-3-2
	Climatic conditions	Class 2K3
	Temperature	-25...65 °C
	Humidity	<95% r.h.
	Mechanical conditions	Class 2M2
Standards and directives	Storage	IEC 60721-3-1
	Climatic conditions	Class 1K3
	Temperature	-25...65 °C
	Humidity	<95% r.h.
	EU conformity (CE)	CE1T3191xx ^{*)} (RDG100KN) CE1T3191xx01 ^{*)} (RDG16..KN)
	Electronic control type	2.B (micro-disconnection on operation)
	RCM conformity	CE1T3191en_C1 ^{*)}
	Safety class	II as per EN60730
	Pollution class	Normal

	Degree of protection of housing	IP30 as per EN60529	
Environmental Compatibility	The product environmental declaration CE1E3181 ^{*)} and CE1E3191 ^{*)} contains data on environmentally compatible product design and assessments (RoHS compliance, materials composition, packaging, environmental benefit, disposal).		
Eco design and labelling directives	Based on EU Regulation 813/2013 (Eco design directive) and 811/2013 (Labelling directive) concerning space heaters, combination heaters, the following classes apply:		
	RDG100KN		
	- Application with On/Off operation of a heater	Class I	value 1%
	- PWM (TPI) room thermostat, for use with On/Off output heaters	Class IV	value 2%
	RDG16..KN		
	- Application with On/Off operation of a heater	Class I	value 1%
	- Modulating room thermostat, for use with modulating heaters	Class V	value 3%
eu.bac 	Meets the requirements for eu.bac certification		
	See product list at: http://www.eubaccert.eu/licences-by-criteria.asp		
	RDG160KN (license 213356)	Energy Efficiency Label	Control accuracy [K]
	Fancoil unit systems (2 pipes, 2 wires) (motorized actuator DC, variable fan speed)	AA	Heating 0.1 Cooling 0.1
	Fancoil unit systems (4 pipes) (thermal actuator, On/Off, variable fan speed)	A	Heating 0.4 Cooling 0.4
General	Connection terminals	Solid wires or stranded wires with wire end sleeves 1 x 0.4...2.5 mm ² or 2 x 0.4...1.5 mm ²	
Caution 	Minimal wiring cross section on L, N, Q1, Q2, Q3, Y1, Y2, Y3, Y4	Min. 1.5 mm ²	
	Housing front color	RAL 9003 white	
	Weight without/with packaging	RDG100KN	0.270 kg/0.380 kg
		RDG16..KN	0.240 kg/0.320 kg
*) The documents can be downloaded from http://siemens.com/bt/download .			
Reference documentation	Handbook for Home and Building Control - Basic Principles (http://www.knx.org/knx-en/training/books-documentation/knx-association-books/index.php)		
Synco	CE1P3127 Communication via the KNX bus for Synco 700, 900 and RXB/RXL Basic documentation		
Desigo	CM1Y9775 Desigo RXB integration – S-mode		
	CM1Y9776 Desigo RXB/RXL integration – individual addressing		
	CM1Y9777 Third-party integration		
	CM1Y9778 Synco integration		
	CM1Y9779 Working with ETS		

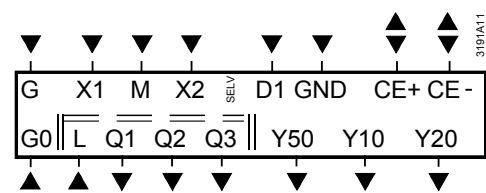
Connection terminals

RDG100KN



- L, N Operating voltage AC 230 V (RDG100KN)
- G, G0 Operating voltage AC 24 V (RDG16..KN)
- L Feed for relays AC 24...230 V (RDG16..KN)
- X1, X2 Multifunctional input for temperature sensor (e.g. QAH11.1) or potential-free switch
Factory setting:
 - X1 = external temperature sensor
 - X2 = no function(function can be selected via parameters P38/P40).

RDG16..KN



- M Measuring neutral for sensors and switches
- D1, GND Multifunctional input for potential-free switch
Factory setting: Operating mode switchover contact (function can be selected via parameter P42).
- Q1 Control output fan speed I AC 230 V
- Q2 Control output fan speed II AC 230 V
- Q3 Control output fan speed III AC 230 V
- Q1...Q3 Also for special functions AC 24...230 V (RDG16..KN)
- Y1...Y4 Control outputs “Valve” AC 230 V (RDG100KN)
(N/O triac, for normally closed valves),
output for electric heater via external relay
- Y10, Y20 Control outputs “Valve” DC 0...10 V (RDG16..KN)
- Y50 Control output “Fan” DC 0...10 V (RDG16..KN)
- CE+ KNX data +
- CE- KNX data –

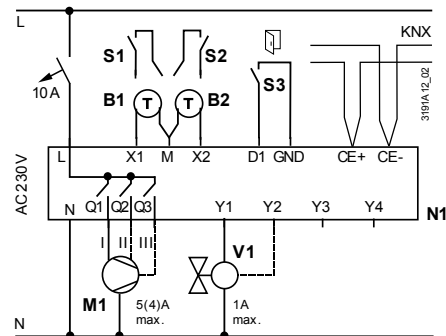
Connection diagrams RDG100KN

Application

V1
↓
V2
↓

- 2-pipe

YHC



- 2-pipe and radiator

YHC

YR

- 4-pipe

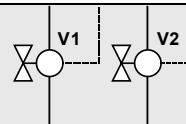
- 2-stage

YH

YC

YHC1

YHC2

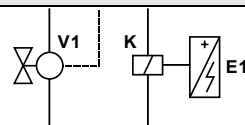


- 2-pipe

and electric heater

YHC

YE



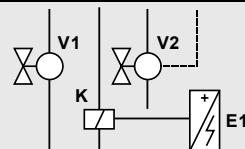
- 4-pipe

and electric heater

YH

YC

YE



N1 Room thermostat RDG100KN
S1, S2 Switch (keycard, window contact, presence detector, etc.)
S3 Switch at SELV input (keycard, window contact)
B1, B2 Temperature sensor (return air temperature, external room temperature, changeover sensor, etc.)
CE+ KNX data +
CE- KNX data -
YHC1/YHC2 1st/2nd stage

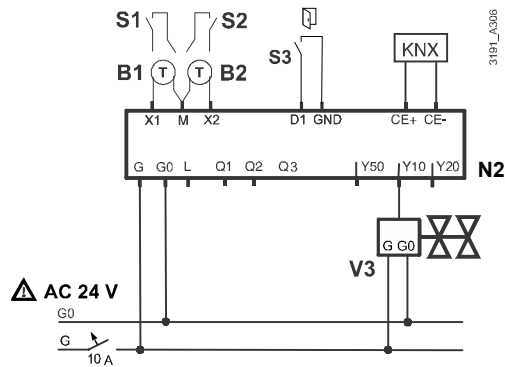
M1 1-speed or 3-speed fan
V1, V2 Valve actuators:
On/Off or PWM, 3-position,
heating, cooling, radiator, heating/cooling, 1st or 2nd stage
YE Electric heater
K Relay
YH Heating valve actuator
YC Cooling valve actuator
YHC Heating/cooling valve actuator
YR Radiator valve actuator

Connection diagrams RDG16..KN

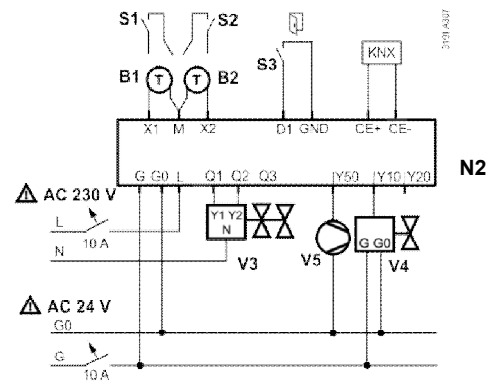
DC 0...10 V fan			1-speed/3-speed fan		
Application	V1	V2			
• 2-pipe	YHC		Y10 Y20		
• 2-pipe and radiator	YHC	YR	Q1 Q2	Y10 Y20	Y10 Y20
• 4-pipe	YH	YC			
• 2-stage	YHC1	YHC2			
Control outputs:	2 x DC				
	1 x DC 1 x On/Off				
	2 x On/Off				
• 2-pipe and electric heater	YHC	YE	Q1 Q2	Y10 Y20	Y10 Y20
Control outputs:	2 x DC				
	1 x DC 1 x On/Off				
	2 x On/Off				
• Compressor 1-stage	C1		Q1 Q2	Y10 Y20	
• Compressor 2-stage	C1	C2			
N1	Room thermostat RDG16..KN		YE	Electric heater	
S1...S3	Switch (keycard, window contact, presence detector, etc.)		M1	1-speed or 3-speed fan, DC 0...10 V fan	
B1, B2	Temperature sensor (return air temperature, external room temperature, changeover sensor, etc.)		V1, V2	Valve actuators: On/Off or DC 0...10 V, heating, cooling, radiator, heating/cooling, 1 st or 2 nd stage	
CE+	KNX data +		YH	Heating valve actuator	
CE-	KNX data -		YC	Cooling valve actuator	
DH	De-Humidifier RDG165KN only		YHC	Heating/cooling valve actuator	
	Q3=On/Off, Y50=0...10V, See P3191.		YR	Radiator valve actuator	
			YHC1/YHC2	1 st /2 nd stage	
			C1/C2	Compressor 1 st /2 nd stage	

6-port ball valve

Application
(RDG160KN
only)



PICV with 6-port ball valve as change over



N2 Room thermostat RDG160KN

S1...S3 Switch (keycard, window contact, presence detector, etc.)

B1, B2 Temperature sensor (return air temperature, external room temperature, changeover sensor, etc.)

V3 6-way modulating control actuator (as DC output)

V4 6-way 3-position control actuator (as H/C changeover control)

V5 PICV control valve

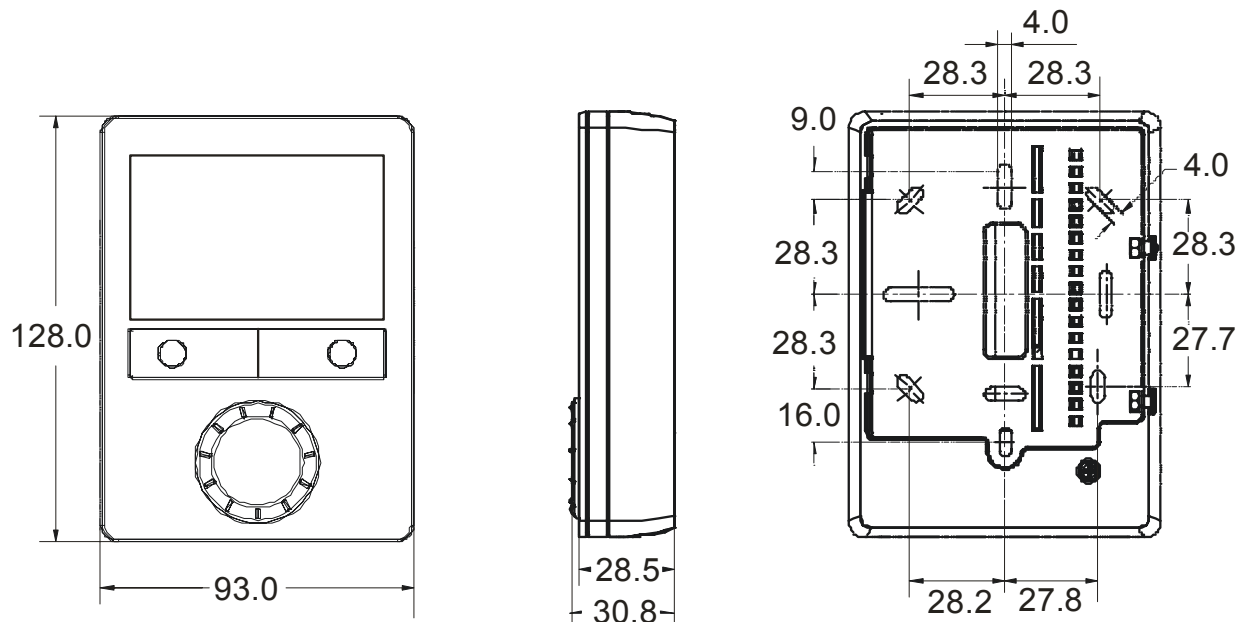
V5 Fan (optional)

CE+ KNX data +

CE- KNX data -

Dimensions

Dimensions in mm





Smart Thermostat

RDS110

To control heating applications in apartments, single family homes, dormitories, and other residential as well as commercial spaces.

-
- Backlit, auto-dimming 90 mm color LCD touch screen for intuitive local operation
 - Mobile app for smartphones
 - Patented¹⁾ self-learning algorithm with PID response
 - Green leaf button for energy-optimized operation
 - Air quality indication via built-in sensor
 - Operate automatically following a scheduler
 - Multifunctional inputs for operating mode switchover contacts, remote sensors, etc.
 - Two relay outputs for heating equipment, humidifier, dehumidifier or domestic hot water boiler
 - Satisfy EU.BAC certification level AA for Home Control and Class IV according to the Eco design directive

1) Patent pending

Room thermostat features

- Direct temperature and operating mode selection
- RoomOptiControl function with Green leaf *) button for energy-optimized operation
- Air quality indication: “Good”, “Okay”, “Poor”
- Temperature setting limitation for use in public spaces
- Screen lock protection against unauthorized access
- Manual switchover between “At home”, “Away” and “Off” on touch screen
- Room temperature control using the built-in temperature sensor or an optional remote sensor
- Optional temperature averaging using an additional remote temperature sensor
- Patented self-learning algorithm with PID response (patent pending) guaranteeing optimum temperature control performance in all room types
- Optimum start control function that advances the switch-on time to ensure the selected setpoint is reached as required
- Floor temperature limitation using a remote sensor in electric floor-heating applications
- Humidity control using the built-in humidity sensor or an optional remote sensor
- Presence detection using a built-in PIR sensor or approach sensor
- Two multifunctional inputs, optional and configurable for:
 - Universal contact
 - Operating mode switchover contact
 - Remote room temperature sensor
 - Floor temperature sensor
 - Outside air temperature sensor
 - Remote humidity sensor
- Two relay outputs for:
 - Heating equipment (see “Use” for examples)
 - Extra output for domestic hot water (DHW) boiler, humidifier or dehumidifier
- Periodic pump/valve operation to protect against seizing
- Navigation wizard for guided, fast commissioning
- Remote firmware upgrade capability

*) The Green leaf indication informs the user that the system provides energy-optimized operation. When the leaf is red, the thermostat setting has been changed. Touch the red leaf to return the setting to energy-optimized operation. See the user guide for more information on this function.

Remote operation and monitoring

- Mobile app for smartphones based on iOS and Android operating systems
- Support “Dark” and “Light” background colors on mobile app
- Manual switchover between “At home”, “Away” and “Off” operating modes on mobile app
- Individual scheduler for each day of the week can be programmed via mobile app with the following operating modes (max. 5 modes per day)
 - “Comfort”: To enjoy comfort and coziness when you are at home.
 - “Economy”: To save energy when maximum comfort is not required, e.g. in the evening or at night.
 - “Unoccupied”: To save energy costs by reducing the temperature setpoint, e.g. when the room is unoccupied.
- Individual scheduler for domestic hot water boiler
- User account management


- Monitoring of temperature and humidity
- Monitoring of indoor air quality: “Good”, “Okay”, “Poor”
- Secure access and data transmission with the Siemens Cloud Computing Platform

Use

The RDS110 is designed to control heating applications in apartments, single family homes, dormitories, and other residential as well as commercial spaces.

RDS110 controls the following plant components:

- Gas boiler
- Radiator with valve
- Radiator with pump
- Electric floor heating
- Fan with electric heating
- Floor heating with valve
- Floor heating with pump
- Electric radiator
- Electric boiler
- Generic heating device

	NOTICE
	When selecting the gas boiler application, ensure a hydronic heating is used. The RDS110.R is not calibrated for use in combination with a gas-fired ducted heating system.

In addition, an external relay is available to optionally control a domestic hot water (DHW) boiler, humidifier or dehumidifier.

Two multifunctional inputs, optional and configurable for:

- Operating mode switchover contact
 - The operating mode can change according to contact status.
- Remote room temperature sensor
 - The remote temperature sensor can acquire the current room temperature. If the sensor input signal is lost, the thermostat controls the room according to the internal sensor.
- Floor temperature sensor
 - The floor heating limitation function prevents the floor temperature from exceeding a preset value.
- Outside air temperature sensor
 - The outside air temperature sensor can acquire outside air temperature information for display on touch screen.
- Remote humidity sensor
 - The thermostat can control a standalone humidifier or dehumidifier. The relative humidity is measured by the remote humidity sensor or internal humidity sensor.

Mechanical design

The room thermostat consists of the following parts:

- Housing front with touch screen and sensors
- Housing rear with terminals and relays
- Metallic mounting plate for wall mounting
- Accessories

Normal display



- 1 Tap to display detailed information and additional setting possibilities.
- 2 Shows if the system is in an energy-optimized mode. If the leaf is red, predefined settings were changed. Tap the red leaf to restore energy-saving mode. The leaf again turns green.
- 3 Room temperature*)
- 4 Tap to toggle between “At home” and “Away”.
- 5 Shows if the thermostat works automatically (AUTO) or manually (MANUAL). Using a scheduler can mean the following:
 - If there is Cloud connection and the scheduler has already been set, the thermostat follows the scheduler. A temporary change of the temperature setpoint only takes effect during the currently scheduled mode.
 - If there is Cloud connection, but no scheduler has been set, the thermostat follows the default scheduler set by the system.
 - If there is no Cloud connection, the thermostat cannot retrieve scheduler information.
- 6 Temperature setpoint slider. Icon color changes as setpoint is changed.
 - If you increase the setpoint by dragging the slider to the right to warm up the room, the slider color changes to orange.
 - If no heating occurs, the slider color changes to white.

	NOTICE
	After initial setup of the thermostat, the displayed room temperature may not be correct because the temperature sensors need time for calibration. Wait for at least one hour for the calibration.

Idle display



- 1 Room relative humidity
- 2 Shows room air quality:
 - If the icon is green, air quality is good.
 - If the icon is orange, air quality is okay.
 - If the icon is red, air quality is poor.
- 3 Shows if the system is in an energy-optimized mode. If the leaf is red, predefined settings were changed. Tap the red leaf to restore energy-saving mode. The leaf again turns green.
- 4 Room temperature

Note: Depending on how the thermostat is set up, the displayed options in idle mode may differ.

Type summary

Product number	Stock number	Description
RDS110	S55772-T100	Room thermostat

Ordering

- When ordering, indicate product number, stock number and description.
- Order valve actuators separately.

Inbox items

Items	Quantity
Thermostat (front and rear)	1
Metallic mounting plate	1
Set of screws and plastic insert	1
Quick guide	1
Mounting instructions	1
Activation code sticker	1
Wiring sticker	1

Equipment combinations

Remote sensors

Type of unit	Product no.	LG-Ni1000 at 0 °C	Pt1000 at 0 °C	NTC 10k at 25 °C	DC 0...10 V	Datasheet*
Room temperature sensors						
- Wall-mounted	QAA24	x				1721
	QAA2012		x			1745
	QAA2030			x		1745
	QAA2061				x	1749
	QAA2061D ²⁾				x	1749
- Flush-mounted ¹⁾	AQR2531AN W	x				1408
	AQR2532NN W				x	1411
- Concealed	QAA64 (vandal-proof)	x				1722
Outdoor temperature sensors						
	QAC22	x				1811
	QAC2012		x			1811
	QAC2030			x		1811
	QAC3161				x	1814
Cable temperature sensors						
	QAP21.3	x				1832
	QAP22	x				1831







Type of unit	Product no.	LG-Ni1000 at 0 °C	Pt1000 at 0 °C	NTC 10k at 25 °C	DC 0...10 V	Datasheet*
	QAP21.3/8000	x				1832
	QAP2012.150		x			1831
	QAP1030.200			x		1831
Room humidity sensors						
- Wall-mounted	QFA2000				x	1857
- Wall-mounted including temperature	QFA2020	x (T)			x (r.h.)	1857
	QFA2060				x (T+r.h.)	1857
	QFA2060D ²⁾				x (T+r.h.)	1857
- Flush-mounted ¹⁾ including temperature	AQR2534AN W + AQR2540Nx	x (T)			x (r.h.)	1410
	AQR2535NN W + AQR2540Nx				x (T+r.h.)	1410

* The documents can be downloaded from <http://siemens.com/bt/download> by specifying the product number as shown in the above table.


1) Requires a mounting plate and/or design frames.

2) With digital display.

Actuators

Type of unit		Product no.	Datasheet*
Electromotoric actuator		SFA21/18	4863
		SUA21/3	A6V10446174
Electrothermal actuator (for radiator valves) AC 230 V, NC		STA23..	4884
Electrothermal actuator (for radiator valves) AC 24 V, NC		STA73..	4884
Electrothermal actuator AC 230 V (for small valves 2.5 mm), NO		STP23..	4884
Electrothermal actuator AC 24 V (for small valves 2.5 mm), NO		STP73..	4884

Accessory

Type of unit		Product no.	Datasheet*
White decoration frame and metallic mounting plate for installation on rectangular conduit box (1 set)		ARG100.01 S55772-T102	A6V11190640

* The documents can be downloaded from <http://siemens.com/bt/download> by specifying the product number as shown in the above table.


Use Product documentation

Topic	Title	Document ID
Mounting and installation	Mounting instruction	A5W90001424
Installation and operation	User guide	A6V10877569
Startup wizard	Quick guide	A5W90001422
CE declaration		A5W90002476
Product environmental declaration		A5W90003412

Related documents such as environmental declarations, CE declarations, etc., can be downloaded at: <http://siemens.com/bt/download>.

Notes

Security


	⚠ CAUTION
	National safety regulations Failure to comply with national safety regulations may result in personal injury and property damage <ul style="list-style-type: none"> Observe any national provisions and comply with the appropriate safety regulations.

Engineering

See the product documentation for information on engineering, selection and sizing connecting cables for supply voltage and field devices.

Installation

The mounting plate of the thermostat can be installed on CEE/VDE conduit boxes and on square boxes 75 x 75 mm. For installation on a rectangular conduit box (e.g. 105 x 72 mm), accessory ARG100.01 must be ordered, which includes 1 set of white decoration frame and bigger mounting plate.

	⚠ WARNING
	No internal line protection for supply lines to external consumers Risk of fire and injury due to short-circuits <ul style="list-style-type: none"> Adapt the line diameters as per local regulations to the rated value of the installed overcurrent protection device.

	<ul style="list-style-type: none"> • The AC 230 V mains supply line must have an external circuit breaker with a rated current of no more than 10 A. • Properly size the cables to the thermostat and for the outputs for AC 230 V mains voltage. • Use only AC 230 V isolated wired cables, as the conduit box carries AC 230 V mains voltage. • Remove wired bridge L - Q11 when loads work with voltages other than AC 230 V. • Inputs X1-M-X2: Several switches may be connected in parallel. Consider overall maximum contact sensing current for switch rating. • Disconnect from power supply before removing the front of the thermostat.
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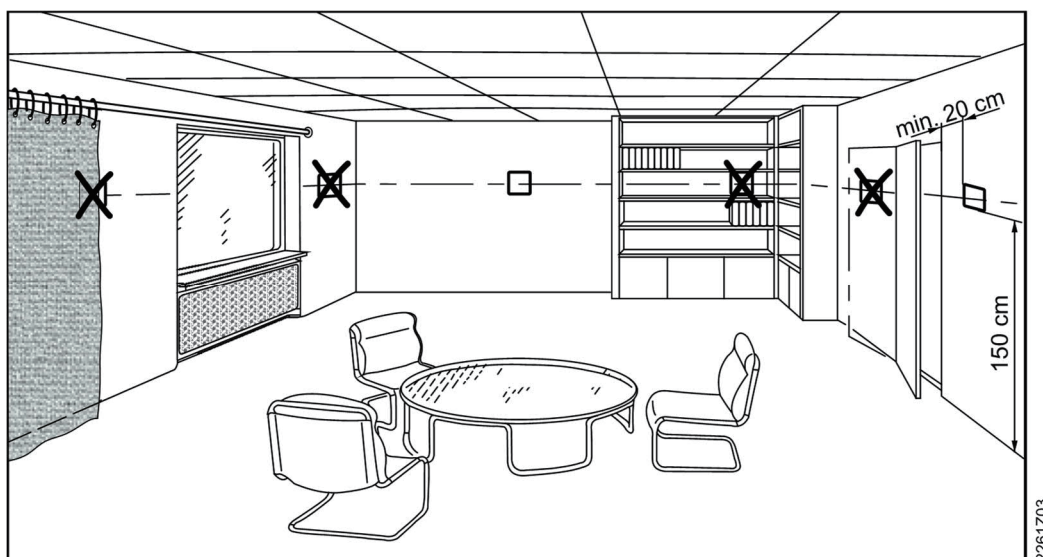
Commissioning Refer to the Quick guide and User guide (see Product Documentation) to configure your device. Commissioning includes the following:

- Internet connection
- Application setup
- Account registration and device pairing

Note:

Before configuring your thermostat, make sure you are connected to the Internet, have a valid email address, and a smartphone.

Mounting



- The devices are suitable for wall mounting.
- Recommended height: 1.50 m above the floor.
- Do not mount the devices in recesses, shelves, behind curtains or doors, or above or near heat sources.
- Avoid direct solar radiation.
- Seal the conduit box or the installation tube if any, as air currents can affect sensor readings.
- Adhere to allowed ambient conditions.

Operation

End users can operate the thermostat directly on the touch screen, or download the mobile app “Siemens Smart Thermostat RDS” and perform operations on their smartphones, including:

- Creating and managing accounts
- Setting the operating mode (Auto, away, home, manual)

Technical data

Power supply

Power supply	
Operating voltage	AC 230 V (+10% / -15%)
Frequency	48...63 Hz
Power consumption	Max. 9 VA
Standby power consumption (LCD off)	0.6 W
Max. external supply line fusing	10 A circuit breaker

Radio parameters


Radio parameters	
Frequency band	2.4...2.4835 GHz
Maximum radio-frequency power	18 dBm
WLAN standard	IEEE 802.11b/g/n (HT20)
WLAN channel	1~13

Inputs

Connections to multifunctional inputs X1 - M - X2	
Passive temperature sensors - Cable length max. (copper cable section) - NTC type Room temperature range Outdoor temperature range - Ni type Room temperature range Outdoor temperature range - Pt type Room temperature range Outdoor temperature range	90 m (1.5 mm ² wire), 70 m (1 mm ² wire) 60 m (0.75 mm ² wire), 40 m (0.5 mm ² wire) NTC10K at 25 °C 0...50 °C -50...80 °C Ni1000 at 0 °C 0...50 °C -50...80 °C Pt1000_375/Pt1000_385 at 0 °C 0...50 °C -50...80 °C
Active DC 0 V ...10 V sensors - Room temperature range (default) - Outdoor temperature range (default) - Humidity range (default)	Min./max. configurable via parameters 0...50 °C -50...80 °C 0...100%
Digital contacts - Operating action - Contact sensing - Parallel connection - Input function	Selectable NO/NC DC 14...40 V, 8 mA (typ.) Max. 20 thermostats per switch Selectable

Outputs

Switching capacity of relay	
Voltage Q11, Q12, Q14 Current, min max resistive (inductive)	Potential free, AC 24...230 V 5 mA...5(2) A
Voltage Q21, Q22, Q24 Current, min max resistive (inductive)	Potential free, AC 24...230 V 5 mA...5(2) A
Note: Connecting different voltages on Q1x and Q2x is allowed (double insulation).	

	NOTICE
	Remove wired bridge L-Q11 when loads work with voltages other than AC 230 V.

Operational data

Setpoint setting range		
0...50 °C		
12...35 °C (default)		

Built-in room temperature sensor		
Temperature range	Accuracy at 25 °C	Display resolution
0...50 °C	±0.5 K	0.5 K

Built-in room humidity sensor		
Humidity range	Accuracy at 25 °C	Display resolution
0%...100%	±5% r.h.	1%

Connections

Interfaces	
Micro USB	A service port is limited to firmware upgrades and onsite diagnosis by professionals.

Wiring connections	
Screw terminals	Solid wires or prepared stranded wires: Max. 1 × 0.5... 2.5 mm ² (14...20 AWG)


Conformity

Ambient conditions and protection classification	
Safety class as per EN60730	Class II
Degree of protection of housing as per EN 60529	IP30
Classification as per EN 60730	
Function of automatic control devices	Type 1
Degree of contamination	2
Overvoltage category	III
Climatic ambient conditions	

Ambient conditions and protection classification	
Storage as per EN 60721-3-1	Class 1K3 Temperature -25...65 °C (-13... 149 °F) Humidity 5...95%
Transport (packaged for transport) as per EN 60721-3-2	Class 2K3 Temperature -25...65 °C (-13... 149 °F) Humidity 5...95%
Operation as per EN 60721-3-3	Class 3K5 Temperature -5...50 °C (23... 122 °F) Humidity 5...95%
Mechanical ambient conditions	
Storage as per EN 60721-3-1 Transport as per EN 60721-3-2 Operation as per EN 60721-3-3	Class 1M2 Class 2M2 Class 3M2

Standards, directives and approvals	
EU conformity (CE)	A5W90002476 ^{*)}
RCM conformity	A5W90002477 ^{*)}
China CMIIT ID	2017DJ1647, A5W90002478 ^{*)}
EAC conformity	Eurasian Conformity ^{*)}
Environmental compatibility	The product environmental declaration A5W90003412 ^{*)} contains data on environmentally compatible product design and assessments (RoHS compliance, materials composition, packaging, environmental benefit, disposal).

^{*)} The documents can be downloaded from <http://siemens.com/bt/download>.

eu.bac certification				
Type	License	Application	Energy Efficiency Label	Control accuracy (K)
RDS110	217739	Water heating systems (radiator)	AA	0.5
 See product list at: http://www.eubacert.eu/licences-by-criteria.asp				

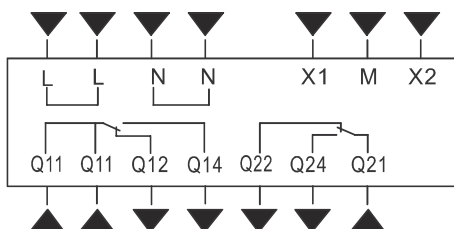
Eco design and labeling directives			
ErP class 4	Based on EU Regulation 813/2013 (Eco design directive) and 811/2013 (Labelling directive) concerning space heaters, combination heaters, the following classes apply:		
	Application with On/Off operation of a heater	Class I	Value 1%
	PWM (TPI) room thermostat, for use with On/Off output heaters	Class IV	Value 2%

General data

General		
Dimension	Refer to Dimensions on page 18	
Weight	Thermostat with package, user document and accessory	435 g
	Thermostat	231 g
Color	Silver plating Housing: Pantone black	

Diagrams

Connection terminals

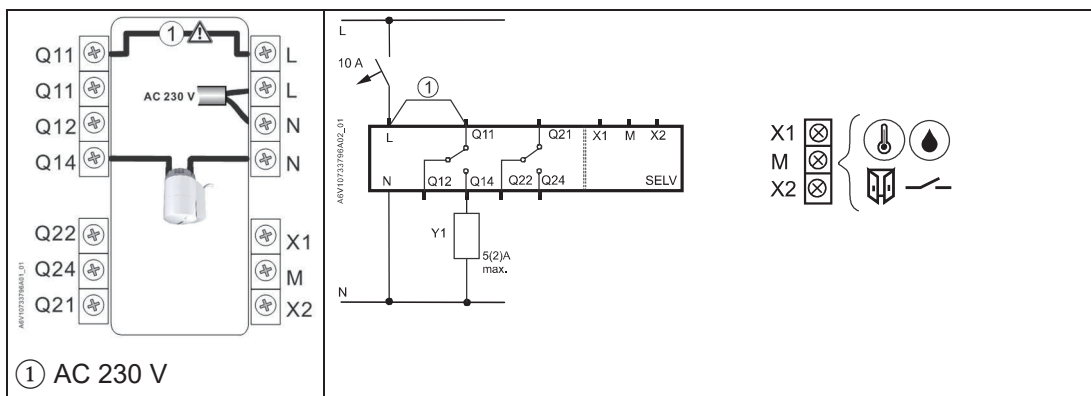


Terminal	Use
L	Mains connection, live conductor
N	Mains connection, neutral conductor
Q11	Control input (com)
Q12	Control output; NC contact
Q14	Control output; NO contact
Q21	Control input (com)
Q22	Control output; NC contact
Q24	Control output; NO contact
X1, X2, M	Multifunctional inputs

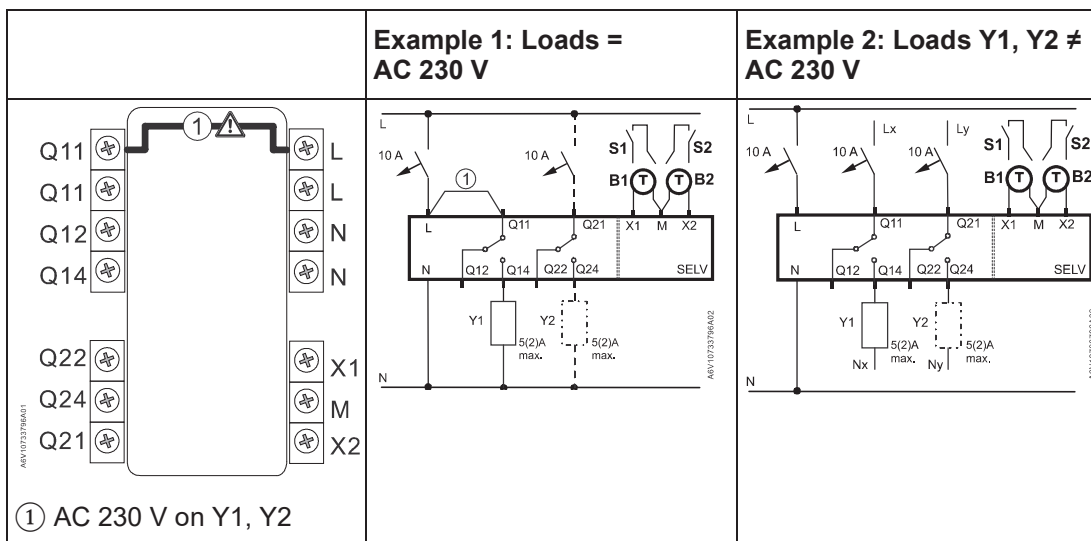
Wiring diagrams

- The thermostat is delivered with one wired bridge ① (L-Q11) for easy installation of AC 230 V HVAC equipment (example 1).
- When loads use voltages other than AC 230 V, bridge ① must be removed before wiring the loads to the thermostat (example 2).
- If the load current through Y2 is more than 3 A, bridge between L-Q11 cannot be used. Adapt parameter “Q22/Q24 electrical load” in “Advanced Settings” / “Optimization”.
- For application with higher currents ($Y1 > 3 \text{ A}$ or $Y2 > 2 \text{ A}$), adapting parameter “Q22/Q24 electrical load” in “Advanced Settings” / “Optimization” accordingly is recommended.

Basic



Advanced



Y1 HVAC equipment

B1, B2 External sensors

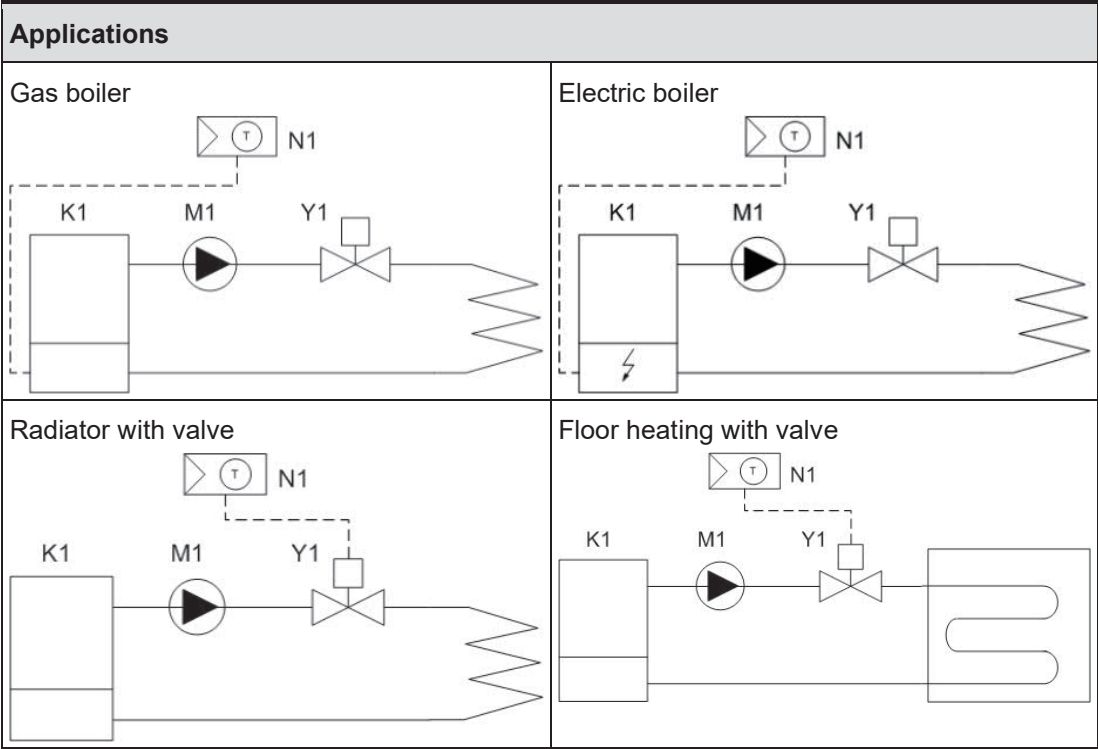
Y2 DHW / Dehumidifier / Humidifier

S1, S2 External switches



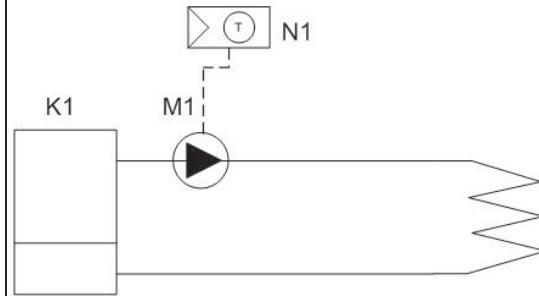
⚠ WARNING

The total current rating must not exceed 8 A.

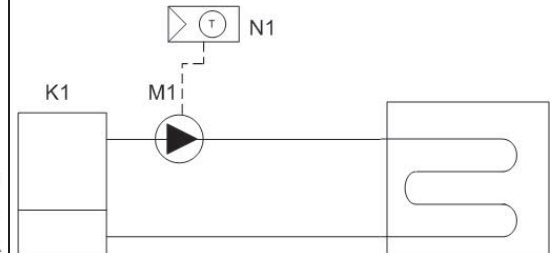


Applications

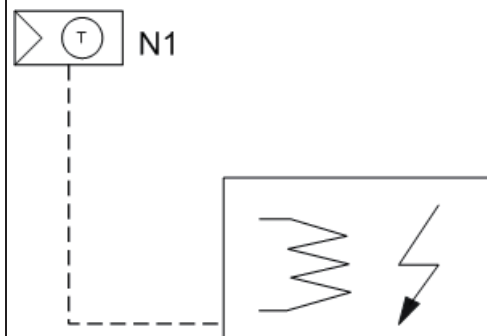
Radiator with pump



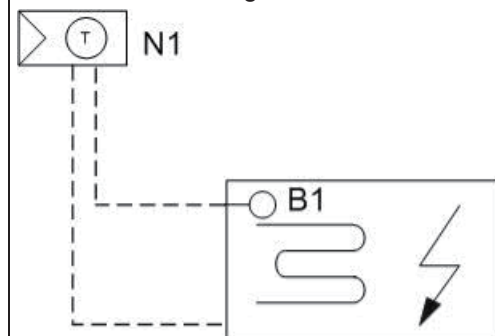
Floor heating with pump



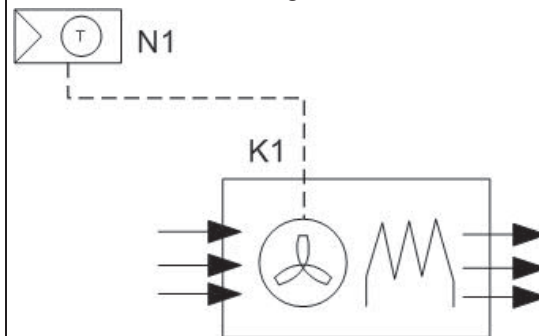
Electric radiator



Electric floor heating



Fan with electric heating

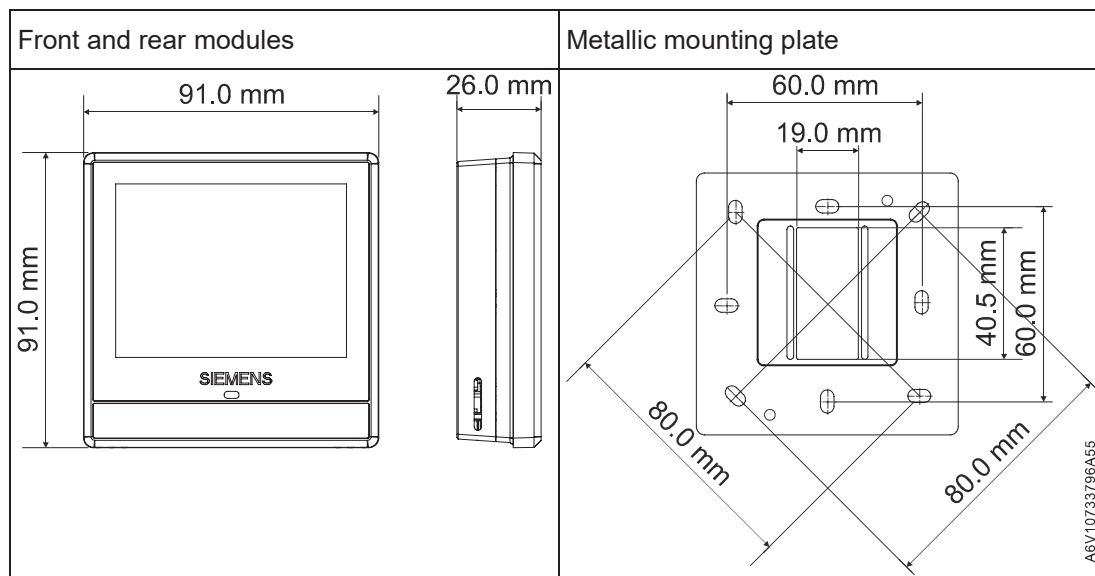


Key

- N1 RDS110
- B1 Floor temperature sensor
- Y1 Valve
- M1 Circulating pump
- K1 Heat generator (e.g. boiler)

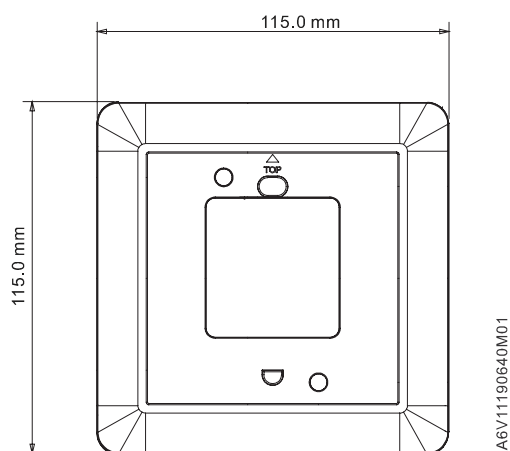
Dimensions

RDS110

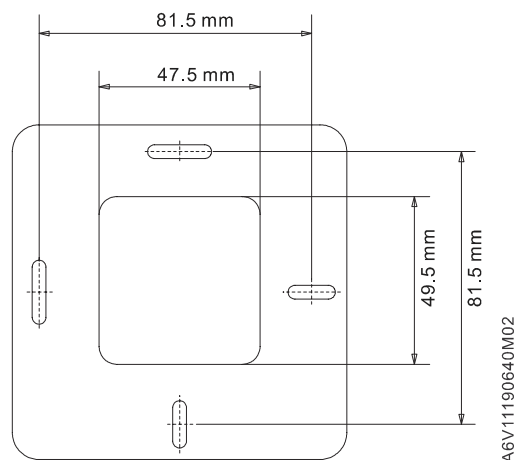


ARG100.01

White decoration frame



Metallic mounting plate



Revision history

Edition	Date	Software version	Changes	Section	Pages
7	July 2021	32.2.48 or higher	Removed information about window contact.	Cover page Room thermostat features Use Installation	1 2 3 8
6	Jan 2019	32.2.27 or higher	Changed setpoint setting range from "12...35 °C" to "0...50 °C, 12...35 °C (default)".	Technical data	12
5	July 2018	32.2.27 or higher	-	-	-

Edition	Date	Software version	Changes	Section	Pages
4	May 2018	32.2.18 or higher	<ul style="list-style-type: none"> Added EAC logo Added EAC conformity Updated application names 	Cover page Technical data Application examples	1 13 17
3	April 2018	32.2.18 or higher	<ul style="list-style-type: none"> Added standby power consumption figure. 	Technical data	11
2	January 2018	32.2.18 or higher	<ul style="list-style-type: none"> Changed operating modes from Comfort, Pre-comfort and Economy to Comfort, Economy and Unoccupied. Added "Dark" and "Light" background color support for mobile app. 	Remote operation and monitoring	2
1	August 2017	32.2.10	New document	---	---

- Changing the room temperature (by setting new setpoints)
- Setting a weekly scheduler (heating and domestic hot water)
- Green leaf (switching to energy-optimized operation)

Supported smartphone types are as follows:

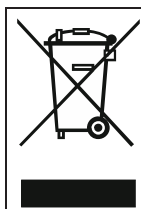
Operating system

OS	OS version	App store
iOS	iOS 12 or above	App store®
Android	Android™ 10.0 or above	Google Play™

Maintenance

The thermostat is designed for maintenance-free operation.

Disposal



The device is considered an electronic device for disposal in accordance with the European Guidelines and may not be disposed of as domestic garbage.

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

Warranty

Technical data on specific applications are valid only together with Siemens products listed under "Equipment combinations". Siemens rejects any and all warranties in the event that third-party products are used.

Radio equipment directive

The equipment is using harmonized frequency in Europe and complies with the Radio Equipment Directive (2014/53/EU, formerly 1999/5/EC).

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