SIEMENS

3182

Wall-mounted Room Thermostat with Display RDG400

for VAV 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 auxiliary output ON/OFF, PWM or 3-pos**
- **Automatic or manual heating/cooling changeover**
- **Operating modes: Comfort, Energy Saving and Protection**
- **Three multifunctional inputs for keycard contact, external sensor, etc.**
- **Adjustable commissioning and control parameters**
- **Minimum and maximum setpoint limitation**
- **Minimum and maximum limitation for air flow signal DC 0..10 V**
- **Output signal inversion as an option**
- **AC 24 V operating voltage**
- **Backlit display**

Use

The room thermostat is suitable for following systems:

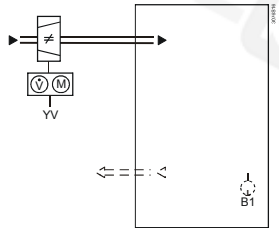
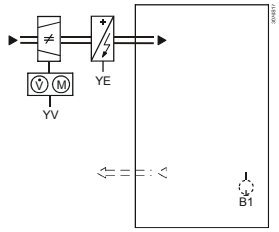
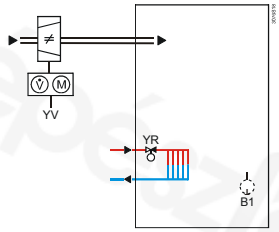
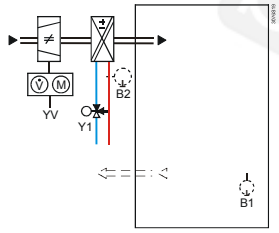
VAV systems via ON/OFF or modulating control outputs:
- Single-duct system
- Single-duct system with electrical heater
- Single-duct system and radiator / floor heating
- Single-duct system with heating / cooling coil

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
- Keypad lock (automatic and manual)
- 3 multifunctional inputs, freely selectable for:
  - Operating mode switchover contact (key card, window contact etc)
  - Automatic heating/cooling changeover sensor
  - External room temperature or return air temperature
  - Dewpoint sensor
  - Electric heater enable
  - Fault input
- Minimum and maximum limitation of air flow signal DC 0..10 V
- Floor heating temperature limit
- Reload factory settings for commissioning and control parameters

Applications

The thermostat supports following applications, which can be configured by DIP-switch on the rear side of the thermostat. The control output for the damper actuator is either DC 0…10 V (factory-setting) or 3-position (see parameter P47), and for the auxiliary heating/cooling output either ON/OFF, PWM, 3-pos or DC 0…10 V respectively.

Application		DIP-switch	Control output
Single duct • DC 0…10 V damper actuator • 3-pos damper actuator			DC 0..10 V 3-pos
Single duct with auxiliary heater • DC 0…10 V damper actuator and either 2-pos, PWM or 3-pos auxiliary heater • 3-pos damper actuator and DC 0…10 V auxiliary heater			DC 0..10 V ON/OFF, PWM or 3-pos
Single duct and radiator / floor heating • DC 0…10 V damper actuator and either 2-pos, PWM or 3-pos radiator • 3-pos damper actuator and DC 0…10 V radiator			DC 0..10 V ON/OFF, PWM or 3-pos
Single duct heating and cooling coil • DC 0…10 V damper actuator and either 2-pos, PWM or 3-pos heating and cooling • 3-pos damper actuator and DC 0…10 V heating and cooling			DC 0..10 V ON/OFF, PWM or 3-pos

Type summary

Type reference	Operating Voltage	Number of control outputs			
		ON/OFF	PWM	3-pos	DC 0..10 V
RDG400	AC 24 V	**1** [1)]	**1** [1)]	**1** [1)]	**1**

1) Either ON/OFF, 3-pos or PWM

Equipment combinations

	Type of unit		Type reference	Data Sheet
	Cable temperature sensor		**QAH11.1**	1840
	Room temperature sensor		**QAA32**	1747
	Condensation detector / Supply unit		**QXA2000 / AQX2000**	1542
DC 0..10 V actuator	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
	Electromotoric actuator, DC 0..10 V (for valves 5.5 mm)		**SQS65…**	4573
	Thermal actuator, DC 0..10 V (for small valves and radiator valves)		**STS61**	4880
	DC 0…10 V damper actuator		**GQD161…**	4605
			**GDB161…**	4634
			GLB161…	
			**GMA161…**	4614
			GEB161…	4621
			**GCA161…**	4613
			GBB161…	4626
			GIB161…	
	VAV compact controller		**GDB181.1E/3**	3544
			GLB181.1E/3	
ON/OFF actuators	Electromotoric ON/OFF valve and actuator (only available in AP, UAE, SA and IN)		**MVI…/MXI…**	4867
	Electromotoric ON/OFF actuator		**SFA21...**	4863
	Thermal actuator (for radiator valve)		**STA21...**	4893

3-position actuators	Thermal actuator (for small valves 2.5 mm)		**STP21...**	4878
	Zone valve actuators (only available in AP, UAE, SA and IN)		**SUA…**	4830
	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
	Electromotoric actuator, 3-position (for valves 5.5 mm)		**SQS35…**	4573

Accessories

Type of unit	Type reference	Data Sheet
Changeover mounting kit (50 pcs/package)	**ARG86.3**	1840
Adapter plate 120 x 120 mm for 4“ x 4“ conduit boxes	ARG70	
Adapter plate for surface wiring 112 x 130 mm	ARG70.2	

Ordering

When ordering, indicate both product number and name:

E.g. **RDG400 room temperature thermostat**

Order valve actuators separately.

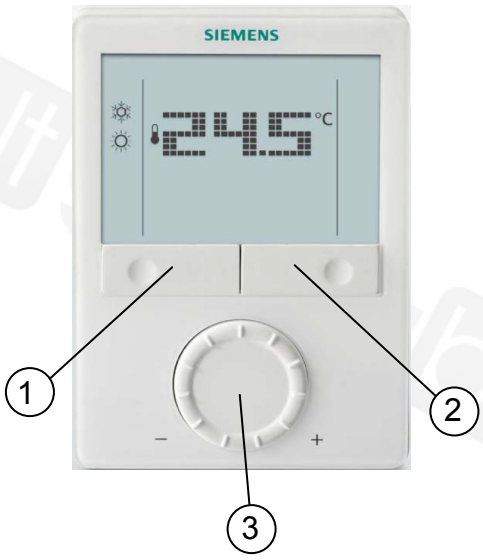
Mechanical design

The thermostat consists of 2 parts:

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

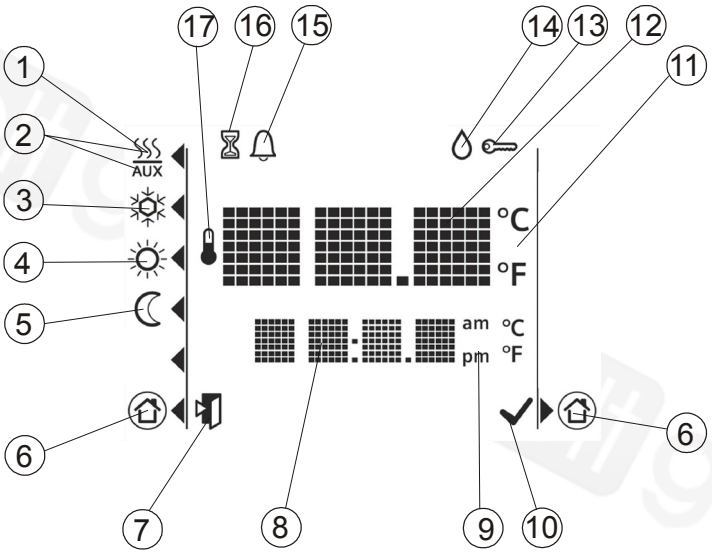
The housing engages on to the mounting plate and is secured with 2 screws.

Operation and settings



1. Operating mode selector / Esc
2. Protection and Ok
3. Rotary knob for setpoint and parameter adjustment

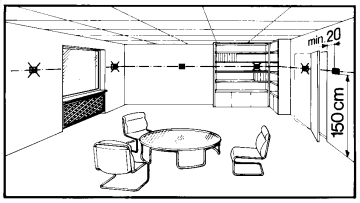
Display



#	Symbol	Description	#	Symbol	Description
1		Heating mode	10		Confirmation of parameters
2	AUX	Heating mode auxiliary heater on (2nd stage)	11	°C °F	Degrees Celsius Degrees Fahrenheit
3		Cooling mode	12		Digits for temperature and setpoint
4		Operating mode Comfort	13		Keylock active
5		Operating mode Energy Saving	14		Condensation in room (dewpoint sensor active)
6		Operating mode Protected	15		Fault
7		Escape	16		Temporary timer function (visible when Comfort prolong, or abcence function is active)
8		Digits for temperature, setpoint etc	17		Indicates Room temperature is displayed
9	am pm	Morning, 12-hour system Afternoon, 12-hour system			

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 about 1.5 m above the floor.



Mounting

⚠

- Devices must be mounted on clean, dry indoor place and not be exposed to dripping or splashing

Wiring

See the mounting instructions M3182 enclosed with the thermostat

⚠
- Comply with local regulations to wire, fuse and earth the thermostat
- The power supply line must have an external fuse or circuit breaker with a rated current of no more than 10 A

⚠
⚠
- Inputs X1-M, X2-M or D1-GND 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
- Disconnect from supply before removing the thermostat from the mounting plate!

Commissioning

Set the thermostat application and type of control output via the DIP switches before mounting the thermostat on the mounting plate.
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 P3182).

Control sequence
- 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
- Recalibrate the temperature sensor if the room temperature displayed on the thermostat does not match the room temperature measured. 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

Disposal

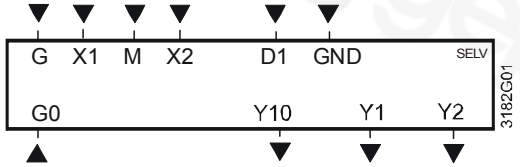
The device is classified as waste electronic equipment in terms of the European Directive 2002/96/EC (WEEE) and should not be disposed of as unsorted municipal waste. The relevant national legal rules are to be adhered to. Regarding disposal, use the systems setup for collecting electronic waste.
Observe all local and applicable laws.

Technical data

⚠ Power supply	Operating voltage		SELV AC 24 V ±20 %
	Frequency		50/60 Hz
	Power consumption		Max. 2 VA
Outputs	Control output Y10-G0		DC 0…10 V
	Resolution		39 mV
	Current		Max. ±1 mA
	Control output Y1, Y2 – G		AC 24 V
	Rating		Max. 1 A
Inputs	Multifunctional input		
	X1-M/X2-M		
	Temperature sensor input:		
	Type		QAH11.1 (NTC)
	Digital input:		
	Operating action		Selectable (N.O./N.C.)
	Contact sensing		DC 0…5 V / max 5 mA
	D1-GND		
	Operating action		Selectable (N.O. / N.C.)
	Contact sensing		SELV DC 6…15 V / 3…6 mA
	Function input: External temperature sensor, heating/cooling changeover sensor, operating mode switchover contact, dewpoint monitor contact, enable electrical heater contact, fault contact		Selectable
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 mode	(P08)	21°C (5...40 °C)
	☾ Energy Saving mode	(P11-P12)	15°C/30°C (OFF, 5...40 °C)
	⌂ Protection	(P65-P66)	8°C/OFF (OFF, 5...40 °C)
	Multifunctional input X1/X2/D1		Selectable
	Input X1		Ext. temperature sensor (P38=1)
	Input X2		Heat/cool changeover sensor (P40=2)
	Input D1		Operating mode switchover (P42=3)
	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	Operation	As per IEC 721-3-3
	Climatic conditions	Class 3K5
	Temperature	0...+50 °C
	Humidity	<95 % r.h.
	Transport	As per IEC 721-3-2
	Climatic conditions	Class 2K3
	Temperature	−25...+60 °C
	Humidity	<95 % r.h.
	Mechanical conditions	Class 2M2
	Storage	As per IEC 721-3-1
	Climatic conditions	Class 1K3
	Temperature	−25...+60 °C
	Humidity	<95 % r.h.
Standards	CE conformity	
	EMC directive	2004/108/EC
	N474 **C-tick** conformity to EMC emission standard	AS/NSZ 4251.1:1999
	RoHS 2002/95/EC Reduction of hazardous substances	2002/95/EC
	Product standards	
	Automatic electrical controls for household and similar use	EN 60730–1
	Special requirements for temperature-dependent controls	EN 60730–2-9
	Electronic control type	2.B (microdisconnection on operation)
	Electromagnetic compatibility	
	Emissions	IEC/EN 61000-6-3
	Immunity	IEC/EN 61000-6-2
	Protective class	III as per EN 60730
	Pollution class	Normal
	Degree of protection of housing	IP 30 to EN 60529
General	Connection terminals	Solid wires or prepared stranded wires 1 x 0.4…2.5 mm^2 or 2 x 0.4…1.5 mm^2
	Housing front color	RAL 9003 white
	Weight	0.350 kg

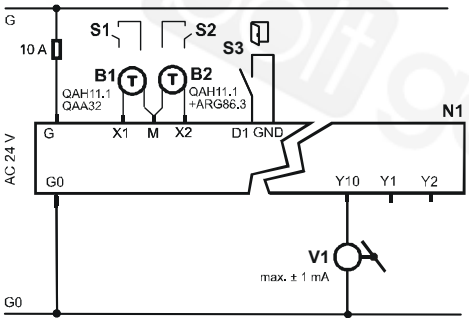
Connection terminals

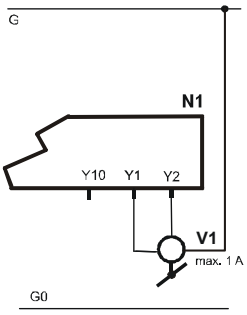


G, G0	Operating voltage thermostat AC 24 V
Y10/G0	Control output for DC 0…10 V actuator
Y1/G, Y2/G	Control output for 2-pos, PWM or 3-pos actuators
X1, X2	Multifunctional input for temperature sensor (e.g. QAH11.1) or potential-free switch Factory setting: - X1:= external room temp. sensor - X2:= automatic heat/cool changeover/switch
M	Measuring neutral for sensor and switch
D1, GND	Multifunctional input for potential-free switch. Factory setting: Operating mode switchover contact

Connection diagrams

Application: Single duct



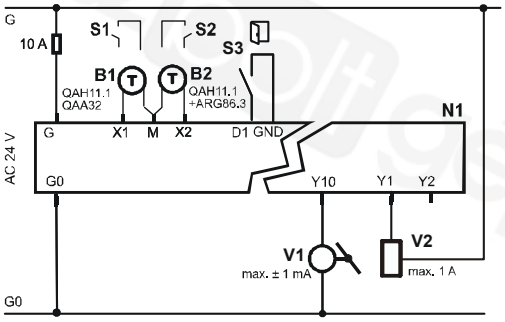


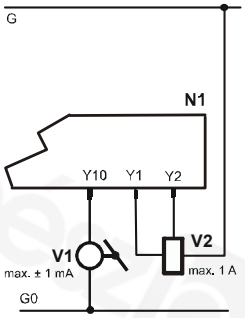
V1 DC 0…10 V damper actuator

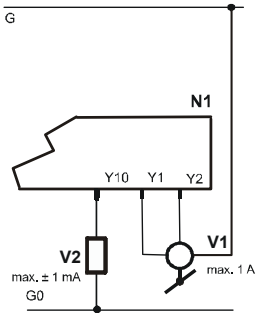
V1 3-pos damper actuator

N1 Room thermostat RDG400
S1..S3 Switch (keycard, window contact, etc.)
B1, B2 Temperature sensor (return air temp., external room temp., changeover sensor, etc.)

Application: Single duct with electrical heater, radiator or heating/cooling







V1 DC 0 10V damper actuator
V2 2-pos or PWM electrical heater, radiator or heating/cooling valve

V1 DC 0 10V damper actuator
V2 3-pos electrical heater, radiator or heating/cooling valve

V1 3-pos damper actuator
V2 DC 0…10 V electrical heater, radiator or heating/cooling valve

N1 Room Thermostat RDG400
S1..S3 Switch (keycard, window contact, etc.)
B1, B2 Temperature sensor (return air temperature, external room temperature, changeover sensor, etc.)

Dimensions

Dimensions in mm