



RDG100 / RDG110
RDG140 / RDG160



RDG100T

Room thermostats with LCD for wall mounting

RDG1...

for fan coil unit applications

for universal applications

for use with compressors in dx type equipment

- **RDG100...: Operating voltage AC 230 V, ON/OFF, 3-position or PWM control outputs**
- **RDG110: Operating voltage AC 230 V, ON/OFF relay (SPDT) outputs**
- **RDG140 / RDG160: Operating voltage AC 24 V, DC 0...10 V control outputs**
- **Operating modes: Comfort, Energy Saving and Protection**
- **Automatic or manual fan speed**
- **Output for 1-speed, 3-speed or ECM fan DC 0...10 V (RDG160)**
- **3 multifunctional inputs for keycard contact, external sensor, etc.**
- **Automatic or manual heating / cooling changeover**
- **Adjustable commissioning and control parameters**
- **Minimum and maximum setpoint limitation**
- **Backlit display**

Additional features of RDG100T:

- **Infrared remote control receiver**
- **Auto Timer mode with 8 programmable timers**

The RDG1... room thermostats are designed for use with the following types of system:

Fan coil units via ON/OFF or modulating control outputs:

- 2-pipe system
- 2-pipe system with electrical heater
- 2-pipe system and radiator / floor heating
- 4-pipe system
- 4-pipe system with electrical heater
- 2-stage heating or cooling system

Chilled / heated ceilings (or radiators) via ON/OFF or modulating control outputs:

- Chilled / heated ceiling
- Chilled / heated ceiling with electrical heater
- Chilled / heated ceiling and radiator / floor heating
- Chilled / heated ceiling, 2-stage cooling or heating

Heat pumps with dx type equipment:

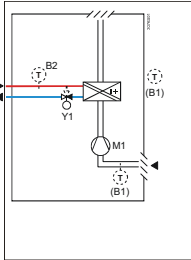

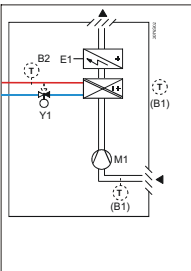

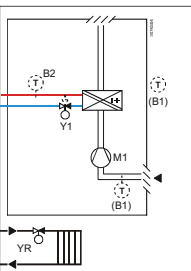

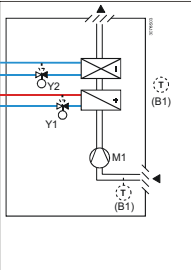

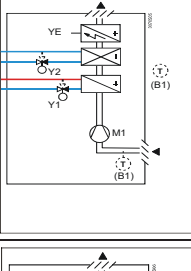

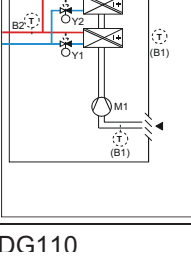

- 1-stage compressor for heating or cooling
- 1-stage compressor for heating or cooling with electrical heater
- 1-stage compressor for heating or cooling and radiator / floor heating
- 1-stage compressor for heating and cooling with reversing valve
- 2-stage compressor for heating or cooling

Functions

- Room temperature control via built-in temperature sensor or external room temperature / return air temperature sensor
- Automatic or manual changeover between heating and cooling mode
- Selection of applications via DIP switches
- Selection of operating mode via operating mode button on the thermostat
- 1- or 3-speed or DC 0...10 V fan control (automatic or manual)
- Display of current room temperature or setpoint in °C and/or °F
- Minimum and maximum setpoint limitation
- Button lock (automatic or manual)
- 3 multifunctional inputs, freely selectable for:
 - Operating mode switchover contact (keycard, window contact, etc.)
 - Changeover sensor for automatic heating / cooling mode
 - External room temperature or return air temperature
 - Dewpoint sensor
 - Electrical heater enable
 - Faults
- Advanced fan control function, i.e. fan kick, fan start, selectable fan operation depending on heating / cooling mode, fan start delay in systems with ON/OFF control
- Purge function in conjunction with 2-port valve in systems with automatic heating / cooling changeover
- Reminder to clean fan filters
- Floor heating temperature limitation
- Reload factory settings for commissioning and control parameters
- 7-day time program: 8 programmable timers to switch over between Comfort and Energy Saving mode (RDG100T)
- Infrared remote control (RDG100T)

Applications

The room thermostats support the following applications, which can be configured via DIP switches at the rear of the unit. Depending on the thermostat type, ON/OFF or modulating control outputs are available.

Application	DIP switch	Control output	Product no.
Heating or cooling <ul style="list-style-type: none"> 2-pipe fan coil unit Chilled / heated ceiling 1-stage compressor ¹⁾ 		ON/OFF, PWM, 3-position	RDG100...
		ON/OFF (SPDT)	RDG110
		DC 0...10 V	RDG140
		DC 0...10 V ²⁾	RDG160
Heating or cooling with auxiliary heater <ul style="list-style-type: none"> 2-pipe fan coil unit with el. heater Chilled / heated ceiling and el. heater 1-stage compressor and el. heater ¹⁾ 		ON/OFF, PWM, 3-position	RDG100..
		ON/OFF (SPDT)	RDG110
		DC 0...10 V Note: Modulating el. heater	RDG140
		DC 0...10 V ²⁾ Note: Modulating el. heater	RDG160
Heating or cooling and radiator / floor heating <ul style="list-style-type: none"> 2-pipe fan coil unit and radiator Chilled / heated ceiling and radiator 		ON/OFF, PWM, 3-position	RDG100...
		ON/OFF (SPDT)	RDG110
		DC 0...10 V	RDG140
		DC 0...10 V ²⁾	RDG160
Heating and cooling <ul style="list-style-type: none"> 4-pipe fan coil unit Chilled ceiling and radiator 1-stage compressor ¹⁾ 1-stage compressor with reversing valve ¹⁾ 		ON/OFF, PWM, 3-position	RDG100...
		ON/OFF (SPDT)	RDG110
		DC 0...10 V	RDG140
		DC 0...10 V ²⁾	RDG160
Heating and cooling with auxiliary heater <ul style="list-style-type: none"> 4-pipe fan coil unit with el. heater 		ON/OFF, PWM, 3-position	RDG100...
2-stage heating or cooling <ul style="list-style-type: none"> 2-stage fan coil unit 2-stage chilled / heated ceiling 2-stage compressor ¹⁾ 		ON/OFF, PWM, 3-position	RDG100...
		ON/OFF (SPDT)	RDG110
		DC 0...10 V	RDG140
		DC 0...10 V ²⁾	RDG160

¹⁾ Heat pump application covered by RDG110

Type summary

Product no.	Features								
	Operating voltage	Number of control outputs				Time program	Backlit LCD	Infrared receiver ¹⁾	ECM fan ²⁾
		ON/OFF	PWM	3-pos.	DC 0..10 V				
RDG100	AC 230 V	3 ³⁾	2 ³⁾	2 ³⁾			✓		
RDG100T	AC 230 V	3 ³⁾	2 ³⁾	2 ³⁾		✓	✓	✓	
RDG110	AC 230 V	2 ⁴⁾					✓		
RDG140	AC 24 V				2		✓		
RDG160	AC 24 V				2		✓	✓	


















1) Infrared remote control must be ordered as a separate item




2) ECM fan output DC 0...10 V

3) ON/OFF, PWM or 3-position (triac outputs)

4) Relay output (SPDT)

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
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...	4877
	Thermal actuator (for small valves 2.5 mm)	 STP21...	4878
	Zone valve actuators (only available in AP, UAE, SA and IN)	 SUA...	4832
3-position actuators	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 Combi-valve VPI45)	 SSD31...	4861
	Electromotoric actuator, 3-position (for valves 5.5 mm)	 SQS35...	4573
DC 0...10 V actuators	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 valve 5,5 mm)	 SSB61...	4891

Electrical actuator, DC 0..10 V (for Combi-valve VPI45)		SSD61...	4861
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

Accessories

Description	Product no.	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 112 x 130 mm for surface wiring	ARG70.2	

Ordering

When ordering, please indicate product no. and description:

E.g. **RDG100 room thermostat**

Order the **IRA211** infrared remote control separately.

Order valve actuators separately.

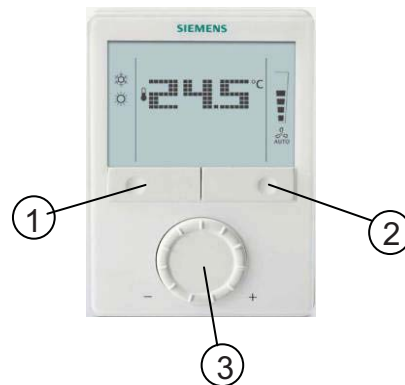
Mechanical design

The room thermostat consists of 2 parts:

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

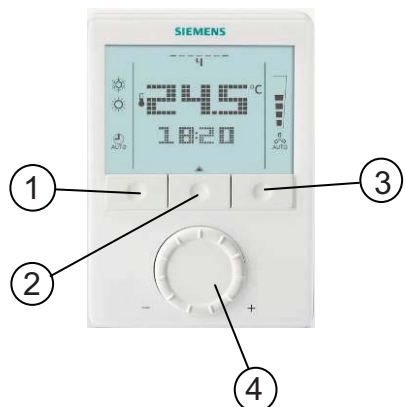
The housing engages in the mounting plate and is secured with 2 screws.

Operation and settings RDG...



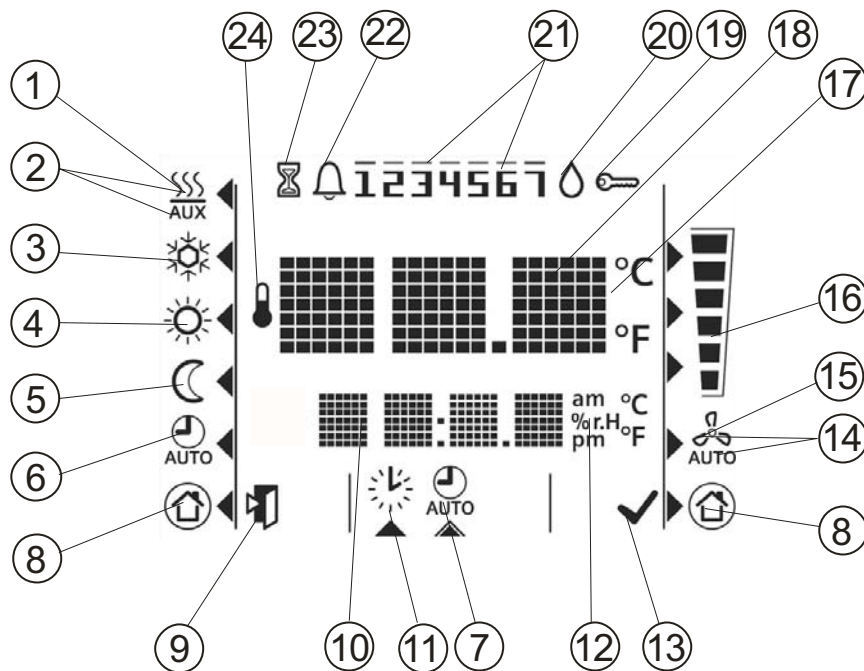
1. Operating mode selector / Esc
2. Fan mode selector / Ok
3. Rotary knob for setpoint and parameter adjustment

RDG100T



1. Operating mode selector / Esc
2. Button to enter the time and to set the timers
3. Fan mode selector / Ok
4. Rotary knob for setpoint and parameter adjustment

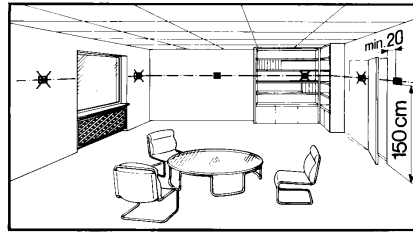
Display



#	Symbol	Description	#	Symbol	Description
1		Heating mode	14		Automatic fan
2		Heating mode auxiliary heater on (2 nd stage)	15		Manual fan
3		Cooling mode	16		Fan speed 1
4		Comfort mode			Fan speed 2
5		Energy Saving mode			Fan speed 3
6		Auto Timer mode	17		Degrees Celsius Degrees Fahrenheit
7		View and set Auto Timer program			
8		Protection	18		Digits for room temperature and setpoint display
9		Escape	19		Button lock
10		Digits for time, room temperature, setpoint, etc.	20		Condensation in room (dewpoint sensor active)
11		Setting the time of day and the weekday	21		Weekday 1...7: 1 = Monday / 7 = Sunday
12		Morning: 12-hour format Afternoon: 12-hour format	22		Fault
			23		Temporary timer function (visible when operating mode is temporarily extended due to prolonged presence or absence)
13		Confirmation of parameters	24		Indicates that room temperature is displayed

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



- The room thermostat must be mounted in a clean, dry indoor place and must not be exposed to drip or splash water

Wiring



See Mounting Instructions (M3181) enclosed with the thermostat.

- Comply with local regulations to wire, fuse and earth the thermostat
- Size correctly the cables to the thermostat, fan and valve actuators for AC 230 V mains voltage
- Use only valve actuators rated for AC 230 V on RDG100... / RDG110
- The power supply line must have an external fuse or circuit breaker with a rated current of no more than 10 A
- Isolate the cables of inputs X1-M / X2-M and D1-GND if the conduit box carries AC 230 V mains voltage
- On the RDG100.. and RDG110, inputs X1-M and X2-M carry mains potential. If the sensor's cables are extended, they must be suited for mains voltage
- 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 power supply before removing the thermostat from the mounting plate!

Commissioning

Select the application and the type of control output via the DIP switches before fitting the thermostat to 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 P3181).

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 in connection with a compressor, the minimum output on-time (parameter P48) and off-time (parameter P49) for Y11/Y21 must be adjusted to avoid damage to the compressor and shortening its life

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 setpoint 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

RDG100... / RDG110

⚠ Power supply	Operating voltage	AC 230 V + 10/-15%
	Frequency	50/60 Hz
	Power consumption	Max. 18 VA
Outputs	Fan control Q1, Q2, Q3-N	AC 230 V
	Rating	Max. 5(4) A
Inputs	Control outputs	
	Y1, Y2, Y3, Y4-N (RDG100)	AC 230 V, max. 1 A
	Y11-N / Y21-N (NO) (RDG110)	AC 230 V, max. 5(3) A
	Multifunctional inputs	
	X1-M / X2-M	
	Temperature sensor input	
	Type	QAH11.1 (NTC)
	Digital input	
	Operating action	Selectable (NO/NC)
	Contact sensing	DC 0...5 V, max. 5 mA
Insulation against mains	N/A, mains potential ⚠	
D1-GND		
Operating action	Selectable (NO/NC)	
Contact sensing	SELV DC 6...15 V, 3...6 mA	
Insulation against mains	3.75 kV, reinforced insulation	
Function input	Selectable	
External temperature sensor, changeover sensor, operating mode switchover contact, dewpoint monitor contact, enable electrical heater contact, fault contact		

RDG140 / RDG160

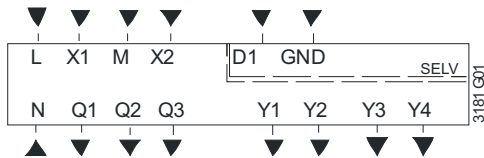
⚠ Power supply	Operating voltage	SELV AC 24 V ±20%
	Frequency	50/60 Hz
	Power consumption	Max. 2 VA
Outputs	Fan control	
	Q1, Q2, Q3-N (RDG140)	AC 230 V, max. 5(4) A
	Y50-G0 (RDG160)	SELV DC 0...10 V
		Max. ± 1mA
Inputs	Control outputs Y10-G0 / Y20-G0	SELV DC 0...10 V
	Resolution	39 mV
	Current	Max. ±1 mA
	Multifunctional inputs	
	X1-M / X2-M	
	Temperature sensor input	
Type	QAH11.1 (NTC)	
Digital input		
Operating action	Selectable (NO/NC)	
Contact sensing	DC 0...5 V, max. 5 mA	
Insulation against mains	3.75 kV, reinforced insulation	
D1-GND		
Operating action	Selectable (NO/NC)	
Contact sensing	SELV DC 6...15 V, 3...6 mA	
Insulation against mains	3.75 kV, reinforced insulation	

	External temperature sensor, changeover sensor, operating mode switchover contact, dewpoint monitor contact, enable electrical heater contact, fault contact		
Operational data, all types	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)
	 Energy Saving mode	(P11-P12)	15 °C/30 °C (OFF, 5...40 °C)
	 Protection	(P65-P66)	8 °C/OFF (OFF, 5...40 °C)
	Multifunctional inputs X1 / X2 / D1		
	Input X1		Selectable Ext. temperature sensor (P38=1)
	Input X2		Changeover sensor (P40=2)
Input D1		Operating mode switchover (P42=3)	
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
	Operation		
	Climatic conditions		As per IEC 721-3-3 Class 3K5
	Temperature		0...50 °C
Humidity		<95% r.h.	
Standards	Transport		
	Climatic conditions		As per IEC 721-3-2 Class 2K3
	Temperature		-25...60 °C
	Humidity		<95% r.h.
	Mechanical conditions		Class 2M2
	Storage		
	Climatic conditions		As per IEC 721-3-1 Class 1K3
	Temperature		-25...60 °C
	Humidity		<95% r.h.
	 conformity		
EMC directive		2004/108/EC	
Low-voltage directive		2006/95/EC	
 N474 C-tick conformity to			
EMC emission standard		AS/NSZ 4251.1:1999	
 Reduction of hazardous substances		2002/95/EC	
Product standards			
Automatic electrical controls for household and similar use		As per EN 60730-1	
Special requirements for temperature-dependent controls		As per EN 60730-2-9	
Electronic control type		2.B (micro-disconnection on operation)	

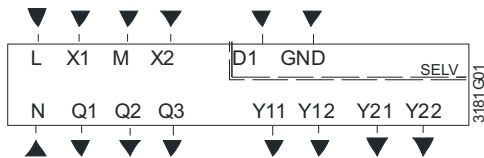
General	Electromagnetic compatibility	
	Emissions	As per IEC/EN 61000-6-3
	Immunity	As per IEC/EN 61000-6-2
	Safety class	
	RDG100... / RDG110, RDG140	II as per EN 60730
	RDG160	III as per EN 60730
	Pollution class	
	Normal	
	Degree of protection of housing	
	IP30 to EN 60529	
Connection terminals		
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 RDG100... / RDG110 / RDG140		
0.30 kg		
RDG160		
0.25 kg		

Connection terminals

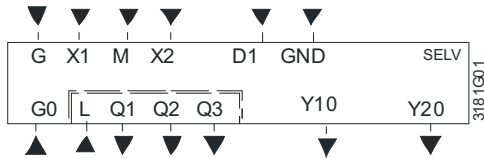
RDG100..



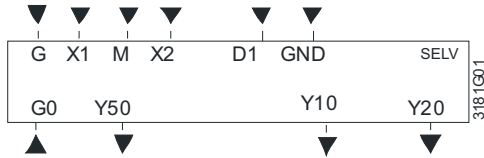
RDG110



RDG140



RDG160



L, N Operating voltage AC 230 V
G, G0 Operating voltage AC 24 V

X1, X2 Multifunctional input for temperature sensor (e.g. QAH11.1) or potential-free switch
Factory setting:
- X1 = external room temperature sensor
- X2 = sensor or switch for automatic heating / cooling changeover.

M Measuring neutral for sensor and switch
D1, GND Multifunctional input for potential-free switch
Factory setting: Operating mode switchover contact

Q1 Control output fan speed "low" AC 230 V
Q2 Control output fan speed "medium" AC 230 V
Q3 Control output fan speed "high" AC 230 V
Y50 Control output fan speed DC 0...10 V

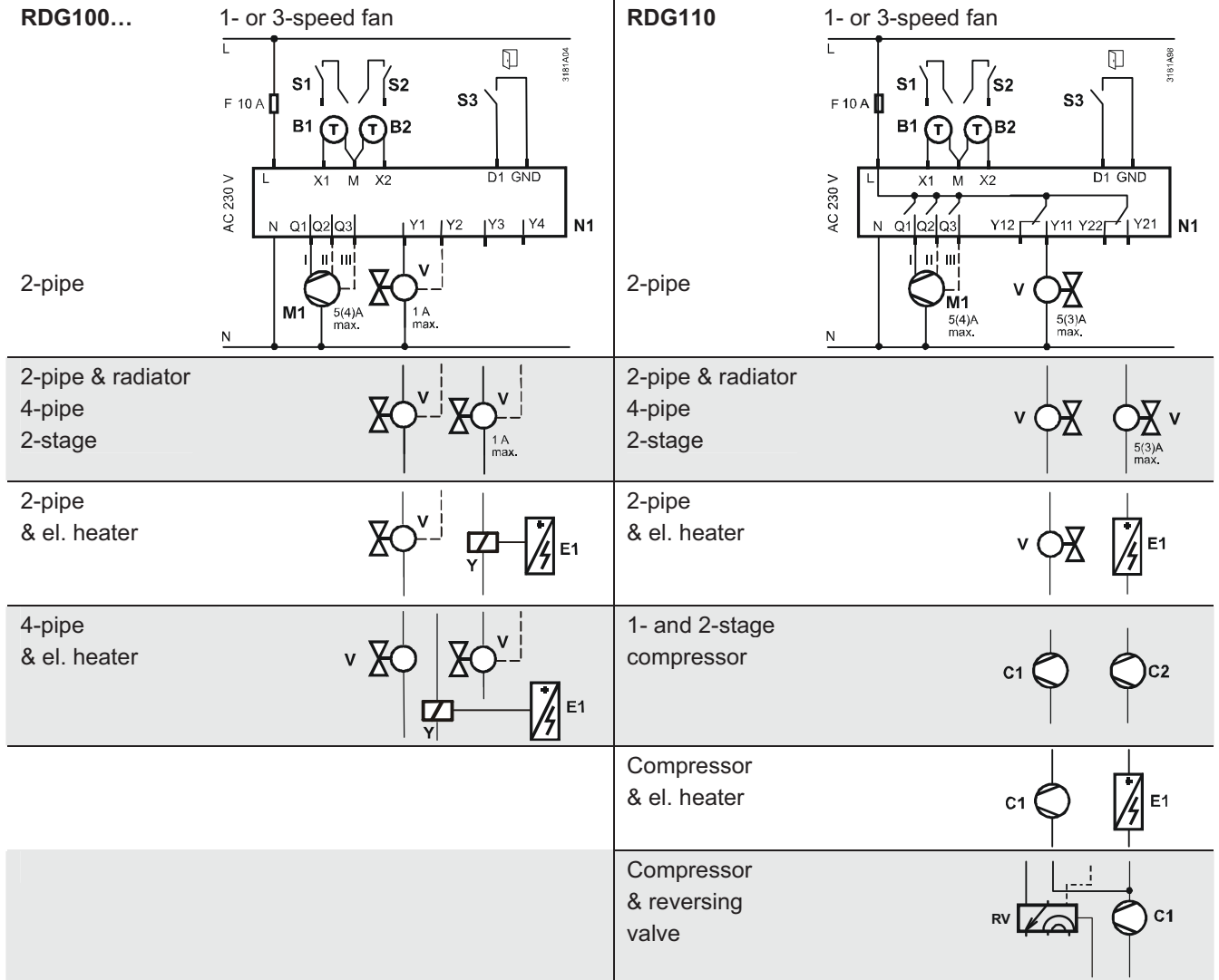
Y1...Y4 Control output "Valve" AC 230 V (NO, for normally closed valves), output for electrical heater via external relay

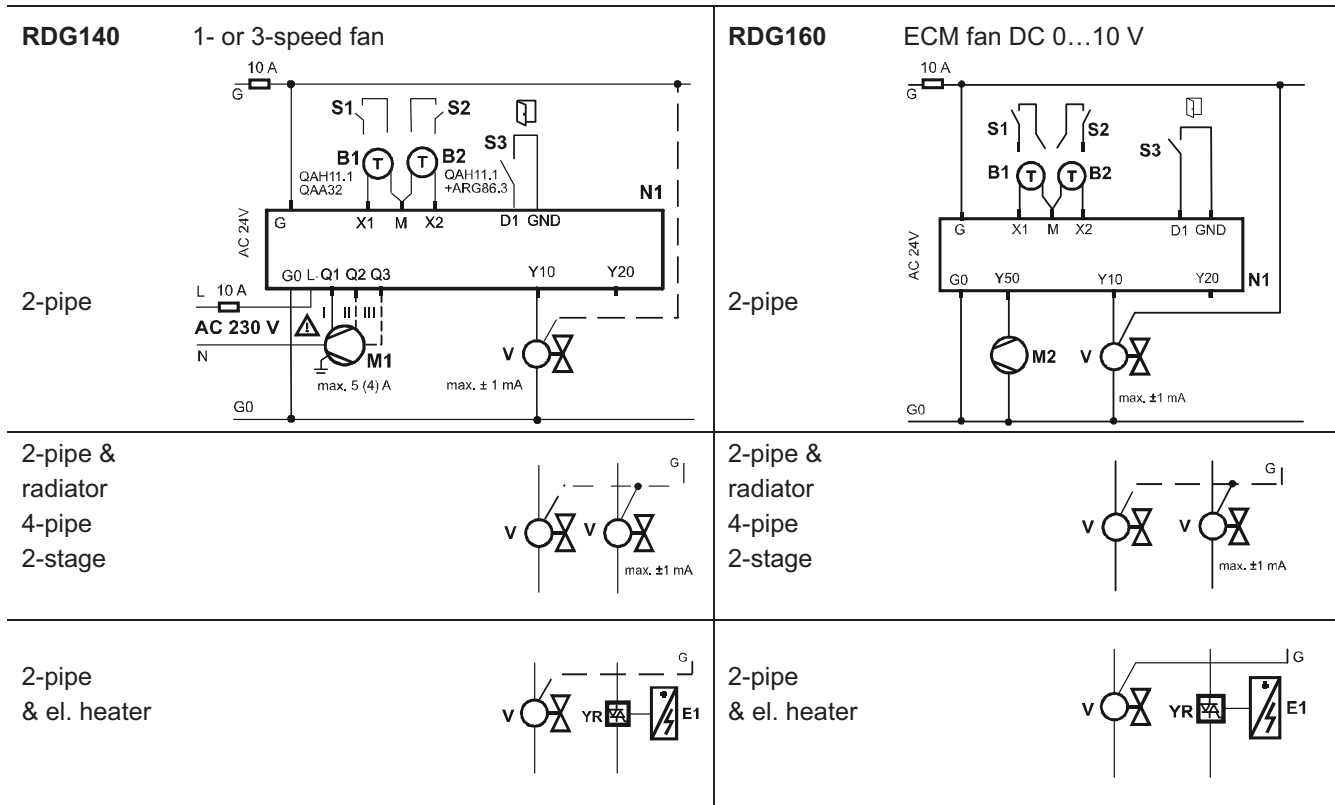
Y11, Y21 Control output "Valve" AC 230 V (NO, for normally closed valves), output for compressor or electrical heater

Y12, Y22 Control output "Valve" AC 230 V (NC, for normally open valves)

Y10, Y20 Control output for DC 0...10 V actuator

Connection diagrams





- | | | | |
|----|--|--------|--|
| N1 | Room thermostat RDG1... | S1, S2 | Switch (keycard, window contact, etc.) |
| M1 | 1- or 3-speed fan | S3 | Switch at SELV input (keycard, window contact) |
| M2 | ECM fan DC 0...10 V | B1, B2 | Temperature sensor (return air temperature, external room temperature, changeover sensor, floor temperature limit, etc.) |
| V | Valve actuators DC 0...10 V:
Heating, cooling, radiator, heating / cooling,
1 st or 2 nd stage | YR | DC 0...10 V signal converter / current valve |
| E1 | Electrical heater | | |

Dimensions

