

REV22RF



REV-R.01/1

Self-learning Room Temperature Controller / Receiver

**REV22RF
REV-R.01/1**

consisting of controller (with integrated radio transmitter) and receiver
(switching unit with relay outputs)

Mains-independent room temperature controller featuring straightforward operation and an easy-to-read display.

Self-learning 2-position controller with PID control (patented).

Choice of one 7-day operating mode with individual 24-hour program and three 24-hour operating modes as well as cooling functions.

Specifically suited for upgrading and renovation projects (wireless unit).

Use

For the control of the room temperature in individual rooms where electrical wiring does not exist or where it would be very troublesome to lay the wiring:

- Single-family and holiday houses
- Apartments and office spaces
- Individual rooms and consulting rooms
- Commercially used spaces

For the control of the following pieces of equipment:

- Solenoid valves of instantaneous water heaters
- Solenoid valves of atmospheric gas burners
- Forced draught gas and oil burners
- Thermic actuators
- Circulating pumps in heating systems
- Electric direct heating
- Fans of electric storage heaters
- Zone valves (normally closed)
- Cooling and refrigeration equipment

Functions

- Radio signal transmission
- PID control
- Self-learning or adjustable switching cycle time
- 7-day time switch
- Preselected 24-hour operating modes
- Override button
- Reset function
- Sensor calibration
- Setting check
- Holiday mode
- Cooling
- Frost protection function
- Minimum limitation of setpoint
- Pump kick
- Optimum start control in the morning (P.1)

Type summary

Radio signal unit consisting of:

Room temperature controller (transmitter) and 7-day time switch
Receiver (switching unit)

REV22RF
REV-R.01/1

Ordering

When ordering, please give type reference according to "Type summary". Both units must be ordered as separate items.

Delivery

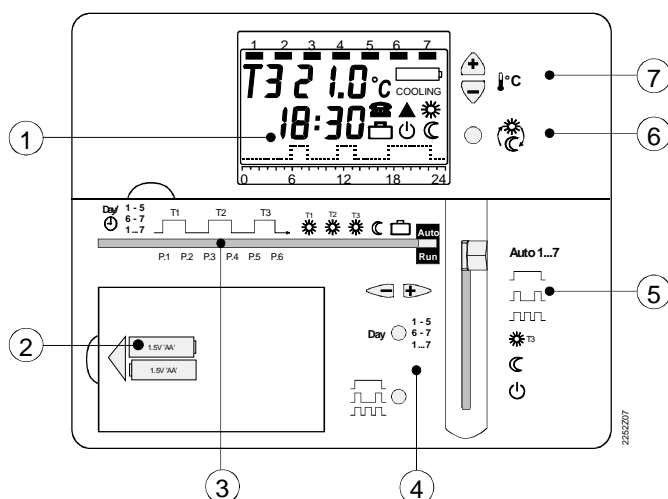
The controller / transmitter **REV22RF** is supplied with batteries. The receiver **REV-R.01/1** is mains-powered.

Mechanical design of controller / transmitter REV22RF

Plastic housing with easy-to-read display, easily accessible operating elements and a removable cover. The removable battery compartment allows straightforward replacement of the two 1.5 V alkaline batteries. Using the support supplied with the unit, the controller / transmitter (including the baseplate) can be placed anywhere in the room. The baseplate can be fitted to all commercially available recessed conduit boxes or directly on the wall before fitting the unit to it. The base carries the transmitter with the antenna and the housing accommodates the electronics with the 3 DIP switches.

Mechanical design of receiver REV-R.01/1

Plastic housing with easily accessible operating elements and a removable cover. The baseplate can be fitted to all commercially available recessed conduit boxes or directly on the wall to be wired before fitting the unit to it. A relay with a potential-free changeover contact and the connection terminals are located on the baseplate. The receiving antenna is integrated in the housing.



① Display

- ⏻ Stand-by with frost protection
- ☀ Normal temperature
- ☾ Economy temperature
- 1 ... 7 Block / day
- ⏏ Switching pattern with flashing time bar
- ▲ Heating / cooling on
- COOLING Cooling mode
- 📅 Holiday mode
- 📞 Function not available
- 🔋 Battery change
- 18:30 Time of day
- 1 Weekday
- 2 1.0°C Room temperature (measured)
- T3 Active normal temperature

② Battery compartment

- 🔋 2 alkaline batteries 1.5 V (AA)

③ Setting slider

- Day/ ⌚ Time / weekday
- 1 - 5 Switching pattern allocation block / day
- 6 - 7
- 1 ... 7
- T1 T2 T3 Switching times P.1...P.6

- T1 T2 T3 Normal temperatures T1...T3
- ☾ Economy temperature
- 📅 Holiday mode
- Auto Run Operating position

④ Setting buttons







- Day 1 - 5 Block / day button
- 6 - 7
- 1 ... 7
- ⏏ Switching pattern button
- ◀ For decreasing values
- ▶ For increasing values

⑤ Operating mode selector





- Auto 1...7 7-day mode with up to 3 heating periods per day
- ⏏ 24-hour mode with one heating period
- ⏏ 24-hour mode with 2 heating periods
- ⏏ 24-hour mode with 3 heating periods
- ☀ T3 Continuously normal temperature
- ☾ Continuously economy temperature
- ⏻ Stand-by with frost protection

⑥ Override button

⑦ Warmer / colder buttons

- Auto 1...7
- 7-day mode with up to 3 heating periods per day
- 24-hour mode with 1 heating period
- 24-hour mode with 2 heating periods
- 24-hour mode with 3 heating periods
- Continuously normal temperature
- Continuously economy temperature
- Stand-by with frost protection

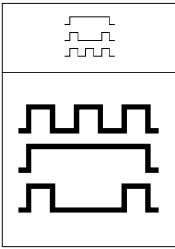
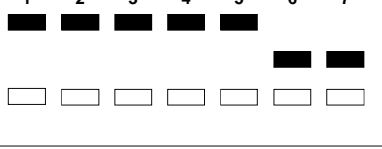
Setpoints

	Standard heating	Setting range	Setting range with setpoint limitation	Standard cooling
 T1	19 °C	3...29 °C	16...29 °C	23 °C
 T2	20 °C	3...29 °C	16...29 °C	23 °C
 T3	21 °C	3...29 °C	16...29 °C	23 °C
	16 °C	3...29 °C	16...29 °C	29 °C

In the 7-day and 24-hour operating modes, the setpoints can be adjusted. Ready entered is only an overtemperature protection of 29 °C in cooling mode.

7-day time switch

To simplify the entry of switching times, there are 3 different switching patterns available. These can be assigned to the respective weekdays 1...5 and weekend days 6...7 in the form of blocks. This means that the respective switching times and room temperatures per block need to be adapted only once.

Switching patterns	Blocks
	<div>1 - 5 6 - 7 1 ... 7</div> <div><div>1234567</div><div></div></div>

It is also possible to enter the individual weekdays 1...7.

Override button



Manual changeover between normal and economy temperature. This manual action will automatically be reset when the next switching action takes place or when the operating mode changes.

Setting check

Day



1 - 5
6 - 7
1...7

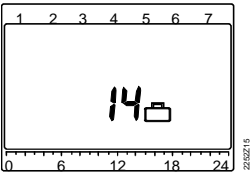
When pressing button

1 - 5
6 - 7
1...7

 in the 7-day mode **Auto 1...7**, the selected switching patterns of the individual days will be displayed, one by one, each for 3 seconds.

Holiday setting

Entry of start and duration of the holiday period. In that case, the controller will switch to economy mode  at the beginning of the holiday period. The display shows this with the **holiday symbol**  and the number of **remaining** days in the holiday period as follows:

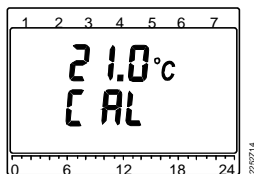


On completion of the holiday period, the controller will resume the selected operating mode (e.g. **Auto 1...7**).

Calibration of sensor

If the displayed room temperature does not agree with the measured room temperature, the temperature sensor can be recalibrated.

When the setting slider is set to position **Day**, press button . Then, the display will change as follows:

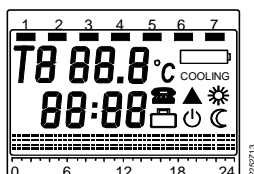


By pressing button or , the temperature can be changed in increments of 0.2 °C (max. ± 2 °C). On completion of the readjustment, the setting slider must be reset to the "Auto / Run" position.

Reset

When pressing buttons and simultaneously, all individual settings will be reset to their standard values.

Resetting also serves as a display check:



After a reset, all individual settings such as time of day, weekday, switching times, etc., must be re-entered.

Technical design of controller / transmitter REV22RF

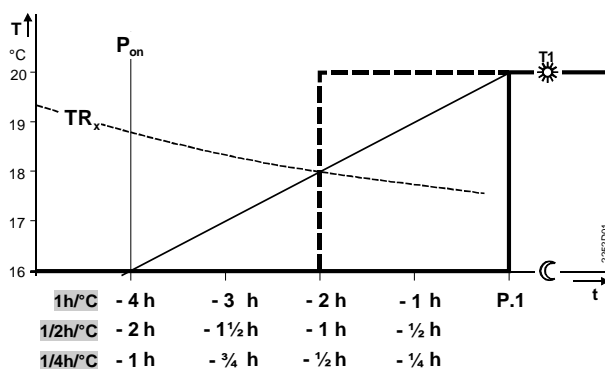
DIP switch no. 1

OPTIMUM P.1	1	2	3
OFF			
1/4h / °C			
1/2h / °C			
P.1 1h / °C			

Optimum start control

Optimization brings forward the switch-on point P.1 such that the adjusted setpoint will be reached at the desired time. The setting depends on the type of control system in use, that is, on heat transmission (piping system, radiators), building dynamics (building mass, insulation), and heating output (boiler capacity, flow temperature). The optimization is set with DIP switch no.1 as follows:

OFF	No effect
1/4h/°C	For fast controlled systems
1/2h/°C	For medium controlled systems
1h/°C	For slow controlled systems



T	Temperature (°C)	TR _x	Actual value of room temperature
t	Forward shift of switch-on point (h)	P _{on}	Starting point for optimum on

DIP switch no. 2

	1	2	3
☀ 3...29°C	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
☀ 16...29°C	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
HEATING	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
COOLING	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
🔌 PUMP OFF	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
🔌 PUMP ON	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Limitation of setpoint

When using minimum limitation of the setpoint to 16 °C, undesired heat transfer to neighbouring flats is prevented in buildings that have several heating zones. The function can be selected with DIP switch no. 2.

Cooling

DIP switch no.2 is used for switching over to cooling mode when used in cooling applications.

Periodic pump run (pump kick)

The setting is made with DIP switch no. 2 while the pump is running. This protects the pump against seizure during longer OFF periods. The periodic pump run is activated for one minute every 24 hours at 12:00 h.

DIP switch no. 3

	1	2	3	4
Self learning	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PID 12	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PID 6	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2-Pt \square	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
🔌 5°C	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
🔌 3°C	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
🔌 10°C	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Control

The REV22RF is a 2-position controller providing PID control. The room temperature is controlled through the cyclic switching of a regulating unit.

Self-learning mode

The controller is supplied with an active self-learning mode, which enables it to automatically adapt to the controlled system (type of building construction, type of radiators, size of rooms, etc.). After a certain learning period, the controller optimizes its parameters and then operates in the mode it has learned.

Exceptions

In exceptional cases, where the self-learning mode may not be adequate, it is possible to choose PID 12, PID 6 or 2-Pt mode:

PID 12 mode Switching cycle of 12 minutes for normal or slow controlled systems (e.g. massive building structures, large spaces, cast iron radiators, oil burners).

PID 6 mode Switching cycle of 6 minutes for fast controlled systems (e.g. light building structures, small spaces, plate radiators or convectors, gas burners).

2-Pt mode Pure 2-position control with a switching differential of 0.5 °C (± 0.25 °C) for very difficult controlled systems with considerable outside temperature variations.

Frost protection

Frost protection is adjustable with DIP switch no. 2, either 3 °C, 5 °C or 10 °C.

Technical data of controller / transmitter REV22RF




General data

controller / transmitter




Operating voltage	DC 3 V
Batteries (Alkaline AA)	2 x 1.5 V
Battery life	approx. 2 years
Backup for battery change	max. 1 min

General data controller

Sensing element NTC	68 k Ω at 25 °C
Measurement range	0...31 °C
Time constant	max. 2 min
Setpoint setting range	
Normal temperature	3 ... 29 °C
Economy temperature	3 ... 29 °C

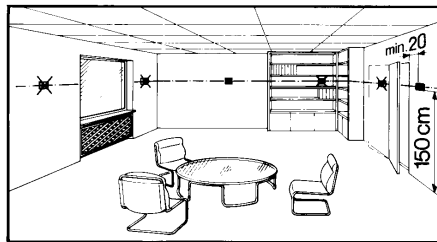
General data transmitter	Setpoint for frost protection	
	Adjustable	3 / 5 / 10 °C
	Factory setting	5 °C
	Resolutions of settings and display	
	Setpoints	0.2 °C
	Switching times	10 min
	Measurement of actual value	0.1 °C
	Display of actual value	0.2 °C
	Display of time of day	1 min
	SRD band	868.7 to 869.2 MHz
Environmental conditions controller / transmitter	Transmitting frequency REV22RF	868.95 MHz
	Max. transmitting power	< 10 mW / typically 4 mW
	Max. data throughput	19,200 symbols/s=38,400 Bit/s
	Modulation	binary frequency changeover BFSK
	Frequency stability	< ±20 ppm (±17 kHz)
	Address range (factory setting)	16 Bit (0...65535)
	Operation	to IEC 721-3-3
	Climatic conditions	class 3K3
	Temperature	0...+35 °C
	Humidity	<95 % r. h.
Norms and standards controller / transmitter	Transport	to IEC 721-3-2
	Climatic conditions	class 2K3
	Temperature	–25...+70 °C
	Humidity	<95 % r. h.
	Mechanical conditions	class 2M2
	Storage	to IEC 721-3-1
	Climatic conditions	class 1K3
	Temperature	–25...+70 °C
	Humidity	<95 % r. h.
	 conformity	
	EMC directives	89/336/EEC
	R&TTE directives	99/5/EEC
	Product norm	
	Radio equipment	ETSI-ETS 300 683
	Electromagnetic compatibility	
	Immunity	EN 50082-1
	Emissions	EN 50081-1
	Radio equipment	ETS 300 220
	Approval	 0885 ⓘ
	In the following countries	all EEC countries, Norway, Iceland and Switzerland
	C-Tick	 N474
	Devices of safety class	III to EN 60 730-1
	Degree of pollution	normal
	Weight	0.24 kg
	Colour	signal-white RAL 9003

Technical data of receiver REV-R.01/1

General unit data	Operating voltage	AC 230 V +10/–15 %
	Power consumption	< 10 VA
	Frequency	50 Hz
	Switching capacity of relays	
	Voltage	AC 230 V
Environmental conditions	Current	6 (2.5) A
	Operation	to IEC 721-3-3
	Climatic conditions	class 3K5
	Temperature	0...+50 °C
	Humidity	<95 % r. h.
	Transport	to IEC 721-3-2
	Climatic conditions	class 2K3
	Temperature	–25...+70 °C
	Humidity	<95 % r. h.
	Mechanical conditions	class 2M2
Norms and standards controller / transmitter	Storage	to IEC 721-3-1
	Climatic conditions	class 1K3
	Temperature	–25...+70 °C
	Humidity	<95 % r. h.
	 conformity	
	EMC directives	89/336/EEC
	Low voltage directives	73/23/EEC
	R&TTE directives	99/5/EEC
	Product norm	
	Radio equipment	ETSI-ETS 300 683
	Automatic electrical controls for household and similar use	EN 60 730-1
	Special requirements on energy controllers	EN 60 730-2-11
	Electromagnetic compatibility	
	Immunity	EN 50 082-1
	Emissions	EN 50 081-1
	Radio equipment	ETS 300 220
	Approval	 0885 ⓘ
	In the following countries	all EEC countries Norway, Iceland and Switzerland
	C-Tick	 N474
	Devices of safety class	II to EN 60 730-1
	Degree of pollution	normal
	Weight	0.16 kg
	Colour	signal-white RAL 9003

- The unit should be located in the main living room (on the wall or free-standing using the support provided):
- The distance to the receiver should not exceed 20 m or 2 floors
- The unit should be located such that the sensor can capture the room temperature as accurately as possible, without getting affected by direct solar radiation or other heat or refrigeration sources
- The unit should be located such that it can transmit signals with as little interference as possible. For this reason, the following points should be observed:
 - Do not mount the unit on metal surfaces
 - Not in the vicinity of electrical cables and equipment like PCs, TV sets, microwave appliances, etc.
 - Not in the vicinity of large metal structures or construction elements with fine metal meshes like special glass or special concrete

Wall mounting



Engineering notes receiver REV-R.01/1

- The unit should preferably be mounted near the controlled device
- The unit should be located such that it can receive signals with as little interference as possible. For this reason, the following points should be observed (same as with the transmitter):
 - Not in control panels
 - Do not mount the unit on metal surfaces
 - Not in the vicinity of electrical cables and equipment like PCs, TV sets, microwave appliances, etc.
 - Not in the vicinity of large metal structures or construction elements with fine metal meshes like special glass or special concrete
- The location where the unit is mounted should be dry and free from splash water
- The unit can be fitted to most commercially available recessed conduit boxes or directly on the wall

Mounting notes controller / transmitter REV22RF

Wall mounting

- When mounting the unit, the baseplate must first be fitted. Then, it must be engaged at the top, swung downward and secured with a screw
- For more detailed information, please refer to the Installation Instructions supplied with the unit

Support

- Refer to the Installation Instructions (included in packing REV-R.01/1)

Mounting and installation notes receiver REV-R.01/1



The receiver must be wired with mains voltage switched off.
Mains voltage may be switched on again only after the unit is completely mounted.

- When mounting the unit, the baseplate must first be fitted and wired (L/N = mains 230 V, LX/L1 = consumers). Then, it must be engaged at the top, swung downward and secured with a screw
- For more detailed information, please refer to the Installation Instructions supplied with the unit

For the electrical installation, the local regulations must be complied with.

Commissioning notes receiver REV-R.01/1

It is recommended to first commission and switch on the receiver, then the transmitter.

- Switch on mains supply
 - a) Press "Reset" button (= delete) for about 4 seconds, LED flashes briefly (deleting the stored address)
 - b) Press "Set" button (= setting / learning) for about 3 seconds until the LED lights up
 - c) The duration of the receiver's learning readiness is a maximum of 25 minutes. If no signal is received from the transmitter during that period of time, repeat steps b) and c)
 - d) Mount transmitter and put it into operation
 - e) When the receiver receives a signal from the transmitter, the LED flashes briefly
 - f) When the LED is steady on, the relay is energized = controlled device ON
 - g) When the LED is dark, the relay is de-energized = controlled device OFF
 - h) In the event of a power failure at the receiver, the relay will automatically be de-energized.

The transmitter repeats the ON or OFF signal at 20-minute intervals, depending on the operational status. This means that the relay will be energized / de-energized again after no more than 20 minutes. This interval was selected to prolong battery life

If the REV-R.01/1 receives no signal from the controller / transmitter for 60 minutes, the relay will drop out so that the controlled device will automatically be switched off.

Commissioning notes controller / transmitter REV22RF

It is recommended to first commission and switch on the receiver and then the transmitter.

- If the reference room is equipped with thermostatic radiator valves, they must be fully opened
- The control mode can be changed with a DIP switch at the rear of the unit
- The battery transit tab, which prevents inadvertent operation of the unit during transport and storage, must be removed from the batteries. The unit switches on
 - a) When – immediately after switching on – symbol ▲ (controlled device ON) appears on the display, the first signal has already been transmitted to the receiver and communication has been opened
 - b) Make settings in agreement with the Operating Instructions
 - c) If symbol ▲ (controlled device ON) does not appear on the display, it must first be activated for signal transmission
 - d) Set operating mode selector to position ☼ T3
 - e) Set setting slider to ☼ T3
 - f) Press - /+ buttons to adjust the setpoint to 29 °C
 - g) Symbol ▲ (heating ON) appears on the display after a maximum of one minute
 - h) The first signal transmission to the receiver has been completed
 - i) After 10 seconds, the transmitter sends another signal

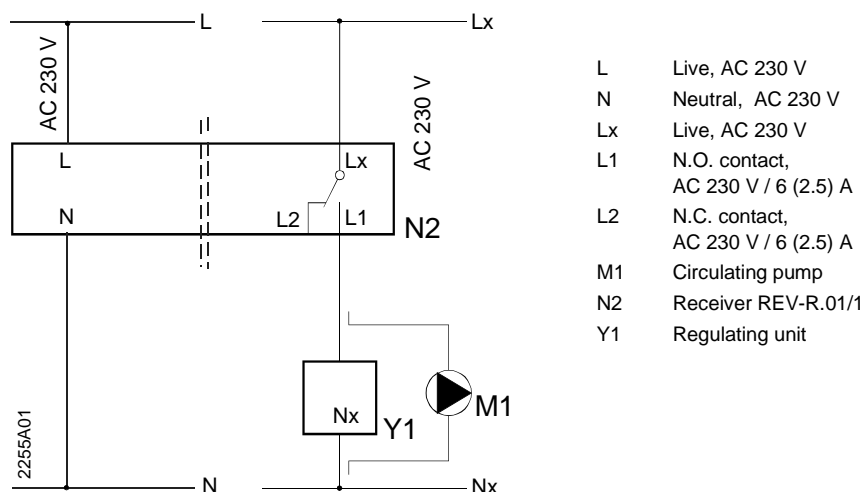
- j) The ON or OFF signal will then be repeated at 20-minute intervals (the 20-minute interval has been selected to prolong battery life)
- k) Reset setpoint according to f) and g)
- l) Set operating mode selector back to the required position

Important:

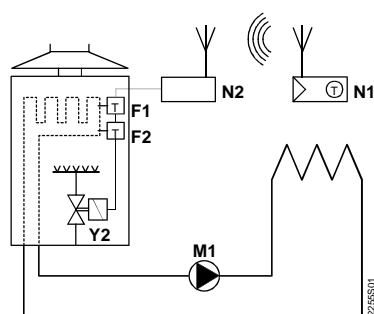
The duration of the receiver's readiness to learn is a maximum of 25 minutes. If no signal is received from the transmitter during that period of time, repeat steps d) through m) above.

- If the room temperature displayed does not agree with the room temperature effectively measured, the temperature sensor should be recalibrated (refer to "Calibration of sensor")

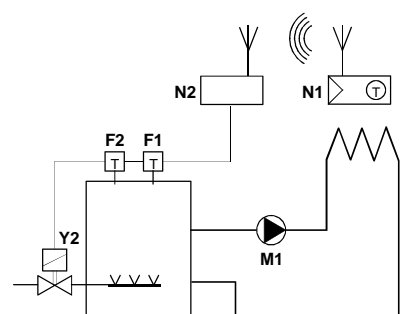
Connection diagram receiver REV-R.01/1



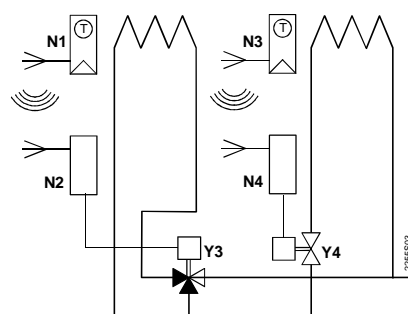
Application examples



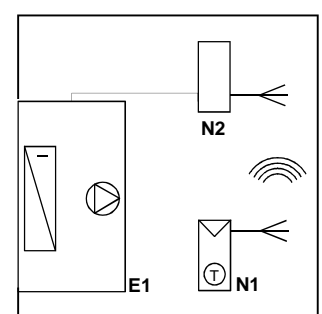
Instantaneous hot water heater



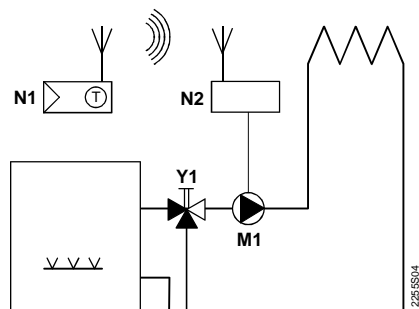
Atmospheric gas burner



Zone valve



Cooling equipment

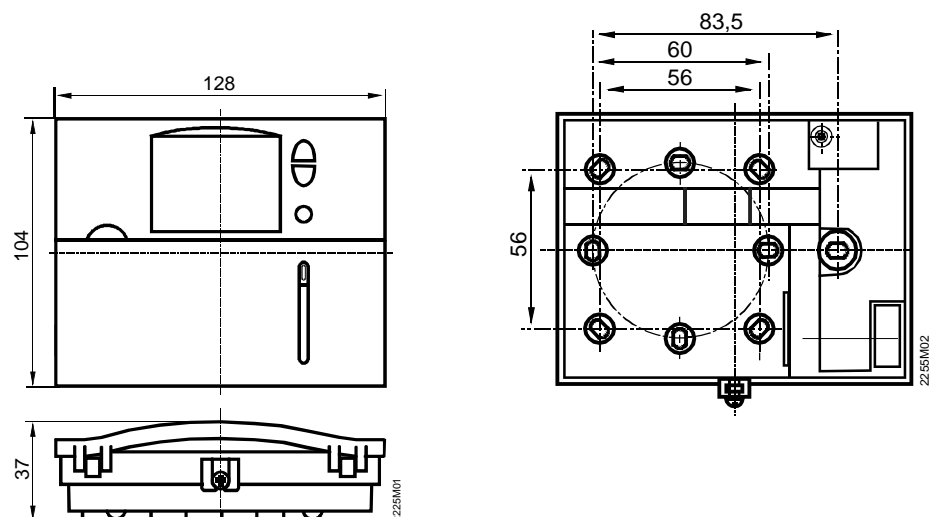


Circulating pump with precontrol by manual mixing valve

- E1 Cooling unit
- F1 Thermal reset limit thermostat
- F2 Safety limit thermostat
- M1 Circulating pump
- N1 Room temperature controller (transmitter) REV22RF
- N2 Receiver REV-R.01/1
- N3 Room temperature controller (transmitter) REV22RF
- N4 Receiver REV-R.01/1
- Y1 3-port valve with manual adjustment
- Y2 Magnetic valve
- Y3 Motorized 3-port valve
- Y4 Motorized 2-port valve

Dimensions

Controller / transmitter REV22RF



Receiver REV-R.01/1

