



SIGMAGYR®

## Room Units and Sensors for Use in Heating Plants

### Type summary

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**Sensors and room units with PPS interface:**

- QAA24, QAA64, QAA10, QAW50..., QAW70, QAW59x, QAC22, QAC32, QAD22..., QAD26..., QAE22..., QAE26..., QAP21.3, AUF77

**Controllers within the SIGMAGYR® range:**

- RVP100, RVP200 series, RVP300 series, RVD100 / 200 series, RVP500 series and RVL400 series

## QAA... room temperature sensors with sensing element LG-Ni 1000

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QAA24



- Sensing of room temperature in heating plants for:
- Room temperature influence for the heating curve
  - Limitation of the room temperature
  - Room temperature compensation or optimization
  - Display of actual room temperature

QAA64



- Sensing of room temperature in heating plants where the sensor needs to be protected against damage or destruction by people. Typical spaces include:
- Public buildings
  - Schools or colleges
  - Administrative buildings
  - Halls or corridors
  - Leisure centers or sports halls

## QAW... room units with PPS interface

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QAW50



- Sensing of room temperature in heating plants with local user adjustment:
- Economy button for overriding the normal heating program to save energy
  - Knob for adjustment of the room temperature setpoint
  - Slider for selection / override of the desired operating mode

QAW70



- The unit features a 7-day heating program, adjustable temperature setpoints, operating mode selection and an Info button.
- Economy button for overriding the normal heating program to save energy
  - Knob for adjustment of the room temperature setpoint
  - Info button for fast retrieval of important information
  - Heating program with 3 individual heating periods per day
  - Holiday function

QAW44



- Sensing of a second room temperature reference in heating plants (for use together with QAW70). The exact % authority of the QAW44 temperature can be assigned on operating line 57 of the QAW70:
- Set operating line 57 to 50 % if averaging is required
  - Set operating line 57 to 100 % if the QAW70 is required as a user interface only

QAW50.03



- Addressable room unit for sensing in 2 separate zones:
- With address selector for selecting the heating zones to be controlled
  - For use together with QAW50 or QAW70 room units

QAA10



- Sensing of room temperature in heating plants where only PPS signals are possible.

QAW590,  
QAW591



- Wireless room units for where the installation of cabling is impractical:
- In old buildings, museums, churches or buildings of historical significance
  - In rooms where the walls cannot easily be reworked
  - In rooms with flexible partitioning and frequently changing décor
- Simple averaging of the temperature from several rooms or areas

## Installation notes

Depending upon the application, all room temperature sensing devices should be located as follows:

- For maximum limitation: in the room with the largest heat gains
- For minimum limitation and control: in the room that cools down the quickest

Room temperature sensors and room units should be sited on an inner wall of the reference room. Units must not be mounted:

- In niches or shelves
- Behind curtains
- Above or near heat sources
- Where the unit is exposed to direct solar radiation
- Where the unit is exposed to drafts or air currents

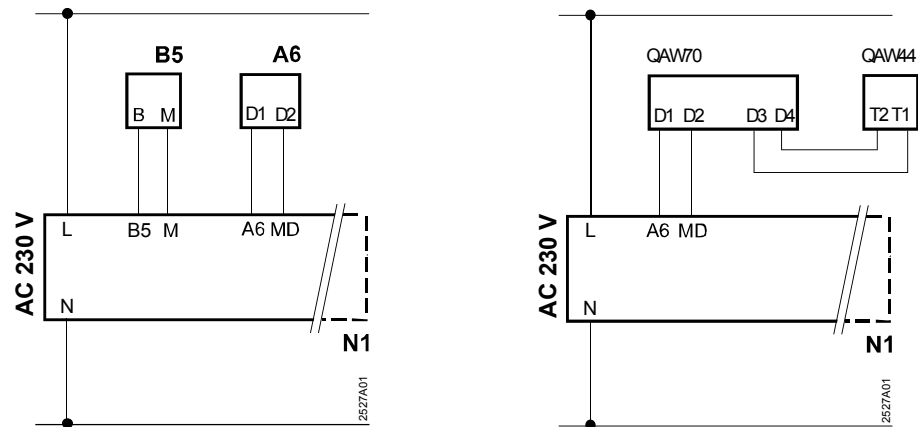
## Averaging of room temperatures

Averaging of room temperatures with SIGMAGYR® is achieved automatically where the controller allows connection of both a room unit (QAW50 or QAW70) and a room temperature sensor (QAA24) across terminals A6/MD and B5/M respectively. With RVL400 and RVP300 series controllers, operating line 65 must be set to "A" (automatic).

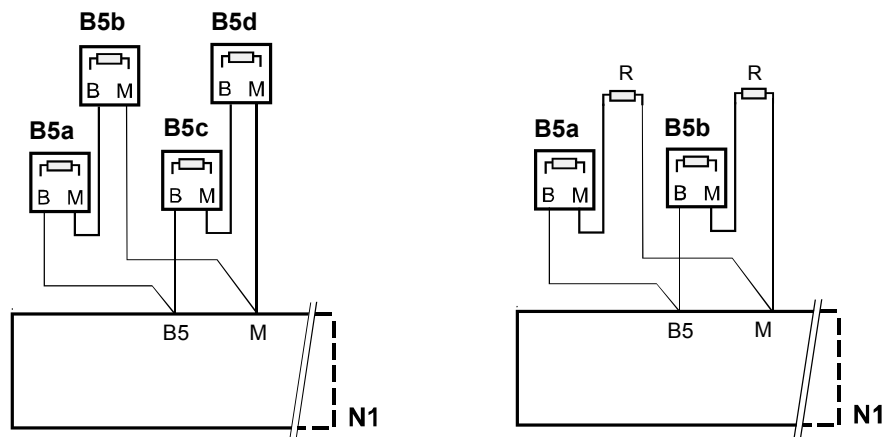
## External sensor

The QAW70 can also be used with an external temperature sensor QAW44. The authority of this sensor can be set on line 57 of the QAW70 (set to 50 % for averaging).

## Connections



**Series / parallel connection** An average value can also be provided for the controllers using 4 standard LG-Ni1000 temperature sensors connected in series / parallel. This combination provides the same resistance value as a single sensor. If only 2 sensors are required, 2 fixed value resistors can be used (e.g.  $1091 \Omega = 20 \text{ }^\circ\text{C}$ ).



A6 Room unit QAW70 or QAW50  
 B5 Room temperature sensor  
 B5... Multiple room temperature sensors

M Measuring neutral  
 N1 Controller RVL, RVP, RVD  
 R Fixed value resistor (e.g.  $1091 \Omega = 20 \text{ }^\circ\text{C}$ )

## Equipment combinations

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### Room devices

### Controller series

QAW50 + QAA24

RVL400\* series, RVP300 series

QAW70 + QAA24

RVL400 series, RVP300 series

QAW70 + QAW44

RVL400, RVP300, RVP100, RVP200, RVD100, RVD200, RVP500

\* Note: All RVL400 series controllers also automatically calculate an average flow temperature, when 2 LG-Ni 1000 sensors are connected in parallel across terminals B1 - M

## QAC... outside sensors with sensing element LG-Ni 1000 / NTC 575

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QAC22,  
QAC32



Sensing of outside temperature and – to a smaller extent – solar radiation, the wind and the temperature of the wall, as a:

- Reference sensor for the weather-compensated flow temperature control
- Reference temperature for optimization
- Reference temperature to calculate energy shutdown of the heating plant (ECO)

### Installation notes

Depending upon the application, the outside sensor should be sited as follows:

*For control:*

- On the wall containing the windows from the living room areas
- Not where the sensor is exposed to the morning sun
- Typically outside sensors are sited on a north (or north-west) facing wall

*For optimization:*

- Always on the coldest wall of the house or building (normally the north side)
- Never where the sensor is exposed to the morning sun

The outside sensor should preferably be located in the middle of the house or building, at least 2.5 m above the ground. The outside sensor must not be mounted:

- Above windows, doors, air exhausts or other heat sources
- Underneath balconies or eaves

The conduit for the sensor must be plugged to avoid measuring errors transmitted via the conduit. The outside sensor must never be painted over.

## QAD... strap-on temperature sensors with sensing element LG-Ni 1000

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QAD22,  
QAD26.220



Sensing of water temperature in heating pipework for:

- Control and limitation of the flow temperature
- Limitation of the return temperature

### Installation notes

Depending upon the application, the strap-on sensor should be sited as follows:

*For flow temperature control:*

- At the heating flow, immediately after the pump (if the pump is in the flow)
- 1.5...2 m after the mixing valve (if the pump is in the return)

*For return temperature limitation:*

- At the location where the return temperature can be ideally sensed
- At the location where the return temperature water is well mixed

The sensor housing must not be covered by pipe insulation.

## QAE... immersion temperature sensors with sensing element LG-Ni 1000

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QAE22A  
QAE22.5A  
QAE22.2A  
QAE26...



Immersion temperature sensors are designed for insertion into the heating pipe or storage tank (typically via a protection pocket). Use QAE22 when it is not possible to fit a QAD22 strap-on device.

Sensing of water temperature in heating pipework for:

- Control and limitation of the flow temperature
- Limitation of the return temperature

### Installation notes

Depending upon the application, the immersion temperature sensor should be sited as follows:

*For flow temperature control:*

- At the heating flow, immediately after the pump (if the pump is in the flow)
- 1.5...2 m after the mixing valve (if the pump is in the return)

*For return temperature limitation:*

- At the location where the return temperature can be ideally sensed
- At the location where the return temperature water is well mixed

The sensor should ideally be mounted in an elbow so that the pocket faces the direction of flow. The minimum immersion length must be 60 mm, irrespective of the type of immersion sensor selected. The sensor housing must not be covered by pipe insulation.

## QAP2... cable temperature sensor with sensing element LG-Ni 1000

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QAP21.3...  
QAP21.2  
QAP22



The cable temperature sensor is well suited for applications where space is confined or where a long sensing depth is needed. Using the appropriate accessories, the cable temperature sensor can be used for:

- Control of flow temperatures in heating pipework
- Control and limitation of the flow / return temperatures
- Measurement of solar collector temperatures
- Measurement of storage tank temperatures

### Installation notes

Using the appropriate accessories, the QAP... sensor can be used as:

- A strap-on temperature sensor for pipework
- A strap-on temperature sensor for heat collectors
- An immersion temperature sensor (with an immersion length of 80...600 mm)

For flow temperature applications the QAP21.3 should be located immediately after the pump (if the pump is in the flow). For the measurement of flow or return temperatures, the QAP21.3 should be mounted as the standard strap-on sensor. For immersion sensing via pocket, the sensor must always be fitted using the cable holder supplied.

## QAK21... screwed immersion temperature sensors with sensing element LG-Ni 1000

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QAK21...



Temperature sensor with threaded connection for direct immersion into the media. QAK... sensors are intended for use by OEMs, which integrate the sensor into their products.

- Control of flow or boiler temperature
- Control or limitation of flow / return temperature
- Measurement of storage tank temperature

## Installation notes

The QAK... sensor is for direct immersion into the medium to be controlled and screws into the threaded hole provided for that purpose. Use a heat-resistant seal ensuring a tight fit.

## QLS... solar sensors with output signal DC 0...10 V

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QLS60



Solar sensors are used as a reference in heating plants where compensation for solar radiation is required:

- Buildings with large surface window areas
- Buildings where thermostatic radiator valves cannot be used

## Installation notes

Solar sensors must be located on the outside wall most affected by solar radiation:

- The wall of the heating zone with the most windows
- The wall of the heating zone receiving the largest exposure to solar radiation

The solar sensor should be mounted at least 3 m above the ground. The sensor must not be sited in the shade of trees, houses, telephone poles, etc. The solar sensor must never be painted over or covered.

## Wind sensors with output signal DC 0...10 V

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3<sup>rd</sup> party devices

Wind sensors are used as a reference in heating plants in which compensation for the effects of wind is required:

- Buildings with large surface window areas
- Buildings where thermostatic radiator valves cannot be used

## Installation notes

Wind sensors must be located on the outside wall:

- On the wall or corner of the building exposed to the wind
- As high as possible

The wind sensor must never be painted over or covered.

## Time signal receiver with LPB

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AUF77



Using the AUF77 time signal receiver, the controller system time will be synchronized with the atomic clock of the radio clock center in Frankfurt (Germany).

- No readjustments required for the system clock time
- Automatic changeover from summer- to wintertime, and vice versa
- Leap years and leap seconds are taken into account

## Installation notes

Ensure that the time signal receiver is mounted in a location where undisturbed signal reception is possible. The AUF77 is not suited for mounting outdoors.

Type reference	Description	Data Sheet	Signal	Max. permissible cable length				Measuring range	Heating controller																									
				0.25 mm <sup>2</sup>	0.50 mm <sup>2</sup>	1 mm <sup>2</sup>	1.5 mm <sup>2</sup>		RVP100	RVP200	RVP210	RVP300	RVP310	RVP320	RVP330	RVP331	RVD110	RVD130	RVD230	RVD240	RVP540	RVP550	RVL470	RVL471	RVL472	RVL469								
QAA24	Room temperature sensor	1721	LG-Ni 1000	20m	20m	80m	120m	0...50 °C				✓									✓												✓	
QAA64	Room temp. sensor (tamper-proof)	1722	LG-Ni 1000		20m	80m	120m	0...50 °C														✓											✓	
QAA10	Room temperature sensor	1725	PPS	25m		50m		0...40 °C																									✓	
QAW50	Analog room unit	1635	PPS	25m		50m		0...32 °C																									✓	
QAW70	Digital room operator unit	1637	PPS	25m		50m		0...32 °C																									✓	
QAW50.03	Room temperature sensor	1635	PPS	25m		50m		0...32 °C																									✓	
QAW44	Room temperature sensor	1637	PPS			20m	50m	0...32 °C																									✓	
QAW590	Wireless room unit set	1632	868 MHz				30m	0...40 °C																									✓	
QAW591	Wireless room unit set	1632	868 MHz				30m	0...40 °C																										✓
QAC22	Outside sensor	1811	LG-Ni 1000			20m	80m	-50 ... +70 °C																										✓
QAC32	Outside sensor	1811	NTC 575			20m	80m	-50 ... +70 °C																										✓
QAD22	Strap-on temperature sensor	1801	LG-Ni 1000			20m	80m	-30 ... +130 °C																										✓
QAD26...	Strap-on temperature sensor	1802	LG-Ni 1000			20m	80m	-35 ... +90 °C																										✓
QAE22...	Immersion temperature sensor	1791	LG-Ni 1000			20m	80m	-30 ... +130 °C																										✓
QAE26...	Immersion temperature sensor	1790	LG-Ni 1000			20m	80m	-50 ... +180 °C																										✓
QAP21.3	Cable temperature sensor	1832	LG-Ni 1000			20m	80m	-30 ... +130 °C																										✓
QLS60	Solar sensor	1943	DC 0...10 V			20m	80m	0...1000 W/m <sup>2</sup>																										✓
- / -	Wind sensor	- / -	DC 0...10 V			20m	80m	0...20 m/s																										✓
AUF77	Time signal receiver	M5811	PPS				75m	0...50 °C																										✓

### SIGMAGYR®

The success story of the SIGMAGYR® heating controller, which ranges from simple analog devices to communicative multifunctional controllers, began with its introduction over 30 years ago. In the 3 decades since their introduction, the original standalone controllers have evolved into a comprehensive range of small but intelligent controllers that cover the requirements of virtually every type of heating system and building.

#### Controller series

#### Description



RVP200

Analog heating controllers for use in residential or smaller commercial buildings that contain their own heat generating plant. Weather-compensated flow or boiler temperature control, with options for room influence, time switch and DHW control. Panel or wall mounting with easy-to-use analog operating elements. Options for room unit operation, temperature limitation and ECO energy saver.



RVP300

Digital heating controllers for use in residential and nonresidential buildings. Ideal for control of heating zones, heat producers, hot water plants or plants with a district heat connection. Weather-compensated flow temperature control with optimum start / stop. Suitable for control of 1 or 2 heating zones, boiler and DHW.

The RVP300 units use an operating line method to display and adjust all parameters. Bus communication allows control and monitoring of interconnected heating plants.



RVD100

Digital controller for residential and nonresidential buildings with own district heating connection and DHW heating. Control of district heat substations, space heating and DHW heating.

Optimized for low return temperatures in district heating networks. Preprogrammed plant types, DRT limitation for the reduction of peak loads / idle heat and options for storage tank charging and legionella protection.



RVD200

Digital controllers for residential and nonresidential buildings with own district heating connection and DHW heating. Control of district heat substations, space heating and DHW heating, or as a primary controller in interconnected systems.

Optimized for low return temperatures in district heating networks. Up to 28 pre-programmed plant types, DRT limitation for the reduction of peak loads / idle heat and options for storage tank charging and legionella protection. Communication capability via LPB or M-bus and remote operation.



RVP500

Digital heating controller dedicated for use with all combinations of alternative energy heat generation, complex storage systems and heating zones. The RVP500 combines renewable energy plants with alternative storage systems and standard heating circuits. Over 2,500 plant combinations can be selected. The RVP500 units use an operating line method to display and adjust all parameters. Bus communication allows control with other heat generating equipment and heating zones.



RVL400

Multifunctional heating controller with analog and digital operating elements, for use in virtually all types of buildings. RVL400 devices are configured for all standard heating, heat generation, district heating and DHW applications. Complete weather-compensated heating control with demand-dependent boiler temperature and DHW control, plus multifunctional relay output and solar and wind sensing. All parameters can be adjusted via the simple user interface, large display and trademark analog settings. Different user levels are available plus bus communication and remote operation. Preprogrammed plant types can be selected, automatically enabling the required functions.