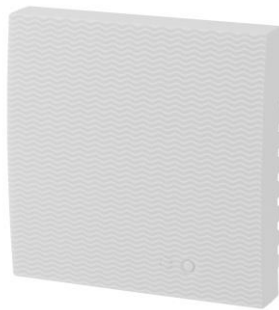


Wireless room sensor

QPA2821.EU



Wireless temperature, humidity and CO2 room sensor, LoRaWAN

- Temperature sensor
- Humidity sensor
- CO₂ sensor (NDIR)
- RGB LED
- Acoustic buzzer
- LoRaWAN Class A device
- Battery-powered: 2x AA (DC 1.5 V each) power supply (included in the device)
- Up to 10 years of battery life (depending on configuration and environment)
- Firmware Update Over-The-Air (FUOTA)
- Port for external 10k NTC sensor (optional)

Use

The wireless room sensor is a smart building sensor for indoor environmental monitoring in:

- Commercial office buildings
- Public infrastructure
- Residential buildings

Functions

The wireless room sensor has a built-in sensor to measure:

- Temperature
- Relative humidity
- CO₂

Temperature

The sensor acquires the temperature via a digital temperature sensor.

The temperature signal from the sensing element is converted to wireless digital signal values, corresponding to a temperature range of 0...+50 °C.

Relative humidity

The sensor acquires relative humidity via a digital capacitive relative humidity sensor (with bandgap temperature sensor).

The electronic unit converts the humidity signal to a wireless digital signal, corresponding to a relative humidity range of 0...80%.

Carbon dioxide (CO₂) levels in indoor air (ppm)

CO₂ in the room increases with occupancy and excess. CO₂ may result in health problems, including drowsiness and lethargy, and impact productivity, concentration, and decision making.

The table below outlines the CO₂ ranges and potential health problems:

Range (ppm)	Air quality / potential health problems
400..600	Healthy
600..1000	Fair
1000..1500	Moderate
1500..2500	Unhealthy: May cause drowsiness
>2500	Poor: May cause headaches, fatigue, loss of focus

The sensor acquires CO₂ concentration by infrared absorption measurement (NDIR) using automatic baseline calibration.

The resulting wireless digital output signal (400...5000) is proportional to the CO₂ content of the ambient air, corresponding to a CO₂ concentration range of 400...5000 ppm.

Automatic baseline calibration (ABC) of CO₂ measurement

The sensor is pre-calibrated by default with the ABC function enabled and based on an 8-day period. The baseline for the CO₂ measurement is 400 ppm (fresh air).

The sensor logs CO₂ values (as ppm) during the ABC period and calibrates the lowest CO₂ value logged against the baseline (400 ppm) for the next ABC period. Values below the baseline trigger the ABC function immediately, as CO₂ levels below 400 ppm are not considered possible for smart building applications.

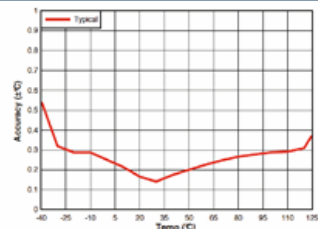
The ABC function is suited for rooms that are not continuously occupied: When enabled, the sensor detects rooms that are not regularly occupied but linked to the outdoor air exchange and periodically performs automatic calibration. The ABC functions can be disabled in rooms that are continuously occupied (e.g. manufacturing plants).

Buzzer notification

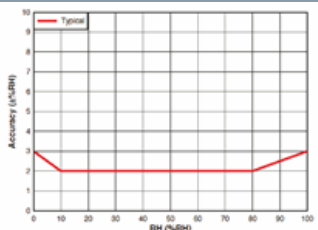
The sensor notifies occupants acoustically and visually to ventilate a room (disabled by default).

Sensor measurement accuracy

The following charts accuracy relative to temperature.

Temperature		
Resolution	0.18 °C	
Accuracy	±0.2 °C	

The following charts accuracy relative to humidity.

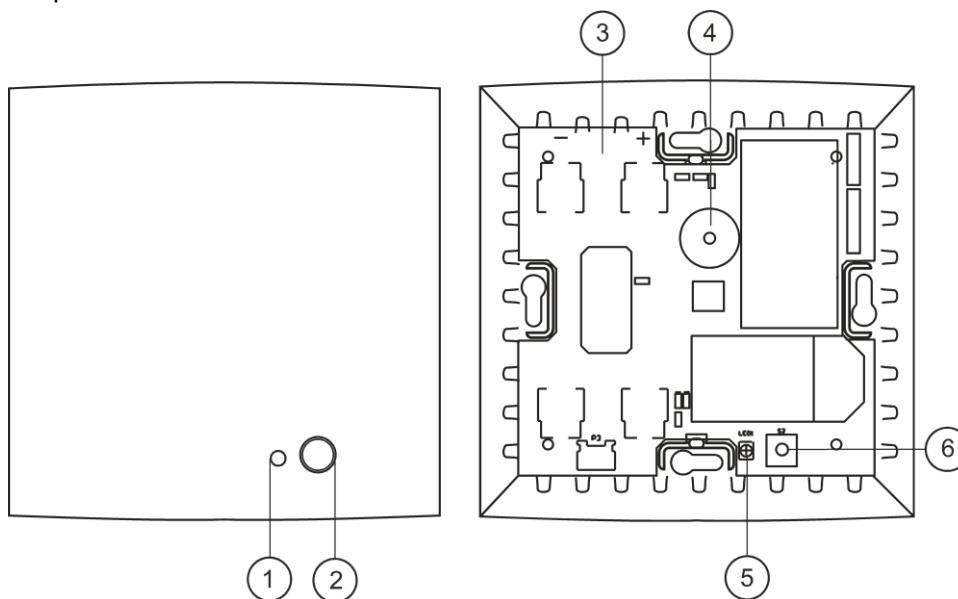
Humidity		
Resolution	0.39 % r.h.	
Accuracy	2 % r.h.	

Carbon dioxide (CO ₂)	
Accuracy	±(30 ppm + 3 % of reading)
Range	400...5000 ppm
Technology	NDIR
Peak consumption	15 mA

Device parts

Wireless room sensors can be for wall, flush, or tape mounting.

An external 10k NTC temperature sensor can be connected, e.g. to monitor pipe surface temperature.



- | | | | |
|---|------------------|---|---------------|
| 1 | LED status | 2 | Status button |
| 3 | Batteries holder | 4 | Buzzer |
| 5 | LED status | 6 | Status button |

Type summary

Ordering

When ordering, specify name, type and order number, e.g.:

Wireless temperature, humidity and CO₂ room sensor, QPA2821.EU, S55720-S649.

Name	Type	Order number
Wireless temperature, humidity and CO ₂ room sensor	QPA2821.EU	S55720-S649

Delivery

The wireless room sensors include the following:

Name	Quantity
Sensor	1
Batteries	2x AA, Lithium
Operating instructions	1

Product documentation

Title	Document ID
Operating Instructions	A6V16160064

Related documents such as the environmental declarations, declarations of conformity, etc., can be downloaded from the following Internet address:

www.siemens.com/bt/download

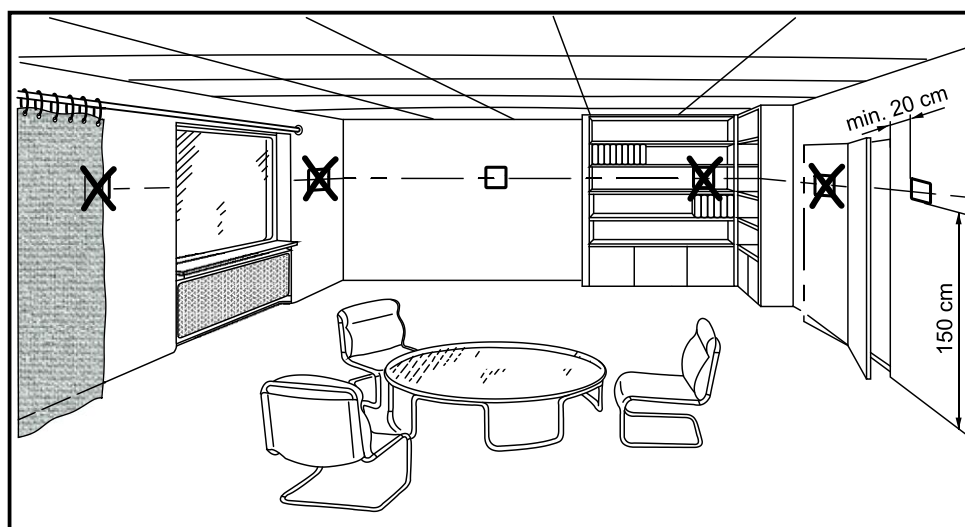
Notes

Safety

 CAUTION	
	National safety regulations Failure to comply with national safety regulations may result in personal injury and property damage. Observe national provisions and comply with the appropriate safety regulations.

Mounting

Location



The device is designed for wall, flush, and tape mounting.

1. Mount in indoor environments (device is not suitable for outdoor use).
2. Do not mount the device in recesses, shelves, behind curtains or doors, or above or near heat sources.
3. Do not mount the device in a cabinet or metal container.
4. Avoid direct solar radiation and drafts.
5. Mount the device about 1.5 m above the floor, and at least 20 cm away from the next wall.
6. Seal the conduit box or the installation tube if any, as air currents can affect sensor readings.
7. Mount the device at least 5 m away from operable windows, air filters, and fresh air diffusers. **NOTICE! In areas where this is not possible, center your device between windows and place your monitor closer to return air and further away from air diffusers.**

Installation

⚠ WARNING	
	Risk of explosion Personal injury and property damage • Install the battery at the correct polarity (+/-) using the illustration in the battery compartment. • Install only the correct battery types according to the indication in the battery compartment. • In case of a leakage, avoid contact with skin, eyes and mucous membranes. • Remove leaking battery from the battery compartment with a cloth.



Operating instructions are enclosed in the package.

Maintenance

Battery exchange



Communication between sensor and gateway becomes unstable when battery power is low.

Disposal



This symbol or any other national label indicate that the product, its packaging, and, where applicable, any batteries may not be disposed of as domestic waste. Delete all personal data and dispose of the item(s) at separate collection and recycling facilities in accordance with local and national legislation.
For additional details, refer to [Siemens information on disposal](#).

Technical data

Mechanical specifications	
Weight	- Without batteries: 0.068 kg - With batteries: 0.116 kg
Dimensions (L x W x H)	80 x 80 x 29 mm
Enclosure	ABS
Buzzer sound pressure level	80 dB at 10 cm

Operating conditions	
Temperature	0...+ 50 °C
Humidity	0...80 % r.h. (non-condensing)

Power supply	
Battery type	2x AA (DC 1.5 V), included in the device
Operating voltage	DC 3 V
Expected battery life	< 10 years, depending on configuration and environment

Radio / Wireless	
Wireless technology	LoRaWAN® 1.0.3
Wireless security	LoRaWAN® end-to-end encryption (AES-CTR)
LoRaWAN device type	Class A device
Supported LoRaWAN features	OTAA, ADR, adaptive channels setup
Supported LoRaWAN regions	EU868
Link budget	130 dB
RF transmission power	14 dB
Frequency range	863...870 MHz

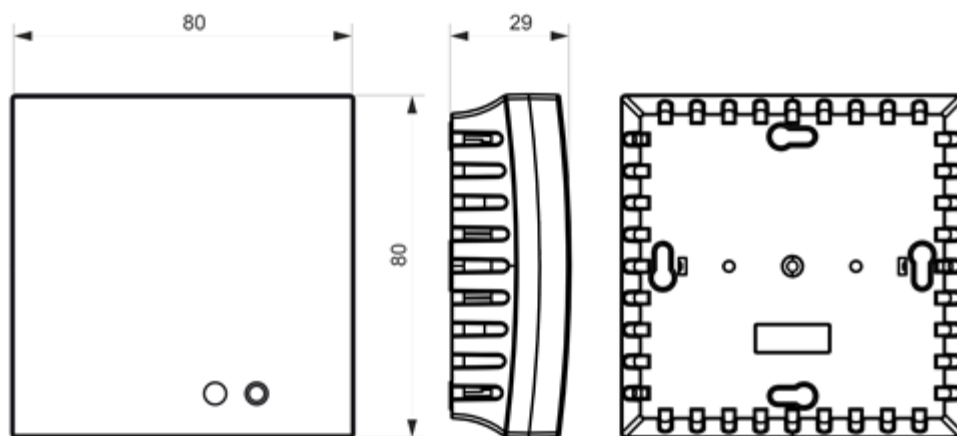
Protection classification	
Degree of protection of housing as per EN 60529	IP20

Ambient conditions	
Climatic ambient conditions • Transport and storage (in packaging) as per IEC/EN 60721-3-2 / -3-1 • Operation as per IEC/EN 60721-3-3	• Class 2K12 / 1K22 Temperature -40...+85 °C Air humidity 5...90 %. (non-condensing) • Class 3K23 Operation in dry locations with no temperature or humidity control Temperature 0...+50 °C Air humidity 5...90 %. (non-condensing)
Mechanical ambient conditions • Transport (in transport packaging) as per IEC/EN 60721-3-2 • Operation as per IEC/EN 60721-3-3	Class 2M4 Class 3M11

Standards, directives and approvals	
Product standard	IEC/EN 62381-1 Information Technology Equipment
Electromagnetic compatibility	For residential, commercial, and industrial environments
EU conformity (CE)	See EU declaration of conformity *)
Environmental compatibility	The product environmental declaration () contains data on environmentally compatible product design and assessments (RoHS compliance, materials composition, packaging, environmental benefit, disposal).

*) The documents can be downloaded at <https://www.siemens.com/bt/download>.

Dimensions



Dimensions in mm

European Union conformity

Contact for regulatory topics: (EU) Siemens AG, Berliner Ring 23, DE-76437 Rastatt