



Processor for ventilation demand

AQP63.1

for use with CO₂/VOC sensors QPA63...

Operating voltage AC 24 V

Input signals DC 0...10 V

Output signal DC 0...10 V

Use

In ventilating and air conditioning plants to enhance room comfort and to optimize energy consumption by providing demand-controlled ventilation.

To ascertain the demand for air quality in rooms and air ducts and to calculate the demand for ventilation.

Ordering

When ordering, please give name and type reference:

processor for ventilation demand **AQP63.1**

Equipment combinations

Input side

The processor can sheet 1958).only be used with the CO₂/VOC sensors QPA63... (refer to data sheet 1958).

Output side

The sensors are suited for use with all systems and devices capable of acquiring and handling the DC 0...10 V output signal, such as:

- UNIGYR[®], VISONIK[®], INTEGRAL
- TEC[™], AEROGYR[™] RWI65.02, POLYGYR[®] RWX..., DESIGO 30, CLASSIC RKN...

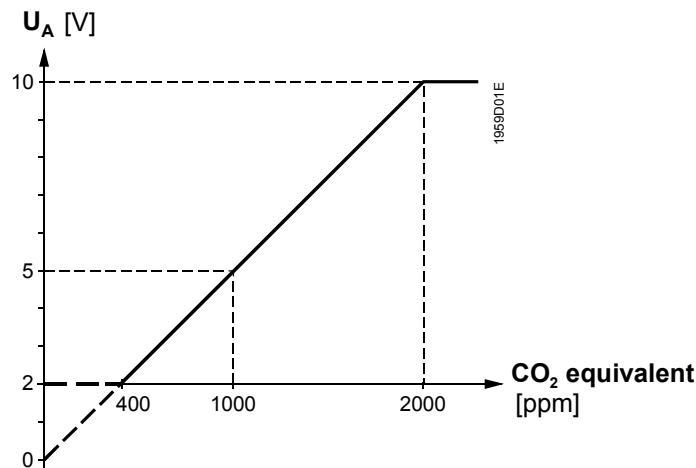
Mode of operation

The processor acquires the two sensor signals (CO₂ and VOC) and evaluates them to generate a ventilation demand signal, which is the result of a maximum selection of the CO₂ sensor signal and the VOC sensor signal filtered by the processor.

With maximum selection, the two demand signals are compared and, depending on the result, the greater of the two delivered as the common indoor air quality demand signal. The output range is DC 2...10 V.

The ventilation demand signal is made available at output Y as a DC 0...10 V signal to be fed to a ventilation controller. This signal transmits three types of computing information: ventilation demand, operation locked, and operational fault.

Function diagram of ventilation demand



Legend

U_A Ventilation demand signal in V

Explanation

1 ppm = 1 part per million

Operational statuses

The processor can assume and signal the following operational statuses:

Operational status	LED	Output signal U3
Off	Dark	No signal
Operation	Lit	DC 2...10 V
Operation locked	Lit	DC 1.5 V
Operational fault	Flashes	DC 0 V

CO₂-VOC weighting

With the help of a potentiometer, the authority of VOC ventilation demand against CO₂ ventilation demand can be changed. In the potentiometer's mid-position, the weighting is 50/50 (factory setting). When the potentiometer is turned in clockwise direction, the VOC ventilation demand is increased against the CO₂ ventilation demand. When the potentiometer is turned in anti-clockwise direction, the VOC ventilation demand is decreased. The setting range is $\pm 1 V_{VOC}$, corresponding to a CO₂ value of ± 200 ppm.

Response time
"VOC signal"

A response time of 4 minutes per Volt signal value change (factory setting) is observed before the processor considers a change of the VOC sensor signal value for maximum selection. In the case of rooms with many smokers, for instance, the response time can be shortened by a factor of 5. It is then 48 seconds per Volt signal value change. The response time can be selected with DIP switch no. 1.

Initial ventilation

After applying operating voltage or after a reset, initial ventilation of 20 minutes can be triggered. During this period of time, the ventilation demand signal present at the output is DC 10 V, which means 100 % demand for ventilation. This function can be selected with DIP switch no. 2.

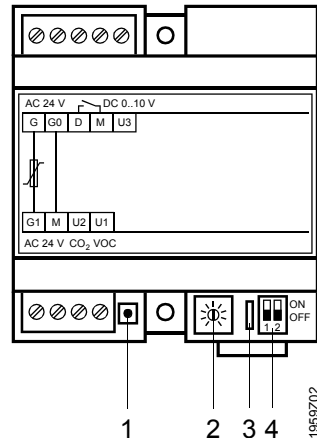
Operating lock

A potential-free contact (locking signal) can be connected to the sensor's input D. When the contact is closed, the processor will be locked. When locked, a voltage of DC 1.5 V is present at signal output U3 and the green LED is lit.

Mechanical design

The processor can be fitted to a DIN rail (35 mm) or screwed directly on a flat surface. The housing is made of plastic and has a cover that cannot be removed. Connection terminals, operating elements and LEDs are accessible from outside. The connection terminals can be protected by a cover (ARG81.1), if required. The housing cover carries the type field and the connection diagram.

Operating and indicating elements



Legend

- 1 Reset button
- 2 Potentiometer for CO₂/VOC weighting (factory-sealed in mid-position)
- 3 LED (green), indicates operational status of processor:

LED	Operational status
Dark	Off
Lit	On or operation locked
Flashes	Fault

- 4 DIP switches:

No.	OFF	ON	Meaning
1	NORM (4 min/V)	SHORT 48 s/V)	Response time "VOC signal " t_{VOC}
2	NO	YES	Initial ventilation

Engineering notes

The processor operates on AC 24 V.
The sensor is powered by the processor.



- The operating voltage must meet the requirements of safety extra-low voltage (SELV) to EN 60 730
- Use safety transformers with double insulation conforming to EN 60 742; the transformers must be suited for 100 % duty

The transformers must be sized and fused in compliance with local safety regulations. When sizing the transformer, consider the power consumption of the AQPA63.1 with the connected QPA63...



The sensors may not be used for safety related measurements of gas concentrations.

Mounting notes

Location: in the control panel on a DIN rail (35 mm) with snap-on facility or on a flat surface (wall, false ceiling, etc.).

The permissible environmental conditions must be observed.

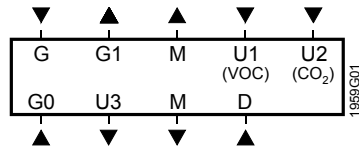
Technical data

Power supply	Operating voltage (SELV)	AC 24 V \pm 20 %
	Frequency	50/60 Hz
	Power consumption, excl. sensor	max. 4 VA
	incl. sensor	max. 10 VA
Setting ranges	CO ₂ -VOC weighting	$\pm 1 V_{VOC} \hat{=} \pm 200 \text{ ppm}^1 \text{ CO}_2$
Measured value inputs U1, U2	Voltage	DC 0...10 V
	Current	$\pm 1 \text{ mA}$
Status input D (locking signal)	Contact sensing voltage	DC 15...40 V
	Current	typ. 8 mA
Output U3 (ventilation demand signal)	Voltage	DC 0...10 V
	Current	$\pm 1 \text{ mA}$
Output G1, M (power supply for sensor)	Voltage	AC 24 V
	Frequency	50/60 Hz
Perm. line lengths	Between AQP63.1 and QPA63...	
	Copper cable 0.5 mm dia.	60 m
	1 mm ²	220 m
	1,5 mm ²	300 m
	2.5 mm ²	450 m
	For contact sensing, copper cable 2.5 mm ²	max. 300 m
Connection terminals	Screw terminals for	2 x 1.5 mm ² or 1 x 2.5 mm ²
Environmental conditions	Operation	
	Climatic conditions	
	Temperature	0...50 °C
	Humidity (non-condensing)	10...90 % r.h.
	Transport to	IEC 721-3-2
	Climatic conditions	class 2K3
Temperature	-25...+70 °C	
Humidity	<95 % r.h.	
Mechanical conditions	class 2M2	
Electromagnetic compatibility	Emissions	EN 50 081-1
	Immunity	EN 50 082-1
CE conformity to	EMC directive	89/336/EEC
	Low voltage directive	73/23/EEC
Degree of protection, safety class	Degree of protection of housing	
	AQP63.1 without terminal cover	IP 20 to EN 60 529
	AQP63.1 with terminal cover	IP 40 to EN 60 529
Safety class	III to EN 60 730	
Weight	AQP63.1	0.119 kg

1) 1 ppm = 1 part per million

Diagrams

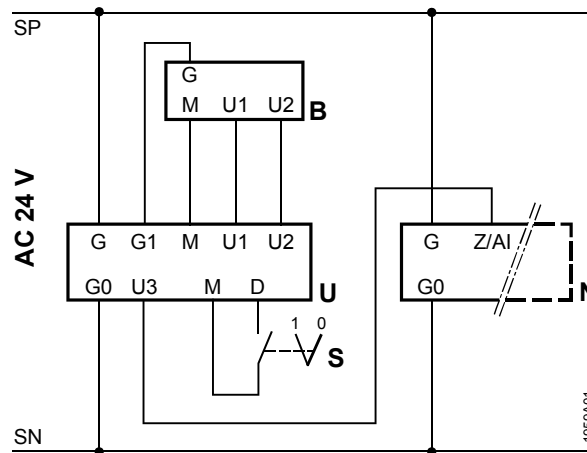
Connection terminals



Legend

- G, G0 Operating voltage AC 24 V (SELV)
 G System voltage
 G0 System neutral
 G1, M Power supply for sensor AC 24 V (SELV)
 U1 Signal input "Measured value VOC", DC 0...10 V
 U2 Signal input "Measured value CO₂", DC 0...10 V
 U3 Signal output "Ventilation demand", DC 0...10 V
 D Contact input "Locking signal"

Connection diagram



Legend

- B CO₂/VOC sensor QPA63...
 N Ventilation controller
 S On/off switch "Locking signal"
 U Processor AQP63.1

Dimensions (in mm)

