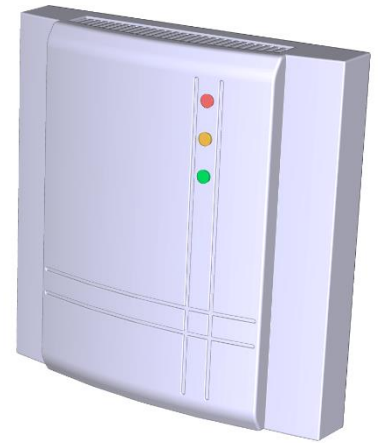


SRC-Q1T1 - Indoor Air Quality + Temperature Transmitter

The SRC-Q1T1 is an indoor VOC (Volatile Organic Compounds) concentration and temperature measuring transmitter. Three LEDs in the colors green, orange and red indicate the air quality of the room air. This shows the user when to ventilate. The device has two analog outputs and one relay output. The air quality background calibration of the SRC-Q1T1 guarantees for accurate room air quality monitoring.

Features

- Indoor air quality and temperature measurement
- Indication with three separate color LEDs
- Minimum and maximum VOC and temperature value memory
- Two analog output signals for VOC and temperature values
- 0...10 V or 2...10 V measuring analog output signal selectable with jumpers
- Relay output indicating VOC concentration
- Levels of VOC indication programmable
- Automatic VOC background calibration
- Output signal ranges programmable
- May be used as simple P-controller
- Averaging signal adjustable
- Optional external display (OPA-S)
- Status LED



Applications

- Indoor air quality and temperature measurement (home, office, school, restaurant, ...)
- Supervision of minimum and maximum VOC and temperature limits for critical environments
- Direct control of extraction fan

VOC transmitter

Reliable evaluation of indoor air quality: The sensing element used is a MOS (metal oxide semiconductor) based gas sensor component. It is specifically designed for a broad detection of reducing gases such as VOCs (volatile organic compounds) associated with bad air quality (cigarette smoke, solvents and cleaning agents, emissions, etc.). The sensor has to run at least 24h for reliable VOC values. It has the following features:

- Sensing range: 0 – 100 % Air Quality Index AQI
- High sensitivity and fast response
- Module with automatic baseline correction

The microprocessor samples the air quality once per second. It calculates an averaging signal over a preset number of samples and generates the output signal.

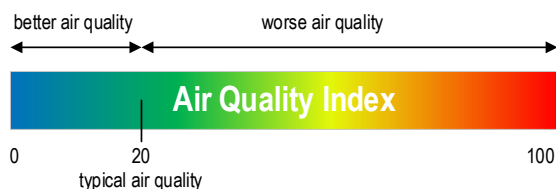
The analog output signal range may be customized by jumpers and if required by a programming module. Standard signal ranges are 0...10 VDC and 2...10 VDC. Other ranges can be defined by using the external display and programming module (OPA-S).



For OPA-S usage see section "Parameter configuration" on page 6.

Air Quality Index (AQI) values

The value 20 refers to the typical indoor gas composition over the past 24 h. While values between 20 and 100 indicate a deterioration, values between 0 and 20 inform about improvement of the air quality.



Temperature transmitter

The temperature is measured with a precision sensing element. The microprocessor samples the temperature once per second. It calculates an averaging signal over a preset number of samples and generates an analog output signal based on a lower and an upper signal range value. Standard range is -40...60°C (-40...140°F) and 10 seconds average. The measuring range and the averaging samples may be customized with the external display and programming module (OPA-S).

The analog output signal range may be selected by jumpers and if required by a programming module. Standard signal ranges are: 0...10 VDC and 2...10 VDC. Other ranges can be defined by using the external display and programming module (OPA-S).



For OPA-S usage see section "Parameter configuration" on page 6.

Minimum and maximum values

Using a display & programming module OPA-S, the user has the option to read out and reset the AQI and temperature minimum and maximum values. The minimum and maximum values may as well be used as output signals. The minimum and maximum values are automatically saved to the device and are available after a power interruption.



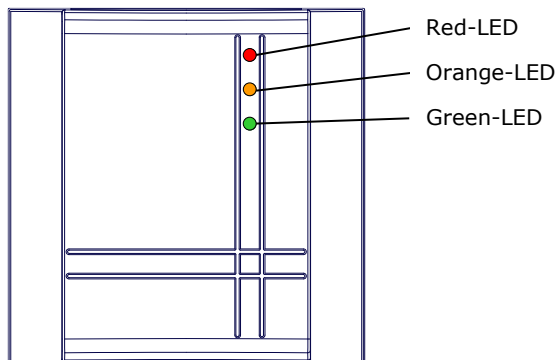
For OPA-S usage see section "Displaying minimum and maximum values" on page 5.



NOTE: On OPA-S devices prior to firmware version V1.9, 0...100.0 % AQI VOC is displayed as 0..1000.

Indication of air quality (VOC concentration)

Three color LEDs are used to indicate air quality: Green for low VOC concentration, orange for medium and red for high concentration. The levels for low-medium-high may be programmed.



Air quality LED	
No light	: No power or unit damaged
Green	: High air quality (low VOC level)
Green + Orange	: Good air quality
Orange	: Moderate air quality (medium VOC level)
Orange + Red	: Low air quality
Red	: Poor air quality (high VOC level)

Default AQI indication setting

Air quality LED	AQI range
Green	0...19
Green + Orange	20...39
Orange	40...59
Orange + Red	60...79
Red	80...100

Safety



DANGER! Safety advice

This device is for use as a VOC concentration indicator and a VOC and temperature transmitter for comfort applications. It is not a safety device. Where a device failure could endanger human life and property, it is the responsibility of the client, installer and system designer to add additional safety devices to prevent such a device failure. Ignoring specifications and local regulations may cause equipment damage and endangers life and property. Tampering with the device and misapplication will void warranty.

Ordering information

Product Name	Product Nr.	Description/Option
VOC + Temperature Transmitter		
SRC-Q1T1	40-300203	VOC + temperature transmitter / monitor
Accessories		
OPA-S	40-500006	External display and programming module. Note: For the correct display of values, V1.7 and later is required.

Technical Specifications

Power supply	Operating voltage	24 VAC 50/60 Hz $\pm$ 10%, 24 VDC $\pm$ 10%
	Power consumption	Max. 2 VA
	Safety extra-low voltage (SELV)	HD 384, class II
Connection	Terminal connectors	For wire 0.34...2.5 mm ² (AWG 24...12)
VOC measurement	VOC sensor	MEMS metal oxide sensor with ABC automatic background calibration algorithm
	Sensing range: TVOC (Inex points) Module	0 – 500 TVOC Index Points (0- 100% AQI) Automatic baseline correction (24 h)
Temperature - measurement	Accuracy:	
	0...50°C (32...122°F)	0.5 °C (1 °F)
	50...60°C (122...158°F)	1 °C (2 °F)
	Note on accuracy: allow one hour for temperature compensation to stabilize after power up	
Signal outputs	Analog outputs	
	Output signal	0...10 VDC or 2...10 VDC
	Resolution	10-bit, 9.7 mV
	Maximum load	Voltage signal: $\geq$ 1k Ω
	Relay output	48 VAC, 1 A max., 30 VDC, 1 A max.
	Insulation strength between relays and system electronics between neighboring contacts	500 VAC to EN 60 730-1 500 VAC to EN 60 730-1
Environment	Operation	To IEC 721-3-3
	Climatic conditions	class 3 K5
	Temperature	0...50° C (32...122° F)
	Humidity	<90% RH non-condensing
	Transport & storage	To IEC 721-3-2 and IEC 721-3-1
	Climatic conditions	class 3 K3 and class 1 K3
Standards	Temperature	5...30° C (41...86° F)
	Humidity	<80% RH non-condensing
	Mechanical conditions	class 2M2
Standards	Degree of protection	IP30 to EN 60 529
	Safety class	III (IEC 60536)
Housing materials	Cover	Fire proof ABS plastic
	Mounting plate	Aluminium
General	Dimensions (H x W x D)	21 x 88 x 88 mm (0.8 x 3.5 x 3.5 in)
	Weight (including package)	135 g (4.8 oz)

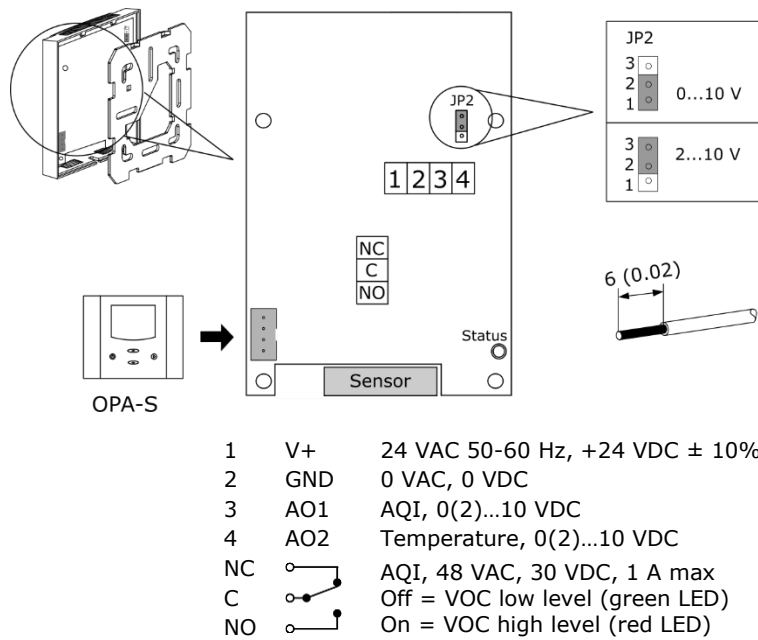
Product testing and certification



Declaration of
Conformity

Information on the conformity of our products can be found on our website
www.vectorcontrols.com on the corresponding product page under "Downloads".

Wiring and Connection



For jumper settings see section "Output signal configuration" on page 6.

Mounting location

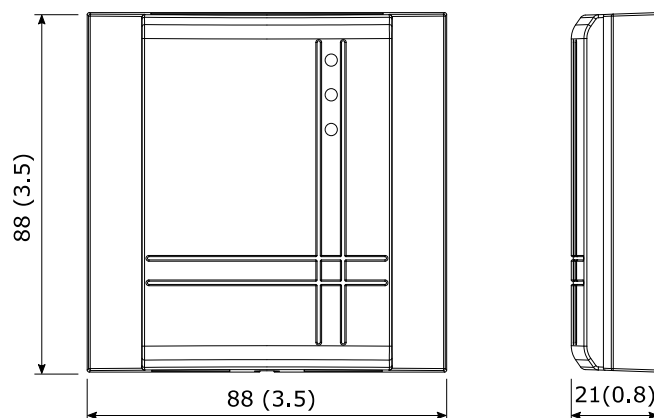
- On a flat, easily accessible inner wall
- The following installation locations should be avoided:
 - Protect from direct exposure to sunlight
 - Do not install near heat sources, e.g., radiators or other heat-generating devices
 - Areas with poor air circulation and niches, e.g., behind doors or shelves
 - Outside walls insufficiently insulated
 - In the direct influence area of ventilation openings and fans

Mounting instruction



See SRC-Q1T1 installation sheet no. 70-000809 (www.vectorcontrols.com).

Dimension mm (inch)



Operation

Displaying minimum and maximum values

To read out or reset the stored AQI and temperature minimum and maximum values use the optional display & programming module OPA-S.

1. Remove SRC housing from the back plate (see SRC-Q1T1 installation sheet 70-000809 www.vectorcontrols.com).
2. Connect the OPA-S operating device to the OPA-S connector on the SRC (see section "Wiring and Connection" on page 4). The measured AQI (Air Quality Index) and temperature value is displayed.
3. Press the "UP" key to see the maximum values or the "DOWN" key to see the minimum values.
4. To reset the minimum value, press the "DOWN" key for at least 5 seconds and wait until the value changes.
5. To reset the maximum value, press the "UP" key for at least 5 seconds and wait until the value changes.

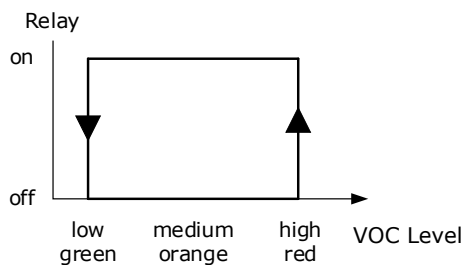


NOTE: On OPA-S devices prior to firmware version V1.9, 0...100.0 % AQI VOC is displayed as 0...1000.

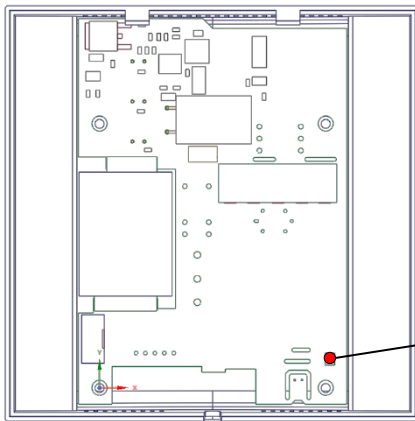
Relay output

The relay output signals the VOC level of the room air. The relay is off if the VOC level is low and on if the VOC level is high. The output can be used to control a ventilation system. The levels may be programmed (see section "Input configuration", page 6).

The diagram shows how the relay output corresponds to VOC level and air quality LED.



Status-LED



Status LED

- No light	: No power or unit damaged
- 5 sec flashing	: Normal
- Constant red > 10 sec	: Sensor error

Red Status-LED

Error messages shown on OPA-S

Error	Description
Err 1:	Communication error: Verify cable connections, cable type and maximum distance.
Err 2:	Temperature sensor error (element damaged or missing)
Err 3:	VOC sensor error (element damaged or missing)

Configuration

Output signal configuration, Jumper settings

The analog output signal type for the analog output AO1 and AO2 is factory set to VDC.

The signal range for the analog output AO1 and AO2 may be set with jumper **JP2**. **JP2** will only operate if the output range specified with output parameter **OP 01** and **OP 02** is left at the default value of 0...100%. With any other setting the position of **JP2** has no influence and the signal range defined with the output parameters applies.

Signal range	JP2
0...10 V	(1-2)
2...10 V	(2-3)



For jumper location see section "Wiring and Connection" on page 4.

Parameter configuration

The transmitter can be adapted to fit perfectly into any application by adjusting the software parameters. The parameters are set with the operation terminals OPA-S. The OPA-S may also be used as remote indicator.



NOTE: For the correct display of data, version 1.7 or greater of OPA-S is required.

OPA-S operation

1. Remove SRC housing from the back plate (see SRC-Q1T1 installation sheet 70-000809 www.vectorcontrols.com).
2. Connect the OPA-S operating device to the OPA-S connector on the SRC (see section "Wiring and Connection" on page 4). The measured VOC value is displayed.
3. Press the "Up" and "Down" keys simultaneously for more than 3 seconds. "Code 0000" is displayed.
4. Use the "UP" and "DOWN" keys to set the password "0009" and confirm with the "RIGHT" key.
5. Select "IP SEL (Input Parameter)" or "OP SEL" (Output Parameter) with "UP" and "DOWN" and confirm with the "RIGHT" key. The first parameter is displayed.
6. Use the "UP" and "DOWN" key to switch to the desired parameter. After pressing the "RIGHT" key adjust the parameter value with the "UP" and "DOWN" keys. Confirm the setting with the "RIGHT" key.
7. Complete parameter setting by pressing the left "ON/OFF" key twice. The measured VOC value is displayed.



Important

In order for the SRC-Q1T1 to apply the new settings correctly, the parameter setting must be completed with the left "ON/OFF" key!



Detailed information on the OPA-S can be found on the website www.vectorcontrols.com on the corresponding product page under "Downloads".

Input configuration

Parameter	Description	Range	Default
IP 00	TI1: Celsius or Fahrenheit, C = OFF, F = ON	ON, OFF	OFF
IP 01	TI1: Samples taken for averaging control signal ¹⁾	1...255	10
IP 02	TI1: Calibration	-10...10	0
IP 03	TI1: Minimum temperature range (Temperature when output is at its minimum)	-40...215 °C -40...419 °F	-40 °C -40 °F
IP 04	TI1: Maximum temperature range (Temperature when output is at its maximum)	-40...215 °C -40...419 °F	60 °C 140 °F
IP 05	QI1: Light intensity of air quality LED on front	0...10	8
IP 06	QI1: Samples taken for averaging control signal ¹⁾	1...255	10
IP 07	QI1: Calibration	-10...10%	0
IP 08	QI1: Minimum AQI range ²⁾ (VOC level when output is at its minimum)	0...100 AQI	0 AQI
IP 09	QI1: Maximum AQI range ²⁾ (VOC level when output is at its maximum)	0...100 AQI	100 AQI
IP 10	QI1: AQI level for medium VOC indication ²⁾	0...100 AQI	40 AQI
IP 11	QI1: AQI level for high VOC indication ²⁾	0...100 AQI	80 AQI

¹⁾ Sample interval: 1 sec.

²⁾ Changing this parameter affects the control of the air quality LEDs or relay as follows:

Air quality LED	AQI value:	Default settings
Green	< (IP 10 value / 2)	< 20
Green + Orange	(IP 10 value / 2) ... IP 10 value	20...40
Orange	IP 10 value ... (IP 10 value + IP 11 value) / 2	40...60
Orange + Red	(IP 10 value + IP 11 value) / 2 ... IP 11 value	60...80
Red	> IP 11 value	> 80

VOC = Volatile Organic Compounds

AQI = Air Quality Index (0 – 100)

Output configuration

Parameter	Description	Range	Default
OP 00	AO1 (AQI): Configuration of AQI output signal: 0 = AQI value 1 = Recorded minimum AQI value 2 = Recorded maximum AQI value	0...2	0
OP 01	AO1 (AQI): Minimum limitation of AQI output signal ^{3) 4)}	0...100 %	0 %
OP 02	AO1 (AQI): Maximum limitation of AQI output signal ^{3) 4)}	0...100 %	100 %
OP 03	AO2 (Temperature): Configuration of temperature output signal: 0 = Temperature value 1 = Recorded minimum temperature value 2 = Recorded maximum temperature value	0...2	0
OP 04	AO2 (Temperature): Minimum limitation of temperature output signal ^{3) 4)}	0...100 %	0 %
OP 05	AO2 (Temperature): Maximum limitation of temperature output signal ^{3) 4)}	0...100 %	100 %

³⁾ The Output signal will be scaled according to selected input range, selected limitation of output signal and the output signal range selected by the jumper.

⁴⁾ If the default values are changed, the position of JP2 has no influence and the output signal range defined with the parameters applies.

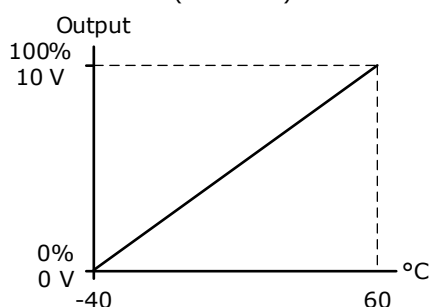
IP = Input Parameter
OP = Output Parameter
QI = VOC Input
TI = Temperature Input
AO = Analog Output

Examples of temperature output signal on AO2:

Output signal range = 0...10 VDC (JP2 jumper setting)

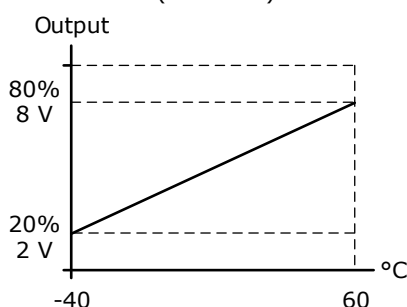
Default setting

IP 03 = -40 °C, IP 04 = 60 °C (range)
OP 03 = 0 (temperature value)
OP 04 = 0 % (limitation)
OP 05 = 100 % (limitation)



Custom setting

IP 03 = -40 °C, IP 04 = 60 °C (range)
OP 03 = 0 (temperature value)
OP 04 = 20 % (limitation)
OP 05 = 80 % (limitation)



Use the VOC-Transmitter as P-Controller

The VOC-transmitter may be converted into a proportional fresh air controller through a simple change of two parameter settings:

1. Set a minimum concentration when the fresh air fan should start to run at its minimum speed at 40 AQI for example. Set this as the minimum value in the **IP 08** parameter.
2. Then define the value when the fan should run at full speed, for example 90 AQI and set this value in **IP 09**.

Your transmitter has now been converted into a P-Controller!

By using the analog output, the fan will start to run if the VOC concentration is higher than 40 AQI. It increases to its maximum when VOC concentration reaches 90 AQI.

VOC = Volatile Organic Compounds
AQI = Air Quality Index (0 – 100)

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Vector Controls GmbH
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info@vectorcontrols.com
www.vectorcontrols.com/

