

# INDOOR AIR QUALITY TRANSMITTERS

## SIRO SERIES

Multifunctional indoor air quality transmitters for building automation systems

Siro is an indoor air quality transmitter with a modern design. The transmitter is available with several optional air quality sensors. The modular device can be equipped with CO<sub>2</sub> concentration and VOC (Volatile Organic Compounds) measurements or alternatively PM (Particulate Matter) measurement and in addition temperature and humidity measurements. It offers easy installation and adjustment, several different model options and various output signals that are configurable separately for each measurement parameter. The Siro series devices are available with user interface that includes LCD display and buttons making the configuration of the device quick and easy. An external configuration tool is available for devices without user interface. Siro utilizes the industry standard NDIR measurement principle with self-calibrating ABC logic™ for CO<sub>2</sub> measurement.

### Siro series devices include:

- Several options for indoor air quality measurements (CO<sub>2</sub>, VOC, PM, rH, T).
- Field configurable outputs for selected measurements.
- Proportional output options including voltage (0–10 V, 0–5 V, 2–10 V) and optional current (4–20 mA).
- Offset feature enabling field calibration for each measurement parameter (CO<sub>2</sub>, VOC, PM, rH, T).
- Optional LCD-display and buttons.



### APPLICATIONS

- Siro series devices are commonly used to monitor and control:
- indoor air quality in offices, public spaces, meeting rooms and classrooms
  - CO<sub>2</sub> and VOC concentration to regulate demand-controlled ventilation and to keep the indoor air quality in a good level
  - PM concentration to measure the size and amount of particulates in the indoor air for example to assess the performance of air filters
  - temperature and humidity in HVAC/R environment

### MODEL SUMMARY

Model	Product code	Model	Product code	Model	Product code	Model	Product code
Siro-CO2	304.001.001	Siro-CO2-rH-T-D	304.001.011	Siro-PM	304.003.001	Siro-PM-T-D	304.003.011
Siro-CO2-A	304.001.002	Siro-CO2-rH-T-A-D	304.001.012	Siro-PM-A	304.003.002	Siro-PM-T-A-D	304.003.012
Siro-CO2-D	304.001.003	Siro-CO2-T	304.001.013	Siro-PM-D	304.003.003	Siro-rH-T	304.004.001
Siro-CO2-A-D	304.001.004	Siro-CO2-T-A	304.001.014	Siro-PM-A-D	304.003.004	Siro-rH-T-A	304.004.002
Siro-CO2-VOC-rH-T	304.001.005	Siro-CO2-T-D	304.001.015	Siro-PM-rH-T	304.003.005	Siro-rH-T-D	304.004.003
Siro-CO2-VOC-rH-T-A	304.001.006	Siro-CO2-T-A-D	304.001.016	Siro-PM-rH-T-A	304.003.006	Siro-rH-T-A-D	304.004.004
Siro-CO2-VOC-rH-T-D	304.001.007	Siro-VOC-rH-T	304.002.001	Siro-PM-rH-T-D	304.003.007	Siro-T	304.004.005
Siro-CO2-VOC-rH-T-A-D	304.001.008	Siro-VOC-rH-T-A	304.002.002	Siro-PM-rH-T-A-D	304.003.008	Siro-T-A	304.004.006
Siro-CO2-rH-T	304.001.009	Siro-VOC-rH-T-D	304.002.003	Siro-PM-T	304.003.009	Siro-T-D	304.004.007
Siro-CO2-rH-T-A	304.001.010	Siro-VOC-rH-T-A-D	304.002.004	Siro-PM-T-A	304.003.010	Siro-T-A-D	304.004.008

CO<sub>2</sub> = Carbon dioxide sensor, VOC = Volatile Organic Compounds sensor, PM = Particulate Matter sensor, rH = Humidity sensor, T = Temperature sensor, A = mA output, D = Display

# INDOOR AIR QUALITY TRANSMITTERS

## SIRO SERIES

### SPECIFICATIONS

#### Performance

##### Measurement ranges:

CO<sub>2</sub>: 0–2000 ppm / 400–2000 ppm  
(selectable via jumper)

VOC: CO<sub>2</sub>eq: 400–2000 ppm  
TVOC ppm: 0–30.0 ppm  
TVOC µg/m<sup>3</sup>: 0–10000 µg/m<sup>3</sup>  
IAQ index: 1–5 (UBA rating)

PM1/PM2.5/PM10: 0–50 µg/m<sup>3</sup> / 0–500 µg/m<sup>3</sup>  
(selectable via jumper)  
IAQ index: 1–5 (WHO rating)

Temperature: 0...50 °C  
Relative humidity: 0–100 %rH

##### Accuracy:

CO<sub>2</sub>: ±33 ppm + 3 % of reading (typical),  
additional ±60 ppm for first weeks

VOC\*: 15 % of reading (typical)

\*VOC sensor is tuned for typical IAQ Mix of 22 VOCs as defined by Mølhave et al. (1997)

PM:  
0...100 µg/m<sup>3</sup>:  
PM2.5: ±15 µg/m<sup>3</sup> (at 25 °C ±5 °C)  
PM1/PM10\*: ±25 µg/m<sup>3</sup> (at 25 °C ±5 °C)

100...1000 µg/m<sup>3</sup>:  
PM2.5: ±15 % (at 25 °C ±5 °C)  
PM1/PM10\*: ±25 % (at 25 °C ±5 °C)

\*PM1 and PM10 values are calculated from PM2.5 measurement reading with the default particle distribution.

Temperature: ±0.5 °C (typical at 20 °C)  
Relative humidity: ±2.4 %rH (typical at 20 °C, 30 % rH)

#### Technical Specifications

##### Media compatibility:

Dry air or non-aggressive gases

##### Measuring units:

CO<sub>2</sub>: ppm  
VOC: CO<sub>2</sub>eq: ppm  
TVOC: ppm, µg/m<sup>3</sup>  
PM: PM1/PM2.5/PM10: µg/m<sup>3</sup>  
Temperature: °C/°F  
Relative humidity: %rH

##### Measuring element:

CO<sub>2</sub>: Non-dispersive infrared (NDIR)  
VOC: Complementary Metal Oxide Semiconductor (CMOS)  
PM: Laser-based light scattering particle sensing

##### Temperature:

Integrated to CMOS

##### Relative humidity:

Thermoset polymer capacitive sensing element

##### Calibration:

Automatic self-calibration ABC Logic™ for CO<sub>2</sub> measurement

##### Environment:

Operating temperature: 0...50 °C  
Storage temperature: -20...70 °C  
Humidity: 0 to 95 %rH, non condensing

#### Physical

##### Dimensions:

Case: 95 x 103 x 30 mm  
(width x height x depth)

##### Weight:

130 g

##### Mounting:

2 screw holes slotted, distance c/c 60 mm

##### Materials:

Case: ABS

##### Protection standard:

IP20

##### Display (optional)

Monochrome LCD, 38 x 23 mm

##### Electrical connections:

8-pin spring loaded terminal block  
0.2...1.5 mm<sup>2</sup> (16-24 AWG)

#### Electrical

##### Input:

24 VAC or VDC, ±10 %  
Power consumption: 2 W max + 25 mW for each voltage output or 50 mW for each current output

##### Outputs:

4 outputs, have to select voltage or current

##### Voltage outputs:

0–10 V  
2–10 V / 0–5 V (optional, display or configuration tool required)

##### Current output:

4–20 mA (optional)

##### Output signal limits:

Voltage outputs: R > 1 kΩ  
Current output: R > 20 Ω, R < 500 Ω

#### Conformance

Meets requirements for CE marking:

EMC Directive 2014/30/EU

RoHS Directive 2011/65/EU

WEEE Directive 2012/19/EU

**COMPANY WITH  
MANAGEMENT SYSTEM  
CERTIFIED BY DNV GL  
= ISO 9001 = ISO 14001 =**



### HOW TO GENERATE A MODEL?

Example:	Product series						
Siro-CO2-T-D	Siro	Indoor air quality transmitter					
		CO <sub>2</sub> sensor					
		-CO2	With CO <sub>2</sub> sensor (option not available with PM sensor)				
			Without CO <sub>2</sub> sensor				
		VOC sensor					
		-VOC	With VOC sensor (option not available with PM sensor)				
			Without VOC sensor				
		PM sensor					
		-PM	With PM sensor (option not available with CO <sub>2</sub> and VOC sensors)				
			Without PM sensor				
		Relative humidity sensor					
		-rH	With relative humidity sensor				
			Without relative humidity sensor (option not available with VOC sensor)				
		Temperature sensor					
		-T	With temperature sensor				
			Without temperature sensor (option not available with VOC or rH sensor)				
		Output					
			Voltage output				
		-A	Voltage and current output				
		Display					
			With display				
			Without display				
		<b>Model</b>	Siro	-CO2		-T	-D