



## FS1380

Air quality transducer indoor for CO<sub>2</sub>, VOC, humidity and temperature, digital output

Measuring size: CO<sub>2</sub>, VOC, humidity, temperature

Output: Modbus RTU, Relay

Highlights: modern housing design, optional LCD-Display



### Description

The air quality transducer FS1380 registers CO<sub>2</sub>, VOC, humidity and temperature. The measuring transducer converts the measured values into a digital output signal.

In the register the switching threshold, hysteresis, offset value etc can be specified. A zero point adjustment can be performed using a command.

The air quality sensor performs an automatic recalibration at regular interval, thus ensuring a long-term stable CO<sub>2</sub> measurement.

As special equipment a potential-free alternating contact and/or a backlit display are available. The contents of the display can be rotated in steps of 90° by using a command.

As special functions a series of defined measured values from other bus-participants (also cross-manufacturers) can be shown in the display. To display measured values from other bus-participants these are entered into the corresponding register by the bus-Master. The optional alternating contact can be configured for measured values from other bus-participants.

The configuration of address, transmission mode/speed, terminating resistor and master/slave function of the bus-devices can easily be done using the innovative DIP switch technology. Thus devices can quickly and easily integrated into the system and later parameterised via the master.

The bus-devices can even be reset to the works settings during operation of the master. Thus the basic functionality of the device is recreated in a matter of seconds. This can be necessary in the event of incorrect parameterisations of, e.g. offset, switching threshold, display modes etc..

By means of the FS master/slave topology autarkic nodes without additional SPS master can be installed within the device series. Hereby a bus-device assumes the master function in the node. This requests the measured values from other bus-participants, automatically enters these into the corresponding register and shows them in the internal display. Furthermore the master can evaluate and operate additional actuators in the device series (analogue in- and outputs, relay station).



## Technical Specifications

|                                  |  |
|----------------------------------|--|
| Measurement range CO2            | 0-10000 ppm, scales: 0-2000/5000/10000 ppm   |
| Measurement range r.H.           | 0-100% r.H.  |
| Measurement range abs. humidity  | 0-80 g/m <sup>3</sup> (calculated)   |
| Measurement range air fuel ratio | 0-80 g/kg (calculated)   |
| Measurement range dew point      | -20...+80°C DP (calculated)  |
| Measurement range temp.          | -30...+100°C   |
| Measurement range VOC            | 0-100% (good / bad air quality, referring to the calibration gas)  |
| Accuracy CO2                     | 0-2000 ppm: ±50 ppm + 2% f. mv, 2000-5000 ppm: ±50 ppm + 3% f. mv, > 5000 ppm: ±100 ppm + 5% f. mv (at 20°C, 1013 mbar, auto-calibration ON)   |
| Accuracy humidity                | ±3% r.H. (30-70% r.H., else ±5% r.H., at 20°C)   |
| Accuracy temperature             | ±0,3 K (10...40°C, else ±0,5 K),   |
| Accuracy voc                     | ±15% FS  |
| Temperature dependency           | CO2: ±5 ppm / K, Humidity: ±0,02% r.F. / K, Temperature: ±0,05°C / 10 K  |
| Pressure dependency              | CO2: 0,16% f. mv/hPa   |
| Running-in time                  | CO2: 10 min, Humidity: 1 min, Temperature: 1 min, VOC: 1 h   |
| Response time (t90)              | < 5 min  |
| Long term stability              | CO2: ±1% FS/year, Humidity: ±1%/year, VOC: ±10% FS/year  |
| Offset                           | can be entered in the register   |
| Sensor                           | CO2: nondispersive infrared sensor (NDIR), Humidity/Temperature: combined electronic sensor, VOC: metal oxide sensor   |
| Sensor protection                | mounted inside housing   |
| Supply voltage                   | 24 V DC (±5%)  |
| Current consumption              | max. 100-200 mA, depending on the selected measurand and equipment   |
| Digital output                   | Modbus RTU   |
| Alarm output                     | 1 x potential-free change-over contact, 48 V, 1 A  |
| Switching Hysteresis Relay       | can be entered in the register   |
| Electrical connection            | push-in terminal, no tools required, time-saving   |
| Housing                          | ABS polyman, colour signal white like RAL 9003   |
| Cable gland                      | on the back or housing side (predetermined breaking point)   |
| Display                          | optional LCD display with backlight on/off/auto  |
| Dimensions                       | Housing: L 82 x W 82 x H 25 mm   |
| Protection type                  | IP30, IP20 (with display)  |
| Protection class                 | III  |
| Working range r.H.               | 0...98% r.H. in contaminant-free, non-condensing air   |
| Working temperature              | 0...+50°C  |
| Storage temperature              | -20...+50°C  |
| Initial operation                | After switch-on of the device it runs a self-test and the zero-point calibration. Depending on the ambient conditions, this process takes approx. 1 min., during this time, the digitally output value deviates from the actual value. |



|                       |  |
|-----------------------|--|
| Automatic calibration | <p>The automatic CO<sub>2</sub>/VOC calibration takes place every 7 days, this compensates for any drifts and achieves excellent long-term stability. To ensure this function, the device must be supplied with power for at least 7 days without interruption and ventilated once with fresh air (CO<sub>2</sub> 300...400 ppm) for approx. 10 minutes within this period.</p> <p>For the CO<sub>2</sub> calibration, the device saves the minimum CO<sub>2</sub> value measured during this period internally. After 7 days, this minimum value is normalized to 400 ppm CO<sub>2</sub> and the output signal corrected accordingly. The maximum correction is limited to half of the determined drift. If the measured value falls below approx. 300 ppm, the calibration is initialized to 400 ppm.</p> <p>The automatic calibration can be deactivated and performed manually if necessary.</p> |
| Installation          | on-wall or on flush-mounted box  |
| Approvals             | CE, EAC, RoHS  |

## Variants

| Article Number                |        |             |              |            |                |
|-------------------------------|--------|-------------|--------------|------------|----------------|
| CO <sub>2</sub>               | VOC    | Humidity    | Temperature  | Output     | Equipment      |
| <b>FS1380-MBR-A2-D</b>        |        |             |              |            |                |
| 0-10000 ppm                   | -      | -           | -            | Modbus RTU | Display        |
| <b>FS1380-MBR-A2-DR</b>       |        |             |              |            |                |
| 0-10000 ppm                   | -      | -           | -            | Modbus RTU | Display, Relay |
| <b>FS1380-MBR-A2-R</b>        |        |             |              |            |                |
| 0-10000 ppm                   | -      | -           | -            | Modbus RTU | Relay          |
| <b>FS1380-MBR-A2-X</b>        |        |             |              |            |                |
| 0-10000 ppm                   | -      | -           | -            | Modbus RTU | -              |
| <b>FS1380-MBR-A2A4-D</b>      |        |             |              |            |                |
| 0-10000 ppm                   | 0-100% | -           | -            | Modbus RTU | Display        |
| <b>FS1380-MBR-A2A4-DR</b>     |        |             |              |            |                |
| 0-10000 ppm                   | 0-100% | -           | -            | Modbus RTU | Display, Relay |
| <b>FS1380-MBR-A2A4-R</b>      |        |             |              |            |                |
| 0-10000 ppm                   | 0-100% | -           | -            | Modbus RTU | Relay          |
| <b>FS1380-MBR-A2A4-X</b>      |        |             |              |            |                |
| 0-10000 ppm                   | 0-100% | -           | -            | Modbus RTU | -              |
| <b>FS1380-MBR-A2A4H1T1-D</b>  |        |             |              |            |                |
| 0-10000 ppm                   | 0-100% | 0-100% r.H. | -30...+100°C | Modbus RTU | Display        |
| <b>FS1380-MBR-A2A4H1T1-DR</b> |        |             |              |            |                |
| 0-10000 ppm                   | 0-100% | 0-100% r.H. | -30...+100°C | Modbus RTU | Display, Relay |



| Article Number               |        |             |              |            |                |
|------------------------------|--------|-------------|--------------|------------|----------------|
| CO2                          | VOC    | Humidity    | Temperature  | Output     | Equipment      |
| <b>FS1380-MBR-A2A4H1T1-R</b> |        |             |              |            |                |
| 0-10000 ppm                  | 0-100% | 0-100% r.H. | -30...+100°C | Modbus RTU | Relay          |
| <b>FS1380-MBR-A2A4H1T1-X</b> |        |             |              |            |                |
| 0-10000 ppm                  | 0-100% | 0-100% r.H. | -30...+100°C | Modbus RTU | -              |
| <b>FS1380-MBR-A2H1T1-D</b>   |        |             |              |            |                |
| 0-10000 ppm                  | -      | 0-100% r.H. | -30...+100°C | Modbus RTU | Display        |
| <b>FS1380-MBR-A2H1T1-DR</b>  |        |             |              |            |                |
| 0-10000 ppm                  | -      | 0-100% r.H. | -30...+100°C | Modbus RTU | Display, Relay |
| <b>FS1380-MBR-A2H1T1-R</b>   |        |             |              |            |                |
| 0-10000 ppm                  | -      | 0-100% r.H. | -30...+100°C | Modbus RTU | Relay          |
| <b>FS1380-MBR-A2H1T1-X</b>   |        |             |              |            |                |
| 0-10000 ppm                  | -      | 0-100% r.H. | -30...+100°C | Modbus RTU | -              |
| <b>FS1380-MBR-A4-D</b>       |        |             |              |            |                |
| -                            | 0-100% | -           | -            | Modbus RTU | Display        |
| <b>FS1380-MBR-A4-DR</b>      |        |             |              |            |                |
| -                            | 0-100% | -           | -            | Modbus RTU | Display, Relay |
| <b>FS1380-MBR-A4-R</b>       |        |             |              |            |                |
| -                            | 0-100% | -           | -            | Modbus RTU | Relay          |
| <b>FS1380-MBR-A4-X</b>       |        |             |              |            |                |
| -                            | 0-100% | -           | -            | Modbus RTU | -              |
| <b>FS1380-MBR-A4H1T1-D</b>   |        |             |              |            |                |
| -                            | 0-100% | 0-100% r.H. | -30...+100°C | Modbus RTU | Display        |
| <b>FS1380-MBR-A4H1T1-DR</b>  |        |             |              |            |                |
| -                            | 0-100% | 0-100% r.H. | -30...+100°C | Modbus RTU | Display, Relay |
| <b>FS1380-MBR-A4H1T1-R</b>   |        |             |              |            |                |
| -                            | 0-100% | 0-100% r.H. | -30...+100°C | Modbus RTU | Relay          |
| <b>FS1380-MBR-A4H1T1-X</b>   |        |             |              |            |                |
| -                            | 0-100% | 0-100% r.H. | -30...+100°C | Modbus RTU | -              |



## Accessories

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FS9510

Table stand for room housing



### Dimensional Drawing

