VOCD 51

VOCD 51 MDR2B

Features

- **Maintenance free MEMS sensor**
- **VOC (Volatile Organic Compounds):**
  Ethanol, Methane, Carbon Monoxide,
  Hydrogen, Ammonia etc etc
- **Automatic Baseline Calculation**
- **VOC ranges/sensitivity, Low, Medium and High**
- **Estimated operating life minimum 5 years**
- **Output(s)**
  0-10 Vdc, 2-10 Vdc, 4-20 mA, 0-5 Vdc or 1-5 Vdc
  (see ordering next page)
- **Accuracy +/- 10 % FSO**
- **Power supply 24 Vac/dc**
- **IP ratings**
  IP65 for enclosure
  IP41 for probe

Options

- **Modbus RS485 communication**
- **LCD Display**
- **1 x relay output , can be set individually**
- **2 x relay outputs, can be set individually**
- **Buzzer**

Applications

- Air quality applications: measuring VOC concentrations as of odors; tobacco smoke, body odor, or material fumes in cinema/theatre halls, exhibition halls, restaurants, canteens, shopping malls and ‘ conference rooms etc
- Ventilation control
- Occupancy level measuring

Detectable gases

- Cigarette smoke
- Automobile exhaust
- Breath air
- Carbon monoxide (CO)
- Solvent fumes
- Alcohol fumes
- Acetone
- Acrylonitrile
- Ammonia
- Benzene
- Chlorine
- Dimethyl amine
- Ethane
- Ethanol
- Ethylene
- Ethylene oxide
- Formaldehyde
- Hydrogen
- Hydrogen sulfide
- Isobutane
- Methane
- Methanol
- n-Hexane 2
- n-Petane
- Propane
- Sulfur dioxide

VOC Ranges/Sensitivity

0V or 4mA: BEST, Clean Air
1V or 5.6mA: STANDARD, calibrated level, reference level
10V or 20mA: WORST, polluted air

In normal conditions, base level is equals to 1V.

Lower than 1V is better than calibrated situation.
In some cases, indoor condition may be better than calibrated level.

Higher than 1V is showing polluted air level.
Pollution is measured from 1V to 10V.

Sensitivity for VOC.
Higher response for VOC gasses at HIGH sensitivity.
10V of HIGH is equal to 4V of LOW.
10V of MEDIUM is equal to 6V of LOW.
1V is same for all sensitivities.
Example: 3.0V @ LOW == 4.6V @ MEDIUM == 7.0V @ HIGH

Ordering codes

Mounting type	Output 1 VOC	Output 2 VOC	”Options”	Advanced Options
VOCD = Duct Mounted type	0 = no output 1 = 0-10 Vdc 2 = 2-10 Vdc 3 = 0-5 Vdc 4 = 1-5 Vdc 5 = 4-20 mA	0 = no output 1 = 0-10 Vdc 2 = 2-10 Vdc 3 = 0-5 Vdc 4 = 1-5 Vdc 5 = 4-20 mA	M = Modbus RS485 D = LCD display R1 = Relay x 1 R2 = Relays x 2 P = PID out B = Buzzer	P = PID out T = RTC L = Datalogger

Ordering examples

Type no.	Description
VOCD 51	Air Quality (VOC) transmitter for duct mounting VOC output 1: 4-20 mA VOC output 2: 0-10 Vdc
VOCD 51 M	Air Quality (VOC) transmitter for duct mounting VOC output 1: 4-20 mA VOC output 2: 0-10 Vdc Modbus RS485 communication
VOCD 51 MDR2B	Air Quality (VOC) transmitter for duct mounting VOC output 1: 4-20 mA VOC output 2: 0-10 Vdc Modbus RS485 communication, LCD Display, 2 x relay outputs and Buzzer

Notes:

Relay and Buzzer options should be ordered with LCD option for installer to change the set values and relay actions anytime.

For advanced options and special application contact us on info@vcp.se

Wall (IP65/IP41) VOCW type and room VOCR type available.

Technical data

Electrical	Power Supply	24 Vac (± %5), 50-60 Hz 15-35 Vdc
	Power Consumption	< 2.5 W
Outputs	Current Output	4-20 mA, maximum 500 Ω
	Voltage Output	0-10 Vdc, minimum 1.000 Ω 0-5 Vdc, minimum 1.000 Ω
	Relay Output	max. rating 1A @ 220 Vac
Accuracy	VOC	+/-10% FSO
Sensor	Sensing Element	MEMS type MOX sensing element
	Life time	> 5 years
	Resolution	0.5%
	Repeatability	< +/-5%
	Baseline	10%
	Operating Temperature	-20 to +50°C
	Operating Humidity	0 to +85% % rH
	Operating Pressure	800 to 1.200 mbar
General data	Sensing Element	Metal oxide
	Media	Air or non-aggressive gasses
	Storage temperature	0 to +50°C
Ranges	VOC	Low – Medium - High as sensitivity
Connections	X1-X2 Terminals	Pluggable screw terminal
	X3 Terminals	Fixed screw terminal
	Cable	maximum 1.5mm2
	Cable gland	M16
Protection	Enclosure	IP65 or NEMA 4
	Probe	IP41 or NEMA 3
Standards	EMC Directive	EN 61326-1
Dimensions	98.0 x 81.5 x45.5 mm enclosure probe length 130 mm probe diameter 30mm	
Weight Packed	300 grams	

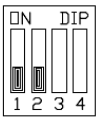
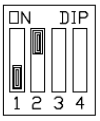
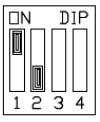
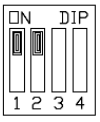
General Notes

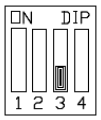
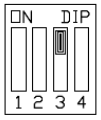
1.. High density of some other gasses may effect the reading.
2.. Observe maximum permissible cable lengths.
3.. If cable runs parallel to the mains cable: Use shielded cables.
4.. Test only with certified calibration gasses.
5.. The cable entry always should have to be pointing downwards.
6.. The data indicated under ‘Technical Data’ apply only to vertically mounted transmitters.
7.. Wall type transmitters should have to be mounted in the center of wall but not near to any doors and windows

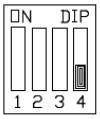
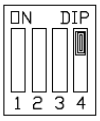
DIP Switch Settings

1.. Please check if there is any special instruction on the enclosure or inside the cover.

2.. For any calibration, please do not keep the unit working for more than 10 minutes..

DIP 1-2	Range/Sensitivity
	Low
	Medium
	High
	Calibration

DIP 3	Baseline
	Auto
	Manual

DIP 4	Response
	60 sec
	10 sec

Electrical Connections

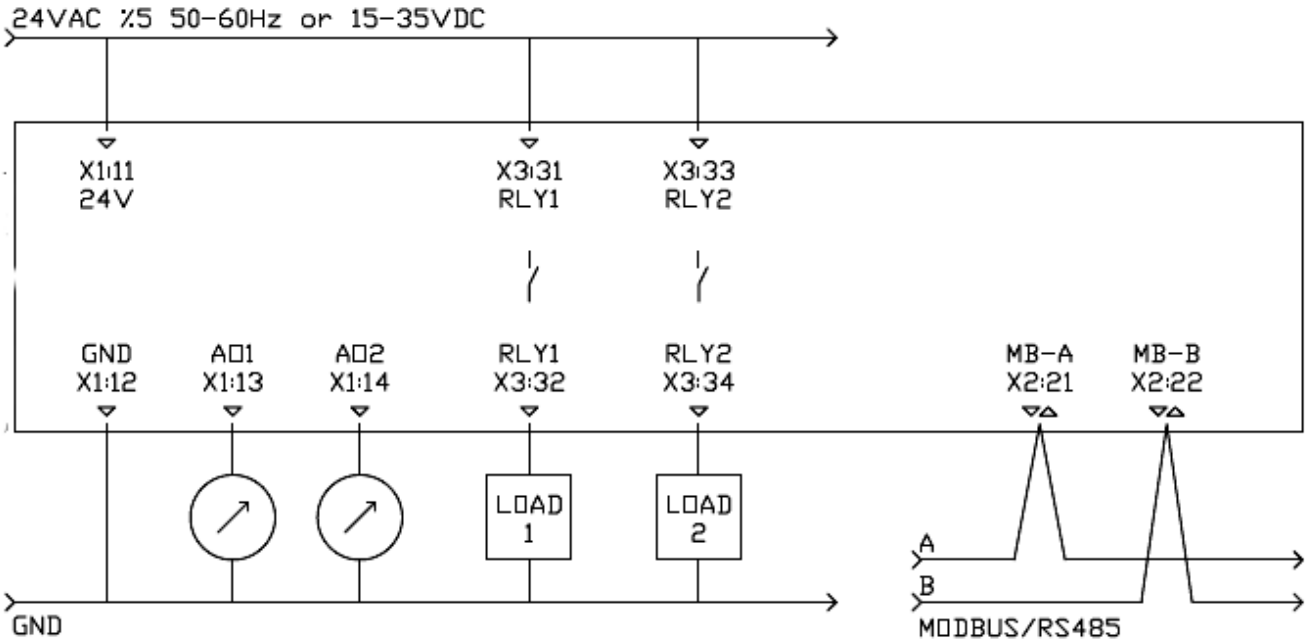
1.. Please be sure about current direction for current outputs and polarity for voltage outputs.

2.. Relay contact is Normally Open and rating is max. 1A at 230VAC

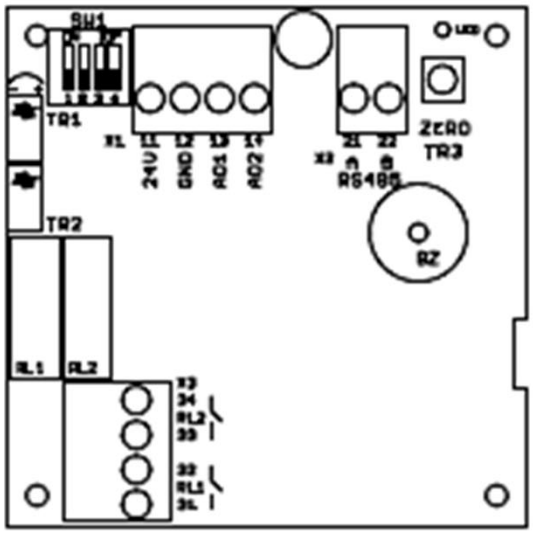
3.. We kindly advise using 24V for avoiding high voltage harmonics and external power relay for bigger loads

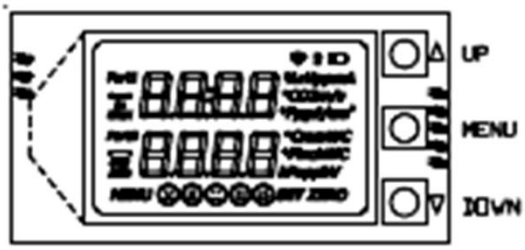
4.. Please use shielded and twisted paired cables for Modbus connections

5.. Please observe RS485 termination rules, max. 32 devices in a single Modbus line



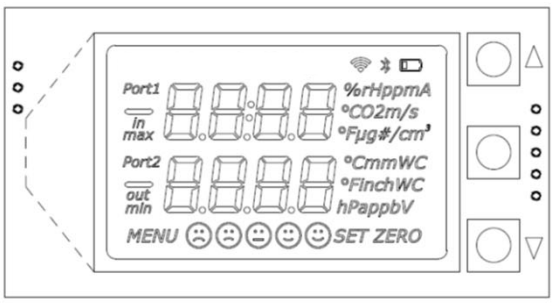
Transmitter Hardware





SW1	DIP Switch for configuration range and response time	
X1 TERMINAL		
11	24V	15...35 Vdc or 24 Vac (± %5, 50-60 Hz)
12	GND	ground for power and reference for outputs
13	AO1	analog output 1
14	AO2	analog output 2
X2 TERMINAL		
21	A / RS485	modbus communication positive pair
22	B / RS485	modbus communication negative pair
LED	bead LED, periodically lights ON and OFF modbus communication, blinks when there is a communication	
TR1	not used	
TR2	not used	
ZERO / TR3	not used	
RL1 & RL2	relay 1 and relay 2	
BZ	buzzer	
X3 TERMINAL		
31	NO - RL1	relay 1 dry contact max. rating 1A @ 220 Vac
32	NO - RL1	relay 1 dry contact max. rating 1A @ 220 Vac
33	NO - RL2	relay 2 dry contact max. rating 1A @ 220 Vac
34	NO - RL2	relay 2 dry contact max. rating 1A @ 220 Vac

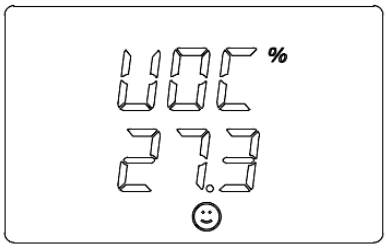
Display and Buttons



UP — *press for increasing the value or choosing the next parameter*

MENU — *press and wait to enter MENU, click to navigate between sub menus one by one*

DOWN — *press for decreasing the value or choosing the previous parameter*



main screen
transmitter is working

keep pressing MENU button until seeing SET
transmitter is not working in MENU mode

Smiling Faces

Faces are showing the Air Quality (VOC) levels as below:

1.. Best % 0 – 15

2.. Good %15 – 35

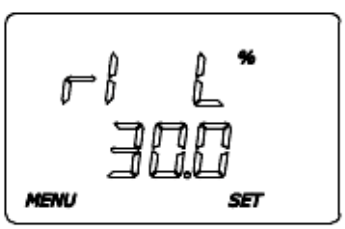
3.. Fair %35 – 50

4.. Bad %50 – 75

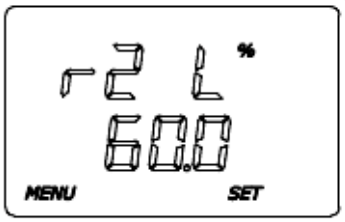
5.. Worst %75 - 100

Parameters for Relay and Buzzer

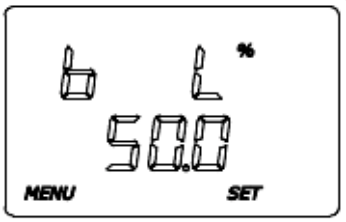
Main Screen >>>>> r1 L > r1 H > r1 A > r2 L > r2 H > r2 A > B L > B H > B A > Main Screen



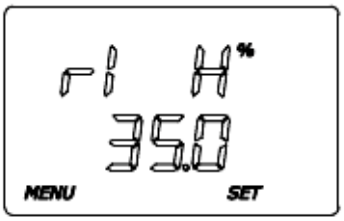
LOW set point for Relay 1



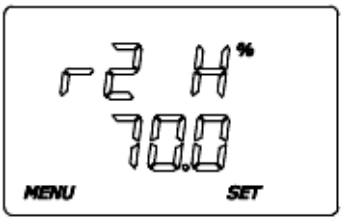
LOW set point for Relay 2



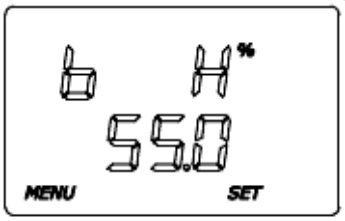
LOW set point for Buzzer



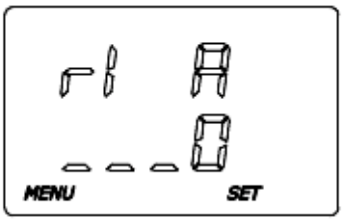
HIGH set point for Relay 1



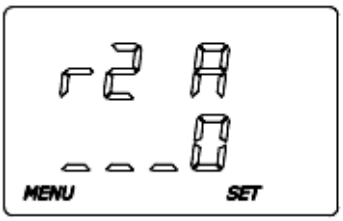
HIGH set point for Relay 2



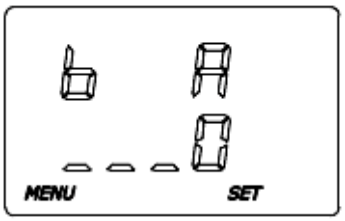
HIGH set point for Buzzer



ACTION selection for Relay 1



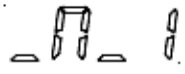
ACTION selection for Relay 2



ACTION selection for Buzzer

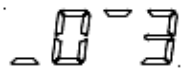
Actions for Relay and Buzzer

action 0, valid for relays and buzzer,
relay contact is always OPEN
buzzer is always SILENCE



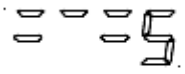
action 1, valid for relays and buzzer,
relay contact is CLOSED between points, OPEN under LOWpoint and OPEN over HIGHpoint
buzzer is WARNING between points, SILENCE under LOWpoint and SILENCE over HIGHpoint

action 2, valid for relays and buzzer,
relay contact is OPEN between points, CLOSED under LOWpoint and OPEN over HIGHpoint
buzzer is SILENCE between points, WARNING under LOWpoint and SILENCE over HIGHpoint

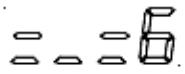


action 3, valid for relays and buzzer,
relay contact is CLOSED over HIGHpoint, OPEN under LOWpoint, hysterisis between points
buzzer is WARNING over HIGHpoint, SILENCE under LOWpoint, hysterisis between points

action 4, valid for relays and buzzer,
relay contact is OPEN over HIGHpoint, CLOSED under LOWpoint, hysterisis between points
buzzer is SILENCE over HIGHpoint, WARNING under LOWpoint, hysterisis between points



action 5, valid only for buzzer,
buzzer is WARNING over HIGHpoint, SILENCE under LOWpoint,
buzzer is WARNING intermittently between points,



action 6, valid only for buzzer,
buzzer is WARNING under LOWpoint, SILENCE over HIGHpoint,
buzzer is WARNING intermittently between points,

action 7, valid only for buzzer,
buzzer is following relay 1 contact,
buzzer is WARNING when relay 1 contact is CLOSED, SILENCE when the contact is OPEN

action 8, valid only for buzzer,
buzzer is following relay 2 contact,
buzzer is WARNING when relay 2 contact is CLOSED, SILENCE when the contact is OPEN

Cont.. Actions for Relay and Buzzer

ACTIONS	under LOW	between LOW & HIGH	over HIGH
0 : 0.0.0	Open / Silence	Open / Silence	Open / Silence
1 : 0.I.0	Open / Silence	Closed / Warning	Open / Silence
2 : I.0.I	Closed / Warning	Open / Silence	Closed / Warning
3 : 0.X.I	Open / Silence	Hysteresis	Closed / Warning
4 : I.X.0	Closed / Warning	Hysteresis	Open / Silence
5 : 0.-.I	Silence	Pre Alarm	Warning
6 : I.-.0	Warning	Pre Alarm	Silence
7 : =r1	Silence when RL1 is Open, Warning when RL1 is Closed		
8 : = r2	Silence when RL2 is Open, Warning when RL2 is Closed		

0 : Relay Contact is OPEN, Buzzer is in Silent mode
I : Relay Contact is CLOSED, Buzzer is in Warning mode
X : Relay Contact is at HYSTERESIS position, OPEN if previous position open, CLOSED if previous position closed
: Buzzer is in HYSTERESIS mode, Silent if previous mode is silent, Warning if previous mode is warning
- : Buzzer is in PRE ALARM mode, Buzzer is warning intermittently

Modbus RS485 Protocol

Default Settings: Modbus ID:1, 9600, 8bit, None, 1. Register Table starts from Base 1.

Use Function 3 for Reading and Function 6 for Writing Holding Registers.

Whenever writing to any Modbus Parameter,
new parameter is activated instantley and you should have to configure master device according to new parameters.

For every reboot/initializing, Modbus is activated with default parameters for 3 seconds.

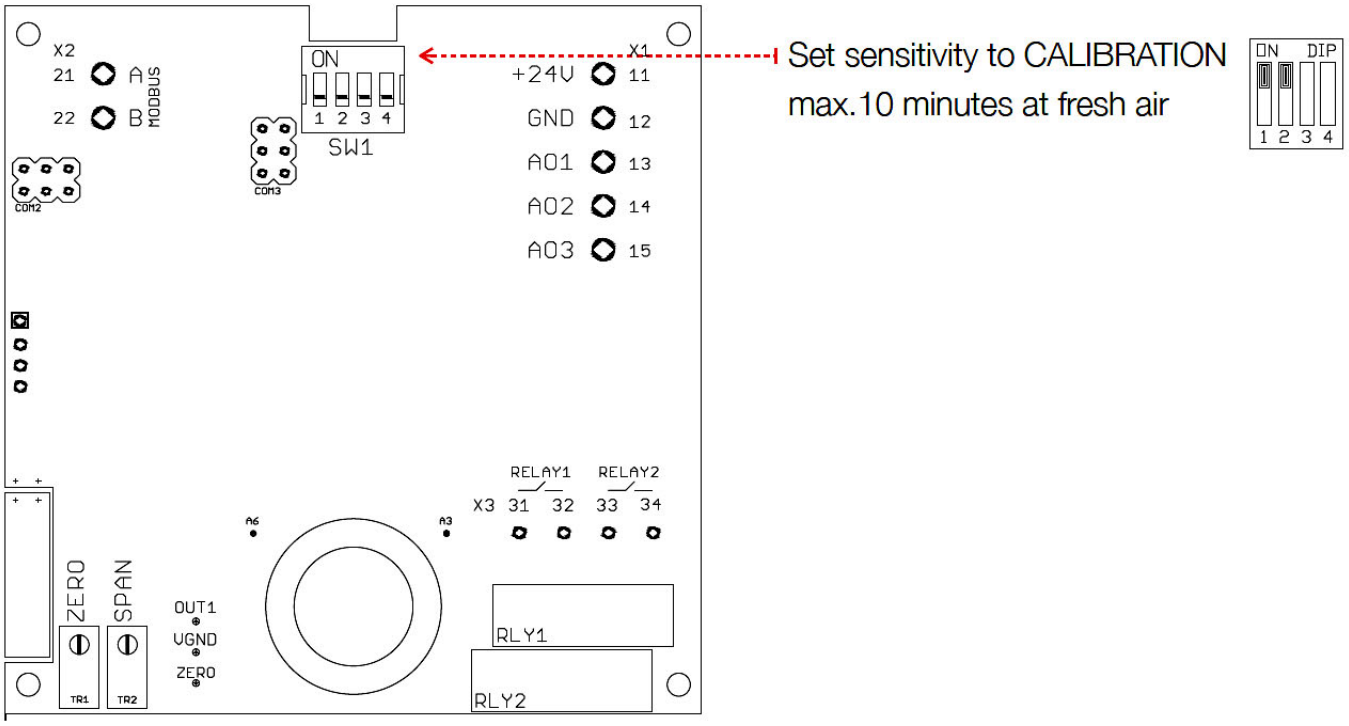
After 3 seconds, Modbus is reconfigured according your parameter settings.

Unlisted registers are for analog output calibrations and some system parameters.

Please do not change unlisted registers..

Register	R/W	Range	Description
1	R & W	1...254	Modbus Address
2	R & W	0...4	Baudrate, 0: 9.600, 1: 19.200, 2: 38.400, 3: 57.600, 4: 115.200
3	R & W	0...3	Bit_Parity_Stop, 0: 8bit_None_1, 1: 8bit_None_2, 2: 8bit_Even_1, 3: 8bit_Odd_1
4	R	0...1.000	VOC level as %, divide by 10 for exact value
5	R	1...5	VOC level as smiling faces, 1:0-15%, 2:15-35%, 3:35-50%, 4:50-75%, 5:75-100%
6	R	0 or 1	Relay 1, contact position, 0: OFF - Contact is Open, 1: ON - Contact is Closed
7	R	0...1.000	Relay 1, LOW point
8	R	0...1.000	Relay 1, HIGH point
9	R	0...4	Relay 1, ACTION
10	R	0 or 1	Relay 2, contact position, 0: OFF - Contact is Open, 1: ON - Contact is Closed
11	R	0...1.000	Relay 2, LOW point
12	R	0...1.000	Relay 2, HIGH point
13	R	0...4	Relay 2, ACTION
14	R	0 or 1	Buzzer, 0: OK-Silence, 1: PreAlarm - warning intermittently, 2: WARNING continuously
15	R	0...1.000	Buzzer, LOW point
16	R	0...1.000	Buzzer, HIGH point
17	R	0...4	Buzzer, ACTION

Calibration



1.. Please keep the unit working for minimum 10 minutes at fresh air.

2.. Set sensitivity to Calibration Mode.

3.. Keep the unit working for between 8-10 minutes at fresh air.

4.. Do not forget the unit at calibration mode, do not keep working at calibration mode more than 10 minutes.

5.. Change sensitivity setting for settling to HIGH, MEDIUM or LOW.

Dimensions (mm)