MYAIR VENTILATION GROUP

UK Design and Engineering

Carbon Monoxide Transmitter

issue date: 2.May.2021, document no: MCMT.W-DSH.R01

Applications

- Vehicle exhaust measuring at garages, auto parks
- Early fire detection
- Air quality applications: measuring CO concentrations as of odors; smoke, body odor, or material fumes in cinema/theatre halls, exhibition halls, restaurants, canteens, shopping malls and conference rooms etc

Features

- Replaceable 20mm Round Type Electrochemical Cell
- Estimated operating life 6 years, long term output drift <5% each year
- Zero-Span Calibration & Linear output
- CO ranges, standard: 50ppm, 100ppm, 200ppm and 300ppm
- CO ranges, extended: 100ppm, 300ppm, 500ppm and 1.000ppm
- CO output signal 4-20 mA and 0...10 Vdc
- Operating voltage 24V AC/DC

Options

- Modbus / RS485 port
- Relay, 1 or 2 relays, can be set individually
- Buzzer, can be set individually
- PID, RTC and Datalogger advanced options for special applications

General Notes

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

Made by MyAir UK

Technical Data

Electrical	Power Supply	AC 24V (± %5), 50-60 Hz DC 15…35 V
	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	CO	±3 %
Sensor	t90	< 50 sec.
	life time	> 6 years expected
	drift	< 5% per year
	resolution	0.5 ppm
	repeatability	< ±2 %
	baseline	< 5 ppm
	filter capacity	> 20.000 ppm per hour
	Operating Temperature	-20 …+50°C
	Operating Humidity	15…90 %rH
	Operating Pressure	800…1.200 mbar
General Data	Sensing Element	Electrochemical Cell
	Media	Air or non-aggressive gasses
	Storage Temperature	0 …+20°C recommended
Ranges	CO	0…50-100-200-300 ppm ranges for standard types 0…100-300-500-1.000 ppm ranges for extended types
Connections	X1-X2 Terminals	Pluggable screw terminal
	X3 Terminals	Fixed screw terminal
	Cable	maximum 1.5mm2
	Cable Gland	M16
Protection	MCMT.W series	IP41 or NEMA 3
Standards	EMC Directive	EN 61326-1
Dimensions	MCMT.W series	98.0 x 81.5 x 45.5 mm
Weight Packed	MCMT.W series	229 gr

DIP Switch Settings

1. Please check if there is any special instruction on the enclosure or inside the cover
2. For any calibration, please choose 1 sec. response time for faster measurements

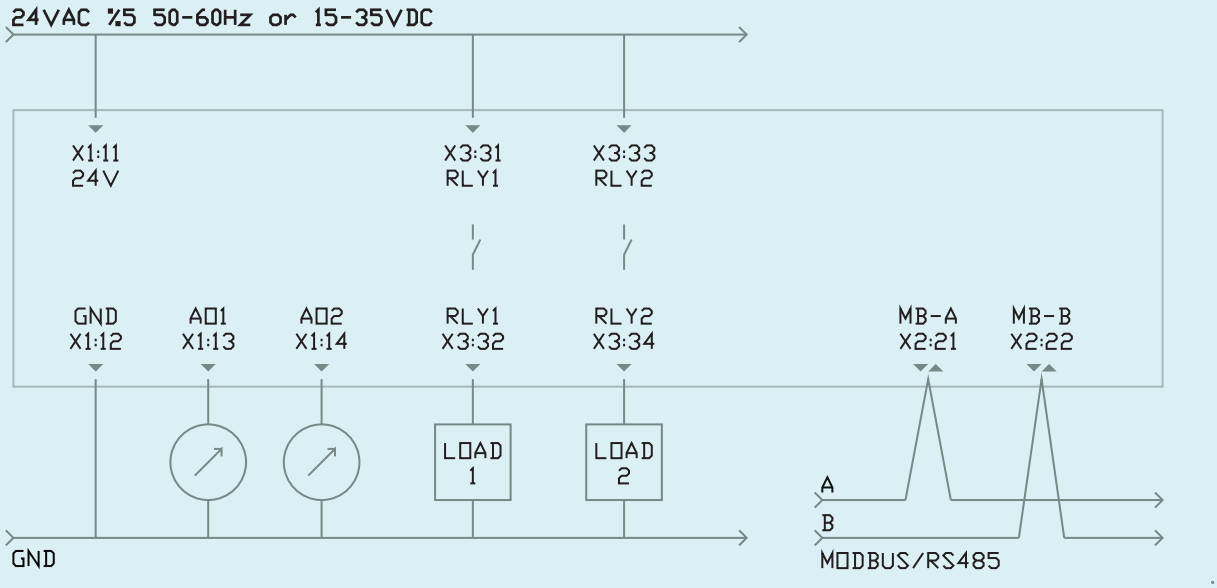
DIP	Standard Ranges
	50 ppm
	100 ppm
	200 ppm
	300 ppm

DIP	Extended Ranges
	100 ppm
	300 ppm
	500 ppm
	1.000 ppm

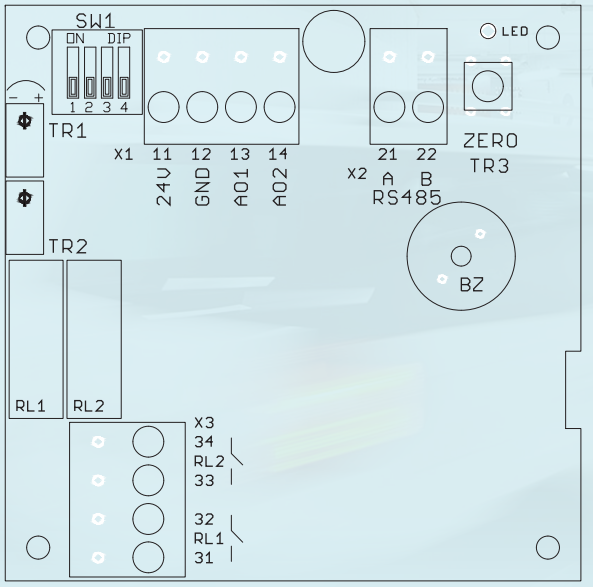
DIP	Resronse
	1 sec
	5 sec
	30 sec
	60 sec

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



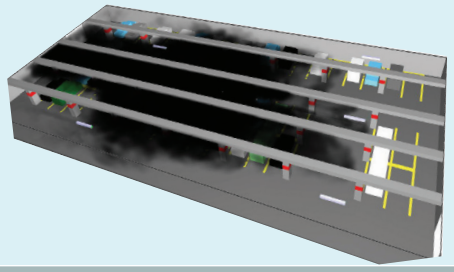
Transmitter Hardware



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

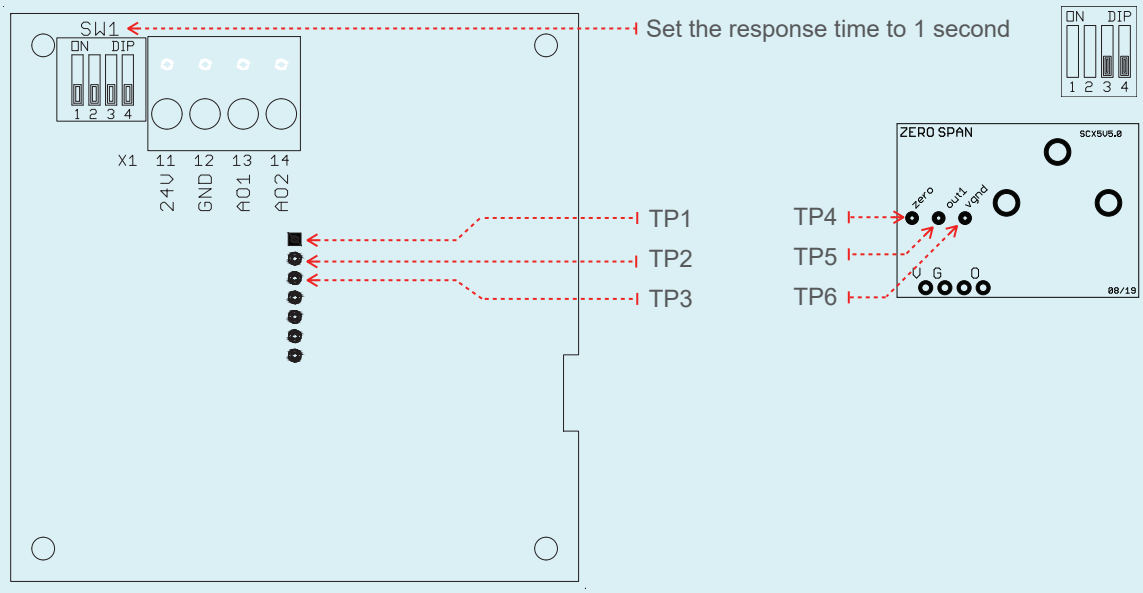
Modbus RS485 Protocol

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 instantly 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	CO level as ppm
5	R	0...10.000	CO level as ppm x10, divide by 10 for exact value
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 - General Information



Before the process;

1. Please keep the unit working for minimum 10 minutes at fresh air for settling the baseline.
2. Please use certified calibration CO Test Gasses.
3. Please use a precision multimeter,
   - ⊖ is showing Negative/Reference Point,
   - ⊕ is showing Positive Measurement Point.
4. Set the best range according to calibration gas.
5. Single point calibration is enough for any range.
6. Calibration steps: Check the typical values, Set ZERO, Set SPAN.

Check Typical Values

1. TP2⊖ vs TP1⊕ is about 5 VDC
2. TP2⊖ vs TP6⊕ is about 455 mV DC
3. TP6⊖ vs TP5⊕ is lower than 200 mV DC

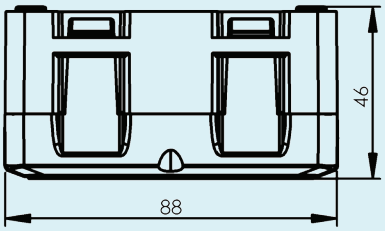
ZERO Calibration

1. Use ZERO Trimmer for setting ZERO value,
2. TP6⊖ vs TP4⊕ should be closest to 0 VDC.
3. In case of the sensing element replacement, Baseline should be set to transmitter Eeprom via Modbus;
   a. Read the data at HR18,
   b. Write the data to HR19,
   c. Write 9 to HR27.

SPAN Calibration

1. Use SPAN Trimmer for calibration.
2. Before applying the Test Gas, measure output as AO1⊕ vs GND⊖, should be very close to 0ppm.
3. Apply the test gas for min. 1 minute with 0.5 lit/min. flow rate
4. Start calibration with SPAN trimmer,
5. Analog output should show the test gas concentration value (AO1⊕ vs GND⊖).
6. Applying test gas for 3 minutes is enough for a standard calibration.
7. For best calibration, you can apply the test gas for 5 minutes.
8. Applying the test gas for longer and for many times, reduces the CO Sensing Element life.

Drawings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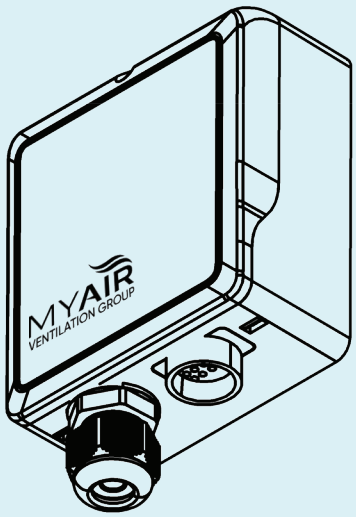
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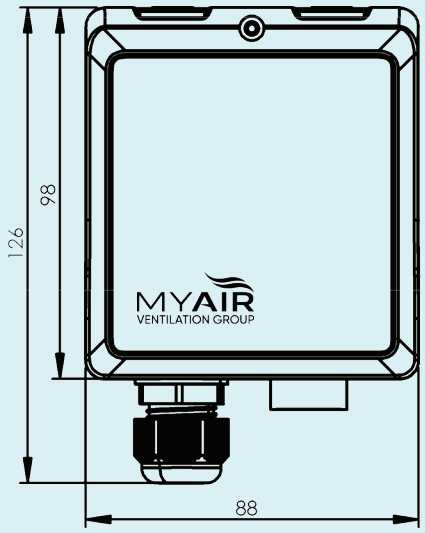
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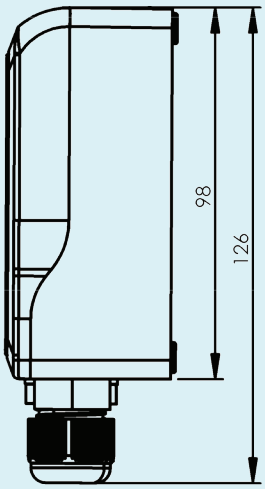
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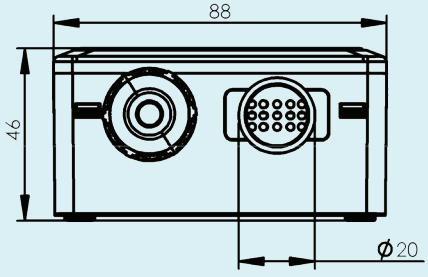
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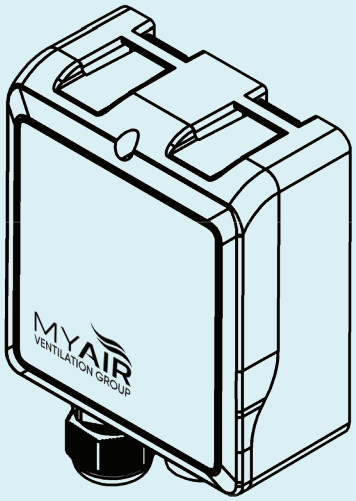
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Cross Sensitivity

1. The values given are only for information and should not be used as a basis for cross calibration.
2. Cross sensitivities may not be linear and should not be scaled either.
3. Data based on gassing for 5 minutes using test equipment.

Test Gas	Test Gas Concentration	CO Equivalent
Carbon Monoxide	100 ppm	100 ppm
Hydrogen Sulfide	50 ppm	0 ppm
Sulphur Dioxide	20 ppm	0 ppm
Hydrogen	100 ppm	< 35 ppm
Nitric Oxide	50 ppm	< 10 ppm
Ethanol	200 ppm	< 1 ppm
Ammonia	50 ppm	0 ppm
Chlorine	15 ppm	< 1 ppm
Ethylene	100 ppm	96 ppm

Ordering Codes

model	mounting type	output 1	output 2	options	advanced options
MCMT	W wall	0 no output 1 0...10Vdc 2 2...10Vdc 3 0...5Vdc 4 1...5Vdc 5 4...20mA	0 no output 1 0...10Vdc 2 2...10Vdc 3 0...5Vdc 4 1...5Vdc 5 4...20mA	M modbus D display R relay 1x RR relay 2x B buzzer E 1.000ppm range	P PID out T RTC L Datalogger

sample order code: MCMT.W51 .MD

- .MD — options: Modbus and Display
- W51 — Wall type, out1: 4-20mA, out2: 0...10Vdc
- MCMT — Myair carbon Monoxide Transmitter

1. ROOM and DUCT types are available, please check own datasheets
2. Standart CO ranges are field selectable as 50ppm, 100ppm, 200ppm and 300ppm
3. Choose “E” for extended ranges 100ppm, 300ppm,500ppm and 1.000ppm
4. Relay and Buzzer options should have be ordered with Display option
5. For advanced options and special applications, please contact with us info@my-air.co.uk

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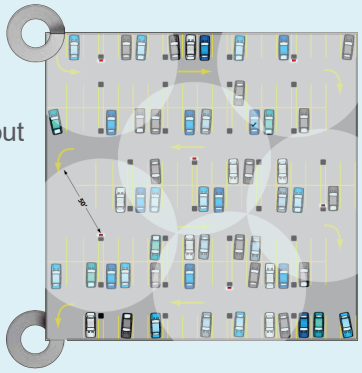
Autopark Guide for MCMT Series CO Detector

version 1

Quantity of sensors and location plan

1. The radius of coverage is maximum 15.2 m (50 feet) per carbon monoxide detector or maximum 725 sq.m (7,850 sq.ft).
2. Ideal area is 400 sq.m.
3. Use open interior support columns as much as possible to maximize the radius of coverage not walls.
4. Each level of the parking structure must be totally covered without overlapping the coverage of the sensors.



Height of sensors

1. The relative density of carbon monoxide compared to air of carbon monoxide is 0.957 (AIR =1).
2. The carbon monoxide will disperse evenly in the air.
3. The carbon monoxide detectors must be located to 1.5 meter (5 feet) above the floor.

Alarm Levels and National Standards for CO Exposure Levels

CO Level	Standard and Regulation	Alarm level
200 ppm	NIOSH-National Institute for Occupational Safety and Health Short term exposure limit 15-minute maximum exposure level	Good for high level alarm setpoint. Maximum concentration allowable high alarm.
50 ppm	OSHA-Occupational Safety and Health Administration The maximum allowable concentration for a workers continuous exposure in any eight hour period.	Acceptable low level alarm setpoint. Maximum concentration for low alarm.
50 ppm	UMC - Uniform Mechanical Code Recommends to activate the mechanical ventilation when CO is monitored in a park- ing structure	Acceptable low level alarm setpoint. Maximum concentration for low alarm.
35 ppm	EPA - Environmental Protection Agency Recommends 35 ppm or lower as an ambient air quality goal averaged over one hour	Acceptable for low level alarm setpoint.
35 ppm	NIOSH- National Institute for Occupational Safety and Health PEL-TWA: 35 ppm is the maximum allowable concentration for a worker to be exposed to in any eight hour period.	Acceptable for low level alarm setpoint.
25 ppm	ACGIH - American Conference of Governmental Industrial Hygienists TLV-TWA: 25 ppm is the maximum allowable concentration for a works continuous exposure in any eight hour period.	Ideal low level alarm setpoint. Minimum concentration for low alarm.
25 ppm	IMC - International Mechanical Code Recommend to actuate the mechanical ventilation when CO is monitored in a parking structure	Ideal low level alarm setpoint. Minimum concentration for low alarm.
9 ppm	EPA - Environmental Protection Agency Recommends 9 ppm or lower as an ambient air quality goal averaged over eight hours.	Too low to be a valuable alarm setpoint. Normally used as being the maximum allowable concentration for office spaces

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Carbon Monoxide Transmitter

Applications

- Air quality applications: measuring CO concentrations as of odors; tobacco smoke, body odor, or material fumes in cinemas,theaters, exhibition halls, restaurants, canteens, shopping malls and conference rooms etc
- Vehicle exhaust measuring at garages, auto parks
- Early fire detection

Features

- Maintenance free compact MEMS sensor
- COranges: 100ppm, 300ppm and 1.000ppm
- Operating voltage AC 24 V or DC 14...35 V
- CO output signals 0...10 Vdc, 0...5 Vdc and 4-20 mA
- Fixed or field selectable output types
- Simple and fast mounting
- 2 universal input option
- Modbus-RS485 port
- Relay option
- Wi-Fi option
- LCD Display

Technical Data

Electrical	Power Supply	AC 24V (± %5), 50-60 Hz DC 14...35 V
	Power Consumption	< 2.5 W
Outputs	Current Output	4...20 mA, mximum 500 Ω
	Voltage Output	0...10 Vdc, minimum 1.000 Ω 0...5 Vdc, minimum 1.000 Ω
	Relay Output	max. rating 3A @ 220 Vac
Accuracy	CO	±2 % for 0...100 ppm ±3 % for 0...300 ppm ±5 % for 0...1.000 ppm
General Data	Sensing Element	MEMS
	Media	Air or non-aggressive gasses
	Temperatures	operating: -25...+70ºC, storage: -30...+85ºC
Ranges	CO	0...100 ppm, 0...300 ppm, 0...1.000 ppm
Connections	Terminals	Pluggable screw terminal,maximum 1.5mm2
	Cable Gland	M16 or PG9
Protection	SCM.D series	enclosure: IP65 or NEMA 4, probe: IP41 or NEMA 3
	SCM.W series	enclosure: IP65 or NEMA 4, probe: IP41 or NEMA 3
	SCM.R series	enclosure: IP 40 or NEMA 1
Standards	EMC Directive	EN 61326-1
	CE Conformity	CE1701
Dimensions	SCM.D series	enclosure: 98.0 x 81.5 x 45.5 mm, probe: ⌀12 mm x 255 mm, SS-304
	SCM.W series	enclosure: 98.0 x 81.5 x 45.5 mm, probe: ⌀12 mm x 46. 5 mm
	SCM.R series	enclosure: 80.0 x 80.0 x 34.2 mm
Weight Packed	SCM.D series	398 gr
	SCM.W series	229 gr
	SCM.R series	82 gr
Sample Codes	SCM.D10-100	duct type, out1: 0...10V, out2: no, no options, range:0...100 ppm
	SCM.WF0.LR-100	wall type, out1: field selectable, out2: no, options: LCD and Relay, range:0...100/300 ppm

model	mounting t.	output 1	output 2	options	range
SCM	D duct R room W wall	0 no output 1 0...10Vdc 2 2...10Vdc 3 0...5Vdc 4 1...5Vdc 5 4...20 mA F 0...10Vdc or 4...20mA field selectable	0 no output 1 0...10 Vdc 2 2...10 Vdc 3 0...5 Vdc 4 1...5 Vdc 5 4...20 mA F 0...10 Vdc or 4...20mA, field selectable	M modbus L LCD R relay W wi-fi P PID out 1 1 input 2 2 inputs	100 100 ppm 300 300 ppm 1.000 1.000 ppm

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+44 793 701 7043
https://my-air.co.uk
info@my-air.co.uk

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