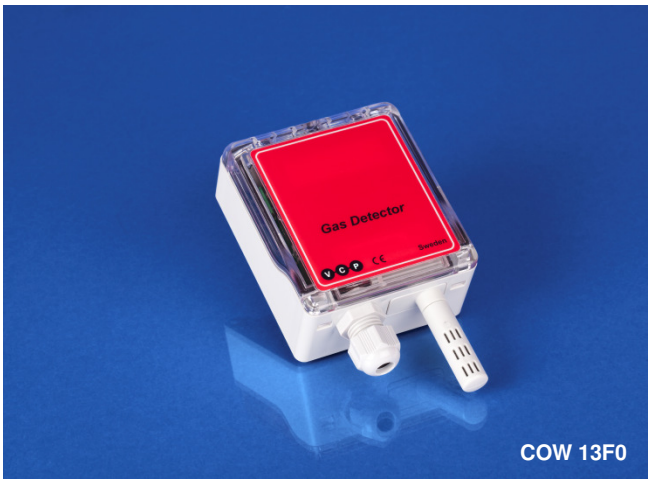


Features

- **Power supply 24 Vac/dc**
- **IP ratings**
  IP65 for enclosure
  IP41 for probe
- **Electrochemical sensor**
- **Accuracy ±3 %**
- **t90 < 50 sec.**
- **Sensor life time minimum 10 years**

COW 13F0:

- **Measuring ranges**
  0-50 ppm, 0-100 ppm or 0-300 ppm, jumper selectable
- **Output**
  4-20 mA or 0-10 Vdc, jumper selectable

COW 1351 MDR:

- **Measuring range**
  0-50 ppm, 0-100 ppm or 0-300 ppm, jumper selectable
- **Two Outputs**
  4-20 mA and 0-10 Vdc
- **Modbus RS485 communication**
- **LCD Display 12x2**
- **Relay output, user can set any level**

COW 13F0 and COW 1351 MDR are standard types,
Other types on next page.

- **On request**
  1 x universal input, 2 x universal inputs,
  Wifi, 0-1000 ppm, Duct version, Room version

Application

For detection of Carbon Monoxide (CO)
within a wide range of commercial applications such as:

Vehicle exhaust in parking structures
(e.g. underground garages)

Engine repair shops, Tunnels, loading bays,
Engine test benches, Shelters, Go-kart race courses , Etc.

Ordering codes

Mounting type	Range	Output 1	Output 2	"Options"
COW = Wall IP65 enclosure IP41 probe COD = Duct IP65 enclosure IP41 probe COR = Room IP30 enclosure	13 = 0-50 ppm 0-100 ppm or 0-300 ppm jumper selectable 310 = 0-100 ppm, 0-300 ppm or 0-1000 ppm jumper 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 4-20 mA 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 4-20 mA field selectable	M = Modbus RS485 D = LCD display R = Relay

COW 13F0

COW 1351 MDR

COD 13F0

COD 1351 MDR

COR 13F0

Ordering examples

Type no.	Description
COW 13F0	Carbon Monoxide (CO) detector - for wall mounting, IP65 enclosure and IP41 probe - Range 0-50 ppm, 0-100 ppm or 300 ppm, jumper selectable range - 1 field selectable output 0-10Vdc or 4-20mA
COW 1351 MDR	Carbon Monoxide (CO) detector - for wall mounting, IP65 enclosure and IP41 probe - Range 0-50 ppm, 0-100 ppm or 0-300 ppm, jumper selectable range - Two Outputs 4-20 mA and 0-10 Vdc - Modbus RS485 communication - LCD Display 12x2 - Relay output, user can set any level

Notes:

COW 13F0 and COW 1351 MDR are standard types

COW 13F0 is the simple competitive type.

COW 1351 MDR is the "full featured" type.

Other types in ordering codes above can be supplied in minumum 25 pcs per each unic type.

Technical data

Electrical	Power Supply	24 Vac (± %5), 50-60 Hz 14-35 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
Accuracy	CO	±3 %
Sensor	Sensing Element	Electrochemical
	t90	< 50 sec.
	Sensor life time	min. 10 years
	Drift	< 5% per year
	Resolution	0.5 ppm
	Repeatability	+/-2%
	Baseline	< 5 ppm
	Filter capacity	> 20.000 ppm per hour
	Media	Air or non-aggressive gasses
	Operating Temperature	-20 to +50°C
	Operating Humidity	15 to +90% % rH
	Operating Pressure	900 to 1.100 mbar
Ranges	CO	0-50 ppm, 0-100 ppm or 0-300 ppm on request 0-1000 ppm
Connections	Terminals	Pluggable screw terminal
	Cable	maximum 1.5mm2
	Cable Gland	M16 or PG9
Protection	Enclosure	IP65 or NEMA 4
	Probe	IP41 or NEMA 3
Standards	EMC Directive	EN 61326-1
	CE Conformity	CE1701
Dimensions	Enclosure	98.0 x 81.5 x 45.5 mm
	Probe	ø 12 mm x 46.5 mm
Weight Packed	230 grams	
Universal input(s)	Can be 0-10 Vdc, 0-5Vdc, PT1000 (only on request).	
Sensing Coverage area	400 m2	

Output Jumpers

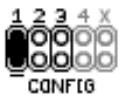
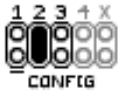
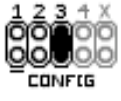
1.. There is no output jumper for the fixed output types
2.. Please check if there is any special Jumper Instruction in the enclosure
3.. Range Jumpers for AO1 and AO2 have same specifications

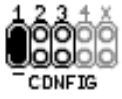
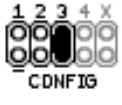
AO1	Output 1
no jumpers	fixed at the factory *according to your request*
	0…10V *jumper selection*
	4…20mA *jumper selection*

AO2	Output 2
no jumpers	fixed at the factory *according to your request*
	0…10V *jumper selection*
	4…20mA *jumper selection*

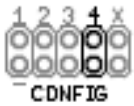
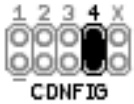
CONFIG Jumpers

1.. Never use the jumper X at CONFIG..!
2.. Please check if there is any special Jumper Instruction in the enclosure
3.. There is no jumper for fixed range models

Range	0-50, 0-100, 0-300 ppm
	0…50 ppm
	0…100 ppm
	0…300 ppm

Range	0-100, 0-300, 0-1000 ppm
	0…100 ppm
	0…300 ppm
	0…1.000 ppm

Response

	5 sec.
	60 sec.

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. Never test with flammable 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. Duct type transmitters should be far away from humidifiers, min. 2 meters. (duct version on request).
8. Room and Wall type transmitters should have to be mounted in the center of wall but not near to any windows (room version on request)

Cross Sensivity

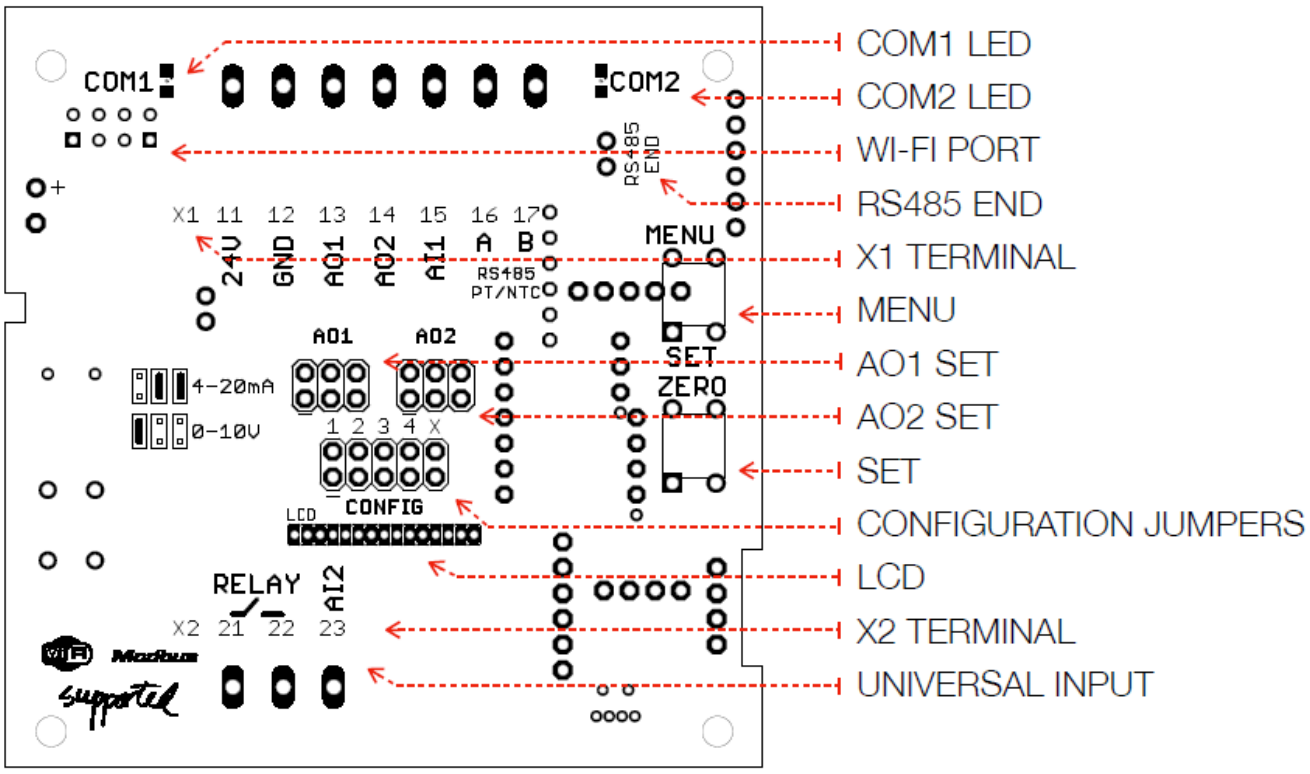
The values given are only for information and should not be used as a basis for cross calibration.

Cross sensivities may not be linear and should not be scaled either.

Datas based on gasing for 5 minuttes using test equipment.

Test Gas	Test Gas Concentration	CO Equivalent
Carbon Monoxide	100	100
Hydrogen Sulfide	50	0
Sulphur Dioxide	20	0
Hydrogen	100	40
Nitric Oxide	50	0
Ethanol	200	< 2
Ammonia	50	0
Chlorine	15	0
Ethylene	100	0

Hardware


COM1
COM2
RS485 END
X1 11 12 13 14 15 16 17
24V GND AO1 AO2 AI1 A B
RS485 PT/NTC
MENU
SET
ZERO
AO1
AO2
4-20mA
0-10V
1 2 3 4 X
CONFIG
LCD
RELAY
AI2
X2 21 22 23
COM1 LED
COM2 LED
WI-FI PORT
RS485 END
X1 TERMINAL
MENU
AO1 SET
AO2 SET
SET
CONFIGURATION JUMPERS
LCD
X2 TERMINAL
UNIVERSAL INPUT

Definitions

COM1 LED without relay option, Bead LED, ON for one period, OFF for one period with relay option, shows the relay position, lights when contact is closed (X2:21-22)

COM2 LED modbus communication LED, blinks when there is communication

Wi-Fi PORT wi-fi port, it is an advanced option, please contact us for more details

RS485 END modbus ending jumper to connect internal 120ohm resistor to the RS485 line

X1 TERMINAL

11	power	14-35 Vdc or 24 Vac (± %5, 50-60 Hz)
12	GND	ground for power and reference for outputs and inputs
13	output 1	analog output for main measurement
14	output 2	analog output for other measurement or duplicated output1 for third party devices
15	input 1	universal input for nearby passive field devices
16	A modbus	modbus communication positive pair
17	B modbus	modbus communication negative pair

MENU BUTTON press and wait to enter MENU, click to navigate between sub menus one by one after all parameters turns back to main screen

AO1 & AO2 SET output set as 0-10 Vdc or 4-20 mA with jumpers, only for output selectable products, for the fixed output models there is no jumpers, please be sure about the output type and electrical connections

SET BUTTON click to change parameters, parameters are automatically set while exiting menu

CONFIGURATION JUMPERS jumpers to set output range and delay time
please refer to the “jumper reference” sticker on PCB or inside of cover

CAUTION **never use jumper X..!**

LCD 12x2 LCD for monitoring and setting parameters

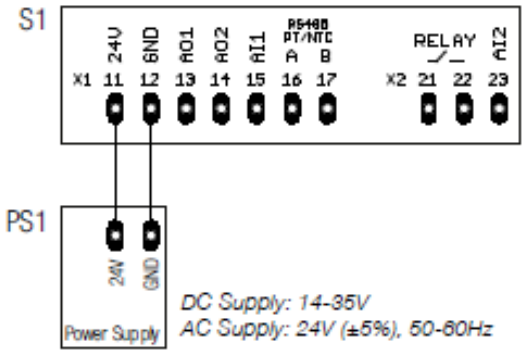
contrast	adjust the contrast from MENU for a better performance
brightness	adjust the brightness from MENU for a better performance

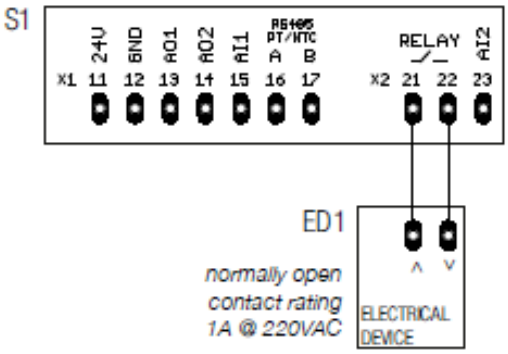
X2 TERMINAL

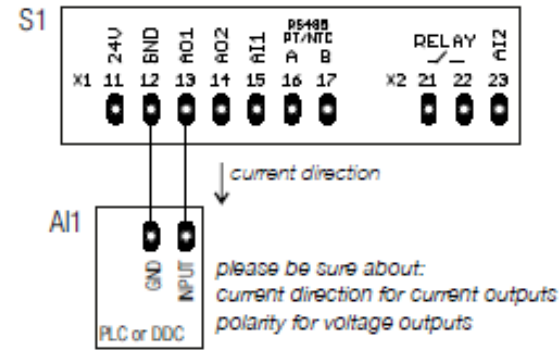
21	NO contact	relay dry contact max. rating 1A @ 220 Vac
22	NO contact	relay dry contact max. rating 1A @ 220 Vac
23	input 2	universal input for nearby passive field devices

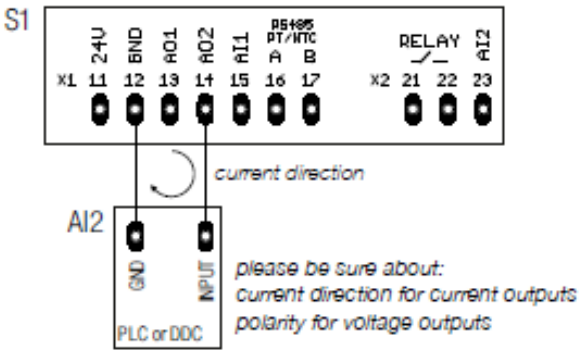
UNIVERSAL INPUT universal inputs (X1:15 and X2:23) can be digital input as dry contact or analog input as NTC10k, PT1000, 0-10 Vdc or 0-5 Vdc.
universal input is an advanced option, please contact us for more details

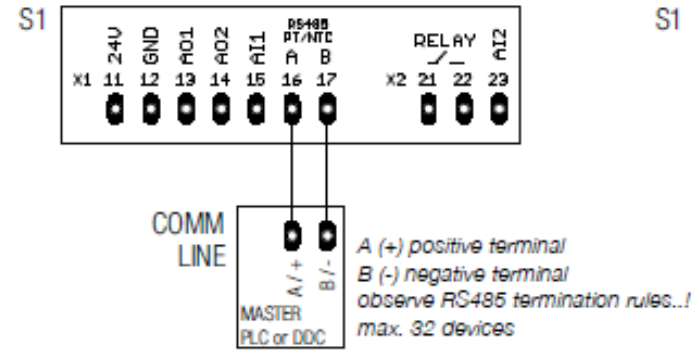
Electrical connections

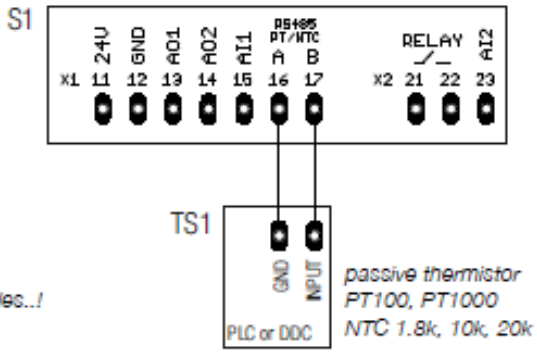


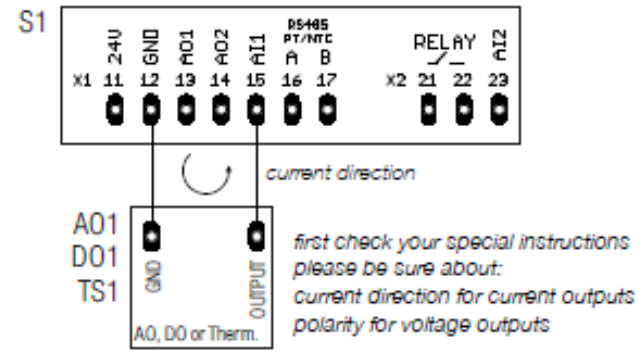


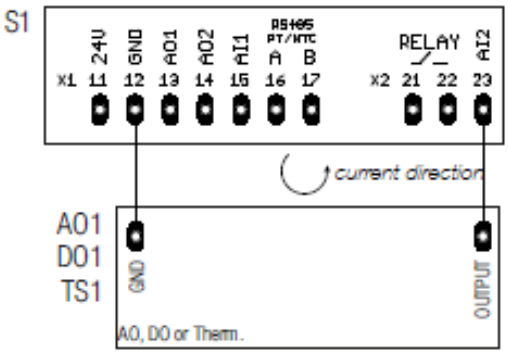




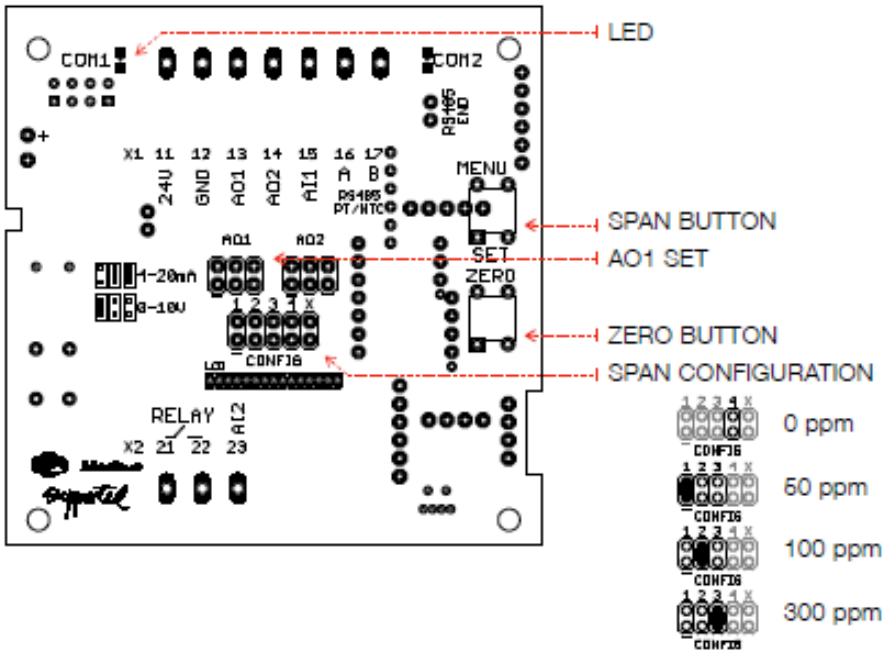








Calibration



1.. 6 months of stock life needs nearly 10 minutes of working at fresh air for settling the baseline.
2.. SPAN Calibration can be done one by one for 0ppm, 50ppm, 100ppm and 300ppm for best performance.
3.. 0…50ppm, 50…100ppm and 100…300ppm ranges have independent calibration maps.
4.. Besides calibrating the max. range that will used, please make calibration for lower ranges.
5.. Before any calibration, check CONFIG Jumpers and set to calibration level.

Calibration - 0ppm, 50ppm, 100ppm, 300ppm

1.. Open the cover and power the detector, do not close the cover during process,
2.. Wait for min. 3 minutes for warming up the sensor,
3.. Use right CO Calibration Gas according to Jumper Settings, 0ppm, 50ppm, 100ppm or 300ppm,
You may use Fresh Air for 0ppm calibration (which is lower than 1ppm CO),
4.. Apply the gas for min. 2 minutes with 0.5 lt/min. flow rate,
5.. Keep pressing for min. 10 seconds to SPAN (MENU) button, LED will light continuously,
6.. When LED gets OFF, take your finger from the button,
7.. LED double flashes during ZERO process for 10 seconds,
8.. The calibration point is an average of 20 measurements between 5th and 10th seconds,
9.. LED lights continuously for 3 seconds,
10..Gas Detector turns back normal condition and works with new calibration setting.

Calibration - Factory Reset

1.. Keep pressing for min. 10 seconds to ZERO button, LED will light continuously,
2.. When LED gets OFF, take your finger from the button,
3.. LED flashes continuously during RESET process for 10 seconds,
4.. LED lights continuously for 3 seconds,
5.. Gas Detector turns back normal condition and work with factory calibration settings.

Menu

VCP	intro screen duration 2 seconds
CO ppm 8	Main screen, measuring value normal operating mode
ENTER MENU >>>>>>>	press and hold MENU button for entering menu if you skip pressing MENU button before seeing OK, you will be back to main screen
ENTER MENU OK	now you are in MENU
M1 Relay EnterSetting	RELAY_MENU, press SET button for entering RELAY_MENU, press MENU button to skip RELAY_MENU and pass to M2_RANGE
M1a Min.Set 10 ppm <>	you can set Min.Set for RELAY_MENU while arrows (< >) are on screen, press SET button for decreasing or MENU button for increasing the Min.Set
M1a Min.Set 12 ppm	wait for 3 sec. after pressing to any button, the arrows (< >) are hidden, press MENU button to pass Max.Set, press SET button for editing Min.Set
M1b Max.Set 22 ppm <>	Max.Set setting is same as Min.Set setting
M1c Mode Set Closed 0.I.0	relay contact action according to min. and max. set points, select with SET button, skip or pass to next screen with MENU button
M2 RANGE 0...100 ppm	select the RANGE with SET button, skip or pass to next screen with MENU button
M3 RESPONSE SLOW (60sec)	select the RESPONSE time with SET button, skip or pass to next screen with MENU button
M4 CONTRAST 5	set the CONTRAST between 0 to 10 with SET button, default is 5, skip or pass to next screen with MENU button
M5 BRIGHTNES 5	set the BRIGHTNESS between 0 to 10 with SET button, default is 5, skip or pass to next screen with MENU button
M6 Cal/Reset EnterSetting	device ID, check the identification datas of the device with SET button, skip and EXIT the menu with MENU button, you will be back to main screen
M6a 0 ppm Calibrate?	calibration for 0 ppm, press MENU button to pass next menu, for calibration, keep pressing SET button for 5 seconds and wait for 10 seconds,
M6b 50 ppm Calibrate?	calibration for 50 ppm, press MENU button to pass next menu, for calibration, keep pressing SET button for 5 seconds and wait for 10 seconds,
M6c 100 ppm Calibrate?	calibration for 100 ppm, press MENU button to pass next menu, for calibration, keep pressing SET button for 5 seconds and wait for 10 seconds,
M6d 300 ppm Calibrate?	calibration for 300 ppm, press MENU button to pass next menu, for calibration, keep pressing SET button for 5 seconds and wait for 10 seconds,
M6e Reset Factory Set?	reset to factory calibration, press MENU button to pass next menu, for resetting, keep pressing SET button for 5 seconds and wait for 10 seconds,
CO ppm 8	Main screen, measuring value normal operating mode

Modbus Protocol

Using Function 3 for Reading and Function 6 for Writing Holding Registers.
Register Table starts from Base 1. Default Settings: Midbus ID:1, 96000, 8bit, None, 1.

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…1.000	CO level as ppm
6	R	0 or 1	Relay contact position, *0: OFF/Open, 1: ON/Close*
7	R & W	0 to 4	Relay Mode, *0:Closed, 1:Open, 2:HighOn, 3:LowOn, 4:Off*
8	R & W	0…1.000	MIN SET for Relay
9	R & W	0…1.000	MAX SET for Relay
10	R & W		Blank
11	R & W		Blank
12	R & W		Blank
13	R & W		Blank
14	R & W		Blank
15	R & W		Blank
16	R & W		Blank
17	R & W		Blank
18	R & W		Blank
19	R & W		Blank
20	R & W		Blank

Relay

Relay Mode	< Min. Set	between Min. & Max. Set	> Max. Set
Closed / 0.I.0	OPEN	CLOSED	OPEN
Open / I.0.I	CLOSED	OPEN	CLOSED
HighOn / 0.X.I	OPEN	HYSTERESIS	CLOSED
LowOn / I.X.0	CLOSED	HYSTERESIS	OPEN
Off / 0.0.0	OPEN	OPEN	OPEN

0 : Relay Contact is at OPEN position
I : Relay Contact is at CLOSED position
X : Relay Contact is at HYSTERESIS position, OPEN if previous position open, CLOSED if previous position closed,

Dimensions (mm)