Solvent Vapors Detector-Transmitter E2611-VOC is intended for early detection of leakages or accumulation of light hydrocarbon gases (acetylene, methane, propane, butane) and hydrogen.

The instrument is based on fully calibrated and temperature compensated semiconductor metal-oxide (MOS) gas sensor with high repeatability, stability and long lifetime. Pellistor (catalytic bead) sensor is available as an option.

E2611 series devices provide two independent analog outputs OUT1 and OUT2, user-selectable to 4-20 mA or 0-10 V, proportional either to gas concentration or temperature. RS485 Modbus RTU digital communication interface allows easy instrument configuration and integration into various automation systems. Two relays RE1 and RE2 with closing contacts can be used to switch 24 V or 230 V powered alarm sirens, ventilation fans, shut-off valves or other actuators.

Safety requirements

Always adhere to the safety provisions applicable in the country of use. Do not perform any maintenance operation with the power on. Do not let water or foreign objects inside the device.

Operating conditions

- The device should be used in explosion-safe (non ATEX -rated) indoor areas at the atmospheric pressure ±10%, <95 %RH, without condensation, and temperature within the range -30...+70 °C for MOS-type devices / -20...+60 °C for pellistor type.
- Metal-oxide and pellistor sensors cannot properly operate in a zero or low oxygen content atmosphere. Normal ambient oxygen concentration is recommended.
- Avoid exposure to highly corrosive gases (H_2S, SO_2, HCl, Cl_2 etc), and volatile silicon containing materials.
- Avoid mechanical shock or strong vibrations.
- Avoid sources of electromagnetic interference

Installation and connections

The gas detector should be mounted on a wall at a place locatedas close as possible to a possible gas leakage source and not very close to ventilation openings, with the sensor pointing downwards. Avoid the areas without air circulation (corners, niches) as well. Solvent vapors are heavier than air and tend to sink. Consider, if the vapours are heated or not, if the tetector is used for fire safety (LEL range) or air quality control (ppm range) etc. Take into consideration the geometry of the room and the speed and direction of air currents. The device should be available for maintenance and repair.

To install and connect the device, proceed as follows:
1. Detach the base of the enclosure by gently pulling along four guiding pins.
2. Attach the base to the wall with two screws. (see dimensional drawing below).
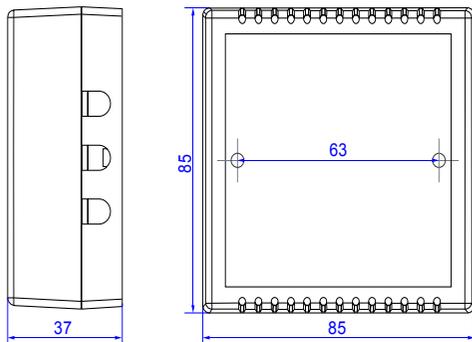
3. Connect power supply and external devices to the terminal blocks on the PCB according to the connection diagram below.
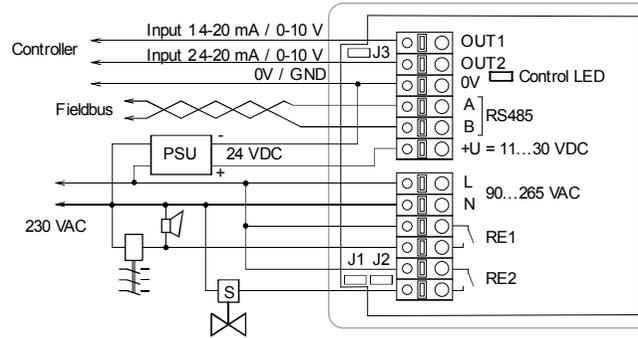
To power the instrument from an external 24 VDC source, connect terminals 0 V and +U to the source. If an integrated mains power supply module is used, connect terminals L and N to the mains.

NB! If the instrument is powered from mains, connect to 0 V and +U terminals only light external loads, which consume less than 30 mA in total, as the integrated mains supply module capacity is limited.

To use analog outputs, connect the terminals OUT1 and/or OUT2 and 0 V to the input of the secondary instrument (indicator or controller).

NB! The outputs are not galvanically isolated from 24 V power supply and share common 0 V. Allowed load resistance limits are stated in Specifications table.

The type of each analog output can be independently changed between 4-20 mA and 0-10 V with jumpers J1 (OUT1) and J2 (OUT2).

With closed jumper the output is 0-10 V, with open jumper the output is 4-20 mA. By default both outputs OUT1 and OUT2 are assigned to gas concentration. The device has built-in temperature sensor which may be tied to any of the outputs. The output assignments and scales can be changed by Modbus commands.

We recommend to set the difference between the upper and bottom limits of the output scale not narrower than 20% of detection range. In any case, do not set the output scale below the tenfold resolution of the device.

To use relay outputs, connect the chosen actuators to the relay terminals RE1 and/or RE2.

NB! Actuator short-circuits shall be avoided, to protect the instrument relays use external fuses or safety switches.

4. Turn on the power. It may take up to five minutes after switching on for the sensor to stabilize. During this period relays, analog outputs and Modbus interface are off. A LED placed on the PCB of the device allows to control the connection process. The LED response to different processes is presented in the table below.

Process	LED mode
Sensor heating period	Blinking 0.5 Hz (50% on, 50% off)
Sensor absence or malfunction	Blinking 0.5Hz (90% off, 10% on)
Relay 1 turned on	Blinking 1 Hz (50% on, 50% off)
Relay 2 turned on	Blinking 2 Hz (50% on, 50% off)
Modbus response	The signal is modulated with short onoff pulses, even single Modbus cycle is traceable*
Normal measurement	Continuous light
* Pulse corresponding to Modbus response is visible only when diode light is on	

5. Push enclosure to the base.

Operation

For best stability the gas detector should be powered permanently. If the instrument is left for a long time in unpowered state, then after initial power-on the metal-oxide gas sensor needs some time to heat up and burn adsorbed contaminants. So for first tens of seconds of few minutes an alarm activation may be possible. After this heating-up period the instrument turns into normal mode.

When the concentration of the detected gas reaches the LOW alarm level, the control LED starts blinking and the buzzer starts beeping with 1 Hz frequency. When the HI alarm level is reached, the frequency of blinking/beeping is 2 Hz. The alarm signal turns off automatically, if gas concentration decreases to 80% of the alarm setpoint.

Configuring

E2611 series devices share all functionalities of the PluraSens® multifunctional transmitter platform. The features and options include:
- digital output change rate limiting filter
- digital integrating (averaging) filter
- temperature measurement channel with internal sensor
- free assignment of each analog output to chosen parameter
- flexible setting of analog output scales for each output
- output shift and slope adjustment for calibration
- free assignment of each of two relays to chosen parameter
- several relay control logic modes (HI or LO with hysteresis, U or П)
- switch delays and minimum on/off state durations for each relay
- Modbus controlled forced state option for analog outputs and relays.

E2611 can be configured through its RS485 interface by Modbus RTU commands. A standard configuration kit includes Model E1087 USB-RS485 converter and E26XX Configurator software. Please contact your seller or manufacturer for more information.

Return to default settings

To reset the device's Slave ID, baudrate and sbit number to factory settings, proceed as follows:
1. De-energize the device   2. Connect the J3 jumper
3. Turn on the device   4. De-energize the device
5. Disconnect the J3 jumper   6. Turn on the device

Calibration

E2611-VOC has been calibrated by Manufacturer with standard gas mixtures before delivery. The semiconductor gas sensor exhibits high stability and > 5 years lifetime. However, as the gas sensor is directly exposed to environment, the instrument requires at least annual field recalibration with a portable calibration kit. The catalytic sensor is more sensitive to the environment and requires calibration every 3...6 months.

The calibration should be performed by trained specialist. Please contact your dealer for more information.

Warranty

This product is warranted to be free from defects in material and workmanship for a period of one year from the date of original sale. During this warranty period Manufacturer will, at its option, either repair or replace product that proves to be defective. This warranty is void if the product has been operated in conditions outside ranges specified by Manufacturer or damaged by customer error or negligence or if there has been an unauthorized modification.

Delivery set

– Solvent Vapor Detector-Transmitter E2611-VOC
– Mounting accessories: 2 screws and 2 plastic dowel plugs

RS485 communication interface

Databits: 8 Parity: none Stop bits: 1 or 2	Supported Modbus functions: 03 - read multiple registers 06 - write single register

Modbus registers (0-based, decimal format)

Reg	Description	Supported values
1	Hardware version	read only
2	Software version	read only
3	Product serial number	read only
4	Slave ID (network address)*	1...247, default 1
5	Baudrate*	1200...57600 baud, default 9600
6	Response delay, ms	1...255 ms, default 10
7	Stop bits*	1 / 2, default 1
17	Restart	write '42330' for soft restart
162	Temperature shift adjustment	-32000...+32000 T units (0,01 °C)
165	Gas channel shift adjustment	-32000...+32000 gas units, default 0
166	Gas channel slope adjustment	1...65535, default 512
167	Output change rate limit	1...32000 gas units/s, 0=no limit
168	Integrating filter time constant	1...32000 s, 0=no, integrating filter
201	Parameter assigned to OUT1	0=none, 1=T, 2=gas, 9=forced by 203
202	Parameter assigned to OUT2	0=none, 1=T, 2=gas, 9=forced by 204
203	Forced value for OUT1	0...1000 (0.0...100.0% of full scale)
204	Forced value for OUT2	0...1000 (0.0...100.0% of full scale)
211	Parameter assigned to RE1	0=none, 1=T, 2=gas, 9=forced by 213
212	Parameter assigned to RE2	0=none, 1=T, 2=gas, 9=forced by 214
213	Forced state for RE1	0=off, 1=on (relay control by Modbus)
214	Forced state for RE2	0=off, 1=on (relay control by Modbus)
215	Switch delay for RE1	0...1000 s, default 0
216	Switch delay for RE2	0...1000 s, default 0
217	Min on/off time for RE1	0...1000 s, default 0
218	Min on/off time for RE2	0...1000 s, default 0
219	Control logic for relay RE1	0:_, 1:_↓↑ • P, 2: • P↑↓_, 3:_↑ • P↓_, 4: • P↓_↑ • P
220	Control logic for relay RE2	0:_, 1:_↓↑ • P, 2: • P↑↓_, 3:_↑ • P↓_, 4: • P↓_↑ • P
221	LOW setpoint for relay RE1	-32000...+32000, gas or T units
222	HIGH setpoint for relay RE1	-32000...+32000, gas or T units
223	LOW setpoint for relay RE2	-32000...+32000, gas or T units
224	HIGH setpoint for relay RE2	-32000...+32000, gas or T units
258	Measured temperature	-4000...+12500 T units (0,01 °C)
259	Gas concentration	0...65535 gas units
261	0% value of OUT1	-32000...+32000 gas units / integer °C
262	100% value of OUT1	-32000...+32000 gas units / integer °C
263	0% value of OUT2	-32000...+32000 gas units / integer °C
264	100% value of OUT2	-32000...+32000 gas units / integer °C

* - the new value is applied after restart
Broadcast ID=0 may be used to assign a new ID to device with unknown ID

Specifications

Detected vapors	Toluene, Xylene, Ethanol and other solvents	
Default calibration	Toluele	
Sensor type	Metal oxide semiconductor	
Sampling method	Diffusion	
Detection range options	0...100% LEL	0...100 to 0...1000 ppm
Resolution / digital unit	0.1% LEL	1 ppm
Default alarm setpoints (set/release)	RE1 (LOW): 20/16 % LEL; RE2 (HIGH): 50/40% LEL	RE1 (LOW): 100/80 ppm; RE2 (HIGH): 300/240 ppm; (for 0...500 ppm range)
Response time T90	< 120 s	
Sensor lifetime	> 5 years	
Calibration interval	12 months	
Operating conditions	-30...+70 °C; <95 %RH, atmospheric pressure ±10%; explosion safe (non ATEX rated) spaces Normal ambient oxygen level Avoid strong mechanical shock, vibrations or EMI Avoid exposure to corrosive gases or silicone containing products	
Warm-up time	up to 3 minutes, depending on unpowered period and atmosphere	
Power supply	11...30 VDC/24 VAC with integrated mains supply module 90...265 VAC	
Power consumption	< 2 VA	
Analog outputs	2 × 4-20 mA or 0-10 V	
Load resistance	for 4-20 mA output mode: RL < (Us - 2V) / 22 mA for 0-10 V output mode: RL > 250 kOhm	
Digital interface	RS485, Modbus RTU protocol	
Relay outputs	2 × SPST, max 5 A, 30 VDC / 250 VAC	
Alarm signalling	Buzzer 85 dB	
Enclosure	ABS plastic with ventilation slots, wall-mount, IP20	
Dimensions	85 × 85 × 37 mm	
Electromagnetic compatibility	according to 2014/30/EU, 2014/35/EU and EN61321-1 standard requirements	

Factory settings

Gas unit	0,1 % LEL
OUT1 assignment and scale	2: gas, 0 - 100% LEL
OUT2 assignment and scale	2: gas, 0 - 100% LEL
RE1 assignment and logic	2: gas, 1: on at high values
RE1 HIGH setpoint (set)	20% LEL for 0...100% LEL range
RE1 LOW setpoint (release)	16% LEL
RE2 assignment and logic	2: gas, 1: on at high values
RE2 HIGH setpoint (set)	50% LEL
RE2 LOW setpoint (release)	40% LEL

CE

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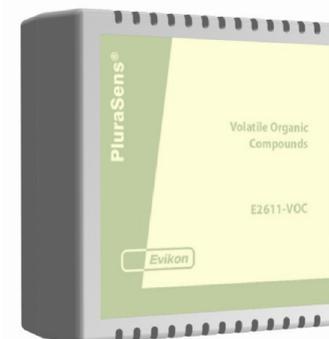
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User manual

Evikon