

User Manual



VentilationAlarm EP2



VentilationAlarm EP2 Highlights

VentilationAlarm EP2 is a universal alarm with sound and light signal. It is used to monitor pressure, temperature or a 0-10V signal, where alarm is required when a value / setpoint is exceeded. External equipment such as external alarm lamp or rotating light can be connected. Also the VentilationAlarm EP2 can be used with ModBus for monitoring.

The alarm is equipped with a green operating LED, which is lit when supply voltage is OK. Red LEDs flash at alarm and a sounding device beeps at 85dBA @ 10cm, also you find a button for muting the alarm sound.

In case of supply voltage failure the battery backup of VentilationAlarm EP2 takes over. Depending on age the battery lasts up to 48 hours in continuous operation. It is recommended to replace the battery with a new battery every 12 months to ensure battery backup is optimal. The replacement could be part of the annual service check of the ventilation system. Furthermore the battery should always be replaced after a period of battery operation.

Factory setting is pressure monitoring (PressureGuard).

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Manufacturer Information

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Safety Instructions

Read the entire manual before installation and use of VentilationAlarm EP2.

If the instructions in this manual are not followed it may cause damage to the product and invalidate the warranty.

This manual is primarily intended for the use of technical personnel who is to mount and install the VentilationAlarm EP2.

It is a precondition that personnel mounting and installing the product possess the necessary practical experience and education within the area of product use and also possess any necessary authorization for installing electric wiring material.



Contact hazard.

Take care of live parts (230V AC) in the device during installation and setting.



Be careful not to damage the product during unpacking.



Make sure to follow common directions for tools used during mounting.



Do not touch product with wet hands.



Do not store or use product outside recommended temperature area.



Do not wash product with water or any other liquids.



Product is only to be used in non-condensing environment.



Product must not be exposed to direct sunlight or any other UV-light.



Make sure to be ESD-discharged before installing the product.



Product must not be disposed of in refuse collection.

Product must be disposed of according to local regulations regarding disposal of small electronic products.

Standards and Directives

VentilationAlarm EP2 complies with the standards and directions below.

- DS/EN 60730-1:2016 - Automatic electrical controls - Part 1: General requirements.
- EN 60730-1:2016/A1:2019 - Appendix: Automatic electrical controls - Part 1: General requirements.
- EN 61000-6-1:2007 - Electromagnetic compatibility (EMC) - Part 6-1: Generic standards - Immunity for residential, commercial and light-industrial environments
- EN 61000-6-3:2007 - Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for residential, commercial and light-industrial environments
- EN 61000-6-3/A1:2011 - Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for residential, commercial and light-industrial environments

This product complies with the RoHS directive, Directive 2011/65/EU

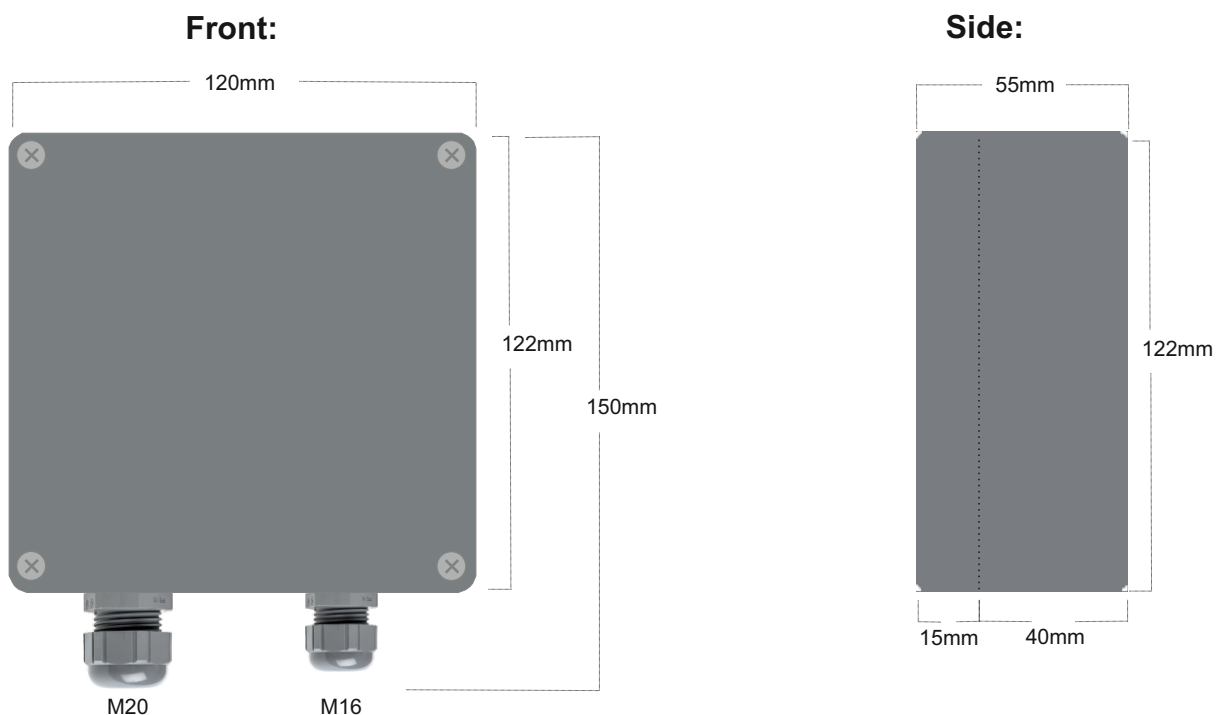
The manufacturer of this product is registered with the statutory return system under the WEEE directive.



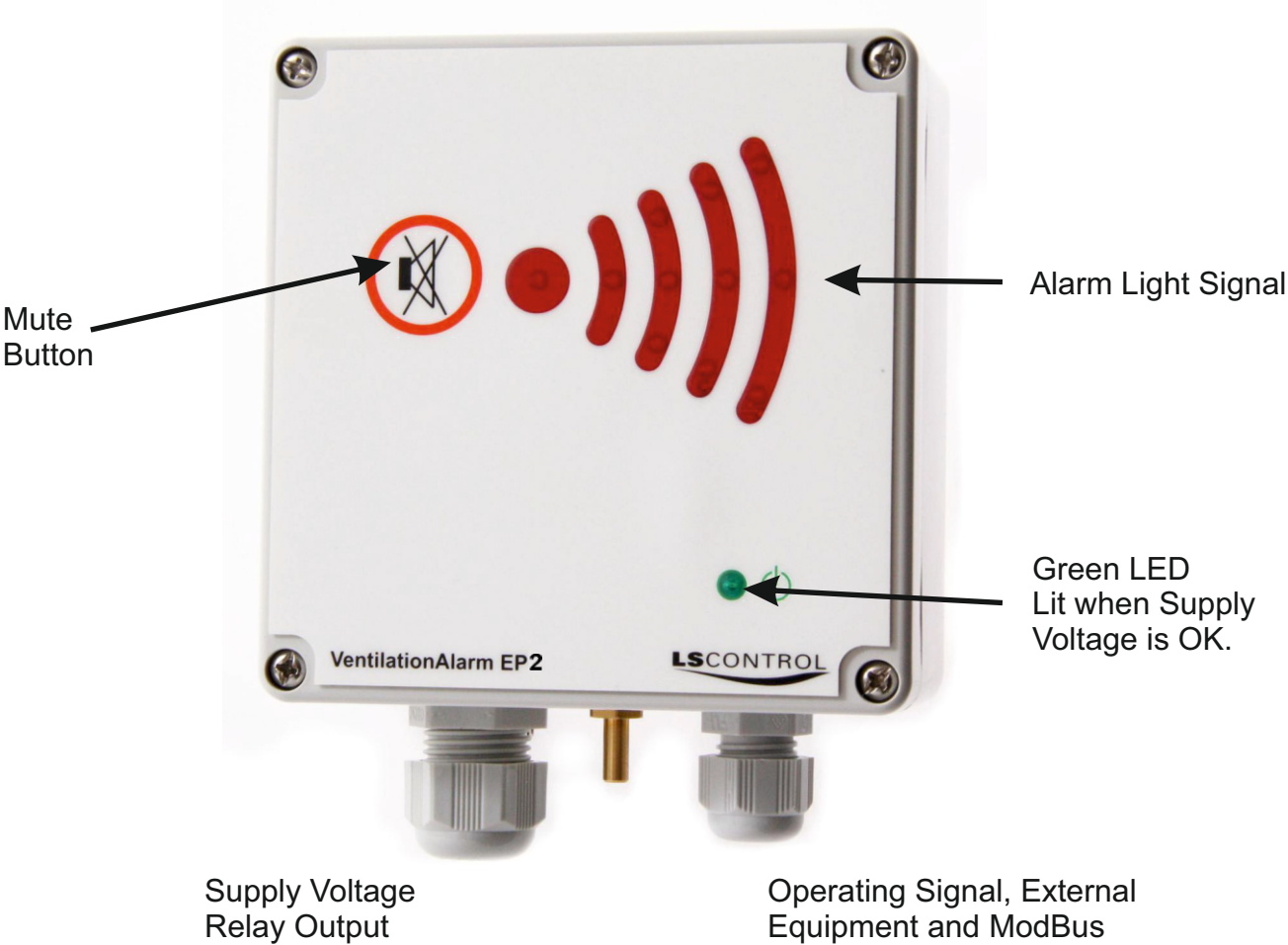
Technical Specifications

Supply Voltage:	100-240 AC or 24V AC/DC depending on model	Pressure Area :	9-2500 Pa
		Max Tolerated Pressure:	34 kPa
		Pressure Measurement Accuracy:	1,5% of measured value (min. 3Pa)
Mains Fuse 230V:	16A	Hysteresis Pressure:	Adjustable, min 5Pa
Frequency for AC:	50-60Hz	Measurement Signal:	Approx. 0-10V
Relay:	8A Ac1	Hysteresis Signal:	Adjustable (min. 0.1V)
Power Consumption:	3,5-5W	Measurement Temperature:	-30 to +60°C
Enclosure:	IP 53	Hysteresis Temperature:	Adjustable (min. 0.2°C)
Dimensions HxWxD:	120x122x55 mm	Sensor Type:	NTC resistance 10k or 22k ohm
Operating Temperature:	0-50°C	Battery:	9V 6LR61 (alkaline is recommended)
Humidity:	0-80% RH non-condensing	Enclosed Accessories:	Battery, tube fitting and 2m PVC plastic tube.
Voltage Output:	24V DC max. 50 mA		
Sound Level:	>85dBa @ 10cm	Firmware Version:	6.0

Size and Measurements



Product Description

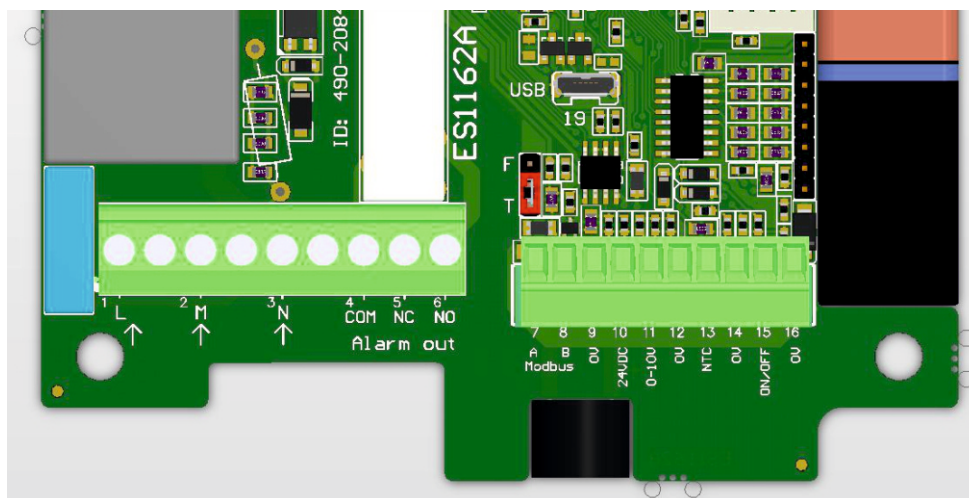


Mounting

Alarm EP2 must be mounted on a vertical, fixed and non-vibrating surface with screws through the deep screw holes in each corner of the box.

Please also pay attention to the section on Safety Instructions.

Overview of Terminals on 230V Model



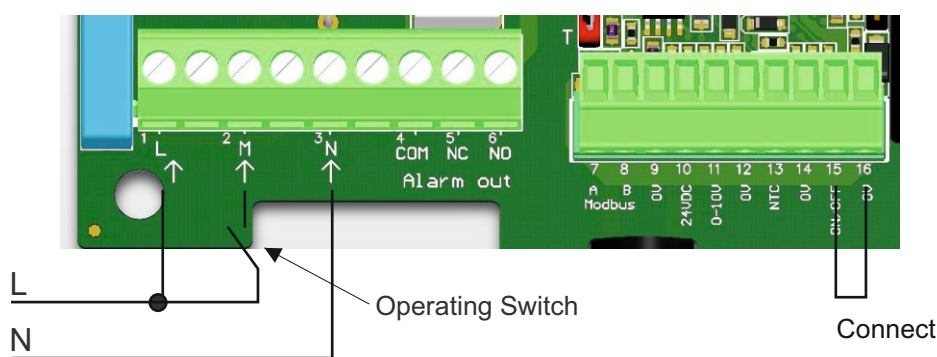
Terminal No.	Description	Comment
1 (L)	Supply Voltage connection (L)	230V AC $\pm$ 10%
2 (M)	Operating Signal connection (M)	230V AC $\pm$ 10%
3 (N)	Supply Voltage connection (N)	230V AC $\pm$ 10%
4 (COM)	Alarm Out	COMMON
5 (NC)	Alarm Out	Closed to COM during normal operation / no alarms
6 (NO)	Alarm Out	Closed to COM at alarm and power failure
7 (A)	ModBus A	RS 485 ModBus RTU
8 (B)	ModBus B	RS 485 ModBus RTU
9	0V/GND	GND
10	24V DC	24V for supply of external sensor max 50mA
11	0-10V	0-10V signal input
12	0V/GND	GND
13	NTC	For NTC Sensor (10k or 22k)
14	0V/GND	For NTC Sensor (10k or 22k)
15	ON/OFF	Operating Signal
16	0V/GND	GND
17	-	Not available in 230V model. Refer to page 9
18	-	Not available in 230V model. Refer to page 9
19	USB	USB connection for control/setting and possible software updating

Electrical Connection 230V Model

Constant voltage 230V AC must be connected to terminal L and N. Operating Signal (Start monitoring) can be phase (L) or a potential free contact (low voltage), which connects when the equipment that should be monitored, is turned on. 9V battery must be connected to the battery clip.

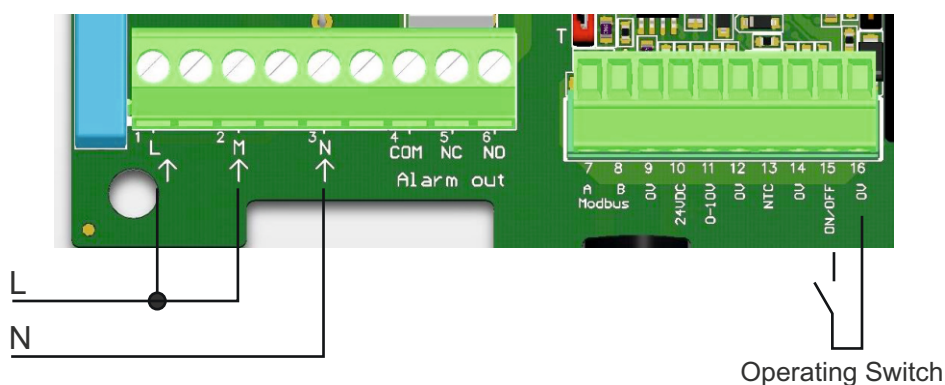
Operating Signal Phase:

Constant voltage on L and N, phase on M when monitoring is to begin, e.g. when exhaustion is turned on. Connect terminal 15 and 16 to each other.

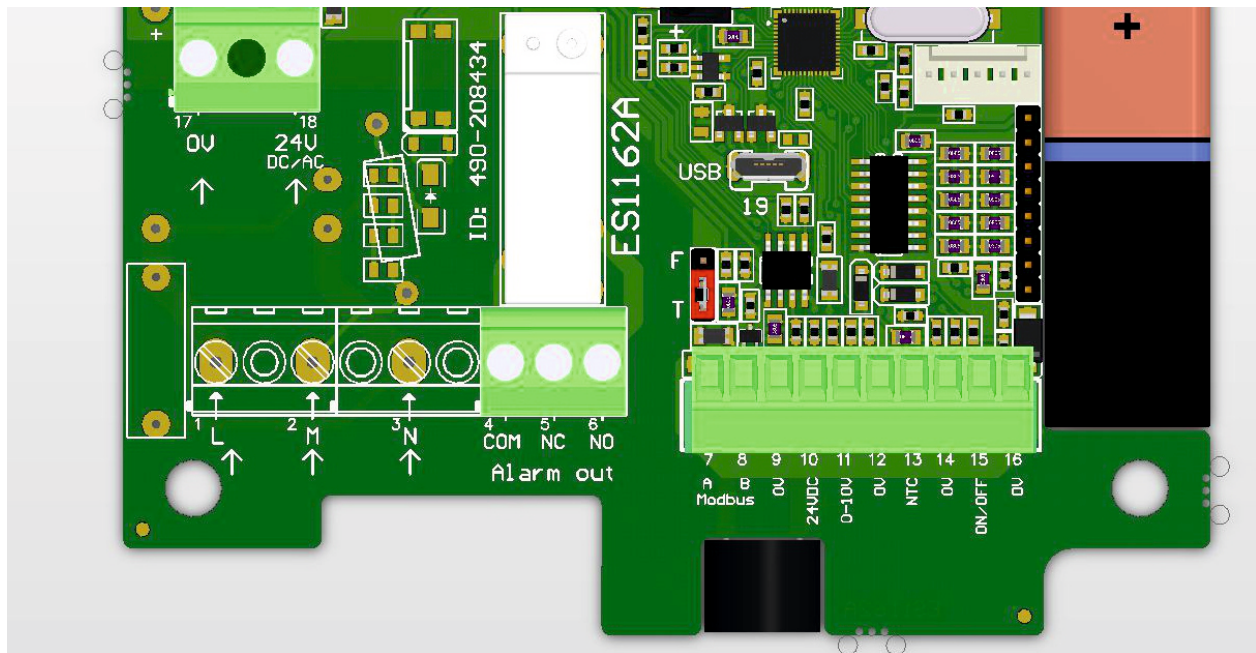


Operating Signal Low Voltage:

Constant voltage on L and N, constant phase on M. Operating switch (potential free contact) is connected to terminal 15 and 16



Overview of Terminals on 24V Model

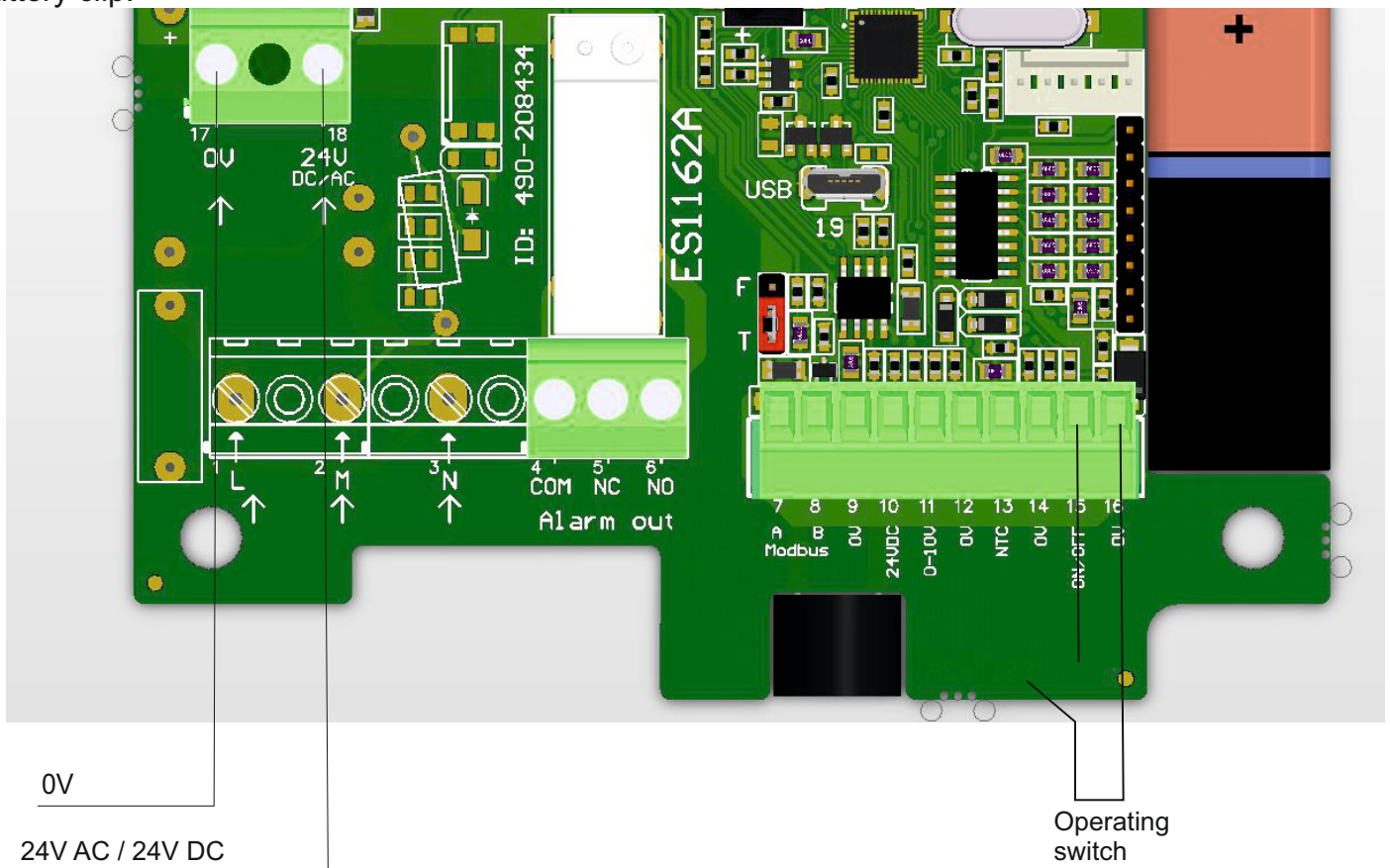


Terminal No.	Description	Comment
1	-	Not available in 24V model. Refer to page 7
2	-	Not available in 24V model. Refer to page 7
3	-	Not available in 24V model. Refer to page 7
COM (4)	Alarm Out	COMMON
NC (5)	Alarm Out	Connected to COM at normal operation / no alarm
NO (6)	Alarm Out	Connected to COM at alarm and power failure
7 & 8	Modbus A & B	RS 485 Modbus RTU
9	0V/GND	GND
10	24V DC	24Vfor supply of external sensor max 50mA
11	0-10V	0-10V signal input
12	0V/GND	GND
13	NTC	For NTC sensor (10k or 22k)
14	0V/GND	For NTC sensor (10k or 22k)
15	ON/OFF	Operating signal
16	0V/GND	GND
17	0V	Supply voltage (low voltage)
18	24V DC/AC	Supply voltage 24V AC or 24V DC
19	USB	USB connection for control/setting and possible software updating

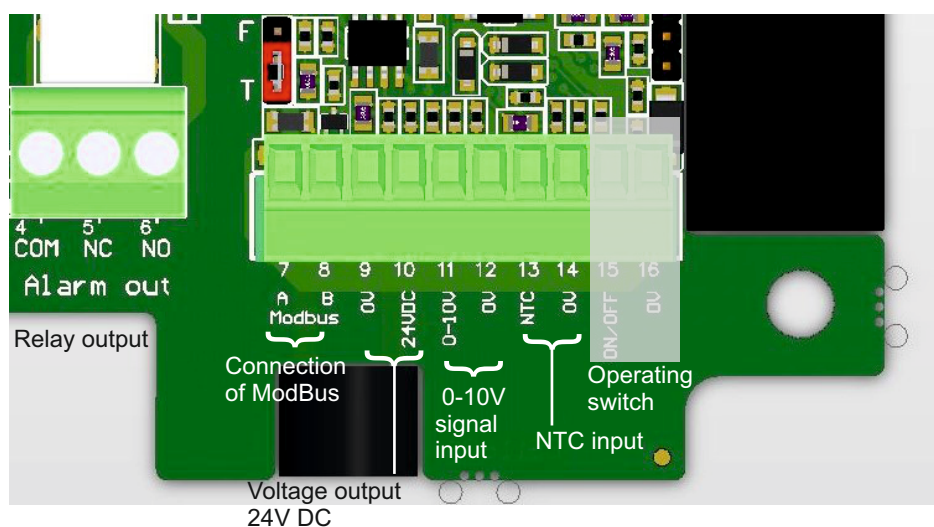
Note: In 24V model of VentilationAlarm EP2 terminal L (1), N (3) or M (2) is not available since operating signal on model 24V must be connected to terminal 15 and 16. Supply voltage must be connected to terminal 17 og 18.

Electrical Connection 24V Model

0V must be connected to terminal 17 and 24V AC or 24V DC to terminal 18. Operating signal (Start monitoring) is to be connected to the potential free contact (terminal 15 and 16), which closes when the connected equipment which should be monitored is turned on. 9V battery must be connected to the battery clip.



Connection other terminals



Setting up the Unit / Display

To setup the VentilationAlarm EP2 the 4 digit display and 3 push buttons can be used.
It can also be setup using ModBus, please refer to page 21.

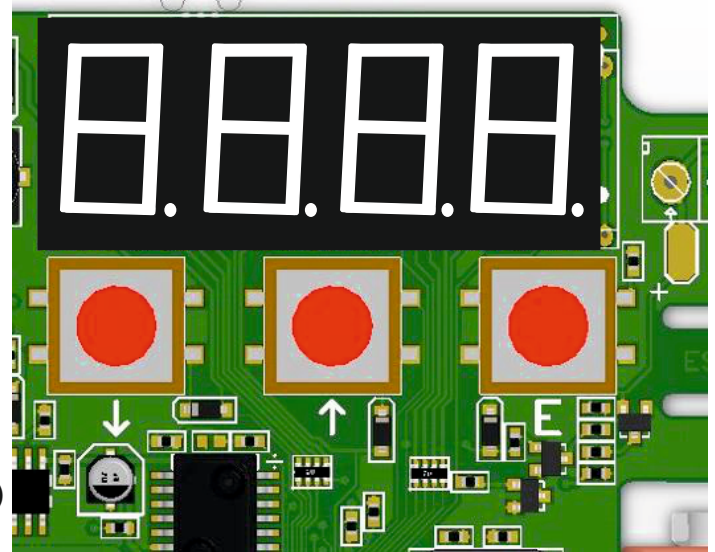
Button Description:

Button ↓ and ↑ is used to roll up and down among the menu items.

Button ↓ = DOWN

Button ↑ = UP

Button E = ENTER. Is used to confirm a choice or a setting, leave menu or shift amongst the set points (S.) and data points (d.).



Setting Up VentilationAlarm EP2

VentilationAlarm EP2 is either to be setup after connection of supply voltage or, if wanted, without supply voltage only using connection of 9V battery.

When VentilationAlarm EP2 detects minimum backup supply the green LED in the front panel will start flashing or be constantly lit.

Display shows "■ ■ ■ ■",

Shortly after the version number of the Software is shown (e.g. **0.0.0.3.**).

When version number turns off the setup can begin.

Display is activated by pressing either ↓ or ↑ and then E, to go to set point menu.

After more than 3 minutes since any buttons were pushed (set point editing), setup can be re-activated by pushing any of the 3 buttons down for 10 seconds. This will force a shift from 'battery mode' to 'configuration mode'.

Description of Data Points

When setting up the VentilationAlarm EP2 the display will start showing a number of data points. To browse amongst the data points use ↓ and ↑.

To shift to set point menu press 'E'.

Code in Display	Description		
001	Current alarm: nonE (no errors / alarms) alLo (Alarm low. The monitored value is under the minimum limit) alHi (Alarm high. The monitored value is over the maximum limit) Alba (Battery failure, if battery voltage is less than 7,5V. Battery voltage is measured 6 times in 10min intervals before alarm) Please also refer to page 25: Measuring battery voltage. AICf (Setup failure. Incorrect setting of alarm limits e.g. maximum limit is lower than minimum limit)		
d002	Measured pressure in Pascal		
d003	Measured temperature in degrees Celcius (Only if NTC sensor is connected)		
d004	Measured voltage on 0-10V input (Only when equipment is connected to 0-10V input terminal)		
d005	Detects operating signal on terminal 15 (on/off). 0=no, 1=yes		
d006	Detects operating signal on terminal M (on/off). 0=no, 1=yes		
d007	Function. 0=Pressure, 1=Temperature, 2=Voltage Signal on 0-10V input		
d008	Battery voltage. The measured battery voltage in Volt		
d009	Supply voltage. The measured supply voltage in volt		
d0010	Function Error	No in Display	Error Type
		0	No error
	Pressure	1	Pressure error - low pressure
		2	Pressure error - high pressure
	Temperature	4	Temperature error - low temperature
		8	Temperature error - high temperature
	0-10V	16	0-10V error - 0-10V input too low
		32	0-10V error - 0-10V input too high
	Battery	64	Battery error - battery voltage too low
d0011	Software Version		

Description of Setpoints

VentilationAlarm EP2 has 20 setpoints. Different setpoints are used for each function. Please refer to the section describing the required function.

Below table gives an overview of all setpoints in VentilationAlarm EP2, setting possibilities and factory setting. When factory setting is 'OFF' it means that the function is deactivated. Minimum value is therefore stated as the lowest possible setting when function is activated.

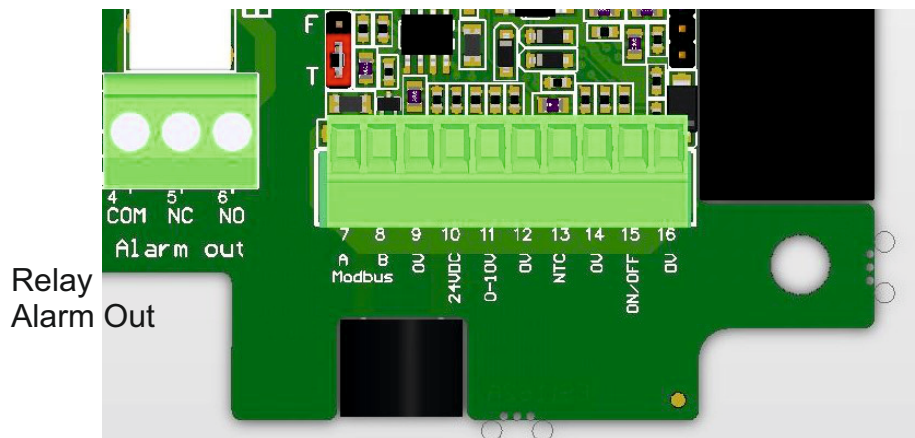
To set a setpoint you must scroll to the code of the setpoint using the buttons ↓ and ↑ - press 'E' and then use ↓ and ↑ until required number is shown in the display. When the required value is in the display, confirm and save the setpoint by pressing 'E'. You may now scroll to the next setpoint.

Code in Display	Description	Factory Setting	Minimum Value	Maximum Value	Unit
S000	Exit menu - Press 'E' to exit the setpoint menu	0	0	1	
S001	Minimum Pressure - alarm limit for low pressure	OFF	9	2500	Pascal
S002	Maximum Pressure - alarm limit for high pressure	OFF	9	2500	Pascal
S003	Hysteresis time pressure - time from value exceeds setpoint until alarm activates.	OFF	1	600	Seconds
S004	Hysteresis value Pressure - Difference in pressure between alarm limit and actual measured pressure before deactivating the alarm. E.g. Setpoint Minimum Pressure is 100 and Maximum is 200, hysteresis is 10. Then alarm for low pressure deactivate when pressure exceeds 110Pa (min. +10) and High pressure alarm deactivates at 190Pa (max-10).	5	5	1250	Pascal
S005	Minimum temperature - alarm limit for low temperature	OFF	-29,9	60,0	°C
S006	Maximum temperature - alarm limit for high temperature	OFF	-29,9	60,0	°C
S007	Hysteresis time temperature - time from value exceeds setpoint until alarm activates.	OFF	1	600	Seconds
S008	Hysteresis value temperature. Difference in temperature between alarm limit and actual measured temperature before deactivating the alarm.	0,2	0,2	45,0	°C
S009	Minimum Volt. Alarm limit for low voltage signal on the 0-10V signal input.	OFF	0,1	10,0	Volt
S010	Maximum Volt. Alarm limit for high voltage signal on the 0-10V signal input.	OFF	0,1	10,0	Volt
S011	Hysteresis time 0-10V signal - time from value exceeds setpoint until alarm activates.	OFF	1	600	Seconds
S012	Hysteresis value 0-10V signal. Difference in 0-10V signal alarm limit and actual measured signal voltage before deactivating the alarm.	0,1	0,1	5,0	Volt
S013	System mode / function. Choice of signal monitoring. 0=Pressure, 1=Temperature, 2=0-10V signal	0	0	2	
S014	NTC Select. Choice of temperature sensor 10K or 22K 0=NTC 10K ohm, 1=NTC 22K ohm	0	0	1	
S015	ModBus address. Insert ModBus address between 1 and 100	30	0	100	
S016	ModBus Parity. Choice of parity Odd/Even/None 0=None, 1=Even, 2=Odd	1	0	2	

Description of Setpoints (continued)

Code in Display	Description	Factory Setting	Minimum Value	Maximum Value	Unit
S017	ModBus Baud Rate. Choose 9600 or 19200 0=9600, 1=19200	1	0	1	
S018	Pressure Neutral Calibration. Calibrating neutral of pressure sensor. 0=ingen kalibrering, 1=Foretag kalibrering	0	0	1	
S019	Battery Measurement. Measuring voltage on backup battery. 0=No measuring, 1=Measure	0	0	1	
S020	Sounddelay during startup	30	0	600	Seconds

Description of Relay Alarm Out



State of VentilationAlarm Ep2	Light Signals	Terminals Closed
Standby	Green LED flashes slowly Red LEDs turned off	Terminal COM and NC closed
In operation and OK	Green LED constant lit Red LEDs turned off	Terminal COM and NC closed
In operation and in alarm	Green LED constant lit Red LEDs flash (Acoustic alarm beeps)	Terminal COM and NO closed
Supply voltage turned off	Green LED turned off Red LEDs flash once each 30 second (acoustic alarm beeps once each 30 seconds)	Terminal COM and NO closed
Low battery Voltage on backup battery is under 7.75V	Green LED flashes or is constant lit. Red LEDs turned off (Acoustic alarm beeps each 20 seconds)	Terminal COM and NO closed

Setting Up VentilationAlarm EP2 for Monitoring Pressure

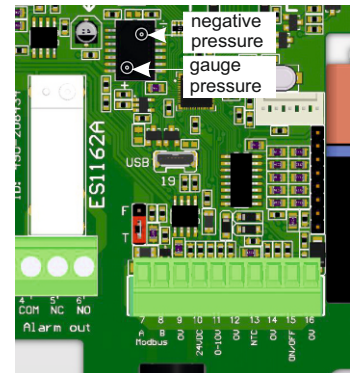
VentilationAlarm EP2 is setup to monitor negative pressure.

In case gauge pressure monitoring is required the pressure hose on the PCB must be moved from the upper connection to the lower connection, closer to the terminal block (see picture).

When VentilationAlarm EP2 is used to monitor pressure, it is possible to set both a minimum and a maximum setpoint. Alarm is activated when pressure gets below minimum setpoint or exceeds maximum setpoint.

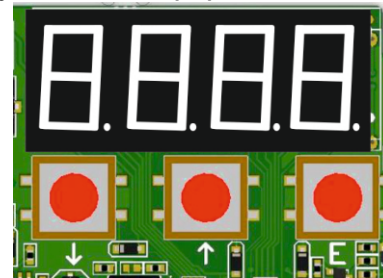
It is possible to only set one of the setpoints and the other is in such cases set to 'OFF' (this value is lower than lowest value for setpoint).

Pressure hose from duct is connected to the connection in the bottom of VentilationAlarm EP2. Please follow common instructions for placement of point of measurement for ducts.



Setting Up Pressure Monitoring

1. Connect supply voltage, operating signal, battery and any external equipment for relay and pressure hose from duct.
2. Start exhaustion on lowest level.
3. Activate display of Ventilation Alarm EP2 by pressing either of the buttons ↓ or ↑
4. Display starts up showing ---- and software version number. when software version number turns off menu navigation can begin.
5. Press ↑ until ›d.0.0.2.‹ is shown in display, wait a moment and read the reference pressure at low speed.
6. Turn on the exhaustion to highest level.
7. Read the reference pressure at high speed.
8. To go to setup menu press ›E‹
9. Navigate using ↓ or ↑ to menu item ›S.0.0.1.‹ (insertion of minimum pressure). Press ›E‹



Setting Up VentilationAlarm EP2 for Monitoring Pressure (continued)

Setting Up Pressure Monitoring (continued)

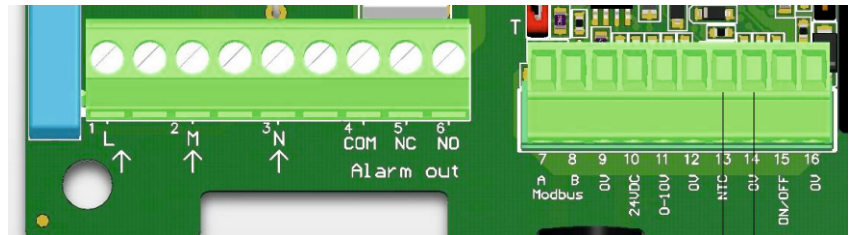
10. Minimum pressure is inserted by pressing ↓ or ↑ until required pressure value is shown in the display. Setpoint must be 10pa under reference pressure at low speed. If no alarm is required for low pressure, display must show ›0.0.0.F‹. Confirm and save by pressing ›E‹.
11. Navigate to ›S.0.0.2‹ (insertion of maximum pressure) by pressing ↑. Press ›E‹
12. Insert maximum pressure by pressing ↓ or ↑ until required pressure is shown in display. Setpoint should be 40Pa higher than the reference maximum pressure. If no alarm is required when maximum pressure is exceeded, display must show ›0.0.0.F‹
Press ›E‹ to confirm and save.
13. Navigate to ›S.0.0.3‹ (entering of hysteresis time) by pressing ↑. Press ›E‹
14. Hysteresis time, the number of seconds pressure needs to deviate from setpoints before alarm is activated
Press ↓ or ↑ until required number of seconds is shown in display. Press ›E‹ to confirm and save.
15. Navigate to ›S.0.0.4‹ (entering of hysteresis value) by pressing ↑ , Press ›E‹
16. Hysteresis value is the deviation in pascal from setpoints before alarm deactivates again.
Press ↓ or ↑ until the requested value in pascal is shown in display. Press 'E' to confirm and save.
17. Navigate to ›S.0.0.0‹ by pressing ↓.
Press 'E' to leave setup menu
18. Control the setting by navigating to the menu point ›d.0.0.1‹ by use of the buttons ↓ and ↑.
If the display shows ›A.I.C.F‹ the setup has discrepancies and setpoints must be looked through and corrected for any conflicting values. If the display shows ›n.o.n.E‹ the setup has no discrepancies and alarm is ready.

Setting Up VentilationAlarm EP2 for Monitoring Temperature

VentilationAlarm EP2 can be used to monitor temperature by use of an external NTC sensor (additional accessory).

The sensor must be a 10K or 22K NTC sensor and it must be connected to terminal 13 and 14.

When VentilationAlarm EP2 is used to monitor temperature, it is possible to set both a minimum and maximum setpoint. Alarm is activated if temperature falls below the set minimum setpoint or exceeds the set maximum setpoint.

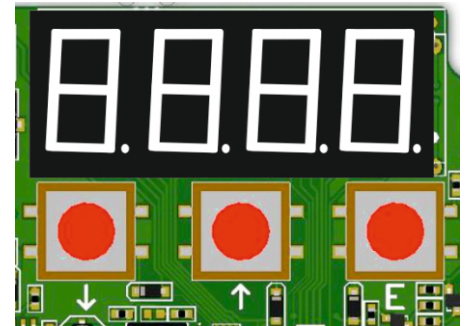


NTC Sensor connection

It is possible to only monitor the minimum or maximum setpoint. Then only the setpoint representing the requested monitoring must be set and the other setpoint is set to 'OFF' (this value is lower than the lowest setpoint value).

Setting Up Temperature Monitoring

1. Connect supply voltage, operating signal, battery, any external equipment for relay and NTC sensor to terminal 13 and 14.
2. Activate display of VentilationAlarm EP2 by pressing either of the buttons ↓ or ↑
3. Display starts up showing ---- and software version number. When software version number turns off menu navigation can begin.
4. To go to setup menu press >E<.
5. Navigate by use of ↓ or ↑ to >**S.0.0.5.**< (Minimum temperature). Press >E<
6. Minimum temperature is inserted by pressing ↓ or ↑ until required temperature is shown in display. If minimum temperature is not to be monitored, the setpoint is set to >**0.0.0.F.**<. Confirm and save by pressing >E<.
7. Navigate by use of ↑ to >**S.0.0.6.**< (Maximum temperature). Press >E<
8. Maximum temperature is set by pressing ↓ or ↑ until required temperature value is displayed. If maximum temperature is not to be monitored, the setpoint is set to >**0.0.0.F.**<. Press >E< to confirm and save.



Setting Up VentilationAlarm EP2 for Monitoring Temperature (continued)

Setting Up Temperature Monitoring (continued).

9. Navigate to ›**S.0.0.7.**‹ (setting of hysteresis time) by pressing $\uparrow$. Press ›E‹
10. Hysteresis time, the number of seconds temperature must deviate from setpoints before alarm is activated.
Press $\downarrow$ or $\uparrow$ until requested number of seconds is displayed. Press ›E‹ to confirm and save.
11. Navigate to ›**S.0.0.8.**‹ (setting of hysteresis value) by pressing $\uparrow$. Press ›E‹
12. Hysteresis value is the deviation in degrees celcius from setpoints before alarm deactivates again.
Press $\downarrow$ or $\uparrow$ until requested number degrees Celcius is displayed. Press ›E‹ to confirm and save.
13. Navigate to ›**S.0.1.3.**‹ (setting of system mode / function) by pressing $\uparrow$. Press ›E‹
14. Value is changed to ...1 to choose temperature. (factory setting is '...0' Pressure).
Press ›E‹ to confirm and save.
15. Navigate to S.14 (Choose NTC Sensor). Press ›E‹
16. Shift between '...0' and '...1', where 0=10K ohm NTC and 1=22K ohm NTC (factory setting is 0).
Press 'E' to confirm and save choice.
17. Navigate to ›**S.0.0.0.**‹ by pressing $\downarrow$.
Press 'E' to leave setup menu
18. Control the setting by navigating to the menu point ›**d.0.0.1.**‹ by use of the buttons $\downarrow$ and $\uparrow$.
If the display shows ›**A.I.C.F.**‹ the setup has discrepancies and setpoints must be looked through and corrected for any conflicting values. If the display shows ›**n.o.n.E.**‹ the setup has no discrepancies and alarm is ready.

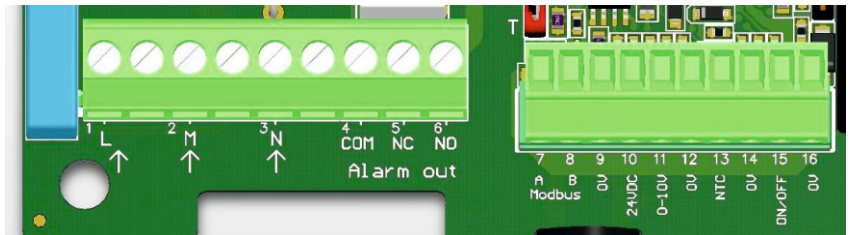
Setting Up VentilationAlarm EP2 for Monitoring 0-10V Signal

VentilationAlarm EP2 can be used to monitor a 0-10V signal from an external sensor (e.g. 0-10V flow sensor or 0-10V humidity sensor).

The 0-10V signal from the external sensor must be connected to terminal 11.

Note the external sensor can be supplied by 24V DC, however, max. 50mA.

If external sensor is to be supplied by VentilationAlarm EP2, it must be connected to voltage output (terminal 9 and 10).



When VentilationAlarm EP2 is used to monitor a voltage signal (0-10V) a minimum and maximum setpoint can be set. Alarm is activated if signal falls under minimum setpoint or exceeds maximum setpoint.

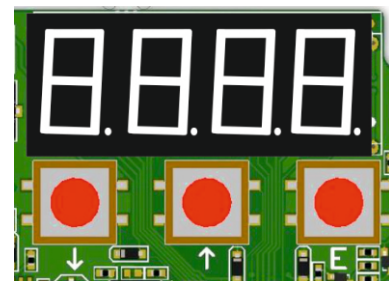
If only either minimum or maximum setpoint is to be monitored, only the setpoint for monitoring is to be set. The other setpoint is set to 'OFF'.

Setting up Voltage Signal Monitoring

1. Connect supply voltage, operating signal, battery, any external equipment for relay and external sensor to terminal 11 and if required supply for sensor to terminal 9 and 10.

2. Activate display of VentilationAlarm EP2 by pressing either of the buttons ↓ or ↑

3. Display starts up showing ---- and software version number, when software version number turns off, menu navigation can begin.



4. To go to setup menu press 'E'.

5. Navigate using ↓ or ↑ to >S.0.0.9.< (Minimum voltage signal). Press >E<

6. Limit for minimum voltage signal to activate the alarm is set by pressing ↓ or ↑ until required signal value is displayed. If minimum voltage signal is not to be monitored, the setpoint is set to >0.0.0.F.<. Press >E< to confirm and save.

7. Navigate using ↑ to >S.0.1.0.< (Maximum voltage signal). Press >E<

Setting Up Ventilation Alarm EP2 for Monitoring 0-10V Signal (continued)

Setting up Voltage Signal Monitoring (continued)

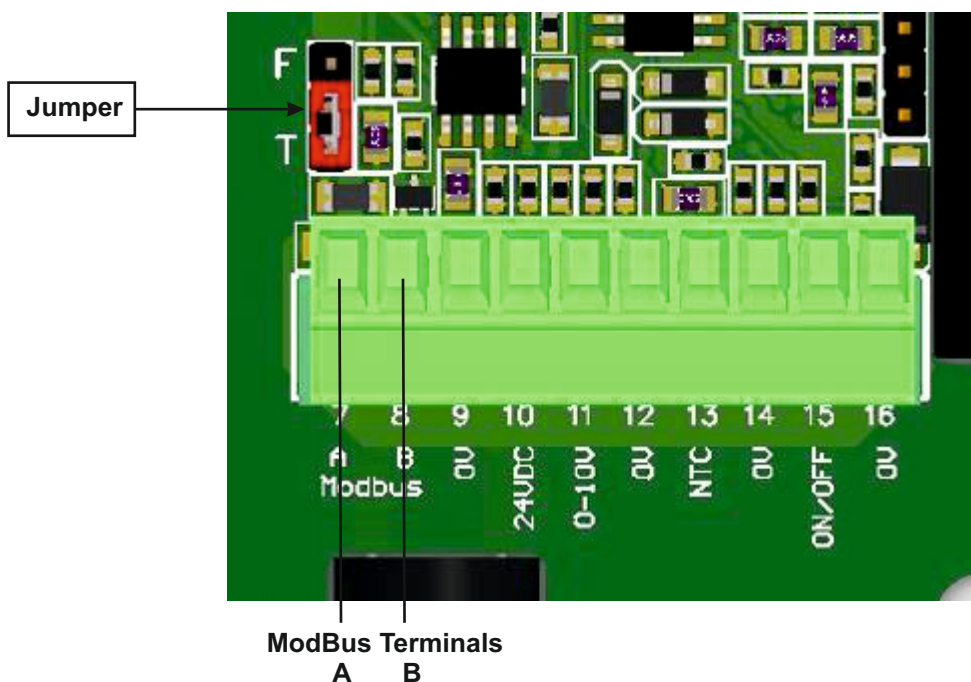
8. Limit for maximum voltage signal to activate alarm is set by pressing ↓ or ↑ until required signal value is displayed. If maximum voltage signal is not to be monitored, the setpoint is set to >0.0.0.F.<. Press >E< to confirm and save.
9. Navigate using ↑ to >S.0.1.1.< (Hysteresis time). Press >E<
10. Hysteresis time, the number of seconds the voltage signal needs to deviate from the setpoint before alarm is activated.
Press ↓ or ↑ until requested number of seconds is displayed. Press >E< to confirm and save.
11. Navigate using ↑ to >S.0.1.2.< (Hysteresis value) Press > E<
12. Hysteresis value is the deviation in volt from setpoints to deactivate the alarm.
Press ↓ or ↑ until required value with one decimal is displayed. Press >E< to confirm and save.
13. Navigate using ↑ to >S.0.1.3.< (System mode / function). Press >E<
14. Value is changed by use of the buttons ↓ and ↑. to >0.0.0.2.< to choose 0-10V Signal (factory setting is >0.0.0.0.< Pressure). Press 'E' to confirm and save.
15. Navigate to >S.0.0.0.< by pressing ↓.
Press 'E' to leave setup menu.
16. Control the setting by navigating to the menu point >d.0.0.1.< by use of the buttons ↓ and ↑.
If the display shows >A.I.C.F.< the setup has discrepancies and setpoints must be looked through and corrected for any conflicting values. If the display shows >n.o.n.E.< the setup has no discrepancies and alarm is ready.

ModBus Setting

If VentilationAlarm EP2 is the last unit on a string of ModBus units the 120Ω terminating resistor must be connected. It must be done using the jumper placed just above terminal 7 on the PCB. Jumper must be in lowest position (**T**) to connect the 120Ω terminating resistor.

If however, the VentilationAlarm EP2 is not the last unit on a string of ModBus units the 120Ω terminating resistor is *not* to be connected and jumper must be placed in upper position (**F**).

Factory setting is (**F**).



Modbus Protocol

Mode:	RTU	(MSB first)	
Standard:	Modbus application protokol specification V1.1a Modbus over serial lin V1.02		
WWW address	Modbus.org		
Baud	0=9600, 1=19200	Setpoint menu S.17	Default: 1=19200
Start bits	1		
Data bits	8		
Stop Bits	1		
Parity	Odd- Even- None	Setpoint menu S.16	Default: Even
Address	1-100	Setpoint menu S.15	Default: 30
Registers Map			
Support function	4, 6, 17		

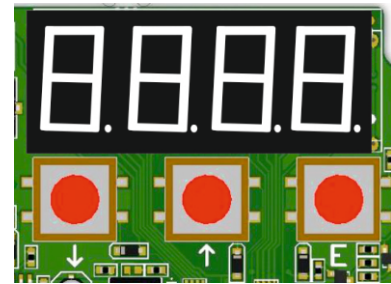
Setting Up ModBus Protocol in VentilationAlarm EP2

When VentilationAlarm EP2 is to be used with ModBus protocol, the ModBus signal must be connected to terminal 7 and 8 as described on page 22 and the jumper might need to shift position to (T), to connect the terminating resistor.

In addition the below setpoints must be set in VentilationAlarm EP2s internal menu.

Setting the ModBus address

1. Connect supply voltage, operating signal, battery, any external equipment for relay and external sensor to relevant terminals on the PCB.
2. Connect ModBus to terminal 7 and 8.
3. Activate display of VentilationAlarm EP2 by pressing either of the buttons ↓ or ↑
4. Display starts up showing ---- and software version number, when software version number turns off, menu navigation can begin.
5. To go to setup menu press ›E<.
6. Navigate using ↓ or ↑ to ›S.0.1.5.< (ModBus address). Press ›E<
7. Press ↓ or ↑ until correct ModBus address is shown in the display. Press 'E' to confirm and save.
8. Navigate using ↑ to ›S.0.1.6.< (ModBus parity). Press ›E<
9. Press ↓ or ↑ to choose ModBus Parity.
›0.0.0.0.<= None, ›0.0.0.1.<= Even, ›0.0.0.2.<= Odd. Press 'E' to confirm and save.
10. Navigate using ↑ to ›S.0.1.7.< (ModBus baud). Press ›E<
11. Press ↓ or ↑ to choose ModBus Baud.
›0.0.0.0.<=9600, ›0.0.0.1.<=19200. Press 'E' to confirm and save.
12. Navigate to ›S.0.0.0.< by pressing ↓.
Press 'E' to leave setup menu.



VentilationAlarm EP2 is now setup to monitor using ModBus protocol and further setting can be set in the ModBus protocol according to the description on the following pages.

ModBus Data Points

All ModBus data points are 'read only'. Below table gives an overview of the data points in VentilatonAlarm EP2 ES 1162, software version 1.

Register number	Data description	R/W	Length	Units	Valid response	Remarks
3x0000	Alarm	R	1	UINT16	0-64	0= None 1=Alarm low Pressure 2=Alarm high pressure 4=Alarm low temp 8= Alarm high temp 16= Alarm low Voltage 32= Alarm High Voltage 64= Alarm low battery 128= Alarm configuration.
3x0001	Pressure Sensor (Pa)	R	1	UINT16	0-9999	
3x0004	Operating Switch (terminal 15)	R	1	INT16	0-1	0=OFF, 1=ON
3x0005	L2 Operating Signal (terminal 2)	R	1	INT16	0-1	0=OFF, 1=ON
3x0006	Mode	R	1	UINT16	0-2	0=pressure 1=temperature 2=0-10V signal
3x0007	008 - Volt_Battery (V)	R	1	INT16	0-1000	1000=10V
3x0008	Software Version	R	1	INT16		
3x0018	CTS Relay	R	1	UINT16	0-1	0=OFF, 1=ON
3x0027	Temperature (°C)	R	1	INT16	-300_600	600=60°C
3x0028	Signal 0-10V (V)	R	1	INT16	0-100	100=10V

ModBus Setpoints

ModBus setpoints can be set to be both 'read' and 'write'. Below table gives an overview of the setpoints in VentilationAlarm EP2 ES 1162 software version 2.

Register number	Data description	R/W	Length	Units	Valid response	Remarks
4x0002	K17: Zero calibration of Pressure sensor	R/W	1	UINT16	0-1	
4x0003	A01: Reset To Default	R/W	1	UINT16	0 / 11223	11223=Reset
4x0004	M01: Modbus Baudrate (0 = 9600, 1 = 19200)	R/W	1	UINT16	0-1	
4x0005	M02: Modbus Paritet (0 = NONE, 1= EVEN, 2 = ODD)	R/W	1	UINT16	0-2	
4x0006	M03: Modbus Adresse	R/W	1	UINT16	1-100	
4x0012	A06: Reboot	R/W	1	UINT16	0 / 11223	11223=Reboot
4x0013	K14: System mode (0= Pressure, 1= Temperature, 2= 0,10V)	R/W	1	UINT16	0-2	
4x0014	K01: Minimum Temperature Threshold	R/W		INT16	-300_600	-300=OFF
4x0015	K02: Maximum Temperature Threshold	R/W		INT16	-300_600	-300=OFF
4x0016	K03: Hysteresistime for Temperature	R/W		UINT16	0-600	
4x0017	K04: HysteresisValue for Temperature	R/W		UINT16	2-450	
4x0018	K05: Minimum Pressure Threshold (20=OFF)	R/W		UINT16	8-2500	8=OFF
4x0019	K06: Maximum Pressure Threshold (20=OFF)	R/W		UINT16	8-2500	8=OFF
4x0020	K07: Hysteresistime for Pressure	R/W		UINT16	0-600	
4x0021	K08: Hysteresisvalue for Pressure	R/W		UINT16	5-1250	
4x0022	K09: Minimum Voltage for 0-10V	R/W		UINT16	0-100	
4x0023	K10: Maximum Voltage for 0-10V	R/W		UINT16	0-100	
4x0024	K11: Hysteresistime for 0-10V	R/W		UINT16	0-600	
4x0025	K12: Hysteresisvalue for 0-10V	R/W		UINT16	1-50	
4x0028	K13: NTC Select	R/W		UINT16	0-1	0=10k, 1=22k
4x0031	K21: Sounddelay during startup	R/W		UINT16	0-600	

Calibrating Pressure Sensor to Neutral

›**S.0.1.8.**‹ Pressure Neutral Calibration: Calibration of neutral for pressure sensor. 1= Calibrate
After calibration the setpoint returns to factory setting (0).

To ensure correct measurement calibration can be needed. E.g. if another pressure than 0Pa can be read in ›**d.0.0.2.**‹ without any hose connected. It is very important to read the pressure without hose connection *before* any calibration is performed.

Measuring the Battery Voltage

›**S.0.1.9.**‹ Battery Measurement. Measures the voltage on the backup batteri. 1 = Measure
After measuring the setpoint returns to factory setting (0).

Battery is automatically measured when connecting supply voltage to VentilationAlarm EP2. If a new measurement is requested - e.g. at service to ensure sufficient voltage on backup battery, a new measurement can be performed by setting ›**S.0.1.9.**‹ til ›**0.0.0.1.**‹.

Note: At battery change due to low battery voltage the battery voltage must be measured according to above procedure to reset the battery low voltage alarm.

The measured voltage can be read in data point ›**d.0.0.8.**‹.

Alarm Overview

Supply	Operation	Alarm Input	Green LED	Alarm	Relay out	Battery Operation
OK	Discontinued	NO	Flashes slowly	None	COM and NC closed	No
OK	On	NO	Lit	None	COM and NC closed	No
OK	On	YES	Lit	Signal below lower limit Sound: 100ms on / 200ms off Light: flashes through all red LEDs in 1.4 sec.	COM and NO closed	No
OK	On	YES	Lit	Signal above higher limit Sound: 100ms on / 100ms off / 100ms on / 300ms off Light: All LED flashes - 300ms on / 300ms off	COM and NO closed	No
None	-	-	Off (no light)	Sound: 0,5sec each 5. sec. for 30 min. Thereafter once per minut. Light: Midle red LEDs flash 0.5sec. each 5 sec. for 30min thereafter once per minut.	COM and NO closed	Yes
OK	Discontinued / off	Noj	Flashes / lit	If voltage on backup battery falls under 7.75V Acoustic alarm beeps approx. every 60 seconds..	COM and NC closed	No

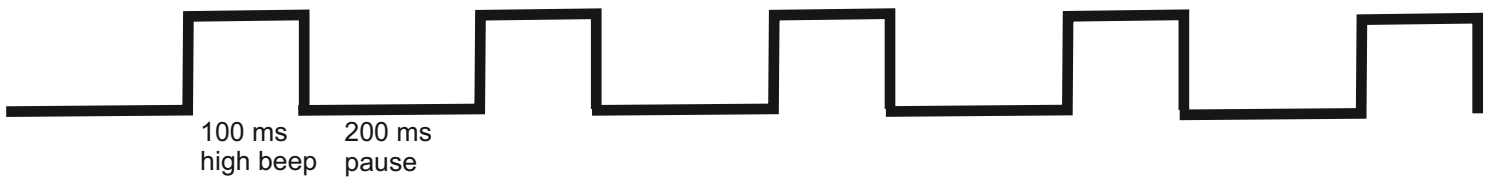
Alarm Signals

Alarm due to Pressure, Temperature or Voltage Signal falls under lower setpoint

Light signal follows below pattern in constant cycle. A cycle runs through in 1.4 seconds.

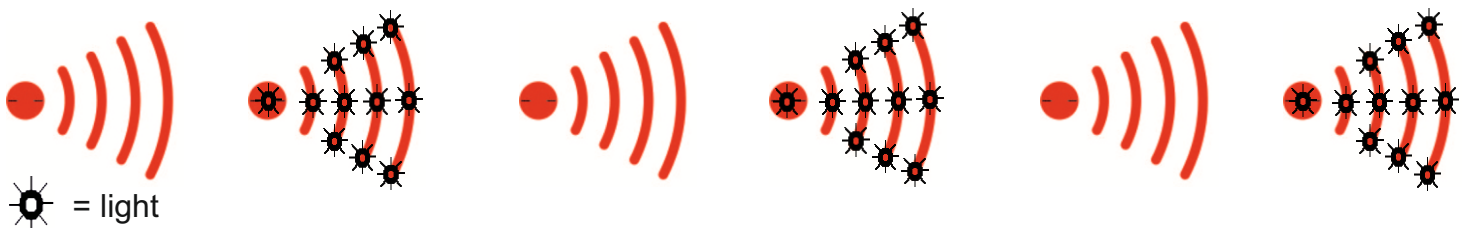


Acoustic signal follow the cycle below with high beeps and pauses. Acoustic signal can be muted.

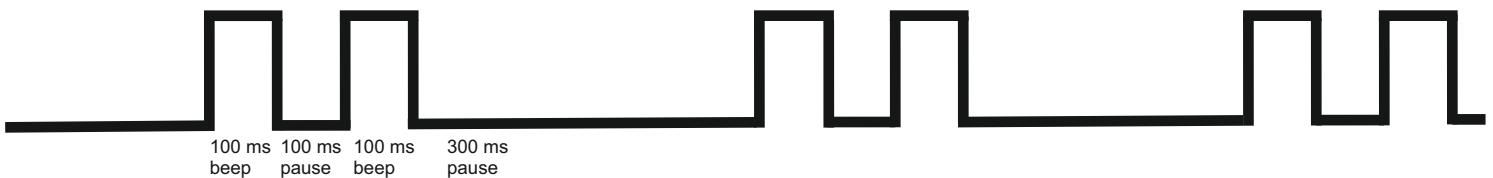


Alarm due to Pressure, Temperature or Voltage Signal exceeds upper setpoint

Light signal follows below pattern in constant cycle. All LEDs turns on for 300ms and off for 300ms.



Acoustic signal follow the cycle below with high beeps and pauses. Acoustic signal can be muted.



Alarm Signals

Alarm due to lack of supply voltage

Light signal follows below cycle, middle LED string flashes each 5 sec. for 0,5sec the first 30min. Thereafter only once a minute).

Acoustic signal is a beep for 0,5 sec. each 5 sec for 30min. Thereafter only once per minute.

Acoustic signal *cannot* be muted. Green LED on front plate is turned off.



Alarm due to low voltage on backup battery

No light signal (all red LEDs remain turned off).

Acoustic signal is one loud beep each 30 seconds. Acoustic signal *cannot* be muted.

Green LED on front plate is turned on if supply voltage is okay, even battery level for backup is low.

