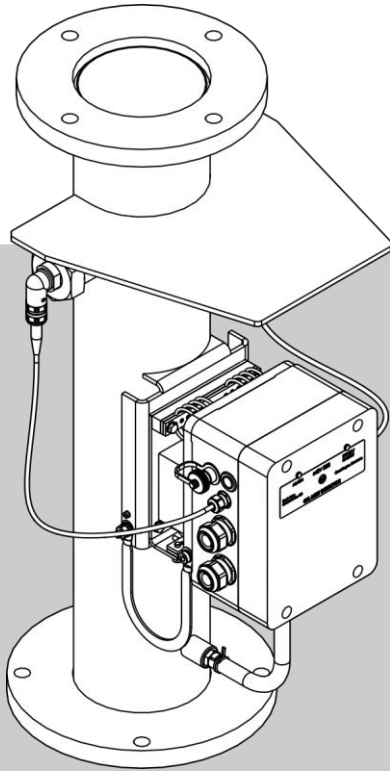


Operating instructions

Oil mist detector MEV283



Read the instructions prior to performing any task!

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Original instructions for use

MEV283, 1, en_GB

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Supplemental directives

Contents of these instructions



These instructions contain specifications for transport, installation, operation, maintenance and troubleshooting of the MEV283 oil mist detector (subsequently referred to as "device").

Prior to beginning any work, personnel must have carefully read through and understood these instructions. These instructions are an integral part of the device and must be stored in the immediate vicinity of the device so that they are accessible to personnel at all times.

A prerequisite for safe working is the observance of all safety instructions and handling instructions stated here.

Furthermore, the local accident prevention provisions and general safety regulations also apply for the area of application of the device.

Figures in these instructions serve to provide a basic understanding and may differ from the actual version.

Copyright

The contents of these instructions are protected by copyright. Their use is permitted within the scope of use of the device. Any use beyond this without the written consent of Horn GmbH & Co. KG is not allowed.

Additional applicable documents

Documents of Horn GmbH & Co KG

- Drawing of the MEV283
- Motor-specific OMD drawing
- Parameter list

Documents of other manufacturers

In addition to these instructions, the instructions included in the delivery for the installed components also apply. The instructions they contain – especially the safety instructions – must be observed.

Customer service

For technical information, the respective motor manufacturer or our customer service is available to you.

Address:

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Furthermore, we are always interested in information and experience arising from use and which can be valuable for the improvement of our products.

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1 Overview

1.1 Device view

Complete view

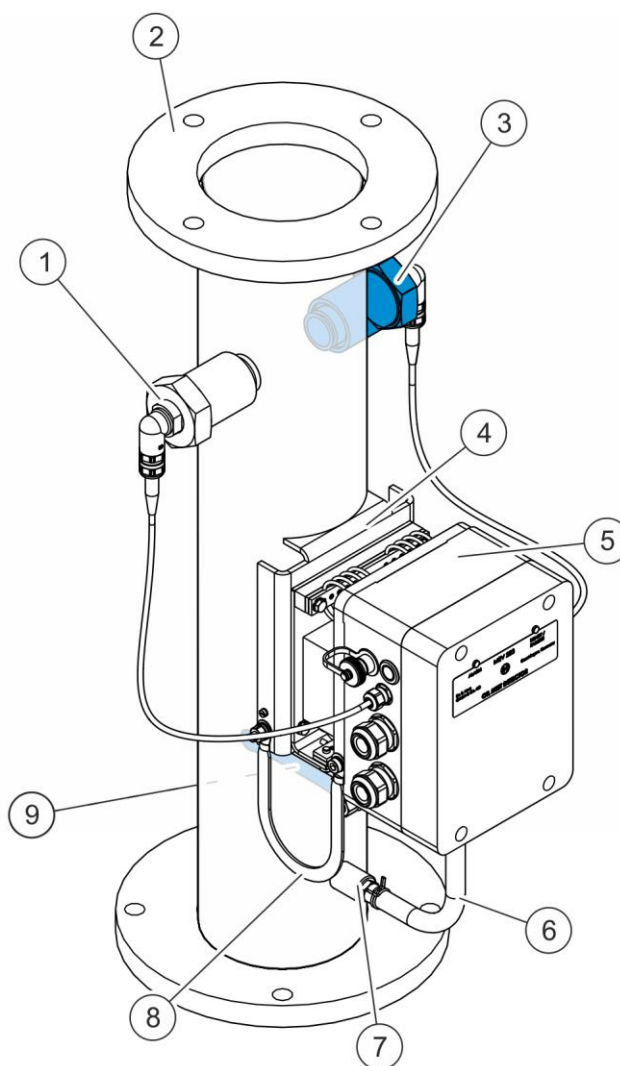


Fig. 1: Complete view

- | | |
|---|--|
| 1 Transmitter X42 (↗ Chapter 4.3.2 "Optical measuring track" on page 42) | 2 Oil mist ventilation pipe (↗ Chapter 4.3.1 "Oil mist ventilation pipe" on page 41) |
| 3 Receiver X43 (↗ Chapter 4.3.2 "Optical measuring track" on page 42) | 4 Base plate with damping system (↗ Chapter 4.3.4 "Base plate with damping system" on page 43) |
| 5 Housing (↗ Chapter 4.3.5 "Housing" on page 43) | 6 Hose for pressure measurement (↗ Chapter 4.3.3 "Pressure sensor" on page 42) |
| 7 Connection for the pressure hose (↗ Chapter 4.3.3 "Pressure sensor" on page 42) | 8 Cable for EMC earthing (↗ Chapter 2.3.4 "Earth connector" on page 19) |
| 9 EMC connection on the oil mist ventilation pipe (rear side; ↗ Chapter 2.3.4 "Earth connector" on page 19) | |

Overview

Detailed view

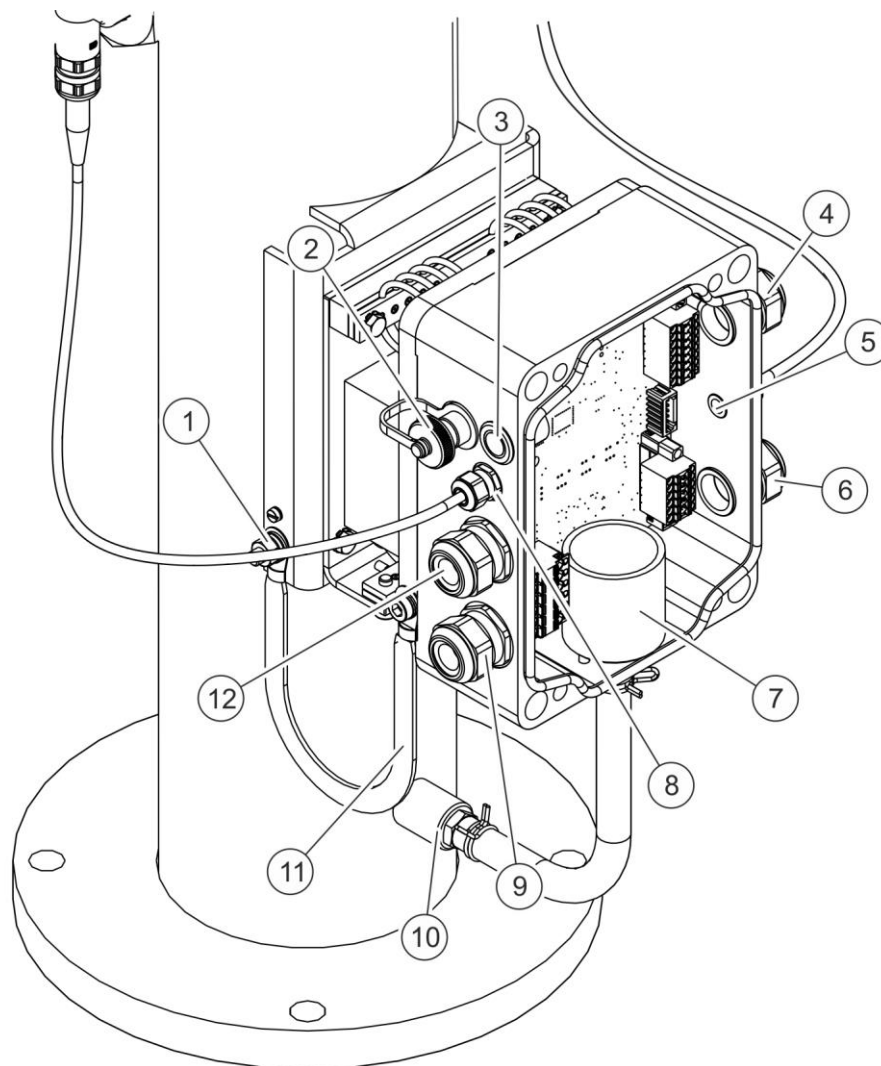


Fig. 2: Detailed view

- | | |
|---|--|
| 1 Connection for the earthing cable (☞ Chapter 2.3.4 “Earth connector” on page 19; to be connected to 11) | 2 M12 connector for Ethernet |
| 3 “Oil mist test” button (☞ Chapter 4.4.2 “[Oil mist test] button” on page 44) | 4 Cable gland for relay |
| 5 Cable gland for receiver cable | 6 Cable gland for cables 4 – 20 mA (☞ Chapter 3.4 “Output signal” on page 36) |
| 7 Pressure sensor (☞ Chapter 4.3.3 “Pressure sensor” on page 42) | 8 Cable gland for transmitter cable |
| 9 Cable gland for power cable | 10 Connection for the pressure hose (☞ Chapter 4.3.3 “Pressure sensor” on page 42) |
| 11 Earth cable (☞ Chapter 2.3.4 “Earth connector” on page 19; to be connected to 1) | 12 Cable gland for CAN |

1.2 Brief description

The MEV283 is an oil mist detector that was developed for monitoring 4-stroke diesel engines.

The device monitors the oil mist concentration and crankcase pressure within the oil mist ventilation pipe.

The device has a self-calibrating optical measuring track for oil mist detection, and a temperature-stabilised pressure sensor.

A galvanically isolated analogue output signal is available for each of the two measured values. The values are also displayed on the web interface.

The device is operated with 24 V DC in order to be able to run it with a backup power supply as well as the main supply. It has two 24 V supply connections.

To start the device, a motor run signal can be used as input from the motor side.

For connection to an alarm monitoring system, the device has relays for the operating states "SystemReady", "PreAlarm", "PressureAlarm" and "Alarm".

To exchange of operational data, parameters and operating information, the device has an Ethernet and a CAN bus interface, both of which can be configured.

1.3 Scope of delivery

- Oil mist detector
- Drawing of the MEV283
- Operating instructions (provided by motor builder)
- Motor-specific OMD drawing
- Parameter list

2 Safety

2.1 Explanation of symbols

Safety instructions

Safety instructions in these instructions are indicated by symbols. The safety instructions are introduced by signal words, which express the scale of the hazard.



DANGER!

This combination of symbol and signal word indicates an immediately dangerous situation that could lead to death or serious injury if it is not avoided.



WARNING!

This combination of symbol and signal word indicates a potentially dangerous situation that could lead to death or serious injury if it is not avoided.



CAUTION!

This combination of symbol and signal word indicates a potentially dangerous situation that could lead to minor injury if it is not avoided.



NOTICE!

This combination of symbol and signal word indicates a situation that could lead to property damage or harm to the environment if it is not avoided.

Safety instructions within handling instructions

Safety instructions can refer to certain individual handling instructions. Such safety instructions are embedded in the handling instruction so that readability is not impaired when carrying out the activity. The signal words described above are used.

Example:

1. Release screw.



CAUTION!

Pinching hazard in the cover!

2. Close the cover carefully.
Do not damage fibre optics.
3. Tighten screw.

Safety





Tips and recommendations



This symbol indicates useful tips and recommendations as well as information for efficient and trouble-free operation.

Additional markings

To highlight handling instructions, results, lists, references and other elements, these instructions employ the following markings:

Marking	Explanation
	Step-by-step handling instructions
	Results of action steps
	References to sections in these instructions and other applicable documents
	Lists without a specified sequence
<i>"Menu"</i>	Web interface menus

2.2 Intended use

Use

This device is designed and constructed exclusively for the intended use described here.

The oil mist detector is intended exclusively for installation in 4-stroke diesel motors.

The device is used for measuring and monitoring the oil mist concentration and the pressure within the drive chamber of diesel engines.

The device is designed for installation and operation in potentially explosive atmospheres (Zone 2).

↪ Chapter 3 "Technical data" on page 35

Measurement of the drive chamber pressure and atmospheric clouding is a system for ensuring personnel safety.



Proper use also includes the observance of all information within these instructions.

Foreseeable misuse

Any use of the device that is other than or beyond the intended use is considered misuse and can lead to dangerous situations.

Foreseeable misuse includes:

- Use of the device with connected loads that do not match the specifications (↪ Chapter 3.2 "Connected load" on page 35).
- Use of the device with motors that do not match the specifications.
- Use of the device with incorrectly positioned or damaged lenses.
- Use of the equipment in a zone other than the approved zone (Zone 2).
- Unauthorised modifications, extensions or conversions of the device.



WARNING!

Danger posed by misuse!

Misuse of the device can lead to dangerous situations.

- Do not undertake any unauthorised modifications, extensions, or conversions on the device.

2.3 Safety devices

Non-functioning safety devices



WARNING!

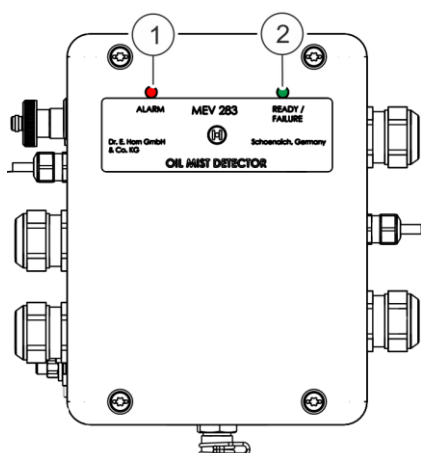
Non-functioning safety devices!

If safety devices are damaged, not functioning or disabled, this poses the danger of severe injury or death.

- Prior to starting work, check whether all safety devices are undamaged, functional, and correctly installed.
- Only operate the device with fully installed safety devices.
- Only disable or bypass safety devices in the exceptional cases that have been described in these instructions.

Safety

2.3.1 Signal LEDs



The LEDs show the operating, error, and alarm status of the device. The red “Alarm” LED (Fig. 3/1) is on the left; the green “Ready/Failure” LED (Fig. 3/2) is on the right.



Under normal circumstances, the “Ready/Failure” LED flashes continuously in an on/off rhythm of 2 seconds and the “Alarm” LED is off.

Fig. 3: Signal LEDs

Fault indicator

When a fault is detected, the “SystemReady” relay (⚡ “Relay” on page 53) is activated and the “Ready/Failure” LED starts to flash in one of the following patterns:

Fault description	Code ³	2 s	Each column represents 0.5 s															
Normal operation		●	● 2 s															
Watchdog error ¹	E01	●	●															
Error on the pressure sensor ¹	E03	●	●	●	●	●												
Oil mist control inactive ²	E05	●	●	●	●	●	●	●	●									
Measuring track error: oil mist measurement not possible ¹	E06	●	●	●	●	●	●	●	●	●								
Cleaning of the optical measuring track required ¹	E08	●	●	●	●	●	●	●	●	●	●	●	●	●	●			
Setting of the clock required ¹	E10	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

● The LED is lit.

● The LED is off.

¹ The flashing repeats until the error is eliminated.

² When switching on/restarting, approx. 90 s are required for the self-test and calibration of the optical sensors.

³ For information on the error codes ⚡ “Error codes” on page 104.

Alarm indicator

If the oil mist alarm is activated, the alarm relay (☞ “Relay” on page 53) is activated and the “Alarm” LED starts to flash in one of the following sequences:

Alarm description	Code ⁵	2 s	Each column represents 0.5 s																			
Pressure higher than P26 ¹	H04	●	●	●	●	●	●	●														
Pressure higher than P27 ¹	H05	●	●	●	●	●	●	●	●	●												
Oil mist pre-warning ²	H09	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●				
Oil mist alarm – load reduction reached ³	H10	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
Oil mist alarm – Autostop level reached ⁴	H11	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	

● The LED is lit.

● The LED is off.

¹ ☞ “Setting the crankcase pressure monitoring/Selecting the pressure range” on page 78

² The flashing repeats until the oil mist value falls below the value of parameter P12 (☞ “Adjusting the oil mist sensor/Activating the motor run signal” on page 77).

³ The flashing repeats until the oil mist value falls below the value of parameter P14 (☞ “Adjusting the oil mist sensor/Activating the motor run signal” on page 77).

⁴ The flashing repeats until the oil mist value falls below the value of parameter P15 (☞ “Adjusting the oil mist sensor/Activating the motor run signal” on page 77).

⁵ For information on the alarm codes ☞ “Alarm codes” on page 104.

Safety

2.3.2 Housing cover

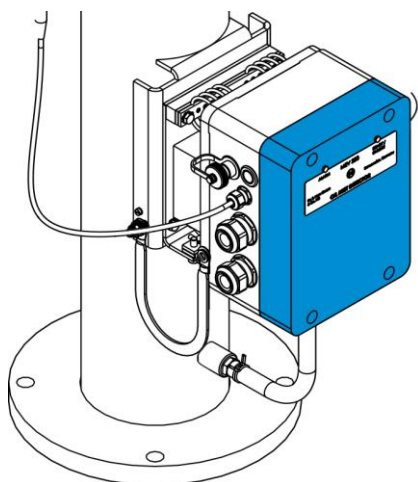


Fig. 4: Housing cover

The housing cover protects the electronics installed in the housing from dirt and damage due to moisture.

2.3.3 Steel plate

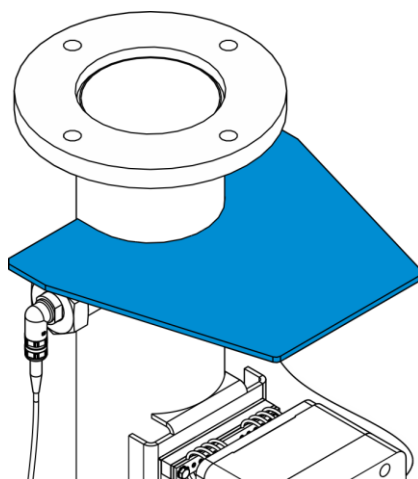


Fig. 5: Steel plate

The steel plate is permanently welded to the oil mist ventilation pipe and serves as a kick protector for the housing.

2.3.4 Earth connector

Contact voltages and ignition sparks



WARNING!

Danger of death due to contact voltages and sparks!

Missing or defective potential equalisation can result in contact voltages and sparks. This poses the danger of severe injury or death.

- Prior to initial commissioning, connect device to the local potential equalisation and check that this functions properly.

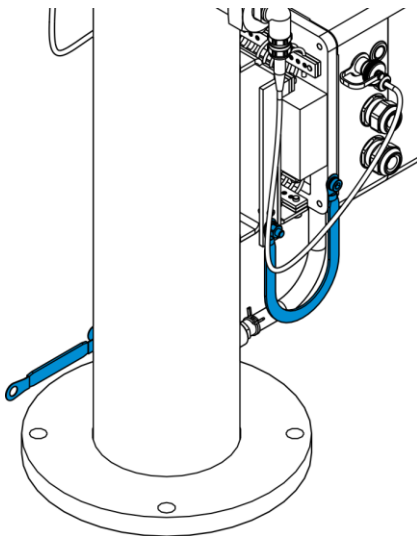


Fig. 6: Earth connector

The earth connector of the device serves in conducting electrical currents into the earth (potential equalisation) in order to prevent sparks and contact voltages if an error occurs.

2.4 Conduct in the event of fire outbreak or accidents

Preventive measures

- Always be prepared for fires and accidents.
- Store first-aid equipment (first-aid kit, blankets, etc.) and fire extinguishers, ensuring that these are functional and within reach.
- Ensure that personnel are familiar with the accident signalling devices, first-aid kit and rescue equipment.
- Keep access routes for rescue vehicles clear.
- Immediately trigger an emergency stop using the emergency stop device.
- If your own safety is not endangered, bring the person(s) in question out of the danger zone.
- If necessary, initiate first-aid measures.
- Alert the fire brigade and/or rescue service.
- In the event of a fire outbreak: If your own safety is not endangered, attempt to put out the fire with extinguishers until firefighters arrive.
- Inform on-site supervisors.
- Keep access routes for rescue vehicles clear.
- Provide information to rescue vehicles.

Measures in the event of fire outbreak or accidents

Safety

2.5 Signage

Illegible signage



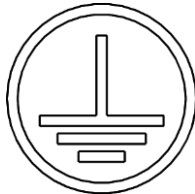
WARNING!

Danger of death due to illegible signage!

Over time, stickers and signs can become soiled or otherwise illegible, so that hazards are not detected and the required operating instructions cannot be followed. This poses a risk of death.

- Always maintain stickers and signs in legible condition.
- Replace damaged stickers and signs immediately.

Earthing



This symbol indicates that the product must be earthed prior to being put into operation.

Connection/installation diagram

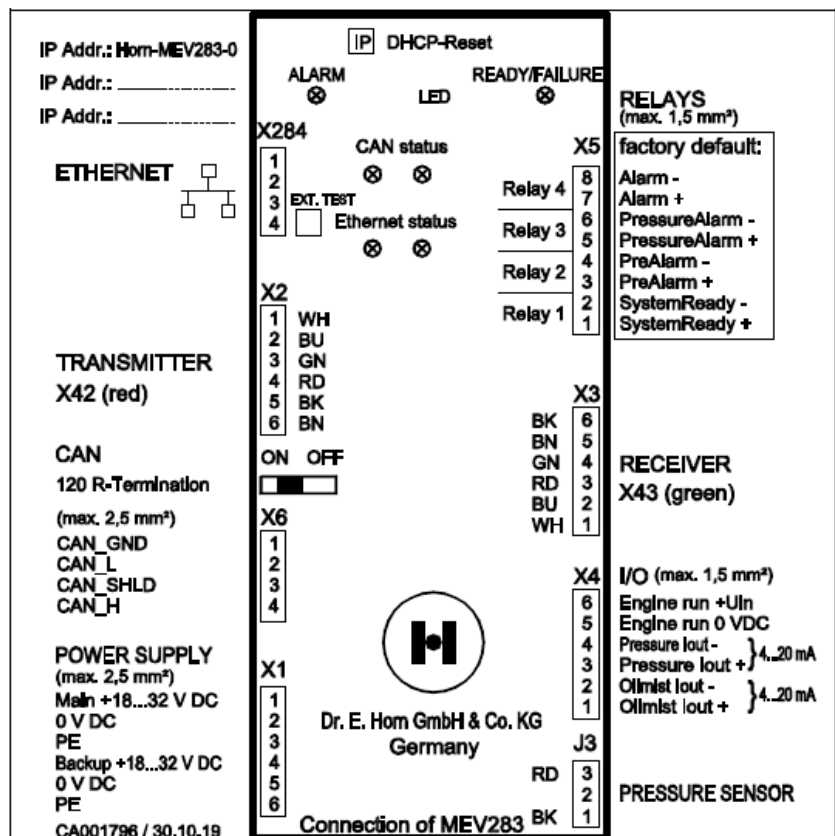


Fig. 7: Connection/installation diagram

This sign indicates the possible connections and connection plugs in the housing of the oil mist detector (↗ Chapter 4.5 “Connections and ports” on page 48).

The sign is located in the housing cover.

ATEX marking

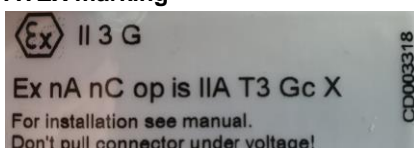


Fig. 8: ATEX marking

2.6 Residual risks

The device has been designed according to the latest technological standards and safety requirements.

Nevertheless, residual risks remain, which require cautious handling. Residual risks and the appropriate conduct and measures required are listed below.

2.6.1 Basic hazards at the workplace

Running motor

**WARNING!****Danger of death due to running motor!**

Starting the motor while working on or inside the motor may lead to serious or fatal injuries.

- Prior to all work, switch off the motor and secure it against being switched on again.

Opened housing

**WARNING!****Danger of explosion with housing opened in explosive atmospheres!**

If a potentially explosive atmosphere is present (regardless of zone), the housing may not be opened when the device is switched on, since this would pose an explosion hazard.

Any zone other than the correct one (Zone 2) is already dangerous.

- Do not open the housing in an explosive atmosphere if the device is switched on.

Infrared light beam

**WARNING!****Risk of eye injury from infrared light beam!**

When maintenance work is performed on the optical measuring track, there is a risk of eye injury from the infrared light beam.

- Never look directly into the infrared light beam.

Working at greater heights

**WARNING!****Risk of falls and injury when working at greater heights!**

Working at greater heights and while standing on climbing aids poses a risk of falls and injury.

- Use suitable fall protection equipment.
- Only use climbing aids that have a solid stand and provide sufficient support.

Strong vibrations**WARNING!****Risk of injury from strong vibrations!**

Exposure to strong vibrations for extended periods can lead to considerable injuries and chronic health damage.

- Do not disable vibration dampers.
- Avoid entering the area of the vibrations during operation.

Noise**WARNING!****Hearing impairment due to excessive noise!**

The noise level occurring in the work area can cause severe hearing impairment.

- Wear hearing protection.
- Only remain in the danger zone as long as necessary.

Sharp corners or edges**CAUTION!****Risk of injury on sharp corners or edges!**

Sharp corners and edges can lead to skin cuts and abrasions.

- Wear the prescribed personal protective equipment when working.

Dirt and objects left lying around**CAUTION!****Risk of injury due to dirt and objects left lying around!**

Dirt and objects left lying around pose a slipping and tripping hazard. A fall could cause injuries.

- Always keep the work area clean.
- Remove no longer required objects from the work area, especially near the floor.
- Mark unavoidable tripping hazards with yellow/black marking tape.

Safety

2.6.2 Dangers posed by electricity

Electrical current



DANGER!

Danger of death due to electrical current!

Contact with live parts poses an immediate danger of death from electric shock. Damaged insulation or individual components can be life-threatening.

- Have work on the electrical system performed only by electricians.
- If the insulation is damaged, immediately switch off the voltage supply and have this repaired.
- Prior to starting work on energised parts of electrical systems and equipment, establish a voltage-free state and ensure this state is maintained for the duration of the work. Observe the 5 safety rules:
 - Switch off.
 - Secure against reactivation.
 - Verify a voltage-free state.
 - Carry out earthing and short-circuiting.
 - Provide protection from adjacent live parts.
- Never bypass or disable fuses. When replacing fuses, observe the correct amperage.
- Keep moisture away from voltage-conducting parts. This could lead to a short circuit.

2.6.3 Dangers posed by heat

Hot surfaces



WARNING!

Risk of injury due to hot surfaces!

Contact with hot components can lead to severe burns.

- Allow components to cool down to the ambient temperature before touching them.
- Wear protective gloves.

Hot operating materials



WARNING!

Risk of injury due to hot operating materials!

Operating materials can reach high temperatures during operation. Skin contact with hot operating materials can cause severe scalding.

- When performing any work with operating materials, always wear heat-resistant work clothing and protective gloves.
- Prior to any work with operating materials, check whether they are hot. If necessary, allow them to cool down.

2.6.4 Dangers posed by chemicals

Motor oil and fuel



WARNING!

Risk of fire due to motor oil and fuel!

Fumes from oil and fuel can ignite if they come into contact with the ignition source.

- Do not light any open flames when working on the motor.
- Do not smoke.
- Remove oil and fuel residues from the motor and floor.

Highly flammable materials



WARNING!

Risk of fire due to highly flammable materials!

Highly flammable materials, liquids and gases can ignite and cause severe or fatal injuries.

Dangerous fumes can be released when chemical substances are burned.

Dust deposits can swirl up and form an explosive mixture with the ambient air.

- Do not smoke in the area of the device. Refrain from contact with exposed lights, flames or sources of ignition of any type.
- Have a suitable fire-extinguishing agent ready.
- Immediately report any suspicious materials, liquids or gases to your supervisor.
- In the event of a fire, stop work at once. Leave the scene of the fire and alert the fire brigade.

Flammable mixtures in the surroundings



WARNING!

Danger of explosion in the case of flammable mixtures in the surroundings!

When flammable mixtures are present in the atmosphere, explosions can occur.

Oil under pressure



WARNING!

Risk of injury due to oil under pressure!

If lines or machine components are defective, oil under pressure can escape. This can lead to serious injuries.

- Never open pressurised pipelines.
- Prior to starting work, completely depressurise pipelines.
- Have defective parts repaired.

2.7 Replacement parts

Incorrect replacement parts

**WARNING!****Risk of injury due to incorrect replacement parts!**

The use of incorrect or defective replacement parts can pose dangers as well as cause damage, malfunctions or total failure.

- Use only original replacement parts made by Horn GmbH & Co. KG, or replacement parts that have been approved by Horn GmbH & Co. KG.
- Order replacement parts only through the customer service of Horn GmbH & Co KG (☎ “Customer service” on page 3).

2.8 Responsibility of the operator

Safety

Operator

The operator is defined as the person operating the device for business or commercial purposes, or who allows others to use/employ the device, and who during operation bears the legal product responsibility for the protection of the user, of personnel or of third parties.

Obligations of the operator

The device is used in the commercial sector. The operator of the device is therefore subject to legal obligations regarding occupational safety.

In addition to the safety instructions detailed here, the regulations for safety, accident prevention and environmental protection valid for the device's area of application must be observed.

In particular, the following applies:

- The operator must familiarise himself with the applicable occupational health and safety regulations and, by means of a risk assessment, also determine any hazards arising from the special operating conditions at the location where the device is used. The operator must implement this in the form of operating instructions for the operation of the device.
- During the entire lifetime of the device, the operator must check whether the operating instructions created conform to the latest technical standards, and if necessary, revise them.
- The operator must ensure that all persons working with the device have read and understood these instructions, and that they possess the required qualifications for the individual tasks. Furthermore, the operator must train personnel at regular intervals and inform them of the dangers and how to act in an emergency.
- The operator must clearly regulate and define the responsibilities for installation, operation, troubleshooting, maintenance and cleaning.
- The operator must provide personnel with the required protective equipment and advise them that it is mandatory to wear the required protective equipment.
- The operator must observe the locally applicable fire protection ordinances.
- The operator must ensure that the area of the device and its surroundings have sufficient illumination.
- The operator is responsible for maintaining the device in a technically flawless condition.

Therefore, the following applies:

- The operator must ensure that the maintenance intervals described in these instructions are adhered to.
- The operator must have all safety devices regularly checked for proper function and completeness.

Duties of the owner in relation to fire and explosion protection

The owner must comply with further obligations from directive 99/92/EC relating to the improvement of health protection and safety of employees who could be endangered by a potentially explosive atmosphere.

This includes compliance with further organisational measures such as:

- Indication of the Ex-areas
- Creation of an explosion protection document for each zone
- Creation of an access ban for unauthorised persons
- The clear display of all bans

The owner must inform the personnel at regular intervals about:

- Local fire and explosion protection measures.
- Location and function of the safety devices.
- Necessity of a smoking ban.
- Necessity to avoid open flame.
- Procedures for cleaning and maintenance work, plus repairs, including the tools, auxiliaries, and cleaning agents to be used.
- Necessity of wearing personal protective equipment suitable for the potentially explosive area.

The owner must provide and locate suitable fire extinguishers for fire fighting.

The owner must appropriately indicate the potentially explosive areas and the zones where flames, naked light, and smoking are banned, by the use of meaningful signs.

Safety

2.9 Personnel qualifications

Inadequate qualifications**WARNING!****Inadequate qualifications can result in fatalities.**

Allowing an inadequately qualified person to perform work on the device poses a life-threatening danger. Considerable property damage could occur as well.

- Have all activities carried out only by persons who possess the qualifications stated in the individual chapters.
- In case of doubt, address the individuals in question and direct them to exit the danger zone and work area.
- Halt the work as long as inadequately qualified persons are present at the device.

Requirements of personnel

Staff should be made up exclusively of persons who can be expected to carry out their work reliably. Persons whose responsiveness is affected, e.g. by drugs, alcohol or medicines, are not authorised.



Observe the locally applicable regulations relating to age and profession.

Safety

List of qualifications

The various tasks described in these instructions have different requirements regarding the personnel qualifications for those assigned to perform them.

Electrician with additional qualification in explosion protection

Electricians with additional qualification in explosion protection have been specially trained for their duties and are familiar with the relevant standards and regulations.

Electricians with additional qualification in explosion protection can carry out work on electrical systems on the basis of their technical training and experience and can recognise and avoid potential hazards independently.

Installation specialist

Installation specialists with additional qualification in explosion protection have been specially trained for their duties and are familiar with the relevant standards and regulations.

Installation specialists with additional qualification in explosion protection are specially trained by the manufacturer in working with the product. Their technical training and experience enable them to carry out tasks on systems and components and independently recognise and avoid potential hazards.

Instructed person

Instructed persons have been verifiably instructed by the operating company in a briefing about the tasks assigned to them and the potential hazards posed by improper conduct.

Instructed persons are able to perform this work professionally and safely.

Instructed persons are authorised for the following activities:

- Switching on the device
- Switching off the device
- Performing a manual oil mist test
- Cleaning work

Maintenance personnel with additional qualification in explosion protection

Maintenance personnel with additional qualification in explosion protection have been specially trained for their duties and are familiar with the relevant standards and regulations.

Maintenance personnel with additional qualification in explosion protection can carry out work on hydraulic systems on the basis of their technical training and experience and can recognise and avoid potential hazards independently.

Transport specialist

The transport specialist has been trained in the use of cranes or industrial lift trucks. This specialist is able to select appropriate load handling and lifting tackle and apply it properly. Based on this knowledge, the specialist can independently recognise and avoid potential hazards when moving transport components.

2.10 Personal protective equipment

Personal protective equipment serves to protect persons from safety and health risks during work.

While performing various work on the device, personnel must wear their personal protective equipment as specifically indicated in the individual sections of these instructions. Explanation:



Hearing protection

Hearing protection serves to protect against hearing damage due to exposure to noise.



Industrial safety helmet

Industrial safety helmets protect the head from falling objects, swinging loads and impacts on fixed stationary objects.



Protective clothing

Protective clothing is close-fitting work attire with a low tear strength, narrow sleeves and no protrusions.



Protective gloves

Protective gloves serve to protect hands from chafing, abrasions, punctures or deeper wounds as well as from contact with hot surfaces.



Puncture-resistant safety shoes

Safety shoes protect the feet from crushing, falling parts and slipping on slippery surfaces.



Safety goggles

Safety goggles serve to protect the eyes from flying parts and spurting liquids.



Safety harness

The safety harness serves as protection against falls in the case of increased danger of falling. This situation occurs when certain height differences are exceeded and the worksite is not secured by a railing.

Attach the safety harness so that the safety rope is connected to the harness as well as to a fixed attachment point. If necessary, provide fall-impact absorbers.

Safety harnesses may only be used by persons specially instructed in their use.

2.11 Environmental protection

Environmentally hazardous materials



NOTICE!

Danger to the environment due to incorrect handling of environmentally hazardous materials!

If environmentally hazardous materials are incorrectly handled, in particular through improper disposal, this could result in considerable environmental damage.

- Always observe the instructions stated below for handling and disposing of environmentally hazardous materials.
- In case of doubt, request information from local authorities or specialist disposal companies.
- Observe safety data sheets and instructions.

Observe the following instructions for environmental protection when performing maintenance work:

Electrical and electronic components

Electrical and electronic components may contain toxic substances. These components must be collected separately and handed over to municipal collection points or disposed of by a specialist company.

Lubricants

Lubricants such as grease and oil contain toxic substances that should not be allowed to enter the environment. Their disposal must be carried out by a specialist disposal company.

3 Technical data

3.1 Dimensions and weights

Dimensions

See drawing (additional applicable documents)

Weights

Data	Value	Unit
Motor-specific oil mist detector with pipe, approx.	25	kg
Housing, approx.	5	kg

3.2 Connected load

Data	Value	Unit
Voltage supply	24	V DC
	-25 to +30%,	%
Max. allowed residual ripple	≤ 5	%
Fuse	3.15	A
Power consumption, max.	35	W
Safety class acc. to DIN 60529	IP65	
Safety class acc. to DIN 60529, optical sensors	IP67	
Conductor cross-section	0.14 – 1.5	mm

3.3 EMC standard

Specification	Value
Generic no.	EN 55016 and EN 55022
Safety regulations	acc. to EN 61000-4, -6
Rules for type checking	acc. to DNV GL

Technical data

3.4 Output signal

Data	Value	Unit
Output signal of current output	4 – 20	mA
Isolation	Galvanically isolated	
Pressure	± 25	mbar
Pressure outlet, load max.	500	Ω
Oil mist outlet, load max.	500	Ω
Resolution of pulse width modulation	10,000	steps
Linearity	± 0.25% of final value	
Reaction time, approx.	300	ms

3.5 Relay

Specification	Value
Type	PhotoMOS
Error relay	Self-monitoring, short circuit-protected, freely configurable
Limit value relay	Self-monitoring, short circuit-protected, freely configurable

Data	Value	Unit
Max. switching current	500	mA
Switching voltage	7 – 60	V AC

3.6 Communication interface

Ethernet for parameter settings and process data display (galvanically isolated).

Data	Value	Unit
Transmission rate	100	Mbit/s
CAN	Galvanically isolated	
Protocol	CANopen, J1939	
Addressing (node ID), adjustable	1 – 127	
Transmission rate, adjustable	10k – 1M	Baud

3.7 Engines

Specification	Value
Motor	Several manufacturers
Motor types	

3.8 Ambient conditions

Data	Value	Unit
Operating temperature	-20 – +85	°C
Relative humidity, non-condensing	< 90	%

3.9 Software version

Specification	Value
Version	2.26 and higher

Technical data

3.10 Certificates

- DNV GL
- ABS
- LR



Other certificates available on request.

3.11 Name plate

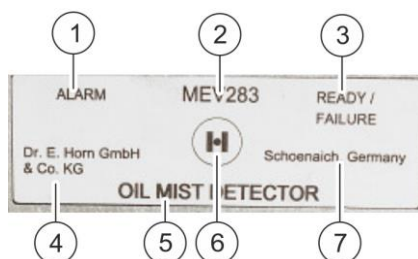


Fig. 9: Name plate

- | | |
|---|--------------------------------------|
| 1 | Lettering of the "Alarm" LED |
| 2 | Product type |
| 3 | Lettering of the "Ready/Failure" LED |
| 4 | Manufacturer |
| 5 | Product name |
| 6 | Logo |
| 7 | Head office of manufacturer |

4 Device description

4.1 Overview

Complete view

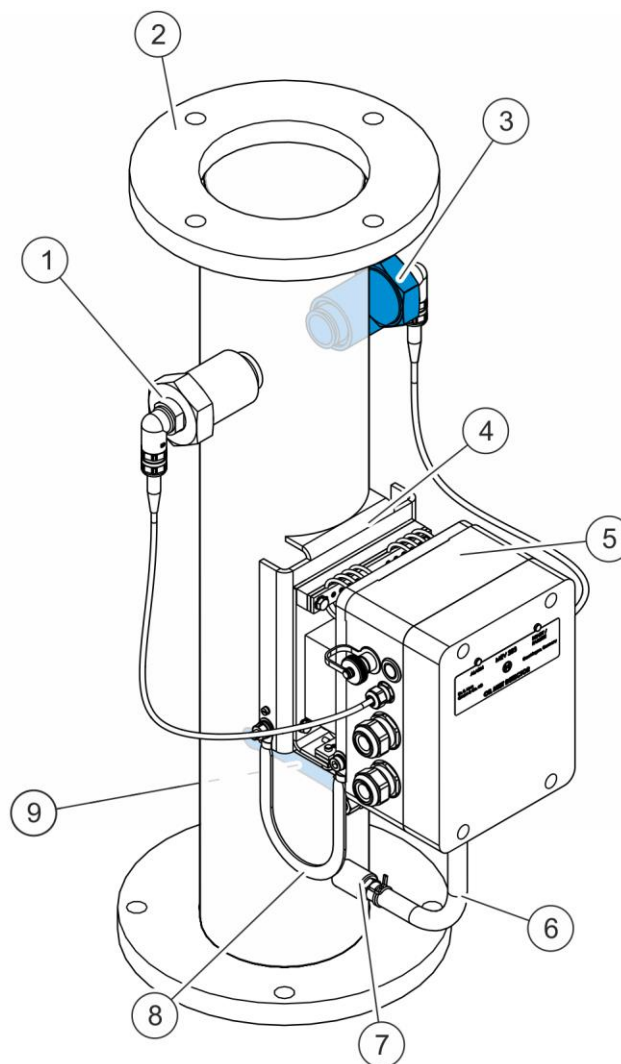


Fig. 10: Complete view

- | | |
|---|--|
| 1 Transmitter X42 (↗ Chapter 4.3.2 "Optical measuring track" on page 42) | 2 Oil mist ventilation pipe (↗ Chapter 4.3.1 "Oil mist ventilation pipe" on page 41) |
| 3 Receiver X43 (↗ Chapter 4.3.2 "Optical measuring track" on page 42) | 4 Base plate with damping system (↗ Chapter 4.3.4 "Base plate with damping system" on page 43) |
| 5 Housing (↗ Chapter 4.3.5 "Housing" on page 43) | 6 Hose for pressure measurement (↗ Chapter 4.3.3 "Pressure sensor" on page 42) |
| 7 Connection for the pressure hose (↗ Chapter 4.3.3 "Pressure sensor" on page 42) | 8 Cable for EMC earthing (↗ Chapter 2.3.4 "Earth connector" on page 19) |
| 9 EMC connection on the oil mist ventilation pipe (rear side; ↗ Chapter 2.3.4 "Earth connector" on page 19) | |

Device description

Detailed view

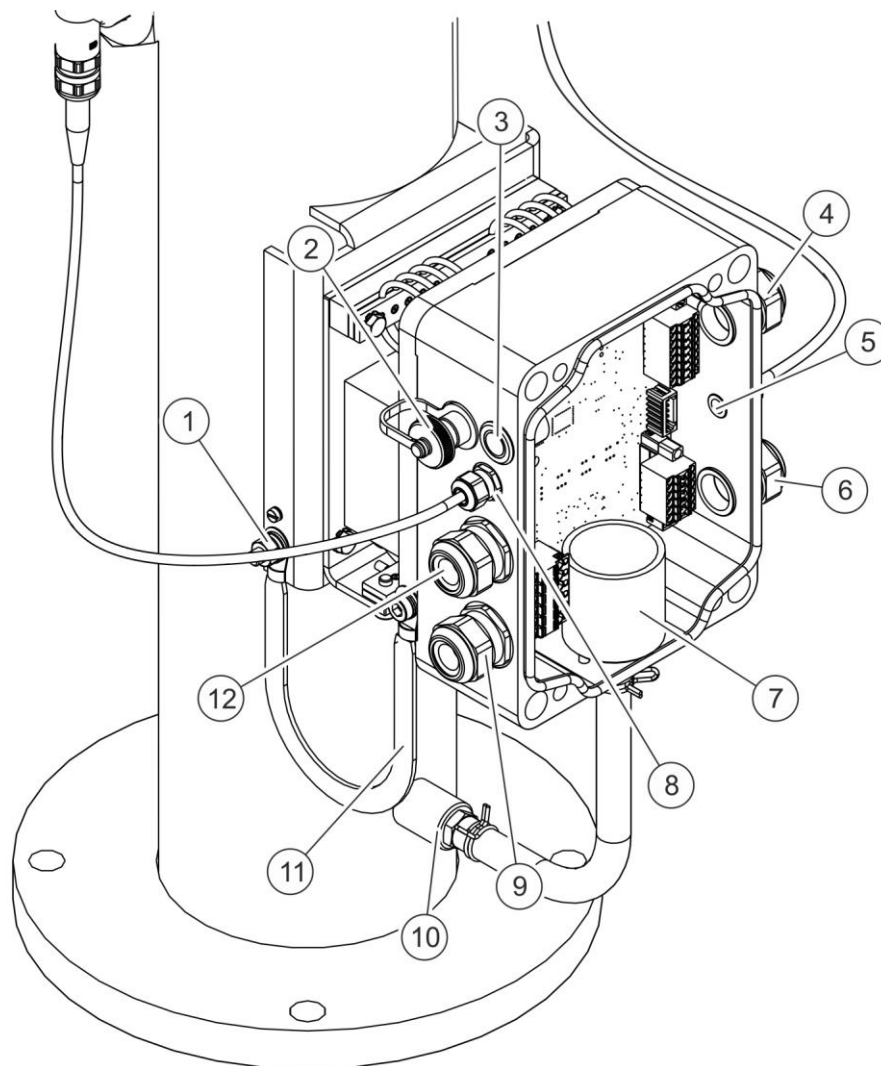


Fig. 11: Detailed view

- | | | | |
|----|---|----|---|
| 1 | Connection for the earthing cable (☞ Chapter 2.3.4 “Earth connector” on page 19; to be connected to 11) | 2 | M12 connector for Ethernet |
| 3 | “Oil mist test” button (☞ Chapter 4.4.2 “[Oil mist test] button” on page 44) | 4 | Cable gland for relay |
| 5 | Cable gland for receiver cable | 6 | Cable gland for cables 4 – 20 mA (☞ Chapter 3.4 “Output signal” on page 36) |
| 7 | Pressure sensor (☞ Chapter 4.3.3 “Pressure sensor” on page 42) | 8 | Cable gland for transmitter cable |
| 9 | Cable gland for power cable | 10 | Connection for the pressure hose (☞ Chapter 4.3.3 “Pressure sensor” on page 42) |
| 11 | Earth cable (☞ Chapter 2.3.4 “Earth connector” on page 19; to be connected to 1) | 12 | Cable gland for CAN |

4.2 Functional and process description

The oil mist detector measures the oil mist concentration in the air inside the oil mist ventilation pipe.

Two lenses are used as well.

The first lens emits a light beam, which is registered by the second lens.

If the same amount of light was not received as was transmitted, the opacity of the drive chamber atmosphere has changed.

The degree of light transmittance depends on the oil mist concentration.

Warnings and alarms are issued if the oil mist concentration exceeds the set limit values.

The device also measures the pressure within the oil mist ventilation pipe.

Warnings and alarms are issued if the pressure exceeds the set limit values.

4.3 Component description

4.3.1 Oil mist ventilation pipe

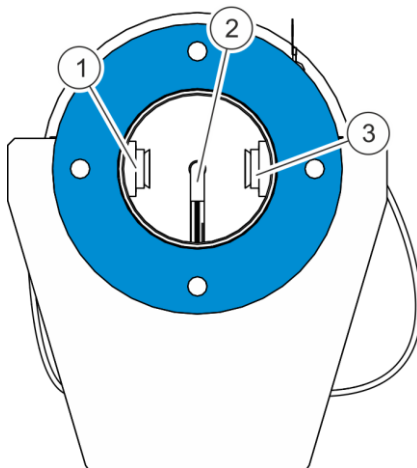


Fig. 12: Oil mist ventilation pipe



The version of the oil mist ventilation pipe depends on the motor type. An example version is shown here.

The oil mist ventilation pipe is a part of the device and conveys the oil mist to the on-site ventilation system.

The oil mist ventilation pipe is made of steel.

Inside the oil mist ventilation pipe are the lenses of the optical measuring track (Fig. 12/1, 3; § Chapter 4.3.2 "Optical measuring track" on page 42) and the hose for the pressure measurement (Fig. 12/2).

The housing (§ Chapter 4.3.5 "Housing" on page 43) is located on the oil mist ventilation pipe.

Device description

4.3.2 Optical measuring track

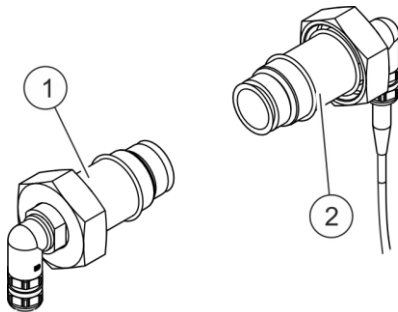


Fig. 13: Lenses

The optical measuring track delivers the oil mist measurements.

The optical measuring track consists of 2 aluminium lenses, a transmitter X42 (Fig. 13/1) and a receiver X43 (Fig. 13/2).

The transmitter and receiver operate in the non-visible infrared light spectrum.

The transmitter and receiver have internal temperature-controlled heating systems in order to prevent condensation from forming on the optical surfaces.



A too-high water content in the oil can lead to water vapour in the oil mist. The heating system prevents condensation of the water vapour on the optical measuring track.

The transmitter emits light, which is registered by the receiver. When oil mist streams through the optical measuring track, parts of the light are absorbed. The signal of the optical measuring track is constantly monitored so that the current value can always be displayed on the web interface.

If the signal does not lie within the normal range, the alarm or autostop is activated. The information is also displayed on the web interface.



The soiling of the optical measuring track (at the transmitter and/or the receiver) is regularly measured.

If the maximum allowed degree of soiling is reached, error code E08 is displayed and the optical measuring track must be cleaned (↪ Chapter 10.3.7 “Cleaning the optical measuring track” on page 101).

4.3.3 Pressure sensor

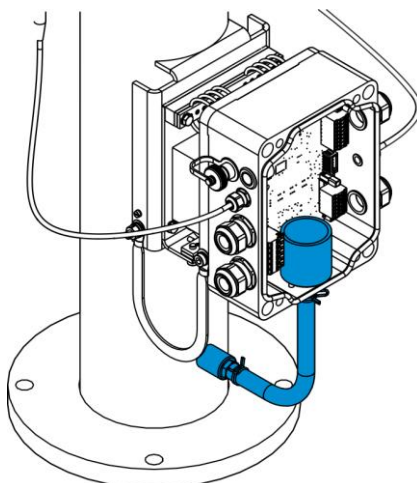


Fig. 14: Pressure sensor

The pressure sensor is located in the housing (↪ Chapter 4.3.5 “Housing” on page 43).

The pressure sensor is temperature-stabilised and connected to the oil mist ventilation pipe (↪ Chapter 4.3.1 “Oil mist ventilation pipe” on page 41) by a hose.

The pressure is monitored in order to activate the PressureAlarm relay, if necessary.

The measured pressure is forwarded to the higher-level system by means of an output signal (↪ “Output signal” on page 52).

4.3.4 Base plate with damping system

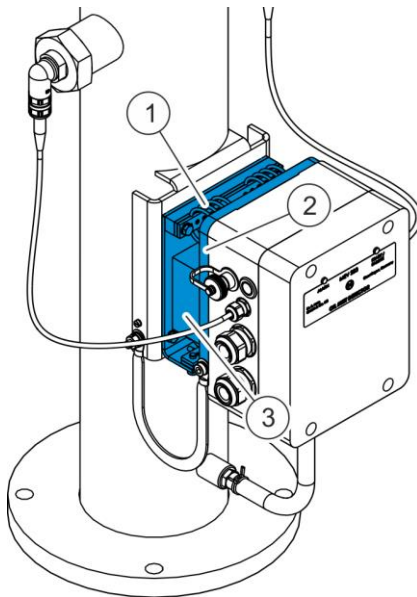


Fig. 15: Base plate

The base plate with damping system connects the housing (↗ Chapter 4.3.5 “Housing” on page 43) to the oil mist ventilation pipe (↗ Chapter 4.3.1 “Oil mist ventilation pipe” on page 41).

The damping system of the base plate consists of springs (Fig. 15/1), which are attached above and below.

The damping system reduces vibrations arising from the motor.

Also on the base plate (Fig. 15/2) is a weight (Fig. 15/3), which is used to minimise or eliminate vibration frequencies.

4.3.5 Housing

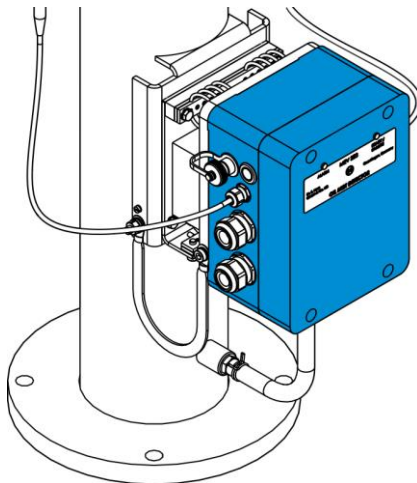


Fig. 16: Housing

The housing is installed over a base plate with damping system (↗ Chapter 4.3.4 “Base plate with damping system” on page 43) on the oil mist ventilation pipe (↗ Chapter 4.3.1 “Oil mist ventilation pipe” on page 41).

The housing is made of die-cast aluminium and serves to protect the electronics from damage due to dirt and moisture.

The relays (↗ “Relay” on page 53) and pressure sensor (↗ Chapter 4.3.3 “Pressure sensor” on page 42) are located inside the housing.

On the exterior of the housing are the cable connections and the button for the manual oil mist test (↗ Chapter 4.4.2 “[Oil mist test] button” on page 44).

Device description

4.4 Display and operating elements

4.4.1 Signal LEDs



For information on the signal LEDs ↗ *Chapter 2.3.1 "Signal LEDs" on page 16.*

4.4.2 [Oil mist test] button

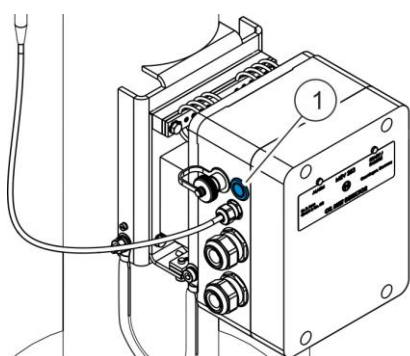


Fig. 17: [Oil mist test] button

The [Oil mist test] button is located on the left-hand side of the housing. This button is used to initiate the oil mist test (↗ *Chapter 10.3.2 "Performing the oil mist test manually" on page 91*). After 8 seconds, the LED ring lights up red and the test starts.



The test will not start if the button is pressed for less than 8 or more than 12 seconds.

4.4.3 Web interface

On the web interface, maintenance staff can view warnings and error messages, carry out maintenance work, set parameters and change the date.

The manufacturer can also carry out password-protected settings.

Home page

Oil mist detection system MEV283

[\[Home \]](#)
[\[HELP \]](#)
[\[Oilmist test \]](#)
[\[Pressure adjustment \]](#)
[\[Relay test \]](#)
[\[Network Settings \]](#)
[\[Parameter list \]](#)

[\[Application Parameters \]](#)
[\[Basic Parameters \]](#)
[\[Admin Parameters \]](#)
[\[Clock \]](#)
[\[Info \]](#)
[\[Logout \]](#)

HORN

Process data

Item	Physical value
Crankcase pressure	0.0 mbar
Oil mist concentration	-1.95 %
IR power	23.64 %
System voltage	25.56 V
Actual system time	2050-01-01 12:32:12
Engine	Running

Code	Description	State
H04	Pressure limit 1	Not active
H05	Pressure limit 2	Not active
H09	Oil mist pre-warning	Not active
H10	Oil mist increasing	Not active
H11	Oil mist shutdown	Not active
E01	Systemfailure (Watchdog,E2PROM)	Not active
E03	Failure crankcase pressure sensor	Not active
E05	Oil mist control state inactive	Not active
E06	Optical line out of order	Not active
E08	Optical line cleaning requested	Not active
E10	Real time clock out of power	Active
E42	Manual oil mist test activated	Not active

Errors and Events

Number of Events: 240

Code	Event	Max. value	Time	Date
E10	No voltage supply to built-in clock	-	12:20:29	01.01.2050
E14	Reset of MCU	-	12:20:26	01.01.2050
E11	Parametrization entered	-	12:20:21	01.01.2050
E10	No voltage supply to built-in clock	-	12:19:56	01.01.2050
E14	Reset of MCU	-	12:19:52	01.01.2050
E15	Power fail detected	-	00:00:00	00.00.2000
E11	Parametrization entered	-	12:19:47	01.01.2050
E10	No voltage supply to built-in clock	-	12:00:00	01.01.2050
E14	Reset of MCU	-	00:00:00	00.00.2000
E15	Power fail detected	-	14:30:18	28.09.2018
E14	Reset of MCU	-	13:37:16	28.09.2018
E15	Power fail detected	-	13:37:11	28.09.2018
H11	Increasing oil mist high/high	73.50 %	13:37:10	28.09.2018
H10	Increasing oil mist high	73.50 %	13:37:10	28.09.2018
H09	Increasing oil mist	13.38 %	13:37:05	28.09.2018

Fig. 18: Home page

The home page of the web interface shows process data, error messages and events, which are updated each second.

The events history is collected in an internal memory under "Errors and Events".

Device description

Info page

Oil mist detection system MEV283

[[Home](#) | [HELP](#) | [Oilmist test](#) | [Pressure adjustment](#) | [Relay test](#) | [Network Settings](#) | [Parameter list](#)]
[[Application Parameters](#) | [Basic Parameters](#) | [Admin Parameters](#) | [Clock](#) | [Info](#) | [Logout](#)]

Device information

Oil mist detection system MEV283

Clock: [12:32:35_2050-01-01](#)
IP address: 192.168.5.103

Serial number: 1788888
SW-Version: 2.25
HW-Version: PB011524
Compilation time / date: 10:06:12 / Sep 5 2018
Parameter checksum: 19ED

Contact

Dr.E.Horn GmbH & Co. KG
Max-Planck-Str. 34
71116 Gaertringen
Germany
Mail-address service: info@dr-horn.org

For additional information about Horn products, please visit:
www.dr-horn.org

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Fig. 19: Info page

This page contains important and necessary information on the device and contact data for support.

Help page

Oil mist detection system MEV283

[\[Home \]](#)
[HELP](#)
[Oilmist test](#)
[Pressure adjustment](#)
[Relay test](#)
[Network Settings](#)
[Parameter list](#)

[\[Application Parameters \]](#)
[Basic Parameters](#)
[Admin Parameters](#)
[Clock](#)
[Info](#)
[Logout](#)

information for usage

a) Documentation of individual web-pages

The easiest way is to use a printer (e.g. Print to PDF) or similar. Then you simply use a right mouse click in your browser on the page and select \"Print\" with a sub-selection of \"Print to PDF\" or similar.

b) DHCP is normally activated.

Is no DHCP-server available, the device creates a so-called local-link address in the range of 169.254.x.y. This address can be found by ping \"host-name\" like \"ping Horn-MEV283-0\"

Attention: please wait a while (1 minute) after switching on the device!

🔍

Was DHCP de-activated over the parameter and you can't find the device anymore, please press the key 'R' (in the monitoring box) for around 10 seconds. That re-activates DHCP, and reboots the device.

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Fig. 20: Help page

The help page of the web interface contains information regarding use.

4.4.4 Reset button

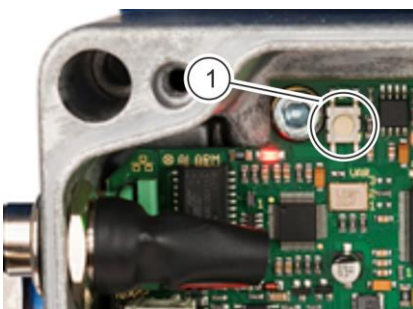


Fig. 21: Reset button

The reset button (Fig. 21/1) is located at the top left on the circuit board. If the DHCP server was deactivated via the parameters and the device is no longer displayed, the reset button can be pressed for approx. 10 seconds. This reactivates the DHCP server and the device is restarted.

Device description

4.5 Connections and ports

Unplugged connector



WARNING!

Danger due to unplugged connector in potentially explosive atmospheres!

Unplugging the connector in a potentially explosive atmosphere (regardless of zone) poses a risk of explosions.

Any zone other than the correct one (Zone 2) is already dangerous.

- Do not unplug connectors in explosive atmospheres.

4.5.1 Circuit board

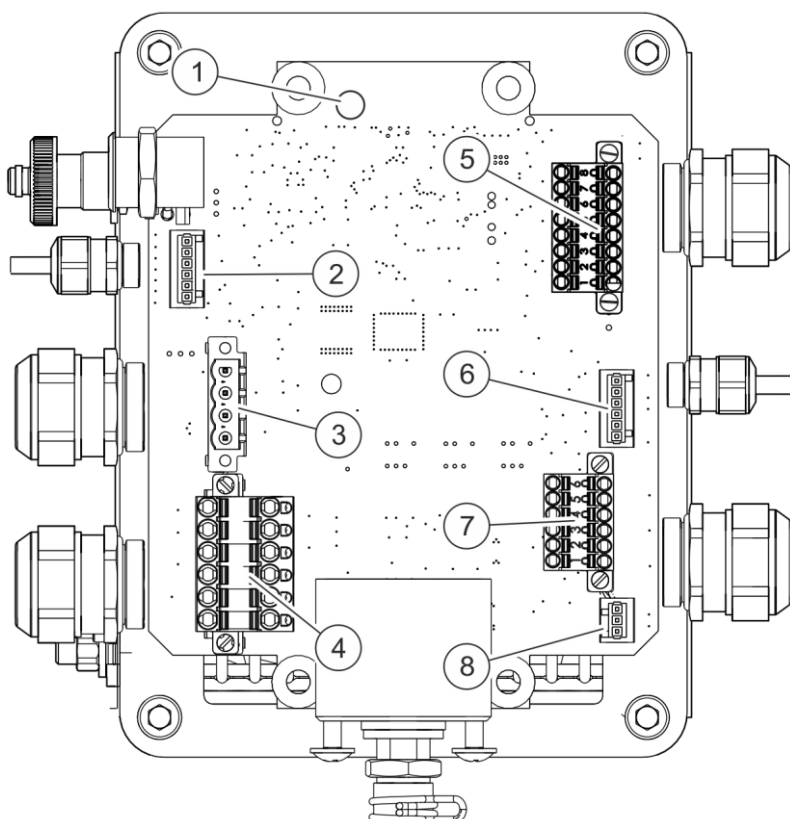


Fig. 22: Circuit board

- 1 Reset button (↪ *Chapter 4.4.4 "Reset button" on page 47*)
- 2 Connector X2 (↪ *Chapter 4.5.3 "Connector X2 (X42 red)" on page 49*)
- 3 Connector X6 (↪ *Chapter 4.5.7 "Connector X6" on page 54*)
- 4 Connector X1 (↪ *Chapter 4.5.2 "Connector X1" on page 49*)
- 5 Connector X5 (↪ *Chapter 4.5.6 "Connector X5" on page 53*)
- 6 Connector X3 (↪ *Chapter 4.5.4 "Connector X3 (X43 green)" on page 51*)
- 7 Connector X4 (↪ *Chapter 4.5.5 "Connector X4" on page 51*)
- 8 Connector J3 (↪ *Chapter 4.5.9 "Connector J3" on page 55*)

The circuit board is located in the housing and holds the connector.
The reset button is also located on the circuit board.

4.5.2 Connector X1

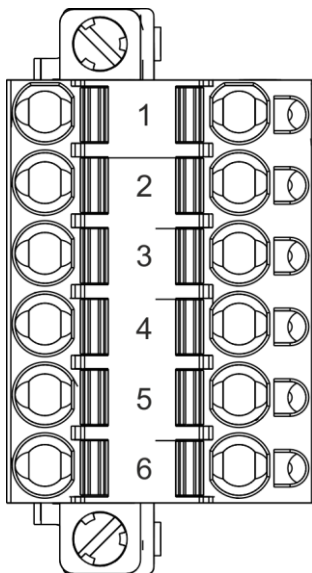


Fig. 23: Connector X1

Connector X1 (Fig. 22/4) is used for the power supply (clamping area up to 2.5 mm²).

Pin no.	Description
X1/1	Main supply 24 V DC
X1/2	Main supply 0 V
X1/3	Earthing
X1/4	Redundant supply 24 V DC
X1/5	Redundant supply 0 V
X1/6	Earthing



If no emergency power supply is available, connect pins X1/1 and X1/4.

4.5.3 Connector X2 (X42 red)

Device description

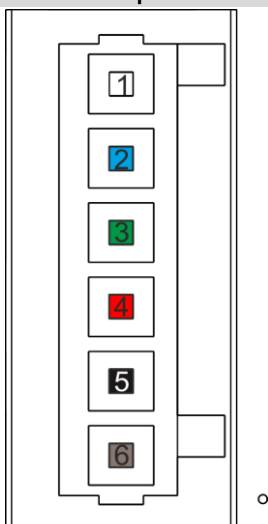


Fig. 24: Connector X2

Connector X2 (Fig. 22/2) connects the transmitter of the optical measuring track to the oil mist detector.

The colours shown indicate the colour of the cable to be connected.

Pin no.	Cable colour	Description
X2/1	White	Temperature sensor, transmitter +
X2/2	Blue	Temperature sensor, transmitter -
X2/3	Green	Heating coil, transmitter +
X2/4	Red	Heating coil, transmitter -
X2/5	Black	Transmitter current +
X2/6	Brown	Transmitter current -

4.5.4 Connector X3 (X43 green)

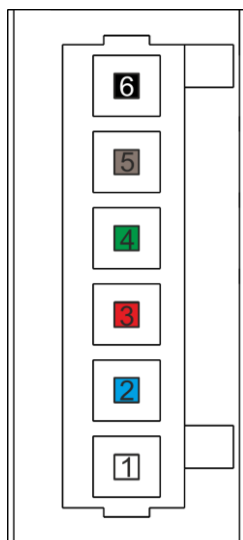


Fig. 25: Connector X3

Connector X3 (Fig. 22/6) connects the receiver of the optical measuring track to the oil mist detector.

The colours shown indicate the colour of the cable to be connected.

Pin no.	Cable colour	Description
X3/1	White	Temperature sensor, receiver +
X3/2	Blue	Temperature sensor, receiver -
X3/3	Red	Heating coil, receiver +
X3/4	Green	Heating coil, receiver -
X3/5	Brown	Receiver current +
X3/6	Black	Receiver current -

4.5.5 Connector X4

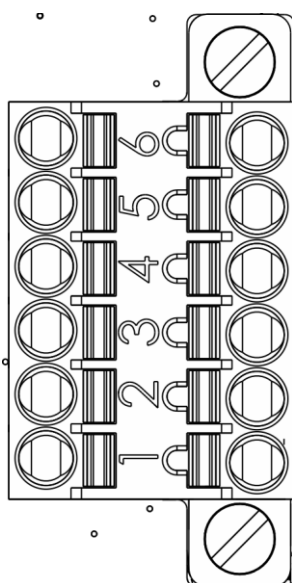


Fig. 26: Connector X4

Connector X4 (Fig. 22/7) transmits the output signal (☞ “Output signal” on page 52) and the motor run signal (☞ “Motor run signal” on page 52) (clamping area 1.5 mm²).

Pin no.	Description
X4/1	Oil mist analogue output 4 – 20 mA
X4/2	Oil mist analogue output 4 – 20 mA
X4/3	Pressure analogue output 4 – 20 mA
X4/4	Pressure analogue output 4 – 20 mA
X4/5	Motor run signal +
X4/6	Motor run signal -

Device description

Output signal

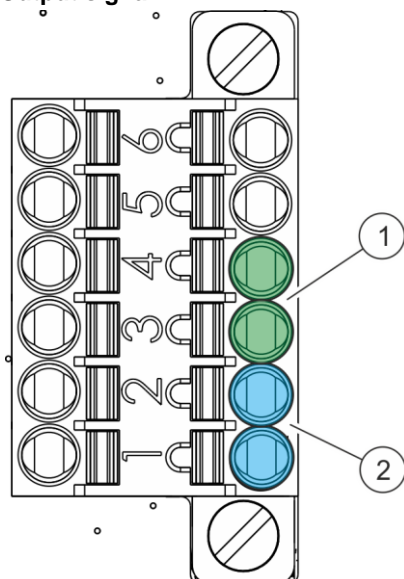


Fig. 27: Output signal, connector X4

Motor run signal

The output signal is transmitted via connector X4 (§ Chapter 4.5.5 “Connector X4” on page 51) to the 2 LEDs in the housing cover (§ Chapter 2.3.1 “Signal LEDs” on page 16).

The output signal is transmitted with 4 – 20 mA.

The output signal can transfer the following values:

- Oil mist level (Fig. 27/1)
- Drive chamber pressure (Fig. 27/2)

The motor run signal of connector X4 (§ Chapter 4.5.5 “Connector X4” on page 51) is used to signal the device that the motor is running.

The signal can be activated by parameter P21 in the parameter list (§ “Adjusting the oil mist sensor/Activating the motor run signal” on page 77).

An input signal can be provided in two ways:

- potential-free contact or switch
- analogue voltage signal between 6 V and 24 V



The device must be earthed (§ Chapter 7.4 “Earthing the device” on page 64).



If no input signal can be provided, either the control can be carried out using CAN or the parameter can be set to the “AlwaysOn” value.

4.5.6 Connector X5

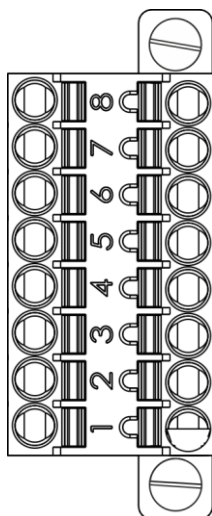


Fig. 28: Connector X5

Connector X5 (Fig. 22/5) transfers the relay signals (☞ “Relay” on page 53).

Pin no.	Description	Relay no.	Config. value
X5/1	SystemReady relay +	1	2
X5/2	SystemReady relay -		
X5/3	PreAlarm relay +	2	4
X5/4	PreAlarm relay -		
X5/5	PressureAlarm relay +	3	8
X5/6	PressureAlarm relay -		
X5/7	Alarm relay + (optional)	4	16
X5/8	Alarm relay - (optional)		

Relay

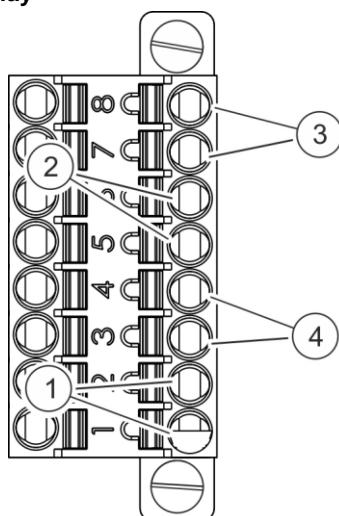


Fig. 29: Relay

PhotoMOS relays are used.

Relays 1 – 4 may be set in the configuration as “normally open” or “normally closed”. This influences the behaviour during the relay test (☞ Chapter 7.6 “Testing relays” on page 67).

The maximum switching current of the PhotoMOS relay is 500 mA.

The relays are activated in the following situations:

- A failure detected in the system or a power loss activates the **SystemReady relay (Relay1, Fig. 29/1)**¹.
- The “Oil mist pre-warning” or “Load reduction level reached” messages activate the **PreAlarm relay (Relay2, Fig. 29/4)**.
- A pressure exceeding or falling below the set limit value activates the **PressureAlarm relay (Relay3, Fig. 29/2)**.
- The “Oil mist autostop value reached” message activates the **Alarm relay (Relay4, Fig. 29/3)**.

¹ The SystemReady relay is activated by an oscillating voltage, which is generated by the processor. If the processor stops, the voltage is no longer generated and the relay changes its status. In the event of a power failure, the relay reverts to its initial status, independent of the setting (“normally open/closed”).



It is recommended to leave the SystemReady relay in “normally open” status.

If a relay is activated, this is displayed on the web interface by error messages and warnings.



The relays are automatically reset once the error has been rectified.

Device description

4.5.7 Connector X6

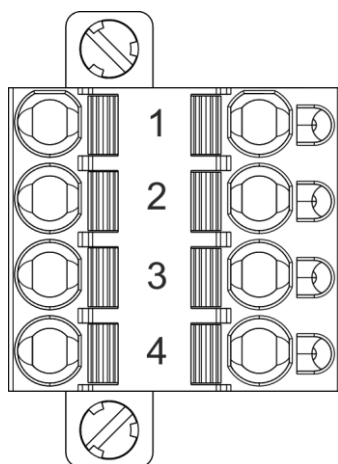


Fig. 30: Connector X6

Connector X6 (Fig. 22/3) transfers the CAN bus signals (clamping area up to 2.5 mm²).

The device has a galvanically isolated CAN bus interface for external data exchange.

Parameters P70 – P78 (⚡ “Setting the CAN bus” on page 80) are relevant for the configuration of the CAN bus.

Pin no.	Description
X6/1	CAN earthing
X6/2	CAN “low”
X6/3	Earthing
X6/4	CAN “high”



The “CANopen” protocol is supported on the CAN bus.



If the device is the last CAN node on the network, the termination switch for 120 Ohm must be set to “On” to use the resistor.

4.5.8 Connector X284

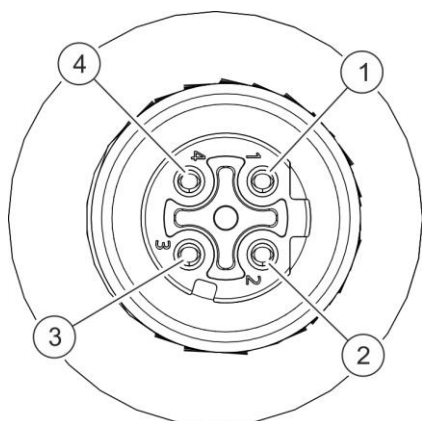


Fig. 31: Connector X284

Connector X284 establishes the Ethernet connection.

The connection is located on the left-hand side of the housing.

Pin no.	Description
X284/1	Transmitter TX+
X284/2	Receiver RX+
X284/3	Transmitter TX-
X284/4	Receiver RX-

4.5.9 Connector J3

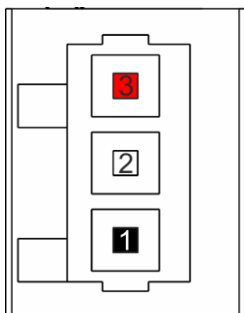


Fig. 32: Connector J3

Connector J3 (Fig. 22/8) connects the pressure sensor.



Connector J3 is only intended for internal use by the manufacturer.

The colours shown indicate the colour of the cable to be connected.

Pin no.	Cable colour	Description
J3/1	Black	–
J3/2	–	–
J3/3	Red	–

Device description

4.6 Operating states

4.6.1 Normal status

In normal status, there are no errors or alarms present. In normal status, data regarding pressure, oil mist concentration and IR power are available.

All these data are process data and are visible on the home page of the web interface.



If no action is taken on the web interface, the flashing of the green “Ready/Failure” LED in the 2-second on/off rhythm indicates normal operation.

4.6.2 Error status

Error status indicates that error messages are present. Error and alarm statuses can be active simultaneously.

All error messages are visible as error codes on the home page of the web interface.



The type of error can be determined through the flashing of the “Ready/Failure” LED (🔌 “Fault indicator” *on page 16*) and is shown on the web interface.

4.6.3 Alarm status

In alarm status, alarm messages are present. Error and alarm statuses can be active simultaneously.

All alarm messages are visible as alarm codes on the home page of the web interface.



The type of alarm can be determined through the flashing of the “Alarm” LED (🔌 “Alarm indicator” *on page 17*) and is shown on the web interface.

5 Materials and tools

Materials

The described activities require the following materials:

- Cleaning agent
- Cleaning rags

Tools

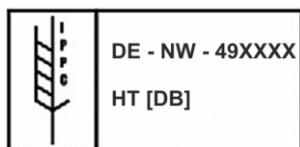
The described activities require the following standard tools:

- Combination spanner set
- Allen key set
- Screwdriver set

6 Transport, packaging and storage

6.1 Symbols on the packaging

IPPC symbol



International symbol for the handling status of packaging materials made of wood:

- **DE** Country code (e.g. Germany)
- **NW** Region code (e.g. NW for North Rhine-Westphalia)
- **49XXX** Registration no. of the wood supplier
- **HT** Heat treatment
- **DB** Debarked

Top



The arrow tips on the sign mark the top of the package. They must always point upwards; otherwise the content could be damaged.

Protect against moisture



Protect packages against moisture and keep dry.



Additional symbols and instructions may be present on the packaging materials. Always observe these.

6.2 Delivery

Transport inspection

Upon receipt, check the delivery immediately for completeness and transport damage.

If there is any visible exterior transport damage, proceed as follows:

1. Do not accept the delivery, or accept it only with reservations.
2. Make a note of the scope of the damage on the transport documents or on the delivery note of the carrier.
3. Submit a complaint.



Submit a complaint for every defect as soon as it is detected. Compensation claims will only be accepted within the applicable reclamation periods.

Transport, packaging and storage

6.3 Transport

Eccentric centre of gravity



CAUTION!

Risk of injury due to packages tipping over or falling!

Lifting packages with an eccentric centre of gravity can cause them to swing out, tip over and fall down. This poses a risk of injury.

- Only use the intended attachment points.
- Note the position of the centre of gravity.
- Always lift packages carefully and ensure that they cannot tip over or fall.
- When transporting packages with the forklift, lash them down if there is no other way to ensure that the transport item is securely fixed.

Pallets with the forklift



A maximum of 4 devices can be stacked and transported with the forklift.

- | | |
|-----------------------|-----------------------------------|
| Personnel: | ▪ Transport specialist |
| Protective equipment: | ▪ Protective clothing |
| | ▪ Puncture-resistant safety shoes |
| | ▪ Industrial safety helmet |

Packages that are fastened on pallets may be transported with a forklift under the following conditions:

- The forklift operator must be authorised to drive the forklift.

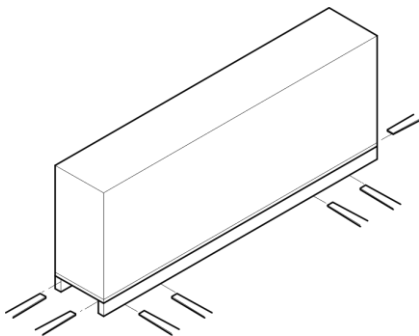


Fig. 33: Transport of pallets with the forklift

1. Drive the forklift so that the forks are between or under the beams of the pallet (Fig. 33).
2. Insert the forks far enough so that they protrude on the opposite side.
3. If the centre of gravity is off-centre, ensure that the pallet cannot tip over.
4. Lift the package and begin transport.

6.4 Packaging

The individual packages are packed according to the expected transport conditions. Only environmentally sound materials are used for the packaging. The packaging is designed to protect the individual components from transport damage, corrosion and other damage until they are installed. For this reason, do not destroy the packaging and only remove it shortly prior to the installation.

Incorrect disposal



NOTICE!

Harm to the environment due to incorrect disposal!

In many cases, packaging materials can be processed and re-used. Incorrect disposal of packaging materials can pose hazards to the environment.

- Dispose of packaging materials in an environmentally sound manner that is in conformance with locally applicable waste disposal regulations.
- If applicable, contract a specialist company to handle the disposal.

6.5 Storage

Store packages under the following conditions:

- Do not store outdoors.
- Store in a dry and dust-free area.
- Do not expose to aggressive media.
- Avoid salt-laden atmospheres.
- Avoid mechanical vibrations.
- Storage temperature: -20 to 90 °C
- Relative air humidity: max. 90%

When storing for periods longer than 3 months, regularly check the general condition of all parts of the packaging. If necessary, renew or replace the preservation.



In certain cases, there are instructions on the packages regarding their storage that go beyond the requirements mentioned above. Observe these accordingly.

7 Installation and start-up

7.1 Safety during installation

Opened housing



WARNING!

Danger of explosion with housing opened in explosive atmospheres!

If a potentially explosive atmosphere is present (regardless of zone), the housing may not be opened when the device is switched on, since this would pose an explosion hazard.

Any zone other than the correct one (Zone 2) is already dangerous.

- Do not open the housing in an explosive atmosphere if the device is switched on.

7.2 Installing the device

Personnel:	▪ Installation specialist
Protective equipment:	▪ Protective clothing
	▪ Puncture-resistant safety shoes
	▪ Protective gloves
	▪ Industrial safety helmet
	▪ Safety harness

To install the device, proceed as follows:

1. Establish a suitable connection in the on-site pipeline.
 2. Insert operator-supplied seals.
 3. Insert the device in the recess.
 4. Fasten the device with operator-supplied screws.
- ⇒ The device is installed.

Installation and start-up

7.3 Connecting the device to the mains supply



NOTICE!

Risk of property damage due to incorrect electrical connection!

The device can be damaged if it is incorrectly connected.

- Connect the device to an external power supply (18 – 32 V DC, nominal 24 V DC) in conformance with DIN EN IEC 60900 VDE 0682-201:2019-04 and/or IEC61558.

- | | |
|-----------------------|---|
| Personnel: | <ul style="list-style-type: none"> ▪ Electrician with additional qualification in explosion protection |
| Protective equipment: | <ul style="list-style-type: none"> ▪ Protective clothing ▪ Puncture-resistant safety shoes ▪ Protective gloves ▪ Safety harness |

Prerequisite:

- The device is installed (↪ *Chapter 7.2 "Installing the device" on page 63*).

To connect the device to the operator's mains supply, proceed as follows:

- ▶ Connect the power cable of the operator's mains supply to connector X1 (↪ *Chapter 4.5.2 "Connector X1" on page 49*).

For this, use an external power supply in conformance with DIN EN IEC 60900 VDE 0682-201:2019-04 and/or IEC61558.

⇒ The device is connected to the mains supply.

7.4 Earthing the device

Contact voltages and ignition sparks



WARNING!

Danger of death due to contact voltages and sparks!

Missing or defective potential equalisation can result in contact voltages and sparks. This poses the danger of severe injury or death.

- Prior to initial commissioning, connect device to the local potential equalisation and check that this functions properly.

- Personnel:
- Electrician with additional qualification in explosion protection
- Protective equipment:
- Protective clothing
 - Puncture-resistant safety shoes
 - Protective gloves

Prerequisite:

- The device is installed (↗ Chapter 7.2 "Installing the device" on page 63).



To guarantee proper EMC protection, the housing is connected by means of a flexible copper mesh strap (Fig. 34/2) to the motor earth.

To earth the device, proceed as follows:

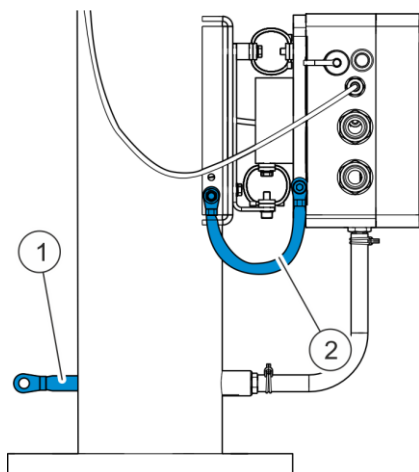


Fig. 34: Earthing the device

1. To avoid EMC interference, ensure good conductance through short earthing straps from the oil mist ventilation pipe to the motor block (Fig. 34/1).



Each pipe has an M8 thread connection near its flange.

2. Make sure that the shielding is connected to the cable gland and that the connection is tight.
 - ⇒ The device is earthed.

Installation and start-up

7.5 Connecting the network

Connecting the device to the network

- Personnel:
- Electrician with additional qualification in explosion protection
- Protective equipment:
- Protective clothing
 - Puncture-resistant safety shoes

Prerequisites:

- The device is installed (↗ Chapter 7.2 "Installing the device" on page 63).
- The device is connected to the mains supply (↗ Chapter 7.3 "Connecting the device to the mains supply" on page 64).
- The device is earthed (↗ Chapter 7.4 "Earthing the device" on page 64).

To connect the device to the network, proceed as follows:

- ▶ Connect the device to the operator's network using an Ethernet cable (M12 connector, code D) at connector X284 (↗ Chapter 4.5.8 "Connector X284" on page 54).
 - ⇒ The device is connected to the network.

Connecting the device directly to the PC

- Personnel:
- Electrician with additional qualification in explosion protection
- Protective equipment:
- Protective clothing
 - Puncture-resistant safety shoes

Prerequisites:

- The device is installed (↗ Chapter 7.2 "Installing the device" on page 63).
- The device is connected to the mains supply (↗ Chapter 7.3 "Connecting the device to the mains supply" on page 64).
- The device is earthed (↗ Chapter 7.4 "Earthing the device" on page 64).
- The device is connected to the network (↗ "Connecting the device to the network" on page 66).

To connect the device directly to a PC (with the Windows operating system), proceed as follows:

1. Set up the Ethernet connection so that an IP address is automatically assigned.
2. Wait approx. one minute.



The wait time depends on the computer network.

3. Enter the name of the device "horn-mev283-0" or the device's link local address in the browser.



If the network ID has already been changed, change the network ID to "horn-mev283-<ID>".

- ⇒ Access to the web interface of the device is established.
The device is connected directly to the PC.

Connecting the device to the network with DHCP server

- Personnel:
- Electrician with additional qualification in explosion protection
- Protective equipment:
- Protective clothing
 - Puncture-resistant safety shoes

Prerequisites:

- The device is installed (↗ *Chapter 7.2 "Installing the device" on page 63*).
- The device is connected to the mains supply (↗ *Chapter 7.3 "Connecting the device to the mains supply" on page 64*).
- The device is earthed (↗ *Chapter 7.4 "Earthing the device" on page 64*).
- The device is connected to the network (↗ *"Connecting the device to the network" on page 66*).

To connect the device to a network that is running with a DHCP server, proceed as follows:

1. Use a direct connection (↗ *"Connecting the device directly to the PC" on page 66*).
2. Reboot the PC/system.
3. Check the DHCP server for the IP address to which the device is assigned.

Alternatively, use the hostname of the device ("horn-mev283-0") to display the web interface.



If the current IP address is unknown and the device is not in DHCP mode, press the reset button (↗ *Chapter 4.4.4 "Reset button" on page 47*) on the circuit board until the green LED is no longer lit.

4. Then restart the device with active DHCP.
 - ⇒ The device is connected to the network with DHCP server.

7.6 Testing relays

- Personnel:
- Installation specialist
- Protective equipment:
- Protective clothing
 - Puncture-resistant safety shoes
 - Hearing protection

Prerequisite:

- A user is logged into the web interface (↗ *Chapter 9.3 "Logging into the web interface" on page 74*).

To test the relays, proceed as follows:

Installation and start-up

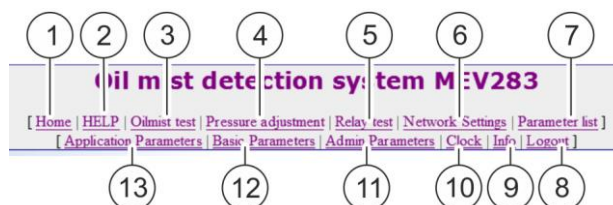


Fig. 35: Menu bar

1. Click on "Relay test" (Fig. 35/5) in the menu bar.

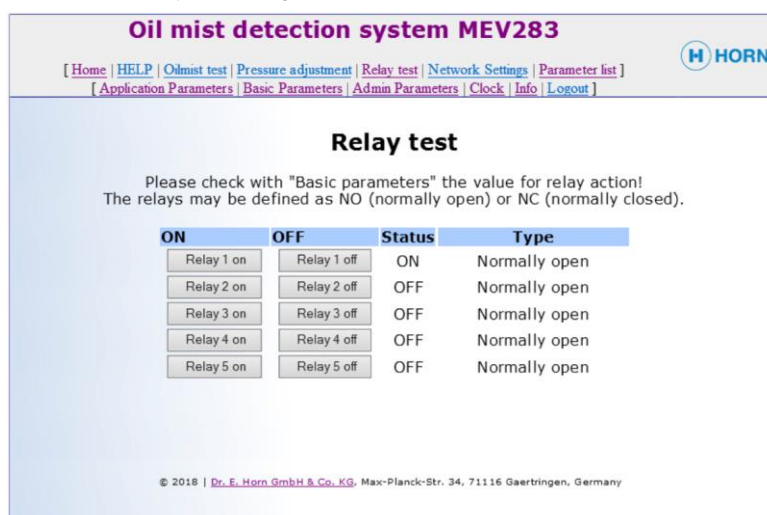


Fig. 36: "Relay test" page

- ⇒ The "Relay test" page (Fig. 36) opens.



Five relays are displayed on the page, although only four relays are implemented.
Relay 5 is a dummy relay.

2. Compare the values of the relay actions with the basic parameters (🔗 "Setting relay functions" on page 78).



The relays can either be defined as "NO" (normally open) or "NC" (normally closed).

3. For all relays, press "Relay x on".



The relay test switches the relays according to the corresponding parameters. Switching is independent of the external status of the device.
When performing the test, note the connected alarms in the higher-level alarm management system.



If the relay type is set to "normally open", the relay ON/OFF switching is opposite: in other words, "Relay on" sets the status to "OFF" and "Relay off" sets the status to "ON".



After exiting this page, the selected relays revert back to the normal status according to the setting.

⇒ The relays have been tested.

Installation and start-up

8 Operating concept

8.1 Password protection and user role

The web interface is password-protected to prevent unauthorised persons from making entries and changes. For this, various user roles are distinguished. The respective access rights are linked to the user roles. The access rights are linked to each user role by means of a password level. The higher the password level, the more far-reaching the settings that can be undertaken with the corresponding user role.



Not all pages are accessible for every user or role.

After a password has been entered, access rights of the corresponding user role are enabled.

Access to the web interface is dependent on the following access levels:

- User (no user name, no password)
- Service (user name: Service, special password)
- Admin (manufacturer; user name: Admin, special password)



Passwords are set up in the course of commissioning and are disclosed as required.

8.2 Structure of the web interface

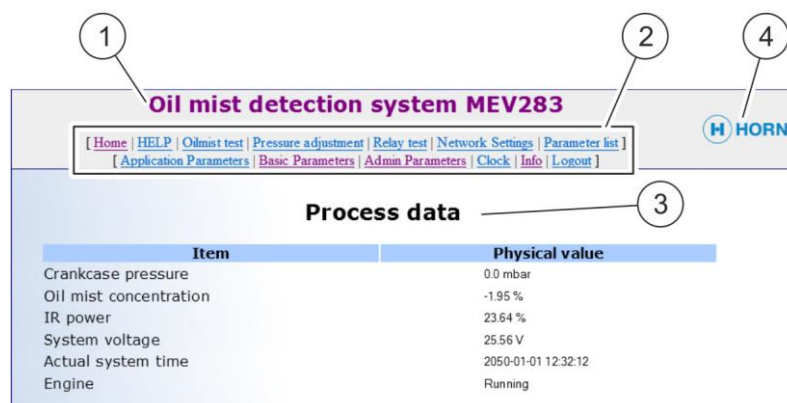


Fig. 37: Structure of the web interface

- 1 Name of device
- 2 Menu bar
- 3 Name of menu
- 4 Logo of manufacturer

9 Operation

9.1 Safety during operation

Improper operation



WARNING!

Risk of injury due to improper operation!

Improper operation can lead to serious injury or property damage.

- Perform all operating steps according to the information in these instructions.
- Prior to starting work, check that all covers and safety devices are installed and functioning correctly.
- Never disable safety devices during operation.
- Keep the work area clean and tidy. Components and tools that are loosely stacked on one another or left lying round can cause accidents.

9.2 Switching on

Personnel:	Instructed person
Protective equipment:	Protective clothing
	Puncture-resistant safety shoes
	Protective gloves
	Hearing protection
	Industrial safety helmet

Prerequisite:

- Installation and start-up have been completed (↪ *Chapter 7 "Installation and start-up" on page 63*).

To switch on the device, proceed as follows:

1. Switch on the motor control (voltage supply).
2. Configure the motor run signal (parameter P21 ↪ *"Adjusting the oil mist sensor/Activating the motor run signal" on page 77*).
 - ⇒ The motor run signal is active.
 - The device is active.

Operation

9.3 Logging into the web interface

Personnel: Maintenance personnel with additional qualification in explosion protection

Prerequisite:

- The device is switched on (↪ Chapter 9.2 “Switching on” on page 73).

To log into the web interface, proceed as follows:

1. Call up the web interface with Windows Internet Explorer.



Alternatively, use any other browser. This could, however, cause problems such as interpretation of commas and decimal points (i.e. values with commas could not be entered).

2. Enter the user name and password, and confirm by pressing “Enter”.

⇒ The user is logged in.

9.4 Setting the date and time

After the installation or following a lengthier period without power (approx. 2 days), the clock must be checked.

If error E10 appears on the home page, the clock must be reset.

Personnel: Instructed person

Prerequisite:

- The user is logged into the web interface (↪ Chapter 9.3 “Logging into the web interface” on page 74).

To set the date and time, proceed as follows:

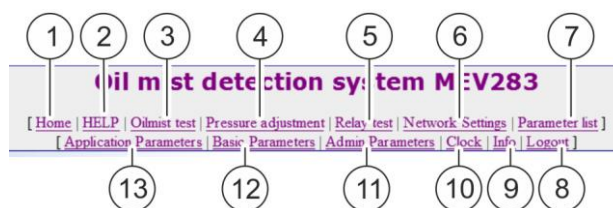


Fig. 38: Menu bar

1. Click on “Clock” (Fig. 38/10) in the menu bar.

⇒ The “Clock Setting” view appears.

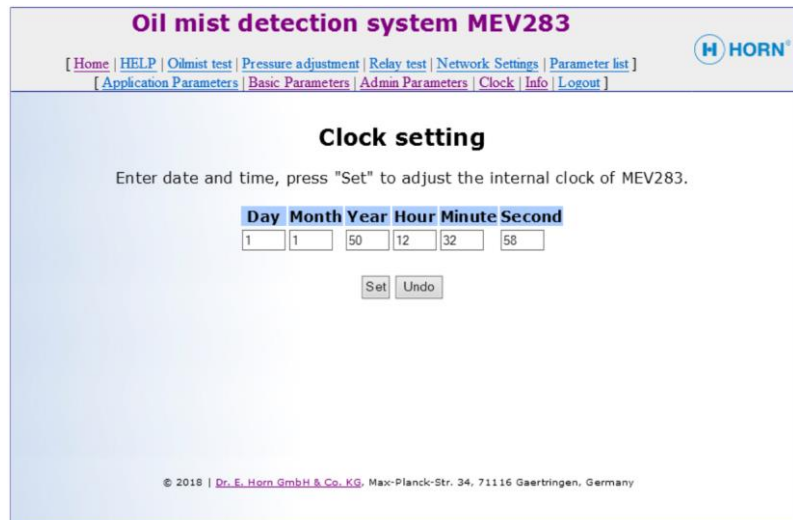


Fig. 39: "Clock Setting" page

2. Enter the date and time in the corresponding fields.
3. Confirm the input with "Set".



The date is always adjusted to the entered value, even if the entered value lies in the future. Therefore, check whether the inputs are correct.

- ⇒ The date and time are set.
If error E10 was displayed on the home page, it disappears.

9.5 Setting parameters

Incorrect parameter values



WARNING!

Danger due to incorrect parameter values!

The device cannot check the entered values. Incorrect values can lead to destruction of the motor and endanger human lives.

- After entering parameter values, always check that they are correct.

Personnel: Maintenance personnel with additional qualification in explosion protection

Prerequisite:

- The user is logged into the web interface (↪ Chapter 9.3 “Logging into the web interface” on page 74).



The actual values can be entered in the “Customer-specific setting” column.

To set the parameters, proceed as follows:

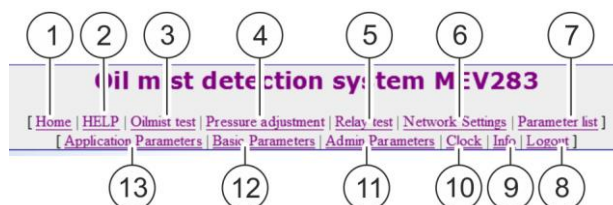


Fig. 40: Menu bar

1. Click on “Application parameters” (Fig. 40/13) or “Basic parameters” (Fig. 40/12) in the menu bar.
⇒ The corresponding page opens.

Oil mist detection system MEV283

[\[Home \]](#) [\[HELP \]](#) [\[Oilmist test \]](#) [\[Pressure adjustment \]](#) [\[Relay test \]](#) [\[Network Settings \]](#) [\[Parameter list \]](#)
[\[Application Parameters \]](#) [\[Basic Parameters \]](#) [\[Admin Parameters \]](#) [\[Clock \]](#) [\[Info \]](#) [\[Logout \]](#)

Application Parameters

Pxx-No.	Default	Min	Max	Value	Meaning/Explanation
P11	6	1	20	<input type="text" value="6"/>	Delay in (s) for oil mist alarm H09..H11
P12	8.0	0.1	10.0	<input type="text" value="8.0"/>	Oil mist increase in % before warning (H09)
P14	10.0	0.1	15.0	<input type="text" value="10.0"/>	Oil mist increase in % before load red.(H10)
P15	12.0	0.1	15.0	<input type="text" value="12.0"/>	Oil mist increase in % before autostop (H11)
P21	1	0	3	<input type="text" value="1"/>	Input ENGINE_RUNNING, 0= high active, 1= low active, 2= CAN, 3= AlwaysOn
P26	25.0	<input type="text" value="25.0"/>	25.0	<input type="text" value="25.0"/>	Pressure limit for alarm H04 [mbar]
P27	25.0	<input type="text" value="25.0"/>	25.0	<input type="text" value="25.0"/>	Pressure limit for alarm H05 [mbar]
P39	1	0	1	<input type="text" value="1"/>	Clock power fail signaling (E10): 0=Off/1=On
P70	1	0	2	<input type="text" value="1"/>	CAN Mode: 0=Off / 1=CANopen / 2=J1939
P71	1	1	127	<input type="text" value="1"/>	CAN node ID
P72	6	1	8	<input type="text" value="6"/>	CANbaud [1=20k, 50k, 100k, 125k, 250k, 500k, 800k, 8=1M]
P73	1	0	1	<input type="text" value="1"/>	CANslave auto operating mode - Object 1F80
P74	1000	0	65535	<input type="text" value="1000"/>	Cycle time for TPDO1 [ms]
P75	1000	0	65535	<input type="text" value="1000"/>	Cycle time for TPDO2 [ms]
P76	1000	0	65535	<input type="text" value="1000"/>	Cycle time for TPDO3 [ms]
P77	1000	0	65535	<input type="text" value="1000"/>	Cycle time for TPDO4 [ms]
P78	1000	0	65535	<input type="text" value="1000"/>	Heartbeat time [ms]

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Fig. 41: "Application parameters" page

2. Enter the parameter values in the respective lines.
 3. Click on "Set" to save the inputs.
- ⇒ The parameters are adjusted.



After the input of parameters in the web interface, the device performs a restart, which is essentially handled as a "switching on".



For motor-specific settings for the device with motor types W20, W20DF, W26, W31, W32 and W34DF,  parameter list in the additional applicable documents.

Adjusting the oil mist sensor/Activating the motor run signal

Pxx no.	Possible setting range	Explanation	Customer-specific Value
P11	1 – 20	Delay in seconds for oil mist alarm H09 – H11	
P12	0.1 – 10	Oil mist increase in % before warning H09 (oil mist pre-warning)	
P14	0.1 – 15	Oil mist increase in % before warning H10 (oil mist alarm – load reduction reached)	
P15	0.1 – 15	Oil mist increase in % before warning H11 (oil mist alarm – autostop level reached)	
P16	0.1 – 8000	Tolerable oil mist increase for 0.8 s (in %)	

Operation

Pxx no.	Possible setting range	Explanation	Customer-specific Value
P20	1 – 16	Digital low pass filter coefficient for oil mist	
P21	0 – 3	Check of motor run signal	
		0 = high active	
		1 = low active	
P22	0 – 250	IR power regulation factor	

Setting the crankcase pressure monitoring/Selecting the pressure range

Pxx no.	Possible setting range	Explanation	Customer-specific Value
P23	0/1/2	Pressure sensor range	1 = -25.0/+25.0 mbar
		0 = no sensor	2 = 0 – 250 mbar
P24	-25 – 25	Pressure value in mbar for the 4 mA output	
P25	-25 – 25	Pressure value in mbar for the 20 mA output	
P26	-25 – 25	Limit value for pressure increase in mbar for alarm H04	
P27	-25 – 25	Limit value for pressure increase in mbar for alarm H05	
P28	1 – 255	Digital low pass filter coefficient for the pressure output	

Setting relay functions

Pxx no.	Possible setting range	Explanation	Customer-specific Value
P32	0 – 1	Relay 1 action (SystemReady relay)	
		0 = normally opened	
P33	0 – 1	Relay 2 action (PreAlarm relay)	
		0 = normally opened	
P34	0 – 1	Relay 3 action (PressureAlarm relay)	
		0 = normally opened	
P35	0 – 1	Relay 4 action (Alarm relay)	

Pxx no.	Possible setting range	Explanation	Customer-specific Value
		0 = normally opened 1 = normally closed	

Setting real-time clock

Pxx no.	Possible setting range	Explanation	Customer-specific Value
P39	0 – 1	Clock power fail signalling (E10) 0 = Off 1 = On	

Selecting relays

The parameters P47 – P64 control which relay is activated by which event.



The table in [Chapter 4.5.6 "Connector X5" on page 53](#) contains a configuration value for each relay.

Personnel: Maintenance personnel with additional qualification in explosion protection

To determine one of the parameters P47 – P64, proceed as follows:

1. Take the configuration value from the table in [Chapter 4.5.6 "Connector X5" on page 53](#) and enter it in the "Basic parameters" list.



Example: P47 is to activate relay 4 → The setting for P47 is 16 (relay 4).

2. If the operator's alarm system needs more than one relay to be activated in the event of an alarm, add configuration values accordingly.



Example: P48 is to activate relays 2 and 3 → The setting for P48 is 4 (relay 2) + 8 (relay 3) = 12.

⇒ The relays are selected and the parameters are determined in P47 – P64.

Pxx no.	Possible setting range	Explanation	Customer-specific Value
P47	0 – 63	Relay for H04 (pressure higher than P26; "Setting the crankcase pressure monitoring/Selecting the pressure range" on page 78)	
P48	0 – 63	Relay for H05 (pressure higher than P27; "Setting the crankcase pressure monitoring/Selecting the pressure range" on page 78)	
P52	0 – 63	Relay for H09 (oil mist pre-warning)	
P53	0 – 63	Relay for H10 (oil mist alarm – load reduction reached)	

Operation

Pxx no.	Possible setting range	Explanation	Customer-specific Value
P54	0 – 63	Relay for H11 (oil mist alarm – autostop level reached)	
P61	0 – 63	Relay for E05 (oil mist control inactive)	
P62	0 – 63	Relay for E03 (error in pressure sensor)	
P63	0 – 63	Relay for E06 (error in optical measuring track, oil mist measurement not possible)	
P64	0 – 63	Relays for Exx (all errors not mentioned: E01, E08 and E10)	

Setting the CAN bus

Pxx no.	Possible setting range	Explanation	Customer-specific Value
P70	0 – 2	CAN mode	
		0 = Off 1 = CANopen 2 = J1939	
P71	1 – 127	CAN node ID	
P72	1 – 8	CAN bit rate	
		1 = 20k 4 = 125k 7 = 800k	
		2 = 50k 5 = 250k 8 = 1M	
		3 = 100k 6 = 500k	
P73	0 – 1	CANslave auto operating mode – Object 1F80	
P74	0 – 65535	Cycle time for TPDO1 [ms]	
P75	0 – 65535	Cycle time for TPDO2 [ms]	
P76	0 – 65535	Cycle time for TPDO3 [ms]	
P77	0 – 65535	Cycle time for TPDO4 [ms]	
P78	0 – 65535	Heartbeat time [ms]	

9.6 Changing the IP address

Personnel:

Maintenance personnel with additional qualification
in explosion protection

Prerequisite:

- The user is logged into the web interface (↪ Chapter 9.3 “Logging into the web interface” on page 74).

To change the IP address, proceed as follows:

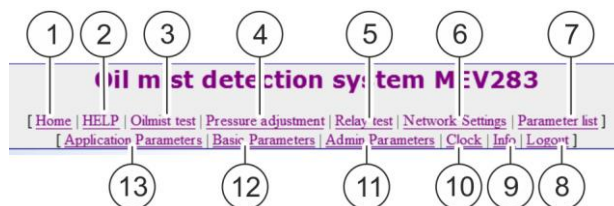


Fig. 42: Menu bar

1. Click on “Network Settings” (Fig. 42/6) in the menu bar.

⇒ The “Network Settings” page opens.

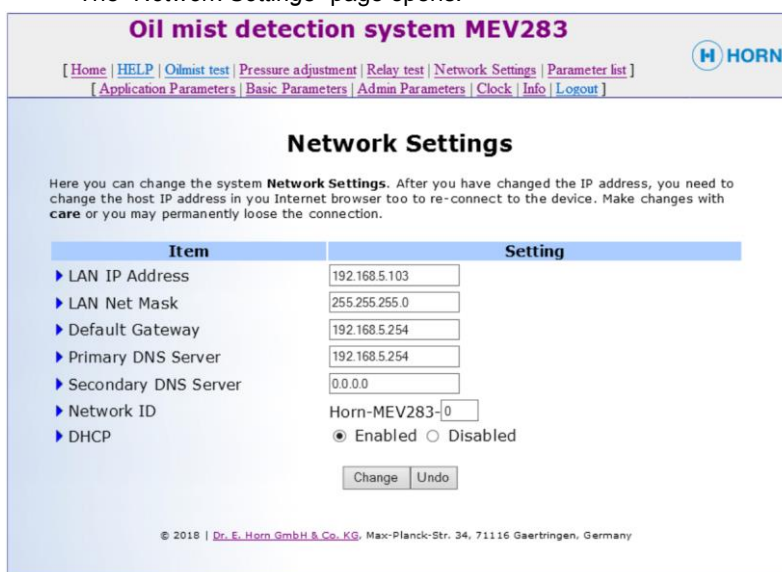


Fig. 43: “Network Settings” page

2. Changing the IP address

3. To connect the device again, change the host ID address in the browser.



Carefully double-check the changes; otherwise the connection could be lost.

4. **Multiple devices in the network:** Edit the network ID so that the device can be called up with “horn-mev283-<ID>”.

5. Confirm changes with “Change”.

⇒ The IP address has been changed.

9.7 Saving the error and event list

Personnel:

Maintenance personnel with additional qualification in explosion protection

Operation

Prerequisite:

- The user is logged into the web interface (☞ *Chapter 9.3 “Logging into the web interface” on page 74*).

To save errors and events, proceed as follows:

1. Right-click on the errors and events list.
⇒ A context menu opens.
2. Click on “Save as”.



Or, instead of steps 1 and 2, press the key combination “Ctrl S”.

⇒ The “Save as” window opens.

3. Enter name, select storage location and confirm with “Save”.
⇒ The errors and events list is saved.

9.8 Calibrating the pressure sensor

This function recalibrates the pressure sensor to the external air pressure (0 mbar).

The pressure must be readjusted if the ambient atmospheric pressure changes.

An error of the pressure sensor or of the wiring is displayed as error message E03 (“Error pressure sensor”).

Personnel: Maintenance personnel with additional qualification in explosion protection

Protective equipment: Protective clothing
Puncture-resistant safety shoes
Hearing protection
Industrial safety helmet

Prerequisites:

- The motor is switched off.
- The user is logged into the web interface (☞ *Chapter 9.3 “Logging into the web interface” on page 74*).



The housing must be aligned **vertically** for the calibration.

To calibrate the pressure sensor, proceed as follows:

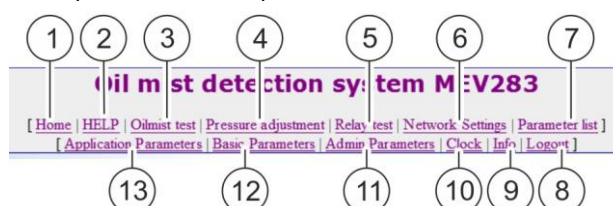


Fig. 44: MEV283 menu bar

1. Click on *"Pressure adjustment"* (Fig. 44/4) in the menu bar.
⇒ The *"Pressure adjustment"* page opens.

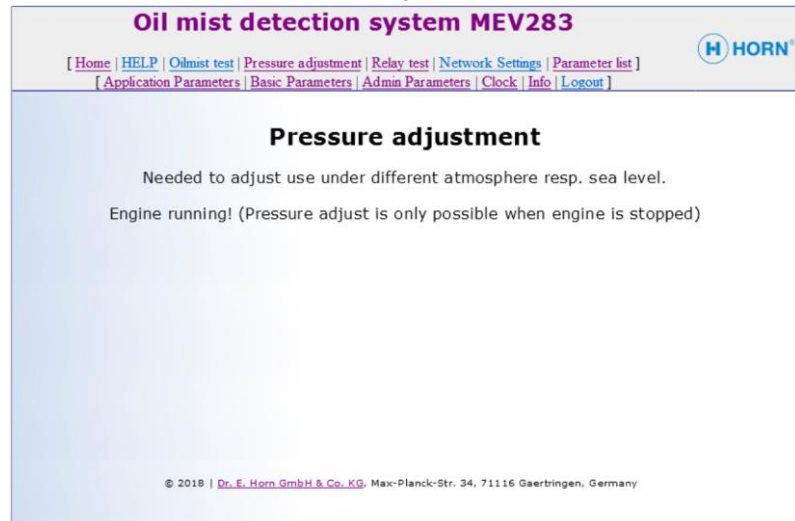


Fig. 45: *"Pressure adjustment"* page

2. Check that the correct sensor for P23 (⚙ "Setting the crankcase pressure monitoring/Selecting the pressure range " on page 78) is entered in the parameter list.



A corresponding error signal at a relay output is possible, providing this is set in the basic parameters.

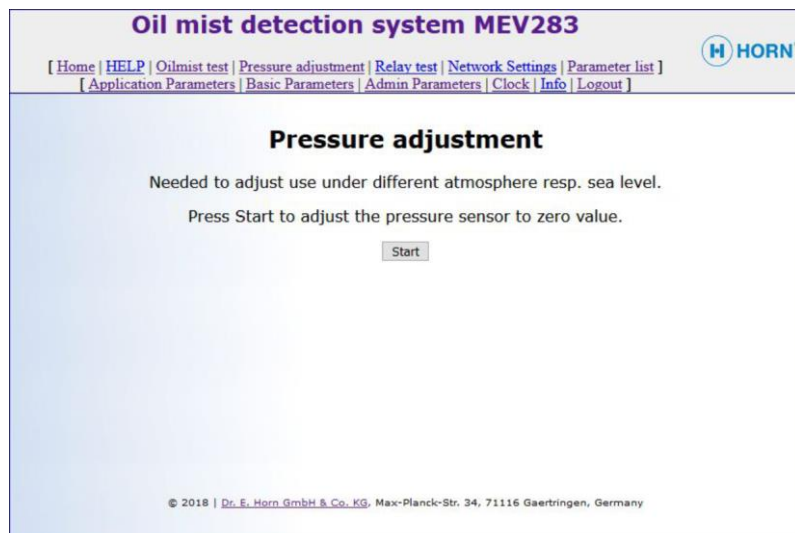


Fig. 46: *Starting the "Pressure adjustment"*

3. On the web interface on the *"Pressure adjustment"* page, click on *"Start"*.
⇒ The sensor is calibrated.

9.9 Logging out from the web interface

Operation

Personnel: Maintenance personnel with additional qualification in explosion protection

Prerequisite:

- A user is logged into the web interface (↪ Chapter 9.3 “Logging into the web interface” on page 74).

To log the user out of the web interface, proceed as follows:

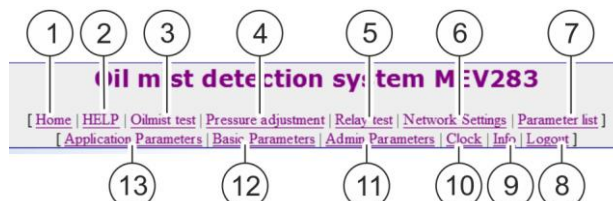


Fig. 47: Menu bar

1. Click on “Logout” (Fig. 47/8) in the menu bar.

⇒ The “Logout” page (Fig. 48) opens.



Fig. 48: “Logout” page

2. Close your browser.

⇒ The user is logged out.

9.10 Switch off.

Personnel: Instructed person

Protective equipment: Protective clothing

Puncture-resistant safety shoes



Only switch off the device if it is to be taken **out of operation for a lengthier period.**

Prerequisite:

- The motor is at a standstill.

To switch off the device, proceed as follows:

- ▶ Disconnect device from the voltage supply.
 - ⇒ The device is switched off.

10 Maintenance

10.1 Safety during maintenance

Unauthorised reactivation



DANGER!

Danger of death due to unauthorised reactivation!

If switched-off energy supplies are switched back on without authorisation, this poses a fatal hazard to persons working on the device.

- Always secure switched-off energy supplies against reactivation.

Infrared light beam



WARNING!

Risk of eye injury from infrared light beam!

When maintenance work is performed on the optical measuring track, there is a risk of eye injury from the infrared light beam.

- Never look directly into the infrared light beam.

Improperly performed maintenance work



WARNING!

Risk of injury due to improperly performed maintenance work!

Improper maintenance can lead to serious injury or property damage.

- Prior to starting work, ensure that adequate freedom of movement for assembly is available.
- Ensure that the assembly area is clean and tidy. Components and tools that are loosely stacked on one another or left lying round can cause accidents.
- If components were removed, install all fastening elements again while paying attention to proper assembly and observing the specified screw tightening torques.

Incorrect replacement parts



WARNING!

Danger due to use of incorrect replacement parts!

Use of incorrect replacement parts or parts not approved by the manufacturer can lead to substantial property damage or complete failure of the device. This could also endanger human lives.

- Only use original replacement parts.

Maintenance

10.2 Maintenance schedule

Maintenance work

The sections below describe the maintenance tasks that must be carried out for optimal and trouble-free operation of the device. The prescribed time intervals must be observed.

The stated time intervals are based on single-shift operation with 8 hours of operation on 5 days in the week and represent the minimum intervals. If the device is used more than 8 hours daily or on more than 5 days in the week, it is the operator's responsibility to shorten the intervals accordingly to the actual operation time.

Should increased wear be detected at regular inspections, shorten the required maintenance intervals accordingly for the actual signs of wear. For questions regarding maintenance work and maintenance intervals, contact customer service (☎ "Customer service" on page 3).

Interval	Maintenance work	Personnel
approx. every 1,000 operating hours	Perform oil mist test. ☞ Chapter 10.3.1 "Performing oil mist test on the web interface" on page 89 or ☞ Chapter 10.3.2 "Performing the oil mist test manually" on page 91	Maintenance personnel with additional qualification in explosion protection
As needed	Check pressure. ☞ Chapter 10.3.3 "Checking pressure" on page 93	Maintenance personnel with additional qualification in explosion protection
	Clean optical measuring track (error E08). ☞ Chapter 10.3.7 "Cleaning the optical measuring track" on page 101	Instructed person

10.3 Maintenance work

10.3.1 Performing oil mist test on the web interface

Personnel: Maintenance personnel with additional qualification in explosion protection

Prerequisite:

- A user is logged into the web interface (↩ Chapter 9.3 “Logging into the web interface” on page 74).

To perform the oil mist test on the web interface, proceed as follows:

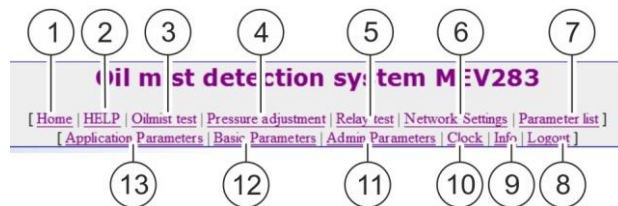


Fig. 49: Menu bar

1. Click on “Oil mist test” (Fig. 49/3) in the menu bar.

⇒ The “Oil mist test” page (Fig. 50) opens.



Fig. 50: “Oil mist test” page

2. Press “Start” to start the oil mist test.

⇒ The text “Oil mist test triggered” appears on the web interface (Fig. 51).

Maintenance

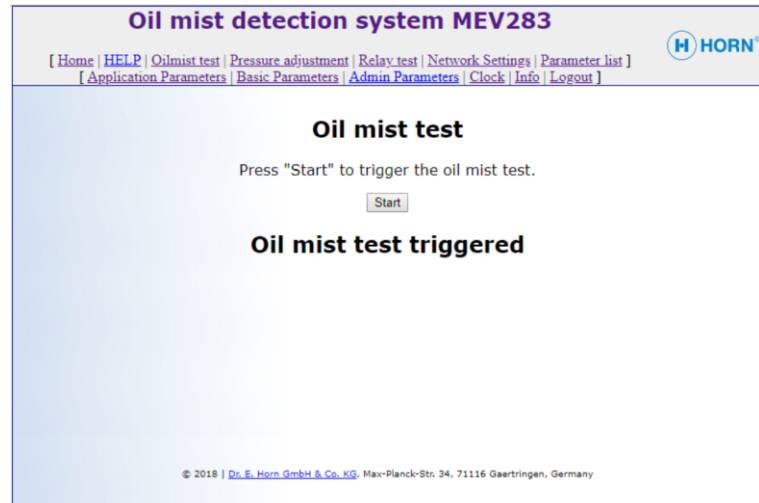


Fig. 51: "Oil mist test" page

3. Click on "Home" (Fig. 49/1) in the menu bar.

⇒ The home page opens.

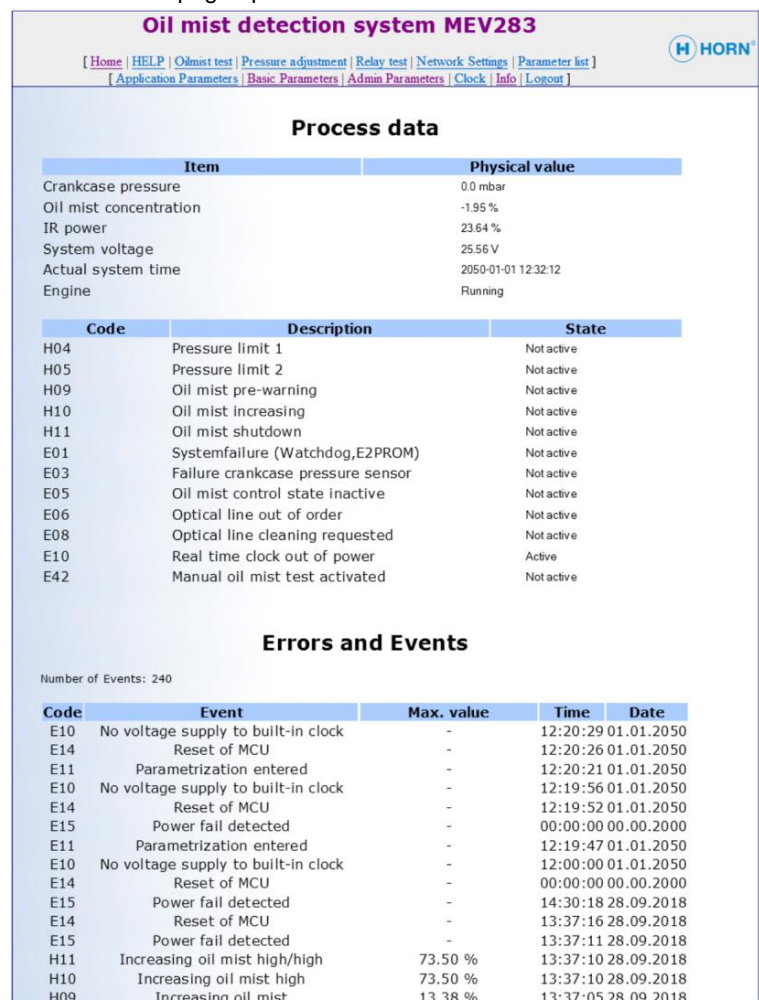


Fig. 52: Home page: example

H09 – H11 are displayed as "Active". An event is saved in the event list.



When the oil mist test is completed, H09 – H11 are displayed again as "Not active".

10.3.2 Performing the oil mist test manually

Personnel:	Instructed person
Protective equipment:	Protective clothing
	Puncture-resistant safety shoes
	Hearing protection
	Industrial safety helmet
	Protective gloves

Prerequisite:

- The device is switched on (↗ Chapter 9.2 “Switching on” on page 73).

To trigger the oil mist test manually, proceed as follows:

1. After switching on the device, wait 5 minutes to ensure that the device functions properly.



This time is required to calibrate the optical measuring track with the device. The system activates the pre-warning relay and the alarm relay (depending on the relay setting in the parameter list).

2. Hold the “Oil mist test” button pressed for 8 seconds until the LED ring of the button lights up red.



If the button is pressed too long, the red indicator light of the LED ring switches off and the test does not start.

⇒ The test is performed (↗ Chapter 10.3.1 “Performing oil mist test on the web interface” on page 89).

The “Alarm” LED flashes successively in the rhythm of errors H09 – H11.



When the oil mist test ends, the “Alarm” LED no longer flashes.



This test can also be started via CAN (↗ “Starting the oil mist test via CAN” on page 92).

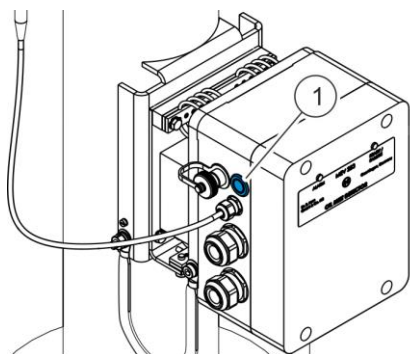


Fig. 53: Oil mist test button

The following time sequences of the manufacturer serve as an aid and show how the flow for introducing the test functions.

Maintenance

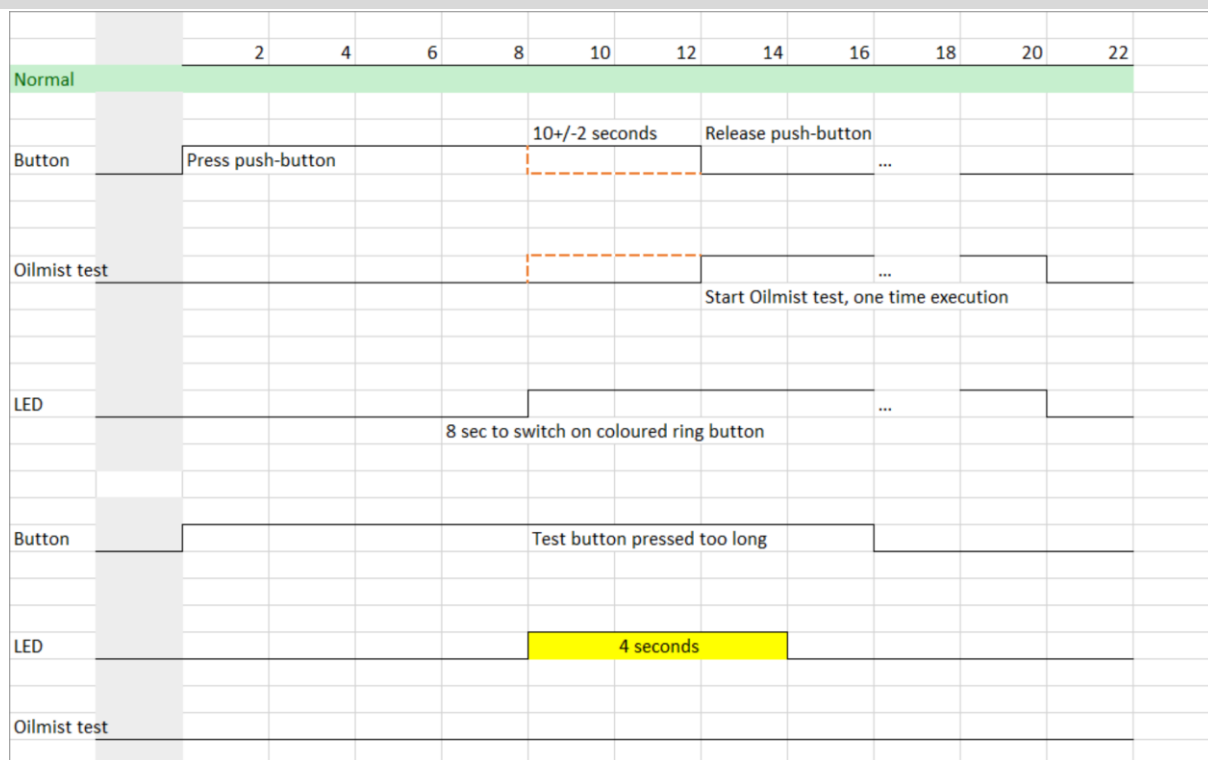


Fig. 54: Time sequence of manual oil mist test

Starting the oil mist test via CAN

Personnel:

Maintenance personnel with additional qualification in explosion protection

To start the oil mist test via CAN, proceed as follows:

- Set the command "CAN oil mist test start" via the motor control to "1" and then to "0".



If the CAN signal is activated for too long, the red indicator light of the LED ring switches off and the test does not start.

⇒ The test is performed.

The "Alarm" LED flashes successively in the rhythm of errors H09 – H11.



When the oil mist test ends, the "Alarm" LED no longer flashes.

10.3.3 Checking pressure

Personnel:	Maintenance personnel with additional qualification in explosion protection
Protective equipment:	Protective clothing
	Puncture-resistant safety shoes
	Industrial safety helmet
	Protective gloves

To check the pressure (for error E03), proceed as follows:

1. Check whether the pressure sensor is correctly mounted on the pipe.
2. Check for damaged wiring:
Wiring damaged: Replace the wiring.
Wiring OK: Check connection at X4/3 and X4/4 (↪ Chapter 4.5.5 "Connector X4" on page 51).
3. Measure signal:
< 2 mA: Replace damaged sensor (↪ Chapter 10.3.4 "Replacing the pressure sensor" on page 93).
> 2 mA – < 22 mA: Sensor is OK.
> 22 mA: Replace damaged sensor (↪ Chapter 10.3.4 "Replacing the pressure sensor" on page 93).
⇒ The pressure is checked.

10.3.4 Replacing the pressure sensor

Personnel:	Maintenance personnel with additional qualification in explosion protection
Protective equipment:	Protective clothing
	Puncture-resistant safety shoes
	Protective gloves
	Industrial safety helmet
	Safety goggles

To replace the pressure sensor, proceed as follows:

1. Disconnect device from the power supply.

Maintenance

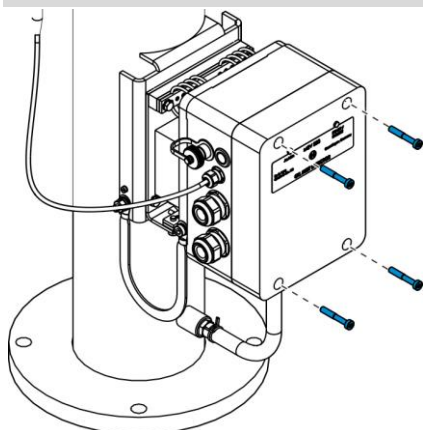


Fig. 55: Removing screws

2. Remove the screws of the housing cover (Fig. 55).

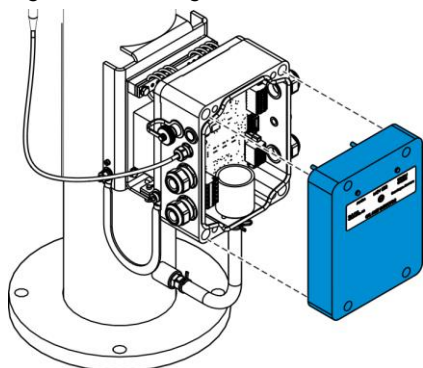


Fig. 56: Removing the housing cover

3. Remove the housing cover (Fig. 56).

Removing the pressure sensor

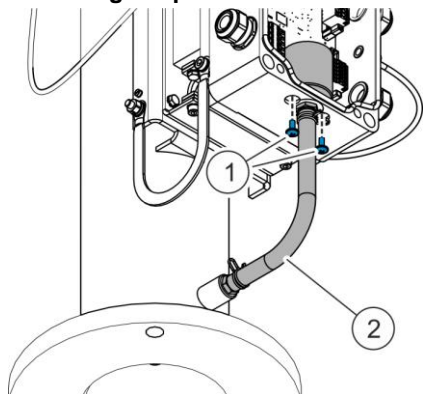


Fig. 57: Removing the screws on the pressure sensor

4. Undo screws (Fig. 57/1) and set them aside where they cannot be lost.
5. Remove connecting hose (Fig. 57/2).
6. Remove connector J3.
⇒ The pressure sensor is removed.

Installing the pressure sensor

7. Connect connector J3.

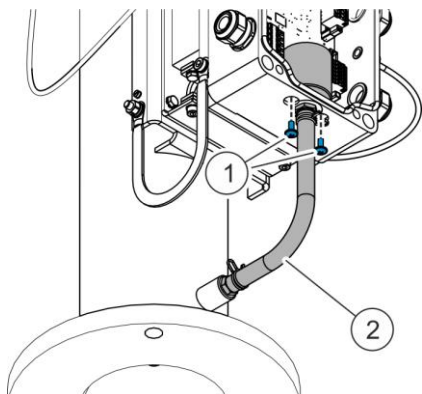


Fig. 58: Inserting the screws on the pressure sensor

8. Attach connecting hose (Fig. 58/2).
9. Tighten screws (Fig. 58/1).
⇒ The pressure sensor is installed.

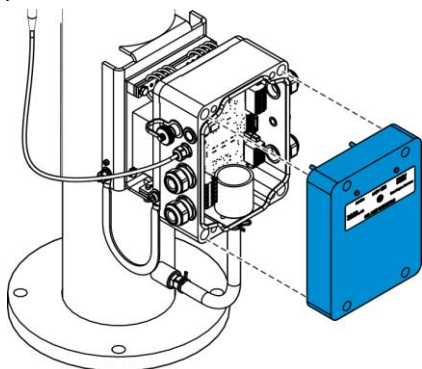


Fig. 59: Attaching the housing cover

10. Attach the housing cover (Fig. 59).

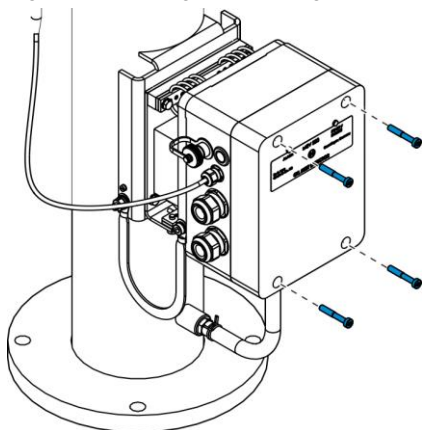


Fig. 60: Inserting screws

11. Tighten the screws of the housing cover (Fig. 60).

10.3.5 Checking the optical measuring track

Maintenance

Personnel:	Maintenance personnel with additional qualification in explosion protection
Protective equipment:	Protective clothing
	Puncture-resistant safety shoes
	Protective gloves
	Industrial safety helmet
	Safety goggles

To check the optical measuring track (error E06), proceed as follows:

Oil mist detection system MEV283

[\[Home \]](#) [\[HELP \]](#) [\[Oilmist test \]](#) [\[Pressure adjustment \]](#) [\[Relay test \]](#) [\[Network Settings \]](#) [\[Parameter list \]](#)
[\[Application Parameters \]](#) [\[Basic Parameters \]](#) [\[Admin Parameters \]](#) [\[Clock \]](#) [\[Info \]](#) [\[Logout \]](#)

Process data

Item	Physical value
Crankcase pressure	0.0 mbar
Oil mist concentration	-1.95 %
IR power	23.64 %
System voltage	25.56 V
Actual system time	2050-01-01 12:32:12
Engine	Running

Errors and Events

Number of Events: 240

Code	Description	State
H04	Pressure limit 1	Not active
H05	Pressure limit 2	Not active
H09	Oil mist pre-warning	Not active
H10	Oil mist increasing	Not active
H11	Oil mist shutdown	Not active
E01	Systemfailure (Watchdog,E2PROM)	Not active
E03	Failure crankcase pressure sensor	Not active
E05	Oil mist control state inactive	Not active
E06	Optical line out of order	Not active
E08	Optical line cleaning requested	Not active
E10	Real time clock out of power	Active
E42	Manual oil mist test activated	Not active

Code	Event	Max. value	Time	Date
E10	No voltage supply to built-in clock	-	12:20:29	01.01.2050
E14	Reset of MCU	-	12:20:26	01.01.2050
E11	Parametrization entered	-	12:20:21	01.01.2050
E10	No voltage supply to built-in clock	-	12:19:56	01.01.2050
E14	Reset of MCU	-	12:19:52	01.01.2050
E15	Power fail detected	-	00:00:00	00.00.2000
E11	Parametrization entered	-	12:19:47	01.01.2050
E10	No voltage supply to built-in clock	-	12:00:00	01.01.2050
E14	Reset of MCU	-	00:00:00	00.00.2000
E15	Power fail detected	-	14:30:18	28.09.2018
E14	Reset of MCU	-	13:37:16	28.09.2018
E15	Power fail detected	-	13:37:11	28.09.2018
H11	Increasing oil mist high/high	73.50 %	13:37:10	28.09.2018
H10	Increasing oil mist high	73.50 %	13:37:10	28.09.2018
H09	Increasing oil mist	13.38 %	13:37:05	28.09.2018

Fig. 61: MEV283 home page

1. Check the optical measuring track.

To do this, check the light intensity ("*IR power*") on the home page.

Light intensity between 20% and 70%: The optical measuring track is in order. The optical measuring track is checked.

Light intensity < 20% or > 70%: The optical measuring track is not in order. Continue with step 3.

2. Check the wiring of the optical sensors on the housing.

Connections damaged: Replace connections (↗ “Disconnecting the transmitter and receiver” on page 97 and ↗ “Connecting the transmitter and receiver” on page 100).

Cable break: Replace the transmitter and receiver (↗ Chapter 10.3.6 “Replace the transmitter and receiver” on page 97).

Connections OK; no cable break: transmitter and receiver are damaged.

Replace the transmitter and receiver (↗ Chapter 10.3.6 “Replace the transmitter and receiver” on page 97).

⇒ The optical measuring track is checked.

10.3.6 Replace the transmitter and receiver

Personnel:	Maintenance personnel with additional qualification in explosion protection
Protective equipment:	Protective clothing
	Puncture-resistant safety shoes
	Industrial safety helmet
	Safety goggles
	Protective gloves

To remove the transmitter and receiver, proceed as follows:

Disconnecting the transmitter and receiver

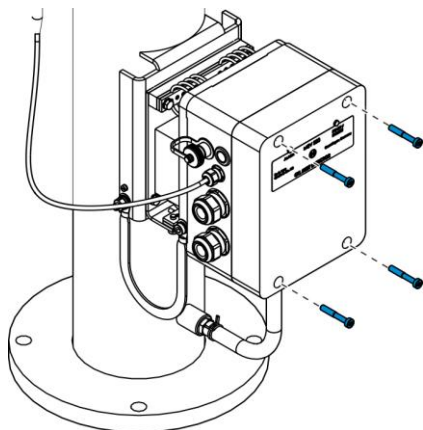


Fig. 62: Removing screws

1. Disconnect device from the power supply.
2. Remove the screws of the housing cover (Fig. 62).

Maintenance

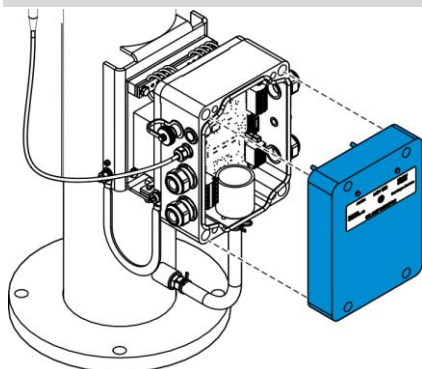


Fig. 63: Removing the housing cover

Removing the cable from the housing

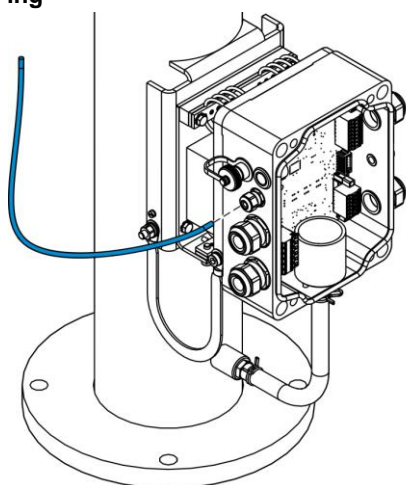


Fig. 64: Removing the cable from the screw connection

Removing the transmitter and receiver

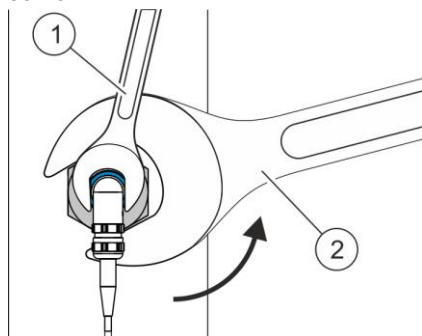


Fig. 65: Releasing the nut of the transmitter

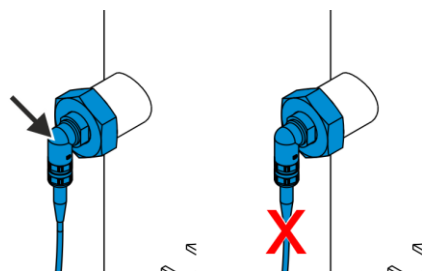


Fig. 66: Removing the transmitter

3. Remove the housing cover.
4. Unplug the connections in the housing (connectors X2 and X3).
⇒ The transmitter and receiver are disconnected.



If there is a cable break, the cable must be replaced.

5. Remove the transmitter cable from the cable gland.
6. On the other side, remove the receiver cable from the cable gland.
⇒ The cables are removed from the housing.

7. Disconnect device from the power supply.
8. Place a 20 mm open-ended spanner (Fig. 65/1) on the transmitter in front of the nut to hold the transmitter in position.
Release the fixing nut with a 46 mm open-ended spanner (Fig. 65/2) in the direction of the arrow.
9. Carefully turn the transmitter with the 20 mm open-ended spanner approx. 30° in both directions to release the transmitter.
10. Manually undo the fixing nut far enough until the thread no longer engages.



NOTICE!

Risk of property damage from pulling on cables!

11. Do not pull on the cable to remove the transmitter.
Pull out the cable gland of the transmitter (Fig. 66/arrow) to remove the transmitter.
⇒ The transmitter of the optical measuring track is removed.

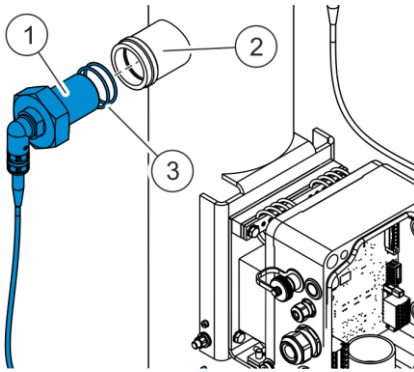


Fig. 67: Removing transmitter and O-rings

12. Set the O-rings (Fig. 67/3) aside where they cannot be lost.
13. Clean the assembly opening of the oil mist ventilation pipe (Fig. 67/2) on the inside.
14. Repeat steps 8 – 13 on the other side for the receiver.
 - ⇒ The transmitter and receiver of the optical measuring track are removed.

Personnel:	Maintenance personnel with additional qualification in explosion protection
Protective equipment:	Protective clothing
	Puncture-resistant safety shoes
	Industrial safety helmet
	Protective gloves

To install the transmitter and receiver of the optical measuring track, proceed as follows:

Maintenance

Installing the transmitter and receiver

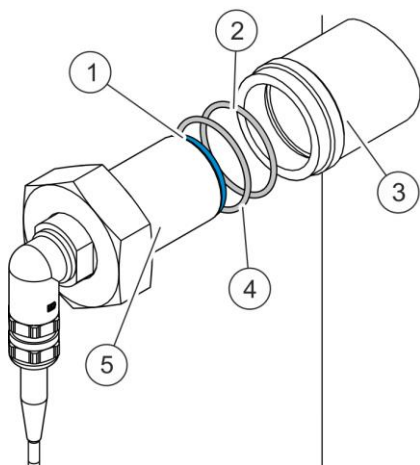


Fig. 68: Attaching O-rings

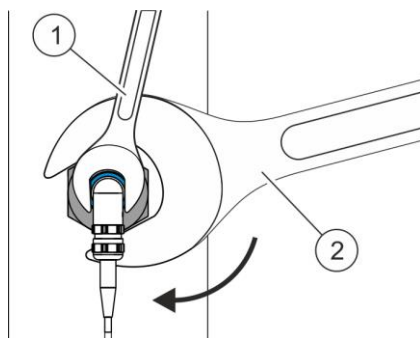


Fig. 69: Tightening the nut of the transmitter

Inserting cables in the housing

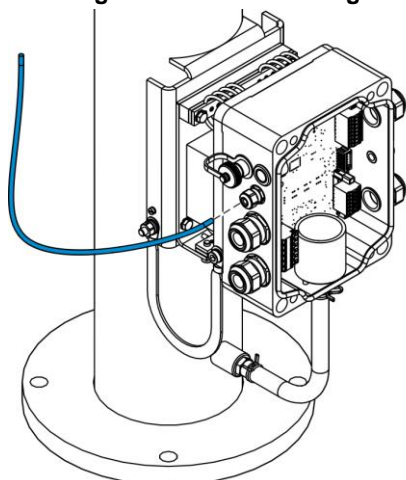


Fig. 70: Inserting cable in screw connection

Connecting the transmitter and receiver

1. If the O-ring (Fig. 68/1) was removed with the transmitter (Fig. 68/5) from the assembly opening of the oil mist ventilation pipe (Fig. 68/3), grease the O-ring with acid-free grease or motor oil.
2. Place the O-ring (Fig. 68/1) in the assembly opening of the oil mist ventilation pipe (Fig. 68/3).



The O-ring must lie flat at the end of the opening.

3. Insert the O-rings (Fig. 68/2, 4) into the grooves located in the assembly opening of the oil mist ventilation pipe.
4. Grease the exterior surface of the transmitter (Fig. 68/5).
5. Manually insert the transmitter (Fig. 68/5) into the assembly opening of the oil mist ventilation pipe.



NOTICE!

Risk of damaging the cable by turning the sensor during installation!

6. Attach the fixing nut with the 46 mm open-ended spanner (Fig. 69/2) while holding the transmitter in position with the 20 mm open-ended spanner (Fig. 69/1).
7. Tighten the fixing nut with a torque of 25 Nm.
8. Repeat steps 1 – 7 on the other side for the receiver.
 - ⇒ The transmitter and receiver of the optical measuring track are installed.

9. Insert the transmitter cable into the cable gland.
10. On the other side, insert the receiver cable into the cable gland.
 - ⇒ The cables are inserted in the housing.

11. Plug the connections into the housing (connectors X2 and X3).

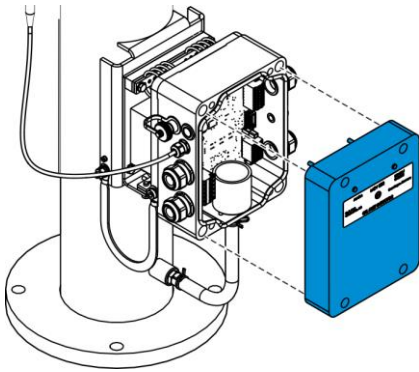


Fig. 71: Attaching the housing cover

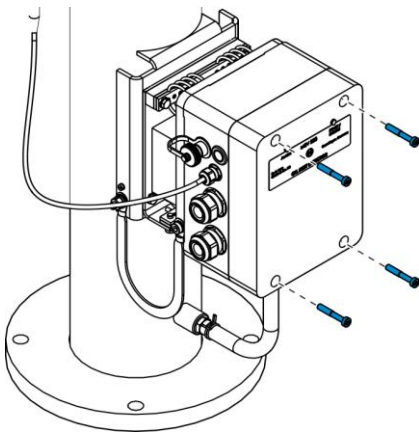


Fig. 72: Inserting screws

12. Attach the housing cover (Fig. 71).

13. Tighten the screws of the housing cover (Fig. 72).

14. Connect device to the power supply.

⇒ The transmitter and receiver are connected.

10.3.7 Cleaning the optical measuring track

Personnel:	Maintenance personnel with additional qualification in explosion protection
Protective equipment:	Protective clothing
	Puncture-resistant safety shoes
	Industrial safety helmet
	Protective gloves

To clean the optical measuring track (error E08), proceed as follows:

1. Remove the transmitter and receiver (☞ "Removing the transmitter and receiver" on page 98).
 2. Clean the surfaces of the optical elements on the front of the sensors with a cotton bud dipped in industrial-grade alcohol (ethanol).
 3. Install the transmitter and receiver (☞ "Installing the transmitter and receiver" on page 100, up to step 8).
- ⇒ The optical measuring track is cleaned. The error codes disappear from the home page.

Maintenance

10.4 After maintenance

1. Remove any dirt from the work area of the device.
2. Check that disassembled components are properly mounted again, that removed covers have been reattached and that all safety devices are functional again.
3. Gather any tools and operating materials that were required and remove them from the work area of the device.

11 Troubleshooting

11.1 Safety during troubleshooting

Unauthorised reactivation



DANGER!

Danger of death due to unauthorised reactivation!

If switched-off energy supplies are switched back on without authorisation, this poses a fatal hazard to persons working on the device.

- Always secure switched-off energy supplies against reactivation.

Incorrect troubleshooting



WARNING!

Risk of injury due to incorrect troubleshooting!

If troubleshooting measures are performed improperly, serious injury and considerable property damage could result.

- Have work in regard to troubleshooting carried out only by qualified personnel.
- Only carry out the troubleshooting measures described in these instructions.
- Prior to starting work, ensure that adequate freedom of movement for assembly is available and that the assembly area is tidy.

11.2 Procedure in the event of faults

Faults leading to dangerous situations

If a fault presents a recognisable danger for persons or could result in property damage, proceed as follows:

1. Shut down the device.
2. Inform your supervisor of the fault.

Faults that do not lead to dangerous situations

If a fault is present that prevents further operation of the device without prior intervention, proceed as follows:

1. Check whether the fault can be remedied based on the fault message that was issued.
2. Check whether the fault table provides any additional helpful information.
3. Remedy the fault or assign suitably qualified personnel do so.

11.3 Fault indications

The warnings and error codes are output for the following components:

- CAN
- Ethernet

Troubleshooting

- Signal LEDs (↪ *Chapter 2.3.1 "Signal LEDs" on page 16*)
- Information on the web interface

11.3.1 Signal LEDs



For information on the signal LEDs ↪ *Chapter 2.3.1 "Signal LEDs" on page 16*.

11.3.2 Information on the web interface

Alarm codes

- | | | |
|-----|---|----------------------|
| H04 | - | Pressure over P26 |
| H05 | - | Pressure over P27 |
| H09 | - | Oil mist pre-warning |
| H10 | - | Increase in oil mist |
| H11 | - | Oil mist autostop |

Error codes

- | | | |
|-----|---|---|
| E01 | - | The watchdog function detected a problem in the software or in the EPROM checksum.
This could arise if a power failure occurs during switching on and the operator cannot end the process in the correct mode. |
| E03 | - | The crankcase pressure is not correct.
↪ <i>Chapter 10.3.3 "Checking pressure" on page 93</i> |
| E05 | - | The device is inactive. This is the case if the motor run signal is not active and after each switching on of the system. |
| E06 | - | The optical measuring track is disabled and oil mist detection is no longer possible.
↪ <i>Chapter 10.3.5 "Checking the optical measuring track" on page 95</i> |
| E08 | - | The transmission power of the measuring track exceeds a defined value (85%) of its maximum value and cleaning of the optics is requested.
↪ <i>Chapter 10.3.7 "Cleaning the optical measuring track" on page 101</i> |
| E10 | - | If this error code is present, read out the error code via the Ethernet or CAN connection and set the current time.
↪ <i>Chapter 9.4 "Setting the date and time" on page 74</i> |

11.4 Troubleshooting

Fault description	Cause	Remedy	Personnel
The device does not measure any values.	The device does not run because the motor is not running (E05).	Switch on the device. ↳ Chapter 9.2 "Switching on" on page 73	Instructed person
	The transmitter and receiver are dirty (E08).	Clean the transmitter and receiver. ↳ Chapter 10.3.7 "Cleaning the optical measuring track" on page 101	Maintenance personnel with additional qualification in explosion protection
	The transmitter is faulty (E06).	Replace transmitter. ↳ Chapter 10.3.6 "Replace the transmitter and receiver" on page 97	Maintenance personnel with additional qualification in explosion protection
	The receiver is faulty (E06).	Replace receiver. ↳ Chapter 10.3.6 "Replace the transmitter and receiver" on page 97	Maintenance personnel with additional qualification in explosion protection
The status LEDs do not light up.	The device is off.	Switch on the device. ↳ Chapter 9.2 "Switching on" on page 73	Instructed person
	The connection to the LEDs is faulty.	Send the device in for repair (↳ "Customer service" on page 3).	
	The LEDs are faulty.	Send the device in for repair (↳ "Customer service" on page 3).	
The date and time are incorrect.	Error E10 is displayed on the web interface.	Set the date and time (↳ Chapter 9.4 "Setting the date and time" on page 74).	
The device does not measure any pressure.	The pressure sensor is not plugged in.	Plug in the pressure sensor.	
	The amperage at the analogue output is not 4 – 20 mA.	Check analogue output. If necessary, send the device in for repair (↳ "Customer service" on page 3).	

12 Disassembly

After use

Once the device has reached the end of its useful life, it must be disassembled and disposed of in an environmentally sound manner.

Prior to disassembly

- Switch off the device and secure it against being switched on again.
- Physically disconnect the entire electricity supply from the device.

Disassembly of the housing

Personnel: Installation specialist

Protective equipment: Protective clothing

Puncture-resistant safety shoes

Protective gloves

Industrial safety helmet

Safety harness



WARNING!

Danger of explosion with housing opened in explosive atmospheres!

An explosive atmosphere must not/must no longer be present when the housing is opened, as otherwise there is a danger of explosion.

- Only open the housing if an explosive atmosphere is not or is no longer present.

Prerequisite:

- The device is switched off (↪ *Chapter 9.10 "Switch off." on page 84*).

To disassemble only the housing, proceed as follows:

Disassembly

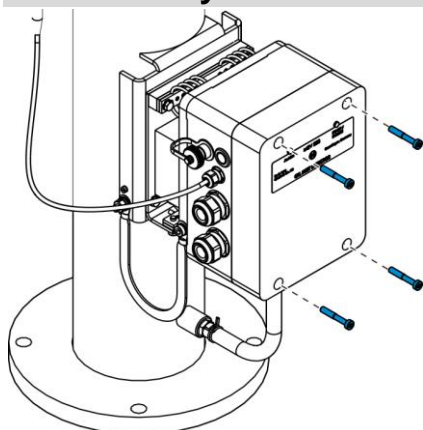


Fig. 73: Removing screws

1. Remove the screws of the housing cover (Fig. 73).

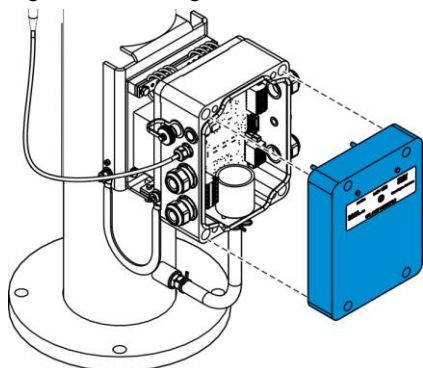


Fig. 74: Removing the housing cover

2. Remove the housing cover (Fig. 74).

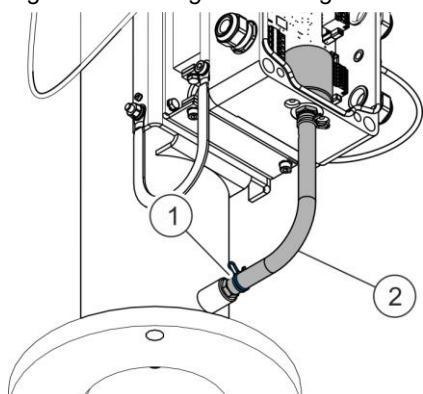


Fig. 75: Removing clip on pressure hose

3. Remove the clip (Fig. 75/1) below on the pressure hose.
4. Remove the pressure hose (Fig. 75/2).
5. Remove the transmitter and receiver (☞ "Removing the transmitter and receiver" on page 98).

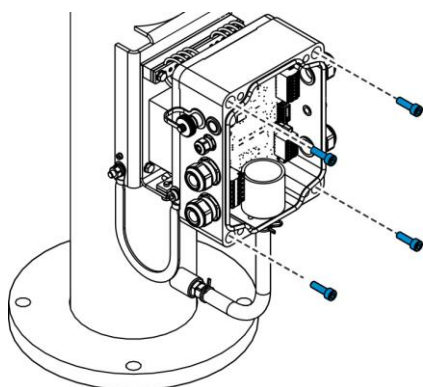


Fig. 76: Removing the housing

6. Remove the screws (Fig. 76).
7. Take off the housing.
⇒ The housing is disassembled.

Disassembly of the device

Personnel:	Electrician with additional qualification in explosion protection
	Installation specialist
Protective equipment:	Protective clothing
	Puncture-resistant safety shoes
	Protective gloves
	Industrial safety helmet
	Safety harness

Prerequisite:

- The device is switched off (↗ *Chapter 9.10 "Switch off." on page 84*).

To remove the device, proceed as follows:

Disconnecting from the network

1. Disconnect the Ethernet connection. To do this, remove the cable in connector X284.
2. Disconnect the power connection. To do this, remove the cable in connector X1.

Removing device

3. Remove the operator-supplied screws from the device.
4. Remove the device from the recess of the on-site pipeline.
5. Remove the operator-supplied seals.
6. Seal the connection in the on-site pipeline with a pipe end.
 - ⇒ The device is removed.

13 Disposal

Incorrect disposal

Constituent parts of the device



Fig. 77: Not household waste



NOTICE!

Harm to the environment due to incorrect disposal!

Incorrect disposal can pose hazards to the environment.

- Have electrical scrap, electronic components, lubricants, and other auxiliary materials disposed of only by authorised specialist companies.
- In case of doubt regarding environmentally sound disposal, request information from local authorities or specialist disposal companies.

If no return or disposal agreement was made, send the dismantled constituent parts to a recycling centre:

- Scrap metals.
- Recycle plastic elements.
- Dispose of remaining components, sorted according to material.

Constituent parts of the device designated with the adjacent symbol should never be disposed of as regular household waste. Disposal of these components may only be performed by locally authorised specialist companies.

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