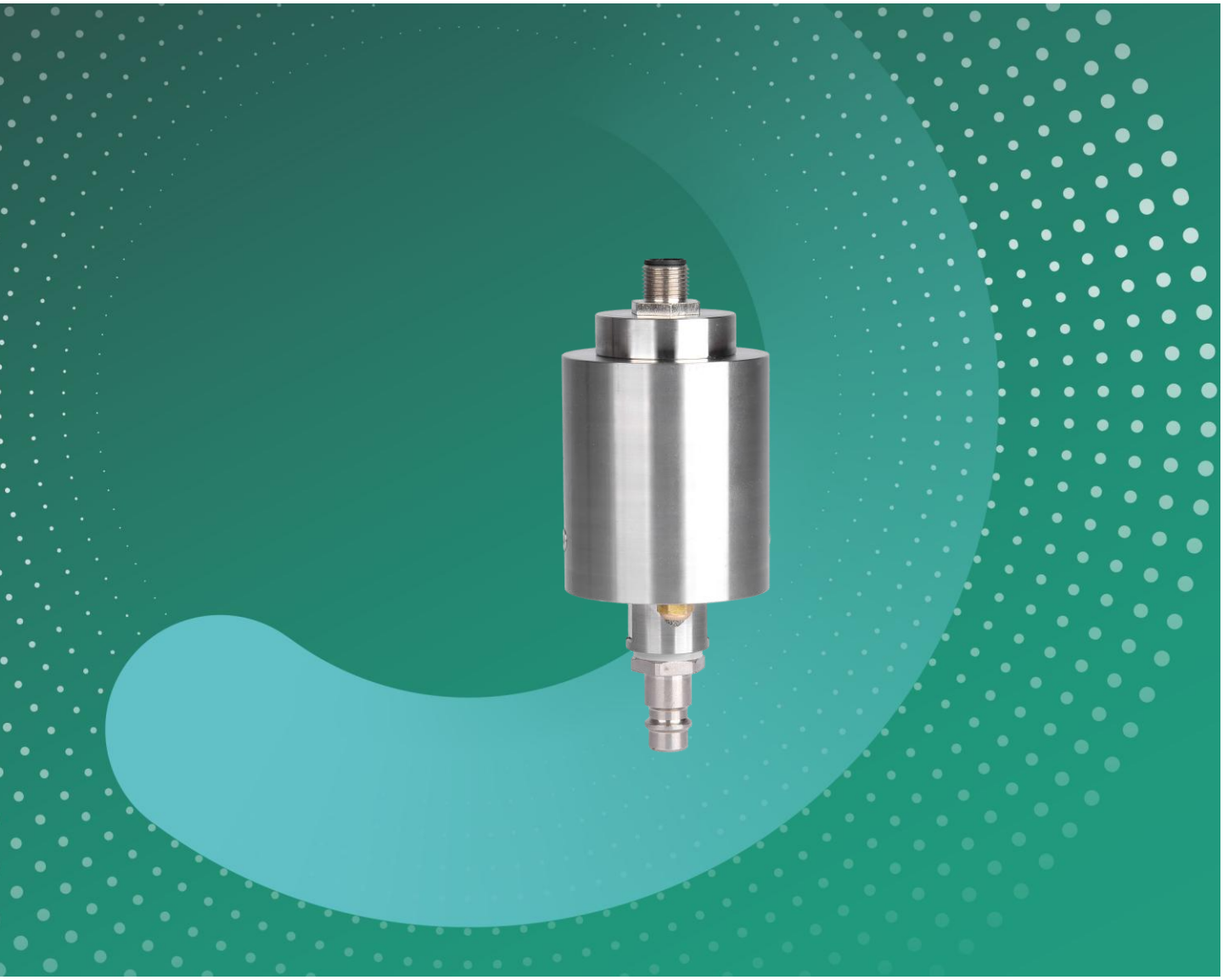
CS INSTRUMENTS

Translation of the original operating instructions

EN

OIL CHECK 511 / OIL CHECK 512

| COMPRESSED AIR QUALITY |



The completeness and accuracy of this documentation have been carefully checked. We reserve the right to make technical changes at any time. These changes may result in deviations from the information provided in this documentation.

The original document was published in the manufacturer's national language (German). All translations are copies of the original document and are only valid in conjunction with the original.

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1 General information

For the sake of simplicity, this documentation refers to the product "OIL CHECK 511 / OIL CHECK 512," which will be referred to as **product** hereinafter.

1.1 Documentation

This documentation contains safety instructions and guidelines for proper operation.

▷ Read this documentation before commissioning the unit and make sure you understand its contents.

▷ Keep this documentation handy.

1.2 Symbols and labels used

The following markings and symbols are used in this documentation:

Labeling/symbol	Usage
Text	Important text passages are highlighted
2 Security	Cross-reference to text passage, figure or chapter
•	Enumeration, list element
▷	Call to action as part of an instruction. Can also be numbered.
✓	Final or intermediate result of an instruction
✗	Final or intermediate result of an instruction that has not been achieved
ⓘ	Note on an intermediate result

Table 1: Symbols and labels used

1.3 Safety instructions and notes

Safety instructions describe hazards, possible consequences, and protective measures.

▷ Be sure to follow the safety instructions before performing the respective task.



DANGER
Indicates an imminent danger.
Death or very serious injuries may result.



WARNING
Indicates a potentially dangerous situation.
Death or serious injury may result.



CAUTION
Indicates a potentially dangerous situation.
Slight or minor injuries may result.



NOTICE
Indicates a potentially harmful situation.
Material or environmental damage may result.



NOTE
Indicates important information, application tips, and useful information for proper working.

2 Security

The product has been designed, manufactured, and functionally tested in accordance with applicable safety regulations.

To ensure operational safety, please observe the following:

- Chapter "Intended use"
- Chapter "Organizational measures to be taken by the operator"
- Chapter "Residual hazards"

Regardless of the instructions provided in this manual, all applicable country-specific occupational health and safety regulations must be observed.

2.1 Intended use

The operational safety of the product supplied is only guaranteed if it is used as intended.

This product is a high-precision measuring device for monitoring the residual oil content in compressed air systems. It helps ensure compliance with the quality classes defined in ISO 8573-1 through continuous, indicative monitoring of the oil vapor content in accordance with the measurement procedures specified in ISO 8573-5.

The product is considered to be used as intended, in particular, when

- the product is operated within the specified pressure range,
- the permissible medium temperature is maintained,
- only gaseous, non-corrosive, and non-aggressive carrier gases are used,
- contact with liquids or aerosols is avoided—in particular through suitable pre-filtration,
- the installation is carried out in such a way that condensation within the product is prevented (e.g., through appropriate temperature control), and
- calibration and maintenance are performed regularly by qualified personnel.

Any use outside these conditions is considered improper and may lead to malfunctions or irreversible damage. This applies in particular if pressure or temperature limits are exceeded or if liquids or hazardous substances enter the system.

Any use beyond or contrary to these instructions is considered improper. The manufacturer assumes no liability for any resulting damage.

Intended use also includes:

- Adherence to the supplied documentation
- Compliance with all inspection and maintenance requirements specified by the manufacturer

Reasonably foreseeable misuse includes, in particular:

- Overheating the product
- Contact with unsuitable media, e.g., aggressive, corrosive, or contaminated media
- Use as a climbing aid
- Operation outside the technical specifications
- Any modifications to the product that do not correspond to the intended and described procedures
- Continuous, unprotected outdoor operation in wet conditions or when directly exposed to the elements
- Use in areas at risk of explosion

2.2 Organizational measures of the operator

The operator must ensure that the product is used as intended and only when it is in perfect working order. Damaged or improperly modified products must not be used.

Instructions

The operator must make the instructions available at all times to persons assigned to perform tasks on the product. The operator must ensure that the applicable guidelines for the respective tasks are followed.

Personnel

The operator may only assign persons who possess the knowledge and qualifications required for their tasks. They must be instructed on the hazards involved and the necessary protective measures.

Before starting work, these individuals must have read and understood the sections of the instructions relevant to their tasks. This also applies to individuals who work on the product only occasionally.

Safety regulations

The operator must ensure compliance with the safety and occupational safety regulations applicable at the site of use. In doing so, the specific requirements of the respective application as well as hazards posed by the equipment, the environment, and, where applicable, any substances used must be taken into account.

2.3 Residual risks



DANGER

Risk of injury due to insufficiently qualified personnel

Improper handling of the product can lead to serious personal injury and damage to property. All work described in these instructions may only be carried out by qualified specialists.

Qualified personnel are persons with appropriate training and in-depth knowledge of measurement, control, regulation and compressed air technology. They must also be familiar with the applicable national regulations, standards and directives and be able to assess risks independently.



DANGER

Risk of injury from escaping fluid and unsecured equipment components

Media escaping under pressure and system components coming loose can cause serious or fatal injuries.

- ▷ Before performing installation or maintenance work, disconnect the affected system components from all power sources. Safely discharge any stored energy and verify that the system is de-energized. Secure the system components against unintentional energization.
- ▷ Use installation materials suitable for the medium and operating pressure, as well as appropriate, serviceable tools.
- ▷ Inspect the system components for damage and ensure that all screw connections are tight. Tighten any loose screw connections in accordance with the specified tightening torques.
- ▷ Lay and secure piping properly.
- ▷ Open valves and shut-off devices in a controlled manner to prevent sudden changes in pressure or flow.
- ▷ Ensure that any escaping medium does not endanger people or damage property.
- ▷ Avoid transmitting excessive vibrations, oscillations, and impacts to the product.
- ▷ Before commissioning, perform a leak test in accordance with the specifications for the system.



WARNING

Danger when operating outside the specified limit values

Operation outside the approved operating, storage, or transport conditions may endanger people, cause property damage, and distort measured values.

▷ Adhere to the limit values and conditions specified on the nameplate and in the technical data.



WARNING

Danger from pressure, high temperatures, or fire

Excessive pressure, excessive temperatures, or fire can cause serious injury or property damage. Required safety devices are not included in the scope of delivery.

▷ Observe the operating limits approved for your facility.

▷ Ensure that appropriate protective measures are in place to prevent pressure and temperature exceedances, especially in the event of a fire.

▷ At the installation site, adhere to the permissible environmental conditions and take potential fire hazards into account.



WARNING

Risk of injury due to unauthorized modifications

Unauthorized modifications can cause injuries and malfunctions.

▷ Do not modify the product on your own.

▷ Use only original components.



CAUTION

Danger due to product malfunctions

Improper installation or maintenance can cause malfunctions and dangerous misinterpretations.

▷ Observe all applicable regulations and safety requirements during installation and operation.



CAUTION

Risk of burns from hot surfaces

Hot process media can cause pipes, measuring sections, and connected components to become very hot.

▷ Allow the components to cool before touching them.

▷ Wear appropriate protective gloves if necessary.



NOTICE

Measurement errors and product damage caused by liquids and contaminants

Aerosols, liquids, condensate, and solid contaminants in the measured medium can contaminate or damage the sensor and distort the measured values.

▷ Use only the measurement media approved for the specific version of the product.

▷ Install a suitable compressed air filter upstream of the product to trap aerosols and liquids.

▷ Ensure that no condensate can enter the product.

3 Cybersecurity

To ensure safe use throughout the product's entire service life, the cybersecurity measures described in this chapter must be followed.

Security environment and interfaces

The product can be integrated into higher-level control and monitoring systems via the interfaces provided for the respective product version. The available interfaces and functions are described in the technical data. Protection against unauthorized physical or digital access must be ensured through restricted access to the product as well as through appropriate protective measures in the connected systems and networks.

Secure integration into higher-level systems

The product is intended for integration into controlled systems and, where applicable, into protected networks. An unprotected connection may result in unauthorized access to the product, transmitted data, or connected systems.

- ▷ Connect the product only to trusted devices and higher-level systems.
- ▷ Restrict physical and digital access to the product, the connection cables, and the communication interfaces.
- ▷ Ensure that only authorized persons and systems have access to the product.
- ▷ Protect connected systems and networks with appropriate access control measures.
- ▷ Do not expose communication interfaces unprotected on publicly accessible networks.
- ▷ Enable only the communication interfaces and services that are necessary, provided they are configurable.
- ▷ Document the product’s integration and any security-related changes to the connected systems.

Update device software

Device software updates may contain security-related improvements and bug fixes.

- ▷ Check the manufacturer’s website during initial commissioning and regularly thereafter to see if a current firmware version is available.
- ▷ Install security-related updates promptly.
  - ⓘ The product does not support automatic installation of security updates.
- ▷ Use only update files provided by the manufacturer.
  - ⓘ For further information, see chapter "8.5 Update device software".

Impact of changes on data security

Changes to communication, security, or configuration settings may affect the integrity, confidentiality, and availability of data, as well as the functionality of the product and connected systems.

- ▷ Have changes performed exclusively by authorized technical personnel.
- ▷ Change only settings and functions that are documented and approved for the user.
- ▷ Do not modify reserved or undocumented parameters.
- ▷ Verify security-related settings before applying them.
- ▷ After making changes, verify that data transmission and product functionality are working properly.
- ▷ Document any safety-related changes.

Report security-related incidents

- ▷ Report suspected security issues or vulnerabilities to security@cs-instruments.com.
- ▷ For information on reporting security-related vulnerabilities and the Coordinated Vulnerability Disclosure (CVD) process, visit the manufacturer’s website under the “Product Security” section.

Product lifecycle and support

Security updates and the handling of security-related vulnerabilities are provided for a support period of 5 years from the order date.

Secure decommissioning and transfer

Depending on the product version, measurement, configuration, network, access, or log data may be stored in the product or in connected systems. This data must be taken into account before transfer, decommissioning, or disposal.

▷ Disconnect the product from all higher-level systems and networks.

▷ Remove any personal, confidential, and customer-specific data, if such data is stored in the product.

▷ Reset customer-specific settings, provided the product supports this feature.

▷ Remove the product from the configuration and device management of connected systems.

▷ Check whether any product-related data is still stored in connected systems.

Intended use from a cybersecurity perspective

From a cybersecurity perspective, intended use requires the following:

- Operation in an industrial environment with restricted access
- Access and modifications only by authorized users and systems
- Disabling of unnecessary communication interfaces and services
- Use of approved device software only
- Protection through appropriate network and access security measures

Reasonably foreseeable cybersecurity-related misuse

Reasonably foreseeable cybersecurity-related misuse includes, in particular:

- Operation on publicly accessible or unsecured networks
- Connection to untrusted devices or networks
- Disabling, bypassing, or manipulating security features
- Using outdated device software despite available security updates
- Use of insecure login credentials or sharing of login credentials
- Unauthorized changes to network or security settings

ⓘ These misuse scenarios can compromise the confidentiality, integrity, and availability of the product and connected systems and lead to unauthorized access, data loss, tampering, or malfunctions.

ⓘ The EU declaration of conformity can be found in the appendix or on the manufacturer’s website.

4 OIL CHECK 511 / OIL CHECK 512

The product is designed for continuous, indicative monitoring of the concentration of vaporous oil components in compressed air and the gaseous media approved for the respective version. It enables the detection of elevated oil concentrations and the monitoring of concentration trends.

The product can be used at suitable points of measurement in media supply, media treatment, or media distribution systems. Typical points of measurement include points of use, points of measurement upstream of critical processes or machines, and points of measurement downstream of media treatment. This requires that the operating conditions specified for the product be observed.

The measurement gas bypass flow is discharged into the environment via the air outlet. The sintered filter integrated into the air outlet protects the product from the ingress of contaminants from the environment.

The measured values can be transmitted to higher-level control or monitoring systems via a galvanically isolated 4–20 mA output and an RS-485 interface with Modbus RTU.

4.1 Product overview

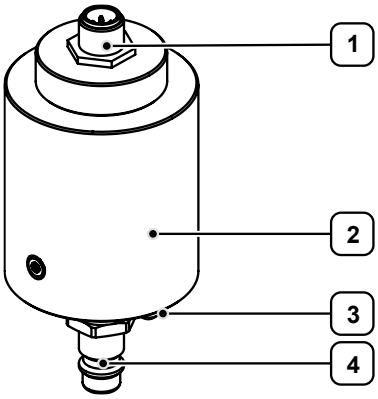


Figure 1: OIL CHECK 511 / OIL CHECK 512 (example)

1	M12 electrical connector	**3**	Air outlet
2	Measuring chamber	**4**	Process connection

4.2 Type plate



Figure 2: Nameplate (example)

1	Manufacturer information	**4**	Technical specifications
2	Electrical connection data	**5**	Material/Serial number
3	Conformity/Certification markings	**6**	Product name

4.3 Scope of delivery

Depending on the version of the product ordered, the scope of delivery includes:

- OIL CHECK 511 / OIL CHECK 512
- M12 connector
- Calibration certificate
- Translation of the original operating instructions

4.4 Applicable documents

Depending on the version, please also note the following documents:

Document	Contents
Operating Instructions - Service Software	Configuration, parameterization, and data retrieval and transmission
Operating Instructions - Modbus Installation	Information on Additional Modbus Registers

Table 2: Related documentation

5 Transportation and storage

NOTE

Improper transport, improper storage, or improper commissioning may cause damage to or malfunctions in the product, for which the manufacturer, (CS INSTRUMENTS), assumes no liability and provides no warranty.

5.1 Delivery

Transport damage

▷ Check the delivered components for any visible transportation damage.

▷ Report any transportation damage to the following parties immediately:

- the carrier
- the manufacturer's customer service (CS INSTRUMENTS)

▷ Ensure that the product is handled properly during transportation.

Packaging

▷ Keep the original packaging for any future transportation or storage.

5.2 Storage

To prevent damage caused by environmental factors, the product must be stored properly when not in use.

▷ If possible, store the product in its original packaging.

▷ Store the product in dry, dust-free rooms.

▷ Keep the product away from direct sunlight, heat sources, and corrosive or aggressive chemicals.

6 Installation and commissioning

CAUTION

Danger from commissioning a damaged product

If a damaged product is installed or put into operation, it may result in functional failures, electrical hazards, or mechanical risks.

- ▷ Before each commissioning, inspect the product, accessories, and all supply lines for visible damage, loose parts, or missing components.
- ▷ Immediately take any defective product out of operation immediately.

NOTICE

Damage to the product caused by aerosols and liquids

Aerosols and liquids in the measured medium can contaminate or damage the sensor and distort the measured values.

- ▷ Install a suitable compressed air filter upstream of the product to trap aerosols and liquids.
- ▷ Operate the product only with a compressed air filter installed upstream.

6.1 Set up measuring point

Set up a measurement location

NOTICE

Appropriate measurement location

The choice of measurement location affects the reliability of the measured values. The measured medium sampled at the sampling point must be representative of the condition of the medium being monitored.

- ▷ Select a measurement location where a homogeneous distribution of the vapor-phase oil components can be assumed.
- ▷ Select the measurement location downstream of the complete media treatment process and the final filter stage specified for the respective system.
- ▷ Do not select a measurement location upstream of the media treatment process or between individual treatment stages.
- ▷ Do not select a measurement location where liquids or condensate can enter the product.
- ▷ Use a fixed measurement location for continuous monitoring.

To obtain meaningful measured values, the measurement location must be properly installed.

Prerequisite

- The affected section of the system must be depressurized, secured against re-pressurization, and verified to be free of pressure.

- ▷ Select a suitable installation location for the measurement location.
- ▷ Install an oil- and grease-free shutoff valve between the product and the process to facilitate maintenance work.
- ▷ Set up the measurement location so that the product can be safely separated from the pressurized part of the system.
- ▷ Do not install the product below the sampling point, as liquids or condensate could enter the product and damage it.
- ▷ Check that the connection components are securely fastened.

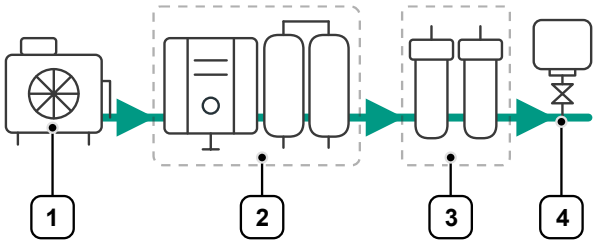


Figure 3: General layout of the measurement location

1	Compressor	**3**	Final filter stage
2	Media treatment (e.g., drying and adsorption)	**4**	Measurement location with product

6.2 Connect product

Connect the product pneumatically

Prerequisite

- The measurement location has been set up.
- The relevant part of the system has been depressurized, secured against re-pressurization, and checked to ensure it is free of pressure.

▷ Remove the protective cap from the process connection.

▷ Connect the product's process connection to the prepared measurement location.

▷ Slowly apply pressure to the relevant section of the system.

▷ Slowly open the shut-off valve to apply pressure to the product.

▷ Check the connection for a secure fit and leaks.

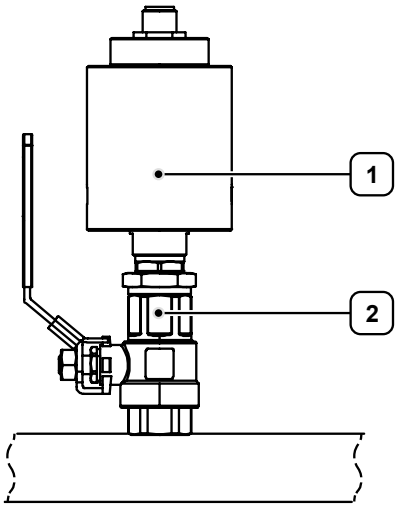


Figure 4: Connecting the product – Example of a G 1/2" process connection

1	G 1/2" process connection	**2**	Ball valve with G 1/2" female thread

NOTICE

Damage to the product caused by an incorrect electrical connection

An incorrect supply voltage or incorrect pin assignment can damage the product and cause malfunctions.

▷ Disconnect the product from the power supply before connecting or disconnecting electrical connections.

▷ Secure the power supply to prevent accidental reconnection.

▷ Operate the product exclusively within the specified supply voltage range.

▷ Connect the product according to the specified pin configuration.

▷ Check all electrical connections before commissioning.

Connect the product to a power source

▷ Make all necessary electrical connections to the product.

ⓘ If no connection cable was ordered, the product is shipped with an M12 connector.

▷ Follow the country-specific electrical safety regulations.

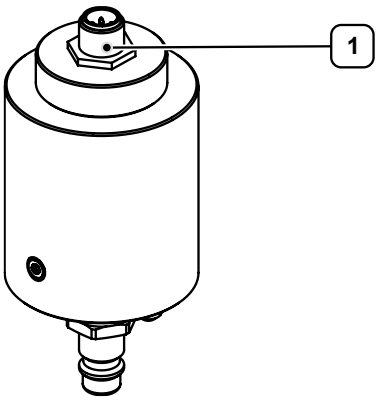


Figure 5: Connecting the product to the power supply (example)

1 Connector A

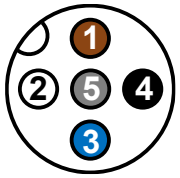
Designation	Pin assignment	Wire color	Plug
A Electrical connection	Pin 1 (VB+ (positive power supply))	brown	
	Pin 2 (Modbus (A))	white	
	Pin 3 (VB- (negative power supply GND))	blue	
	Pin 4 (Modbus (B))	black	
	Pin 5 (I+ (analog output))	gray	

Table 3: Pin assignment

6.3 Putting the product into service and turning it on/off

Putting the product into service

CAUTION

Temperature equalization before commissioning

Significant temperature fluctuations, such as those caused by transport or storage, can damage the product or result in inaccurate measured values.

▷ Make sure the product has reached ambient temperature, especially after storage below 20°C.

▷ Do not put the product into service until it has fully equilibrated to ambient temperature.

NOTICE

Escaping measured medium

A partial flow of the measured medium continuously escapes from the air outlet during operation.

▷ Keep the air outlet clear.

▷ Do not block or cover the air outlet.

▷ Do not direct the air outlet toward people.

▷ Ensure that the measured medium can be safely discharged into the surrounding area.

Prerequisite

- The product is properly connected to the pneumatics system.
- The required compressed air filter is installed upstream of the product.
- The product is electrically connected according to the pinout.
- The air outlet is unobstructed.
- The escaping measured medium can be safely discharged into the environment.

▷ Turn on the power supply.

▷ After turning on the power, wait until the measured value stabilizes.

ⓘ After commissioning, the measuring chamber must first be completely flushed with the measured medium.

ⓘ Depending on the system and storage conditions, it may take up to 24 hours for the measured value to stabilize.

Turning the product on and off

Prerequisite

- The product has been properly installed and electrically connected.

▷ To turn on the product, connect it to the power supply.

▷ To turn off the product, disconnect it from the power supply.

7 Residual oil measurement

7.1 Adjust measurement parameters

Each measuring instrument undergoes a comprehensive calibration process prior to shipment. This involves calibration and verification using certified reference systems across multiple concentration levels.

If necessary, the instrument can be readjusted for the specific location where it will be used.

NOTICE

Incorrect measured values due to changed calibration parameters

Improper changes to calibration parameters can lead to significant measurement errors.

▷ Have calibration parameters changed only by qualified personnel with knowledge of the system and the monitored application.

NOTICE

Matching scaling

The scaling of the product and the connected signal conditioner must match. Otherwise, the transmitted measured values will be interpreted incorrectly.

▷ Ensure that the values specified for 4…20 mA match the scaling of the connected signal conditioner.

NOTE

If the measured values need to be updated at short intervals of a few days, it is recommended to maintain the product and its process coupling and to subject the gas or compressed air used to a laboratory analysis.

7.2 Perform the measurement

Relative and absolute concentration

Oil vapor typically consists of complex mixtures of molecules, not a single gas. The conversion to mg/m³ is therefore based on the assumption of a typical average molecular weight according to ISO 8573-5, relative to the vapor phase under near-standard conditions.

The performance data stated in the calibration certificate are based on single gas measurements with certified test gas.

- ppm values: typical deviation ±10%
- mg/m³ values: systematic deviation of ±20% due to unknown molecular masses in the field

NOTE

Unknown molecular composition leads to increased uncertainty in determining the absolute value (mg/m³).

Typical standard volumetric flow rate

The standard volumetric flow rate through the product depends on the process pressure and the orifice diameter used.

▷ Ensure a standard volumetric flow rate between 100 and 500 Nml/min.

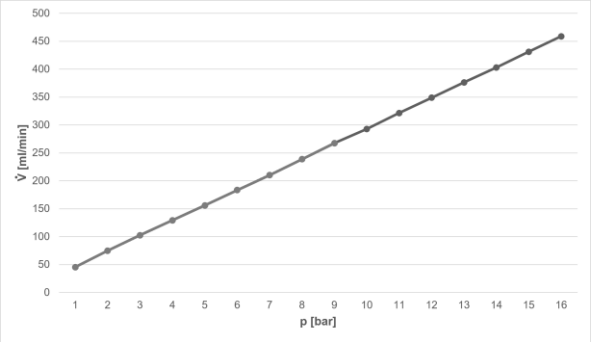


Figure 6: Typical standard volumetric flow rate as a function of process pressure and orifice diameter [1]

NOTICE

Measurement errors due to pressure changes

The measurement technology used in the product generally operates independently of flow rate. However, rapid or large pressure changes (> 2 bar) can affect the measurement, particularly at low concentrations of vapor-phase oil components.

▷ Avoid pressure surges and large pressure fluctuations in the product to ensure reliable measured values.

[1] The values shown are typical values and may vary by approximately ±10%.

8 Maintenance and servicing

NOTICE

Property damage caused by improper maintenance

Improper work can damage the product and cause malfunctions.

▷ Have maintenance work performed only by qualified persons.

▷ Have work on the electrical equipment performed only by qualified electricians or by trained personnel under the direction and supervision of a qualified electrician. Be sure to follow the applicable electrical safety regulations.

▷ Have any repairs or adjustments that go beyond the maintenance and replacement procedures described in this manual performed exclusively by the manufacturer.

▷ Use only spare parts that meet the manufacturer's technical specifications.

NOTE

Unless otherwise specified in this manual, do not begin any maintenance or servicing work until

- the product has been turned off and disconnected from the power supply,
- the product has been secured against being turned back on, and
- it has been verified that there is no voltage present.

8.1 Clean the product

Perform a visual inspection

▷ Inspect the product annually for damage, corrosion, and dirt.

▷ Do the product's cleaning as needed.

Clean the product

▷ Clean the exterior surfaces as needed with a slightly damp, lint-free cloth.

▷ If necessary, use a solvent-free cleaning agent that is suitable for the product's materials and surfaces.

8.2 Check electrical wires and connections

Check electrical wires and connections

The product's electrical wiring and connections must be inspected regularly by a qualified person. It is the operator's responsibility to establish appropriate maintenance intervals.

Prerequisite

- The product must be disconnected from the power supply and secured against being turned back on.

▷ Check the electrical wiring for damage.

▷ Check the terminal connections of the electrical installation to ensure a secure contact and that they are free of corrosion.

8.3 Testing mechanical components

Inspect mechanical components

The product's mechanical connections must be inspected for secure fit, integrity, and leak-tightness. It is the operator's responsibility to determine appropriate inspection intervals.

Prerequisite

- The product is de-energized and freely accessible.

▷ Check all connections and joints for tightness and visible leaks.

▷ Carefully tighten any loose connections.

▷ Check for wear, cracks or leaks.

8.4 Perform calibration

Set calibration intervals

It is the operator's responsibility to determine appropriate calibration intervals.

NOTICE

Manufacturer's recommendation

To detect measurement deviations early on, calibration is recommended every 12 months.

▷ Perform an initial recalibration of the product no later than 12 months after delivery - regardless of operating conditions.

A shorter calibration interval may be necessary, particularly under the following conditions:

- extreme ambient temperatures, particularly low temperatures
- exposure to moisture or condensate use other than as intended
- mechanical stress, e.g., from impact or overload
- interventions for maintenance or repair purposes
- high requirements for measurement precision

▷ Follow your company's guidelines for determining calibration intervals, as well as the specifications in your quality management manual.

▷ When determining calibration intervals, take into account the operating conditions, the required measurement precision, and economic considerations.

ⓘ Rare recalibrations increase the risk of inaccurate measurement results. Frequent recalibrations can increase operating costs.

▷ Always have the product calibrated after exposure to special operating conditions.

ⓘ For more information, refer to the enclosed factory calibration certificate.

NOTE

For applications with very high accuracy requirements (e.g., ISO Air Class I, oil vapor content < 0.01 mg/m³):

- Recommended initial inspection interval: 6 months
- If measurement readings are stable: The interval can be extended to 12 months

Arrange for factory calibration

▷ Send the product to the manufacturer.

ⓘ If the product is used in mission-critical systems, have an identical replacement product on hand if necessary.

Calibration point	PPB-Vol	mg/m³	ISO air class
1	2	0.0064	I
2	4	0.0128	II
3	8	0.0256	II
4	16	0.0513	II
5	32	0.1025	III
6	64	0.2051	III
7	128	0.4102	III

Table 4: Factory-set calibration points to comply with ISO air quality classes according to ISO 8573-1 (product version: ISO Air Class I)

Calibration point	PPB-Vol	mg/m³	ISO air class
1	8	0.0256	II
2	16	0.0513	II
3	32	0.1025	III
4	64	0.2051	III

Calibration point	PPB-Vol	mg/m³	ISO air class
5	128	0.4102	III

Table 5: Factory-set calibration points to comply with ISO air quality classes according to ISO 8573-1 (product version: ISO Air Class II)

8.5 Update device software

8.5.1 Download software package

Download the software package

▷ Go to the manufacturer's website.

▷ Download the software package that is compatible with your product.

ⓘ You can find the installed firmware version and the serial number in the device information.

▷ Depending on the update procedure, save the software package to the designated destination directory or to a USB flash drive.

8.5.2 Establish connection

▷ Connect the service/diagnostic interface (RS-485) of the product to your computer.

ⓘ For further information, see chapter "6.2 Connect product".



NOTICE

Avoiding inconsistent data

The product is locked during an active connection with the computer. This prevents changes to the product and protects against inconsistent or incomplete data transfers.

▷ Do not disconnect manually during data transfer.

8.5.3 Performing a software update

The software update is performed using the service software.

▷ For information on updating the device software, please contact the appropriate customer service department.

8.6 Problems and solutions

Correcting error states

Warnings still allow measurements to be taken without affecting the measured value. In the event of critical errors, no measurement is possible.

▷ Contact customer service if necessary.

▷ For further information, see chapter "10.3 Register assignment (incl. error and warning messages)".

8.7 Customer service

Contact customer service

▷ When contacting us, please have the following information ready, if available:

- Part number from the type plate
- Serial number from the type plate
- Product model
- Device software version
- Error message displayed
- Relevant operating and environmental conditions
- Time and frequency of the error

▷ Describe the problem as accurately as possible and list any recent changes made to the product, its configuration, or its operating conditions.

9 Decommissioning and disposal

Decommissioning

If the product is taken out of service temporarily or permanently, it must be safely decommissioned, disassembled, and, if necessary, stored.

ⓘ For further information, see chapter "5.2 Storage."

Waste disposal

The product and its packaging contain recyclable materials and must not be disposed of with general waste.

▷ Before passing on or disposing of the device, delete any stored data, if present.

▷ Dispose of the product and packaging via the designated disposal channels in accordance with applicable local disposal regulations and waste codes. If necessary, hire a licensed waste disposal company.

ⓘ For information on proper disposal, contact your local authorities or a specialized waste management company.

ⓘ Alternatively, you can return the product to the manufacturer for proper disposal.

10 Appendix

10.1 Technical data

Parameters	Specification	Unit
Weight	0.82	kg
Supply voltage	24 (18...36 V DC)	V DC
Measuring range	Depending on the product version: • ISO Air Class I: 0.007...0.5 • ISO Air Class II: 0.05...0.5	mg/m³
Measurement technology	Photoionization detector (PID)	
Detection limit	0.001	mg/m³
Measured medium	• Compressed air • Nitrogen • Carbon dioxide (free of corrosive, toxic, flammable, and oxidizing components) (other gases available upon request)	
Measured variable	Residual oil content	
Measured values	mg oil/Nm³ (pressure- and temperature-compensated), ppm (Based on 1.0 bar [abs], +20 °C, 0% relative humidity, in accordance with ISO 8573-1)	
Sample gas flow rate	~0.5	l/min
Medium temperature	+20...+45 (short-term: +70)	°C
Media humidity	≤ 40% relative humidity, non-condensing, pressure dew point max. +10 °C	
Identifiable substance groups	(Functional) hydrocarbons, aromatics	
Operating pressure	3...16 (Option: Upstream pressure regulator)	bar gauge pressure
Electrical connection	M12 plug	
Process connection	Depending on the product version: • G ¼ female thread • G ½ male thread • ½ NPT male thread • Plug-in nipple NW 7.2	
Communication interface	RS-485 (Modbus RTU), in accordance with the EIA/TIA-485 standard	
Analog output	1 x 4…20 mA (galvanically isolated)	
Wetted materials	• 316L stainless steel • Fluoroelastomer (FKM) • Sintered bronze CuSn11	
Application range	Indoor use	
Contamination level	2	
Ambient temperature	+5...+45	°C
Storage temperature	-10… 60	°C
Air humidity	≤ 80% relative humidity, non-condensing	
Altitude rating	Up to 4,000 m above sea level	
Degree of protection	IP54	

Table 6: Technical specifications | OIL CHECK 511 / OIL CHECK 512

10.2 Dimensions

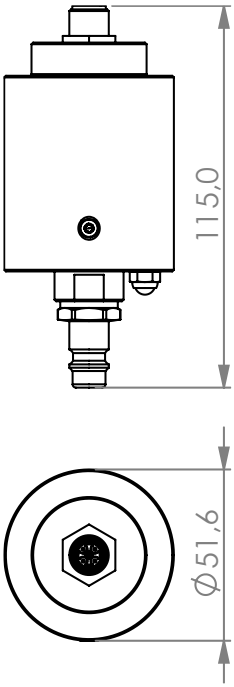


Figure 7: Dimensions | OIL CHECK 511 / OIL CHECK 512 (dimensions in mm)

10.3 Register assignment (incl. error and warning messages)

Index	Description value	Data type	Unit
1000	Reserved	float	–
1002	Oil vapor	float	mg/m³
1004	Reserved	float	–
1006	Oil vapor	float	ppm
1008	Gas temperature	float	°C
1010	Gas pressure	float	mbar
1012	Reserved	float	–
1014	Light intensity	float	%
1016	Reserved	float	–
1018	Reserved	float	–
1020	Device error (bit mask)	UInt32	–
1022	Device warning (bit mask)	UInt32	–
1024	User-defined critical error (bit mask)	UInt32	–

Table 7: Register allocation (Modbus RTU)

NOTE

Each value occupies two consecutive 16-bit registers. Register 1024 can be read and written. All other listed registers are read-only. Reserved registers must not be used.

Bit position	Error	Limit value/Details	Note
0	Power supply (24 V) too low	< 18.0 V	–
1	Power supply (24 V) too high	> 36.0 V	–
4	Lamp intensity too low	< 70%	Fatal error; limit value configurable via Modbus
7	PID error	Internal PID error	Fatal error

Bit position	Error	Limit value/Details	Note
12	PID adjustment error	Error code 0x0000	Fatal error
14	Error during automatic PID shutdown	Low pressure	Fatal error
15	PID shutdown error via Modbus	–	Fatal error
16	User-defined severe error	Register 1024 (R/W)	Fatal error

Table 8: Implemented error bits (Register 1020)

Bit position	Warning	Limit value/Details	Note
0	Power supply (24 V) too low	< 19.0 V	Limit value configurable via Modbus
1	Power supply (24 V) too high	> 35.0 V	Limit value configurable via Modbus
4	Lamp intensity too low	< 75%	Limit value configurable via Modbus
7	Insufficient oil vapor resolution	2 µg/m³	Limit value configurable via Modbus
9	Measurement below the range limit for oil vapour measurement	Depending on the product version: • ISO Air Class I: 0.007 mg/m³ • ISO Air Class II: 0.050 mg/m³	Active below the threshold value; resets at or above the threshold value. Invalid measured values reset the warning.

Table 9: Implemented warning bits (Register 1022)

10.4 EU Declaration of Conformity

CS INSTRUMENTS GmbH & Co. KG

EU-KONFORMITÄTSERKLÄRUNG

EU DECLARATION OF CONFORMITY

Wir / We: CS INSTRUMENTS GmbH & Co.KG
Zindelsteiner Straße 15, 78052 VS-Tannheim

erklären in alleiniger Verantwortung, dass das Produkt
hereby declare under our sole responsibility that the product

Öldampf-Messgerät OC 511 & OC 512
Oil vapor measuring device OC 511 & OC 512

den Anforderungen folgender Richtlinien entspricht:
comply with requirements of the following EU directives:

Elektromagnetische Verträglichkeit Electromagntic compatibility	2014/30/EU
RoHS Restriction of certain Hazardous Substances	2011/65/EU & (EU) 2015/863

Angewandte harmonisierte Normen:
Harmonised standards applied:

EMV-Anforderungen EMC requirements	**EN IEC 61326-1:2021**
RoHS Restriction of certain Hazardous Substances	**EN IEC 63000:2018**

Das Produkt ist mit dem abgebildeten Zeichen gekennzeichnet.
The product is labelled with the indicated mark.

CE

Tannheim, den 17.11.2026

Wolfgang Blessing Geschäftsführer



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