



OIL CHECK 500

The monitoring system for permanent highly precise measurement of the vaporous residual oil content in compressed air, nitrogen and gases

In many industrial processes, compressed air comes into direct contact with the end product. If the compressed air is contaminated with oil, moisture or particles, this can have serious consequences.

While dew point monitoring is important for all production facilities to prevent corrosion in the compressed air network and machine failures, residual oil and particle measurement is widely used by manufacturers of food, pharmaceuticals, electronics and semiconductors.



The limit values are defined in ISO 8573

ISO 8573-1:2010 Class	Solig particles			Humidity	Oil
	Number of particles per m ³			Pressure dew point °C	Total share of oil (liquid aerosol and vapor) mg/ m ³
	0,1 - 0,5 µm	0,5 - 1 µm	1 - 5 µm		
0	In according with specification by the devices user, stricter requirements than class 1				
1	≤ 20.000	≤ 400	≤ 10	≤ -70 °C	≤ 0,01
2	≤ 400.000	≤ 6.000	≤ 100	≤ -40 °C	≤ 0,1
3	--	≤ 90.000	≤ 1.000	≤ -20 °C	≤ 1
4	--	--	≤ 10.000	≤ +3 °C	≤ 5
5	--	--	≤ 100.000	≤ +7 °C	--
6	--	--	--	≤ +10 °C	--
7	--	--	--	--	--
8	--	--	--	--	--
9	--	--	--	--	--
x	--	--	--	--	--

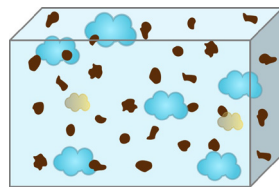


But how can residual oil get into the compressed air?

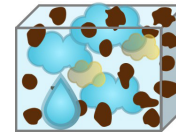
1. Intake air:

A significant amount of residual oil can enter compressed air systems through the intake air. Only in rural areas does the ambient air contain less oil vapour than defined in Class 1. In industrial areas, the intake air can be contaminated that only Class 2 or worse is achieved. Heavy goods traffic, commercial kitchens and hydrocarbon-rich exhaust air from industrial processes pollute the air accordingly.

	Average (mg/m ³)	ISO class
Rural	< 0.001	1
Suburban	0.01	1
Industrial	0.01-0.03	1-2
Large city	0.01-0.10	2
Industrial area with significant hydrocarbon industry	0.1-0.2	2-3



Atmospheric



Compressed to 7 bar

2. Compressors:

Many critical applications are already covered by oil-free compressors in order to eliminate the risk of oil contamination from the compressor. However, most oil-free compressors still use oil in their gears and bearings. If seals fail, oil vapor can enter the intake air.

In oil-injected compressors, oil is present in the compressor stage and must be separated from the compressed air using a complex oil separator cartridge. If the oil separation fails, extremely large amounts of oil enter the compressed air.

3. Filtration and treatment technology:

The appropriate filtration and treatment technology is selected depending on the specified ISO class. Filtration elements and activated carbon fillings are consumables that must be replaced regularly.

Here too, failure to observe the service intervals can lead to increased oil ingress into the compressed air system. In addition, filter elements must be precisely matched to the compressed air consumption. The filtration effect is reduced if consumption fluctuates greatly or is too low or too high.

4. Other components:

All installed systems and components that are installed after treatment, such as pipes, valves, pressure reducers, measuring technology, point-of-use dryers, etc., must be selected and installed with appropriate cleanliness (oil and grease free) and care.

5. Installers and maintenance personnel:

If maintenance technicians and installers do not work carefully when adjusting the system or performing maintenance, e.g. without gloves, short-term oil peaks can occur due to oil on their hands.



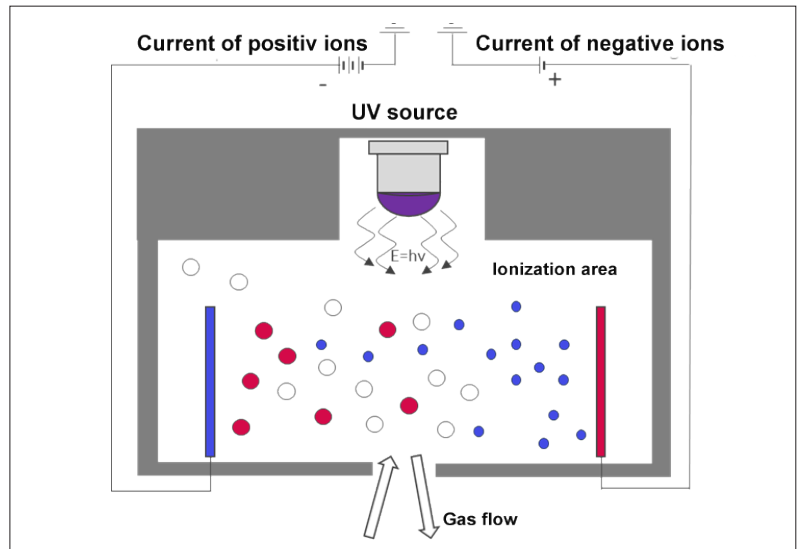
Measuring principle

Permanent Oil vapor measurement OIL CHECK 500

At the heart of the Oil Check 500 is a PID sensor (photo ionization detector).

A partial flow of compressed air is taken from the system and fed to the PID sensor. Hydrocarbons (> C6) are ionized by a special UV lamp.

Normal components of the air (oxygen, nitrogen, carbon dioxide, argon, water vapor, etc.) are not ionized. This creates an ion current that is proportional to the concentration of the ionized molecules.



Gas temperature

ISO 8573 defines a reference temperature of 20°C for residual oil measurement.

Since modern compressed air systems can have heat recovery, it is possible that the compressed air temperature during measurement in the compressor room is below 20°C, but rises again above 20°C further back in the production process.

This can result in less oil vapor occurring in the compressor room at low temperatures than at the consumer.

The optional integrated heating element ensures a measurement temperature > 20°C. The measured value can thus be reliably calculated back to the reference temperature of 20°C.



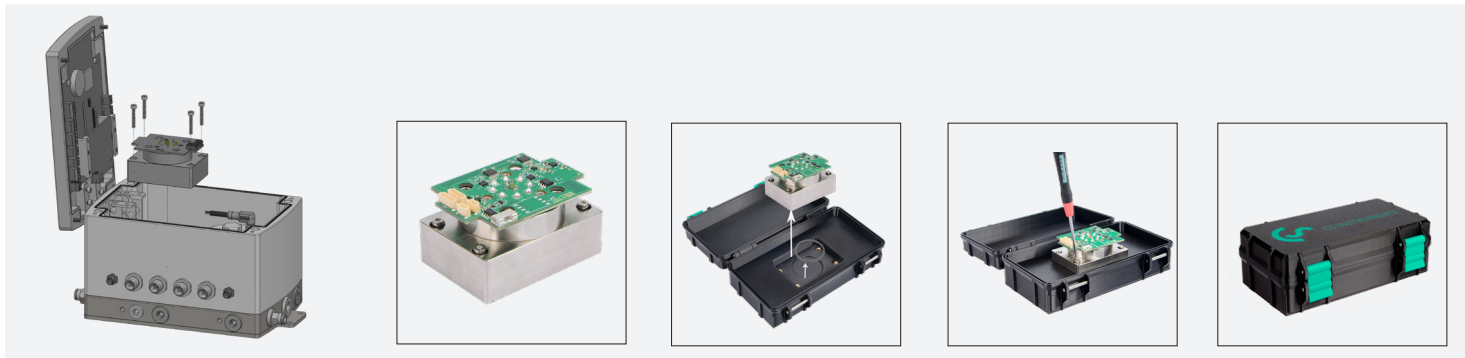
Long-term stability – service-friendly – reliable

„Forced Pressure Variation“ for long-term stable measurement results - auto-calibration

Thanks to the innovative „forced pressure variation“ measurement method, the OIL CHECK 500 generates reference gas in different mass concentrations inside the device. This method, which is protected by CS INSTRUMENTS, compensates for ageing or contamination-related components in the measurement signal, in particular long-term drift. No wear parts such as activated carbon filters are required to generate zero air. The result is low-maintenance and long-term stable measurement.

Service-friendly, no downtime

The sensor unit can be replaced by the customer on site. This eliminates the need to return the entire device for recalibration.



Process reliability

All important functions/components are monitored internally

- Supply voltage
- Sensor voltage
- Gas temperature
- Internal relative humidity
- Intensity of the light source relative to calibration (lamp intensity)
- Increased sensor sensitivity (oil vapor resolution)

Calibration

The most important factor for accurate measurement is the calibration of the measuring system.

The limit value specified in ISO 8573 for Class 1 is 0.01 mg/m³. This corresponds to a volume concentration of 2.5 ppb, which means 2.5 particles per billion.

Table 1 - Calibration points / Calibration Support Points
The high-precision, certified calibration process in the CS INSTRUMENTS laboratory enables reproducible calibration below Class 1.

Calibration at 7 additional points ensures that even high residual oil measurements can be measured reliably.

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Kalibrierzertifikat / Calibration Certificate

Messergebnisse / Measuring Results

Unter den genannten Bedingungen wurden bei der Kalibrierung folgende Ergebnisse erzielt:
The following results were achieved during calibration under these conditions:

Table 1 - Kalibrierpunkte / Calibration Support Points

Messwerte Measurement Values					Abweichung Deviation		Im Bereich In Range	
Nr	Sollwert Required Value [ppb]	Sollwert Required Value [mg/m ³]	Istwert Actual Value [ppb]	Istwert Actual Value [mg/m ³]	Absolut absolute [mg/m ³]	Zulässig Permissible +/- [mg/m ³]	<input checked="" type="checkbox"/>	ISO Class
1	0,0	0,0000	0,9030	0,0029	0,0029	0,0030	<input checked="" type="checkbox"/>	I
2	1,0	0,0032	1,2335	0,0040	0,0007	0,0050	<input checked="" type="checkbox"/>	I
3	2,0	0,0065	1,9090	0,0061	-0,0004	0,0050	<input checked="" type="checkbox"/>	I
4	4,0	0,0129	3,8614	0,0124	-0,0006	0,0050	<input checked="" type="checkbox"/>	II
5	8,1	0,0259	7,7327	0,0248	-0,0011	0,0050	<input checked="" type="checkbox"/>	II
6	16,2	0,0518	16,2121	0,0520	0,0002	0,0052	<input checked="" type="checkbox"/>	II
7	32,3	0,1036	32,1878	0,1032	-0,0004	0,0103	<input checked="" type="checkbox"/>	III
8	64,6	0,2071	64,7838	0,2076	0,0005	0,0208	<input checked="" type="checkbox"/>	III
9	129,3	0,4143	129,4752	0,4149	0,0006	0,0415	<input checked="" type="checkbox"/>	III
10	258,6	0,8286	258,7286	0,8291	0,0005	0,0829	<input checked="" type="checkbox"/>	III
11	517,1	1,6572	518,3607	1,6612	0,0040	0,1661	<input checked="" type="checkbox"/>	IV

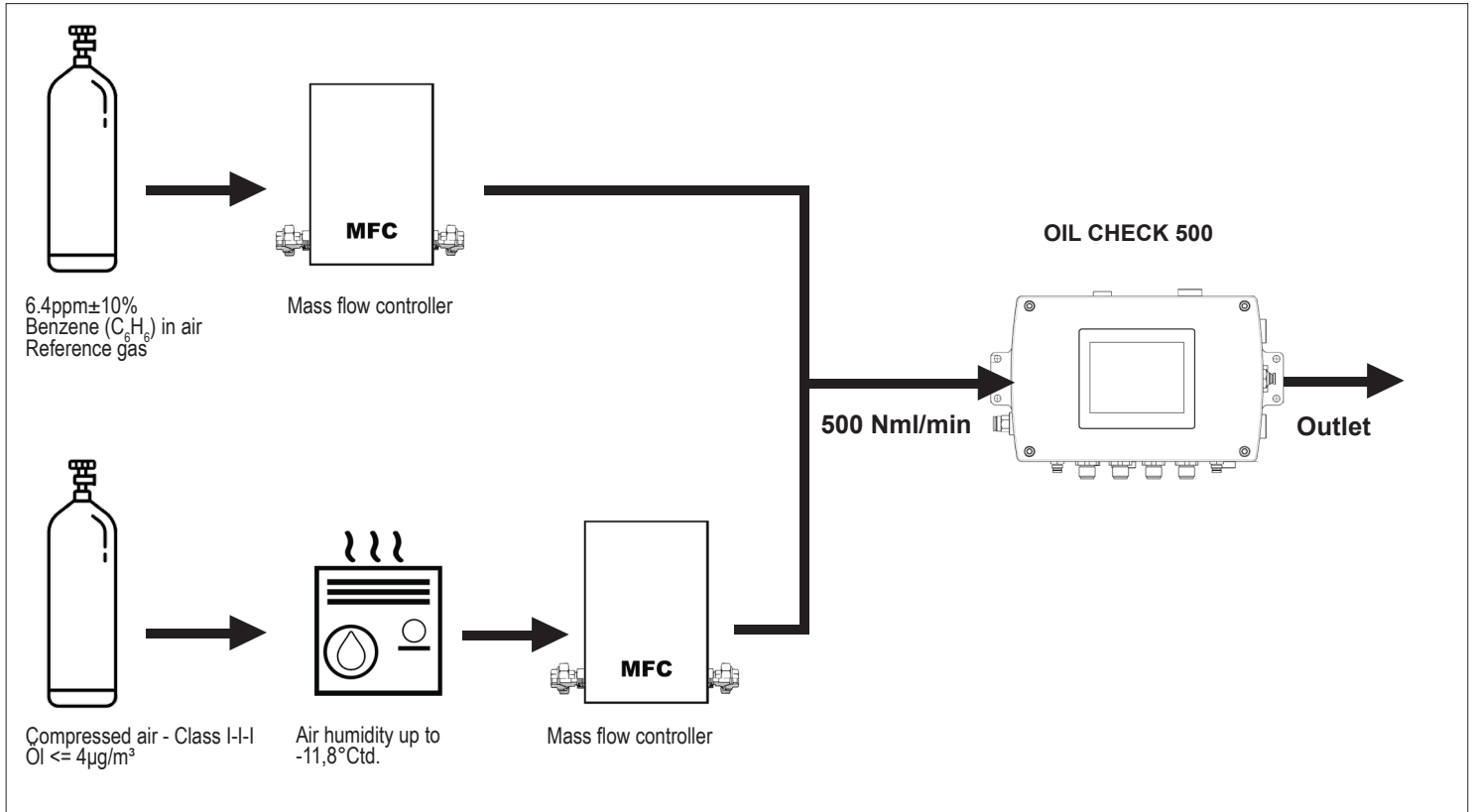
Ergebnis: Die Gegenprobe aller Kalibrierpunkte war innerhalb der angegebenen Spezifikation.
Result: The cross-check of all calibration points was within the stated specification.



OIL CHECK 500 - PERFORMANCE MEASUREMENT

(December 2024, Johannes Herbst, Fraunhofer IPM)

Schematic diagram of laboratory measurement

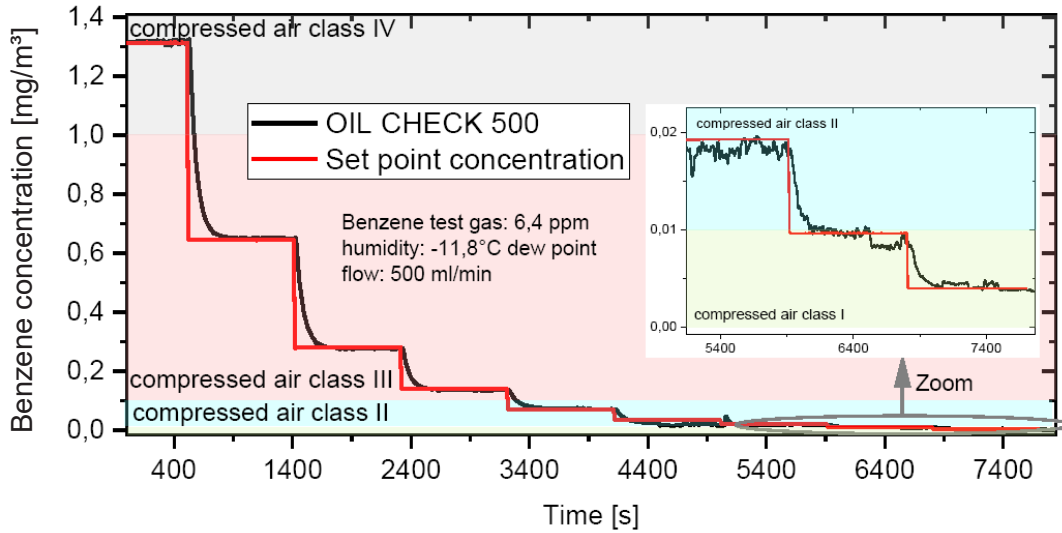


SETUP

Laboratory and conditions

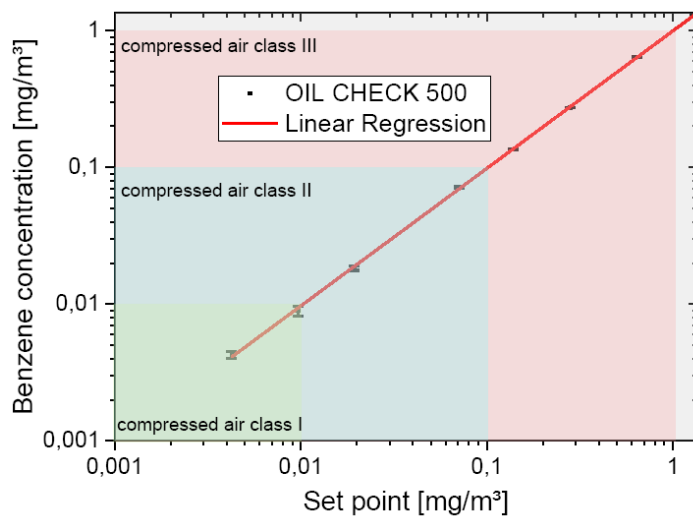
- Performance test of the OIL CHECK 500 with benzene in air in the gas laboratory of Fraunhofer IPM
- IPM Test gas cylinder: 6.4 ppm benzene in air
- Dilution of the test gas with compressed air of quality 0.004 mg/m³
- 4 l/min dry compressed air: <-80°C dew point
- Moisture supply: -11.8 °C dew point H₂O
- Flow through OIL CHECK: 0.5 l/min
- Measurement at ambient pressure
- Data logging per second

Benzene measurement



- Detection limit (6σ): 0.0015 mg/m³
- With an SNR of 1.5 μg/m³, the signal sensitivity is high enough to reliably detect the transition from class I to class II at 10 μg/m³.

Linearity



Data point	Setpoint (mg/m ³)	Concentration measurement (mg/m ³)
1	0.0043	0.0043
2	0.0097	0.0090
3	0.0193	0.0183
4	0.0708	0.0716
5	0.1380	0.1351
6	0.2801	0.2745
7	0.6442	0.6461
8	1.3127	1.3048

- The measurement dynamics in the tested range exceeds three orders of magnitude from class I to class IV.



LABORATORY MEASUREMENT

Differences from laboratory measurement

In order to guarantee the residual oil class, many users still just take samples at regular intervals using activated carbon tubes and have them analysed in a laboratory. This procedure does not provide 100% security, as it is not a 24/7 online measurement. Any oil breakthrough cannot be detected, or is detected far too late. The user is flying blind for 12 months without any monitoring.

The user and the laboratory can also make mistakes during manual sampling and analysis:

- Sample quantity too low (flow and time), see sample calculation*
- Solvent used to remove oil components from the activated carbon is not suitable
- Temperature of the laboratory analysis too low

Advantages of OIL CHECK 500:

- Ensures 24/7 monitoring
- Fast response to oil breakthrough
- Higher sensitivity than activated carbon tubes and gas chromatographs

*Calculations for the minimum sampling period for class I/II differentiation.

Laboratories require a minimum amount of sorbed sample, typically $3\mu\text{g}/\text{m}^3$ to $5\mu\text{g}/\text{m}^3$, for the extraction of organic components from activated carbon or Tenax.

The substances absorbed in the tube are almost exclusively mixtures of various alkanes and aromatics with different molar masses and different interactions with the surface of the separation column in the gas chromatograph.

This is even a basic requirement, in order to be able to identify a kind of fingerprint consisting of several peaks over time in the chromatogram.

This means that the total amount of absorbed substances in the tube is distributed across several peaks in the chromatogram. Assuming a detection limit of approx. $5\mu\text{g}/\text{m}^3$ per peak, at least 3 to 10 times the amount must be collected in order to obtain a chromatogram that exceeds the detection limit of the measuring device.

Let us assume that approx. $50\mu\text{g}$ of oil vapours need to be collected:

Typical volume flow during sampling using activated carbon or Tenax tubes: $0.5\text{ l}/\text{min}$ Typical concentration of organic substances for a low Class II reading: $20\mu\text{g}/\text{m}^3$ ($0.02\text{ mg}/\text{m}^3$).

To collect $50\mu\text{g}$ for clear detection, $50/20 = 2.5\text{ m}^3$ of homogeneously contaminated compressed air is therefore required. At $0.5\text{ l}/\text{min}$, this results in a minimum sampling time of 5000 min or 83.33 hours or 3 days and 11 hours.

In order to detect average oil vapour concentrations below $0.020\text{ mg}/\text{m}^3$, the sampling period must be correspondingly longer, so to determine whether ISO Class I ($<0.01\text{ mg}/\text{m}^3$) is complied with, the sample should be flowed through for at least 7 to 9 days.

If this sampling duration is not observed, the laboratories will always conclude that the compressed air in the sample is ISO Class I due to their detection limit.



OIL CHECK 500 - Stationary solution



DESCRIPTION	ORDER NO.
OIL CHECK 500 – residual oil measurement of the oil vapor content from 0.001...5 mg/m ³ , 43.5 ... 130.5 psi. High-precision PID-Sensor, innovative “Forced Pressure Variation” measuring method, with integrated display, with 4...20 mA analog output and digital Modbus RTU interface, incl. calibration certificate.	0699 0080
Options:	
Integrated heating element for the stationary OIL CHECK 500. Keeps the gas temperature constantly above +68 °F. Recommended for installations where the room temperature may fall below +68 °F	Z699 0078
Additional calibration curve for measurement in 100% N2	Z699 0181
Additional calibration curve for measurement in 100% CO2	Z699 0179
Additional calibration curve for measurement in other gases (please specify gas)	Z699 0180
2x 4...20 mA analog output (electrically isolated)	Z699 0178
External alarm unit, wired ready to plug in, for direct connection to the OIL CHECK 500 with 16 ft cable (buzzer and continuous red light)	Z699 0077
Sampling system OIL-Check 500:	Z699 0175
Sampling system consisting of ½" ball valve (oil- and grease-free), 1 m (3.25 ft) stainless steel tube 6x1 mm (oil- and grease-free), clamp screwing (oil- and grease-free)	
Alternatively: Portable sampling system consisting of 2 m (6.5 ft) PTFE hose, quick coupling (oil- and grease-free)	Z699 0174
Options for systems > 130.5 psi: Pressure reducer (oil- and grease-free), input pressure max. 4350 psi, output pressure up to 130.5 psi	Z699 0076
For systems with pressure of 14.5...43.5 psi (g)	Z699 0182
DS 500 – intelligent chart recorder in basic version (4 sensor inputs)	0500 5000
Connection cable for probes, 16 ft with open ends	0553 0104
CS Basic - data evaluation in graphic and table form - readout of the measured data via USB or Ethernet. Includes 2 user licenses.	0554 8040

SERVICE / RECALIBRATION	ORDER NO.
Pre-calibrated sensor unit for the OIL CHECK 500, incl. certificate	0699 8080
Recalibration of OIL CHECK 500 or sensor unit, including certificate	0699 3405
As-found Certificate (NIST tracibility Equivalent) OIL CHECK 500 with certificate	0999 3501
Loaner OIL CHECK 500 for the period of recalibration	0699 3930

Measure compressed air quality accordance with ISO 8573 Residual oil - particles - residual moisture



DS 500 chart recorder

Residual oil content measurement – OIL CHECK 500

For permanent and highly precise measurement of the vaporous oil content from 0.001 mg/m³ to 5 mg/m³. Due to the low detection limit of 0.001 mg/m³, the compressed air quality Class 1 (ISO 8573) can be monitored.

Particle counter PC 400

The highly precise, optical particle counter PC 400 measures particles from a size of 0.1 µm and is therefore suitable for monitoring the compressed air quality Class 1 (ISO 8573).

Moisture – dew point sensor FA 510

FA 510 measures the pressure dew point down to -112 °Ftd. Dryer breakdowns can be detected with continuous monitoring. Alarms can be triggered when connected with the DS 500 or other automation systems.

DESCRIPTION

DS 500 – intelligent chart recorder in basic version (4 sensor inputs)

CS Basic - data evaluation in graphic and table form - readout of the measured data via USB or Ethernet. Includes 2 user licenses.

Residual oil measurement:

OIL CHECK 500 – residual oil measurement of the vaporous oil content from 0.001...5 mg/m³, 43.5 ... 130.5 psi. High-precision PID-Sensor, innovative "Forced Pressure Variation" measuring method, with integrated display, with 4...20 mA analog output and digital Modbus RTU interface, incl. calibration certificate

Options:

Integrated heating element for the stationary Oil Check 500. Keeps the gas temperature constantly above 68 °F. Recommended for installations where the room temperature may fall below 68 °F.

Additional calibration curve for measurement in 100% N₂.

Additional calibration curve for measurement in 100% CO₂.

Additional calibration curve for measurement in other gases (please specify gas)

2x 4...20 mA analog output (electrically isolated)

Sampling system OIL CHECK 500:

Sampling system consisting of ½" ball valve (oil- and grease-free), 1 m (3.25 ft) stainless steel tube 6x1 mm (oil- and grease-free), clamp screwing (oil- and grease-free)

Alternative: Portable sampling system consisting of 2 m (6.5 ft) PTFE hose, quick coupling (oil- and grease-free)

Options for systems > 130.5 psi:

Pressure reducer (oil- and grease-free), input pressure max. 4350 psi, output pressure up to 130.5 psi

For systems with pressure of 14.5...43.5 psi (g)

Connection cable for probes 16 ft with open ends

PC 400 particle counter up to 0.1 µm for compressed air and gases, incl. pressure reducer/sampling hose, calibration certificate, Modbus-RTU interface

Connection cable for probes, 16 ft with open ends

FA 510 dew point sensor for adsorption dryers -112 ... 68 °Ftd incl. factory certificate, 4...20 mA analog output (3-wire connection) and Modbus-RTU interface

Standard measuring chamber up to 232 psi (1/2" NPT)

Connection cable for VA/FA series, 16 ft with open ends

ORDER NO.

0500 5000

0554 8040

0699 0080

Z699 0078

Z699 0181

Z699 0179

Z699 0180

Z699 0178

Z699 0175

Z699 0174

Z699 0076

Z699 0182

0553 0104

0699 0040

0553 0104

0699 0510

0699 3390

0553 0104



Mobile transport trolley for measurement at the points of use Residual oil - particles - residual moisture



DESCRIPTION	ORDER NO.
DS 500 – intelligent chart recorder in basic version (4 sensor inputs)	0500 5000
CS Basic - data evaluation in graphic and table form - readout of the measured data via USB or Ethernet. Includes 2 user licenses.	0554 8040
Residual oil measurement:	0699 0080
OIL CHECK 500 – residual oil measurement of the vaporous oil content from 00001...5 mg/m ³ , 43.5 130.5 psi. High-precision PID-Sensor, innovative "Forced Pressure Variation" measuring method, with integrated display, with 4...20 mA analog output and digital Modbus RTU interface, incl. calibration certificate	
Mobile transport trolley on wheels (outer dimensions: 26.77x 41.73x 16.14 Inches) (W x H x D) with firmly mounted components of OIL-Check 400, PC 400, FA 510	0554 6017
Options:	Z699 0181
Additional calibration curve for measurement in 100% N ₂	
Additional calibration curve for measurement in 100% CO ₂	Z699 0179
Additional calibration curve for measurement in other gases (please specify gas)	Z699 0180
Options: Integrated heating element for the stationary OIL CHECK 500. Keeps the gas temperature constantly above 68 °F. Recommended for installations in which the room temperature may fall below 68 °F.	Z699 0078
Options for systems > 130.5 psi:	Z699 0076
Pressure reducer (oil- and grease-free), input pressure max. 4350 psi, output pressure up to 130.5 psi	
Alternative: Mobile sampling system consisting of 2 m (6.5 ft) PTFE hose, quick coupling (oil- and grease-free)	Z699 7774
For systems with pressure of 14.5...43.5 psi (g)	Z699 0182
Connection cable for probes, 16 ft with open ends	0553 0104
PC 400 particle counter up to 0.1 µm for compressed air and gases, incl. pressure reducer/sampling hose, calibration certificate, Modbus-RTU interface	0699 0040
Connection cable for probes, 16 ft with open ends	0553 0104
FA 510 Dew point sensor , -112 ... +68 °Ftd	0699 0510
Standard measuring chamber (1/2" NPT)	0699 3390
Connection cable for VA/FA series, 16 ft with open ends	0553 0104

Service case “All in one solution” Residual oil - particles - residual moisture



DESCRIPTION	ORDER NO.
Service case “All-in-one solution” - Compact trolley with wheels (External dimensions 607 x 275 x 475 mm) (WxHxD) and permanently mounted sensors: OIL CHECK 500, PC 400, FA510, including mobile sampling system consisting of 2 m PTFE hose, quick coupling (oil and grease free)	0699 0090
DS 500 – intelligent chart recorder in basic version (4 sensor inputs)	0500 5000
CS Basic - data evaluation in graphic and table form - readout of the measured data via USB or Ethernet. Includes 2 user licenses.	0554 8040
Residual oil measurement: OIL CHECK 500 – residual oil measurement of the vaporous oil content from 0.001...5 mg/m ³ , 43.5 ... 130.5 psi. High-precision PID-Sensor, innovative “Forced Pressure Variation” measuring method, with integrated display, with 4...20 mA analog output and digital Modbus RTU interface, incl. calibration certificate	0699 0080
Options: Integrated heating element for the stationary Oil Check 500. Keeps the gas temperature constantly above 68 °F. Recommended for installations where the room temperature may fall below 68 °F.	Z699 0078
PC 400 particle counter up to 0.1 µm for compressed air and gases, incl. pressure reducer/sampling hose, calibration certificate, Modbus-RTU interface	0699 0040
FA 510 Dew point sensor , -80°...+20 °Ctd with integrated pressure sensor	0699 0510
Standard measuring chamber	0699 3390

OIL CHECK 500 - Mobile solution



DESCRIPTION	ORDER NO.
OIL CHECK 500 portable- Residual oil measurement of the vaporous oil content from 0.001...5 mg/m ³ , 43.5 ... 130.5 psi. High-precision PID sensor, innovative “Forced Pressure Variation” measuring method, with integrated display, with 4...20 mA analog output and digital Modbus RTU interface, Integrated heating element for fast start-up at cold ambient temperatures ,incl. calibration certificate, in a protective case. Connection cable ODU/ODU 16 ft	0699 0081
Options: Additional calibration curve for measurement in 100% N2	Z699 0181
Additional calibration curve for measurement in 100% CO2	Z699 0179
Additional calibration curve for measurement in other gases (please specify gas)	Z699 0180
Alternative: Portable sampling system consisting of 2 m (6.5 ft) PTFE hose, quick coupling (oil- and grease-free)	Z699 0174
DS 500 mobile - intelligent chart recorder with 4 sensor inputs	0500 5012
CS Basic - data evaluation in graphic and table form - readout of the measured data via USB or Ethernet. Includes 2 user licenses.	0554 8040



MEASUREMENT IN GASES

In addition to measurement in compressed air, there are solutions for residual oil measurement in gases such as CO₂, N₂, H₂, He, etc. In our in-house laboratory, we offer real gas calibrations in the desired gases. We also offer gas mixers (mixture with pure N₂) to make various gases measurable.

Gas mixing system



For evaluation of gases such as:

- H₂
- He
- Ar

DESCRIPTION	ORDER NO.
<p>Gas mixing system for the OIL CHECK 500 for determining residual oil in special gases, consisting of:</p> <ul style="list-style-type: none">- 2 mass flow controllers with stored setpoint- Pressure reducer to ensure the same pressure level at the inlet of the OIL CHECK 500- Mounted on an aluminium plate for wall mounting- Fully electrically wired and gas-hose connected	Z699 0200



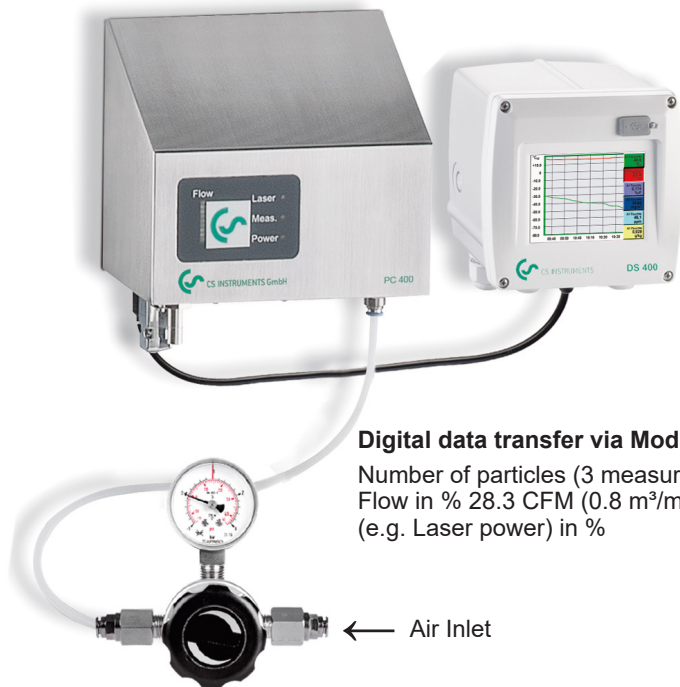
Application: Measurement in the compressor room - OIL CHECK 500- DS 500 - PC 400

TECHNICAL DATA OIL CHECK 500

Measured medium:	Compressed air, nitrogen, (free from aggressive, corrosive, acid, toxic, flammable and oxidising components). Further gases on request
Measuring unit:	Residual oil content in mg oil/norm m ³ referred to 1.0 bar [abs], +20 °C, 0% relative humidity, in accordance with ISO 8573-1
Identifiable substances:	Hydrocarbons, functional hydrocarbons, aromatic hydrocarbons
Field of application:	After activated carbon filter, after activated carbon adsorber, after oil-free compressor, always with connected upstream filtration and dryer
Ambient temperature:	+68 °F... +113 °F, rel. humidity <= 80% without condensation
Media temperature:	+68 °F... +113 °F (Short-term +70 °C)
Operational overpressure:	43.5...130.5 psi, optional pressure reducer connected upstream for up to 4351 bar
Humidity of measured gas:	<= 40% rel. humidity, pressure dew point max. +145 °Ftd, non-condensable humidity
Compressed air connection:	G 1/4" female thread according to ISO 228-1
Measured values:	mg/norm m ³ , pressure and temperature compensated residual oil vapour content
Measuring range:	0.001...5 mg/m ³ (higher measuring ranges on request)
Detection limit (residual oil):	0.001 mg/m ³
Flow of measuring gas:	approx. 0.5 norm litres/minute, referred to to 1.0 bar [abs] and + 20 °C, (atmospheric conditions)
Plug-in power supply	100...240 VAC / 1 Ph. / PE / 50...60 Hz / ± 10%
Outputs	Digital output: RS 485 interface (Modbus RTU), Ethernet via DS 400 / 500 Analogue output: 4...20 mA (electrically isolated) Alarm: 2 alarm relays for external alarm unit, alarm values freely adjustable Optional: 2x 4...20 mA analog output (electrically isolated)
Operating hours counter:	integrated
Dimensions (mm):	200 x 130 x 120 (W x H x D)
Weight:	approx. 7 kg



Particle counter PC 400 and DS 400



Digital data transfer via Modbus-RTU:
Number of particles (3 measuring channels)
Flow in % 28.3 CFM (0.8 m³/min)
(e.g. Laser power) in %

The DS 400 shows all 3 measuring channels according to ISO 8573-1

Particle size 0.1...0.5 µm: Number or particles per CF
Particle size 0.5...1.0 µm: Number or particles per CF
Particle size 1.0...5.0 µm: Number or particles per CF

A1a	PC 400	0.1-0.5µ	<input checked="" type="checkbox"/>
		1458	cts/m³
A1b	PC 400	0.5-1.0µ	<input checked="" type="checkbox"/>
		246	cts/m³
A1c	PC 400	1.0-5.0µ	<input checked="" type="checkbox"/>
		8	cts/m³
Home		Setup	Alarm <input checked="" type="checkbox"/> Lg.stop 10.01.2012 22:34:33

Advantages at a glance:

- Highly precise, optical laser particle counter for use in compressed air and technical gases
- Highly precise optics for detecting the smallest particles up to 0.1 µm and therefore suitable for monitoring the compressed air class 1 according to ISO 8573-1
- The flow rate of 1 CFM is 10 times higher than other particles counters generally available on the market. Advantage: Counts the smallest particles with high counting accuracy at the same time
- Due to the digital data transfer (Modbus-RTU) to the chart recorders DS 400 or DS 500, 3 measuring channels can be transferred at the same time (without any faults due to check sum)
- The class 1 filter which is included in the scope of delivery can be used for on-site calibration at any time. Contaminations on the optics can therefore be quickly detected or eliminated.

Advantages of the DS 400

- Data logger for long-term monitoring
- Display shows trend curves (online and history curves available)
- Zoom function directly on the touch screen
- Integrated Ethernet interface (Modbus/TCP) and RS 485 interface (Modbus-RTU) for data transfer to superordinate controls
- 2 alarm relays (changeover contact 230 VAC, 3A) – threshold values freely adjustable
- Easy operation via 3.5" touchscreen

TECHNICAL DATA PC 400

Measured medium:	Compressed air (free from aggressive, corrosive, acidic, toxic, flammable and oxidizing components) as well as gas types like N ₂ , O ₂ , CO ₂ . Further gas types on request
Field of application:	In case of compressed air after filtration In case of gases / pure gases also without filtration
Parameter:	Number of particles per CF (relative to expanded air: 68°F, 1000 mBar) Size channels for the PC 400 0.1 µm: Particle size 0.1...0.5 µm: Number or particles per m ³ Particle size 0.5...1.0 µm: Number or particles per m ³ Particle size 1.0...5.0 µm: Number or particles per m ³ Size channels for the PC 400 0.3 µm: Particle size 0.3...0.5 µm: Number or particles per m ³ Particle size 0.5...1.0 µm: Number or particles per m ³ Particle size 1.0...5.0 µm: Number or particles per m ³
Operating pressure:	Max. input pressure on the pressure reducer: 580 psi
Humidity of measured gas:	<= 90% rel. humidity, pressure dew point max. 50 °F, non-condensable humidity
Ambient temperature:	41...104 °F
Temperature of the measured medium:	0...104 °F
Compressed air connection:	6 mm PTFE-hose incl. quick coupling
Flow rate:	1 CFM
Interface:	RS 485 (Modbus-RTU)
Light source:	Laser diode
Power supply:	24 VDC, 300 mA
Dimensions:	5.9 x 7.8 x 11.8 Inches
Weight:	17.64 lbs
Housing:	Stainless steel

Stationary solution with particle counter PC 400 and DS 400



DESCRIPTION	ORDER NO.
PC 400 particle counter up to 0.1 μm for compressed air and gases, incl. pressure reducer and calibration certificate	0699 0040
Connection cable for probes 16 ft, M12 / open ends	0553 0104
DS 400 chart recorder with graphic display and touch screen operation	0500 4000 D
Option:	
Integrated data logger for 100 million measured values	Z500 4002
Integrated Ethernet and RS 485 interface	Z500 4004
CS Basic - data evaluation in graphic and table form - readout of the measured data via USB or Ethernet. Includes 2 user licenses.	0554 8040
As an alternative to PC 400 up to 0.1 μm: PC 400 particle counter up to 0.3 μm for compressed air and gases, incl. pressure reducer and calibration certificate	0699 0041

Mobile solution with particle counter PC 400 in a service case and DS 500 mobile



DESCRIPTION	ORDER NO.
PC 400 particle counter up to 0.1 μm for compressed air and gases incl. pressure reducer and calibration certificate in a service case	0699 0042
Connection cable to portable devices, ODU/ M12, 16 ft	0553 1503
Chart recorder DS 500 mobile, 4 sensor inputs	0500 5012
CS Basic - data evaluation in graphic and table form - readout of the measured data via USB or Ethernet. Includes 2 user licenses.	0554 8040
As an alternative to PC 400 up to 0.1 μm: PC 400 particle counter up to 0.3 μm for compressed air and gases incl. pressure reducer and calibration certificate in a service case	0699 0043

Re-calibration and accessories particle counter PC 400



DESCRIPTION	ORDER NO.
Re-calibration particle counter PC 400 incl. certificate	0699 3304
CS Service Software incl. PC connection set for PC 400	0554 2009
Certificate for "As found data" for Nist equivalent traceability	9999 3304
Swap Program to eliminate downtime	on request
Loaner Program for time of calibration to eliminate downtime and allow serial number traceability	on request