



## Compressed air quality meas. according to ISO 8573 Residual oil content - particles - moisture



### DS 500 - the intelligent chart recorder of the next generation.

The centerpiece of compressed air quality measurement is the chart recorder DS 500. It measures and documents the measured data of the sensors for residual oil content, particles and moisture. The measured values are indicated on the

7" color screen. The curve progressions from the beginning of the measurement can be viewed by an easy slide of the finger. The integrated data logger stores the measured values safely and reliably. The threshold value can be freely entered for each measured parameter. 4 alarm relays are available for automatic alarm in

case of an exceeding of the threshold values. Optionally DS 500 can be upgraded with up to 12 sensor inputs. For connection to a PLC DS 500 has an Ethernet interface as well as a RS 485 interface. The communication is done via the Modbus protocol.

### Extract from ISO 8573-1 - threshold values

ISO 8573-1:2010 Class	Solids			Water	Oil
	Maximum number of particles per m <sup>3</sup>			Pressure dew point vapor	Totalshare in oil (liquid aerosol and mist)
	0.1 - 0.5 µm	0.5 - 1 µm	1 - 5 µm		mg/ m <sup>3</sup>
0	According to determination by the instruments user, more severe 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	--	--	--	--	--



## Residual oil content measurement - OIL check

The residual oil content sensor OIL check measures the vaporous residual oil content in the compressed air. By means of a sample taking a representative part volume flow is taken from the compressed air and led to the OIL check.

Due to the continuous measurement threshold value exceeding will be recognized immediately and remedial actions initiated.

## 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 of the compressed air quality class 1 (ISO 8573). The correct function the filtration elements mounted in the compressed air is monitored and possible filter perforations are recognized immediately. The compressed air flow through the particle counter is automatically supervised.

## Moisture - dew point sensor FA 510

FA 510 measures the pressure dew point in the compressed air down to -80 °Ctd. The mounting is effected either directly into the pipe via the G 1/2" thread or better by means of the measuring chamber which allows a defined stream of about 2 l/min to bypass the sensor. Also in this case the continuous measurement takes care that alert is triggered immediately if the compressed air dryer breaks down.

### Technical data

#### OIL Check

<b>Dimensions:</b>	487 x 170 x 120 mm (W x H x D)
<b>Power supply:</b>	230 VAC 50 Hz ±10% resp. 115 VAC 60 Hz ±10%
<b>Medium:</b>	Compressed air
<b>Noticeable substances</b>	Polyalohaolefins aliphatic hydrocarbons hydrocarbons functional hydrocarbons aromatics
<b>Ambient temp.:</b>	+5 ... +45 °C
<b>Compres.air temp.:</b>	+5 ... +55 °C
<b>Operating over-pres.:</b>	3 bar ... max. 16 bar (ü)*
<b>Meas.gas humidity:</b>	<= 40% rel. humidity
<b>Measuring unit:</b>	mg/m <sup>3</sup> (standard cubic meters in accordance with ISO 1217; 1 bar, 20°C, 0% rel. humidity)
<b>Measuring range:</b>	0,0006 - 5 mg/m <sup>3</sup> residual oil vapor content
<b>Measuring accuracy:</b>	0.003 mg/m <sup>3</sup>
<b>Detection limit:</b>	0.0006 mg/m <sup>3</sup>
<b>Connections:</b>	G 3/8" internal thread. Please observe install. instructions
<b>Installation requirements:</b>	Vertically** into the rising main pipe via oil and grease free measuring section
<b>Inlet section:</b>	10 x DN (min.200 mm) according to ISO 8573-2
<b>Outlet section:</b>	3 x DN (min. 100 mm) according to ISO 8573-2

\* further operating pressures on request

#### Technical data PC 400

<b>Measuring range:</b>	Number of particles per m <sup>3</sup> Particle size channels: 0.1...0.5 µm, 0.5...1 µm, 1...5 µm Further particle size channels on request
<b>Flow rate:</b>	28.3 l/min (1 cfm)
<b>Light source:</b>	Laser diode
<b>Interface:</b>	RS 485 (Modbus protocol)
<b>Power supply:</b>	24 VDC, 300 mA
<b>Dimensions:</b>	150 x 200 x 300 mm
<b>Weight:</b>	8 kg

#### Technical data FA 510

<b>Measuring range:</b>	-80...20 °Ctd
<b>Accuracy:</b>	± 1 °C at 20...-20 °Ctd ± 2 °C at -20...-50 °Ctd ± 3 °C at -50...-80 °Ctd
<b>Pressure range:</b>	-1...50 bar (with measuring chamber 16 bar, special version up to 350 bar)
<b>Protection class:</b>	IP 65
<b>EMV:</b>	according to DIN EN 61326
<b>Operating temp.:</b>	-20...70 °C
<b>Burden:</b>	< 500 Ω
<b>Screw-in thread:</b>	G 1/2" without meas. chamber

### Technical data DS 500

<b>Dimensions housing:</b>	280 x 170 x 90 mm, IP 65, 7.3 kg
<b>Connections:</b>	18 x PG 12 for sensors and power supply, alarm relay 1 x RJ 45 Ethernet connection
<b>Version panel mounting:</b>	Cutout panel 250 x 156 mm
<b>Weight:</b>	7.3 kg
<b>Material:</b>	Diecast, front keypad: Polyester
<b>Sensor inputs:</b>	4/8/12 sensor inputs for analogue and digital sensors freely assignable, see options. Digital CS sensors for dew point and flow with SDI interface FA/ VA series. Digital third-party sensors RS 485 / Modbus RTU, other bus systems can be realized on request. Analogue CS sensors for pressure, temperature, clamp-on ammeters pre-configured. Analogue third-party sensors 0/4...20 mA, 0...1/10/30 V, pulse, Pt 100 / Pt 1000, KTY
<b>Power supply sensors:</b>	24 VDC, max. 130 mA per sensor, integrated mains unit max. 24 VDC, 25 W In case of version 8/12 sensor inputs 2 integrated mains units each 24 VDC, 25 W
<b>Interfaces:</b>	USB stick, Ethernet / RS 485 Modbus RTU / TCP
<b>Alarm relays:</b>	4 relays (changeover contact 230 VAC, 6 A), alarm management relays freely programmable, collective alarm. Analogue output, pulse in case of sensors with own signal output looped, like e.g. VA/FA Series
<b>Memory card:</b>	Memory size 4 GB SD memory card
<b>Power supply:</b>	100...240 VAC / 50-60 Hz, special version 24 VDC
<b>Color screen:</b>	7" touch panel TFT transmissive, graphics, curves, statistics
<b>Accuracy:</b>	see sensor specifications
<b>Operating temperature:</b>	0...50 °C
<b>Storage temperature:</b>	-20...70 °C
<b>Optional:</b>	Websserver



## 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, incl. calibration certificate	0699 0040
Connection cable 5 m	0553 0108
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
Option: Integrated Ethernet and RS 485 interface	Z500 4004
CS Soft Basic - data evaluation in graphic and table form - reading out of the measured data via USB or Ethernet	0554 7040
Alternative version 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, incl. calibration certificate	0699 0041

## Portable solution with particle counter PC 400 and DS 500 mobile

The particle counter fixed onto a portable mounting plate with pedestal



Description	Order No.
PC 400 particle counter up to 0.1 µm for compressed air and gases incl. pressure reducer, incl. calibration certificate	0699 0040
Connection cable for third-party sensors to portable devices, ODU/open ends, 5m	0553 0501
Portable mounting plate with pedestal	0554 6016
Chart recorder DS 500 mobile , 4 sensor inputs	0500 5012
CS Soft Basic - data evaluation in graphic and table form - reading out of the measured data via USB or Ethernet	0554 7040
Alternative version 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, incl. calibration certificate	0699 0041

## Portable 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, incl. calibration certificate in a service case	0699 0042
Connection cable for third-party sensors to portable devices, ODU/open ends, 5m	0553 0501
Chart recorder DS 500 mobile , 4 sensor inputs	0500 5012
CS Soft Basic - data evaluation in graphic and table form - reading out of the measured data via USB or Ethernet	0554 7040
Alternative solution 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, incl. calibration certificate in a service case	0699 0043

## Re- calibration of particle counter PC 400

Description	Order No.
Re- calibration particle counter PC 400 with Certificate	0699 3304



## Stationary solution with OIL-Check and DS 400



Description	Order No.
OIL-Check residual oil content measurement for vaporous residual oil content (DN 20-DN 40), 3-16 bar, measuring range <math><0.01...5.000\text{ mg/m}^3</math>, including sampling probe (DN 20-DN 40), inspection certificate, 4...20 mA analogue output. Please order measuring section for sampling separately.	0699 0060
OIL-Check measuring section for sampling (DN 20, 3/4", 16 bar, stainless steel, outer diameter 26.9 mm, outer thread R 3/4")	4000 2001
Ball valve G 3/8" incl. connection fittings for installation between sampling probe and OIL-Check, cleaned oil- and grease-free	3300 0004
Connection plug for 4...20 mA analogue output	3300 0005
Connection cable 5 m	0553 0108
DS 400 chart recorder with graphic display and touch screen operation	0500 4000 A
Option: Integrated data logger for 100 million measured values	Z500 4002
Option: Integrated Ethernet and RS 485 interface	Z500 4004
CS Soft Basic - data evaluation in graphic and table form - reading out of the measured data via USB or Ethernet	0554 7040
<b>OIL-Check versions for different pipe diameters:</b> OIL-Check - residual oil content measurement for vaporous residual oil content (DN 50 - DN 80), 3-16 bar, meas.range <math><0.01...5.000\text{ mg/m}^3</math> including sampling probe (DN 50 - DN 80), inspection certificate, 4...20 mA analogue output. Please order meas. section for sampling separately.	0699 0061
OIL-Check - residual oil content measurement for vaporous residual oil content (>DN 80), 3-16 bar, meas.range <math><0.01...5.000\text{ mg/m}^3</math>, incl. sampling probe (customer-specific length), insp. certificate, 4...20 mA analogue output. Please order meas. section for sampling separately.	0699 0062
OIL-Check measuring section for sampling (DN 25, 1"), 16 bar, stainless steel, outer diameter 33.7 mm, R 1"	4000 2002
OIL-Check measuring section for sampling (DN 32, 1 1/4"), 16 bar, stainless steel, outer diameter 42.4 mm, R 1 1/4"	4000 2003
OIL-Check measuring section for sampling (DN 40, 1 1/2"), 16 bar, stainless steel, outer diameter 48.3 mm, R 1 1/2"	4000 2004
OIL-Check measuring section for sampling (DN 50, 2"), 16 bar, stainless steel, outer diameter 60.3 mm, R 2"	4000 2005
OIL-Check measuring section for sampling (DN 65, 2 1/2"), 16 bar, stainless steel, outer diameter 76.1 mm, R 2 1/2"	4000 2006
OIL-Check measuring section for sampling (DN 80, 3"), 16 bar, stainless steel, outer diameter 88.9 mm, R 3"	4000 2007
Stainless steel pipe 6x1 mm for horizontal installation, length max. 1000 mm including connection fittings	4000 2008
Replacement unit OIL-Check for the period of re-calibration	0699 3910
Replacement unit OIL-Check with DS 400 for the period of re-calibration	0699 3920
Re- calibration Oil Check with Certificate	0699 3301
Re- calibration and maintenance Oil Check, with Certificate, rate 1 up to 8760 hours of operation	0699 3302
Re- calibration and maintenance Oil Check, with Certificate, rate 2 over 8760 hours of operation	0699 3303

## Stationary solution with OIL-Check, particle counter PC 400 and DS 500



Description	Order No.
OIL-Check residual oil content measurement for vaporous residual oil content (DN 20-DN 40), 3-16 bar, measuring range <math><0.01...5.000\text{ mg/m}^3</math>, including sampling probe (DN 20-DN 40), inspection certificate, 4...20 mA analogue output. Please order measuring section for sampling separately.	0699 0060
OIL-Check measuring section for sampling (DN 20, 3/4"), 16 bar, stainless steel, outer diameter 26.9 mm, outer thread R 3/4"	4000 2001
Ball valve G 3/8" incl. connection fittings for installation between sampling probe and OIL-Check, cleaned oil- and grease-free	3300 0004
Connection plug for 4...20 mA analogue output	3300 0005
Connection cable 5 m	0553 0108
PC 400 particle counter up to 0.1 $\mu\text{m}$ for compressed air and gases incl. pressure reducer, incl. calibration certificate	0699 0040
Connection cable 5 m	0553 0108
DS 500 - intelligent chart recorder in basic version (4 sensor inputs)	0500 5000
CS Soft Basic - data evaluation in graphic and table form - reading out of the measured data via USB or Ethernet	0554 7040
<b>OIL-Check versions for different pipe diameters:</b> Optionally available: dew point sensor, pressure sensor, flow sensor	Please see above

## Portable solution with OIL-Check, particle counter PC 400 + DS 500 mobile



Description	Order No.
OIL-Check residual oil content measurement for vaporous residual oil content (DN 20-DN 40), 3-16 bar, measuring range <math><0.01...5.000\text{ mg/m}^3</math>, including sampling probe (DN 20-DN 40), inspection certificate, 4...20 mA analogue output. Please order measuring section for sampling separately.	0699 0060
OIL-Check measuring section for sampling (DN 20, 3/4"), 16 bar, stainless steel, outer diameter 26.9 mm, outer thread R 3/4"	4000 2001
Mobile transport trolley with wheels	0554 6015
Connection plug for 4...20 mA analogue output	3300 0005
Connection cable for third-party sensors to portable devices, ODU/open ends, 5 m	0553 0501
PC 400 particle counter up to 0.1 $\mu\text{m}$ for compr. air and gases, incl. pressure reducer, incl. calibration certificate	0699 0040
Connection cable for third-party sensors to portable devices, ODU/open ends, 5 m	0553 0501
DS 500 mobile - intelligent chart recorder in basic version (4 sensor inputs)	0500 5012
CS Soft Basic - data evaluation in graphic and table form - reading out of the measured data via USB or Ethernet	0554 7040



**CS INSTRUMENTS GMBH & CO. KG**

Am Oxer 28c  
D-24955 Harrislee  
GERMANY

P: +49 (0) 461 700 20 25  
F: +49 (0) 461 700 20 26  
info@cs-instruments.com  
www.cs-instruments.com

**BcfH '5 a Yf]Wub'8 ]glf]Vi Hcb**  
**G 5 '7 ca dfYggYX'5 ]f'Gc'i Hcbg'**

**fG 5 '8 Yj Ycda Ybh'@@ L**  
5460 33rd St SE  
Grand Rapids, MI 49512  
P: +1 616 828 1024  
F: +1 616 425 5281  
info@cs-instruments.us  
www.cs-instruments.us

