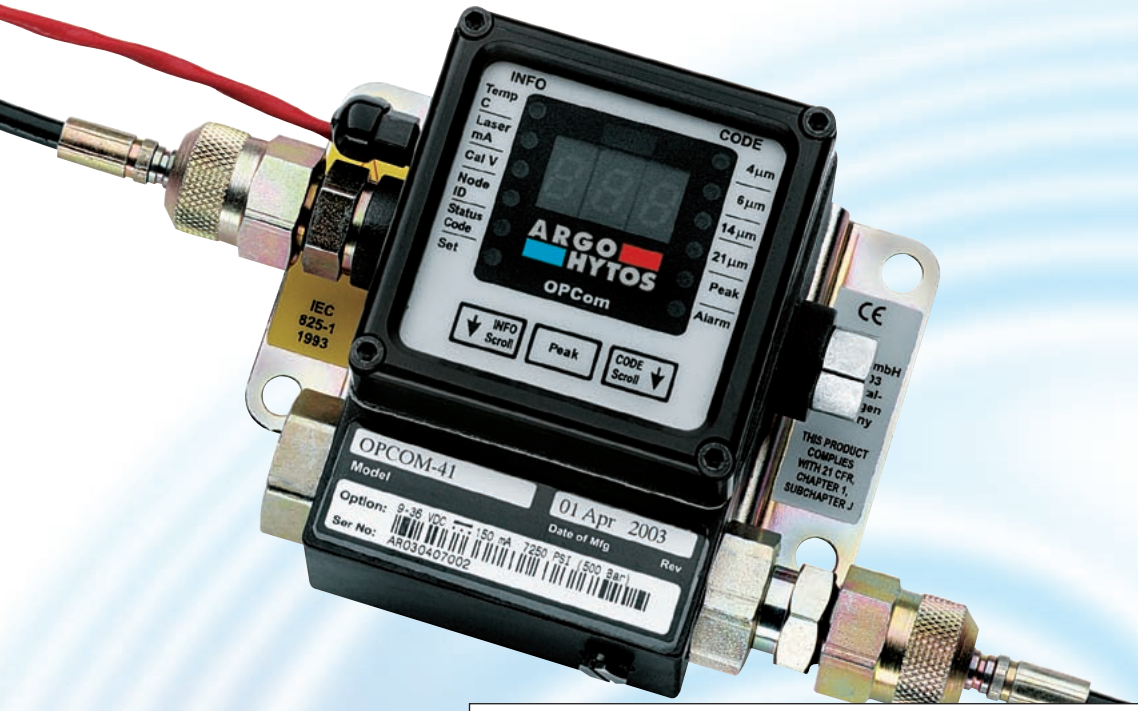
ARGO HYTOS



Particle Monitor

OPCom

- With laser diode
- Measurement range 4, 6,14 and 21 µm(c)
- Operating pressure up to 500 bar

100.10-1e

Description

Application
As stationary particle monitor in hydraulic and hydrostatic lubrication systems.

Performance features
Protection: By continous controlling of the oil cleanliness, damage can already be recognized in the early stage. This offers the possibility of avoiding machine faults by suitable measures and of extending maintenance and oil change intervals.

Special design features
Modular
Construction: The particle monitor consists of a sensor module and a communication module.
The sensor module is selected according to the pressure and viscosity conditions in the working range, the communication module is chosen according to the requirements for data processing. Each sensor module is optionally also availabe with a display, from which the degrees of purity can be read off according to ISO 4406:1999.

Measurement
principle: The particle monitor operates according to the light extinction principle. The oil flows through the sensor with system pressure and approx.
50 ... 500 ml/min. It is analyzed by a laser. Opposite of the laser a photodiode measures the weakening of the light with presence of a particle and calculates from it the particle size and number. For the tuning of the monitor on different pressure and viscosity ranges different variations of the sensor are selectable. For the installation of the particle monitor particularly lines are suitable in which no large pressure fluctuations and pressure peaks occur, like e. g. pilot oil lines.

Standard Accessories
DDE-Software
Optical fibre optic cable, 6 m
Operating instructions

Under the designation OPCom portable a portable on-line monitor is available, with which by connection to a computer the measuring data can also be plotted and filed. For dimensions and technical data see brochure OPCom portable.

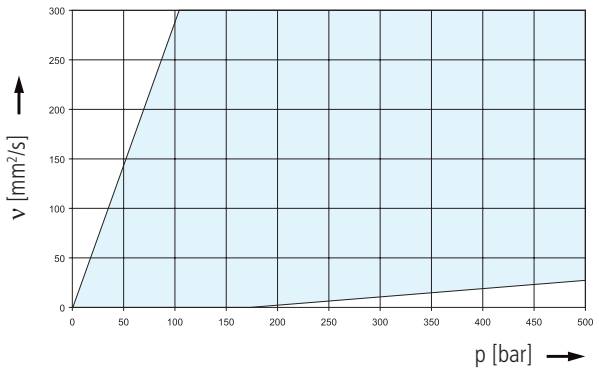
Technical Data

Size channels		4, 6, 14, 21 µm(c)
Display		Cleanliness classes according to ISO 4406:1999 with additional decimal
Concentration limit		Class 29 according to ISO 4406:1999
Operating pressure		9 ... 36 VDC at approx. 150 mA charging rate
Fluid pressure		max. 500 bar
Temperature range		-20 °C ... +80 °C
Viscosity range		> 2 mm²/s
Ambient conditions operation		-20 °C ... +60 °C, 20 ... 95% rel. humidity, non condensing
Ambient conditions storing		-40 °C ... +85 °C, < 98% rel. humidity, non condensing
Dimensions	System with display	LxWxH: 9.4 x 8.7 x 4.6 cm
	System without display	LxWxH: 9.4 x 8.7 x 3.6 cm
Weight	System with display	1.28 kg
	System without display	1.26 kg
Hydraulic fluids		Mineral oils and biodegradable fluids (HEES, HETG...) On request: Phosphate ester (e.g. Skydrol)
Wetted materials		SAE 1020 steel, spring steel, synthetic sapphire, chrome, zinc, bronze, aflas, Buna-N Attention: Sensors for Skydrol do not contain Buna-N

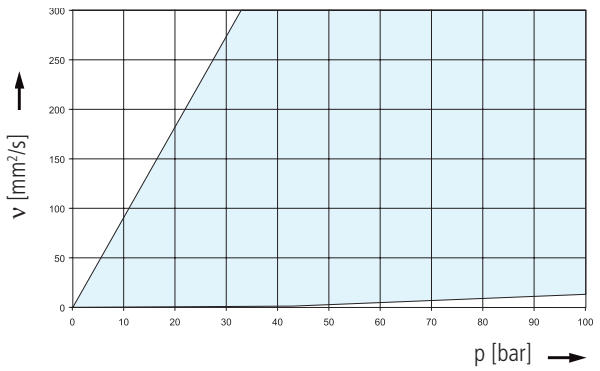
Diagrams

Viscosity diagrams / permitted ranges for different sensor versions (see order terms)
Viscosity as a function of the **pressure** (within working range)

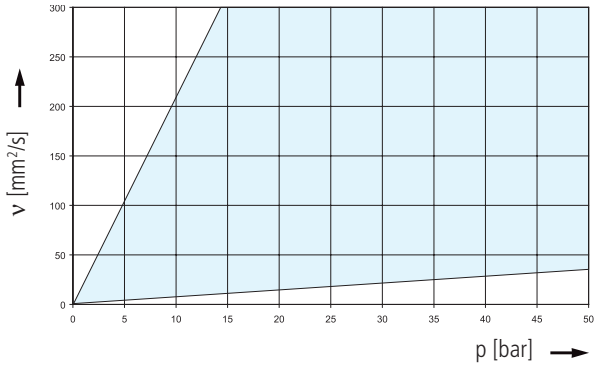
High pressure (30 ... 500 bar)



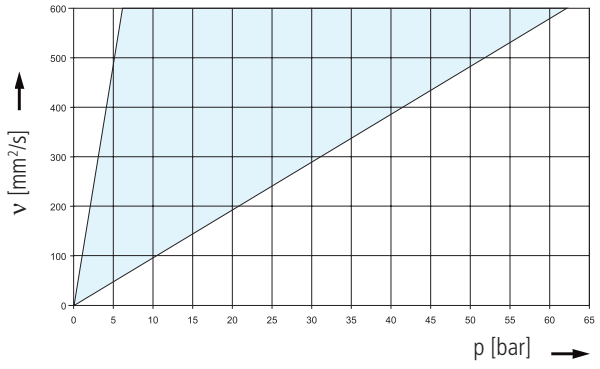
Medium pressure (5 ... 100 bar)



Low pressure (2 ... 10 bar)



Without orifice (0,3 ... 500 bar)



Communication Interface Description

Configuration only possible by infrared interface (IrDA).

Data recording by computer or data logger over the following interfaces:

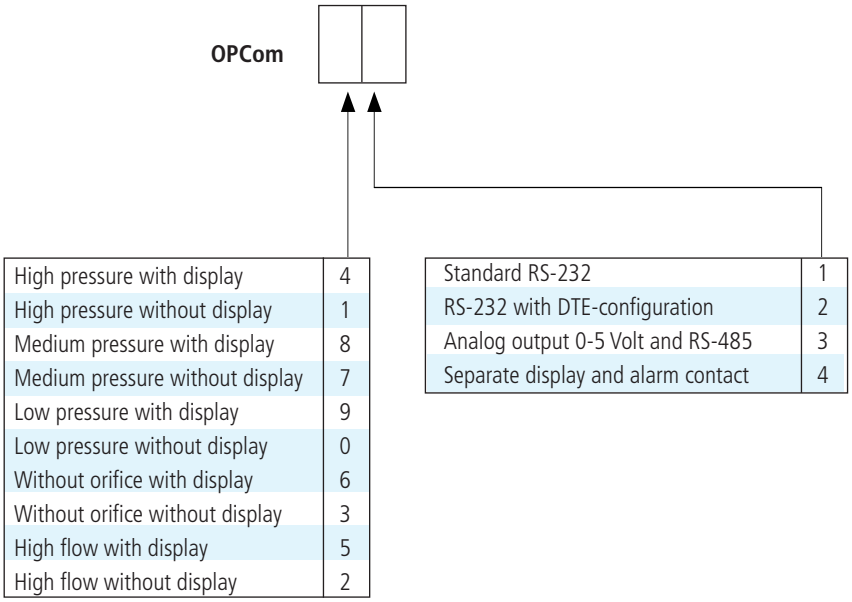
- RS-232 standard
- RS-232 DTE for serial printers or PDA connections
- Data logger or PLC systems:
  8 channels with in each case 0 - 5 VDC analogue output
- RS-485 with MODBUS record for operation in the network
- Separate indication with programmable alarm limit and floating contact

Order Terms

The selection of the suitable OPCom takes place in two steps:

1. Definition of the sensor module and the indication
2. Selection of the communication version

For the selection of the sensor module viscosity and pressure in the work area must be known. By means of these parameters the suitable version can be selected on the basis of the permissible ranges in the diagrams.



High pressure with display	4
High pressure without display	1
Medium pressure with display	8
Medium pressure without display	7
Low pressure with display	9
Low pressure without display	0
Without orifice with display	6
Without orifice without display	3
High flow with display	5
High flow without display	2

Standard RS-232	1
RS-232 with DTE-configuration	2
Analog output 0-5 Volt and RS-485	3
Separate display and alarm contact	4

Quality Assurance

Quality management according to DIN EN ISO 9001

Various quality controls during the production process guarantee the leakfree function and solidity of our filters.

Our engineers will be glad to advice you in questions concerning filter application, selection as well as the cleanliness class of the filtered medium attainable under practical operating conditions.

We produce fluid power solutions
ARGO-HYTOS GMBH · Industriestraße 9 · D-76703 Kraichtal
Tel: +49 7250 76-0 · Fax: +49 7250 76-199 · info.de@argo-hytos.com · www.argo-hytos.com

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ARGO HYTOS

Portable Particle Monitor

OPCom portable –
Particle Counting – The Easy Way

- Easy
- Compact
- Cost-Efficient

NEW!
With Data Memory!

OPCom Portable – Particle Counting – The Easy Way

Particle Counting – Compact, Easy and Beneficial
OPCom portable is a "Plug and Play"- Instrument with which the oil cleanliness of hydraulic and hydrostatic lubrication systems can be measured quickly and easily. It is simply connected to the sample port, switched on and gives results regularly. There is no easier way for particle monitoring.

OPCom portable displays the cleanliness class according to ISO 4406:1999.
A computer can be connected to display curves graphically, to archive data and to display how the cleanliness in the system changes over the time. A lot of arising damages can be recognized and prevented.

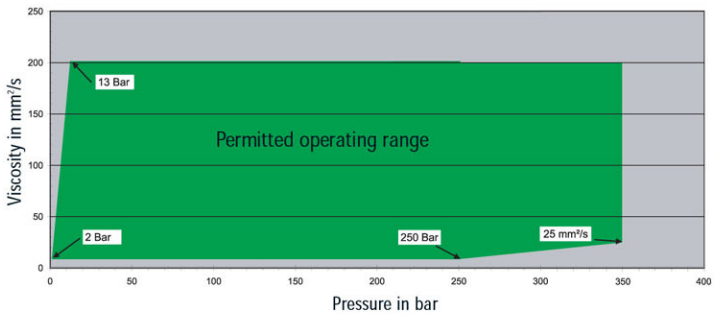
By setting up a database and observing over a longer period of time, the progress of cleanliness in a system at different operating states can be noticed. These insights could enable operators and engineers to optimize the machine and process.

With this instrument everybody is easily able get a picture of the cleanliness of his hydraulic system.

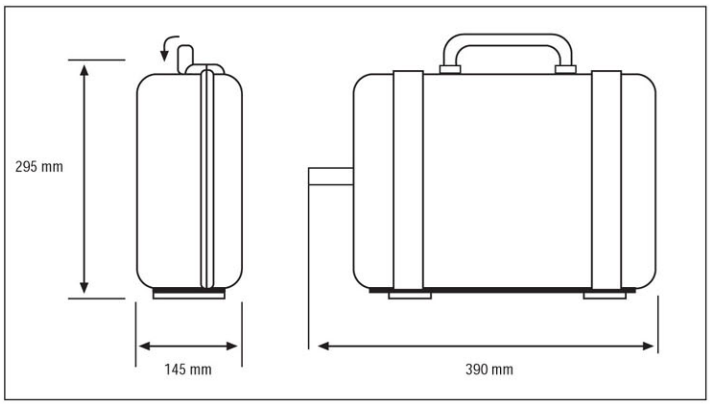
Technical Data

Voltage:	100 – 240 VDC Internal battery 12 VDC
Pressure Range:	10 – 350 bar (see diagram)
Viscosity Range:	10 – 200 cSt (see diagram)
Display:	ISO-Classes according to ISO 4406:1999
Size Channels:	4, 6, 14, 21 µm (c)
Operating Condition.:	Oil Temperature: 0 – 80 °C (viscosity has to be in the specified range) Ambient temperature: 5 – 60 °C Relative humidity: 10 – 90 % (non condensing)
Interface:	RS232
Weight:	8,5 kg
Dimensions L x W x H:	295 x 390 x 145 mm
Standard accessories:	2 minimess tubes, power cable, RS 232 data cable, software for data recording, manual
Data Memory	Saves more than 500 readings, every measurement is saved with date and time, download in an Excel-compatible format

Pressure and viscosity range



Dimensions



We produce fluid power solutions
ARGO-HYTOS GMBH · P.O. Box 1160 · D-76699 Kraichtal-Menzingen
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9107408-E

ARGO HYTOS

Oil Diagnostic Systems

PODS *Pro*

PORTABLE OIL DIAGNOSTIC SYSTEM

- **Online and bottle measurement**
- **Mobile and stationary operation**
- **Lab quality accuracy**

The new generation of oil diagnostics

Mobile and stationary operation: Shop-air connector for laboratory measurement and gas bottle for field measurement

PODS *Pro*

PORTABLE OIL DIAGNOSTIC SYSTEM

PODS *Pro* is the new generation of portable oil-diagnostic instruments for simple, quick and reliable monitoring of oil cleanliness.

PODS *Pro* is based on many years of know how and represents the advanced version of PODS with newest technology. Many features were improved, thus PODS *Pro* is not only lighter than its predecessor, but also offers the classification according to SAE AS 4059.

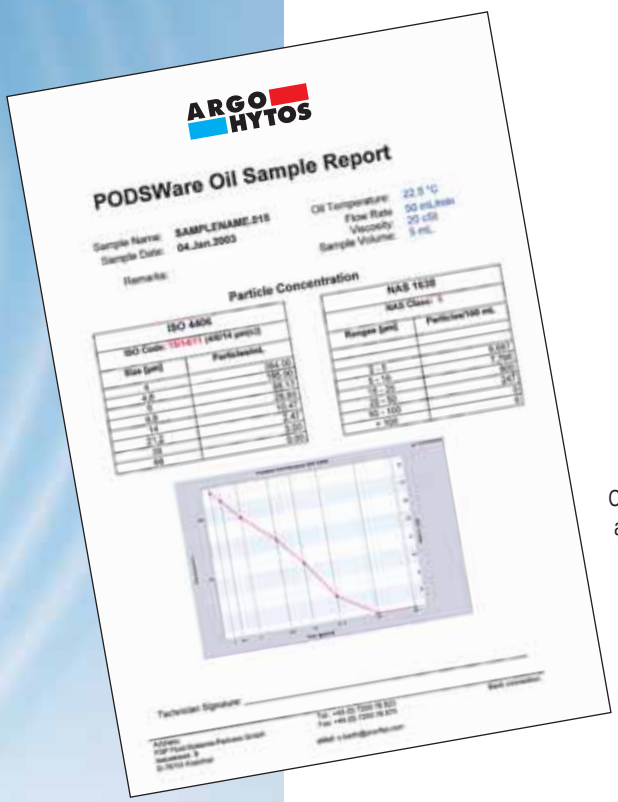
Productive – Online & Bottle sample analysis by one instrument.
As before you can rely on PODS *Pro* even under severest operating conditions. The measurement results are reported simply, quickly and reliably.
With PODS *Pro* you have the option to run online or bottle sample analysis with the same instrument.

Profitable – the PODS *Pro* Special:
The all-inclusive delivery program includes a robust rollerbox with all necessary accessories.
The ARGO-HYTOS software PODSWare sets new standards for service statistics and allows, for example, a detailed mapping of the machine life.

Proving – PODS *Pro* „live“
We would be happy to show you PODS *Pro* „live“. Simply ask for a noncommittal demonstration.

Rely on hightech oil diagnostic systems from ARGO-HYTOS.

Online and bottle measurement:
Bottle adapter for batch sampling and minimess connector for online measurement


ARGO HYTOS

PODSWare Oil Sample Report

Particle Concentration

ISO 4406

NAS 1638

Certificate for measurements according to the different standards. These certificates can be issued with individual labels.

Advantages at a glance

PODS *Pro*

PORTABLE OIL DIAGNOSTIC SYSTEM

1. Online and bottle sample analysis
With two turns of your hand, using the two fluid adapters in the all-inclusive delivery, PODS *Pro* is converted from a "Monitor" to a "Lab analyzer". In the online mode PODS *Pro* is connected directly to the hydraulic circuit via Minimess™ tubing and allows specific and continuous monitoring of the oil cleanliness.

2. Flexibility
Due to its lower weight PODS *Pro* can be easily carried to each location. For longer distance transport the rollerbox is used.

3. All-included delivery
PODS *Pro* is supplied with a very robust rollerbox, which is air- and water tight and contains all necessary accessories such as gas cartridges, power adapter, fluid adapters for online and bottle mode, hand-pump for oil sampling as well as clean sample bottles. The box is lockable and can be used for safe shipping to the ARGO-HYTOS Service Center, for instance for calibration.

4. Pressure range up to 420 bar
By direct measurement at system pressures up to 420 bar without bypassing, the risk of outgasing and bubble counting is drastically reduced.

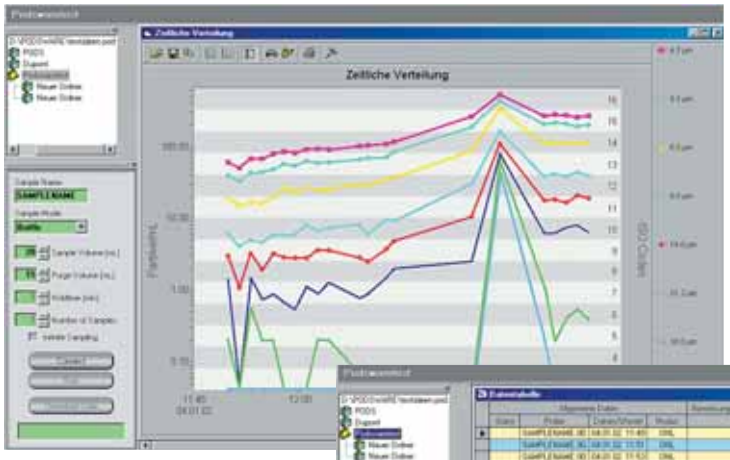
5. High viscosity and high contamination
PODS *Pro* can measure particle contamination up to code 24 according to ISO 4406:1999. This is achieved by a sensor with a limit concentration of 90.000 particles/mL at 10% optical coincidence and avoids time consuming and complicated dilution procedures. Another important advantage is its ability to measure oils with a viscosity up to 850 mm^2/s.

6. Variable flow rate
PODS *Pro* automatically regulates the flow rate to an appropriate value between 15 and 50 mL/min, depending on the oil pressure and the viscosity. This feature makes it insensitive to variations in the hydraulic system during the measurement.

7. Controlled cleaning with ECOLINE
The oil service filter unit ECOLINE cleans oils up to a selected cleanliness class with PODS *Pro*. For this purpose ECOLINE pumps the oil over a filter. At the same time PODS *Pro* measures the cleanliness of the oil in front of the filter online and turns off ECOLINE when the target cleanliness class is reached. The cleanliness class is documented on a printout.

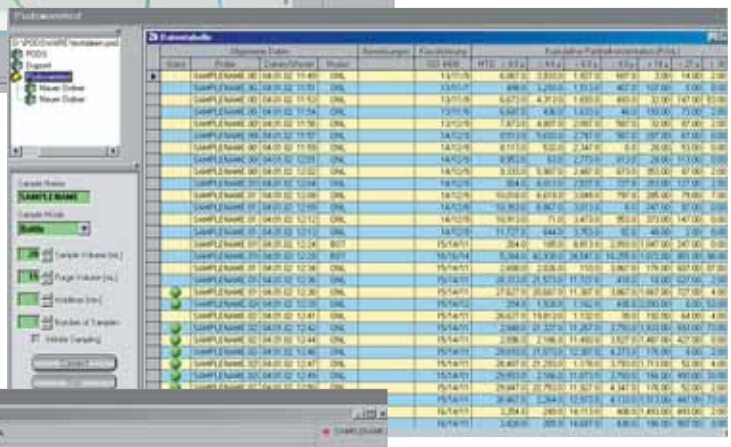
Software

PODSWare – A powerful software!
PODSWare as supplement to PODS *Pro* is a tool to record and evaluate the measured data in a comfortable manner.
Apart from this PODS *Pro* may be completely controlled from the control window of the software.
The PODSWare includes the following languages: German, English, French, Italian



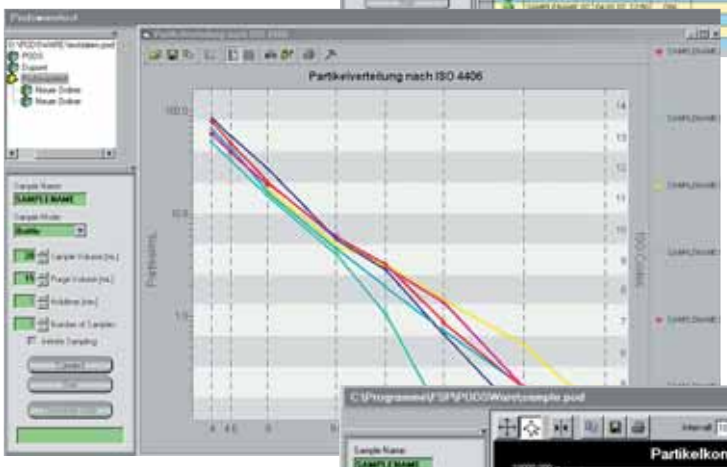
Starting and stopping measurements. Setting parameters and downloading stored data.

Graphical tracking of online measurements by time graphics.

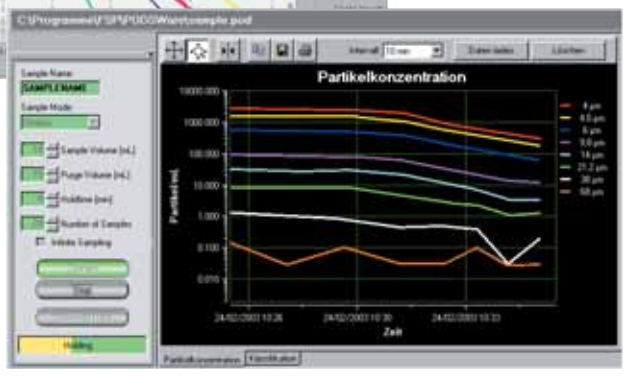


Build-up of a data bank and linking of measurements to machines.

Historic review of the oil cleanliness.



Particle concentration-size distribution.



Chronological review of the particle concentration.

Technical information

Detection	Light extinction
Sensitivity	complies with Japanese Industry Standard (JIS-B-9925:1997)
Size ranges	4 - 100 µm(c) (ISO-MTD); ~1 - 100 µm (ACFTD)
Size channels	4 - 100 µm(c) (ISO-MTD); ~1 - 100 µm (ACFTD)

8 channels	1	2	3	4	5	6	7	8
ISO-MTD sizes [µm (c)]	4	4,6	6	9,8	14	21,2	38	68
ACFTD sizes [µm]	~1	2	~5	10	~15	25	~50	100

Flow rate	15-50 mL/min automatic regulation
Calibration	ISO-MTD in oil (ISO 11171:1999)
Cleanliness classification	ISO 4406; NAS 1638; MIL-STD-1246C; NAVAIR 01-1A17, SAE AS 4059
Cleanliness classes	ISO 4406 code 1 to 24
Concentration limit	90.000 particles/mL @ 10% optical coincidence
Measurement results	Oil cleanliness classes (according to standard), concentration (particles/mL), viscosity (mm^2/s, cSt or SUS), temperature
Light source	Laser diode
Counting efficiency	By JIS-B-9925:1997
Wetted materials	Stainless steel, sapphire, aluminium, Aflaz™, PTFE
Fluid pressure	0,5 - 420 bar
Temperature	0-90°C oil at 25°C ambient; 0-50° C ambient; 5 - 40° C housing
Relative humidity	20 - 85% non-condensing, up to 98% when stored
Viscosity	5-500 mm^2/s particle counting with viscosity measurement, 1-850 mm^2/s particle counting only
Material compatibility	Mineral oils, Skydrol™, environmentally compatible pressure fluids and phosphate esters
Pressure medium	CO_2 liquid (1 cartridge for about 60 oil samples), or pressurized shop air
Sample bottles	100 mL
System properties	Metal housing / Carry handle and shoulder strap / Universal power adapter/charger (90-240 VAC) Built-in thermal printer / LCD-display and keyboard / Memory for 500 samples / RS232C-interface Tube connector for filtered and dry pressurized shop air / Exchangeable CO2-gas cartridges, refillable, 100 g filling NiMH-battery, computer controlled recharging for extended battery life Digitaloutput 0-5VDC / < 20 mA, potential-free output 0-5VDC / Online-adapter with Minimess™ tubing M16x2
Operating modes	Bottle sample analysis (4-7 bar); online-analysis (0,5-420 bar); Monitoring of ECOLINE UMP-45 by ARGO-HYTOS
Software (optional)	PODSWare for download, storage and management of PODS *Pro* data under Windows 9X/Me/2000 and XP
Weight	8,5 kg
Dimensions	(B x H x T) 330 x 350 x 200 mm

We produce fluid power solutions
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