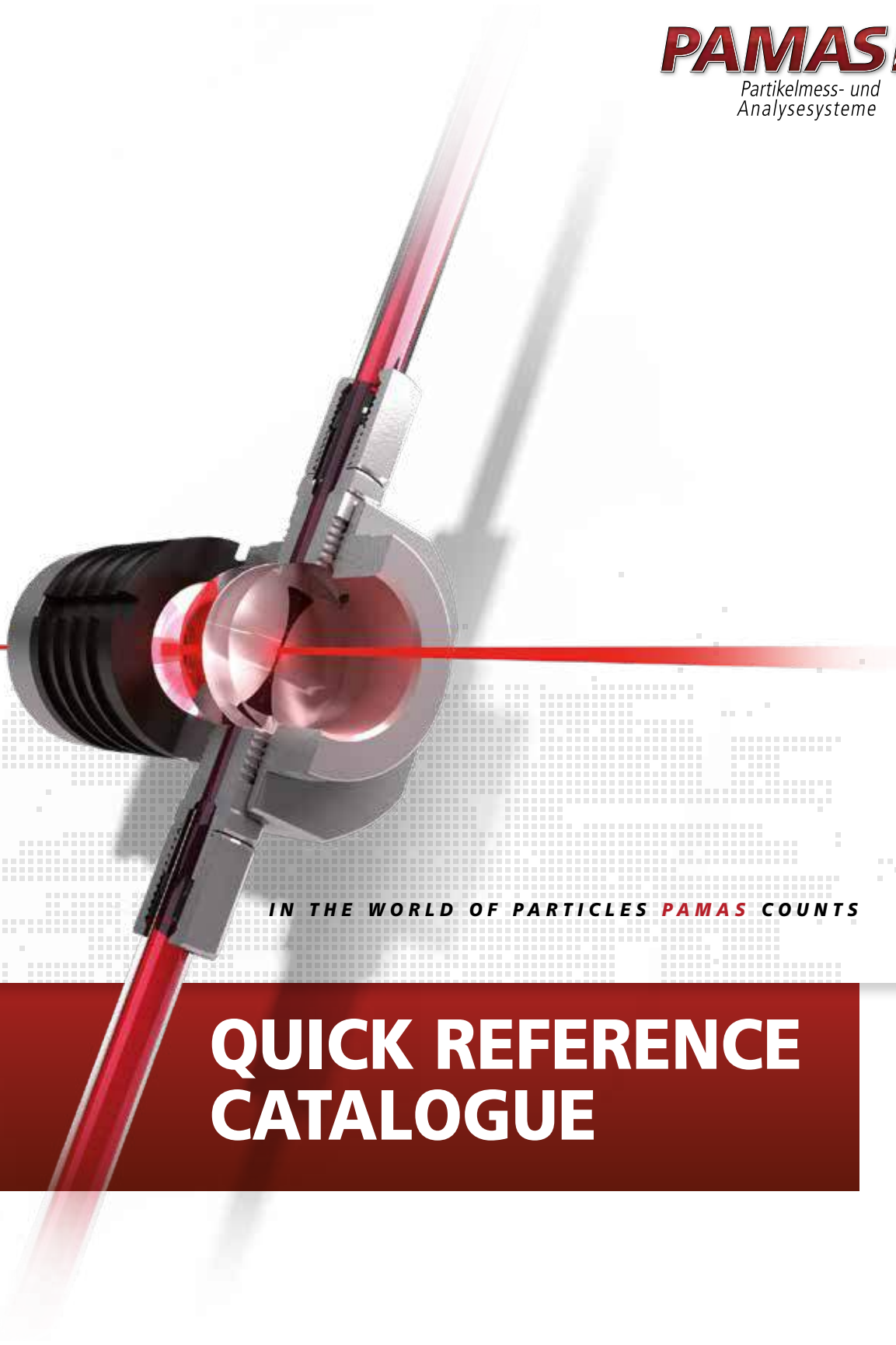




IN THE WORLD OF PARTICLES **PAMAS** COUNTS

QUICK REFERENCE CATALOGUE

Table of Contents

PAMAS particle counters

Overview on features and applications of PAMAS products	3
---	---

Portable particle counters

PAMAS S40 –Standard version	4
PAMAS S40 – Lube oil version	5
PAMAS S40 – Fuel version	6
PAMAS S40 – Skydrol version	7
PAMAS S40 AVTUR – Aviation Turbine Fuel version	8
PAMAS S4031 – Multifunctional version	9
PAMAS S4031 WG – Water-Glycol version	10
PAMAS GO – Rugged case for harsh environments	11

Laboratory particle counters

PAMAS SBSS – Laboratory particle counter	12
PAMAS SBSS WG – Laboratory particle counter for Water-Glycol	13
PAMAS SBSS Small Volume version – Laboratory instrument for small volumes of higher viscosity samples	14
PAMAS SVSS – Laboratory instrument for low viscous fluids	15
Accessories for PAMAS SVSS	16
PAMAS AS3 – Autosampler with tray system	17
PAMAS FastPatch 2 GO – Advanced automatic microscope system	18

Online particle counters

PAMAS S50 – Online particle counter	19
PAMAS S50P – Online particle counter with pump	20
PAMAS S50DP – Online particle counter with integrated dilution system	21
PAMAS S50P Fuel – Online particle counter for Fuel	22
PAMAS OLS4031 – Online particle counter with 32 size channels	23
PAMAS OLS50P – Online particle counter for all sorts of liquids	24
PAMAS WaterViewer – for Water Applications	25
PAMAS 4132 – for Single & Multipass filter tests	26
PAMAS FSA-2002 – Floc Size Analyser	27

PAMAS particle sensors

PAMAS HCB-LD – Light Extinction Sensors	28
PAMAS SLS-25/25 – Scattered Light Sensor	28
PAMAS sensor overview	29

PAMAS software

PAMAS CMDM – Condition Monitoring Data Management	30
PAMAS Download-Software	30
PAMAS POV – PAMAS Online Visualization	31
PAMAS PCT – PAMAS Component Test	31
PAMAS PMA – Particle Measurement and Analysing software	32
PAMAS USP – Pharmaceutical procedural software	32
Compatibility of PAMAS instruments and software tools	33

Overview on features and applications of PAMAS products

		PAMAS S40 Standard	PAMAS S40 Lube Oil	PAMAS S40 Fuel	PAMAS S40 AVTUR	PAMAS S40 Skydrol	PAMAS S4031	PAMAS S4031 WG	PAMAS SBSS	PAMAS SBSS WG	PAMAS S50
Environment	Portable instrument	■	■	■	■	■	■				
	Laboratory instrument	■	■	■	■	■	■	■	■		
	Fixed installation									■	
PAMAS GO	available in GO case	■	■	■	■	■	■				
Sampling	for online measuring	■	■	■	■	■	■			■	
	for bottle sampling	■	■	■	■	■	■	■	■		
Medium	Oil	■	■					■		■	
	Fuel			■	■			■			
	Water					■	■	■	■		
	Phosphate-Ester				■			■			
	Pharm. Applications							■			
	Water Glycol						■		■		
	Emulsions										

■ = recommended

□ = possible (ask manufacturer)

		PAMAS S50P	PAMAS S50P Fuel	PAMAS FastPatch 2 GO	PAMAS FSA-2002	PAMAS OLS4031	PAMAS OLS50P	PAMAS WaterViewer	PAMAS SVSS	PAMAS 4132	PAMAS AS3
Environment	Portable instrument										
	Laboratory instrument			■				■			■
	Fixed installation	■	■		■	■	■		■		
PAMAS GO	available in GO case										
Sampling	for online measuring	■	■		■	■	■		■		
	for bottle sampling			■				■		■	
Medium	Oil	■		□	■	■			■	■	
	Fuel	■	■	□	■	■					
	Water			□	■	■	□	■	■	■	
	Phosphate-Ester			□	□	□					
	Pharm. Applications							■			
	Water Glycol					□					
	Emulsions			■							

Portable particle counters



PAMAS S40 Standard version

Application:

Portable particle counter for oil based liquids, like hydraulic oil, gearbox oil, motor oil, lubrication oil, etc.; handles batch and online measurements.

Sample input:

Low pressure: 0 to 6 bar - batch and online mode
High pressure: 3 to 420 bar - online mode

Viscosity at 22° C:

Up to 200 cSt; pressurised up to 350 cSt

Sensor specifications:

Particle sensor: PAMAS HCB-LD-50/50
Maximum concentration:
24.000 particles per ml at 7.8 % coincidence

Calibration:

- Standard calibration as per ISO 11171:
size range 4 $\mu\text{m(c)}$ to 70 $\mu\text{m(c)}$
- 8 size channels:
4, 6, 10, 14, 21, 25, 38 and 70 $\mu\text{m(c)}$
according to the cleanliness standards
SAE AS 4059 and ISO 4406:1999
- Optional calibration as per ISO 4402:
size range 2 to 100 μm

8 size channels:
2, 5, 10, 15, 20, 25, 50 and 100 μm
according to the cleanliness standards
NAS 1638 and ISO 4406:1987

Portable particle counters



PAMAS S40 Lube **Lube oil version**

Application:

Portable particle counter for lubricating oil

Handles batch and low pressure online measurements.

Sample input:

0 to 6 bar batch and online mode

Viscosity at 22° C:

up to 1000 cSt

Sensor specifications:

Particle sensor: PAMAS HCB-LD-50/50

Maximum concentration:

24.000 particles per ml at 7.8 % coincidence

Calibration:

- Standard calibration as per ISO 11171:
size range 4 $\mu\text{m(c)}$ to 70 $\mu\text{m(c)}$
- 8 size channels:
4, 6, 10, 14, 21, 25, 38 and 70 $\mu\text{m(c)}$
according to the cleanliness standards
SAE AS 4059 and ISO 4406:1999
- Optional calibration as per ISO 4402:
size range 2 to 100 μm
- 8 size channels:
2, 5, 10, 15, 20, 25, 50 and 100 μm
according to the cleanliness standards
NAS 1638 and ISO 4406:1987

Portable particle counters



PAMAS S40 Fuel Fuel version

Application:

Portable particle counter for contamination control in low viscous liquids.

The particle counter is optimised for fuel analysis through structural alterations at the flow path.

Sample inlet:

0 to 6 bar batch and online mode

Sensor specifications:

Particle sensor: PAMAS HCB-LD-50/50

Maximum concentration:

24.000 particles per ml at 7.8 % coincidence

Calibration:

- Standard calibration as per ISO 11171:
size range 4 - 70 $\mu\text{m(c)}$

- 8 size channels:
4, 6, 10, 14, 21, 25, 38 and 70 $\mu\text{m(c)}$;
according to the cleanliness standards
SAE AS 4059 and ISO 4406:1999

- Optional calibration as per ISO 4402:
size range 2 to 100 μm

8 size channels:
2, 5, 10, 15, 20, 25, 50 and 100 μm
according to the cleanliness standards
NAS 1638 and ISO 4406:1987

Portable particle counters

7



PAMAS S40 Skydrol Phosphate-Ester version

Application:

Portable particle counter for phosphate ester based hydraulic liquids, mainly used in airplane hydraulic systems.

Sample input:

- Low pressure: 0 to 6 bar - batch and online mode
- High pressure: 3 to 420 bar - online mode

Sensor specifications:

Particle sensor: PAMAS HCB-LD-50/50

Maximum concentration:

24.000 particles per ml at 7.8 % coincidence

Calibration:

- Standard calibration as per ISO 11171:
size range 4 to 70 $\mu\text{m}(\text{c})$

- 8 size channels:
4, 6, 10, 14, 21, 25, 38 and 70 $\mu\text{m}(\text{c})$;
according to the cleanliness standards
SAE AS 4059 and ISO 4406:1999

- Optional calibration as per ISO 4402:
size range 2 to 100 μm

8 size channels:
2, 5, 10, 15, 20, 25, 50 and 100 μm
according to the cleanliness standards
NAS 1638 and ISO 4406:1987

Portable particle counters



PAMAS S40 AVTUR
Aviation Turbine Fuel version

Application:

Portable multifunctional particle counting system for Aviation Turbine Fuel, Diesel, etc.

Ideal for:

- online measurements at pressureless systems or at live systems up to 6 bar
- offline measurements using sample bottles (laboratory mode)
- long-term analysis
- filter verification
- bypass filtration monitoring

Technical Data:

- free adjustable size channels
- special AVTUR mode according to the standards EI-IP 577 and DEF STAN 91-91 (Edition 7)

Portable particle counters



PAMAS S4031 **Multifunctional version**

Application:

Portable multifunctional particle counting system for water, organic and corrosive fluids (please confirm sample fluid before quoting).

Sample inlet:

0 to 6 bar - batch and online mode

Sensor specifications:

Particle sensor PAMAS HCB-LD-50/50

Maximum concentration:

24,000 particles per ml at 7.8% coincidence

Calibration:

According to ISO 21501-3

Size range: 2 to 200 μm ,

1 to 400 μm (option on request).

Technical Data:

up to 32 free adjustable size channels.

Portable particle counters



PAMAS S4031 WG Water-Glycol version

10

Application:

Portable particle counting system for water based liquids, mainly used for hydraulic systems in the offshore oil industry

Sample Input:

0 to 6 bar – batch and online mode

Sensor specifications:

Particle sensor PAMAS HCB-LD-50/50

Maximum concentration:

24,000 particles per ml at 7.8% coincidence

Calibration

- according to ISO 11171: size range 4 to 70 $\mu\text{m(c)}$
- according to ISO 21501-3: size range 2 to 200 μm

Technical data:

up to 32 free adjustable size channels

Three different channels settings

for Water-Glycol measurements are pre-set in the system:

- SAE AS 4059 A–F, 4 to 70 $\mu\text{m(c)}$:
 $> 4, > 6, > 14, > 21, > 38, > 70 \mu\text{m(c)}$
- SAE AS 4059 B–F, 6 to 70 $\mu\text{m(c)}$:
 $> 6, > 14, > 21, > 38, > 70 \mu\text{m(c)}$
- NAS 1638 / 5 to 100 μm :
 $\rightarrow 5, > 15, > 25, > 50, > 100 \mu\text{m}$

Portable particle counters



PAMAS GO
Rugged case for harsh environments

- PAMAS S40 GO / Standard
- PAMAS S40 GO / Lube
- PAMAS S40 GO / Fuel
- PAMAS S40 GO / Skydrol
- PAMAS S40 GO AVTUR / Aviation Turbine Fuel
- PAMAS S4031 GO
- PAMAS S4031 GO WG / Water-Glycol

11



**Carrying bag for particle counter
in rugged case PAMAS GO**

- black textile bag for safe and easy transportation
- designed for the rugged case PAMAS GO:
the case perfectly fits into the carrying bag.
- equipped with 3 handy side pockets
for documents or additional material
- size: 400 x 210 x 210 mm

Laboratory particle counters

12



PAMAS SBSS Standard version

Application:

Laboratory particle counter for high viscosity liquids. Usable for laboratory measurements and as reference system in oil laboratories. Integrated vacuum and pressure facilities. Programmable for bottle sampling to a minimum of handling (as stand alone system or controlled by PAMAS PMA software).

The PAMAS SBSS system is used for hydraulic oils, insulation and turbine oils, organic fluids or solvents. With the software PAMAS USP, the system may be also used to analyse pharmaceutical fluids of higher viscosity according to international pharmacopoeia.

Viscosity at 22° C:

up to 1600 cSt

Sensor specifications:

Particle sensor PAMAS HCB-LD-50/50

Maximum concentration:

24,000 particles per ml at 7.8% coincidence

Calibration:

- according to ISO 11171: Size range 4 to 70 $\mu\text{m(c)}$
- according to ISO 21501-3: Size range 1 to 200 μm

Size of sample bottle:

- maximum diameter: 7 cm
- maximum height: 18 cm

Software:

PAMAS PMA (Particle Measuring and Analysing Software)
or PAMAS USP (Pharmaceutical Procedural Software)

Laboratory particle counters



PAMAS SBSS WG for Water-Glycol

Laboratory particle counter for the measurement of water/glycol samples in the offshore oil and gas industry.

Integrated vacuum and pressure devices.
Programmable for bottle sampling to a minimum of handling.

Applications:

- Water/Glycol hydraulic fluids
- Subsea Christmas tree, used in wellhead assemblies
- Hydraulic Power Units
- Hydraulic Accumulators
- Subsea umbilicals
- Hydraulic valves and control systems

Viscosity at 22° C:

up to 1600 cSt

Sensor specifications:

Particle sensor PAMAS HCB-LD-50/50

Maximum concentration:

24,000 particles per ml at 7.8% coincidence

Calibration:

- according to ISO 11171: Size range 4 to 70 $\mu\text{m(c)}$
- according to ISO 21501-3: Size range 1 to 200 μm

Size of sample bottle:

- maximum diameter: 7 cm
- maximum height: 18 cm

Software:

PAMAS PMA (Particle Measuring and Analysing Software)

Laboratory particle counters



PAMAS SBSS Small Volume version for small volumes of higher viscosity samples

Applications:

The PAMAS SBSS can be equipped with a smaller pressure container: With the help of this new feature, the instrument is able to analyse under pressure also smaller volumes of higher viscosity samples.

The PAMAS SBSS laboratory instrument offers full flexibility, as almost all measuring parameters can be set by the user and adapted to the specific application.

With these new options available, the pharmaceutical industry, in particular, will take great benefit of the small pressure container, allowing them to degas and analyse under pressure higher viscosity liquids in small volume containers down to 1.5 millilitre.

Viscosity at 22° C:

up to 1000 cSt

Sensor specifications:

Particle sensor PAMAS HCB-LD-50/50

Maximum concentration:

24,000 particles per ml at 7.8% coincidence

Calibration:

according to ISO 21501-3: Size range 1 to 200 µm

Container volume:

down to 1.5 ml

Software:

PAMAS USP (for pharmaceutical applications)

Laboratory particle counters



PAMAS SVSS for low viscous fluids

Application:

Standard laboratory particle counter for pharmaceutical applications. Mainly used in quality control of parenterals, infusion solutions, intravenous fluids, ophthalmic solutions and clean fluids.

Together with the software PAMAS USP, PAMAS SVSS fulfils many national calibration standards for pharmaceutical applications, such as EP, USP, JP, KP, BP, IPC, etc. Possibility to create user specific standards.

Viscosity at 22°C:

up to 15 cSt

Sensor specifications:

available with various PAMAS particle sensors; the standard sensor PAMAS HCB-LD-50/50 has a maximum particle concentration of 24,000 P/ml at a coincidence quote of 7.8%

Calibration:

according to ISO 21501-3: Size range 1 to 200 µm

Sample volume:

- Container volume: 1 ml to 2000 ml
- Analysis volume: 100 µl to 1000 ml

Software:

PAMAS PMA (Particle Measuring and Analysing Software) or PAMAS USP (Pharmaceutical Procedural Software)

Accessories for PAMAS SVSS



Small Volume Kit for PAMAS SVSS

- for small volumes of low viscosity samples, including infusion solutions, parenterals, pharmaceutical suspensions and intravenous or ophthalmic liquids
- for samples volumes down to 100 μ l
- The Small Volume Kit includes a 1 ml syringe, a sensor connector and a probe for sampling down to 100 μ l.

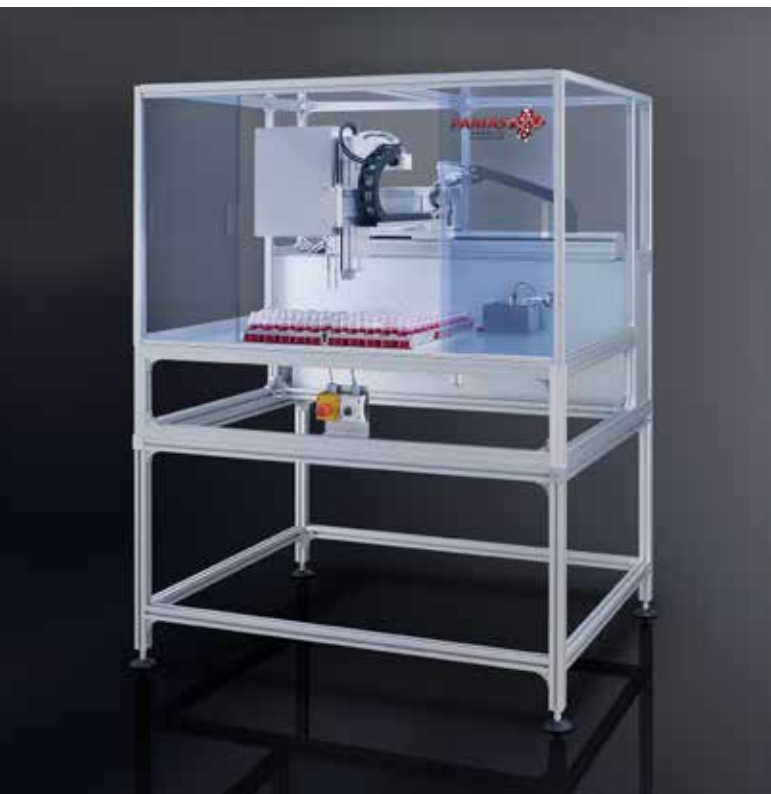
16



Kit of infusion solutions accessories for PAMAS SVSS

- for the analysis of infusion solutions
- Direct measurement out of the liquid bag without filling the infusion solution into another container.
- The kit of infusion solution accessories includes a long tube, a "Luer Lock" connector, a needle and a hook to attach the sample bag.

Laboratory particle counters



PAMAS AS3 **Autosampler with tray system**

Application:

Contamination analysis of a continuously high number of oil samples

Features:

- Fully automated analysis
- Up to 200 samples within 8 hours
(i.e. up to 600 samples per day in case of continuous operation).
- Viscosity at 22°C: up to 200 cSt
- Equipped with ultrasonic agitation probe for sample preparation
- Automatic sampling: XYZ robot handles with samples on tray
- Programmable flushing of sample wetted components to prevent cross contamination
- Integrated dilution system for highly contaminated or high viscous fluids and for samples that may contain undissolved additives or undissolved water

Sensor specifications:

Particle sensor PAMAS HCB-LD-50/50

Maximum concentration:

24.000 particles per ml at a coincidence rate of 7.8%

Laboratory particle counters



PAMAS FastPatch 2 GO
Advanced automatic
microscope system

Applications:

- Dark fluids
- Two phase liquids
- Emulsions
- High levels of contamination
- Very high viscosities

Key Features include:

- Optimised LED ringlight illumination with polarisation function enabling differentiation of metallic/non-metallic particles
- Presentation of counts in accordance with a particle length classification (e.g. in compliance with ISO 4407, ISO 16232, SAE AS 4059, ISO 4406)
- Comprehensive automatic analysis of the entire membrane filter patch
- Specific treatment for particulates in contact with the edge of the image

Online particle counters



PAMAS S50 Standard version

Application:

for online measurements under pressure,
e.g. for contamination control and condition monitoring
of hydraulic oil systems, lube oil systems,
test rigs or parts cleaning

Pressure:

0.2 to 20 bar

Flow rate:

5 to 50 ml per minute (free flow)

Viscosity at 22° C:

up to 1000 cSt depending on system pressure

Sensor specifications:

Particle sensor PAMAS HX;

Maximum concentration:

24.000 particles per ml at 7.8 % coincidence

Calibration:

- Size range: 4 to 70 µm(c) as per ISO 11171
- 8 size channels:
4, 6, 10, 14, 21, 25, 38, 70 µm(c)
according to cleanliness standards
SAE AS 4059 and ISO 4406

Software:

PAMAS POV (PAMAS Online Visualisation):
Software for online visualisation of measuring results
and for long-term trend monitoring

PAMAS PCT (PAMAS Component Test):
Software for online monitoring of parts cleanliness
and for roll off cleanliness testing

Online particle counters



PAMAS S50P Standard version with pump

20

Application:
Online measurements

Option:
pressureless and with pressure

Pressure:
0 to 6 bar

Flow rate:
25 ml per minute (internally controlled)

Viscosity at 22° C:
Depending on system pressure

Sensor specifications:
Particle sensor PAMAS HX
Maximum particle concentration:
24.000 particles per ml at 7.8 % coincidence

Calibration:

- Size range 4 to 70 $\mu\text{m}(\text{c})$ as per ISO 11171
- 8 size channels:
4, 6, 10, 14, 21, 25, 38, 70 $\mu\text{m}(\text{c})$
according to cleanliness standards
SAE AS 4059 and ISO 4406

Software:
PAMAS POV (PAMAS Online Visualisation):
Software for online visualisation of measuring results
and for long-term trend monitoring

PAMAS PCT (PAMAS Component Test):
Software for online monitoring of parts cleanliness
and for roll off cleanliness testing

Online particle counters



PAMAS S50DP with integrated dilution system

21

Applications:

- Sample fluids which cannot be analysed without prior dilution, e.g. highly contaminated or high viscous fluids or samples containing undissolved additives
- Fuel containing free water: Without prior dilution, free water in fuel would lead to false measurements. With the dilution device, the water drops in the fuel sample are dispersed in the added solvent and thus are not detected as particles during posterior online measurement

The PAMAS S50DP online particle counter offers an integrated dilution system to dilute the sample liquid directly online. For dilution, the system continuously adds a programmable amount of a low viscous solvent to the raw sample before online measurement.

Pressure range:

0 to 6 bar

Sensor specifications:

Particle sensor PAMAS HCB-LD-50/50

Maximum particle concentration:

24.000 particles per ml at 7.8 % coincidence

Calibration:

- Size range: 4 to 70 $\mu\text{m(c)}$ according to ISO 11171
- 8 size channels:
4, 6, 10, 14, 21, 25, 38 and 70 $\mu\text{m(c)}$
according to cleanliness standards
SAE AS 4059 and ISO 4406

Online particle counters



PAMAS S50P Fuel Fuel version

22

Application:

Online measurements of low viscous liquids

The particle counter is optimised for fuel analysis through structural alterations at the flow path.

Pressure:

0 to 6 bar

Flow rate:

25 ml per minute (internally controlled)

Viscosity at 22° C:

Depending on system pressure

Sensor specifications:

Particle sensor PAMAS HX

Maximum particle concentration:

24.000 particles per ml at 7.8 % coincidence

Calibration:

- Size range 4 to 70 µm(c) as per ISO 11171
- 8 size channels:
4, 6, 10, 14, 21, 25, 38, 70 µm(c)
according to cleanliness standards
SAE AS 4059 and ISO 4406

Software:

PAMAS POV (PAMAS Online Visualisation):

Software for online visualisation of measuring results and for long-term trend monitoring

PAMAS PCT (PAMAS Component Test):

Software for online monitoring of parts cleanliness and for roll off cleanliness testing

Online particle counters

PAMAS OLS4031 with 32 size channels

Application:

Online monitoring and data output for higher demand
e.g. for monitoring facilities systems in the aircraft industry,
for test rigs, for parts cleaning processes and for production
test lines.

Technical data:

up to 32 free adjustable size channels

Sample inlet:

Low pressure mode (standard version):
from pressureless up to 6 bar

High pressure mode (on request):
from 3 to 420 bar

Viscosity at 22° C:

up to 200 cSt; pressurised up to 350 cSt

Calibration:

- 4 to 70 µm(c) according to ISO 11171
- 1 to 200 µm according to ISO 21501-3

Software:

PAMAS PMA (Particle Measuring and Analysing Software)

Online particle counters



PAMAS OLS50P
for all sorts of liquids

24

Application:
all sorts of fluids

Pressure range:
pressureless or up to 6 bar

Sensor specifications:
Particle sensor PAMAS HCB-LD-50/50
Maximum particle concentration:
24.000 particles per ml at 7.8 % coincidence

Calibration:
4 to 70 $\mu\text{m(c)}$ as per ISO 11171
or
2 to 100 μm as per ISO 4402
or
1 to 200 μm as per ISO 21501-3

Software:
PAMAS POV (PAMAS Online Visualisation):
Software for online visualisation of measuring results
and for long-term trend monitoring

PAMAS PCT (PAMAS Component Test):
Software for online monitoring of parts cleanliness
and for roll off cleanliness testing

Online particle counters



PAMAS WaterViewer for Water Applications

25

Application:

Online particle counter for low viscous liquids.

Enables water quality control measurements for potable water, waste water, industrial water, pool water, filter control.

Sample inlet:

- Standard system (pressure system):
0.5 to 4 bar;
- Suction system (grab sampling)
or mixed system available on request

Product features:

- Automated sensor cleaning
- Fully automated operation
- Network options
- Analogue and digital devices

A standard Multiplexer Unit contains 1 to 8 measuring point inputs. By combining 2 or more multiplexer units, one PAMAS WaterViewer system is expandable to up to 32 measuring point inputs.

Online particle counters



PAMAS 4132 for Single & Multi Pass filter tests

The PAMAS 4132 is used as a filter efficiency testing system or β -ratio measuring system for Single & Multi Pass Filter test rigs. The standard system fits in the test rigs of filter manufacturers.

In case of a Single Pass Filter Test, the liquid passes the filter only once and then is deviated to the outflow. For β -ratio-analyses, the Single Pass Filter Test is performed with two instruments. Two instruments - equipped with 32 size channels each - are also used for the Multi Pass Filter Test. This test rig with two particle counters allows simultaneous upstream and downstream measurements.

The particle counting system PAMAS 4132 analyses liquids of various viscosities (e.g. oil, fuel, water, etc.).

- The system is adaptable to any Multi Pass Test application and β -ratio analysis.
- Please contact PAMAS for the product integration into your specific application.
- Please consult a PAMAS application specialist before quoting.

Online particle counters

27

**PAMAS FSA-2002
Floc Size Analyser**

The PAMAS FSA-2002 Floc Size Analyser has been designed for coagulation and water treating systems. Water is often treated by adding flocculents. These flocculation agents are used to gather solid undissolved contaminants to particulate agglomerates. Before the process of filtration commences, the floc size and quantity is analysed using the PAMAS FSA-2002.

Precise information about the particle size helps to verify and to determine if the process of coagulation is complete or if further flocculation agents must be added.

Sensor specification:

Particle sensor PAMAS HCB-LD-900

Size range:

30 to 8,000 μm as per calibration standard ISO 21501-3

Maximum particle concentration:

10 P/ml at a 7.8 % coincidence

Particle Sensors



PAMAS HCB-LD **Light Extinction Sensors**

- Measuring principle: Light Extinction technology
- Eight sensor models with different orifices are available
- Size ranges between 1 and 8000 μm
- Maximum particle concentrations up to 200.000 p/ml
- Calibration with certified ISO Medium Test Dust according to ISO 11171 or with monodisperse latex spheres according to ISO 21501

28



PAMAS SLS-25/25 **Scattered Light Sensor**

- works with Light Scattering Technology
- for contamination analysis of particle sizes down to 0.5 μm according to ISO 21501-2 or down to 1.5 $\mu\text{m(c)}$ according to ISO 11171
- Sensor orifice: 250 μm x 250 μm
- Maximum particle concentration:
13.000 particles per millilitre at a coincidence rate of 7,8%

Particle Sensors

Overview on particle sensors

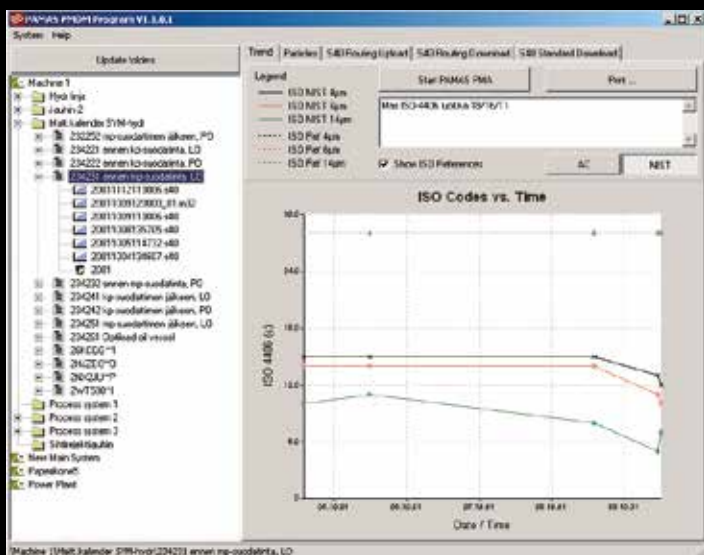
The first eight sensor types mentioned in this schedule work according to the principle of light extinction.

The last sensor PAMAS SLS-25/25 works with a scattered light (SLS for "Scattered Light Sensor").



Sensor type	Cell size in μm	Nominal flow rate in ml/min (millilitre per minute)	Maximum concentration of particles per millilitre (P/ml) including a coincidence rate of lower than 8 %	Flow rate range in ml/min(The flow rate affects the sensitivity of the sensors.)	Potential interval of detection in μm and $\mu\text{m(c)}$
PAMAS HCB-LD-15/25	150 x 250	10	200 000 P/ml	5 – 25	1 – 100 μm ; 4 – 70 $\mu\text{m(c)}$
PAMAS HCB-LD-25/25	250 x 250	10 / 25	120 000 P/ml	5 – 50	1 – 200 μm ; 4 – 70 $\mu\text{m(c)}$
PAMAS HCB-LD-50/50	500 x 500	25	24 000 P/ml	5 – 150	1 – 400 μm ; 4 – 70 $\mu\text{m(c)}$
PAMAS HX	500 x 500	25	24 000 P/ml	5 – 50	4 – 70 $\mu\text{m(c)}$) [for oil only]
PAMAS HCB-LD-100	1 000 x 1 000	25	1 200 P/ml	25 – 500	5 – 800 μm ; 5 – 150 $\mu\text{m(c)}$
PAMAS HCB-LD-250	2 500 x 2 500	200 / 500	180 P/ml	200 – 500	20 – 2000 μm ; [oil calib. on request]
PAMAS HCB-LD-900	9 000 x 9 000	500	10 P/ml	500 – 2000	30 – 8000 μm ; [oil calib. on request]
PAMAS HCB-25/25	250 x 250	10	24 000 P/ml	5 – 50	1.5 – 200 μm ; 4 – 170 $\mu\text{m(c)}$
PAMAS SLS-25/25	250 x 250	10	13 000 P/ml	10	0.5 – 20 μm ; 1.5 – 25 $\mu\text{m(c)}$

Software

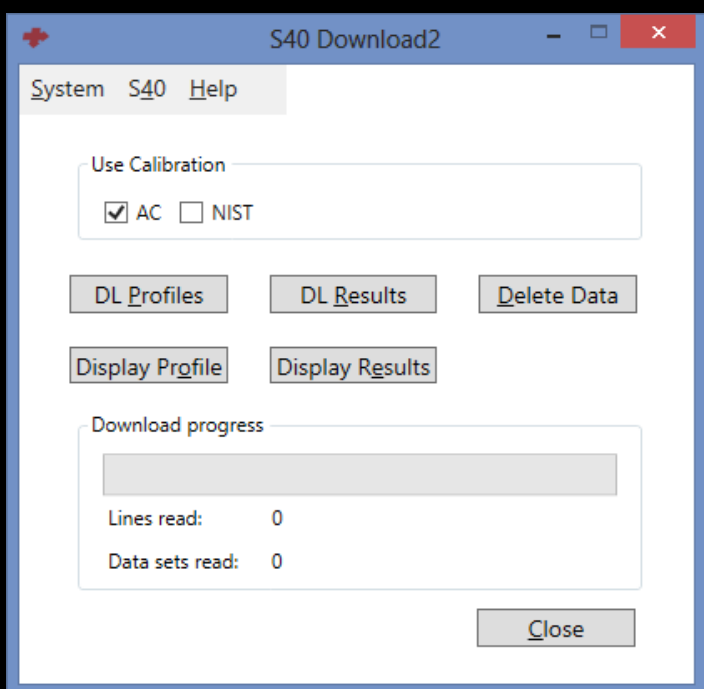


PAMAS CMDM Condition Monitoring Data Management

The PAMAS CMDM software has been developed as an oil contamination control tool for preventive maintenance in hydraulic and lube oil systems.

Software features:

- Trend Monitoring: Recording and analysis of cleanliness trends
- Data management of measuring results coming from batch sampling or microscopic analysis
- Allows route based measuring
- Upgrades particle counter PAMAS S40 to a condition monitoring system
- Systematic cleanliness monitoring allows longer maintenance intervals



PAMAS Download-Software Software for portable particle counters

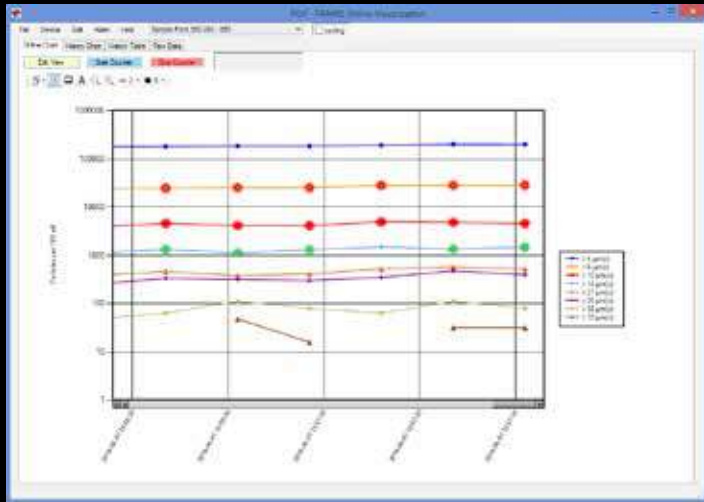
With the aid of the software, measuring results can be transferred from the particle counter to a PC.

The data are transferred at first into a text file, which can then be converted into the required format (e.g. Excel or PDF).

Output of measuring results:

The programme indicates the measuring parameters that had been selected during measurement on the display of the portable particle counting device (selectable parameters are e.g. the type of calibration, the measuring profile, the number of size channels or the cleanliness standards).

Software

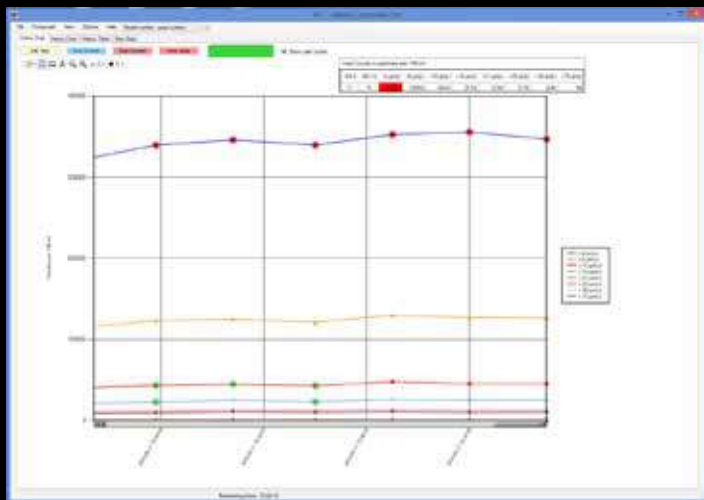


PAMAS POV PAMAS Online Visualization

Software for online visualisation of particle measuring results and for long-term condition monitoring

Output of measuring results:

The results are displayed on charts and tables and can be printed and exported. The results are assigned to certain sample points. Historical results can also be loaded, printed and exported.



PAMAS PCT PAMAS Component Test

The PAMAS PCT software enables online cleanliness tests of manufactured components in machinery engineering applications (test rigs).

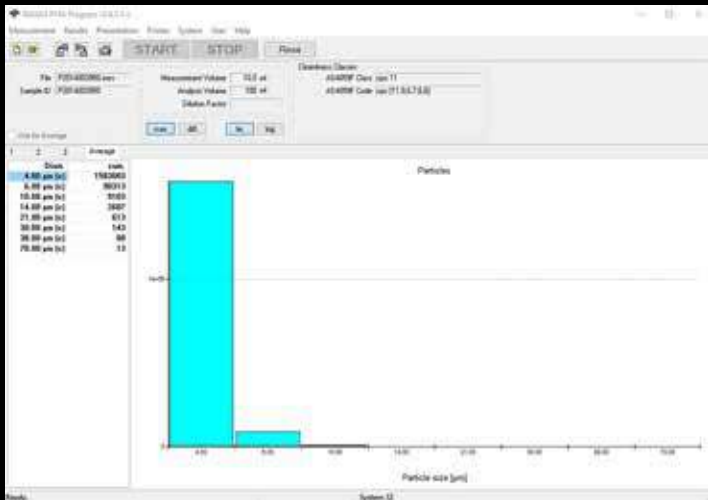
Output of results:

- Particle counts according to ISO codes over time
- Raw data of single measurements
- Data storage in single measurement files

Additional feature:

Definition of cleanliness limits

Software



PAMAS PMA Particle Measuring and Analysing Software

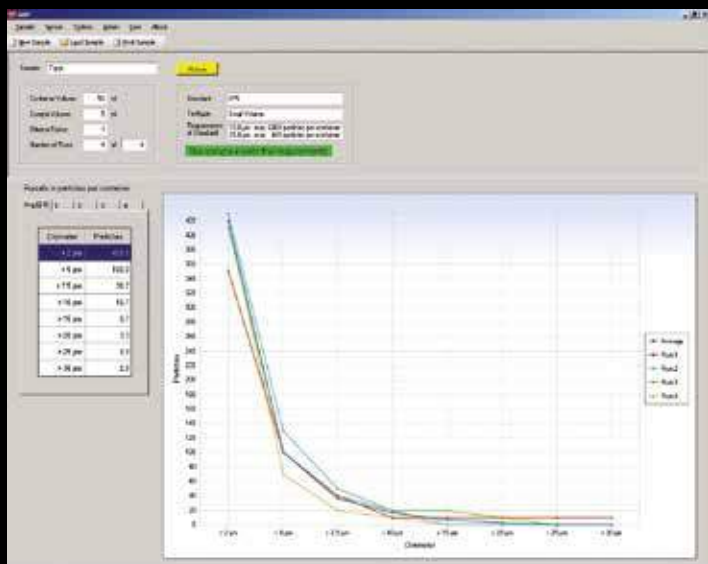
Main function:

Software for operation, for parameter setting, for data storage and for the analysis of measurement results

Output of measuring results:

numerical and graphical report of cumulative and differential particle counts in compliance with the cleanliness standards ISO 4406, NAS 1638, SAE AS 4059, GJB 420 and GOST 17216

32



PAMAS USP Pharmaceutical procedural software

Measurements according to United States Pharmacopeia USP <787> (Subvisible Particulate Matter in Therapeutic Protein Injections), USP <788> (Particulate Matter in Injections), USP <789> (Particulate Matter in Ophthalmic Solutions) and to other national pharmacopeias, like EP, JP, KP, BP, IPC, etc.

Output of results:

Numerical and graphical display of particle counts according to pharmaceutical standards

Additional features:

- 21 CFR Part 11 conform
- Automatic backup of database
- Sensor calibration
- In-house standards

Compatibility of PAMAS instruments and software tools

33

	Tested with Windows 8	Tested with Windows 10	PAMAS S40 standard	PAMAS S40 lube oil	PAMAS S40 Fuel	PAMAS S40 AVTUR	PAMAS S40 Skydrol	PAMAS S4031	PAMAS S4031 WG	PAMAS SBSS	PAMAS SBSS WG
PAMAS Download-Software	■	■	■	■	■	■	■	■			
PAMAS CMDM	■	■	■	■	■	■					
PAMAS PMA	■	■	■	■	■	■	■	■	■	■	■
PAMAS POV	■	■									
PAMAS PCT	■	■									
PAMAS USP	■	■								■	
WVS/PC*	■	■									
Betatest**	■	■									
Autosampler3***	■	■									

	PAMAS S50	PAMAS S50P	PAMAS S50DP	PAMAS S50P Fuel	PAMAS OLS4031	PAMAS OLS50P	PAMAS WaterViewer	PAMAS SVSS	PAMAS 4132	PAMAS AS3
PAMAS Download-Software										
PAMAS CMDM										
PAMAS PMA				■			■			
PAMAS POV	■	■	■	■	■					
PAMAS PCT	■	■	■	■	■					
PAMAS USP							■			
WVS/PC*						■				
Betatest**								■		
Autosampler3***									■	

* WVS/PC (WaterViewerSystem for PC) = Software for PAMAS WaterViewer

** Betatest = Software for PAMAS 4132

*** Autosampler3 = Software for PAMAS AS3

EXPERTS IN FLUID PARTICLE COUNTING

PAMAS headquarters in Germany:

Dieselstraße 10
D-71277 Rutesheim
Phone +49 71 52 99 63-0
Fax +49 71 52 99 63-32
E-mail info@pamas.de
Web www.pamas.de

PAMAS subsidiaries worldwide:

PAMAS BENELUX

Mechelen / Belgium

PAMAS FRANCE

Saint-Julien-en-Born / France

PAMAS HISPANIA

Algorta / Spain

PAMAS INDIA

Bangalore / India
Sonpath / India

PAMAS LATIN AMERICA

Curitiba / Brazil

PAMAS UK

Cheshire / UK

PAMAS USA

Tulsa / Oklahoma
Houston / Texas