



## Particle Measuring Systems for Liquids



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# Particle Measuring Systems for Liquids

Markus Klotz GmbH has been engaged in laser technologies and devices for particle measuring since 1990. We develop, manufacture and test the complete product range of optical and electronic components at our production facilities in Bad Liebenzell and Burgholz.

When developing and manufacturing our products we work with full assembly automats for SMD components, a processing center with tool changer and a CNC lathe with 8-fold revolver. For the development of the sensors and the determination of optoelectronic basic parameters we have in addition to the standard equipment a stereo microscope, a fluorescence microscope, a high resolution spectrometer as well as a measuring device for measuring the steel profile available.

Our products: Our particle measuring devices are applied for the testing of liquids (drinking water, purity of solutions in the pharmaceutical and chemical industry, testing of oils), the monitoring of gases and cleanrooms as well as for the particle size analysis.

A further focus is the design and manufacturing of diagnostic and radiation devices in medicine.



Contamination control of liquids

## Precision particle counting system for the lab

Particle counters are applied for contamination control of liquids. Particles residing in the liquid are detected and counted in the respective size class. For the testing of liquids in containers the lab system **Syringe®** is primarily used. The liquid is drawn through the laser sensor with the help of the built-in pump. The representation and storage of measuring data on the PC is carried out in consideration of the standard in effect.

## The portable counter – a true allrounder!

The mobile measuring system **Abakus®** mobil fluid (Amf) is applied for on-site measurements. This prevents the sample from being contaminated by a container. The device is designed to take samples from pressure lines and containers. The measured value memory and the PC evaluation software make the device suitable for online purposes (optional built-in cupboard – see illustration). The rechargeable battery pack allows for field measurements of up to 3 hours.

## Online measuring system wherever around-the-clock quality is required!

For online measurements there is the measuring system **TCC3** available with three adjustable size classes. The device features a display for on-site representation of the number of particles.

Readout is via the voltage output or the adjustable threshold switch. The device can be easily integrated (or networked) into a process cycle.

## Online, but value for money!

Data exchange at the online system **CSS-fluid** is executed solely via a voltage interface. Two particle sizes can be recalled continuously. Switching outputs signalize the overstepping of predefined threshold values. In combination with the ascending pipe (see illustration) or the retainer valve the system is a true low cost system.

## Areas of application:

- Contamination control of liquids in pharmaceuticals
- Control of drinking water and beverages
- Contamination control of the manufacturing and production of optical, fine mechanical and electronic parts and components
- Particle counting in cleaning facilities
- Monitoring of filtration and filling facilities

## Accessories

### Syringe®



Autom. sample changer (20 sample bottles) on request



Evaluation software for Syringe®



Sampling from bag



Particle size determination in the range of 1-200 µm



Liquid feed with funnel for residual dirt determination

### Abakus® mobil fluid



Abakus® mobil fluid with protection caps



Battery operation 3 hours



Evaluation software for Abakus® mobil fluid



Measuring point switcher (6 measuring points) on request

### Liquids accessory



Calibration set



## SYRINGE® Particle measuring system

The particle measuring system Syringe® was specifically designed for lab operation. The system includes the sample feeder Syringe®, the PC insert card PCI 1.0, the evaluation software and the PC. For the pharmaceutical sector the usp evaluation software SW-CA is available; the system is equipped with the laser sensor LDS 23/25 usp. It works in the range of 1-50 µm linear and is specifically made to meet the demands in the pharmaceutical sector.

For contamination control of water, beverages and other process liquids the laser diode sensor LDS 30/30 and the evaluation software SW-PE is normally used. The system can measure a particle size of 0.9-139 µm. As option the device can be supplied with magnetic stirrer.

The system is optionally also suitable for particle size analysis. The particle is dispersed in the liquid; the greatest possible concentration of 120.000 particles/ml must not be exceeded.

The system can be equipped with an automatic sample changer (rotary disc see illustration).

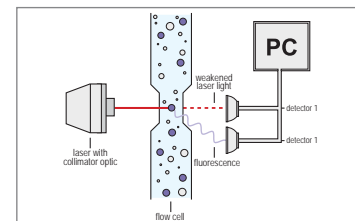
### Software:

With the software program SW-PE for normal liquids, up to 256 freely selectable particle sizes can be measured. The evaluation can be executed as cumulative or distributive according to particle numbers or volume and/or dimensions. A flexible export to MS Excel for further evaluation and processing is possible.

The program SW-CA was specifically designed for the pharmaceutical industry. It allows the execution and evaluation of measurements according to the USP standard/Pharm EUR. Measurements or measuring sequences according to company specifications are possible. Likewise measurements that have been executed with diluted solutions can be evaluated. Log printouts as well as tabular representation are possible.

### Areas of application:

Particle counting in the lab area, contamination control of liquids, quality control of pharmaceutical products, residual dirt determination, particle size analysis



Syringe with fluorescence detection for trailing marked particles on request





## ABAKUS® MOBIL FLUID

Particle counter

The particle measuring system Abakus® mobil fluid (Amf-Fluid) is used for counting particles from pressure lines and from bottles. The particle number can be displayed, printed out, stored and transmitted to the interface for up to 16 freely definable size classes. For the monitoring of cleaning baths or residual dirt determination, a laser sensor LDS 45/50 or LDS 1/1 is used. The bigger sensor opening prevents a blockage by too big particles. In addition, it is possible to work with a greater flow.

### Software:

With the evaluation software "Log and Show" the measuring results can be exported via the built-in interface to the PC and further processed in diverse programs (MS-Excel, Lotus 1-2-3 etc.). Direct measuring and storing via the software is also possible.

### Areas of application:

Drinking water pollution control (monitoring or filtration), checking of chemical and pharmaceutical solutions (online and from sample bottles), testing of filtration facilities and cleaning baths

### Option:



Abakus® mobil fluid classic



Abakus® mobil fluid touch



Abakus® mobil fluid V4A



## TCC

Particle counter TCC with standpipe

The particle counter TCC with stainless steel standpipe is particularly used as monitoring system in the drinking water area. The system can evaluate three freely selectable particle sizes. For each channel threshold values can be set which monitor the degree of pollution. With the help of the interface RS 232 or the current interface 4-20 mA the devices can be connected with a central evaluation unit. The flow is kept constant with the help of an ascending pipe. By setting the measuring time at the TCC the particle number can be detected in dependence of the volume.

Optional: Alternatively to the standpipe it is also possible to use a pressure control valve for a constant flow. The pressure range at the input may be 1-10 bar.

### Areas of application:

Drinking water control, monitoring of cleaning baths, cleaning facilities and production facilities for the production of liquids, online measurement during the blowing off of mechanical components



## CSS-FLUID

Particle measuring system

The dual-channel counter CSS-Fluid is accommodated in a splash water protected diecasting shell. The liquid feed is executed with the help of a standpipe or the pressure control valve. Alternatively, a liquid pump may be used in depressured systems. All parameters (measuring time, particle size and threshold values) can be parametered with the help of the PC. The particle number can be transferred via the current interface 4-20 mA to an evaluation unit. The overstepping of the threshold values can be queried at two potentialfree contacts at the box.

### Areas of application:

Drinking water control, filtration testing, online monitoring in the chemical-pharmaceutical sector

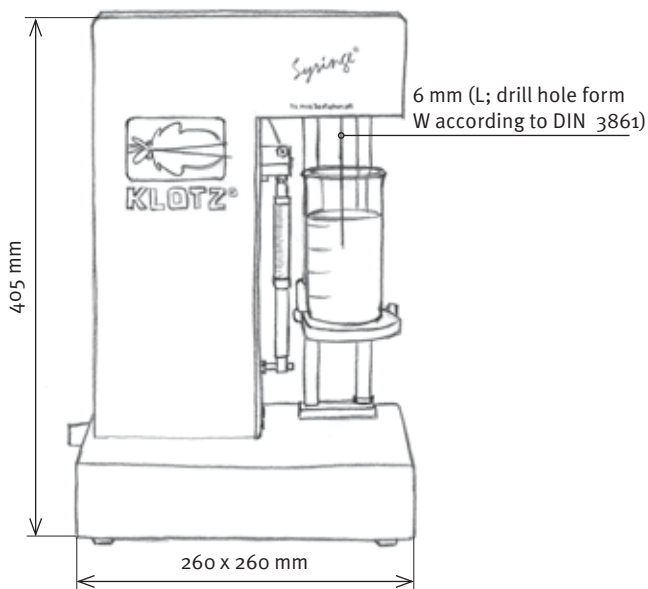
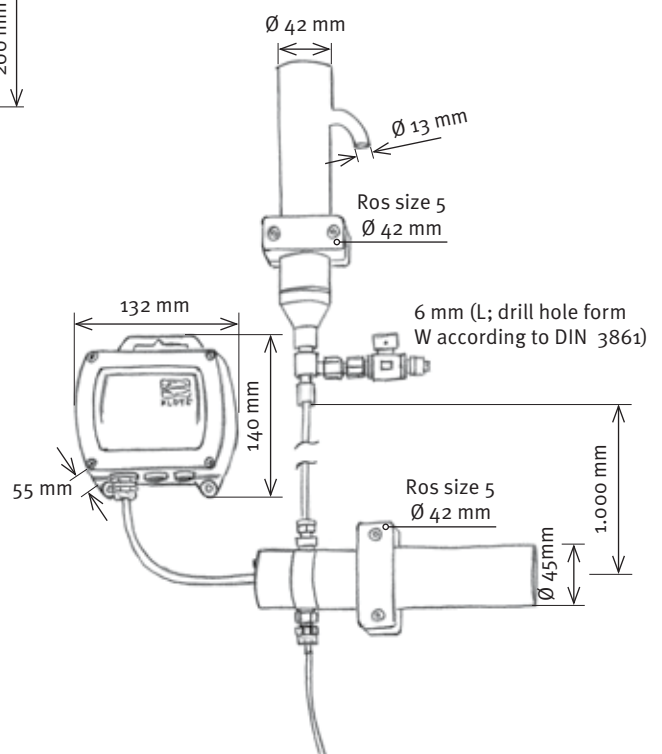
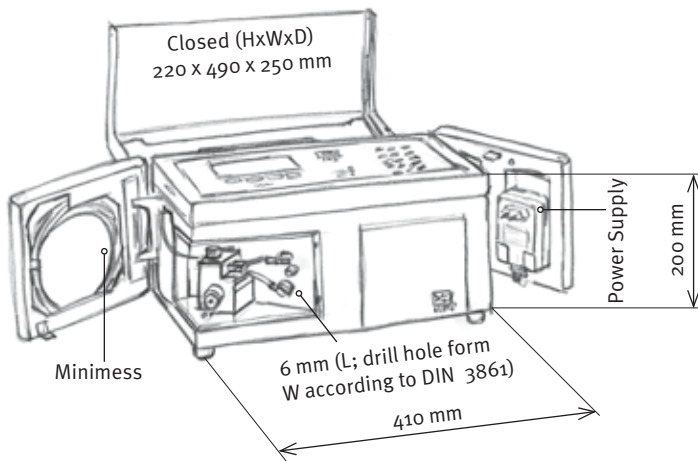


# Particle Measuring Systems Technical Specifications



|                                                   | <b>Syringe®</b>                                                                                                                 | <b>ABAKUS®<br/>MOBIL FLUID</b>                                           | <b>TCC<br/>WITH STANDPIPE/<br/>FLOW CONTROL VALVE</b>                               | <b>CSS-FLUID<br/>WITH STANDPIPE/<br/>FLOW CONTROL VALVE</b> |
|---------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------|
| <b>Sensor/<br/>Range/<br/>Concentration</b>       | LDS 23/25 usp / 1-50µm /<br>100.000 particles/ml<br><br>LDS 30/30 / 0.9-139µm /<br>120.000 particles/ml                         | LDS 30/30 / 0.9-139µm /<br>120.000 particles/ml                          | LDS 30/30 / 0.9-139µm /<br>120.000 particles/ml                                     | LDS 30/30 / 0.9-139µm /<br>120.000 particles/ml             |
| <b>Measuring Value<br/>Readout/Soft-<br/>ware</b> | LDS 23/25 usp: SW-CA<br>(Pharma)<br><br>LDS 30/30:SW-PE<br>(optional SW-PE fluores-<br>cence for detecting marked<br>particles) | LAS 3.2<br>RS 232<br><br>Display<br><br>Printer<br><br>Threshold readout | Display<br><br>Current 0-20mA / 4-20mA<br><br>RS 232<br><br>Option: CAN-, Profi-Bus | Display<br><br>Current 0-20A / 4-20mA                       |
| <b>Channels</b>                                   | SW-CA: max. 8 perma-<br>nently set channels<br><br>SW-PE: max 256 freely se-<br>lectable channels                               | max. 16 freely selectable<br>channels                                    | max. 3 freely selectable<br>channels                                                | max. 2 freely selectable<br>channels                        |
| <b>Power Supply</b>                               | 230 V/AC<br>115 V/AC                                                                                                            | 230/115 V/AC<br>battery pack                                             | 18-36 VDC<br>max. 10W                                                               | 230 V/AC                                                    |
| <b>Dimensions<br/>(H x W x D)</b>                 | 405 x 260 x 260 mm                                                                                                              | 220 x 490 x 250 mm                                                       | 185 x 245 x 120 mm                                                                  | 140 x 55 x 132 mm                                           |

# Particle Measuring Systems Dimensions





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