

## Description

The Large Particle detector is a compact particle detector for applications in ultra pure and chemical aggressive media. The detection limit of 1 µm-particles makes this sensor particular suitable for in-line process monitoring and control of complex and high concentrated submicron dispersions, micro-emulsions or polishing slurries or even pure fluids.

The integrated evaluation unit with a LCD-display, the RS485 interface as well as the free programmable digital or analogue output minimizes additional hardware requirements and guarantees an easy connectivity to a PC or PLC.



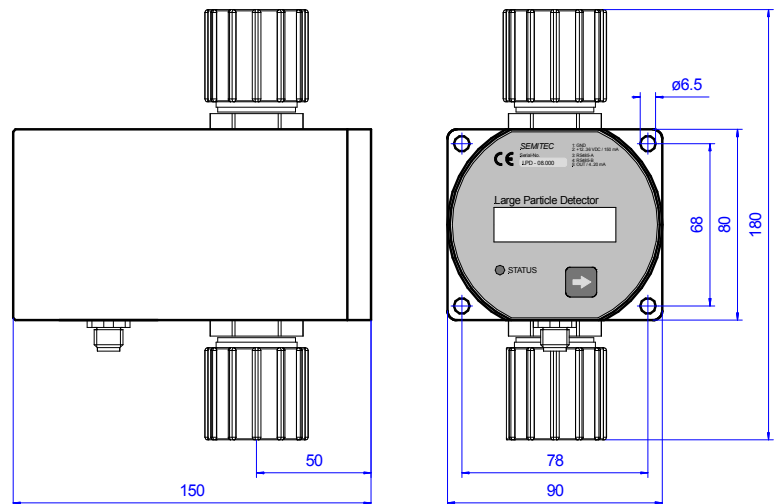
## Applications

- ▶ Large particle detection in pure fluids and in slurries
- ▶ In-line Quality monitoring of CMP slurries
- ▶ Prevention of micro scratches at polishing processes
- ▶ Filter control
- ▶ Optimization of filter lifetime
- ▶ Ultra pure and chemical aggressive liquids
- ▶ Low-cost quality monitoring of purified water
- ▶ Defect detection in supply systems

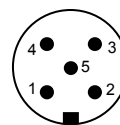
## Specification

Detection Limit 1 µm - particles  
 Measurement slit 1 mm  
 max. Concentration ~10.000 p/ml  
 max. Pressure 8 bar  
 Degree of protection IP54  
 Temperature range -10 + 60 °C

Dimensions 150 x 90 x 180  
 Mounting 4 drill holes Ø 6,5 mm  
 Process interface Flare tube 1" (3/4"), NPT 1"  
 Wetted materials Housing: PTFE  
 Sealing: Viton®  
 Windows: Sapphire  
 Tube Fittings: PFA  
 Fully plastic housing, no metallic parts



Power supply 24 V DC (18-36 V), 200 mA  
 Communication RS485  
 Analogue Output 4 - 20 mA  
 Digital Output Open-Drain-Output (max. 1 A, 24 V)  
 Electrical connector 5 pin - M12 male connector



- 1: GND
- 2: +12..36 VDC / 150 mA
- 3: RS485-A
- 4: RS485-B
- 5: Programmable digital or analogue output

Software Easy-to-use configuration, monitoring and measurement software (Windows®)  
 Communication protocol Serial ASCII-protocol for the implementation into custom specific applications

## Contact

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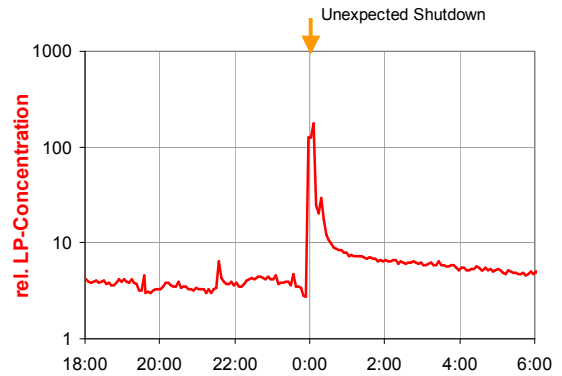
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## Large Particle Concentration - Correlation to Supply Line Events

### Unexpected shutdowns

Unexpected and uncontrolled shutdowns of CMP-slurry supply plants cause a significant increase of the large particle concentration. The example shows an approx. 50 times higher concentration after such an event.

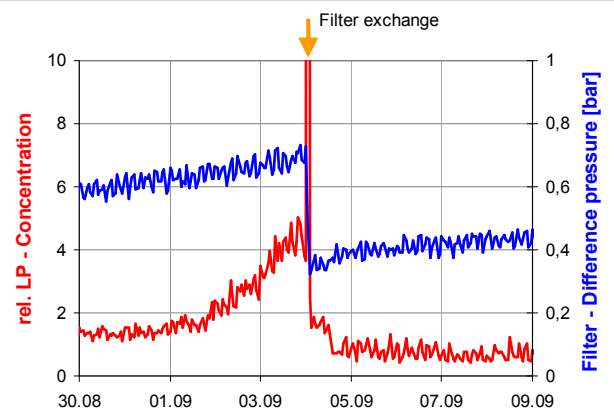
The *Large Particle Detector* enables to determine the duration for rinsing and cleaning the system from large particles.



### Filter load

Common used deep-bed filters in supply plants lose their efficiency with increasing load. The filter control is often realized by a difference pressure measurement. A more significant and direct control of the filter efficiency allows the *Large Particle Detector*.

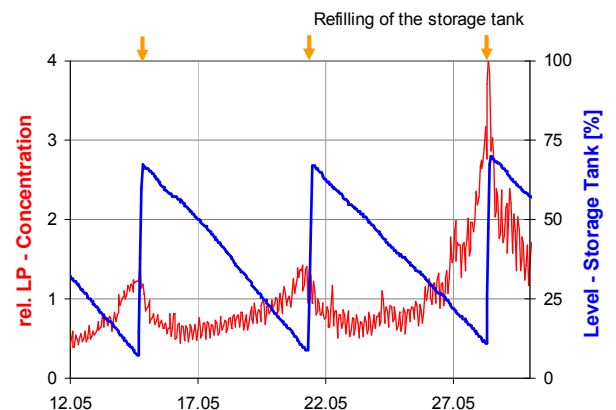
The diagram shows the increase of the large particle concentration with the increasing difference pressure of the filter. This makes the sensor excellently suitable for the optimization of the filter lifetime.



### Fill level of the storage tank

Process states of a supply plant have a direct influence on the supply quality. The example shows a direct correlation of the filling level of a storage tank with the large particle concentration.

An increase of the concentration can be observed at very low filling levels. This behavior is caused by a contamination of the tank or by a high specific energy entry in the fluid at low filling levels by the circulation pumps or agitators.



### Defects in the supply system

The large particle concentration responds very sensitive to defects or intervention in the supply system.

The diagram shows the concentration course of two alternating peristaltic pumps with one defect pump (gray shadowed stripes). The defect pump is responsible for a high and very fluctuating large particle concentration. After exchanging the defect pump the system needs a certain time for stabilizing at a low concentration level.

