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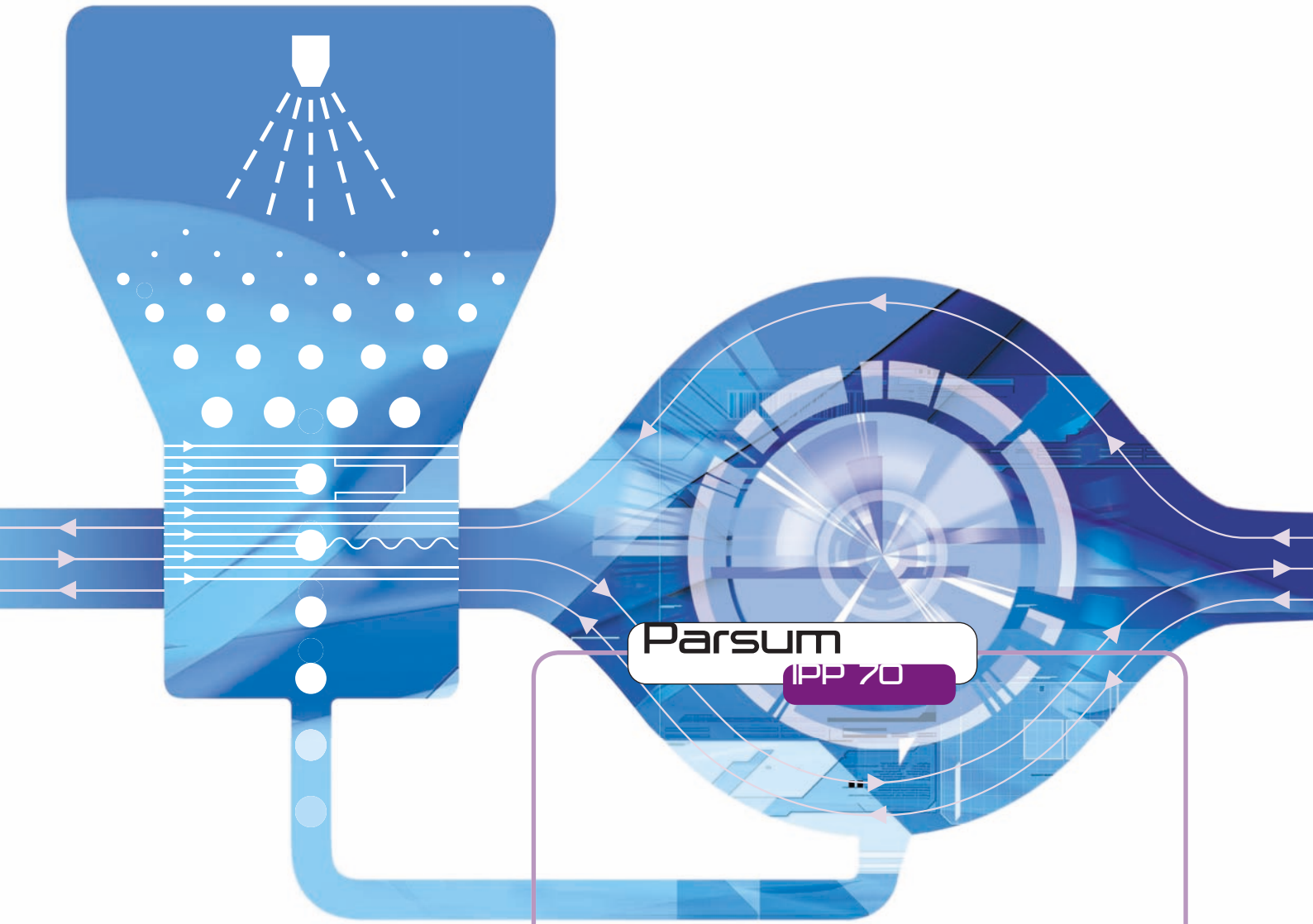
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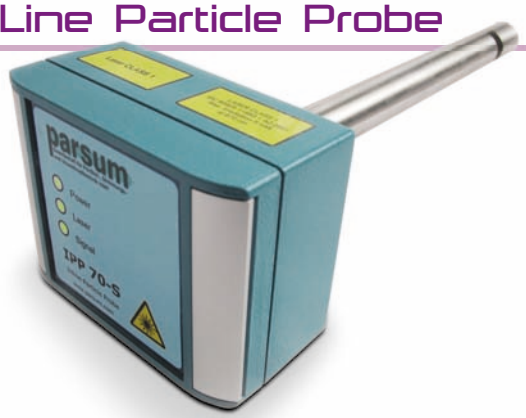
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Find the *Malvern / Parsum IPP 70 VK1* at our website: *Click HERE*



Parsum IPP 70

In-Line Particle Probe



Spatial filter velocimetry from 50 to 6000µm

Malvern

detailed specification sheets from www.malvern.com

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Advanced spatial filter velocimetry in real-time avoids the need for sampling

The Parsum IPP 70 is a compact yet highly robust in-line particle size analyzer for processes involving larger particulate sizes of up to 6000µm. The small fiber optics at the heart of the instrument deliver consistent, highly accurate measurements with low sensitivity to fluctuations at high particle loadings making it suitable for chemical, pharma or food industries where the probe can be inserted directly into new or existing gravity or pneumatic process lines or vessels. Measuring at rates of up to 10,000 particles per second, the IPP 70 continuously tracks a large variety of PSD parameters making it ideal for endpoint detection, process control, process optimization and real time quality control for a range of applications including

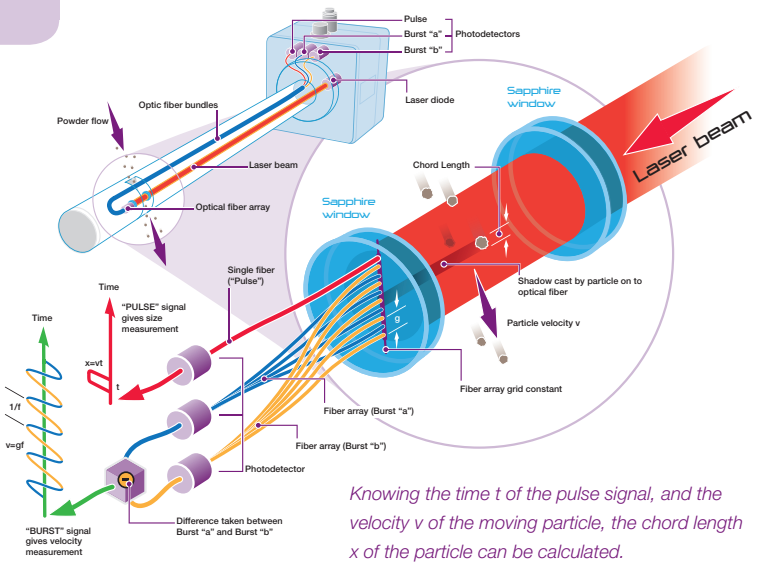
- Grinding/Dosing
- Agglomeration
- Spraying
- Fluidized Bed Processes
- Transportation and Filling
- Wet and Dry Granulation
- Sieving
- Spray Drying

Measurement principle

Using the established principle of spatial filter velocimetry, size and velocity can be simultaneously extracted from particles as they pass through a laser beam, casting shadows onto a linear array of optical fibers.

- No calibration required
- Patented measurement technology
- Volumetric size and number distributions
- Constant measurement with no time gaps in data
- Doesn't assume spherical particles

A burst signal is generated due to the particle crossing fiber bundles labeled "burst a" and "burst b". The frequency of this signal is measured by photodetectors and is proportional to the particle velocity v. Knowing the spatial filter constant g, the velocity v can be calculated. As the particle passes through the beam, a secondary "pulse" signal is generated by a single optical fiber.

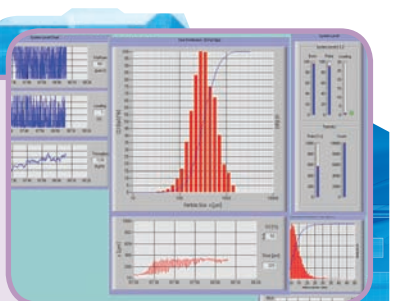


Knowing the time t of the pulse signal, and the velocity v of the moving particle, the chord length x of the particle can be calculated.

Comprehensive software support

The unique software is compatible with Windows® XP or 2000 and designed with user flexibility in mind, allowing for up to 4 probes to be displayed on one PC. Results can be calculated and expressed in various ways.

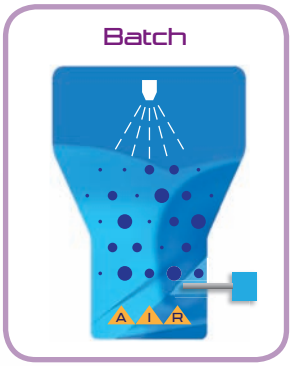
- Sieve distribution as fraction and passage
- Fractions
- Volume distribution
- Number distribution
- Velocity distribution
- Oversize particle

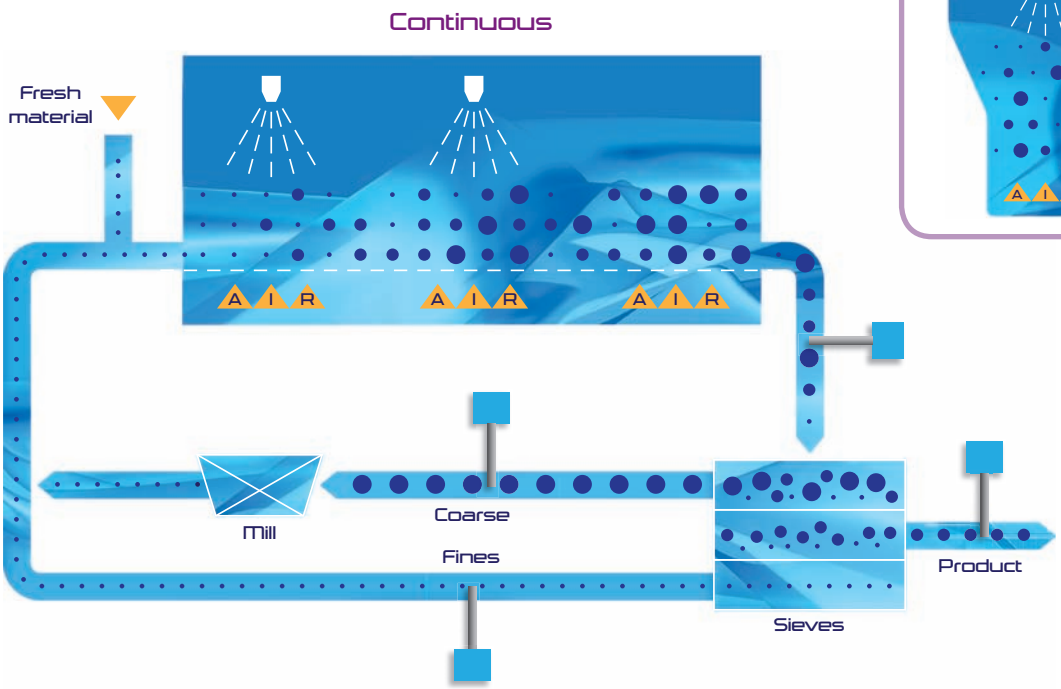


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Possible sampling locations

The IPP 70 is compact, lightweight (1.5kg) yet highly robust. Depending on the optimization objective it can be inserted directly in the process lines in multiple locations for real-time process optimization and verification with continuous feedback.





Parsum IPP 70 - compact, robust and highly accurate



Lightweight, easy installation	For quick integration into new and existing process facilities
Wide dynamic range	For particles from 50µm to 6mm, travelling at speeds up to 50m/s
Precise measurements ensured	Reproducible accuracy at high end fluctuating particle concentrations makes it ideal for irregular moving particles such as those found in fluidized bed granulation
Real-time analysis/feed back control via comprehensive software	Two modes - 'Standard' and 'Expert' ensure results can be configured in an optimum way for every application and operator

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Two systems plus accessories to meet a wide range of processes

Parsum IPP 70-S

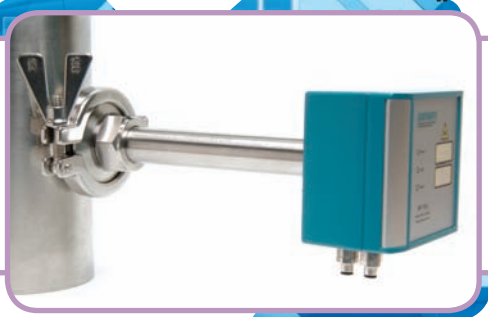
An internal compressed air supply system ensures the IPP 70-S is highly suited for specific processes where dispersion is needed in order to break up agglomerated particles and when measuring sticky or wetter materials. As well as keeping the flow channel clear, a pulsed air setting can also help to keep the optics clean. Dry clean compressed air at a maximum flow rate of 25L/min is required for its operation. A clear LED display on the casing signals the instrument status (power, laser and signal) for optimum performance.



Parsum IPP 70-SE

The IPP 70-SE is an intrinsically safe unit. Its low power input allows for its implementation in hazardous areas. The probe can be used in Ex-Zones 0 and 20, e.g. in a variety of industrial plants. Due to zone separation the corresponding electronics casing may be used in Ex-Zones 1 and 21.

- Certified at ATEX 100
- Option for use in hydrogen



Accessories

A special range of accessories has been developed to expand the field of use of the IPP 70 by adapting it to difficult process measurement conditions. The range of accessories is intended to provide constant protection of the measurement optical system against abrasive, greasy, sticky and adherent particles under high loads and/or high temperatures.

Clip-in cells adapt probe for different loadings and flows



The accessories can easily be installed in the measurement chamber of an IPP 70. In the IPP 70-S, the components are operated by compressed air to create a constant curtain of scavenging air in front of the measurement optical system and for the carriage and thinning of the particle jet.
The compressed air required is fed to the measurement chamber inside the IPP 70 sensors and from there to the accessories.

- In-line thinning of dense particle flows
- Directional particle movement through the sensor
- Decoupling from high process temperatures



Air regulation kit

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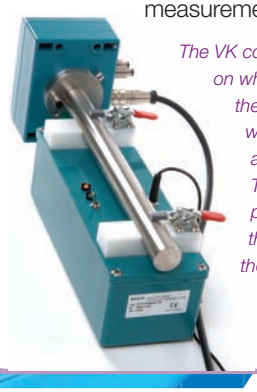
Pharmaceutical applications

Both the IPP 70-S and IPP 70-SE are available with two options to support their use in the pharmaceutical industry.

Pharma Option 1

The Installation Qualification (IQ) – a guide that includes all instructions necessary to install an IPP 70-S or -SE in the correct manner for pharmaceutical applications. This document is designed for trained personnel and guides, step by step, through the installation process. Each step requires user confirmation to fulfil pharma industry documentation requirements.

The Verification Kit (VK) – a test device that allows operators to check the basic function of the probe to ensure that installation performance can be maintained. The software/hardware interface makes it possible to perform a one-click calibration of the whole measurement system that can be stored.



The VK consists of a rotating disc inside a casing on which the probe is attached. Set into the rotating disc are 3 calibration pins with certified diameters of 150, 1000 and 2000µm. The probe measures these rotating pins as it would do particulates and the results can be checked against the known parameters.

The Operational Qualification (OQ) - a guide that documents the above verification procedure. The result of the OQ procedure is a verification certificate (form included).

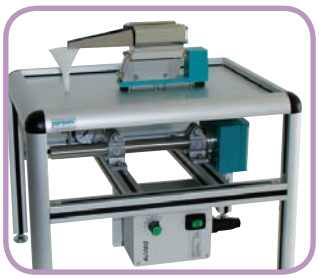
Pharma Option 2

All the documents necessary to ensure the material traceability of all contact components. A drawing of the probe and the Eductor D23 gives an overview of all contact parts complete with Drawing No. and Heat No.

For each contact part a 3.1 certificate is supplied.

- Polished surfaces for the probe's contact areas (Ra<0.5) to aid cleaning/sterilization

At-line option for IPP 70-S



For routine sample measurement at the production line

- Mobile system to facilitate fast and easy particle size analysis
- Multi-line use
- For control and optimization of processes
- Vacuum cleaner

Make the Parsum IPP 70 a valuable addition to your process

- **Enhances process transparency**
- **Shortens reaction time if malfunctions occur**
- **Facilitates constant quality control**
- **Precludes wrong batches**
- **Facilitates new automation solutions**
- **Saves time and money for sampling, specimen carriage and laboratory analysis**

Case study

Granulation is a pivotal stage of the tabletting process in pharmaceutical manufacturing. Good control of particle size and growth rate is essential to obtain a quality material with good compressibility and thus good tabletting properties.

Schering AG, a large pharmaceutical manufacturer, tested the Parsum in-line probe with a view to saving valuable time and resources in the optimization of their fluidized bed granulation process.[1]

Excellent results[1]

The unexpectedly high detail recorded by the probe in real-time made it easy to adjust critical process parameters such as spray rate, temperature and air flow to produce the right sized granulate

- **Good transferability and reproducibility of results were demonstrated**
- **Investigators found the Parsum in-line probe to be robust, easy to handle (hardware and software) and easy to clean with no demonstrable influence on the actual process**

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Parsum IPP 70

In-line particle size analysis in real-time

Product specification

Measurement range	Particle size 50 to 6000µm Velocity 0.01m/s to 50m/s
Materials	316L stainless steel for in-line probe Sapphire (window), epoxy resin (optics) Pressure-cast aluminium for electronics enclosure
Particle concentration	200-120,000ppm volume content depending on particle size and velocity
Data rate	Up to ca 10,000/s (process dependent)
Temperature range	-20°C to +100°C at measuring point in continuous operation -20°C to +60°C on probe housing
Max operating pressure	4 bar (at the probe's sensing volume)
Industrial protection	IP65 (probe)
Dimensions	Tube length L = 280mm Tube diameter D = 25mm
Weight (approx)	1.5kg
Software interface	Current interface (0) 4-20mA (to be installed at measuring PC) consists of: - Software module for transmission of characteristic values (X10, X50, X90) - Plug-in board (PCI) with active current loop interfaces (8 channels, free configurable) - OPC server (Provides the measurement data of up to 24 (max) probes in OPC compatible format)
Max number of instruments/PC	4
Installation	Inserted directly into process line. Usually retrofitted easily into pipes, vessels and reactors
Sensor	Utilises an extended fiber optic local filter method (Spatial Filter Velocimetry)
Intrinsic safety (IPP70-SE only)	The IPP 70-SE is intrinsically safe

Malvern® Instruments has a policy of continuous product improvement and specifications may change.
Further information about the optic specifications can be found at www.malvern.com/parsumsystem

Reference 1.
Schmidt-Lehr S, Moritz H-U, Jürgens KC. Online Control of Particle Size during Fluidised Bed Granulation. *Pharm Ind* 2007; **69(4):** 478-484.

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