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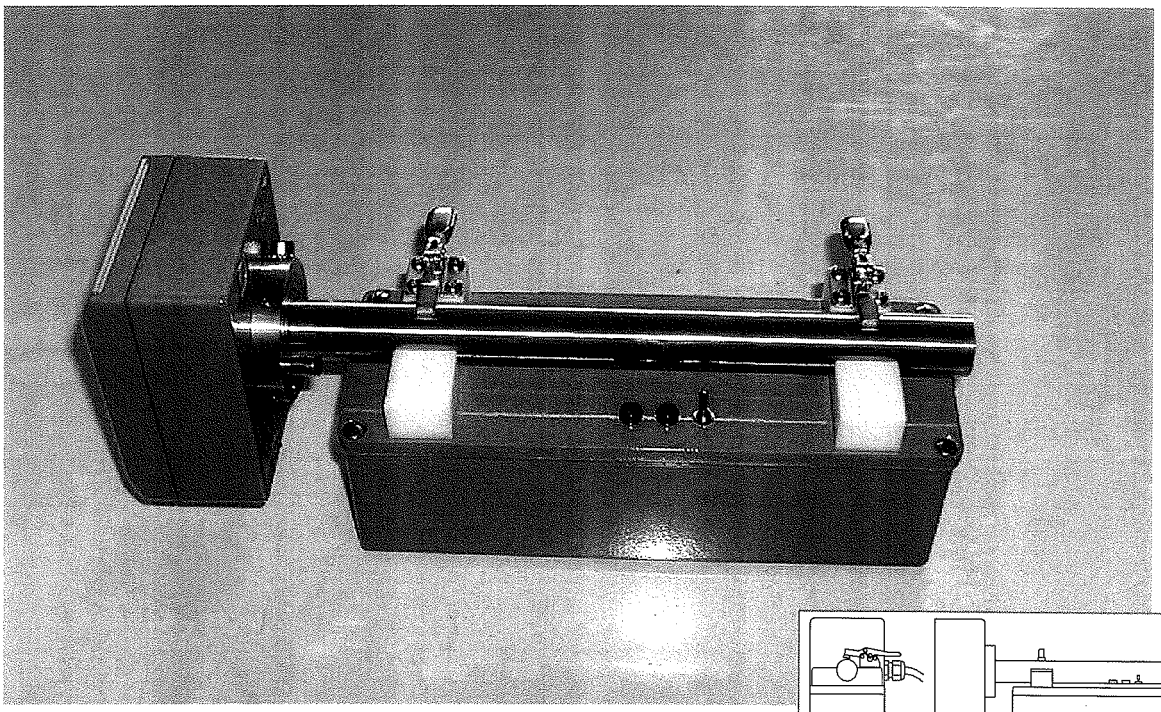
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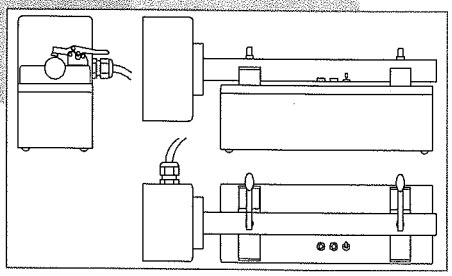
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Gesellschaft für Partikel-, Strömungs- und Umweltmeßtechnik mbH





Operating Manual

Testing device for IPP 70-S and IPP 70-Se

parsum parsum GmbH, Germany,
D-09126 Chemnitz, Reichenhainer Str. 34-36

Typ: IPP70-Prüfgerät VK1
Nr.: 700/025-2009
Ub = 12VDC

CE
Made in Germany

Status 02/2008

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Notes

Safety information

The VK1 testing device is designed for use in a dry and dust-free environment. The VK1 testing device is safe to use under normal conditions if used correctly and if the instructions in the Operating Manual are complied with.

The testing device must be used according to the Operating Manual. To avoid electrical damage, the device must only be used with the supplied mains unit.

This Operating Manual does not include instructions for repair. For your own safety, repairs and adjustments must only be performed by the manufacturer. The housing must therefore not be opened.

Incorrect handling (shock, impact, dropping) may cause damage to the measuring pins. The precision or the entire function of the device is then no longer guaranteed.

Objects (pins, screwdrivers etc) must not be inserted into the measuring apertures, regardless of whether the device is switched on or not. This may damage the measuring pins and render the device unusable.

No warranty can be made for damage which is caused by not observing this safety information.

The information for laser safety in the Operating Manual for the IPP-70-S or -Se must be observed.

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Warranty conditions

Unless otherwise agreed, the warranty period is 12 months. This warranty only applies to components supplied by Parsum GmbH. No warranty is provided for wear and tear associated with materials, such as abrasion of the probe tube or the optical windows becoming opaque. The same applies to mechanical damage to the measuring probe due to the incorrect fitting and removal. No warranty is given for wearing parts. The laser module is a wearing part (the life-span essentially depends on the conditions of use, particularly the temperature, and the length of time it is switched on). The laser module can only be replaced by the Parsum GmbH workshop.

Parsum GmbH warrants that the object supplied is free from manufacturing faults. The suitability, classification and function of the object supplied are solely determined by the performance specification in the order confirmation, even if these differ from those of the order.

Unless otherwise agreed, we are not liable for the suitability of the object supplied for the customer's intended purpose of use. The same applies to performance specifications expected by the customer, unless we have been able to carry out appropriate application-specific tests in advance and the appropriate performance specifications have been declared to be binding in our confirmation of the order.

Our warranty is also void if repairs, attempted repairs or other interventions to the goods that we have supplied are performed by persons other than those commissioned by us, or unsuitable accessories are used, insofar as this is the cause of the defect which has occurred. The basic condition for warranty is compliance with the instructions for operation and use.

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General description

Purpose

The VK1 testing device serves to verify the correct functionality of the IPP 70-S and IPP 70-Se in-line particle probes (from year of manufacture 2007). A basic calibration of the entire measuring system consisting of the probe, PC and software can be performed in conjunction with the IPP measuring software from Version 7.10 upwards.

The testing device can be used to perform functional qualification (Operational Qualification OQ). The procedure is described in the corresponding documents (OQ instructions).

Function

The testing device contains a rotating disk, to the circumference of which 3 measuring pins with defined diameters are attached. The diameters are 150µm, 1000µm and 2000µm. (A measurement report for the pins is included in the Appendix to this manual).
On each rotation of the disk, the measuring pins move through the measuring volume of the probe to be tested and produce a defined signal which is evaluated by the electronics of the probe and the measuring software. Due to the known diameter of the pins used, the functionality of the optical and electronic components and the measuring software can be tested on the basis of the particle size information displayed.

Start-up

Preparing the probe to be tested

1. The probe to be tested is removed from its measuring position. The signal cable and the air supply pipes must be removed. The position (depth of insertion or any angle of rotation) must be marked so that the probe can be re-installed in the same position. Flanges or screw fittings that are attached to the probe must be removed.

2. Flushing cells (e.g. SZ 11.SZ 20-4) or dispersion devices (e.g. Inline disperser D23) must be removed by loosening the screw (M3) in the measuring volume of the probe.

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3. All material deposits must be removed from the probe. The optical window in the measuring volume must be thoroughly cleaned (dry, moist, plastic spatula) (see the operating instructions for the IPP 70-S. -Se probes). To test the probe, the window must be free from all deposits, as these can cause incorrect adjustments. The windows in the measuring volume of the probe must only be cleaned when the laser is switched off. To do this, disconnect the signal cable from the probe or the measuring PC (with power supply), or switch off the external power supply.

4. Connect the probe to the measuring PC. If necessary, in explosion hazard areas, an additional cable must be used in order to set up the testing device outside of the explosion hazard area. The testing device is not approved for use in areas for which there is an explosion hazard. The test is always carried out taking the measuring system as a unit consisting of the probe and the measurement PC. Therefore the probe must be connected to the PC to which it is normally connected in order to perform measurements.

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Installing the IPP 70 probe on the testing device

The testing device must be set up in a firm horizontal surface. Care should be taken that the device cannot tip over.

The IPP 70-S probe is laid on the testing device with the probe tube horizontal and the open side of the measuring volume facing downwards. The measuring volume of the probe includes the round apertures in the housing of the rotating disk. The probe is fixed with the two clamping stirrups (noticeably snaps into place). (Fig 1)

The testing device is supplied with mains voltage (110-240V/50-60 Hz) via the plugged mains unit (yellow LED lights up) and switched on with the toggle switch (green LED lights up).

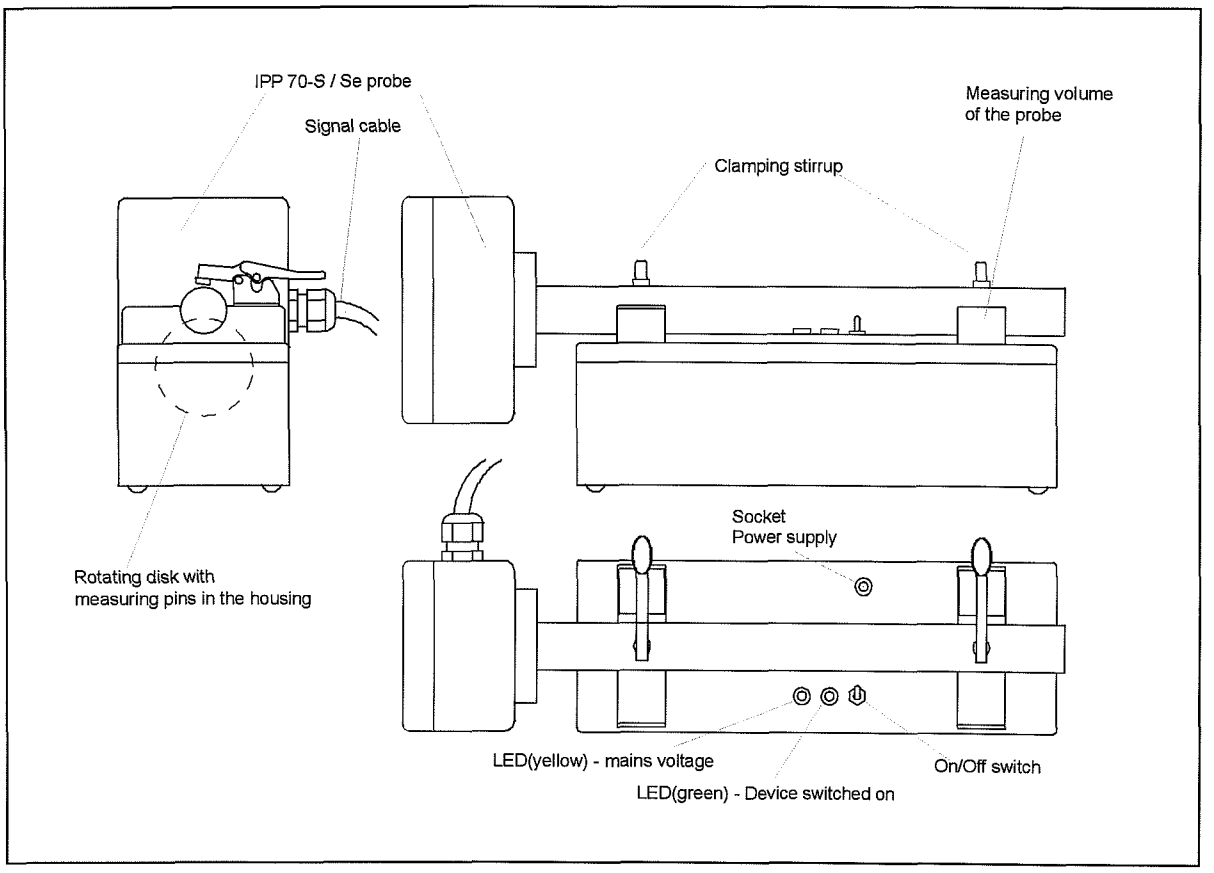


Fig 1: Testing device with IPP 70 probe

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Performing the test

Software settings

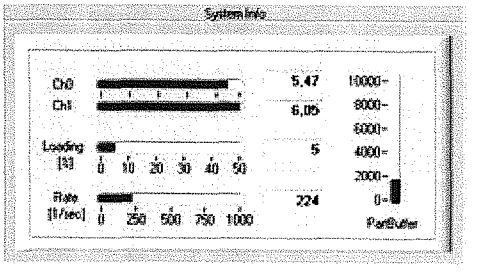
Before starting the test the settings of the IPP measurement software should be saved in a file (*.cfg) (see IPP 70 Manual). This enables the settings to be loaded again before the test.
The test is performed with the default settings. To do this, activate "Default Settings" in the menu item "Settings". (Applies from software version 7.10)

Information for older versions:
"Default Settings" must also be activated. Then change the following settings manually:

"Mean Velocity"	→	20m/sec or 2MHz
"Coincidence Level"	→	0.000

Checking the signal quality

Before starting the test the probe should be allowed to warm up for 15 minutes. Switch on the testing device with the toggle switch and start the measurement with the measuring PC connected to the probe. (Press "Go" button or F12).
In the "Size Distribution Q3/q3 lg(x)" window the measurement should now be displayed in the form of 2 red bars. Open the "Size Distribution Q0/q0(x)" window in order to display all 3 red bars. Each of these lines represents one of the measuring pins inside the testing device.
The "System Info" window displayed on the right hand side of the screen serves to check the signal quality of the two signal channels (CH0, CH1). The two upper bars should show a value of at least 3.5 in the numerical window next to the bar chart. The signal LED (Optional, only for IPP 70-S) on the front panel of the probe should now light up in green.



If a lower value is displayed for one or both of the signal channels, the sapphire windows should first be checked again and cleaned if necessary. Cleaning is described in detail in the operating instructions for the IPP 70 probe.

If a higher value is not displayed after thoroughly cleaning several times, the amplification should be readjusted (see section "Adjusting the IPP 70 probe").

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Measurements

To ensure a precise measurement of the 3 testing pins the measurement range should be limited so that for each in turn, only one testing pin is within the active range of particle size measurement. These settings are made in the Setting panel under the "Range" tab. The following ranges should be set for the individual testing pins:
Test pin 1 (150 µm) 10 ... 500 µm
Test pin 2 (1000 µm) 500 ... 1500 µm
Test pin 3 (2000 µm) 1500 ... 6000 µm
Each measurement should be started after setting the measurement range. The "Size Distribution Q0/q0(x)" window now only displays one red line for the relevant testing pin. At the lower right (next to the Time Chart) "Q0 [%]" = 50 should be set (default). This corresponds to the X50 value and therefore the average of all measurements of the testing pin. For the measurement, about 1000 individual measurements (see the "Part Buffer" display in the "System Info" window) should be made, or wait until the display is stable. The current measurement value can be read out and noted for subsequent calibration, or a report (menu File/Print) can be printed out.

Calibration

If the measured values (see "Measurements") are not in the range of +/-3% of the nominal diameter of the testing pins, the measuring system can be calibrated by entering the measured values in the menu "Extra/OQ".
Enter the value measured for each testing pin in the window displayed. In addition, the serial number (see the probe identification plate) must be entered into the field provided. The serial number later appears in the "Edit Settings" window in order to prevent possible confusion with other probes. Press the "Calculate" key. The new calibration factors are calculated and saved in a file. The calibration can be deleted by pressing "Delete Calibration". At the same time the serial number of the probe is deleted.
If the deviation for one of the testing pins is greater than +/-20%, there may be a fault with the probe which cannot, or can only partially, be remedied by recalibration. In this case contact either your Parsum distribution partner or Parsum directly.

Caution! Incorrect entry of measurement values can lead to incorrect measurements. Therefore check the changes by repeating the measurement of the 3 testing pins as described above.

If the measured value for the smallest testing pin is too high although the measured value for the other testing pins is within the normal range, this may be

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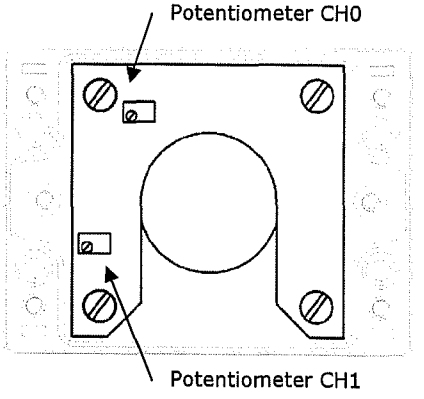
due to damage to the testing pin (testing pin bent). In this case contact either your Parsum distribution partner or Parsum directly.

Adjustments to the IPP 70 measuring probe

Caution!: Adjustments and repairs must only be performed by trained personnel. Incorrect handling can damage or destroy the electronic components. The following descriptions are therefore brief and are not intended to replace detailed instruction by Parsum staff or Parsum distribution partners.

If the signal LED on the front panel of the probe (optional, only for IPP 70-S) lights up yellow or red (with the testing device switched on) and it has been ensured that the sapphire window is not dirty, the signal strength can be adjusted by changing the amplification. This should also be performed if a signal strength of less than 3.5 is displayed for CH0 and/or CH1.

Leave the probe firmly mounted on the testing device, open the probe housing and fold back the cover. On the left hand side of the circuit board 2 adjustment potentiometers can be seen (see picture). While observing the bar charts on the screen, the two 11 gang potentiometers can be adjusted with a suitable screwdriver. Both bars should be adjusted to approx. 5.4 to 5.6. This corresponds to approx. 110% of the normal signal amplitude.



Functional qualification (Operational Qualification OQ)

Functional qualification should be carried out according to the documents "OQ for Parsum Inline Particle Probe IPP 70-S and -Se" and "IPP 70 Performance Verification Certificate".

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Calibration laboratory for length measuring instruments

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DKD-K-18802

W&Z081219-01

Kalibrierschein-Nr.
Calibration Certificate-No.

Werks-Kalibrierschein
Proprietary Calibration Certificate

Gegenstand *Object*	**6 Prüfstifte**
Hersteller *Manufacturer*	-
Typ *Type*	**siehe Protokoll**
Serien-/Ident-Nr. *Serial -/Identitynumber*	**siehe Protokoll**
Auftraggeber *Customer*	**Parsum Gesellschaft für Partikel-, Strömungs- und Umweltmesstechnik mbH Reichenhainer Str.34-36 09125 Chemnitz**
Auftragsnummer *Work order No.*	**2008124227**
Anzahl der Seiten *Number of pages*	7
Datum der Kalibrierung *Date of calibration*	**19.12.2008**

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Identnummer: -

Nennmaß: 0.1500 mm
Oberes/unteres Abmaß: 0,50 µm (0,15050 mm) / -0,50 µm (0,14950 mm)
Standard: DIN-ISO 286

Art der Prüfung: Überwachungsprüfung

Lehrenabmaße

oberes Abmaß: 0,50 µm 0,15050 mm
unteres Abmaß: -0,50 µm 0,14950 mm

Istmaßprüfung

Messebene	Messwert	Messwert in [mm]	Tol.-Überschr. in [µm]	Messwertlage im Toleranzfeld
1	1	0,15010	-	|----------x---------|
2	1	0,15000	-	|----------x----------|
3	1	0,15020	-	|----------x------|

Bewertung: **Prüfling toleranzhaltig**

Messunsicherheit: 0.6 µm + 0.9 µm x L (Messlänge L in m)

Anschluss an nationale Normale: ULM 01-600 C, Nr. 7041
Endmaßsatz 31826/90 (DKD-Kal.-Schein-Nr. 5103/09001/07-04)

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1	1	0,15020	-	|----------x------|
2	1	0,15010	-	|----------x--------|
3	1	0,15000	-	|----------x----------|

Bewertung: **Prüfling toleranzhaltig**

Messunsicherheit: 0.6 µm + 0.9 µm x L (Messlänge L in m)

Anschluss an nationale Normale: ULM 01-600 C, Nr. 7041
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Identnummer: -

Nennmaß: 1.0000 mm
Oberes/unteres Abmaß: 0,50 µm (1,00050 mm) / -0,50 µm (0,99950 mm)
Standard: DIN-ISO 286

Art der Prüfung: Überwachungsprüfung

Lehrenabmaße

oberes Abmaß: 0,50 µm 1,00050 mm
unteres Abmaß: -0,50 µm 0,99950 mm

Istmaßprüfung

Messebene	Messwert	Messwert in [mm]	Tol.-Überschr. in [µm]	Messwertlage im Toleranzfeld
1	1	0,99970	-	|----x----------|
2	1	0,99980	-	|------x--------|
3	1	0,99990	-	|---------x-----|

Bewertung: **Prüfling toleranzhaltig**

Messunsicherheit: 0.6 µm + 0.9 µm x L (Messlänge L in m)

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Identnummer: -

Nennmaß: 1.0000 mm
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Standard: DIN-ISO 286

Art der Prüfung: Überwachungsprüfung

Lehrenabmaße

oberes Abmaß: 0,50 µm 1,00050 mm
unteres Abmaß: -0,50 µm 0,99950 mm

Istmaßprüfung

Messebene	Messwert	Messwert in [mm]	Tol.-Überschr. in [µm]	Messwertlage im Toleranzfeld
1	1	0,99990	-	|---------x----------|
2	1	0,99980	-	|------x-----------|
3	1	0,99990	-	|---------x----------|

Bewertung: **Prüfling toleranzhaltig**

Messunsicherheit: 0.6 µm + 0.9 µm x L (Messlänge L in m)

Anschluss an nationale Normale: ULM 01-600 C, Nr. 7041
Endmaßsatz 31826/90 (DKD-Kal.-Schein-Nr. 5103/09001/07-04)

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Standard: DIN-ISO 286

Art der Prüfung: Überwachungsprüfung

Lehrenabmaße

oberes Abmaß: 0,50 µm 2,00050 mm
unteres Abmaß: -0,50 µm 1,99950 mm

Istmaßprüfung

Messebene	Messwert	Messwert in [mm]	Tol.-Überschr. in [µm]	Messwertlage im Toleranzfeld
1	1	2,00030	-	|----------x----|
2	1	2,00010	-	|----------x---------|
3	1	2,00000	-	|----------x----------|

Bewertung: **Prüfling toleranzhaltig**

Messunsicherheit: 0.6 µm + 0.9 µm x L (Messlänge L in m)

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Messebene	Messwert	Messwert in [mm]	Tol.-Überschr. in [µm]	Messwertlage im Toleranzfeld
1	1	2,00000	-	|----------x----------|
2	1	2,00030	-	|----------x----|
3	1	2,00020	-	|----------x------|

Bewertung: **Prüfling toleranzhaltig**

Messunsicherheit: 0.6 µm + 0.9 µm x L (Messlänge L in m)

Anschluss an nationale Normale: ULM 01-600 C, Nr. 7041
Endmaßsatz 31826/90 (DKD-Kal.-Schein-Nr. 5103/09001/07-04)

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