

Operating Manual PT-SV100 Scott Volumeter

Version 1.1



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The Documentation

This document describes the set-up, operation and general maintenance of the instrument. It should be used by the operators and the technical support staff responsible for the installation and set-up of equipment.

All attached equipment and parts have to be used in compliance with the manufacturer's manuals and papers supplied.

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We reserve all rights.

This manual should be used by the owner of the instrument only. He is allowed to copy the manual for his own use. It is forbidden to supply any copy of this document for any other purpose other than the instrument use without previous approval from Pharma Test Apparatebau AG.

How to Use the Manual

To understand the different information we use different formatting:

- Use any key (i.e. 1 or STOP)
- Display information
- Information entries
- Select from a menu
- Note: informs about special use or possibility



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Document History

Version	Valid from	Author	Change	Remark
1.0	15.07.2013	PTAG	Ν	First release
1.1 26.08.2013 PTAG C Correction in norms				
Table 1: Document History				

Index Information - Change:

N = New Document

C = Correction

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1 About the PT-SV100

The PT-SV100 Scott Volumeter determines bulk density of powders according to the following standard Monographs:

- ISO 3923-2 (metallic powders): determination of apparent density
- EP <2.9.34.1>: bulk density
- USP <616, Method II>: bulk density

The PT-SV100 is applicable to powders including metal powders, compounds, pigments, and so on that will flow freely through a suitable nozzle.

A comparison of the bulk and tapped densities of powders can give an indication of the type of interaction present between the various particles building up in the powder mass and hence provide an index of powder flowability, e.g., the Hausner ratio and compressibility index.

1.1 Technical Data

Parameter	Specification
Stainless steel receiving cup	25 +/- 0.05ml, round
Funnel mesh size	1.00mm (18 mesh) and 2.00mm (10 mesh)
Dimensions (Packaging)	20 x 26 x 40cm
Net Weight	9.5kg
Gross Weight	14kg

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2 Setup of the PT-SV100

The PT-SV100 is delivered in a handy transport box. This chapter describes the components of the PT-SV100 and offers a step by step guide on how to assemble the instrument. When the instrument is not needed it can be stored again in the transport box.

2.1 Components of the PT-SV100

The PT-SV100 consists of these major components:



Figure 1: PT-SV100 Schematic

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2.2 Assembling the PT-SV100

Follow these steps to assemble the PT-SV100 from the individual components:

Place the base plate with spirit gauge (part no. 495-0013) on an even surface:

Screw the holding rod (part no. 495-0014) into the base

plate:







Place the overflow saucer (part no. 495-0012) on the base plate:

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Place the stainless steel measuring cone (part no. 495-0035) on the receiving cup:

Place the receiving cup (part no. 495-0033) on the overflow

saucer:

Install the stand (part no. 495-0011) by sliding it over the holding rod. Fix its position so that it does not fall down. Do not tighten it too much as the exact position has to be adjusted later:

Install the glass plates (part no. 495-0020) into the baffle box (part no. 495-0023):





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Adjust the height of the stand until the outlet of the baffle box rests on the measuring cone:

Place the baffle box onto the stand:

Install the loading funnel holder (part no. 495-0034) by sliding it over the holding rod. Fix its position so that it does not fall down. Do not tighten it too much as the exact position has to be adjusted later:



Place the loading funnel (part no. 495-0032) into the loading funnel holder. Then install the powder funnel (part no. 495-0031). Adjust the height of the loading funnel holder until the outlet of the loading funnel rests on the baffle box:

Remove the measuring cone:

Check the levelness of the PT-SV100 by using the spirit gauge integrated into the base plate:

If necessary adjust the position of the PT-SV100 by using the two screws on the base plate until the instrument is properly leveled:

The PT-SV100 is now ready for use.

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3 Operating Principle and How to Use the PT-SV100

This test method covers the evaluation of the apparent density physical characteristic of powders. The degree of correlation between the results of this test and the quality of powders in use will vary with each particular application and has not been fully determined.

The operating principle relies on the measurement of a mass of a certain quantity of powder which fills a container of a known volume inside the PT-SV100. A loose packing condition is obtained by using the PT-SV100 and this is achieved by filling a stainless steel cup or container by cascading the powder sample over a series of inclined glass baffles within a baffle box. The ratio between the mass and the volume represents the apparent density. The apparent density measured via this test method is often referred to as the "Scott Density".

3.1 How to Use the PT-SV100

The PT-SV100 is easy to use. First weigh and then place the stainless steel receiving cup onto the base plate of the unit:



Figure 2: Steel Cup on PT-SV100 Base

A minimum of 35ml of powder is usually required for one test (actual amount depends on the type of powder used for the test).

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Then carefully pour the powder into the funnel at the top of the baffle box until the cup beneath overflows:



Figure 3: Pouring Powder into the Funnel until Cup Overflows

If the powder is not free-flowing, carefully brush the sample through the top receiving funnel screen without jarring the PT-SV100. Jarring of the instrument could result in packing of the powder in the density cups, thus giving erroneously high values:



Figure 4: Brushing Sample through Funnel

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Now level off the powder using the flat edge scraper (part no. 495-0035):



Figure 5: Levelling Off the Powder

Re-weigh the cup and calculate the weight of the collected powder sample. Now use the known volume of the cup to calculate the apparent density. This can be done using the formula:

$$p = M/V$$

Where ρ is the density, M = mass in grams and V = volume of the receiving cup in mL. The result is expressed in g/mL.

3.2 Result Reporting

Usually there should be a series of at least three tests to provide a basic statistical set of results and to avoid any sample anomalies. Samples should be of a uniform nature and as such should be representatively sampled. This can be achieved by coning and quartering or by the use of suitable riffling device, either electronic or manual. When the test is finished you need to prepare a test report which should include product descriptive information such as batch number, specification, method of drying (if it has been dried).

You can download a sample result report in Microsoft™ Excel©-format to use and modify from our website at:

www.pharma-test.de/wp-content/uploads/2013/07/CA-49-10000_PT-SV100_test_report.zip (10 KB)

4 Maintenance and Cleaning

Clean the instrument after each preferably by using compressed air or similar means.

The instrument does not include any other parts which the user can maintain or repair. Repair work should be done by authorised service agents only.

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