HandyStep® electronic
HandyStep® *S*

Testing Instructions (SOP)

July 2017

1. Introduction

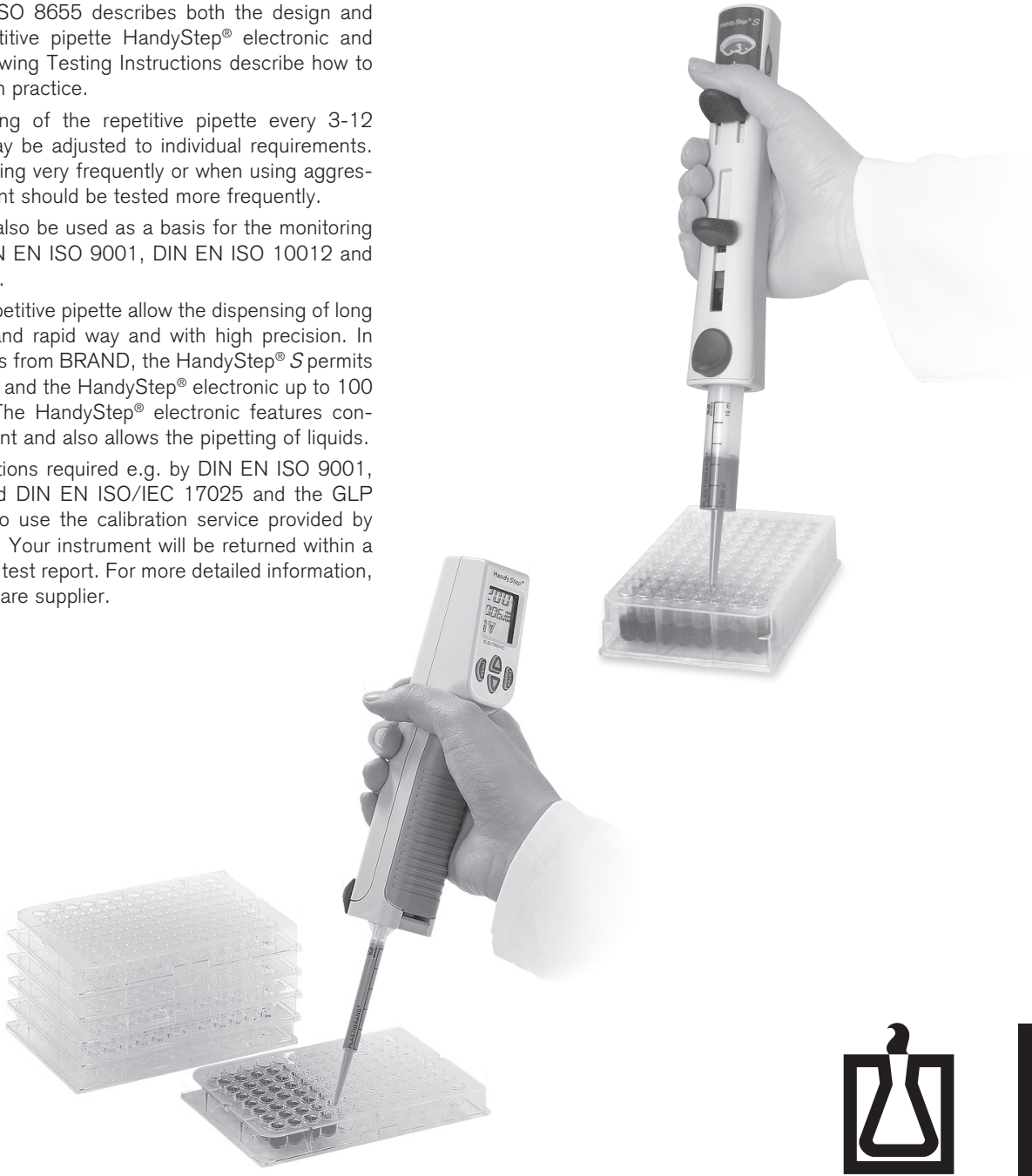
The standard DIN EN ISO 8655 describes both the design and the testing of the repetitive pipette HandyStep® electronic and HandyStep® *S*. The following Testing Instructions describe how to apply the ISO standard in practice.

We recommend a testing of the repetitive pipette every 3-12 months. This interval may be adjusted to individual requirements. For example, when working very frequently or when using aggressive media, the instrument should be tested more frequently.

These Instructions may also be used as a basis for the monitoring of testing devices to DIN EN ISO 9001, DIN EN ISO 10012 and DIN EN ISO/IEC 17025.

Due to their PD-Tips, repetitive pipette allow the dispensing of long series in a stress-free and rapid way and with high precision. In combination with PD-Tips from BRAND, the HandyStep® *S* permits up to 49 pipetting steps, and the HandyStep® electronic up to 100 steps without refilling. The HandyStep® electronic features continuous volume adjustment and also allows the pipetting of liquids.

For the regular examinations required e.g. by DIN EN ISO 9001, DIN EN ISO 10012 and DIN EN ISO/IEC 17025 and the GLP Guidelines, you may also use the calibration service provided by BRAND (see chapter 7). Your instrument will be returned within a few days together with a test report. For more detailed information, please contact your labware supplier.



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2. Preparation for testing and visual examination

2.1 Instrument identification

- Read instrument type (embossed on the casing) ⇒ Enter number into Test Record see page 10 (1).
- Read PD-Tip size ⇒ Enter size into Test Record (1).
- Read customer's identification, if present ⇒ Enter identification into Test Record (1).

2.2 Minimal configuration of the HandyStep® electronic, resp. HandyStep® *S*

- HandyStep® electronic, resp. HandyStep® *S*
- PD-Tips ⇒ Use only appropriate dispenser tips. For best results, use original PD-Tips from BRAND.

2.3 Cleaning

- Clean the casing adequately. ⇒ Wipe with a moist cloth (water or diluted soapy solution). Do not disassemble the instrument!
  ⇒ See Operating Manual for details.

2.4 Visual examination for damage

- Casing ⇒ Mechanical damage?
- PD-Tip ⇒ Scratches? Deformations? Mechanical damages?

Possible faults and corrective actions:

Problem	Possible cause	Corrective action
PD-Tip dripping	■ PD-Tip leaking	⇒ Replace PD-Tip
Important parts damaged	■ Mechanical or chemical damage	⇒ Send instrument in for repair

2.5 Functional test

3.2.1 HandyStep® electronic

- Mount new PD-Tip
- Then PD_Tipis automatically recognized and with compatible dispenser tips simply enter the tip size.
- Adjustment of volume to be dispensed
- Filling the PD-Tip ⇒ Immerse PD-Tip into the testing liquid approx. 2 - 3 mm. Aspirate liquid at a steady rate.
- Hold the HandyStep® electronic vertically for approx. 10 seconds and observe if a drop forms at the end of the tip. ⇒ If a drop forms, see table below.
- Release the liquid step by step. ⇒ Liquid should emerge at a steady rate.
- Empty the PD-Tip completely and remove. ⇒ Enter findings into Test Record (3).

Possible faults and corrective actions:

Problem	Possible cause	Corrective action
PD-Tip dripping	■ PD-tip leaking	⇒ Mount new PD-Tip
PD-Tip not recognized	■ Type encoding missing or damaged, or tip not mounted correctly	⇒ Mount new PD-Tip, or mount again. Select volume range if required.

Note:
If the instrument displays an error message, follow the Operating Manual.

2.5.2 HandyStep® *S*

- Mount new PD-Tip
- Does the piston properly lock into place? ⇒ Operating key must move easily and smoothly.
- Does the volume adjustment work?
- Filling the PD-Tip ⇒ Immerse PD-Tip into the testing liquid and fill the tip. Operating key must move easily and smoothly.
- Hold the HandyStep® *S* vertically for approx. 10 seconds and observe if a drop forms at the end of the tip. ⇒ If a drop forms, see table at the end of this section.
- Release the liquid step by step. ⇒ Liquid should emerge at a steady rate.
- Empty the PD-Tip completely and remove. ⇒ Enter findings into Test Record (3).

Possible faults and corrective actions:

Problem	Possible cause	Corrective action
PD-Tip cannot be inserted	■ Filling/locking key not in bottom position and not tilted upward. ■ Piston of the PD-Tip not inserted completely.	⇒ Push filling/locking key all the way to the bottom, and tilt upward. ⇒ Push piston of the PD-Tip into the cylinder completely.
Filling/locking key cannot be pushed upward	■ Filling/locking key not completely pushed in (closed).	⇒ Push piston of the PD-Tip into the dispenser completely. Close the filling/locking key.
PD-Tip dripping	■ PD-tip leaking	⇒ Replace the PD-Tip.

Note:
For additional examinations and adjustments, see the Operating Manual for HandyStep® *S* and HandyStep® electronic.

3. Equipment required for testing

3.1 For HandyStep® electronic, resp. HandyStep® *S*

- **Recipient vessel** filled with deionized water (e. g. Erlenmeyer flask) (according to ISO 3696, at least quality) ⇒ Match temperature of water and room to 1 °C accuracy.
- **Weighing vessel** filled with small amount of water (e. g. Erlenmeyer flask) ⇒ Bottom must at least be covered. In case of testing volumes < 100 µl, protect against evaporation.
- **Balance,** recommended specifications:

Selected volume[a] of appartatus under test V	Resulution mg	Repeatability and linearity mg	Standard uncertainty of measurement mg
1 µl < V ≤ 10 µl	0,001	0,002	0,002
10 µl < V ≤ 100 µl	0,01	0,02	0,02
100 µl < V ≤ 1000 µl	0,1	0,2	0,2
1 ml < V ≤ 10 ml	0,1	0,2	0,2
10 ml < V ≤ 50 ml	1	2	2
[a] For practical purposes, the nominal volume may be used to choose the balance.			

- **Thermometer** with a measuring error of maximum ⇒ ± 0,2 °C
- **Hygrometer**: Considering the measuring tolerance of the hygrometer a relative atmospheric humidity of at least 40% shoul be reached.
- Place the HandyStep® electronic, resp. the HandyStep® *S*, including appropriate tips, into the testing room for at least 1 hour (unpacked). ⇒ Allow instrument to adjust to room temperature

Traceability of test results to national standards
Through the use of calibrated testing devices (balance and thermometer), the requirement of DIN EN ISO 9001, DIN EN ISO 10012 and DIN EN ISO/IEC 17025 to refer the test to the national standard is fulfilled. The calibration of the balance e.g. can be carried out either by DAkkS calibration or official certification of the balance, or by calibrating the balance with appropiate weights that are traced to the national standard. The calibration of the thermometer, hygrometer and barometer can also be carried out by DAkkS calibration or official certification, or by a comparison with thermometers that are traced to the national standard (under defined conditions).

4. Gravimetric test (calibration)

4.1 HandyStep® electronic

This test can be carried out with PD-Tips of any size. However, size 5 ml is most commonly used for this purpose.

1. Set instrument to nominal volume.
2. Determine temperature of the deionized water.
   ⇒ Enter temperature into Test Record.
3. Priming the PD tip before use.
   ⇒ For this, fill the tip at a minimum with the liquid and then empty it again. Small air bubbles in the area of the piston after priming do not affect the results.
4. Filling the PD-Tip
   ⇒ Immerse PD-Tip vertically into the testing liquid by 2 - 3 mm, and press the step key to take up liquid. After taking in liquid, the HandyStep® electronic will automatically compensate for play to minimize surface tension inside the tip. A small amount of liquid is thereby discharged.
5. Place the weighing vessel (containing a small amount of deionized water) on the balance and tare.
6. Remove weighing vessel from the balance.
7. Dispense the first step into the weighing vessel.
   ⇒ Up to a volume of 5 ml, lean the PD-Tip against the wall of the vessel at an angle of about 30°-45°, then wipe it off against the wall (approx. 10 mm). Volumes over 5 ml may be dispensed in a free jet.
8. Place the weighing vessel on the balance.
   ⇒ Enter weighed value into Test Record ((6.) V1)
9. Re-tare the balance.
10. Repeat steps 2 to 7 ten times.
    ⇒ Enter weighed values into Test Record ((6.) V_1)
11. Repeat the same testing procedure at 50 % and 10 % of nominal volume.
    ⇒ For weighings at 50 % (V_2) and 10 % (V_3) of nominal volume, there is no need to refill the HandyStep® electronic after each measurement, since volumes are dispensed in steps.

    ⇒ Enter all weighed values into the Test Record; a total of 30 values.

4.2 HandyStep® *S*

This test can be carried out with PD-Tips of any size. However, size 5 ml is most commonly used for this purpose.

1. Set the HandyStep® *S* to Step 5.
2. Determine temperature of the deionized water for testing.
   ⇒ Enter temperature into Test Record.
3. Priming the PD tip before use.
   ⇒ For this, fill the tip at a minimum with the liquid and then empty it again. Small air bubbles in the area of the piston after priming do not affect the results.
4. Filling the PD-Tip
   ⇒ Immerse PD-Tip vertically into the testing liquid by 2 - 3 mm.
5. Reject the first step; it only serves to compensate for play to minimize surface tension inside the tip.
6. Place the weighing vessel (containing a small amount of deionized water) on the balance and tare.
7. Remove weighing vessel from the balance.
8. Dispense the second step into the weighing vessel.
   ⇒ Up to a volume of 5 ml, lean the PD-Tip against the wall of the vessel at an angle of about 30°-45°. Push the dispensing lever at a steady rate to the first stop, hold it there, and wipe the tip off against the wall (approx. 10 mm). Volumes over 5 ml may be dispensed in a free jet.
9. Place the weighing vessel on the balance.
   ⇒ Enter weighed value into Test Record ((6.) V_1)
10. Re-tare the balance.
11. Repeat steps 6 to 9 ten times.
    ⇒ Enter weighed values into Test Record ((6.) V_1); a total of 30 values.

    Note:
    At the Step 5 setting, the PD-Tip has to be filled again for dispensing the tenth step.

12. Repeat the same testing procedure at the settings Step 3 (V_2) and Step 1 (V_3).

5. Evaluation of gravimetric test results

The values obtained by weighing during the gravimetric test are only the mass values of dispensed volume. In order to obtain the actual volume, an adjustment calculation must be carried out. To facilitate your calculations and evaluations, we recommend the use of the Windows-compatible calibration software EASYCAL™ from BRAND.

The following calculations must be carried out:

1. Mean weight:
(Example for 10 weighing values)

$$\bar{x} = \frac{x_1 + x_2 + x_3 + x_4 + x_5 + x_6 + x_7 + x_8 + x_9 + x_{10}}{10}$$

2. Mean volume:

$$\bar{V} = \bar{x} \cdot Z$$

⇒ For factor Z, see Table 1.
⇒ Enter value into Test Record (7a).

3. Standard deviation:

$$s = Z \cdot \sqrt{\frac{(x_1 - \bar{x})^2 + (x_2 - \bar{x})^2 + (x_3 - \bar{x})^2 + (x_4 - \bar{x})^2 + \ldots + (x_{10} - \bar{x})^2}{9}}$$

⇒ For factor Z, see Table 1.
⇒ Enter value into Test Record (6b).

4. Accuracy:

$$A\,[\%] = \frac{\bar{V} - V_{\text{nominal value}}}{V_{\text{nominal value}}} \cdot 100$$

⇒ Enter value into Test Record (6c).

5. Coefficient of variation:

$$CV\,[\%] = \frac{s \cdot 100}{\bar{V}}$$

⇒ Enter value into Test Record (6d).

Comparison actual/nominal values:

- See tables of error limits and accuracy for each instrument on the following pages, or define your own error limits.

⇒ Enter value into Test Record (6e, f).

Result:

⇒ Enter value into Test Record (6g).

If the calculated values A [%] and CV [%] are smaller than or equal to the error limits, the instrument is in good working order.

If the calculated values **exceed** the error limits:

- Verify if all instructions in this Manual have been followed carefully.
- Observe the "Troubleshooting" information in the Operating Manual.

If these measures are not successful, we offer you the possibility to have your instruments calibrated by the BRAND Calibration Service (see page 12).

Table 1:

Excerpt from DIN EN ISO 8655, part 6.
Table refers to 1013 hPa
Validity range 980 hPa to 1040 hPa

Temperature °C	Factor Z ml/g	Temperature °C	Factor Z ml/g
15	1.0020	23	1.0035
15.5	1.0020	23.5	1.0036
16	1.0021	24	1.0038
16.5	1.0022	24.5	1.0039
17	1.0023	25	1.0040
17.5	1.0024	25.5	1.0041
18	1.0025	26	1.0043
18.5	1.0026	26.5	1.0044
19	1.0027	27	1.0045
19.5	1.0028	27.5	1.0047
20	1.0029	28	1.0048
20.5	1.0030	28.5	1.0050
21	1.0031	29	1.0051
21.5	1.0032	29.5	1.0052
22	1.0033	30	1.0054
22.5	1.0034		

Table 2:

Excerpt from DIN EN ISO 8655, part 5.

Nominal volume µl	1	2	3	10	20	50	100	200	500
A ±%	5	5	2.5	2	1.5	1.0	1	1	1
CV %	5	5	3.5	2.5	2.0	1.5	1.0	1.0	0.6
Nominal volume ml	1.0	2.0	5.0	10	25	50			
A ±%	1	0.8	0.6	0.5	0.5	0.5			
CV %	0.4	0.4	0.3	0.3	0.3	0.25			

Table 3:

Volumetric error limits for repetitive pipette:

The stated error limits refer to new instruments under optimized testing conditions (qualified operators and standardized ambience conditions).

Accuracy table PD-Tips from BRAND, 20 °C ‚Ex', DE-M marking
for testing with HandyStep® electronic

PD-Tip size	Volume range	Testing volume (A* ≤ ± %)			Testing volume (CV* ≤ %)		
		100%	50%	10%	100%	50%	10%
0.1 ml	1 µl - 100 µl	1.0	1.0	1.6	0.5	1.0	2.0
0.5 ml	5 µl - 500 µl	0.9	0.9	1.0	0.3	0.6	1
1.0 ml	10 µl - 1 ml	0.6	0.9	1.0	0.3	0.5	0.8
1.25 ml	12.5 µl - 1250 µl	0.6	0.6	0.9	0.2	0.5	0.7
2.5 ml	25 µl - 2500 µl	0.5	0.6	0.7	0.15	0.3	0.6
5.0 ml	50 µl - 5000 µl	0.5	0.5	0.7	0.15	0.4	0.7
10.0 ml	100 µl - 10 ml	0.4	0.5	0.7	0.15	0.5	0.8
12.5 ml	125 µl - 12.5 ml	0.5	0.5	0.8	0.15	0.6	1.4
25.0 ml	250 µl - 25 ml	0.5	0.5	0.6	0.15	0.3	1.0
50.0 ml	500 µl - 50 ml	0.5	0.5	0.5	0.15	0.4	1.2

* Error limits refer to the nominal volumes and partial volumes relative to the PD-Tip, obtained with instrument and distilled water at equilibrium with ambient temperature at 20 °C, and with smooth operation. The error limits defined in ISO 8655 are not exceeded.
A = Accuracy, CV = Coefficient of variation
The nominal volume is the maximum volume printed on the PD-Tip.

Accuracy table PD-Tips from BRAND, 20 °C ‚Ex', DE-M marking
for testing with HandyStep® *S*

PD-Tip size ml	Volume range µl	A* ≤ ± % Stroke setting ≙ % of **nominal volume**			CV* ≤ % Stroke setting ≙ % of **nominal volume**		
		1 ≙ 2%	**3 ≙ 6%**	**5 ≙ 10%**	**1 ≙ 2%**	**3 ≙ 6%**	**5 ≙ 10%**
0.1	2 - 10	4.0	2.4	1.6	6.0	3.0	2.0
0.5	10 - 50	2.5	1.5	1.0	2.5	1.5	1.0
1	20 - 100	2.5	1.5	1.0	2.0	1.2	0.8
1.25	25 - 125	2.5	1.4	0.9	2.0	1.1	0.7
2.5	50 - 250	1.8	1.1	0.7	1.5	0.9	0.6
5	100 - 500	1.8	1.1	0.7	1.5	0.9	0.7
10	200 - 1000	1.8	1.1	0.7	2.0	1.2	0.8
12.5	250 - 1250	1.8	1.1	0.8	3.2	2.0	1.4
25*	500 - 2500	1.5	0.9	0.6	3.0	1.5	1.0
50*	1000 - 5000	1.5	0.8	0.5	5.0	1.8	1.2

A* = Accuracy, CV* = Coefficient of variation

The nominal volume is the maximum volume printed on the PD-Tip.
Error limits refer to the partial volume set relative to the PD-Tip size, obtained at equal temperature (20 °C) of instrument, tip, ambience and dist. H_2O, and with smooth, steady operation. The testing is according to DIN EN ISO 8655-5.

For calibration, the error limits to be observed by the operator must be individually defined by the user. For this purpose, the following methods can be applied:

- If required by the application and if the optimized conditions for measuring are present, the stated error limits can also be expected in the case of used volumetric instruments in good working order.
- In analogy to the German regulations for official testing, it is also admissible to apply the limits which are typical for practice. These practice limits correspond to double the limits for official testing. In this case, the values found in Table 3 should be **doubled**.
- The user may also define his own individual tolerance limits corresponding to his particular application, and apply these error limits for the calibration of his instrument.

The above procedures fulfil the requirements of DIN EN ISO 9001, DIN EN ISO 10012 and DIN EN ISO/IEC 17025.

Test Record for Volumetric Instruments (EX)

1. Instrument:

	❑ HandyStep® electronic	❑ HandyStep® *S*	❑ _____
PD-Tip-size:	❑ 0,1 ml	❑ 2,5 ml	❑ _____
	❑ 0,5 ml	❑ 5,0 ml	❑ 25,0 ml
	❑ 1,0 ml	❑ 10,0 ml	❑ 50,0 ml
	❑ 1,25 ml	❑ 12,5 ml	❑ Other:

Serial number: _____

Customer's identification: _____

2. Damage:

❑ None
❑ Type of damage: _____
❑ Damage repaired

3. Functional defects:

❑ None
❑ Type of functional defect: _____
❑ Functional defect repaired

4. Water temperature: _____ °C

Balance: _____

Thermometer: _____

Corrective factor Z: _____

Relative atmospheric humidity: 50 % ± 30 % (default value only)

5. Weighing values from gravimetric test

Weighing No.	V_1 =	V_2 =	V_3 =
x_1			
x_2			
x_3			
x_4			
x_5			
x_6			
x_7			
x_8			
x_9			
x_{10}			

6. Evaluation of gravimetric test

Procedure		V_1 =	V_2 =	V_3 =
a	$\bar{V}$			
b	s			
c	A [%] found			
d	CV [%] found			
e	A [%] nominal			
f	CV [%] nominal			
g	Result			

The testing was carried out according to DIN EN ISO 8655.

_____ _____

Date: **Signature:**

BRAND®

6. Declaration on the Absence of Health Hazards

To be sent together with the instruments or via Mail (if urgent by Fax in advance).

To
BRAND GMBH + CO KG
Otto-Schott-Straße 25

97877 Wertheim

Fax: 09342 808-91290

We intend to give our staff a maximum of protection from health hazards caused by contaminated instruments. We therefore ask for your understanding that we cannot carry out any calibration / repair unless this declaration is submitted completed and signed.

Re: Instrument Consignment dated _____ / Re: Delivery Note No. _____

The Undersigned hereby declares:

- That the instruments have been carefully cleaned and decontaminated before shipment.
- That the instruments pose no danger through bacteriological, chemical, radiological or viral contamination.
- To be authorised to make declarations on behalf of the Institution represented.
- For calibrating service only: minor repairs of a value up to € 25,- + VAT will be carried out and invoiced without further queries (cross out if not applicable).

Company / Laboratory (Stamp)

Tel. / Fax / E-Mail

_____
Name

_____
Position

_____
Date, Signature

- In case of Return for Repair, please provide us with the following supplementary information:

  Detected defect _____

  Media which the instrument has been used with: _____

7. Calibration Service from BRAND

BRAND offers a full service including calibration and adjustment of Brand- and foreign instruments as well as maintenance and repair if necessary - only for BRAND- instruments. This saves money and adds the benefit of an independent review organisation for the calibration of the instruments. Further information and the order form for repair- and calibration service are found on www.brand.de.

7.1 Range of instruments covered

1. Piston-operated pipettes (single- and multichannel)
2. Bottletop dispensers
3. Piston burettes (bottle-top burettes)
4. Repetitive pipettes

7.2 Testing according to DIN EN ISO 8655

At BRAND, a team of qualified staff, working in temperature and humidity controlled rooms and using the state-of-the-art balances and calibration software, calibrates Liquid Handling instruments, regardless of their make, according to ISO 8655.

Instruments with adjustable volumes such as HandyStep® electronic, Transferpette®, Transferpette® *S,* Transferpette® electronic, Transferpette® *S* -8/-12. Transferpettor or Dispensette®, Digital Burette or Titrette® are tested at nominal volume, and at 50%, 10% or 20% of nominal volume.To document the results, a detailed Test Report is compiled which fully complies with all relevant regulations.

To document the results, a detailed Test Report is compiled which fully complies with all relevant regulations.

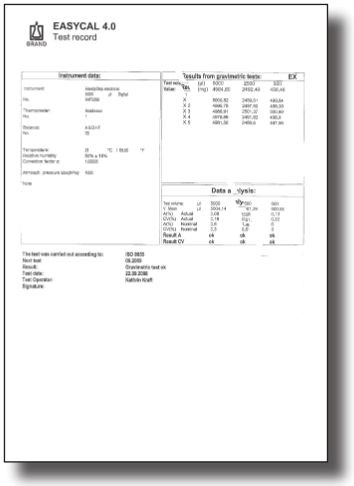
The BRAND Calibration Service provides:

1. Calibration of Liquid Handling instruments, regardless of their make
2. Detailed calibration certificate
3. Return of instrument within a few working days
4. Cost-efficient handling

8. EASYCAL™ Software – advanced calibration technology

8.1 For liquid handling instruments and glass or plastic volumetric instruments

EASYCAL™ simplifies the tedious task of calibrating liquid handling instruments and glass or plastic volumetric instruments to DIN EN ISO 9001, DIN EN ISO 10012, DIN EN ISO/IEC 17025 and GLP standards. The procedures are outlined step-by-step, and all calculations are performed automatically. Reports are generated to document the calibration. All you need is an analytical balance, a PC Windows® 98/2000, NT (SP6), XP, Vista, 7, printer (optional) and EASYCAL™ software.


EASYCAL 4.0
Test record

- Suitable for instruments from all manufacturers.
- Specifications of many instruments preloaded.
- Testing according to ISO 4787, ISO 8655, etc.

8.2 Data Entry

- Connect PC and balance (optional), then start the EASYCAL™ software.
- 100 common balances are preprogrammed for ease of installation.

8.3 Documentation – clearly arranged

The calibration certificate contains all important test data on one page.

9. DAkkS-Calibration Service for Volumetric Instruments at BRAND

9.1 DAkkS – Deutsche Akkreditierungsstelle GmbH and DKD

The German Calibration Service (DKD) was founded in 1977 as a joint task of state and economy and constitutes the link between the measuring equipment in industrial and research laboratories, testing institutions and authorities and the national standards of the PTB (the German Institute of Physics and Metrology). It effectively supplements the existing verification system which serves above all the purposes of consumer protection. Based on the legal requirements the DKD Accreditation was successively transformed to the DAkkS Accreditation (Deutsche Akkreditierungsstelle GmbH), starting from 2010. BRAND has been accredited by the DAkkS since Apr. 23, 2013, with the certificate number D-K-18572-01-00.


Deutscher Kalibrierdienst (DKD)
Akkreditierungsstelle

Deutschen AkkreditierungsRat

Akkreditierung


DEUTSCHER KALIBRIERDIENST DKD

Kalibrierlaboratorium / Calibration laboratory

9.2 DAkkS-Calibration Certificate and Calibration Symbol

The DAkkS-Calibration Certificate documents officially on a high level the traceability of measuring results to national and international standards and to international SI-units, as required by standards as DIN EN ISO 9001 and DIN EN ISO/IEC 17025 for monitoring of measuring devices.

DAkkS-Calibration Certificates are issued when calibrations of an accredited laboratory are requested, when high level calibrations are necessary, when national and international standards are demanded and when reference instruments have to be calibrated.

9.3 DAkkS – A member in the International Accreditation Network

DAkkS is a member of the **International Laboratory Accreditation Cooperation (ILAC),** the highest level international institution for laboratory calibration, and is a signatory to the MRA – Mutual Recognition Agreements.

The accreditation bodies that are signatories to the ILAC mutual recognition agreements (MRAs) recognize their mutual equivalence, and the equivalence of the calibration certificates issued by those same signatories. Likewise, signatories are obliged generally to promote and recommend recognition of the calibration certificates of other signatories (excluding factory calibration certificates).

The DAkkS is a member of the EA (European Co-operation for Accreditation), which again is a member of the ILAC (International Laboratory Accreditation Cooperation). A multilateral agreement assures obligatory recognition of the DAkkS calibration certificate in a variety of countries.

9.4 DAkkS-Calibration Laboratory at BRAND

In 1998 a calibration laboratory for volumetric instruments at BRAND has been accredited by the German Calibration Service according to DIN EN ISO/ IEC 17 025. Our calibration laboratory is therefore authorized to issue DAkkS-Calibration Certificates (in several languages) for the volumetric instruments listed below. Furthermore we offer adjustment and – for BRAND Liquid Handling instruments – repair and maintenance.

For ordering information on DAkkS-Calibration Certificates for volumetric instruments please consult our General Catalog.

9.5 Volumetric instruments for which BRAND issues DAkkS Calibration Certificates

BRAND calibrates the following volumetric instruments (new or already in use and regardless of their make):

- **Piston-operated pipettes,** from 0.1 µl to 10 ml
- **Multichannel piston-operated pipettes,** from 0.1 µl to 300 µl
- **Piston-operated burettes,** from 5 µl to 200 ml
- **Dispensers, Dilutors,** from 5 µl to 200 ml
- **Volumetric instruments of glass,** calibrated to contain (TC, In) from 1 µl to 10000 ml
- **Volumetric instruments of glass,** calibrated to deliver (TD, Ex) from 100 µl to 100 ml
- **Volumetric instruments of plastic,** calibrated to contain (TC, In) from 1 ml to 2000 ml
- **Volumetric instruments of plastic,** calibrated to deliver (TD, Ex) from 1 ml to 100 ml
- **Density bottles of glass,** from 1 cm^3 to 100 cm^3

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