HandyStep® touch / touch S
HandyStep® electronic
HandyStep® S

Testing instructions (SOP)

February 2020

HandyStep® touch / touch S

HandyStep® electronic

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1. Introduction

The standard DIN EN ISO 8655 Part 5 describes both the design and the testing of repetitive pipettes, such as the HandyStep® electronic, HandyStep® S and HandyStep® touch. The following Testing Instructions describe how to apply the ISO standard in practice. We recommend testing the repetitive pipette every 3 to 12 months. However, the testing interval may be adjusted to your individual requirements. In case of high frequency of use or the use of aggressive media, the instrument should be tested more frequently. These Instructions can also be used as a basis for monitoring testing devices in accordance with DIN EN ISO 9001, DIN EN ISO 10012 and DIN EN ISO/IEC 17025. PD-Tips give repetitive pipettes a significant advantage by enabling users to dispense long series comfortably, quickly and with high precision. In combination with PD-Tips from BRAND, the HandyStep® S allows up to 49 pipetting steps without refilling, while the HandyStep® electronic and the HandyStep® touch allow up to 100 steps. The HandyStep® electronic and HandyStep® touch feature variable volume adjustment.
For the regular required testing, for example in accordance with DIN EN ISO 9001, DIN EN ISO 10012, DIN EN ISO/IEC 17025 and the GLP Guidelines, you can 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 BRAND or your labware supplier.

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2. Preparing for testing and visual inspection

2.1 Instrument identification

- Read serial number (laser-etched on the housing)
  ⇒ Enter into test record (1), see page 10.
- Read PD-Tip size.
  ⇒ Enter into test record (1).
- Read customers identification, if available.
  ⇒ Enter ID into test record (1).

2.2 Minimum required equipment

- HandyStep® touch/touch S/ HandyStep® electronic/ HandyStep® S
- PD-Tips
  ⇒ Use only suitable dispenser tips. For best results, use original PD-Tips from BRAND.

2.3 Cleaning

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

2.4 Visual inspection for damage

Troubleshooting

Possible malfunction	Cause	Solution
PD-Tip dripping	■ PD-Tip leaking	⇒ Replace PD-Tip
Damage to important parts of the instrument	■ Mechanical or chemical damage	⇒ Send instrument in for repair

2.5 Functional test

2.5.1 HandyStep® touch / touch S and HandyStep® electronic

- Insert a new PD-Tip.
- The PD-Tips is recognized automatically or, in the case of compatible dispenser tips, the volume size can be selected.
- Change the volume to be dispensed.
- Fill the PD-Tip. ⇒ Immerse the PD-Tip into the test liquid. Aspirate liquid at a steady rate.
- Hold the instrument vertically for approx. 10 seconds and observe if a drop forms on the tip. ⇒ If a drop forms: Follow the instructions in the following table.
- Gradually dispense the test liquid again. ⇒ The liquid must be dispensed at a steady rate.
- Empty the PD-Tip completely and remove it. ⇒ Enter the result into the test record (3).

Possible malfunction	Cause	Solution
PD-Tip dripping	■ PD-Tip leaking	⇒ Replace PD-Tip
After dispensing liquid, air is discharged in the final step.	■ PD-Tip leaking	⇒ Replace PD-Tip
Damage to important parts of the instrument	■ Mechanical or chemical damage	⇒ Send instrument in for repair

Note: If the instrument displays an error message, follow the instructions in the operating manual.

2.5.2 HandyStep® *S*

- Insert a new PD-Tip.
- Does the piston properly lock into place? ⇒ The dispensing lever must move smoothly and jolt-free.
- Can the volume be adjusted?
- Fill the PD-Tip. ⇒ Immerse the PD-Tip into the test liquid and fill the PD-Tip. The dispensing lever must move smoothly and jolt-free.
- Hold the instrument vertically for approx. 10 seconds and observe if a drop forms on the tip. ⇒ If a drop forms: Follow the instructions in the following table.
- Gradually dispense the test liquid again. ⇒ Test the number of dispensing steps: Example on Step 5: 10 steps (1 play compensation + 9 test steps). The dispensing lever must move smoothly and jolt-free.
- Empty the PD-Tip completely and remove it. ⇒ Enter the result into the test record (3).

Possible malfunction	Cause	Solution
PD-Tip cannot be inserted	■ Filling/locking lever not pushed down to bottom position and not tilted upward. ■ Piston of the PD-Tip not inserted completely.	⇒ Push filling/locking lever all the way to the bottom, and tilt upward. ⇒ Push piston of the PD-Tip into the cylinder completely.
Filling/locking lever cannot be pushed upward	■ Filling/locking lever not completely pushed in (closed).	⇒ Push piston of the PD-Tip into the instrument completely. Close the filling/locking lever.
PD-Tip dripping	■ PD-Tip leaking	⇒ Replace PD-Tip

Note: For further checks and adjustments, see the operating manual for HandyStep® *S*, HandyStep® electronic and HandyStep® touch / touch S.

3. Test devices and accessories

3.1 For HandyStep® *S,* HandyStep® electronic and HandyStep® touch / touch S

- **Recipient vessel** filled with deionized or distilled water (e. g. Erlenmeyer flask) (according to ISO 3696, at least quality 3)
  ⇒ Calibrate water and room temperature to 0.5 °C accuracy.
- **Thermometer** with a max. error of measurement of
  ⇒ ± 0.1 °C
- **Hygrometer:** Taking into account the measuring tolerance of the hygrometer, a relative humidity of at least 45% should be reached.
- Place the instrument to be tested in the testing room with the appropriate tips for at least 2 hours (unpacked).
  ⇒ Allow instrument to adjust to room temperature.
- **Weighing vessel** filled with small amount of water (e.g. Erlenmeyer flask)
  ⇒ At least the bottom must be covered. For testing volumes < 100 µl, protect against evaporation.
- **Scale**, recommended specifications:

Selected volume[a] of the instrument to be tested V	Resolution of the scale display mg	Repeatability and linearity mg	Standard measurement uncertainty 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 reasons, the nominal volume may be used to choose the scale.			

Traceability of test results to the national standard

Due to the use of calibrated testing devices (scale, thermometer, hygrometer, barometer), the requirement of DIN EN ISO 9001, DIN EN ISO 10012 and DIN EN ISO/IEC 17025 to trace the test results to the national standard is fulfilled. Calibration of the scale can be carried out using DAkkS calibration, for example, by calibrating the scale with appropriate weights (corresponding accuracy) that are traced to the national standard. Calibration of the thermometer, hygrometer and barometer can also be carried out using DAkkS calibration or by comparing with thermometers that are traced to the national standard (under defined conditions).

4. Gravimetric test (calibration)

4.1 HandyStep® touch and HandyStep® touch S

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

1. Set the nominal volume.
   ⇒ Select Multi-Dispensing mode. Insert a 5 ml PD-Tip.
2. Determine the temperature of the deionized water.
   ⇒ Enter the temperature into the test record.
3. Prime the PD-Tip before use.
   ⇒ Set the step volume to 1 ml. Fill the tip with liquid and empty it again. Small air bubbles in the area of the piston after priming do not affect the results.
4. Fill the PD-Tip.
   ⇒ Immerse PD-Tip vertically into the testing liquid and press the STEP button to aspirate the liquid.
   After aspirating the liquid, the HandyStep® touch / touch S will automatically compensate for play to reduce tension in the tip.
   ⇒ Caution: Aspirating air:
   If air is discharged in the final step, the tip is not leak tight. Replace the tip and repeat the process.
5. Place the weighing vessel (containing a small amount of deionized water) on the scale and tare the scale.
6. Remove the weighing vessel from the scale.
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 approx. 30°-45° °, and then wipe it off over a length of approx. 10 mm.
8. Place the weighing vessel onto the scale.
   ⇒ Enter the weight into the test record ((6) V_1)
9. Re-tare the scale.
10. Repeat steps 5 through 8 ten times.
    ⇒ Enter the weights into the test record. ((6.) V_1)
11. Repeat the same testing procedure at 50 % and 10 % of nominal volume.
    ⇒ At 50 % (V_2) and 10 % (V_3) of nominal volume, there is no need to refill the instrument after each measurement, since volumes are dispensed in steps.
    ⇒ Enter the weights into the test record. This amounts to 30 weights in total.

4.2 HandyStep® electronic

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

1. Set the nominal volume.
2. Determine the temperature of the deionized water.
   ⇒ Enter the temperature into the test record.
3. Prime the PD-Tip before use.
   ⇒ Fill the tip with a minimal amount of liquid and empty it again. Small air bubbles in the area of the piston after priming do not affect the results.
4. Fill the PD-Tip.
   ⇒ Immerse PD-Tip vertically into the testing liquid and press the STEP button to aspirate the liquid.
   After aspirating the liquid, the HandyStep® electronic will automatically compensate for play to reduce tension in the tip. In doing so, a small amount of deionized water is dispensed.
5. Place the weighing vessel (containing a small amount of deionized water) on the scale and tare the scale.
6. Remove the weighing vessel from the scale.
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 approx. 30°-45° °, and then wipe it off over a length of approx. 10 mm.
   Volumes above 5 ml can usually be dispensed in open stream.
8. Place the weighing vessel onto the scale.
   ⇒ Enter the weight into the test record ((6) V1)
9. Re-tare the scale.
10. Repeat steps 5 through 8 ten times.
    ⇒ Enter the weights into the test record. ((6.) V_1)
11. Repeat the same testing procedure at 50 % and 10 % of nominal volume.
    ⇒ 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 the weights into the test record. This amounts to 30 weights in total.

4.3 HandyStep® *S*

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

1. Set the HandyStep® *S* to Step 5.
2. Determine the temperature of the deionized water.
   ⇒ Enter the temperature into the test record.
3. Prime the PD-Tip before use.
   ⇒ Fill the tip with a minimal amount of liquid and empty it again. Small air bubbles in the area of the piston after priming do not affect the results.
4. Fill the PD-Tip.
   ⇒ Immerse the PD-Tip vertically into the test liquid.
5. Discard the first step; it only serves to compensate for play to reduce surface tension in the tip.
6. Place the weighing vessel (containing a small amount of deionized water) on the scale and tare the scale.
7. Remove the weighing vessel from the scale.
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 approx. 30°-45°. At an even speed, press the dispensing lever to the first stop and hold. Then wipe it off over a length of approx. 10 mm. Volumes above 5 ml can usually be dispensed in open stream.
9. Place the weighing vessel onto the scale.
   ⇒ Enter the weights into the test record ((6.) V_1).
10. Re-tare the scale.
11. Repeat steps 6 through 9 a total of ten times.
    ⇒ Enter the weights into the test record.
    This amounts to 30 weights in total.

    Note:
    With the Step 5 setting, the PD-Tip has to be filled/aspirated again for dispensing the tenth step.
12. Repeat the test with the Step 3 (V_2) and Step 1 (V_3) settings.

5. Evaluation of gravimetric test results

The values obtained by weighing during the gravimetric test are only the mass values of the dispensed volume. In order to obtain the actual volume, an adjustment calculation must be carried out. We recommend using software to help perform the calculation and evaluation. BRAND offers the calibration software EASYCAL™ for this. This convenient software runs on Windows and speeds up the calculation considerably.

The following calculations must be carried out:

1. Mean weight:
(Example for 10 weight 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 (6a).

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).

Actual/nominal value comparison:

■ For error limits, see tables 2 and 3 and the following accuracy tables for each instrument, or define your own error limits. ⇒ Enter values into test record (6e).

Result: ⇒ Enter values into test record (6g).

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

If the calculated values are **greater** than the error limits:

■ Check that all instructions have been carried out correctly.

■ Follow the instructions in the “Troubleshooting” section of the Operating Manual.

If these measures are unsuccessful, we recommend using the BRAND Calibration Service (see page XX).

Table 1:

Excerpt from DIN EN ISO 8655, Part 6. Table refers to 1013 hPa. Validity range from 950 hPa to 1040 hPa.

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

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	2.0	1.5	1.0	1.0	1.0	1.0
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			

*The nominal volume is the maximum volume printed on the PD-Tip.

Table 3: Volumetric error limits for repetitive pipettes:

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

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

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 - 250 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 in relation to the nominal volume and partial volumes depending on the PD-Tip, at equal temperature (20 °C) of instrument, ambient environment and distilled water, and with uniform handling. The error limits specified in ISO 8655 are not exceeded.
A = Accuracy, VC = Variation Coefficient

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® 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 - 250 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 in relation to the nominal volume and partial volumes depending on the PD-Tip, at equal temperature (20 °C) of instrument, ambient environment and distilled water, and with uniform handling. The error limits specified in ISO 8655 are not exceeded.
A = Accuracy, VC = Variation Coefficient

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 in relation to the set partial volume depending on the PD-Tip size, at equal temperature (20 °C) of instrument, tip, ambient environment and distilled water, and with uniform, jolt-free handling. Calibration is carried out in accordance with DIN EN ISO 8655-5.

For calibration, the applicable error limits must be defined by the user. Different methods can be applied to accomplish this:

- If the application requires it and the optimized test conditions exist for measurement, the defined error limits can also be expected in the case of used, intact volumetric instruments.
- In accordance with the German Calibration Law, however, it is also admissible to apply operational limits. The operational limits equate to double the calibration error limits. This means that the values in Table 3 should be **doubled!**
- Users may also define their own individual error limits related to their particular application, which their calibrated (adjusted) instrument should adhere to.

These methods meet the requirements of DIN EN ISO 9001, DIN EN ISO 10012 and DIN EN ISO/IEC 17025.

6. Declaration on the Absence of Health Hazards

Please send together with the instrument or via mail (if urgent send by fax in advance).

To

BRAND GMBH + CO. KG

Otto-Schott-Str. 25

97877 Wertheim

Fax: 09342 808-91290

We want to protect our employees as far as possible against health hazards caused by contaminated instruments. Therefore, we thank you for understanding that we can only perform calibrations/repairs when this declaration is completed, signed and provided to us.

Re: Instrument Consignment date _____ **/ 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, viral, chemical or radioactive contamination.
- That he/she is authorized to make declarations on behalf of the institution/laboratory represented.
- For calibration service only: required minor repairs with a value of up to €25 plus VAT should be carried out without prior confirmation (please cross out if not applicable).

Company / laboratory (official stamp)

Tel. / fax / e-mail

_____
Name

_____
Position

_____
Date, signature

- For the repair service, please provide the following additional information:

  Detected defect: _____

  Media used: _____

Test record for volumetric instruments (EX)

1. Instrument:

❑ HandyStep® touch ❑ HandyStep® touch S ❑ HandyStep® electronic

❑ HandyStep® *S* ❑ _____

PD-Tip size:

❑ 0.1 ml ❑ 2.5 ml ❑ 25.0 ml

❑ 0.5 ml ❑ 5.0 ml ❑ 50.0 ml

❑ 1.0 ml ❑ 10.0 ml ❑ Other:

❑ 1.25 ml ❑ 12.5 ml

Serial number: _____

Customer's designation: _____

2. Damages:

❑ None
❑ Type of damage _____
❑ Damage repaired

3. Operating defects:

❑ None
❑ Type of operating defect: _____
❑ Operating defect repaired

4. Water temperature: _____ °C

Scale: _____

Thermometer: _____

Correction factor Z: _____

Relative humidity
(45 % - 55 %): _____

5. Weight values of the gravimetric test:

Weight value 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 the gravimetric test:

Calculated value		**V_1 =**	**V_2 =**	**V_3 =**
a	$\bar{V}$			
b	s			
c	A [%] is			
d	CV [%] is			
e	A [%] should be			
f	CV [%] should be			
g	Result			

The test was carried out in accordance with DIN EN ISO 8655-6.

Date _____ Signature _____

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7. BRAND Calibration Service

BRAND offers a complete service that includes calibration and adjustment of BRAND and third-party instruments as well as any necessary maintenance and repair of BRAND instruments. This saves time and money, with the added benefit of testing by an independent laboratory. Find more information and the order form for the repair and calibration service on brand.de.

7.1 Range of instruments

1. Piston-operated pipettes (single- and multi-channel)
2. Bottle-top dispensers
3. Bottle-top burettes
4. Repetitive pipettes

7.2 Testing in accordance with DIN EN ISO 8655

A team of qualified staff, working in temperature and humidity controlled rooms and using state-of-the-art scales and calibration software, calibrates Liquid Handling instruments, regardless of their make, according to DIN EN ISO 8655.
Instruments with adjustable volume, such as the HandyStep® Touch, HandyStep® Touch S, HandyStep® electronic, Transferpette®, Transferpette® *S,* Transferpette® electronic, Transferpette®-8/-12, Transferpette®-8/-12 electronic, Transferpette® *S* -8/-12, Transferpettor, Dispensette®, Bürette Digital or Titrette®, are tested at nominal volume and at 50%, 10% or 20% of nominal volume.
To document the results, a detailed test record is compiled which fully complies with all relevant regulations.

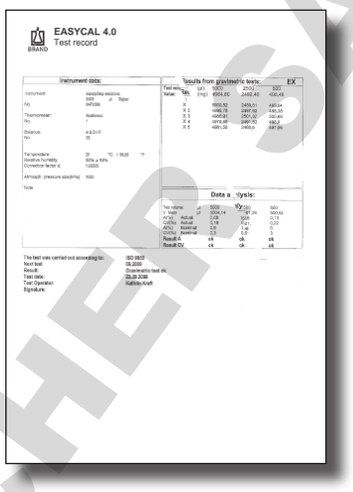
The BRAND Calibration Service provides:

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 implementation

8. EASYCAL™ Software – test equipment monitoring made easy

8.1 For Liquid Handling instruments and glass or plastic volumetric instruments

Test equipment monitoring in accordance with GLP, DIN EN ISO 9001, DIN EN ISO 10012 and DIN EN ISO/IEC 17025 is not always an easy task. Not only can you easily make miscalculations due to the complex formulas, but documenting the results can often be challenging too. EASYCAL™, the professional calibration software from BRAND, performs the calculations for you and creates the associated documentation automatically! All you need is an analytical scale, a PC with Windows® 98/2000, NT (SP6), XP, Vista, 7, a printer (optional) and EASYCAL™ software.



- Manufacturer-independent testing.
- Master data of many instruments preloaded.
- Testing in accordance with ISO 4787, ISO 8655, etc.

8.2 Data entry

- Connect PC to scale (optional) and start EASYCAL™ software.
- For simplified installation, data from over 100 common scale models are already pre-programmed.

8.3 Clear documentation

The calibration certificate contains all important test equipment monitoring data.

DAkkS – calibration service for volumetric instruments at BRAND

8.4 DAkkS – Deutsche Akkreditierungsstelle GmbH and DKD

The German Calibration Service (DKD) was founded in 1977 as a shared institution between the state and the private sector. It 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 Metrology Institute). It effectively supplements the existing verification system, which primarily serves the purpose of consumer protection. Due to legal requirements, the DKD Accreditation was gradually transitioned to the DAkkS Accreditation (Deutsche Akkreditierungsstelle GmbH), starting from 2010. BRAND has been accredited by the DAkkS since April 23, 2013, with the certificate number D-K-18572-01-00.

8.5 DAkkS calibration certificate and calibration mark

The DAkkS calibration certificate officially documents the traceability of measured values to national and international families of standards, including the DIN EN ISO 9001 and DIN EN ISO/IEC 17 025 standards required for the monitoring test equipment.
The DAkkS calibration certificate is issued when calibrations of an accredited laboratory are requested, when high level calibrations are demanded and for the calibration of reference standards and instruments for comparative measurements.

8.6 DAkkS – membership in the International Accreditation Network

DAkkS is a member of the **International Laboratory Accreditation Cooperation (ILAC)**, the highest level international institution for laboratory accreditation, and is a signatory to the mutual recognition arrangements (MRA).
Accreditation bodies that are signatories to the mutual recognition arrangements (MRAs) of the ILAC recognize their mutual equivalence and the equivalence of the calibration certificates issued by signatories. Likewise, there is a general obligation to promote and recommend recognition of the calibration certificates of signatories (excluding factory calibration certificates).
The DAkkS is also a member of the EA (European Cooperation for Accreditation), which in turn is a member of the ILAC (International Laboratory Accreditation Cooperation). A multilateral agreement assures that the DAkkS calibration certificate is recognized as binding in many countries.

8.7 DAkkS calibration laboratory at BRAND

The calibration laboratory for volumetric instruments, which opened at BRAND in 1998, has been accredited by the German Calibration Service in accordance with DIN EN ISO/IEC 17 025. Our calibration laboratory is therefore authorized to issue DAkkS calibration certificates for the volumetric instruments listed below. These are available in several languages. We also offer adjustment services and – for BRAND Liquid Handling instruments – repair and maintenance.
For information on ordering volumetric instruments with DAkkS calibration certificates, please see the current version of the general catalog.

8.8 Volumetric instruments with DAkkS calibration certificates issued by BRAND

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

- **Piston-operated pipettes**, from 0.1 µl to 10 ml
- **Multi-channel 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
- **Glass volumetric instruments**, adjusted to contain (TC, In) from 1 µl to 10,000 ml
- **Glass volumetric instruments**, adjusted to deliver (TD, Ex) from 100 µl to 100 ml
- **Plastic volumetric instruments**, adjusted to contain (TC, In) from 1 ml to 2,000 ml
- **Plastic volumetric instruments**, adjusted to deliver (TC, Ex) from 1 ml to 100 ml
- **Glass pycnometers**, from 1 cm^3 to 100 cm^3