

Improve process reliability with functional validation of air-displacement pipettes!



PLT unit

Pipette Leak Testing Unit

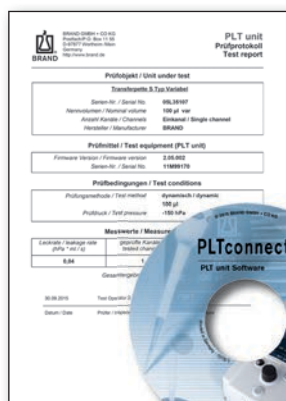
F I R S T C L A S S · B R A N D

The most frequent cause of inaccuracy in air-displacement pipettes is leakage.

This arises from damage either to the seals, pistons, or tip cones. Often not detectable by the naked eye, leaks lead to significant volume errors.

The BRAND pipette leak tester (PLT unit) for air-displacement pipettes finds even the smallest leaks within seconds.

- Limit values for the commercially available single- and multichannel pipettes in the volume range 1 µl to 10 ml are pre-programmed.
- Testing with and without tips
- Test results in seconds
- Patented
- PLTconnect Software for the documentation of the examinations



Pipette Leak Testing Unit (PLT unit)

According to monitoring of measuring instruments, air-displacement pipettes must be checked at regular intervals and the results must be compared with the ISO 8655-2 error limits.

However, a calibration certificate only reflects the results at the time of testing. The time between these calibrations is crucial, since leaks can occur at any time. Well over 80% of pipettes sent in for repair have leaks and are outside their volume tolerances, even if they don't drip.

While the PLT unit cannot replace regular gravimetric testing, daily pipette checks can provide a safeguard during the periods between calibrations. Even the smallest leaks are detected! Process reliability for the pipettes is thus significantly improved.

Leak rates and their detection

The leak rate is a measure of the quantity of material that flows through a leak per time unit. For air-displacement pipettes the PLT unit determines the rate through a differential pressure measurement, i.e., after creating a negative pressure, the pressure rise over a given time is measured.

■ Complex determinations

The leak rate is determined by considering complex physical relationships. Calculation of the limit values resident in the PLT must include factors such as the dead volume of the pipette/tip system, flow cross-section of the pipette tip, pressure rise per time unit, pipette volume and type, etc.

■ The pV value

The pV value is the product of the pressure and the volume of a certain quantity of a gas at the prevailing temperature. This is a measure of the quantity of material or the mass of the gas.

■ The leak rate Q_L

The leak rate Q_L is the ratio of the pV value and the period of time during which the gas flows through a path cross-section.

■ The volume loss

For the pipette test, hPa ml/s is a suitable unit for the leak rate. A leak rate of e.g., 1 hPa ml/s at an air pressure of 1000 hPa means a volume loss of about 1 μ l/s.



PLT unit



Single-channel adapter for pipettes with tip



Single-channel adapter for pipettes without tip



PE filter in single- and multichannel adapters



Multichannel adapter for pipettes with and without tip



Back of the instrument with AC adapter socket and USB port

Testing with and without tip

To check the overall pipette system, the test is conducted with mounted, unused tip.

When a leak has been identified, the test can be repeated without a tip to determine whether the leak arises from the tip cone/tip coupling region.



Dynamic or static test?

The **dynamic test** can rapidly determine whether a defective piston (contamination, scratches, etc.) has caused a leak. The pipette button must be pushed down numerous times during the measurement period. The associated piston movement allows a defective piston to be recognized.

In the **static test**, the pipette button is not pressed during the test procedure, i.e. the piston doesn't move. This will only determine a leak in a general way, without attributing it to a particular component.



BRAND Online - 01.02.2019		PLT unit	
BRAND Online - 01.02.2019		Prüfprotokoll	
BRAND Online - 01.02.2019		Test report	
Prüfobjekt / Unit under test			
Standardname / Test identifier			
Serial No. / Serial No.	96120187	Serial No. / Serial No.	96120187
Nennvolumen / Nominal volume	100 µl var	Einzelkanal / Single channel	BRAND
Hersteller / Manufacturer	BRAND		
Prüfmittel / Test equipment (PLT unit)			
Firmware Version / Firmware version	2.05.002		
Serial No. / Serial No.	11000170		
Prüfbedingungen / Test conditions			
Prüfmethode / Test method	Dynamisch / Dynamic		
Prüfdruck / Test pressure	100 µPa		
Messwerte / Measurements			
Leakrate / Leakage rate	0.04 hPa*s/ml	Ergebnis / Result	bestanden / passed
Q _L / mL/s	0.04	Ergebnis / Result	bestanden / passed
Gesamtergebnis / Final result: bestanden / passed			
BRAND Online - 01.02.2019	Test Number 1		
BRAND Online - 01.02.2019	Werk / Company		

PLTconnect software

The software reads the data from the test examination and displays the information in a test report that is saved.

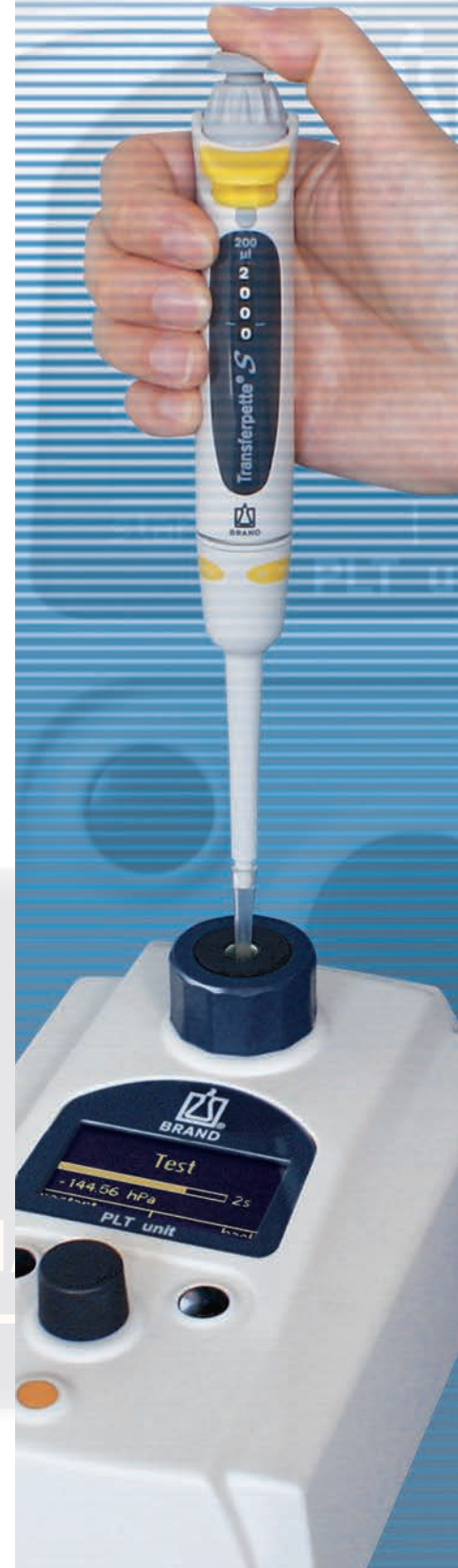
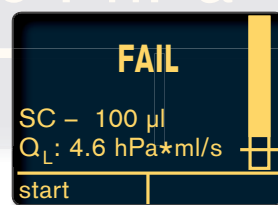
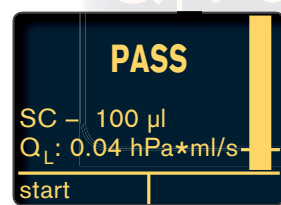
Limit values

The limit values referenced during testing represent a warning limit, from which significantly lower volume values can also be determined gravimetrically. This is one quarter of the volume tolerances, according to ISO 8655-2.

The limit value for the leak volume of a given pipette allows the leak rate to be calculated. These calculations, which are based on over 35 years of experience in the development and production of pipettes, include the dead volume and the intake characteristics, among other things.

If the pipette is mechanically defect-free, clean, and the test is carried out properly with the BRAND PLT unit, then the instrument is within the ISO 8655-2 tolerances. The marks in the vertical progress bars in the display represent the resident limit values for the leak rate Q_L .

With the correlation table in the PLT operating manual, the missing volume can be approximately determined from the leak rate. The level of the progress bar in the display indicates whether the pipette is leak-tight, and whether it lies within the tolerance limits or leaks.



Ordering Information

PLT unit (Pipette Leak Testing Unit)

Including one 1-channel pipette adapter* each for testing single-channel air-displacement pipettes with tip (mounted) and without tip, 2 plugs, 3 replacement PE filters for the pipette adapters, universal AC adapter, quality certificate and operating manual. Pack of 1.

Cat. No. 7039 70

* 4-channel pipette adapter optional



1-channel pipette adapter

for testing of single-channel air-displacement pipettes with tip mounted, including 1 plug. Pack of 1.

Cat. No. 7039 75



4-channel pipette adapter

for testing of multichannel air-displacement pipettes with and without tips, including 4 plugs. Pack of 1.

Cat. No. 7039 77



for testing of single-channel air-displacement pipettes without tip, including 1 plug. Pack of 1.

Cat. No. 7039 76



Filters

PE, for pipette adapter. Pack of 10.

Cat. No. 7039 78



Universal AC adapter

Input: AC 100 V - 240 V,
50/60 Hz
Output: DC 6,5 V, 800 mA
Pack of 1.

Cat. No. 7039 79



PLTconnect software

For the documentation of examinations. Pack of 1.

Cat. No. 7039 80



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