

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 piston-operated 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  $\mu$ l to 10 ml are pre-programmed.
- Testing with and without tips
- Test results in seconds
- Patent pending



# 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  $\mu$ l/s.



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

## Main Menu

A wide variety of submenus can be selected from the main menu, e.g., pipette type, volume range, self-test, and settings (language, shut-off time, pressure units, etc.)



## 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.

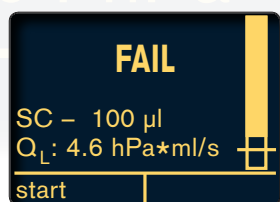
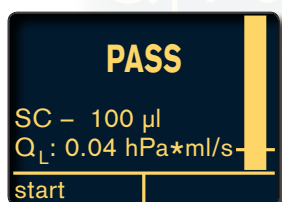
## Limit values

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 adapter each for testing 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



## 1-channel pipette adapter

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

Cat. No.  7039 75



for testing of single-channel piston-operated pipettes without tip, including 1 plug. Pack of 1.

Cat. No.  7039 76



## 4-channel pipette adapter

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

Cat. No.  7039 77



## 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



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