DeltaHi-EPETTechnicalRev5

Delta Hi-*E* PET bottle pressure test machine.

1. BASIC MACHINE FUNCTION AND DESCRIPTION:

The Delta Hi-*E* is a high efficiency device designed to pressure test PET bottles. Typically used in package testing laboratories, bottling plants or at a PET bottle blowing facilities.
The Delta uses precise state of the art measuring and control systems to reflect accurately the actual pressure and expansion in the case of PET specimens. Various ramp and dwell profiles can be created and stored in the machine memory. The control system also holds a calibration routine for both pressure and volume. This can be used for periodic machine calibration and is easily done by the user.
Tooling is flexible and interchangeable to suit most unusual shapes of bottle. The Delta Hi-E operates from a standard 100psi compressed air connection; it does not require connection to a high-pressure gas bottle or air intensifier.

2. OTHER OPTIONS AVAILABLE

The Delta is available in following formats:

Delta 3300:-	for testing both Glass and PET bottles
Delta Hi-*E* Glass:-	for testing Glass bottles.
Delta Hi-*E* PET:-	for testing PET bottles.
Delta Hi-V PET:-	high volume for testing PET KEG's (4Liter expansion)
Delta Aerosol	extra high pressure for testing PET Aerosols (30 BAR)

3. COMPLIANCE OF DELTA Hi-*E* WITH REQUIREMENTS OF TEST STANDARD:

The standard most commonly used for performing burst tests is:

ISBT (International Society of Beverage Technologists) 'Voluntary Standard Test Methods for PET Bottles'

The Delta Hi-*E* complies with all requirements of the standard.

4. SUMMARY OF TECHNICAL SPECIFICATION:

Accuracy	< 1% Full Scale
Compliance with ISBT Voluntary Test Methods for PET	Yes.
Maximum pressure capacity	20 Bar (300 psi). (30 Bar upon request)
Neck holding system	Flexible tooling for most neck sizes.
Max neck diameter	42mm.
Max bottle height	380mm
Max bottle diameter	180mm
Max bottle volume	3000ml (2.1L exp.) (4L exp. upon request)
Pressure and Volume expansion	Yes
13 Second expansion test	Yes
Output Interface	RS 232 (.txt . csv. or Somex Data Logger)
Units	Bar, PSI, Kg/Cm2
User Interface:	Touch screen
Programming	4 x Ramp & Dwell per profile.
Cavity correlation	Yes (numeric, automatic or programmable).
Language selection	English/German/Spanish/Portugese/Italian
Profile storage	Up to 100 profiles
Remote Diagnostics	Yes (requires connection to Network port with Internet, RJ45)
Calibration	Built in sequence for user to calibrate.
Auto door opening.	Yes – user selectable
Stainless Steel Stand	Yes
Installation	Operates from 7 Bar compressed air. Does not require 20 Bar High Pressure connection or continual replacement of a High Pressure Bottle.

5. THE DELTA Hi-E CONSTRUCTION:

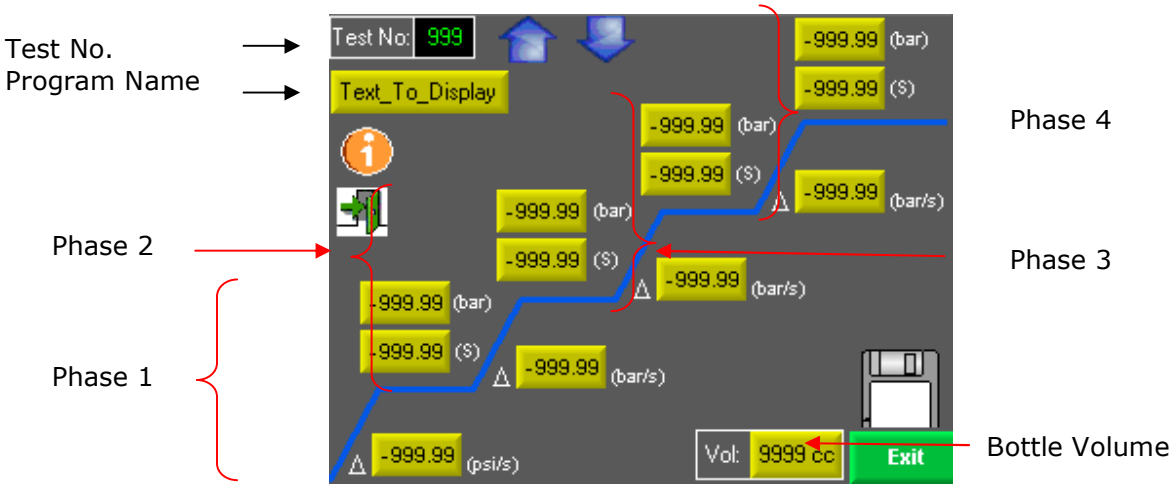
5.1 Cabinet:

The machine is constructed from an heavy duty aluminium frame which supports the burst chamber, the electrical and pneumatic components are located on a stainless steel frame within the enclosure.
The cabinet is supplied with a removable Stainless Steel base frame for ease of transport.

5.2 Electrical, Mechanical & Pneumatic Components:
All wiring terminals are tagged and all electrical cables and pneumatic hoses are tagged at either end.
All electrical, mechanical and pneumatic components are sourced from industry proven leading brands.

5.3.Pressure Testing and Control System:
Pressure of the test specimen is measured using an industrial grade pressure transducer with an accuracy of +/- 1% of full scale.
Volume measurement and % expansion of a PET specimen is measured using an industrial grade linear transducer with an accuracy of +/- 1% of full scale.
A proportional valve continuously monitors the actual vs. the set pressure.
Automatic pre filling of the test specimen with water.
A flow sensor to ensure all air bubbles have been removed from the test circuit prior to pressurization.

5.4 Operator Interface:
A *touch screen* operator interface that is intuitive and easily understood, with the use of symbols rather than text where possible.
Text on Touch Screen can be translated to user language.



6. OPERATION/TEST CYCLE

6.1 Operation:
An empty bottle is loaded by hand into the self-centring neck holder by hand.
The interlocked safety door is closed.
Using the operator interface load the required recipe.
Press start.

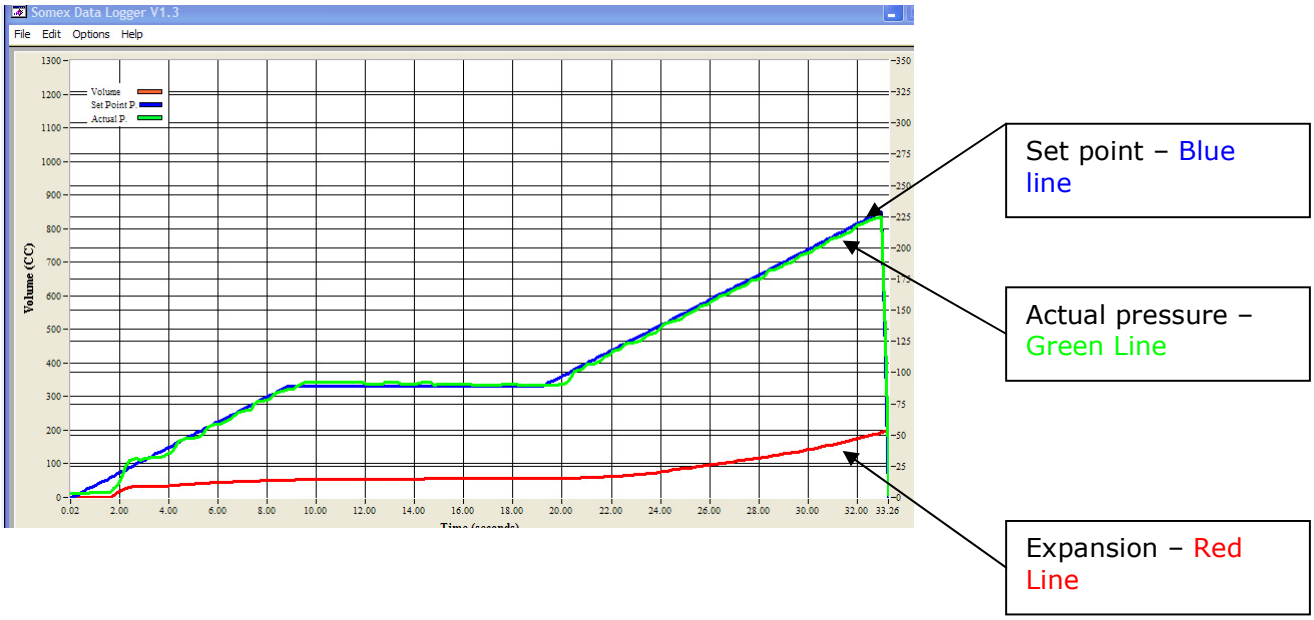
6.2 Test Cycle:
The bottle fills to a point where no more air bubbles remain in the circuit.
The circuit is sealed and the pressure ramps up to the parameters set in the profile.
The pressure is continuously monitored to ensure a deviation of no greater than +/- 1% full scale between the actual and the set pressure.

6.3 Results
A graph of pressure and expansion is displayed on the operator screen as the test proceeds, the current and previous 10 tests are stored in the machine memory, results are also downloaded to a local PC in .csv, .txt format or using the Somex proprietary Data Logging software.

Somex Innovation
www.somex.ie

Serial No	Cavity Number	Date	Time	Volume(CC)		Expansion (%)		Max Pressure		Burst Pressure
3	20	30/08/2010	10:48:26	500	61.25	216.97	215.74	288.21	296.38	126
4	24	30/08/2010	10:58:26	2000	48.35	276	266.01	1287.6	1281.3	127

Somex pressure & volume performance graph



7. SAFETY CIRCUIT:

There are several features to ensure access is denied to a specimen under pressure.

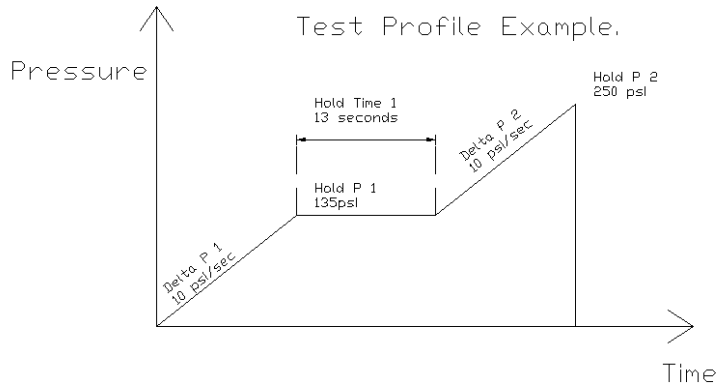
The pressure chamber door is constructed from Stainless Steel and Polycarbonate of sufficient dimensions to withstand continual impact from bursting bottles
The pressure chamber is vented to ensure quick release of residual pressure from a failed bottle.
The neck seal is interlocked, once engaged with a bottle to create a sealed circuit the chamber door cannot be opened.
The door is double interlocked to ensure the cycle cannot begin with the door in the open position.
The double interlock also ensures the latch on the door is not released until the pressure head is in 'home' position.

8. UNIQUE FEATURES:

:- Operates from a standard 7 Bar compressed air connection, it does not require installation of a high pressure gas line or connection to a high pressure gas bottle or air intensifier.

9. ACCURACY:

A typical pressure profile consists of RAMP (Bar/sec), PRESSURE SET POINT (Bar), HOLD (sec.) – repeat. Close monitoring by the control system ensures the actual pressure follows the set pressure profile. The controller will not progress to the next set point until the previous set point has been reached.



Note: it is important feature of pressure testing equipment to ensure the PRESSURE SET POINTS are being reached before beginning HOLD. If during a test the intended pressure was not being reached, before HOLD begins, a PET bottle is given more time to expand and as a result will burst at a lower pressure, additionally the PET bottle may be accepted as a 'pass' without ever having reached the intended pressure.

12: Optional items:

i) Remote Troubleshooting, we can fit a communication module to the Delta which enables our engineers connect directly to customers machine (via internet enabled network connection, RJ45) for speedier resolution of any unforeseen technical issue.

ii) Up to 30 BAR pressure for testing PET Aerosols

iii) KEG Burst Tester, a device which can be connected to the Delta Hi-E for testing Pressure & Expansion in KEG's and other large volume PET containers, up to 4L expansion = 13% on a 30L KEG)

Installation requirements:

Dimensions:	770 x 670 x 1750 mm
Net Weight:	200 Kg's
Compressed Air:	7.0 – 9.0 Bar, flow rate 200L/min, 12mm hose connection
Electrical Power supply:	<5A, 110V (60Hz) or 230V (50Hz)
Water Supply:	2.5 – 4.5 Bar Treated water, (Hardness < 250ppm calcium carbonate)
Waste water outlet:	1 ¼''