

## Blackbelt Compact Bench Top Leak Test Instrument

- **Unique Auto Test Setup**
- **Auto Calibration**
- **RS232, USB, & Ethernet**
- **Color graphic display**

### Versatile Test Capabilities

- Pressure or vacuum decay (leak rate with embedded leak standard)
- Pressure or vacuum change
- Pressure or vacuum rate of change
- Pressure or vacuum occlusion (blockage)
- Pressure or vacuum burst test
- Pressure or vacuum proof test

### Instrument Flexibility accommodates:

- different pressure test pneumatics
- performs various test methods
- accepts different part-to-part test parameters
- allows test specific units of measurement
- selectable digital input and output functions
- utilizes RS232 and TCP/IP (Telnet) communications methods to interface with the factory network.
- USB data up-load / down-load, storage

### 99 Part Programs with Application

**Flexibility** includes test type, linking, timers, pressure limits, leak rates, calibration parameters, units of measurement, and digital input/output options.

**Auto Setup** automatically determines optimal test cycle times to meet desired total cycle time requirements for leak rate tests.

**Auto Calibration** routine tests master production part with internal calibrated leak standard to automatically establish the pressure-loss-over-time (or flow) to leak rate relationship for the part.

**Environmental Drift Correction** maintains calibration accuracy by monitoring and automatically making continuous small adjustments for changes in temperature and environmental conditions.



**Quik Test** monitors the instantaneous in-test results and ends the testing process early when it is obvious that a reject or accept result is imminent.

**Self Test Functions** include internal pneumatic leak check, calibration verification, transducer zero and span calibration, and test regulator adjustment.

**Compact Bench Top Enclosure** contains all electronic and pneumatic components.

**Size:** 11.25”h x 9”w x 15”d  
 28.5cm h x 23cm w x 38cm d

**Modular Pneumatics** with manifold mounted valves, transducer, calibrated leak standard, and regulator.

### Transducers

#### Absolute Pressure Transducer:

Absolute transducers are not influenced by environmental conditions.

**High resolution 24 bit A/D** converter and patent pending signal conditioning for fast, repeatable test results (resolution to 0.00001% of the transducer full scale)

**Monitoring and Programming** via integral operator panel or remote computer. Remote part program selection using Binary digital inputs (1 to 6 digital inputs), RS232, or Ethernet.

**Operator Display Panel** makes operator interface simple, fast and comprehensive

- **Highly visible, color LCD display** with pressure versus time graph results, digital test results, test parameters, counters, and test statistics
- **Light Ring** unique light ring on test port signals in test (white), accept (green) and reject (red) status.
- **Simplified keypad** features a language neutral design, with start and stop, program change, information and menu selection pushbuttons.

**High Speed Communication via RS232 and Ethernet** includes test parameters, test results, counter information, and test statistics at baud rates up to 115200 for RS232. Test result output formats are selectable

**Pressure Streaming** - Test data output every 0.01 seconds via RS232 for plotting test curves.

**Data Collection** stores test results of leak/ flow rates, pressure loss, test pressure, time, date, and more for up to 5,000 tests.

**Tooling Control** for simple applications includes an extend and retract output for part seal with one input start and part presence before start. Easy setup performed within each part program.

**Standard Integral 6 Input / 3 Output Digital Interface.** These inputs and outputs are independently programmable within each individual part program.

**Programmable Digital Inputs** include Start, Stop/reset, Open Leak Std Valve, Part Presence, Ext. Switch feedback (before end of fill timer), Auto Cal, Hold, Vent/Halt, SPC Test Part, and 1-5 Binary Part Select.

**Programmable Digital Outputs** include Test Accept/Reject per test, Part Accept/Reject, Outputs per test reject limits, Outputs for steps of test sequence, 1Tooling Extend, 1Tooling Retract, In Auto Cal sequences, and Press Select.

## Specifications

### Pneumatic Manifold Options for Test Types

#### *Pressure Decay Leak Rate, Pressure Drop, Rate of Change, Burst, Proof and Occlusion Tests*

Single Regulator / Absolute Pressure Transducer / Optional Single Leak Standard

- **Low Volume Manifold** - (<1 cc), Low volume Cv Valves
  - Pressure ranges: 10 psiv to 100 psig
  - Test port: 1/8" FNPT
- **Standard Manifold** - Standard Cv valves (1/8" orifice), Internal volume (8 cc)
  - Pressure ranges: 14.7 psiv to 100 psig
  - Test port: 1/4" FNPT
- **High Flow Manifold** - High flow-high Cv valves (5X flow), Internal volume (12cc)
  - Pressure ranges: 14.7 psiv to 200 psig
  - Test port: 1/4" FNPT

### Transducer Resolution

- **Absolute Pressure Transducer**
  - Displayed Pressure Resolution: 0.001 units during pre-fill, fill, and stabilize
  - Displayed Resolution of pressure loss during test: 0.00001 units
  - Absolute Pressure Resolution: 0.00005% of transducer range (0.3 pa for 200 psi range)

### I/O Board Power Requirements

- Supplied independent of instrument power
- 24 VDC fused for 2.5 amp total

### Control inputs are sinking

- 6 optically isolated inputs

### Control outputs are sourcing

- 3 dry contact relays

### Input/Output Terminals

- Integral 6 inputs and 3 outputs are available within the enclosure.
- Input and output functions per terminal are assigned within the part programs

### Inputs include:

|                          |               |
|--------------------------|---------------|
| Start                    | Stop/reset    |
| Part presence            | Halt/Vent     |
| Hold                     | Ext Press Sw  |
| Auto Cal                 | Open Leak Std |
| Binary part select (1-5) | SPC Test Part |
| Ext Sw feedback          |               |

### Outputs include:

|                   |                    |
|-------------------|--------------------|
| Part Accept       | Part Reject        |
| Malfunction       | Severe Leak        |
| AutoCal Mode      | AutoCal LS         |
| AutoCal Master    | Test Lamp          |
| Press Select      | In Relax           |
| In Pre-fill timer | In fill timer      |
| In stab timer     | In test timer      |
| In Exh timer      | Below LL           |
| Betw Lim          | Above HL           |
| Test passed       | Test failed        |
| Tool Mot 1extend  | Tool Mot 1 retract |

### Instrument Power Requirements

- 120 VAC – 1 amps;
- 230 VAC – 0.5 amps,

### Part Program Storage

- Up to 99 part programs

### Optional Calibration System

- NIST traceable calibrated leak standard sized to within +5%/-0% of specified reject rate with an accuracy of +/-1.2% of value. Mounted directly to pneumatic manifold or

may be optionally located on front panel for external calibration.

### Communication: Two-way

- TCP/IP (Ethernet – telnet and email)
- One portal via one external connection
- RS232 (on front of operator panel for external connection)
- 115600, 57800, 33600, 19200, or 9600 baud rate
- no parity, 8 bits, 1 stop bit, no flow control

### USB memory chip (Formatted Fat32):

- Data up-load and down-load

### Enclosure: Bench top design

Composite panels over sheet metal frame.

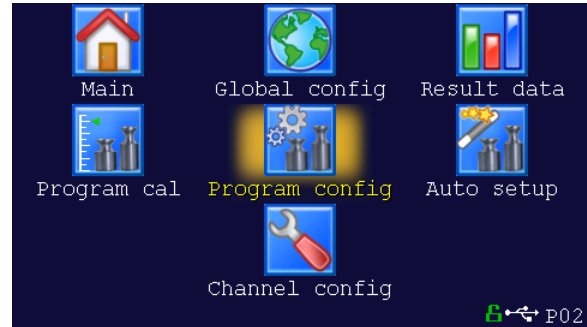
Dimensions: 11.25”h x 9”w x 15”d  
28.5cm h x 23cm w x 38cm d

Weight: 14.6 lbs (6.6 kg)

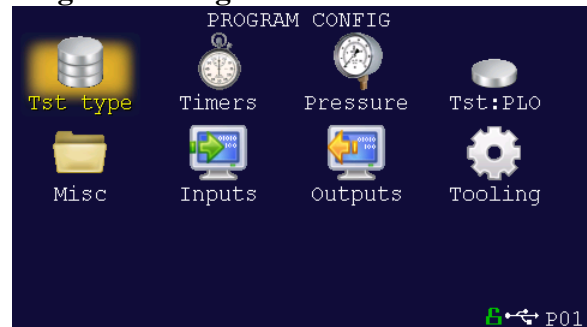
**Ambient conditions:** 5 to 40 C (41 to 109 F)

**Humidity:** 90% non-condensing

### Main Menu Screen



### Program Configuration Screen



## Instrument Option Selection

|  |                            |
|--|----------------------------|
|  | <b>Instrument mounting</b> |
|  | Bench top                  |

|  |                              |
|--|------------------------------|
|  | <b>Pneumatic connections</b> |
|  | NPT                          |

|  |                            |
|--|----------------------------|
|  | <b>Digital I/O Voltage</b> |
|  | 24 VDC                     |

|  |                                    |
|--|------------------------------------|
|  | <b>Power source for instrument</b> |
|  | 120 VAC                            |
|  | 230 VAC                            |

|  |  |
|--|--|
|  | <b>Test Capability Desired</b>   |
|  | Pressure or Vacuum Decay<br>Pressure or Vacuum Change<br>Pressure or Vacuum Rate of Change<br>Pressure or Vacuum Occlusion<br>Pressure or Vacuum Burst Test<br>Pressure or Vacuum Proof Test |

|  |                            |
|--|----------------------------|
|  | <b>Pressure Transducer</b> |
|  | 0 – 20 psia                |
|  | 0 – 45 psia                |
|  | 0 – 115 psia               |
|  | 0 – 215 psia               |

|  |                                |
|--|--------------------------------|
|  | <b>Vacuum Generator Option</b> |
|  | Internal vacuum generator      |

|  |  |
|--|--|
|  | <b>Calibrated Leak Standard Option</b> |
|  | Internal leak standard                 |
|  | External leak standard                 |

1<sup>st</sup> Test Leak Rate \_\_\_\_\_  
1<sup>st</sup> Test Pressure \_\_\_\_\_

## Pneumatic Test Module

|  |   |
|--|---|
|  | <b>Flow capacity of Test pneumatics</b> |
|  | Low Volume – low flow manifold          |
|  | Standard flow – std. volume manifold    |
|  | High flow manifold (5 x higher flow)    |

|  |                                   |
|--|-----------------------------------|
|  | <b>Pressure Package Range</b>     |
|  | Vacuum (0 to 14.7 psiv)           |
|  | 0.5 – 2 psig                      |
|  | 2 – 30 psig                       |
|  | 2 – 100 psig                      |
|  | 2 – 200 psig                      |
|  | Electronic regulator (0-150 psig) |