

ID5 Circuit Board

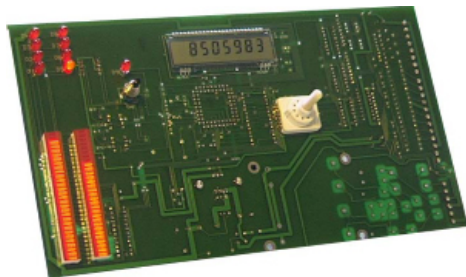
Replacement / Upgrade

PLASTECH
CONTROL SYSTEMS



Overview

The ID5 is a completely new 3rd party circuit board replacement option.



Compatible

- Mechanically and electrically compatible with original circuit board.
- “Drop In” replacement / upgrade. No wiring or operational changes.
- The same circuit board and program can be used for AC or DC, single or twin channel systems. The same program can be used for single and dual channel machines; since empty cycles are not counted the unused channel has no effect on the operation.

Reliable

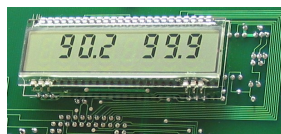
- Noise Immune - 80% of 3rd party faulty boards sent to us from customers failed due to electrical noise spikes, present in many factory environments.
- Improved power supply - The 24V (valve and relay) power supply is now regulated, providing more consistent operation over a wider supply voltage range. This reduces coil heating and extends component life.
- Increased pressurization range - This reduces un-necessary rejects due to over-pressurization of the bottles.
- Improved test algorithm Auto-tuning information is averaged over the last 5 good bottles, instead of a single “rogue bottle” being able to cause rejects for the next few cycles.

Easy to Use

- Improved bottle counting. The number failed count now does not count empty cycles. Only cycles that achieved a significant pressurization are counted.
- Several electronic adjustments automated or eliminated:
 - The transducer zero trimmers have been replaced by software auto-zeroing. When the unit is powered up, the transducer is automatically zeroed. This eliminates long-term drift as well as eliminating a very common setting error. It also eliminates a failure mode where the unit could pass bottles with very large holes due to a permanent pressure offset.
 - Display contrast control eliminated - replaced by an automatic circuit. A significant number of boards sent back for repair have nothing wrong with them, except that

the display contrast is turned off!

- The test time and sensitivity adjustments are retained and adjusted in the usual way.
- More user friendly display format
 - Leading zeros suppressed - 121 bottles not 00000121 bottles.
 - Test results for both channels displayed together side by side - This allows easy monitoring of test results without continual switching backwards and forwards to see both results before the next test.



New Design

- Industry standard proven components used throughout, all parts in full production by their manufacturers.
- High Accuracy Leakage Measurement - Measurement Errors are minimized through the use of a sensitive pressure transducer with a low noise amplifier and high-speed, high-resolution analog to digital converter.

Installation

Remove the old circuit board:

- Switch off leak tester
- Remove front panel control knob. There is an inset grub screw clamping it to the shaft of the rotary switch.
- Remove the pipes going to the transducers, it is important to note which is which (left and right transducers). Take extreme care removing the pipes, the plastic transducer ports are quite delicate. If in doubt, it may be better to cut the pipe at the transducer (if you value the old board).
- Pull off the electrical terminal blocks. These are pluggable; you do not need to remove any wires. Use a screwdriver to lever the blocks up away from the board if required.
- Remove the fixing screws which attach the board to its mounting pillars. Do not remove the screws on the front panel side. There are 7 screws, 6 around the edge and one towards the middle of the board.

Fit the new circuit board:

- Remove any protective film from the display of the new board.
- Fit the new board, taking care to align the START led with its hole.
- Fit the 7 fixing screws.
- Fit the electrical connectors, taking care not to miss-align. Make sure that all pins are connected and that the connector is not offset from its correct location.
- Replace the pipes, making sure they are the correct way around.

- Fit the front panel control knob, making sure it points to the correct position. The easiest way to do this is to turn the switch shaft fully clockwise, then fit the knob pointing to the "NUMBER PASSED" position.
- ONLY If the machine uses DC, fit the "DC" jumper link. Otherwise, remove it.



Setting Up and Testing

Switch on the leak tester.

With the trimmer stopped, and with good bottles in position, press the RESET/TEST button twice in succession. This will put the unit into test mode where it will bring the test heads forward and attempt to maintain test pressure by cycling the fill valves. The pressure indication bargraphs should quickly stabilise, after an initial pressure drop, showing that the test heads are sealing correctly. If there is a leak then the bargraph (s) will keep going up and down as the unit attempts to correct the pressure. Aligning the test heads or replacing the test head seals should correct this.

Press the RESET/TEST button again to exit test mode. The test heads will retract.

Dry cycle the trimmer. Adjust the cycle time trimmer VR3, located on the rear of the circuit board. Adjust so that the test heads stay out for the longest time possible, while still retracting in time for the trimmer conveyor movement.

Start bottle production, or else hand feed the machine with a stream of bottles.

Adjust the pressurization controls on the fill valves, inside the cabinet, so that the bargraphs go between j and z of the way up the scale. The front panel status LEDs will warn of over- or under-pressurization. Do not worry at this point if the bottles are initially rejected, just set up the pressurization correctly.

Turn the front panel switch to position 3. This displays the test results. The number displayed is the percentage of air pressure retained by the bottle under test. This is typically between 90 and 95 %, but anything from 75 to 100% can be encountered depending on the bottle characteristics and cycle time. The important thing is that the numbers should be similar from test to test and between channels, usually within 2%. If not, then the test head is probably not sealing reliably and should be adjusted. After around 10 cycles, the unit will have self-tuned itself and should be passing good bottles. Check operation by sending through some reject bottles, making sure that all channels in use are tested.

Adjustments



VR3 - Test Time

This is the time for which the test heads are extended. Must be set as long as possible. Turning clockwise reduces the test time, so it may help to think of this as a "speed" control.



SW4 - Sensitivity

Adjusts the sensitivity of the test. A lower value will be more sensitive. Factory set to 3, but may be adjusted.

Controls and Indicators

Front Panel Rotary Switch Positions

1. Number Passed

Displays a count of the number of bottles that passed the test. Zero by pressing the reset button once. This will also zero the number failed count.

2. Number Failed

Displays a count of the number of bottles that failed the test. Zero by pressing the reset button once. This will also zero the number failed count. This count has changed slightly, in that only bottles that fail the leak test are counted, not empty cycles. More precisely, only test cycles that achieve significant pressurization are counted.

3. Test Results

Displays the results of the test, side by side. The number displayed is the percentage of air pressure retained by the bottle under test. This is typically between 90 and 95 %, but anything from 75 to 100% can be encountered depending on the bottle characteristics and cycle time.

4. Pressure

Displays the pressure within the bottles. Both channels are displayed side by side. The pressure is displayed in internal units, and will be between zero and around 280 (transducer full scale). The upper limit has been extended from the original to make it easier to set pressurization without exceeding the transducer range.

5. Test Time

Displays the set test time, in seconds. This is the time for which the test heads are extended. Set using trimmer VR3, located on the rear of the board. Turn clockwise to increase the speed. A display of 1-00 would be 1 second.

6. Reject Threshold

Displays the set value of SW4, which is the small rotary switch on the rear of the board used to adjust the sensitivity of the unit. A lower value will make the unit more sensitive. Factory set to 3, but may be adjusted.

7. Raw transducer readings

This displays the raw signal levels from

the pressure transducers, before auto-zeroing. This allows verification of the transducers and associated circuitry. Normally between 68 and 72.

8. Initial Pressure Measurement

Displays the first pressure measurement made during the test, after pressurization. Displayed side by side for each channel.

9. Final Pressure Measurement

Displays the final pressure at the end of the test, just before the test heads retract. Displayed side by side for each channel. Used in conjunction with the previous item to calculate the test result.

10. Reference Level

The current value of the reference level, with which the test results are compared in order to establish pass or fail. This item is auto-tuned based on the measurements made on good bottles passing through the system. The value is essentially the average of the test results for bottles that pass the test, displayed in tenths of a percent.

Test Result Lights

For each channel there are 4 red test status lights. Top to bottom, these are:

● FAULT

Indicates a fault with the leak tester or with its settings (as opposed to a fault with the bottle under test). The *only* thing that can cause this to be turned on is a pressure rise being recorded rather than the usual pressure decay. In descending order of likelihood, possible reasons are:

- Pressurization lines swapped over (twin channel systems)
- Too short a test time
- Bottle collapse during test
- Leaking pressurization valve
- Sudden application of external pressure on the bottle during the test
- A very hot, heavy bottle

● REJECT

This indicates that the bottle will be rejected.

● OVERFILL

This indicates that the bottle was pressurized to a value too great for the transducer to measure accurately. The bottle will be rejected as a precaution. Adjust the pressurization rate control mounted on the fill valve inside the cabinet. Turn clockwise to reduce pressurization. If a twin channel unit intermittently over-pressurizes bottles, this may be due to reversed pressurization pipes between the 2 channels.

● UNDERFILL

Indicates that the leak tester was unable to

pressurize that channel. This can be due to:

- No bottle present
- An extremely large hole
- The test head missing the neck of the bottle
- Missing test head seal
- Faulty fill valve
- Pressurization control turned off

Start LED

Indicates the state of the test start signal. Comes on once per cycle.

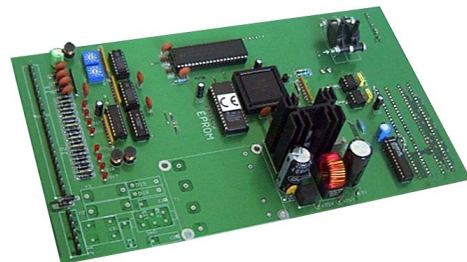
START/RESET button

This button has two functions.

- Press once to reset the passed and failed counts.
- Press twice to enter test mode. The unit will bring the test heads forward and attempt to maintain test pressure by cycling the fill valves. Press again to exit test mode. A start signal from the trimmer will also exit test mode.

Pressure Display Bargraphs

These provide an instantaneous graphical indication of the pressure within the bottle under test. In normal operation they should go up between 1/2 and 3/4 of the way up the scale.



Ordering Information

For more details contact the office, our distributors or see our web site www.plastech-controls.com, where you can obtain complete on-line sales literature, user manuals and technical documentation.

