



Application Bulletin: #157

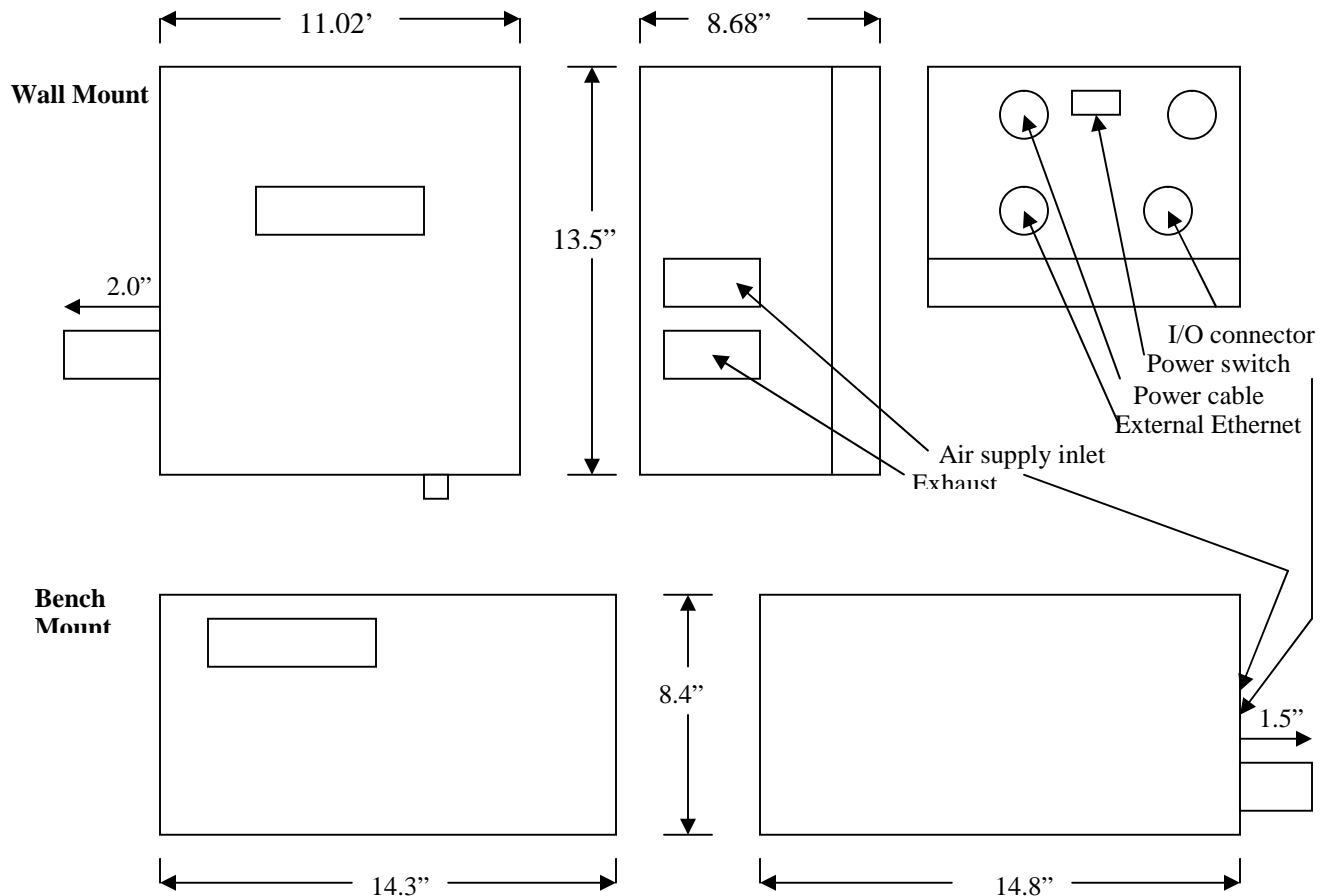
Date: June 12, 2007

## Sentinel I24 Installation Information QUICK START

### Step One:

#### Mount Instrument

- Position the instrument above the part test fixture to minimize dirt and moisture exhausting through the instrument.
- Locate the instrument close to the test fixture to minimize test volume.
- Mount the wall-mount instrument to framing or a panel using the four internal bolt channels. Mount the bench instrument on a bench or shelf. Allow sufficient clearance to the enclosure for the supply connections and test ports and to access the inside for maintenance.



## Step Two:

Connect Supply Air (250-psig max for under 200 psi tests, 550 psig max for up to 500 psi tests)

- The air supply input manifold provides convenient connections for test supply pressure (and/or vacuum) via ¼"FNPT (or M10) and pilot air pressure via 1/8"FNPT (orM10). Check the label above the air supply manifold on the left side of the instrument to see if pilot air is required. Connect a separate 65-110 psig supply to the pilot supply port if required.
- Good leak tests and long instrument life depend on a clean, dry air supply. If you did not purchase in-line air filters with your instrument, be sure to install 5.0 and 0.3-micron filters at the input supply manifold.
- Internal test regulators control the test pressure or vacuum, but it is also recommended to regulate the air supply to the instrument to at least 10 psi greater than the highest test pressure for optimal performance.

## Step Three:

### Power up Instrument

- The electrical power cord is attached to the top, back- left side of the Sentinel I24 wall- mounted enclosure or the back of the bench mounted enclosure.
- Check the instrument label on the left side of the instrument to verify the Supply Voltage for the instrument.
- For 120 VAC, 50-60 Hz instruments plug the power cord into a standard 3-prong wall socket (in the US and Canada).
- For 220 VAC (50-60Hz) and 24VDC instruments this power cord has no three-prong plug on the end so wire directly to power source using line or +V (black) from pin 2, neutral or –V (white) from pin 1, and ground (green).
- Operate the power switch on the top of wall-mounted or back of the bench top enclosure to turn on the Sentinel I24 instrument. (The power switch is a rocker style switch. The On and Off markings on the power switch are marked as "I" and "O" respectively.)

## Step Four:

### Connect your test part

- Use high quality tubing, swaged fittings, and the supplied Quick Connect fitting (with ¼"FNPT) to interconnect a Master (Non-leaking) part to the instrument.
- Connect the Quick Connect fitting to Leak Test Port located on the bottom right side of the panel mounted instrument or the front (or back) of the bench/shelf mounted instrument.

## Step Five:

### Auto Setup

Follow the operator prompted routine to set up the instrument to perform a basic leak test on the test part. Auto Setup will automatically determine the best test sequence to meet the required maximum cycle time for all tests except pressure loss or drop tests over time.

- Press AUTO SETUP on the Function panel
- Press the EDIT key and use the up or down arrow keys to select the desired "Test Type" to perform the desired test like "Single Press Decay". Then press ENTER
- Press the down arrow key, EDIT, and then enter the desired part number for "Apply to Part #" (select part number 01-99)". Press ENTER and AUTO SETUP or right arrow to advance to the next screen.
- Using the same method, edit the appropriate units of measurement for test pressure, leak rate, pressure loss during test cycle, and timers. Press ENTER and AUTO SETUP or right arrow.
- Edit the Desired Cycle Time (maximum total cycle time), Target Pressure (specified test pressure), Leak Std Value (for leak standard mounted on test manifold), Leak Std Pressure (Pressure at which leak standard was calibrated), and Hi Lim Leak (high limit reject point for test) values.
- Edit "Start AutoSetup" for "Yes" and push ENTER.

- Follow the instructions on the screen. The process will give you an opportunity to adjust the regulator pressure to match to Target pressure by pressing ENTER to OK this next step

### **Step Six:**

#### **Set Test Pressure**

- Connect the plug (Self Test Plug) attached to the chain on the bottom of the instrument into the port on right side. For the bench mount, plug the test port located on the front (or back) of the instrument.
- Adjust the regulator so the “Instrument pressure” equals the desired “Target Test Pressure.”

### **Step Seven:**

#### **Proceed with the AutoSetup Routine:**

- The instrument will conduct an automatic tuning process on a master part by performing a sequence of tests defined with Test Type to determine the appropriate timer values within the Desired Cycle Time.
- The AUTO Setup will automatically set the optimal pre-fill, fill, stabilization, test, exhaust, and relax times; Leak Std flow and pressure; and Target pressure and Min and Max Test Pressure into the selected Part # to achieve the best possible test on the tested part for the Desired Cycle Time.
- Connect the sealed master part to instrument via the quick connect fitting per Step Four above and proceed with the Auto Setup routine.
- At the completion of the Auto Setup routine, the display will prompt for an Auto Calib routine.

### **Step Eight:**

#### **AutoCal**

The instrument will automatically determine the pressure loss (or flow) to leak rate relationship for the test part based on the timer values set by the Auto Setup routine.

- Agree to perform the AUTO CALIB function.
- At the completion of a successful Auto Cal routine, the instrument display will indicate a calculated PF (Performance Factor). In general, values greater than 35 and up to 99 indicate an acceptable calibration for reasonably repeatable testing. What value results in an acceptably repeatable test is very application dependent and does not apply to all parts. Further testing is required to determine if these parameters will result in acceptable repeatability. Higher values (which require longer a Desired Cycle Time) will generally predict more repeatable performance.

The instrument is ready for testing upon completion of AUTO CALIB routine.

### **Step Nine:**

After the instrument is calibrated to the test part, setup the digital input and output control for the part program.

- Setup wiring for the digital input/outputs via the internal I/O board for 24 VDC or 120 VAC (50-60 Hz)
- The supply power for the I/O board is separate from the instrument power so that the I/O can be shutdown by an emergency stop without turning off the instrument power. For 120 VAC and 220 VAC instruments, the internal 24 VDC power supply does not have sufficient capacity to handle external I/O power requirements.
- Check the instrument label on the left side of the instrument to verify the correct I/O Voltage.
- Study the digital input and output requirements and assign the appropriate controls to the available 12 input and 8 output terminals. See the list of available Universal and Part Program Specific Inputs and Outputs below.
- Wire all required inputs and outputs.

The tooling control is very flexible because it is set up uniquely within each part program to the specific requirements of the part. The available selection of inputs and outputs is partially defined by the part program setup of the tooling options. This involves the following options:

- **No. of tooling motions (0 to 5)**
- **Two inputs to start test (yes or no)**
- **Anti-tie logic**
- **Part Presence (At start or after tooling motion #)**
- **Retract on Reject (Yes or No)**
- **Part Mark (Accept , Reject or both)**
- **Tooling motion feedback (extend, retract, or both) for each motion**
- **Mark severe leaks as reject (No or Yes)**
- **Part Mark Feedback (Yes or No)**

After establishing this tooling logic for the part program, the following Inputs and Outputs are available within each part program based on the Tooling Options selected above and Test Type selected. The Input and Output functions are divided into two types – Universal and Part Program Specific. The Universal Inputs and Outputs are common to a terminal number within all the part programs when selected within any one program because of their function within the instrument and for safety purposes. The Part Program Specific Inputs and Outputs can be selected or not within each part program. They are grouped by common functions so that if one part program assigns one of these functions to a terminal that terminal can only be used for a common function within other programs or not used at all.

#### Universal Inputs

Test Cycle Inputs	Test Result Inputs	Binary Part Program Selection Inputs
Start Station	SPC Test Part	Part Select B1
Common		Part Select B2
Stop/Reset Station		Part Select B3
Hold		Part Select B4
Vent/Halt		Part Select B5
		Part Select B6
		Part Select B7

Universal inputs are universal to all part programs when selected for any program.

#### Part Program Specific Inputs

Auto Cal Group	Part Control Group	Leak Std Group	Test Control Group	Test Result Group	Tooling Control Extend Group	Tooling Control Retract Group
AutoCal	Part Present	Open Leak Std	Ext Press Sw	Part Mark Fdbk	Tooling Extend Feedback 1	Tooling Retract Feedback 1
			Ext PressSw2		Tooling Extend Feedback 2	Tooling Retract Feedback 2
					Tooling Extend Feedback 3	Tooling Retract Feedback 3
					Tooling Extend Feedback 4	Tooling Retract Feedback 4
					Tooling Extend Feedback 5	Tooling Retract Feedback 5

Part Program Specific inputs are available within any part program. When selected within any part program, only input functions within the same group or no input can be assigned to the same terminal within any of the other part programs.

### Universal Outputs

Test Cycle	Results
Part Accept	Severe Leak
Part Reject	Malfunction
AutoCal Mode	Test Lamp

Universal outputs are universal to all part programs when selected for any program

### Part Program Specific Outputs

Test Cycle	Results	Test Control
<b>Calibration Group</b>	<b>Part Mark Group</b>	<b>Tooling Control Outputs</b>
AutoCal Master	Part Accept Mark	Tooling Extend 1
AutoCal LS	Part Reject Mark	Tooling Extend 2
<b>Test Cycle Timer Group</b>		Tooling Extend 3
In Relax	<b>Test Result Group</b>	Tooling Extend 4
<b>(In 1<sup>st</sup> test)</b>	<b>(After 1<sup>st</sup> test)</b>	Tooling Extend 5
Press Select 1	Test Passed 1	Tooling Retract 1
In Pre-fill 1	Test Failed 1	Tooling Retract 2
In Fill 1	Below low limit 1	Tooling Retract 3
In Stab 1	Between limits 1	Tooling Retract 4
In Test 1	Above high limit 1	Tooling Retract 5
In Exhaust 1		
<b>(In sequential 2<sup>nd</sup> test)</b>	<b>(After sequential 2<sup>nd</sup> test)</b>	
(Press Select 2)	(Test Passed 2)	
(In Pre-fill 2)	(Test Failed 2)	
(In Fill 2)	(Below low limit 2)	
(In Stab 2)	(Between limits 2)	
(In Test 2)	(Above high limit 2)	
(In Exhaust 2)		

Part Program Specific outputs are available within any part program. When selected within any part program, only outputs within the same function group or no output can be assigned to the same terminal within any of the other part programs.

**All the tooling control functions should be set up after the Auto Setup and Auto Cal routines are completed.**

