Application Note:
Four-Channel Sequential Tester

The Problem

Manufacturers face a demanding task when testing products that have multiple parts or multiple cavities. The test typically must check each part or pathway to make certain nothing leaks.

Most often, the tester must be cost effective so numerous stations can be implemented to increase production output.

Custom-built multichannel testers, sometimes assembled from computers and various measuring equipment, often become an awkward collection of difficult-to-operate and difficult-to-maintain components.

The Solution

Sprint iQ model 4S is a four-channel sequential tester incorporating everything needed to test multiple products or devices that consist of multiple parts or separate cavities.

Sprint iQ 4S can test up to four parts in sequence using a pressure drop technique. It can be programmed to conduct four tests at a time on four independent products or on four parts of the same product.

The Sprint iQ 4-channel sequential tester can be ordered with optional flow or burst test functions (dashed boxes in Figure 1).

How It Works

Testing with the Sprint iQ model 4S works like this:

- Product is attached to each test port and the test program is started. (Figure 1)
- Product (**P1** to **P4**) is sealed to block openings for pressure decay testing.
- Air is supplied at test pressure to Sprint iQ's output Port 1 through valves **Va** and **V1**. Pressure is measured at the pressure sensor **PS**. Valves **V2**, **V3** and **V4** can be opened to atmosphere for occlusion testing.
- Each additional part can be tested in sequence.
- With the flow option, Sprint iQ opens valves **Vb** and **Vc** and measures the flow rate through the flow sensor at **FS**.
- Or, optionally, Sprint iQ can perform a burst test by opening valves **Vb** and **Vc**, then ramping up the test pressure through the variable flow control at **FC**.

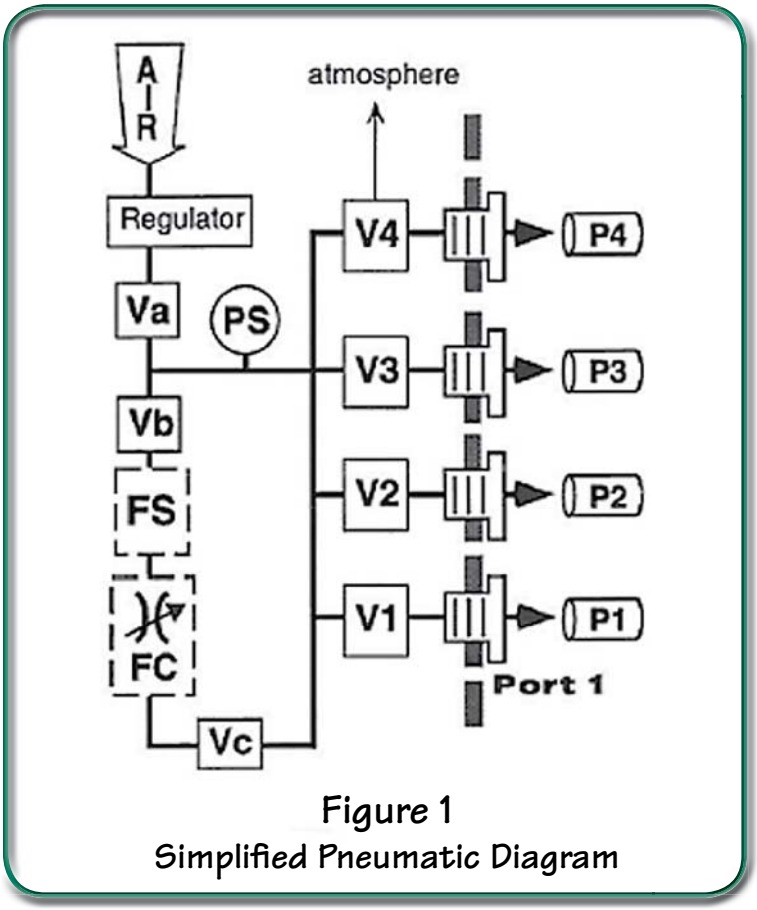

Figure 1
Simplified Pneumatic Diagram

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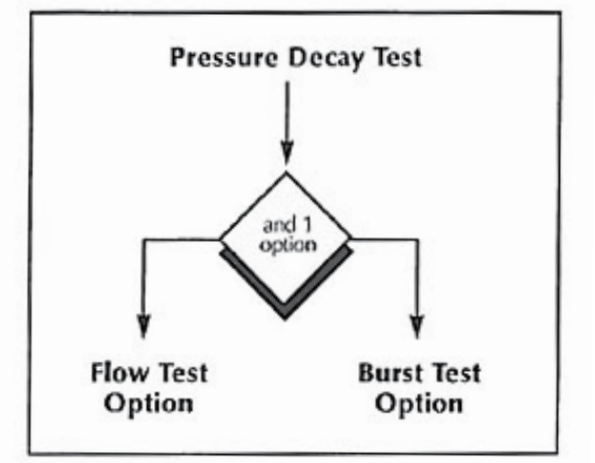

Figure 2
Two Standard Options

NOTE:
Sprint iQ 4S can have either the mass flow OR the burst option installed in addition to pressure decay. Both flow and burst options might be possible depending on the test parameters, and would be a custom machine.

Pressure Decay Test

Sprint iQ looks for a drop in pressure over time. This is the basic testing mode. One of two options can be added to the basic tester. (Figure 2)

Flow Test

As one option, Sprint iQ 4S can be fitted with a mass flow measuring option. This allows the user to test the flow rate through multiple pathways or to test the flow through four individual products in sequence.

Burst Test

As another option, Sprint iQ can be fitted to perform a burst test in addition to a pressure decay test.

In a burst test, pressure in the product is slowly increased through a precision flow control valve. Sprint iQ then captures the pressure at which the product bursts open or begins to flow rapidly.

Applications

Sprint iQ 4S is ideal for testing products that have multiple parts or multiple passages (up to four) that can be tested in sequence.

In addition, the model 4S can be used to test as many as four individual products in sequence.

If a product with fewer ports needs to be tested, Sprint iQ models are available in two and three channels for less money than the 4S.

Sequential testing is often recommended when operator pacing is desired. The operator can load one test port while the others are being tested.

We invite you to call Uson to discuss how a Sprint iQ four-channel sequential tester can be applied to your specific testing needs.

Features

- Tests products in one integrated sequence.
- Ideal for operator pacing.
- Can test for both leak and occlusion
- Tests 1, 2, 3, or 4 parts in sequence
- Fully calibrated and simple to maintain
- Options for flow rate or burst testing
- Small footprint of 8.5 by 15 inches
- User-selectable engineering units
- Easy to program and calibrate
- Large, menu-driven display
- Interface for statistical process control

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