

The Problem

Products such as one-way valves are often designed to open at a certain pressure. Production and test engineers need to know at precisely what pressure the valve starts to open (cracking pressure point).

Normal burst testers do not detect the pressure change when the valve starts to open because the cracking pressure is so small.

Most leak testers cannot determine the cracking pressure because they use merely one pressure sensor upstream from the product being tested. The upstream sensor is constantly supplied with air, so sensing the downstream pressure change is next to impossible.

The Solution

The Sprint iQ check valve tester is equipped with a flow control and an additional transducer called a downstream sensor. The downstream sensor can be either a pressure or mass flow transducer. All components are contained in Sprint iQ's same small enclosure.

The downstream sensor (pressure or mass flow) detects precisely when the product opens and begins to disperse air. The change in pressure or flow tells engineers how the device being tested operated in real application.

The downstream sensor option can be applied to many Sprint iQ test machines.

How It Works

The Sprint iQ check valve tester works like this (Figure 1):

- Product is attached to Sprint iQ's output and input ports either manually or by an automated mechanism.
- The test is initiated by pressing the tester's start button or by remote signal.
- Sprint iQ slowly pressurizes the A side of the product through valve [V] and the flow control [FC]. Pressure to the A side of the product is measured by the upstream sensor [S1]
- The downstream sensor {S2} measures either a pressure or flow from the B side of the product
- As soon as the pressure or flow monitored at [S2] reaches the preset threshold, Sprint stops the test and displays the results. Sprint iQ's display shows the pressure applied to the A side of the product (peak ramp pressure)

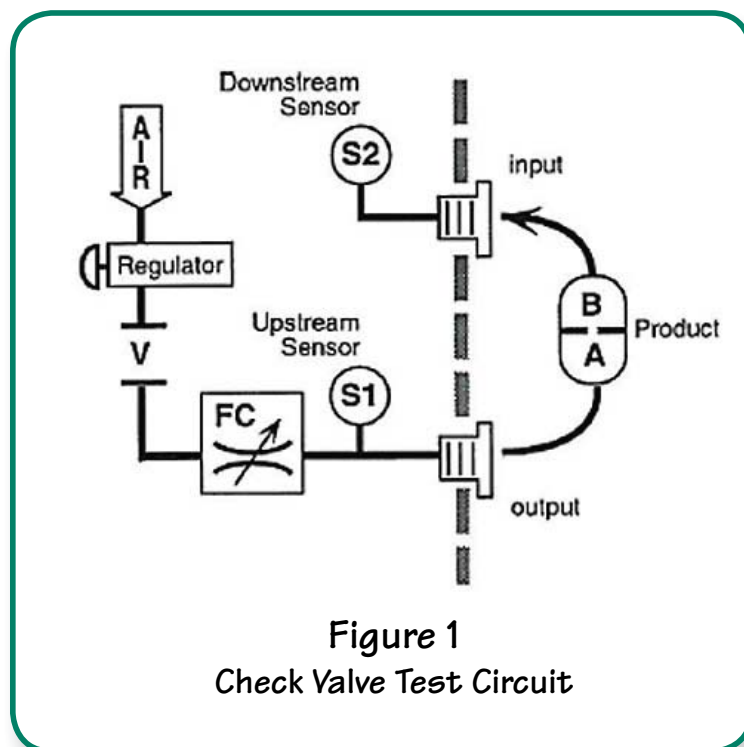
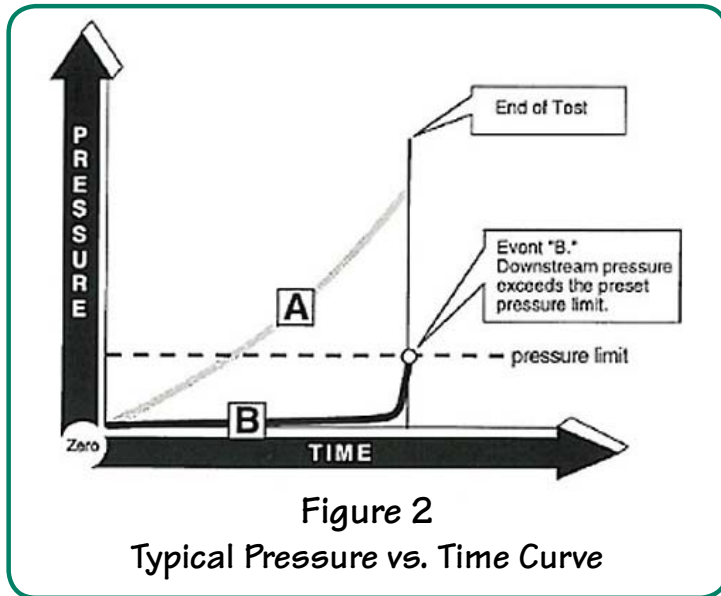


Figure 1
Check Valve Test Circuit



Pressure and Time Sequence

Pressure slowly ramps up through the flow control and pressurizes the upstream side of the product. Curve [A].

During the gradual pressure increase, the pressure measured on the downstream side of the product remains near zero. Curve [B].

Sprint iQ's downstream sensor looks for the slightest pressure above zero at the B-side of the product. When the pressure exceeds the preset pressure limit (dashed line), the EVENT is detected and the tester stops the test.

If the downstream sensor does not detect an event (pressure exceeding the pressure limit within the established test time), the program times out and Sprint iQ shows NO CRACK in the status box on the LCD display.

Applications

The check valve tester is valuable when testing duck-bill valves, check valves, pinch valves or devices that open slowly under applied pressure.

A downstream sensor is especially valuable for testing products that merely weep open or flow just a small amount when fully open.

The downstream configuration can also be used to leak test products that have two chambers not intended to have a passage between the two sides.

A variation of the downstream sensor configuration evaluates the product in both directions. See the separate Application Note describing the bidirectional check valve tester.

Features

- More sensitive than typical leak testers
- Senses downstream pressure or mass flow
- Adjustable precision flow control is built in
- All components are in one small enclosure
- Small footprint of 8.5 by 15 inches
- Perfect for bench or automation
- High pressure resolution
- Easy to program and re-calibrate

Uson L.P.

8640 N. Eldridge Parkway
Houston, Texas 77041
USA

Phone: +1-281-671-2000

Fax: +1-281-671-2001

info@uson.com

www.uson.com