Fast Acting Valve

APPLICATIONS

The fast acting model is ideal for application that require an emergency closure in case of catastrophic failure of an ultra-high vacuum system.

These ultra-high vacuum valves utilize a short stroke toggle mechanism which allows a single quick motion for closure. This is a distinct advantage over the standard screw type sealing mechanisms. The fast valve is actuated by the NEC coaxial pressure sensor.

These valves have been in use for more than 20 years in a wide variety of vacuum and ion beam systems throughout the world.

DESIGN

There are no organic materials used in the construction of the NEC straight through valve. It is bakeable to 300°C in the open position.

The fast acting version is an especially unique product. The Model VS2F was designed for those applications which require emergency closure to protect against catastrophic vacuum failure. A leak-tight seal is produced within 35 milliseconds of detected vacuum failure.

Straight through fast acting valve, VS2F

VS2F

There are three parts to the NEC fast acting valve system; the spring drive all-metal valve, coaxial pressure sensor and the trigger circuit. The following describes the fast acting valve only.

The fast acting valve (VS2F) is identical in construction and sealing principle to the VS2P and VS2M straight through valves with the addition of a unique spring closure to actuate the toggle mechanism.

When a signal is received from the pressure sensor due to a pressure rise, a special solenoid releases the trigger and the spring drive actuates the toggle mechanism for reliable closures in less than 35 milliseconds after the trigger signal is received.

In factory tests, 50 successful fast closings were made on the same aluminum seat without replacement. If the valve fails to seal, a simple in-line adjustment provides another series of successful closures without changing seals or breaking vacuum.

This valve can be operated in either the manual or fast acting mode. Resetting is done manually with a cocking handle supplied with the valve.

As with other NEC straight through valves, all flanges compatible with nominal 2” stainless steel tubing are available. Special extensions have been provided to accommodate 2.75” O.D. flanges.

Although designed for UHV systems, applications permitting o-ring seals can take advantage of an optional seal disk incorporating a Viton o-ring. This would be particularly valuable on systems that experience frequent vacuum failures.

SPECIFICATIONS

Control:	Emergency closure in less than 35 milliseconds. Manual reset.
Open conductance:	37.4 liters/sec without aperture 33 liters/sec with molybdenum aperture in place
Leak rate when closed:	Less than 1 x 10^{-12} standard liters/sec
Bake-out:	300°C in the open position
Tube extensions and flanges:	Nominal 2” (5.1 cm) diameter stainless steel tubing ConFlat flanges standard. Other types available upon request.
Entrance aperture:	1.38” (3.5 cm) diameter Removable molybdenum aperture has 1.25” (3.2 cm) diameter
Length along beamline:	9.5” (24 cm) with 6” O.D. CF flanges Exact length dependent on flange type

Contact NEC

www.pelletron.com +1 (608) 831-7600 nec@pelletron.com

7540 Graber Rd, Middleton, WI 53562-0310 USA