



PRINCIPLE OF OPERATION PNEUMATIC SECTION

The VRC Positioner is a force balance device. There are two (2) forces that oppose each other within the Positioner.

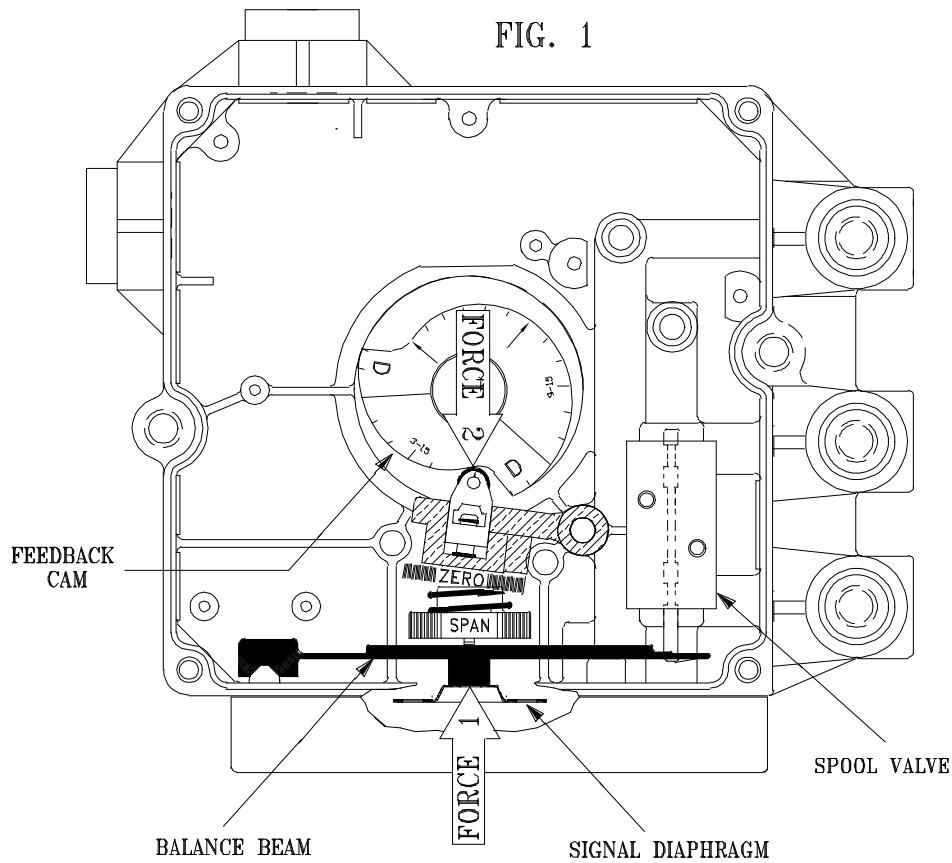
Reference figure 1.

Force 1 is created by the signal pressure (3-15PSI) being applied on the flexible **SIGNAL DIAPHRAGM**. Force increases as pressure is increased.

Force 2 is created by the rotation and cam rise of the **FEEDBACK CAM**. Force is increased as the **CAM** rotates from 0 to 90 degrees.

The two (2) opposing forces meet at the **BALANCE BEAM** which has the **SPOOL VALVE** attached at one end.

When the two (2) forces are not balanced, for example: an increase in signal pressure from 3 PSI to 15 PSI, the **BALANCE BEAM** is deflected causing the **SPOOL VALVE** to flow air to the actuator and rotation of the **FEEDBACK CAM** occurs until Force 2 equals Force 1. When this happens, the **BALANCE BEAM** and **SPOOL VALVE** return to a null position (**SPOOL VALVE** off) and actuator rotation stops.





PRINCIPLE OF OPERATION VK02 I/P MODULE

MODULE FUNCTION

The VK02 I/P Module uses the latest in miniaturized electronics and pressure sensor technology to convert a 4–20 milliamp electrical input signal into a 3–15 PSI pressure output signal.

The VK02 I/P Module is used in the Model VE Positioner and can be installed into a Model VP Positioner to change it from a VP to a VE model. The VK02 I/P Module is designed for all general purpose location applications.

OPERATION

Supply air is ported to the I/P MODULE through an internal Positioner passage. It is then filtered and regulated down to 25 PSI.

The regulated air is ported internally in the Module to a **COIL/NOZZLE** and allowed to bleed off in a controlled manner to develop the 3–15 PSI signal pressure.

A flexible teflon coated steel **DIAPHRAGM** is positioned over the nozzle and is magnetically moved closer or further away from the nozzle to increase or decrease the 3–15 PSI signal pressure.

Control for the 3–15 PSI signal pressure is achieved by electronically comparing the 4–20 milliamp input signal with the 3–15 PSI pressure sensor signal.

When a change occurs on the the 4–20 MA input signal, the electronics cause a change in current flow to the **COIL/NOZZLE ASSEMBLY** and thus a change in the magnetic field strength. This then causes the **DIAPHRAGM** to change position and signal pressure is changed to correspond to the new 4–20 MA input signal.

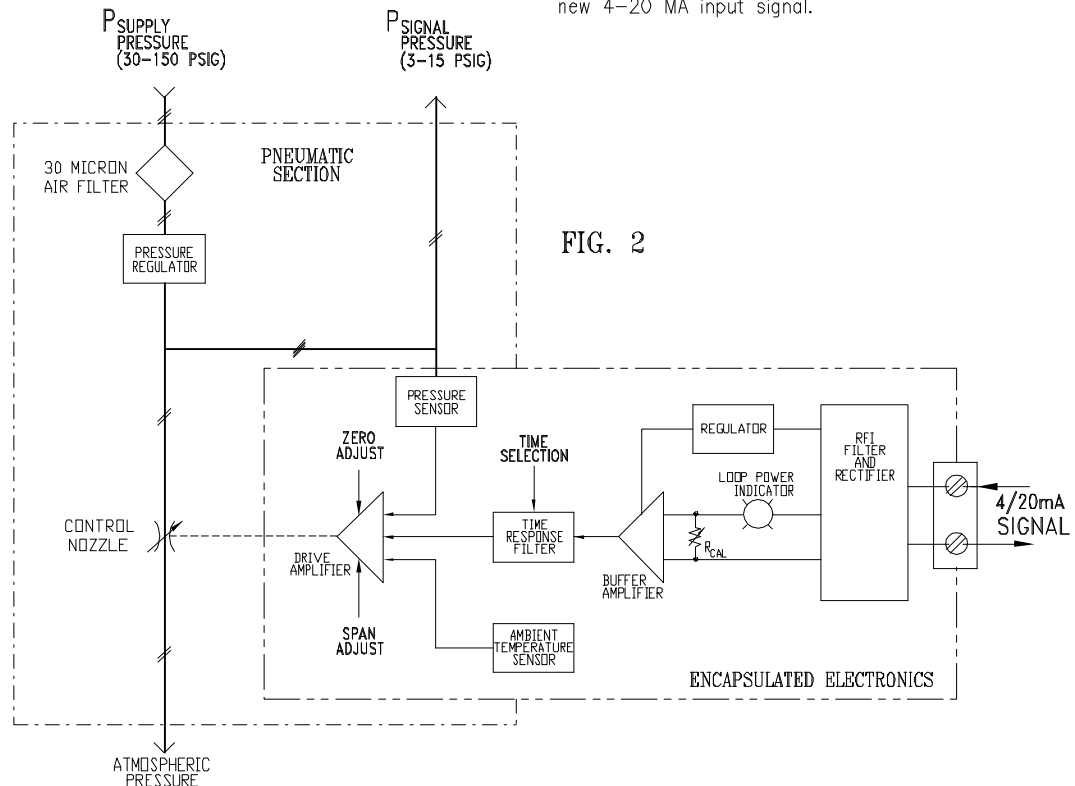


FIG. 2

SIGNAL CURRENT TO SIGNAL PRESSURE VK02 I/P CONVERSION MODULE