

IMPLEMENTATION OF THE DIGITAL VALVE INTERFACE (DVI)

Technical Note 411

NOTE: This technical note replaces the DVI manual, and includes all the information except a schematic drawing. Call VICI Valco if a copy of the schematic is required.

The Valco Digital Valve Interface (DVI) is an electronic controller which uses CMOS integrated circuitry to convert low power logic level signals or contact closures into pneumatic pulses for the operation of Valco two position air actuated valves. The DVI has two solenoids which correspond to the two positions of the actuator, with the output air supplied through the one which is activated. The input signal determining which solenoid is activated may be sent manually with the toggle switch on the front panel, or the DVI can be connected to a data system's timed outputs for automated valve switching.

The input signal to the DVI causes the interface circuitry to provide a two second pulse to the designated solenoid, driving the air actuator and valve to the indicated position. Upon removal of the first signal and application of a second, a two second pulse from the other solenoid drives the actuator to the other position. The result is that air pressure is applied to the actuator only during switching, eliminating the possibility of side-loading, misalignment, or other problems which can arise when torque is continuously applied to the valve. This "pulsed operation" procedure mimics valve switching by hand while providing the advantages of powered, automated operation.

The DVI also has leads to connect a remote LED position readout, for situations in which its own LEDs are out of sight inside an instrument or in a different building. In addition, two contact closures are provided for signalling the time of sample injections or for starting other devices, such as a gradient programmer or data system.

INSTALLATION

The Digital Valve Interface can be easily installed by the user with the following items supplied:

1. One plug-in transformer
2. One remote 10 pin flat cable (5 feet long) for interfacing with a data system
3. 5 feet of 1/8" plastic tubing for the air supply
4. The necessary fittings for air line installation

MOUNTING

Mounting dimensions are shown in **Figure 1**. The DVI features a two-sided face/mounting plate which is factory-installed for mounting on the left side of the instrument panel. However, its design allows the option of removing four screws and the hex nut on the switch and re-installing the plate for mounting on the right side.

BASIC CONNECTIONS

1. Connect the air lines between the DVI and the air actuator as shown in Figure 3 on the back page.
2. Connect the air supply line to a regulated source of compressed air or nitrogen. (60-80 psi recommended, 100 psi maximum)
3. Connect the transformer to the DVI as indicated, and plug it in.

MANUAL OPERATION

No additional installation is required for use of the three position switch on the front panel of the DVI. The manual switch will override automatic operation unless the operation is controlled by a single double throw relay.

AUTOMATIC OPERATION

The DVI can be controlled by one double throw relay, two single throw relays, or remote negative true logic. The input signals to the DVI can be continuous or as short as fifty milliseconds. Any unused wires should be taped or tied out of the way.

One relay operation (double throw):

1. Connect the BLACK (LOAD) wire from the DVI to the Normally Closed (N.C.) relay contact. 2. Connect the RED (ground) wire to the Common (Com/Grnd) relay contact.
2. Connect the BLUE (INJECT) wire to the Normally Open (N.O.) relay contact.

Two relay operation:

1. Connect the RED (ground) wire from the DVI to the common of both relays.
2. Connect the BLACK (LOAD) wire to the Normally Open (N.O.) contact of the relay designated for the LOAD position.
3. Connect the BLUE (INJECT) wire to the Normally Open (N.O.) contact of the relay designated for the INJECT position.

OPERATION BY REMOTE NEGATIVE TRUE LOGIC

1. Connect the RED (logic ground) wire from the DVI to the logic ground of the timing device. (Consult its manual as necessary.)
2. Connect the BLACK (LOAD) wire from the DVI to the output chosen for the LOAD position.
3. Connect the BLUE (INJECT) wire from the DVI to the output chosen for the INJECT position.

FIGURE 1: Mounting dimensions

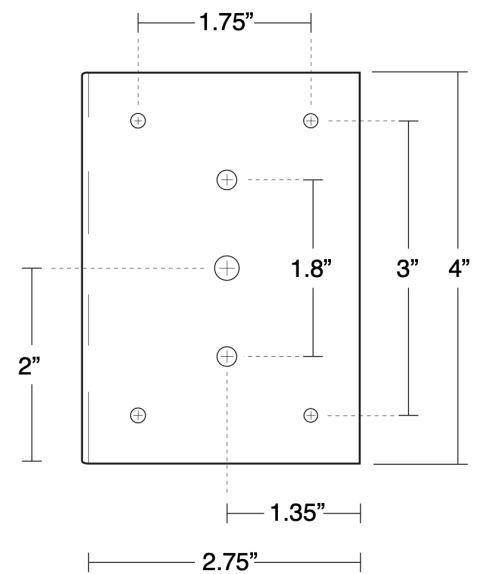
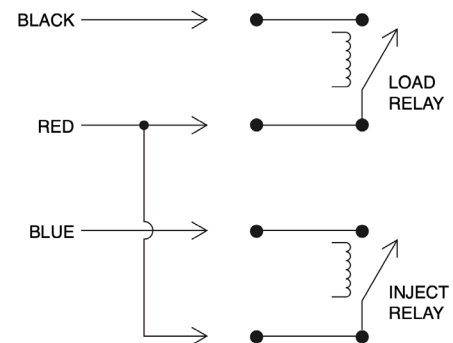


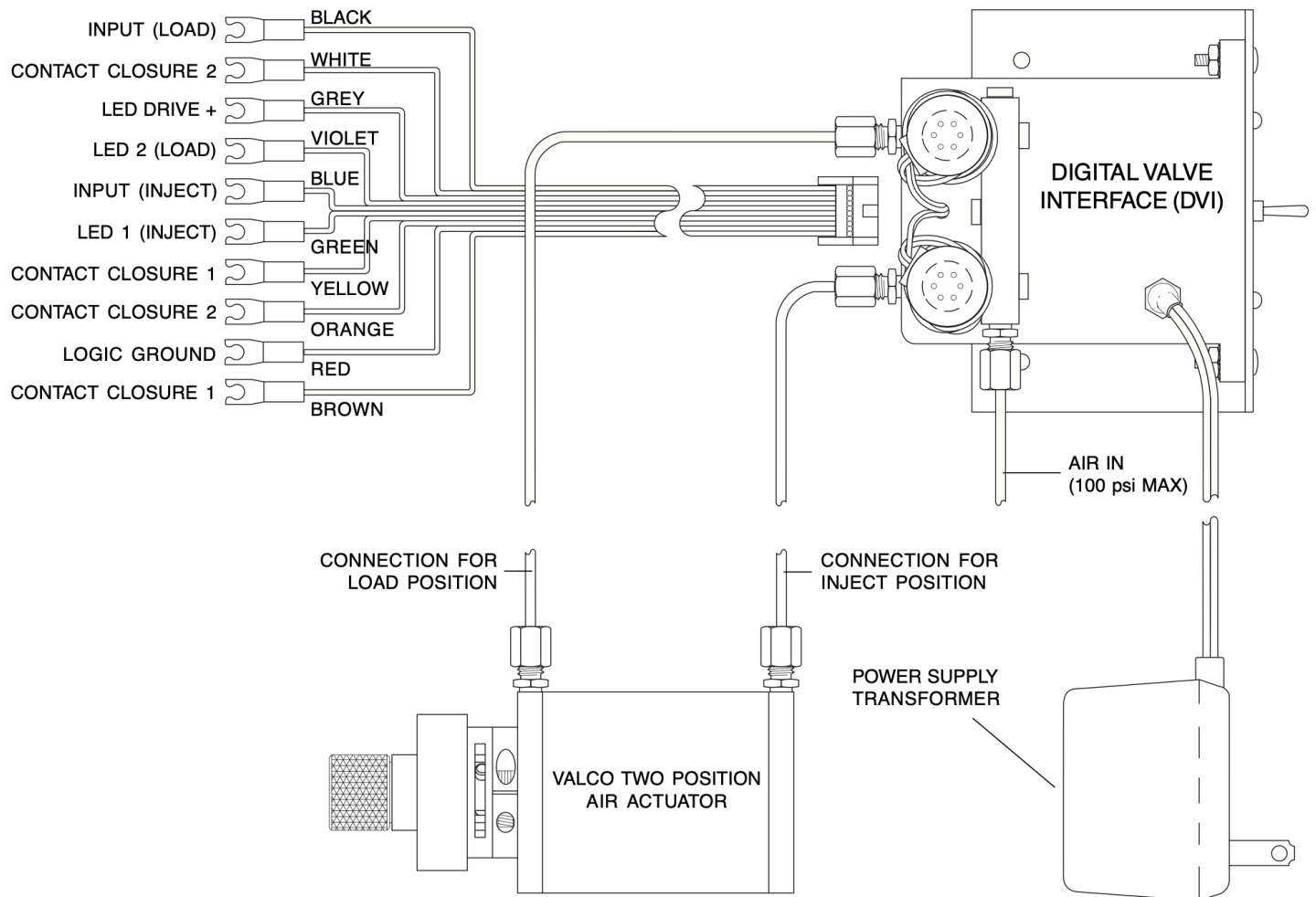
FIGURE 2: Relay connections



USE OF REMOTE LEDS

1. Connect the positive (+) leg of the LEDs to the grey wire of the interface cable.
2. Connect the other legs from the LEDs to the VIOLET wire for the LOAD indicator and to the GREEN wire for the INJECT indicator.

FIGURE 3: DVI Connections



NOTE:

1. All inputs are 5 volt negative true logic
2. Inputs require .5 milliamperes drive
3. Inputs must have a closure to logic ground - (red) to actuate