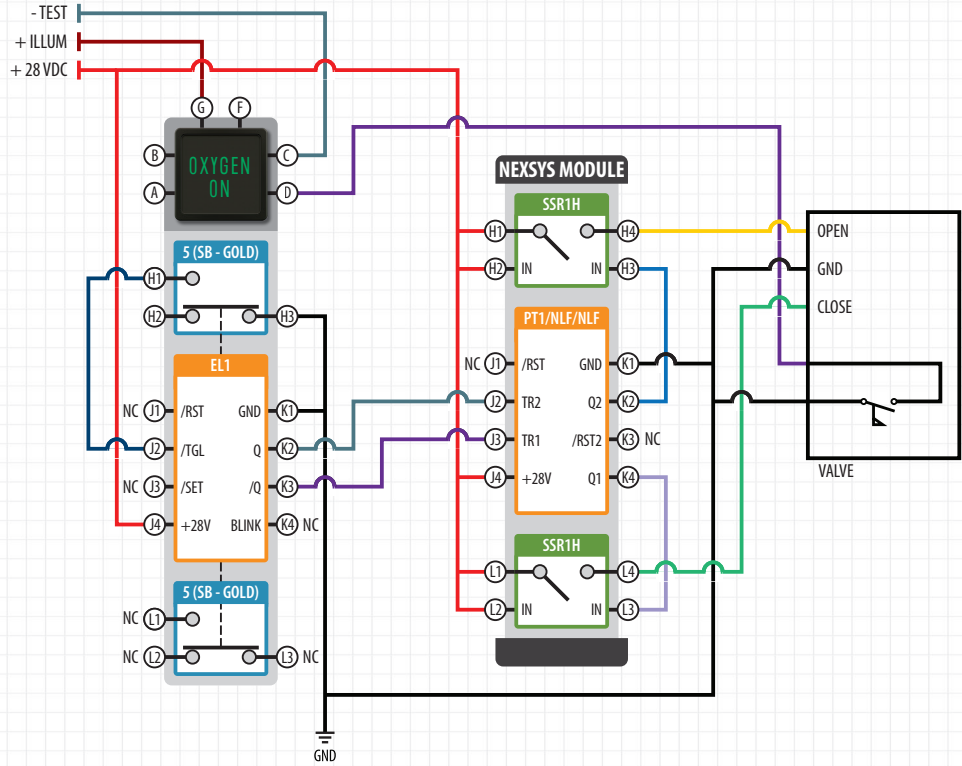


# Valve Control and Annunciation

This application diagram details an oxygen valve control system. The design converts momentary switch presses into timed pulses to actuate the valve open and closed. Once the valve is opened, positive indication of oxygen flow is provided via a flow sensor internal to the valve. As an added feature, the system always defaults the valve to the closed position on power up to prevent any potential issues.

The design uses one switch that has a VIVISUN High Capacity Body which houses two momentary switch poles and a NEXSYS Electronic Latch (EL1) component and a standalone NEXSYS Module which houses NEXSYS Pulse/Timer (PT1) and Solid State Relay (SSR1H) components. The EL1 controls the valve open/close states via momentary switch presses. The EL1 latched outputs trigger the PT1 channels to output pulses which energize the SSR1Hs. The SSR1Hs pass through power to the individual open and close pins on the valve based on the active PT1 channel. The PT1 channels are both configured to sense a high-z (open) to low (ground) signal transition which triggers 500 millisecond (msec) low (ground) pulses to be produced from individual output channels.

In the power up state, the legend is dead face. The EL1 powers up in RESET state with outputs Q (K2) and BLINK (K4) high-z (open) and output /Q (K3) low (ground). The low (ground) from output /Q triggers the TR1 input (J3) of the PT1 and causes a 500 msec low (ground) pulse to be output from Q1 (K4). This low (ground) pulse energizes the lower SSR1H (L3) which passes power through (L1 & L4) to the CLOSE pin of the valve. After 500 msec, the pulse ends and output Q1 (K4) becomes high-z (open). If the momentary switch is pressed, a low (ground) signal is passed through the normally open (H1) contact of the switch pole to the /TGL input (J2) of the EL1. This causes outputs Q (K2) and BLINK (K4) to become low (ground) and output /Q to become low (ground). The low (ground) from Q triggers the TR2 input (J2) of the PT1 and causes a 500 msec low (ground) pulse to be output from Q2 (K2). This low (ground) pulse energizes the upper SSR1H (H3) which passes power through (H1 & H4) to the OPEN pin of the valve. This allows oxygen to flow which closes the flow sensor contacts, passing a ground through and illuminating the OXYGEN ON (D) indicator. This state is held until another momentary switch press, which will return the valve to the closed position and turn the OXYGEN ON indicator off.



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