

TECHNICAL NOTE ON RESETTING 350MHz RF SYSTEM RF LOAD SOLENOID VALVES

The 350MHz rf systems (RF1-RF5) utilize coaxial rf loads as terminations on circulators and combining/splitting hybrids. The rf loads are capable of dissipating 200kW of rf power (see figure 1), and are cooled utilizing de-ionized water at a flow rate of between 19-30GPM, depending on where they are installed in the system.

As an equipment safety feature, all loads of this type are supplied cooling water through an electrical solenoid valve, shown in figure #2. This solenoid valve is used to prevent spillage of cooling water in the event the internal water jacket of the load is damaged, which would result in a severe water leak from the load.



Figure 2

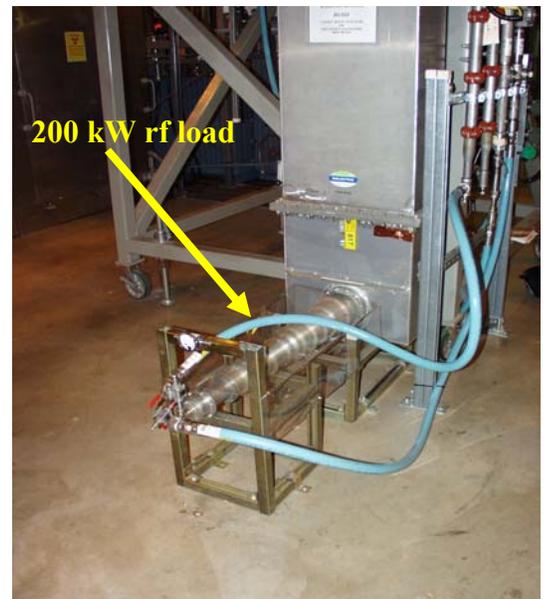


Figure 1

The solenoid valve is designed to open and allow water flow when 24vdc is supplied to the valve coil. The 24vdc power for the solenoid coil is supplied by the local 24vdc power supply at each station, and is applied to the coil when the Red Lion (also known as a "Red Dog") flow meter indicates normal return flow through the load (see schematic in figure 3). Should the water jacket in the load be damaged and a severe water leak develop, the load return flow would fall below the interlock trip point of the Red Lion meter, tripping the flow interlock and also cause the supply-line solenoid valve to close. The closed valve would stop the flow of water into the leak.

Because the solenoid valve cannot open unless the Red Lion meter detects adequate return flow from the load, and return flow cannot be established without the solenoid valve being open, a "reset" button was installed for each solenoid valve. This button bypasses the Red Lion meter control of the solenoid valve, forcing it to open, and allowing water flow through the load. As soon as the load return flow reaches normal levels, the "reset" button can be released and the solenoid valve will remain energized and open. **Because it takes several seconds for return flow to build up to normal levels when the "reset" button is pushed, the button must be held down until the flow interlock clears. It can then be released and the valve will remain open.**

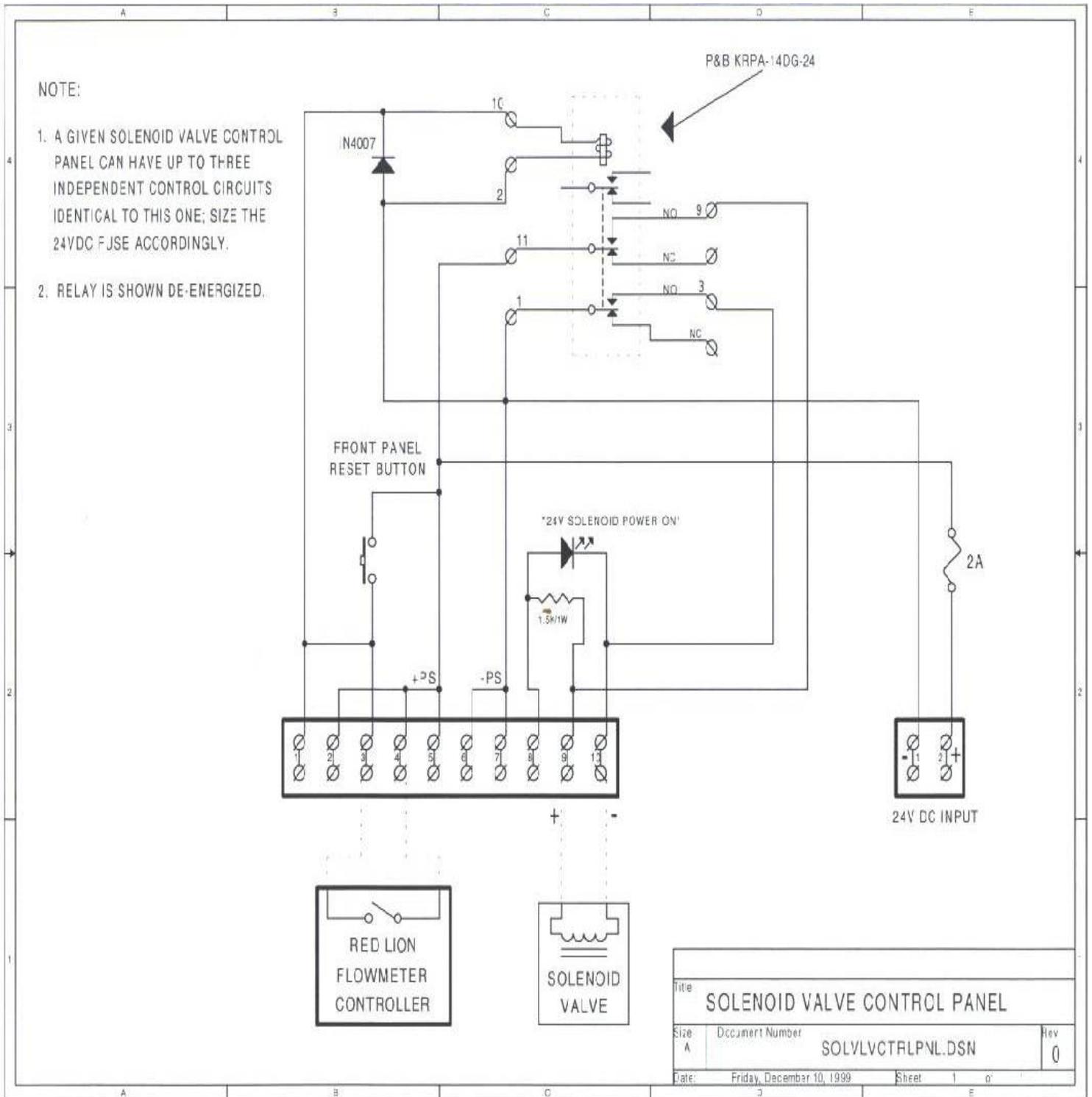


Figure 3

Depending on the location of the load in the system, it can take as long as 10 seconds for normal flow to be established in the load. If the solenoid valve does not remain energized and open after the button is held for several seconds and then released, there is either inadequate

flow through the load or an electrical problem in the interlock system or the solenoid valve controls.

Figures #4 and #5 show typical installations of the solenoid valve “reset” buttons. Figure #4 is the solenoid valve control panel for the RF4 circulator load, and figure #5 is the solenoid valve control panel for the S38 hybrid loads. The green LED under each reset button is in parallel with the 24vdc output of the panel that is fed to that particular solenoid valve. If the LED is illuminated, the solenoid valve coil should be energized, allowing water flow through the valve. If the LED is illuminated and there is no flow indicated on the Red Lion flow meter, further system troubleshooting is required.



Figure 4



Figure 5