

RATE-OF-FLOW WITH EXTERNAL FILTER

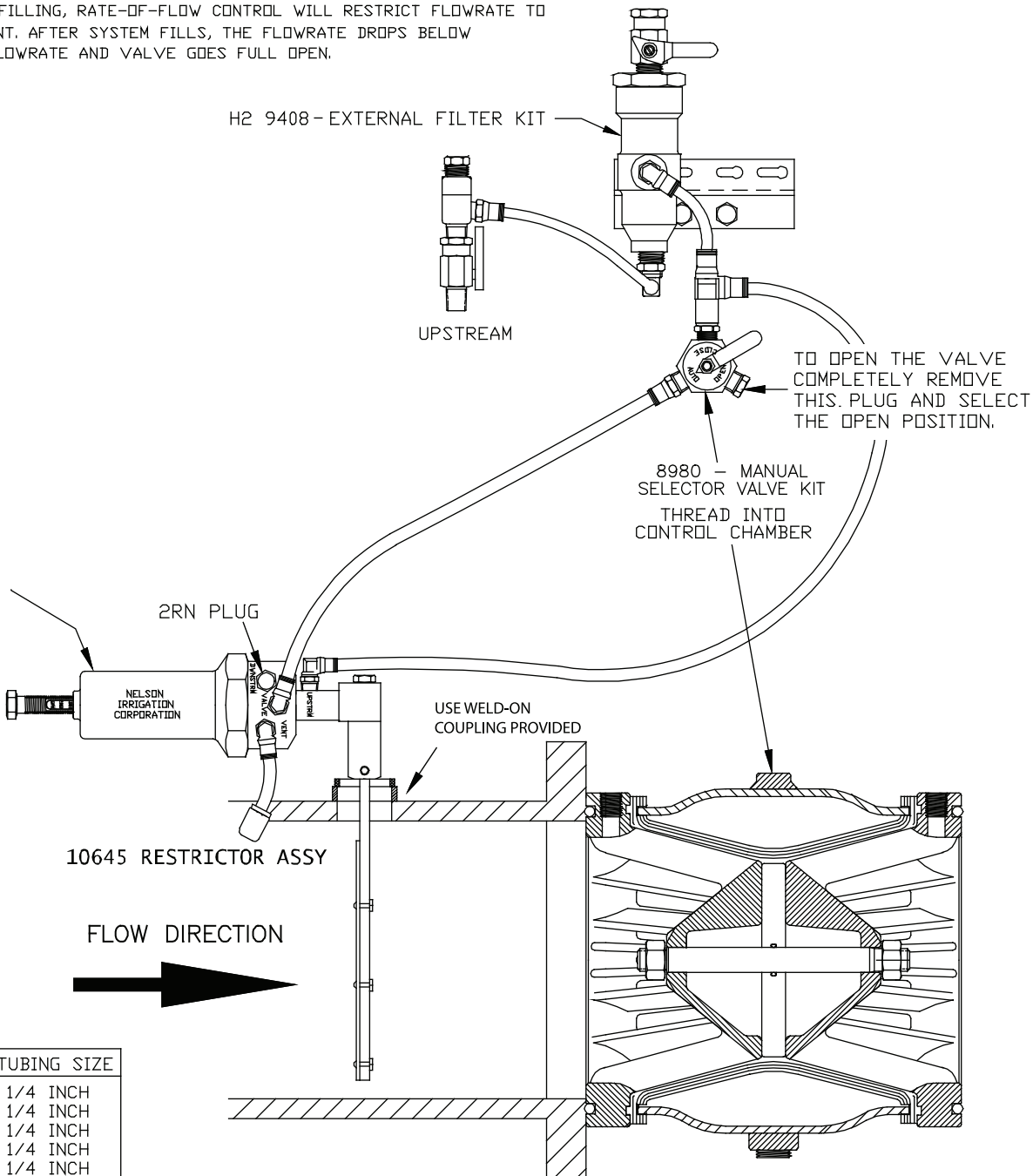
RATE-OF-FLOW CONTROL LIMITS THE FLOW RATE PASSING THROUGH THE VALVE.
RATE-OF-FLOW CONTROL IS SET TO 100% OF SYSTEM FLOW RATE USAGE.
DURING SYSTEM FILLING, RATE OF FLOW WILL RESTRICT FLOWRATE TO
DESIRED SETPOINT. AFTER SYSTEM FILLS, THE FLOWRATE WILL CONTINUE
TO SUPPLY THE SYSTEM WITH THE SAME DESIRED SETPOINT GPM.

MODEL D18 E1 H2

OR

RATE-OF-FLOW CONTROL IS SET TO 110-120% OF SYSTEM FLOW RATE USAGE.
DURING SYSTEM FILLING, RATE-OF-FLOW CONTROL WILL RESTRICT FLOWRATE TO
DESIRED SETPOINT. AFTER SYSTEM FILLS, THE FLOWRATE DROPS BELOW
DESIRED FILL FLOWRATE AND VALVE GOES FULL OPEN.

- D18 9778-001 8" RATE-OF-FLOW CONTROL REMOTE(900-3800 GPM)
- D18 9778-002 8" RATE-OF-FLOW CONTROL IN-VAL VEC(900-3800 GPM)
- D18 9778-003 6" RATE-OF-FLOW CONTROL REMOTE(500-2000 GPM)
- D18 9778-004 6" RATE-OF-FLOW CONTROL IN-VAL VEC(500-2000 GPM)
- D18 9778-005 3" RATE-OF-FLOW CONTROL REMOTE(120-400 GPM)
- D18 9778-006 4" RATE-OF-FLOW LD-FLO CONTROL REMOTE(200-540 GPM)
- D18 9778-007 6" RATE-OF-FLOW LD-FLO CONTROL REMOTE(330-1010 GPM)
- D18 9778-008 8" RATE-OF-FLOW LD-FLO CONTROL REMOTE(490-1530 GPM)



VALVE SIZE	TUBING SIZE
2 INCH	1/4 INCH
3 INCH	1/4 INCH
4 INCH	1/4 INCH
6 INCH	1/4 INCH
8 INCH	1/4 INCH

RATE-OF-FLOW WITH SOLENOID & EXTERNAL FILTER

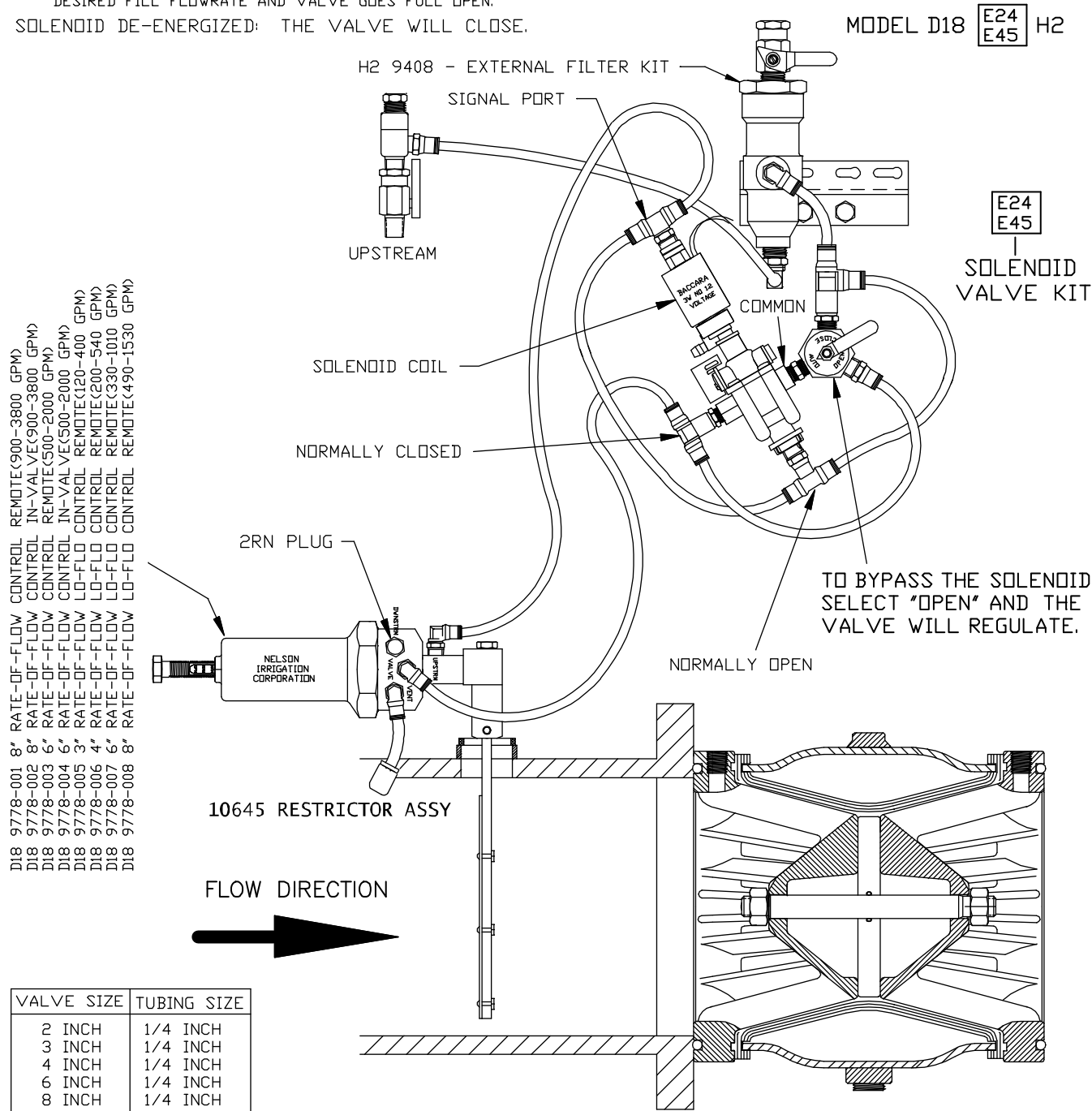
SOLENOID ENERGIZED:

RATE-OF-FLOW CONTROL LIMITS THE FLOW RATE PASSING THROUGH THE VALVE. RATE-OF-FLOW CONTROL IS SET TO 100% OF SYSTEM FLOW RATE USAGE. DURING SYSTEM FILLING, RATE-OF-FLOW CONTROL WILL RESTRICT FLOWRATE TO DESIRED SETPOINT. AFTER SYSTEM FILLS, THE FLOWRATE WILL CONTINUE TO SUPPLY THE SYSTEM WITH THE SAME DESIRED SETPOINT GPM.

OR

RATE-OF-FLOW CONTROL IS SET TO 110-120% OF SYSTEM FLOW RATE USAGE. DURING SYSTEM FILLING, RATE OF FLOW WILL RESTRICT FLOWRATE TO DESIRED SETPOINT. AFTER SYSTEM FILLS, THE FLOWRATE DROPS BELOW DESIRED FILL FLOWRATE AND VALVE GOES FULL OPEN.

SOLENOID DE-ENERGIZED: THE VALVE WILL CLOSE.



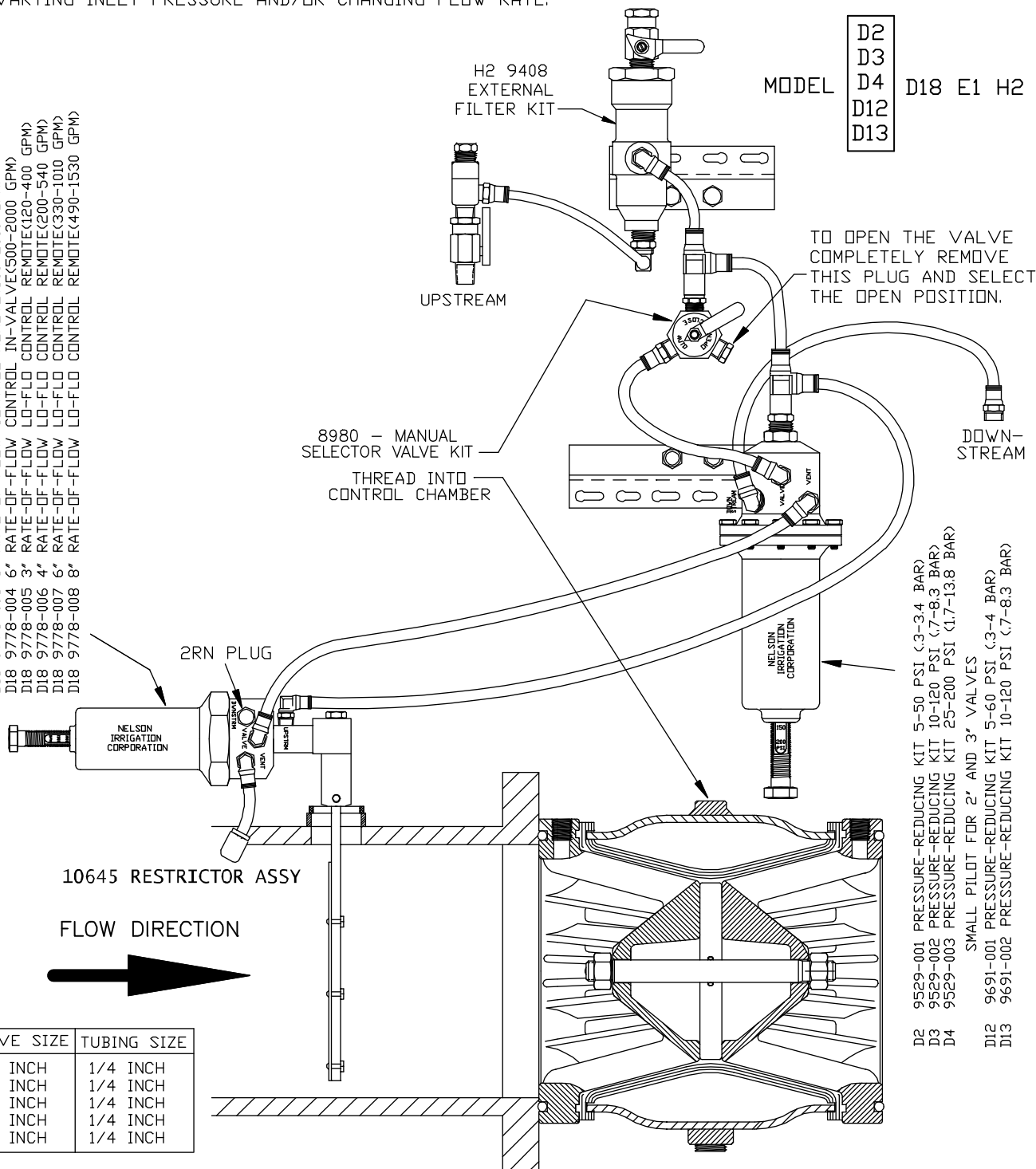
- D18 9778-001 8" RATE-OF-FLOW CONTROL REMDTE<900-3800 GPM>
- D18 9778-002 8" RATE-OF-FLOW CONTROL IN-VALVE<900-3800 GPM>
- D18 9778-003 6" RATE-OF-FLOW CONTROL REMDTE<500-2000 GPM>
- D18 9778-004 6" RATE-OF-FLOW CONTROL IN-VALVE<500-2000 GPM>
- D18 9778-005 3" RATE-OF-FLOW CONTROL REMDTE<120-400 GPM>
- D18 9778-006 4" RATE-OF-FLOW CONTROL REMDTE<200-540 GPM>
- D18 9778-007 6" RATE-OF-FLOW CONTROL REMDTE<330-1010 GPM>
- D18 9778-008 8" RATE-OF-FLOW CONTROL REMDTE<490-1530 GPM>

VALVE SIZE	TUBING SIZE
2 INCH	1/4 INCH
3 INCH	1/4 INCH
4 INCH	1/4 INCH
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8 INCH	1/4 INCH

RATE-OF-FLOW & PRESSURE REDUCING WITH EXTERNAL FILTER

RATE-OF-FLOW CONTROL LIMITS THE FLOW RATE PASSING THROUGH THE VALVE. RATE-OF-FLOW CONTROL IS SET TO 110-120% ABOVE SYSTEM FLOW RATE. DURING SYSTEM FILLING, RATE-OF-FLOW CONTROL WILL RESTRICT FLOWRATE TO DESIRED SETPOINT. AS DOWNSTREAM PRESSURE RISES TO PRESSURE REDUCING SETTING, THE CONTROL AUTOMATICALLY SHIFTS TO PRESSURE REDUCING REGULATOR TO HOLD A CONSTANT OUTLET PRESSURE REGARDLESS OF VARYING INLET PRESSURE AND/OR CHANGING FLOW RATE.

- D18 9778-001 8" RATE-OF-FLOW CONTROL REMDTE(900-3800 GPM)
- D18 9778-002 8" RATE-OF-FLOW CONTROL IN-VALVE(900-3800 GPM)
- D18 9778-003 6" RATE-OF-FLOW CONTROL REMDTE(500-2000 GPM)
- D18 9778-004 6" RATE-OF-FLOW CONTROL IN-VALVE(500-2000 GPM)
- D18 9778-005 3" RATE-OF-FLOW CONTROL REMDTE(120-400 GPM)
- D18 9778-006 4" RATE-OF-FLOW CONTROL IN-VALVE(120-400 GPM)
- D18 9778-007 6" RATE-OF-FLOW CONTROL REMDTE(200-540 GPM)
- D18 9778-008 8" RATE-OF-FLOW CONTROL IN-VALVE(200-540 GPM)
- D18 9778-009 6" RATE-OF-FLOW CONTROL REMDTE(330-1010 GPM)
- D18 9778-010 8" RATE-OF-FLOW CONTROL IN-VALVE(330-1010 GPM)
- D18 9778-011 6" RATE-OF-FLOW CONTROL REMDTE(490-1530 GPM)
- D18 9778-012 8" RATE-OF-FLOW CONTROL IN-VALVE(490-1530 GPM)



RATE-OF-FLOW & PRESSURE REDUCING WITH SOLENOID & EXTERNAL FILTER

SOLENOID ENERGIZED:

RATE-OF-FLOW CONTROL LIMITS THE FLOW RATE PASSING THROUGH THE VALVE. RATE-OF-FLOW CONTROL IS SET TO 110-120% ABOVE SYSTEM FLOW RATE. DURING SYSTEM FILLING, RATE-OF-FLOW CONTROL WILL RESTRICT FLOWRATE TO DESIRED SETPOINT. AS DOWNSTREAM PRESSURE RISES TO PRESSURE REDUCING SETTING, THE CONTROL AUTOMATICALLY SHIFTS TO PRESSURE REDUCING REGULATOR TO HOLD A CONSTANT OUTLET PRESSURE REGARDLESS OF VARYING INLET PRESSURE AND/OR CHANGING FLOW RATE.

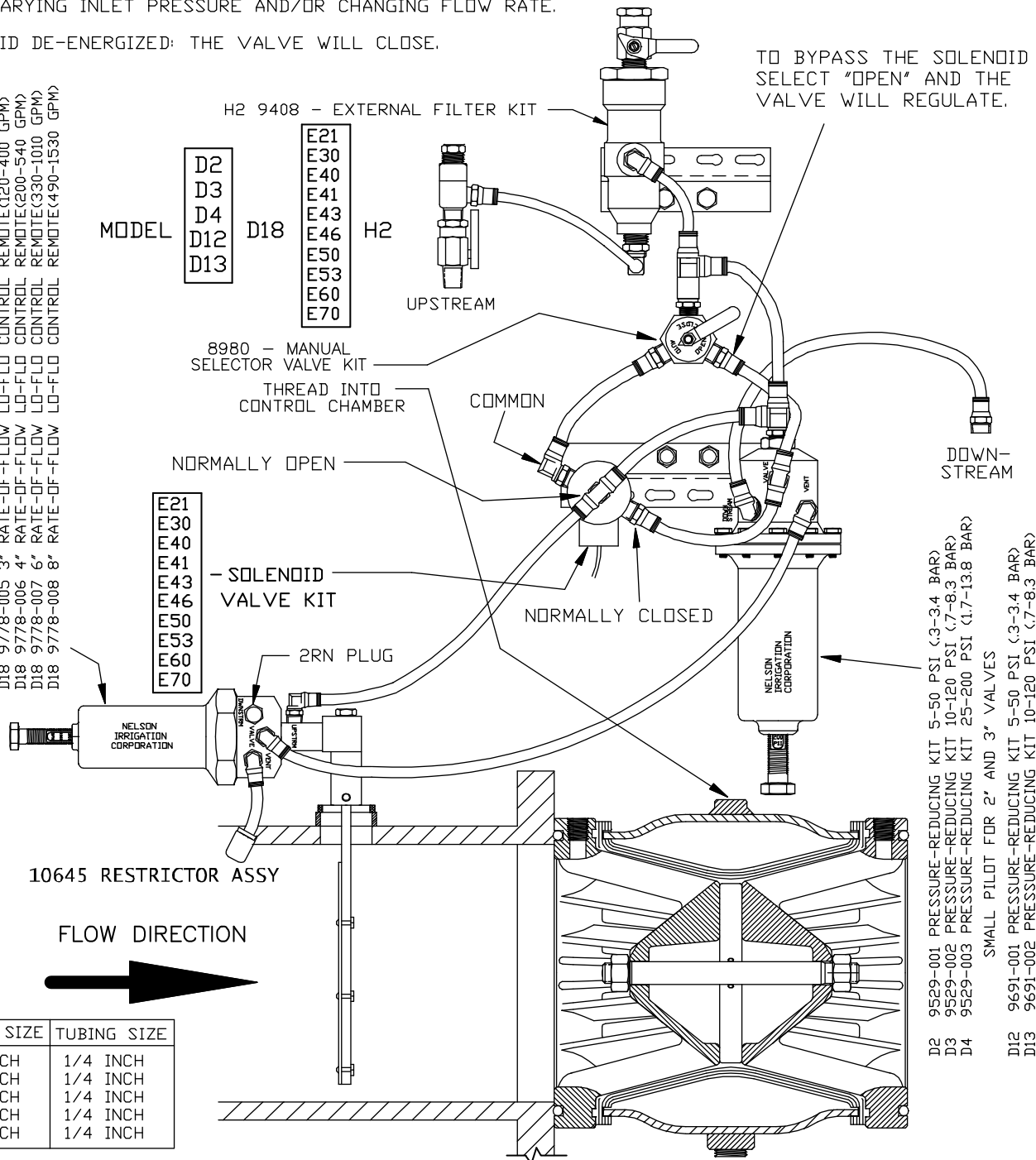
SOLENOID DE-ENERGIZED: THE VALVE WILL CLOSE.

TO BYPASS THE SOLENOID SELECT "OPEN" AND THE VALVE WILL REGULATE.

- D18 9778-001 8" RATE-OF-FLOW CONTROL REMOTE(900-3800 GPM)
- D18 9778-002 8" RATE-OF-FLOW CONTROL IN-VALVE(900-3800 GPM)
- D18 9778-003 6" RATE-OF-FLOW CONTROL REMOTE(500-2000 GPM)
- D18 9778-004 6" RATE-OF-FLOW CONTROL IN-VALVE(500-2000 GPM)
- D18 9778-005 3" RATE-OF-FLOW CONTROL REMOTE(120-400 GPM)
- D18 9778-006 4" RATE-OF-FLOW CONTROL REMOTE(200-540 GPM)
- D18 9778-007 6" RATE-OF-FLOW CONTROL REMOTE(330-1010 GPM)
- D18 9778-008 8" RATE-OF-FLOW CONTROL REMOTE(490-1530 GPM)

- MODEL
- D2
 - D3
 - D4
 - D12
 - D13

- E21
- E30
- E40
- E41
- E43
- E46
- E50
- E53
- E60
- E70

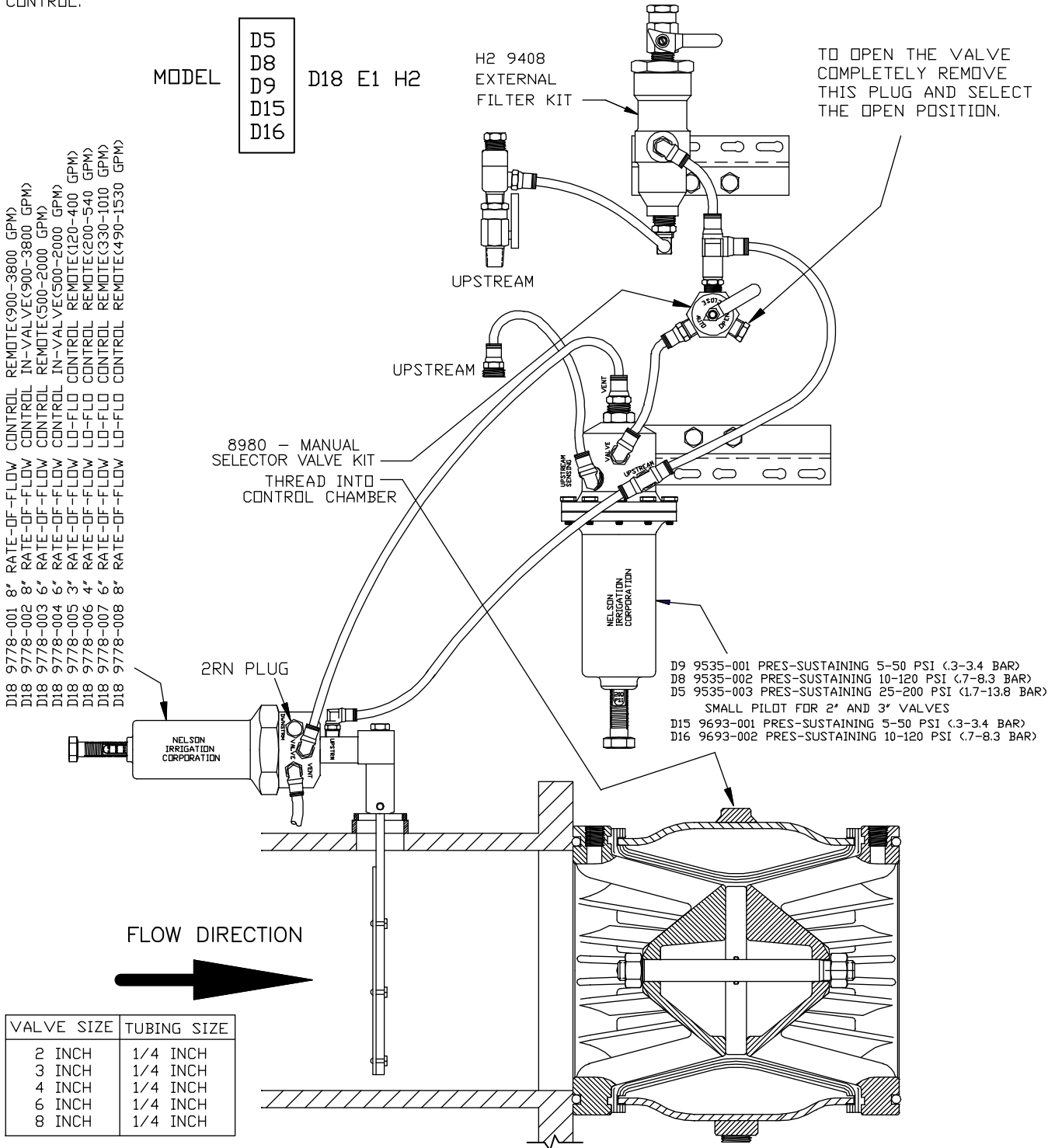


VALVE SIZE	TUBING SIZE
2 INCH	1/4 INCH
3 INCH	1/4 INCH
4 INCH	1/4 INCH
6 INCH	1/4 INCH
8 INCH	1/4 INCH

- D2 9529-001 PRESSURE-REDUCING KIT 5-50 PSI (3-3.4 BAR)
 - D3 9529-002 PRESSURE-REDUCING KIT 10-120 PSI (7-8.3 BAR)
 - D4 9529-003 PRESSURE-REDUCING KIT 25-200 PSI (17-13.8 BAR)
- SMALL PILOT FOR 2' AND 3' VALVES
- D12 9691-001 PRESSURE-REDUCING KIT 5-50 PSI (3-3.4 BAR)
 - D13 9691-002 PRESSURE-REDUCING KIT 10-120 PSI (7-8.3 BAR)

**RATE-OF-FLOW & PRESSURE
SUSTAINING WITH EXTERNAL FILTER**

RATE-OF-FLOW CONTROL LIMITS THE FLOW RATE PASSING THROUGH THE VALVE.
RATE-OF-FLOW CONTROL IS SET TO MAXIMUM FLOW RATE DESIRED THROUGH THE VALVE.
PRESSURE SUSTAINING ACCURATELY MAINTAINS A CONSTANT, PRESET, UPSTREAM PRESSURE
BY DISCHARGING WATER AS REQUIRED UP TO THE MAXIMUM FLOWRATE SET ON RATE-OF-FLOW
CONTROL.



RATE-OF-FLOW WITH SOLENOID & EXTERNAL FILTER

SOLENOID ENERGIZED:

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OR

RATE-OF-FLOW CONTROL IS SET TO 110-120% OF SYSTEM FLOW RATE USAGE. DURING SYSTEM FILLING, RATE OF FLOW WILL RESTRICT FLOWRATE TO DESIRED SETPOINT. AFTER SYSTEM FILLS, THE FLOWRATE DROPS BELOW DESIRED FILL FLOWRATE AND VALVE GOES FULL OPEN.

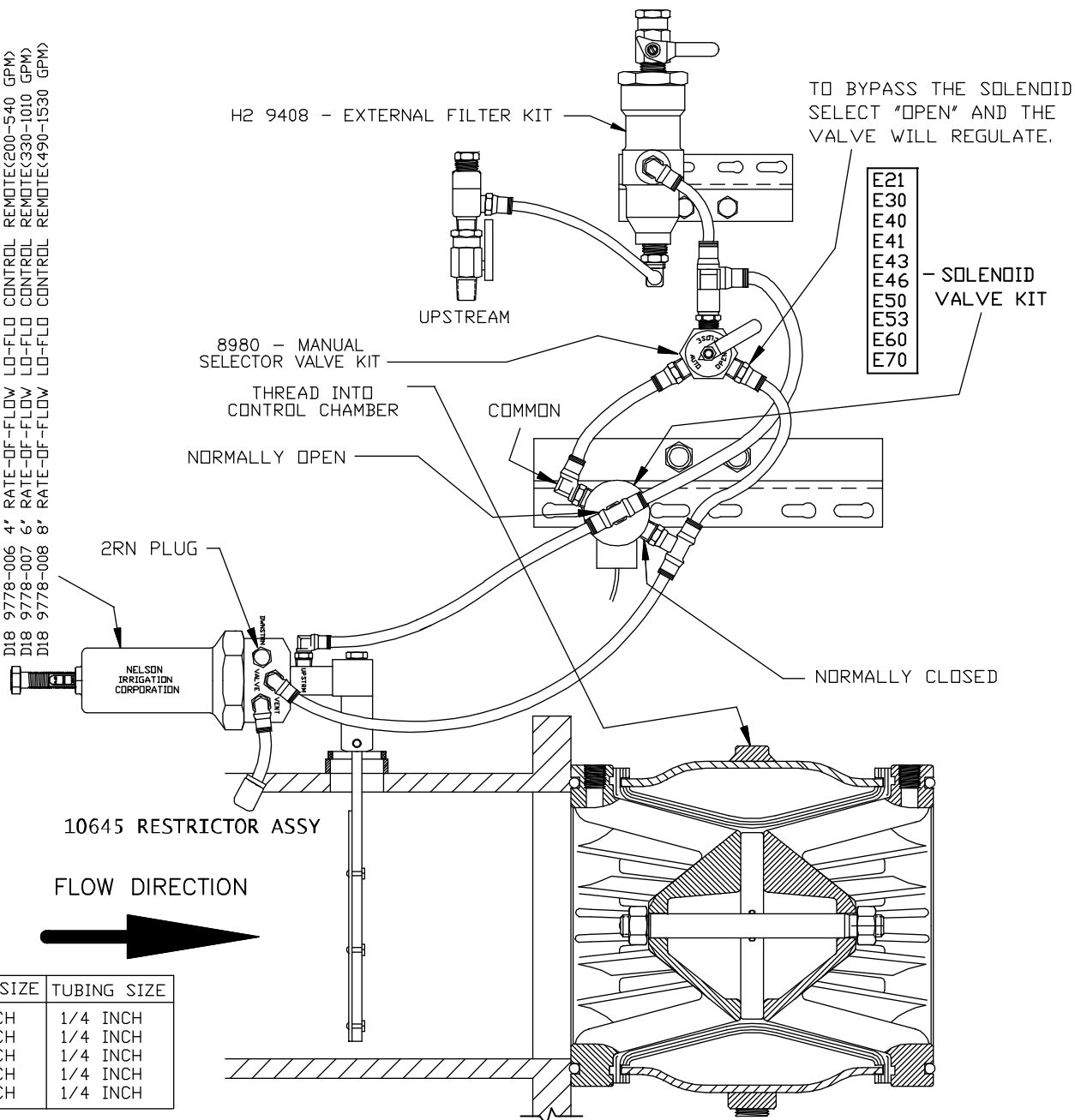
SOLENOID DE-ENERGIZED: THE VALVE WILL CLOSE.

MODEL D18

H2

- E21
- E30
- E40
- E41
- E43
- E46
- E50
- E53
- E60
- E70

- D18 9778-001 8" RATE-OF-FLOW CONTROL REMOTE(900-3800 GPM)
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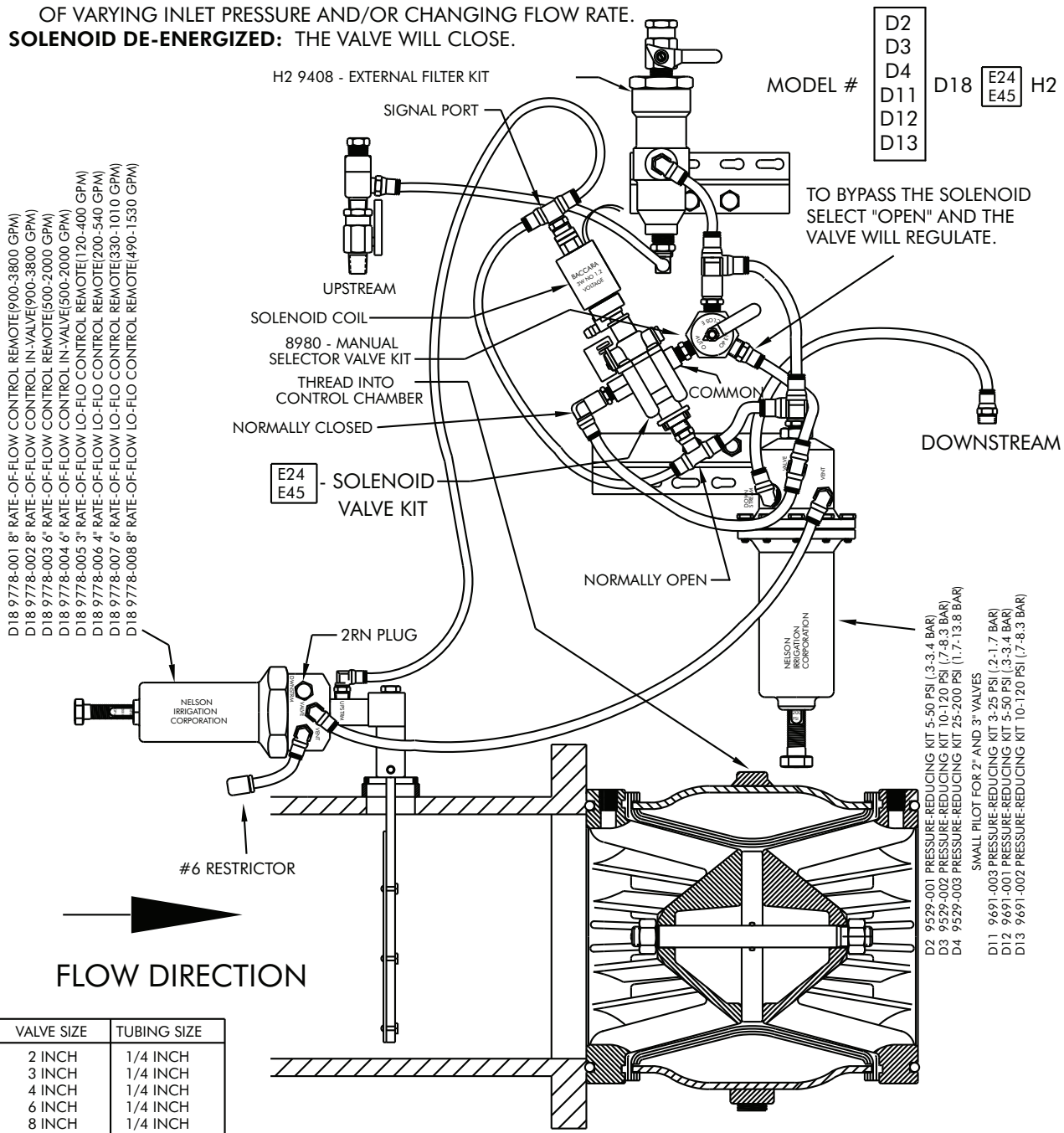
VALVE SIZE	TUBING SIZE
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3 INCH	1/4 INCH
4 INCH	1/4 INCH
6 INCH	1/4 INCH
8 INCH	1/4 INCH

RATE-OF-FLOW & PRESSURE REDUCING WITH SOLENOID ACTUATED HYD. RELAY & EXT. FILTER

SOLENOID ENERGIZED:

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SOLENOID DE-ENERGIZED: THE VALVE WILL CLOSE.



RATE-OF-FLOW INTEGRAL WITH VALVE

Installation Instructions for the Model D18 Rate-Of-Flow Control

In order to minimize the risk of shipping damage, the model D18 Rate-Of-Flow Control is removed from its 800 Series control valve prior to shipment. Follow these steps to install the Rate-Of-Flow control:

1. Remove all packaging material and note the direction of the flow arrows on the 800 Series valve and the Rate-Of-Flow Control.
2. Thread the Rate-Of-Flow Control into the sensing paddle housing.
3. Connect the control tubing marked 1 to fitting 1 and 2 to fitting 2 (see Figure 1).
4. Install the 800 Series valve in the line.

First-Time Start-Up

1. Set the Rate-Of-Flow adjustment screw to its minimum setting to fill the system slowly.
2. After the system is full and operating, turn the Rate-Of-Flow adjusting screw to increase the flow rate as desired. Read the flow scale with the jam nut out of the way. (Go to step 4 if no other pressure control is used on the valve.)
3. If a pressure reducing control is also on the valve, set the Rate-Of-Flow 10-20% higher than normal operating flow. The next time the system is started, the valve will automatically open to the Rate-Of-Flow set point. When normal operating flow is reached, the pressure reducing pilot will take over.

To determine which of the two pilots is controlling the valve, feel for pressure on the number 2 tubing line while the valve is flowing (see Figure 2). To find if the Rate-Of-Flow is set too low, push on the tube in the direction shown in Figure 2. If the tube has pressure the ring will not move easily, indicating that the Rate-Of-Flow has control of the valve. Turn the adjusting screw in more to give control to the pressure reducing pilot. If the ring moves easily into the fitting, the pressure reducing control is in control of the valve. Read the scale on the adjustment screw with the jam nut out of the way. Tighten the jam nut to lock-in the setting.

4. Fine tune the setting and determine the system response to the valve using a flow meter and pressure gages.

Performance Note

The Rate-Of-Flow Control works by means of a flow-sensing paddle on the upstream side of the valve. For better valve operation and accuracy, avoid pipe size changes, flow meters, pumps and elbows upstream of the Rate-Of-Flow valve. A straight length of pipe five pipe diameters long helps take out the turbulence and will improve the valve performance. The Rate-Of-Flow is not intended to replace a flowmeter.

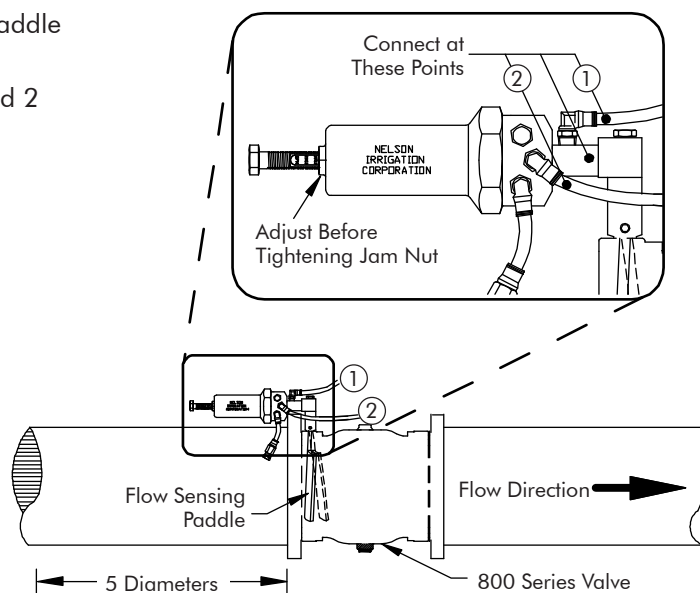


Figure 1

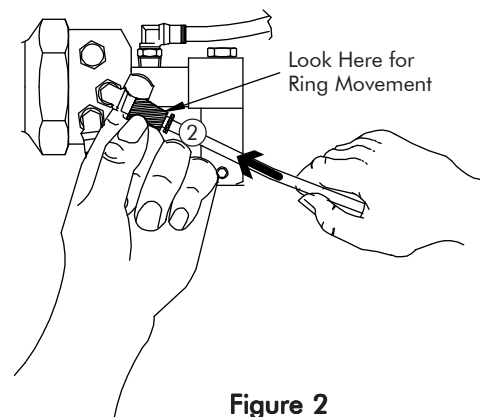


Figure 2

RATE-OF-FLOW INSTALLED ON NELSON FLANGED PIPE SPOOL

Follow these steps to install and setup the Rate-Of-Flow on a pipe:

1. Remove all packaging material and note the direction of the flow arrows on the flanged pipe spool and the Rate-Of-Flow.
2. Thread the Rate-Of-Flow control into the sensing paddle housing.
3. Connect the control tubing marked 1 to the upstream fitting 1, and the control tubing marked 2 to fitting 2 (see Figure 3) and vent at the points shown by the arrows in the sketch.
4. Install the flanged spool and 800 Series valve. Follow steps 3 and 4 in "First Time Start Up" and try to avoid upstream turbulence as noted above.

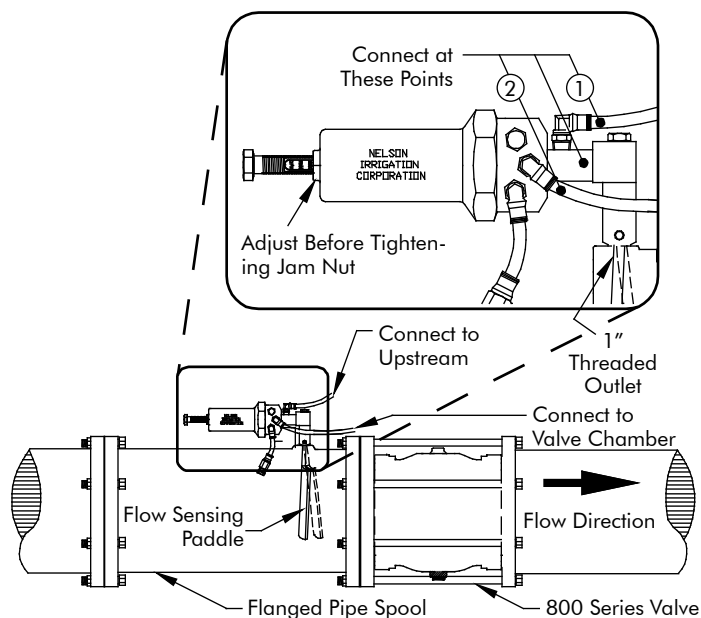


Figure 3

PUMP CONTROL VALVE USING RATE-OF-FLOW CONTROL

The Nelson 800 Series Pump Control Valve using Rate-Of-Flow control is an automatic valve designed to be installed on the discharge side of a pump to prevent surges due to rapid opening of the valve. It is a solenoid operated valve designed to be used with a flow sensing paddle. The 3-way solenoid either applies upstream pressure to the sleeve control chamber to close the main 800 Series valve or vents the sleeve control chamber to atmosphere allowing the main 800 Series valve to open.

1. The solenoid is synchronized with the pump controls to allow the pump to start and stop while the valve is closed thus eliminating any pressure surges.
2. The pump starts against a closed valve which begins to open slowly as the solenoid is energized with the pump.
3. Finally, the 800 Series valve opens full to allow maximum flow with minimal head loss.
4. When finished, the pump is signalled to stop, the solenoid is de-energized causing the main valve to close against the still running pump.

The solenoid can be supplied with various operating voltages.