# Red Deer Ironworks

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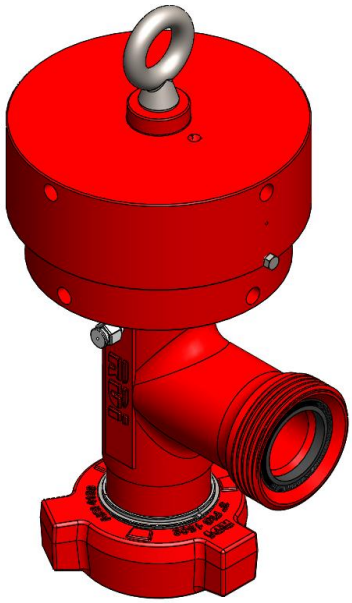

# N2 PRV Operation Manual

RDI
Valves · Flowline · Manifolds
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RDI's N2 PRV uses Nitrogen to set the relief pressure for the PRV. For optimal performance the PRV should be connected to a clean reliable source of Nitrogen (a typical setup is shown in Figure 1).

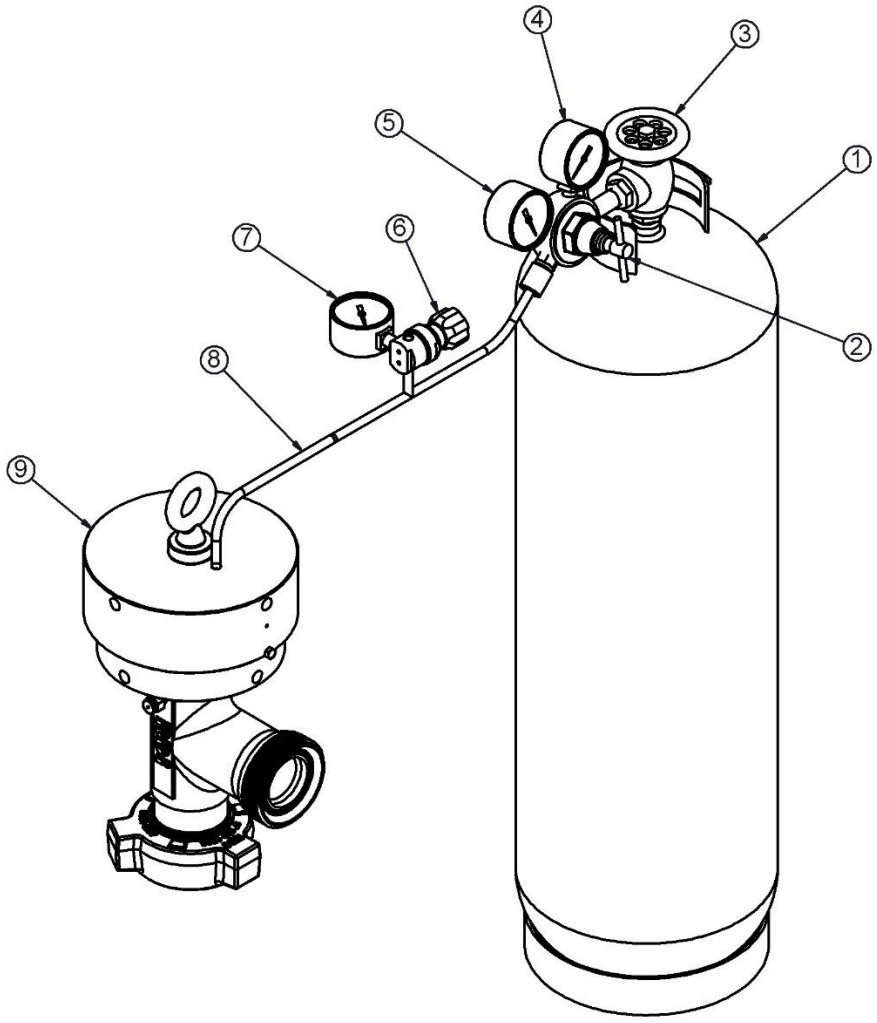
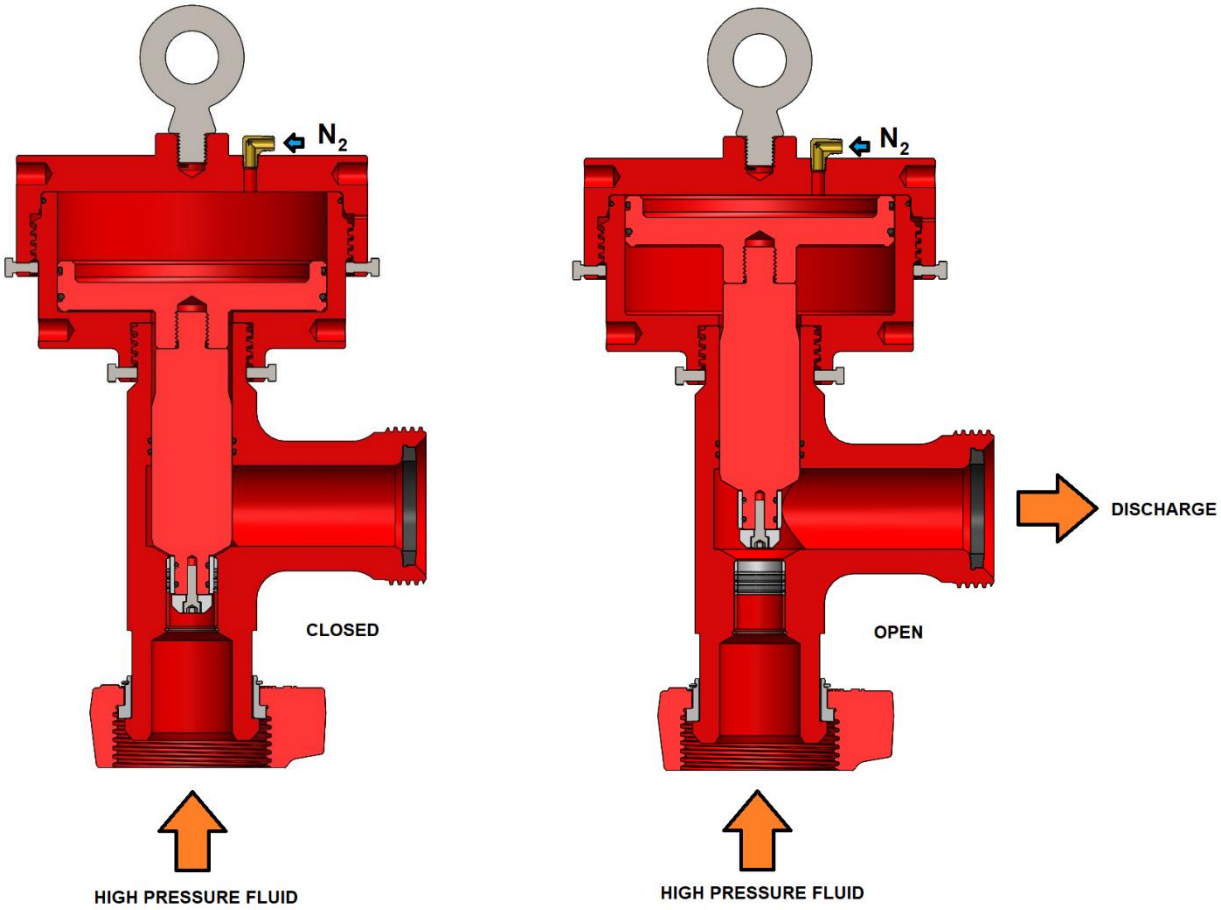



**Figure 1: N2 PRV Typical Connection Setup**

The PRV provides overpressure protection to flowline equipment that may experience pressure surges that exceed the design limit of the equipment. The PRV discharges high pressure fluid through the outlet which can be routed to a safe location. The PRV is designed to open at a predetermined set pressure which is controlled by the nitrogen pressure in the nitrogen chamber. Once the pressure is exceeded the floating piston moves to allow high pressure fluid to be released and remains open until the pressure drops below the set pressure.




Install the PRV between the high pressure source and the equipment being protected as close to the source as possible on a branch line. The PRV only provides protection to downstream connected equipment.

**WARNING: Do not restrict or block the discharge line and ensure it is routed to a safe location in accordance with all applicable safety and environmental regulations.**

Once the Nitrogen is connected the PRV relief pressure can be set by following the steps listed below. Although a chart (see Figure 2) is provided to show the N2 set pressure vs the estimated relief pressure the PRV should be set and tested before being put into service. For each 1 psi of N2 pressure the PRV relief pressure is adjusted by approximately 42 psi. Factors such as the accuracy and resolution of the N2 pressure gauge on the back-pressure relief valve will affect the relief pressure of the PRV.

1. Relief pressure set procedure:
   - 1.1 Ensure all connections between the N2 bottle and the PRV are tight and secure.
   - 1.2 Adjust (increase) the back-pressure regulator (6) to the highest pressure setting.
   - 1.3 Adjust (decrease) the pressure regulator (2) on the bottle to the lowest pressure setting.
   - 1.4 Open the main bottle valve (3) and observe the pressure on the main bottle pressure gauge (4).
   - 1.5 Observe the pressure on the regulated side of the regulator as indicated on the pressure gauge (5).
   - 1.6 The main pressure gauge (4) will read the bottle pressure, while the regulated pressure gauge (5) should show 0 (zero) psi if the regulator is adjusted properly.
   - 1.7 Slowly adjust the main pressure regulator (2) until the desired pressure is indicated on both the regulated pressure gauge (5) and back pressure regulator gauge (7). These pressures should match.
   - 1.8 Adjust (decrease) the back-pressure regulator (6) until it starts to bleed off pressure from the N2 line (8) and then adjust (increase) it just until the flow of N2 stops.
   - 1.9 Hydro test the PRV and determine if the relief pressure is accurate or if it needs to be increased or decreased. Use small increments in the N2 pressure to adjust the relief pressure.
   - 1.10 If the N2 pressure needs to be increased go to step 2, if the pressure needs to be decreased go to step 3.

2. Increase the N2 pressure
   - 2.1 Adjust (increase) the back-pressure regulator (6) to the highest pressure setting.
   - 2.2 Go to step 1.7.

3. Decrease the N2 pressure
   - 3.1 Adjust (decrease) the main pressure regulator (2) and the back-pressure regulator (6) at the same time until the pressure on gauges (5) & (7) drop below the desired pressure setting.
   - 3.2 Adjust (increase) the back-pressure regulator (6) to the highest pressure setting.
   - 3.3 Go to step 1.7.

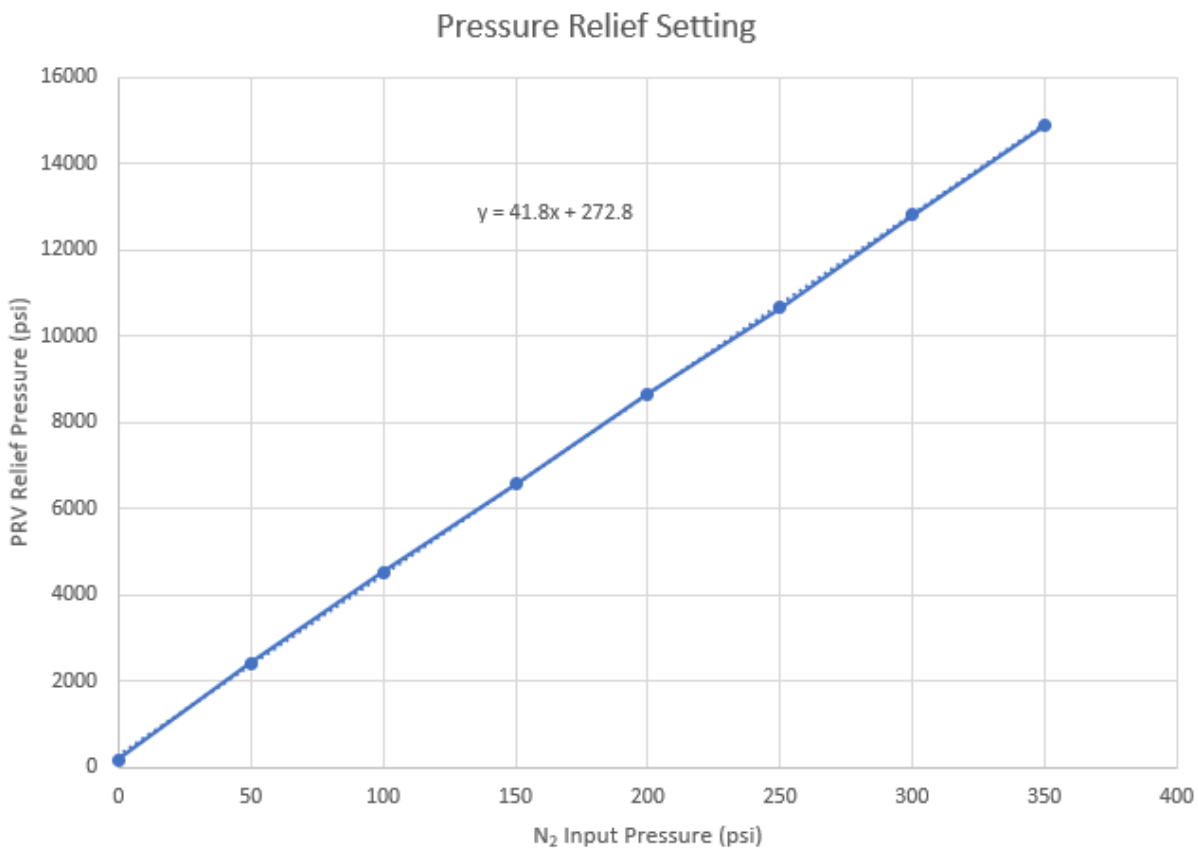



**Figure 2: Estimated Pressure Settings**

**WARNING:** The PRV is only to be used as an emergency pressure relief device, it should not be subjected to continuous flow. After an overpressure event where the valve has experienced an extended flow or been exposed to abrasive fluids it may not reseal completely. The valve should be serviced and inspected after any in service overpressure event to check that all sealing surfaces are in good condition to ensure the valve will properly seal. Not properly inspecting the valve after any discharge event increases the risk of leakage during operation.

**CAUTION: Always wear appropriate PPE (safety glasses, gloves, steel toed boots, etc.) to prevent injury.**

**CAUTION: Always ensure proper ventilation when working with Nitrogen.**

Contact your local repair shop for assistance.

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