

# Operating Instructions

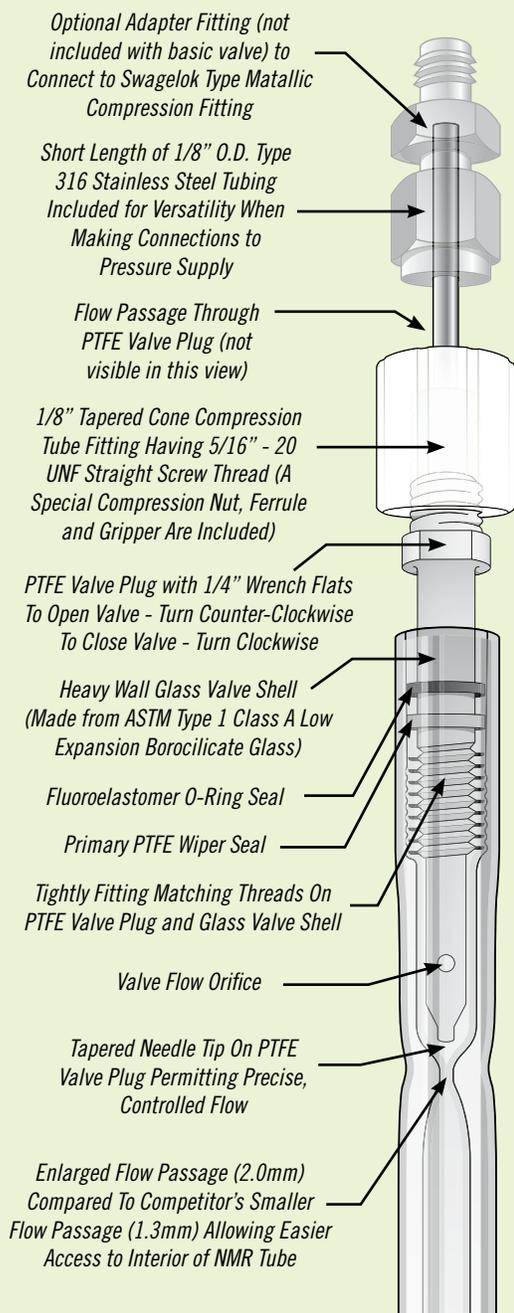
## NORELL® HPV HIGH PRESSURE VALVED NMR SAMPLE TUBES

The HPV High Pressure Valved NMR Sample Tubes facilitate experiments requiring conditions such as pressurized inert atmosphere blanketing, addition of reactive gaseous reagents under pressure, containment of low boiling point solvents or samples at elevated temperatures, and so on.

The High Pressure valves feature a heavy wall glass shell, along with a fully threaded, closely fitting PTFE valve plug held tightly within the glass valve shell for maximum pressure capability and leak resistance, thereby allowing high vacuum use as well. The tapered tip design of the PTFE valve plug permits precise flow control through the valve under high pressure or vacuum.

The HPV Valved NMR tube quickly and easily connects to 1/8 inch (3.2mm) OD metallic or nonmetallic pressure tubing, such as stainless steel, brass, aluminum, PEEK, PTFE, etc., using the included special compression fittings.

We recommend limiting the maximum operating pressure to 700 kPa (7 bar, 100 psi) for a 5mm thin wall NMR tube, 1050 kPa (10.5 bar, 150 psi) for a 5mm medium wall NMR tube, or 1400 kPa (14 bar, 200 psi) for a 5mm heavy wall NMR tube. (Additional information can be found on our website at: Valved NMR Sample Tubes for High Pressure from NORELL®).



1. To make the connection to a pressure source, such as an argon or hydrogen gas cylinder, for example, one end of a length of new pressure tubing of 1/8 inch OD (not supplied with the HPV Valved NMR Tube) must first be connected to the gas pressure regulator outlet, or other source of gas pressure. (Ensure that the regulated pressure is within the safe limits described above for the particular HPV Valved NMR Tube to be used, as well).

2. After this connection is made, the HPV Valved NMR Tube can be easily and quickly connected to the other end of the pressure tubing by slipping the compression nut onto the tubing, followed by the slotted gripper, oriented with the tapered end facing into the threaded end of the compression nut, and lastly the solid ferrule, with the tapered end facing away from the gripper and compression nut.

3. Insert the pressure tubing into the threaded opening of the white PTFE valve plug until the tubing bottoms, then slide the ferrule, gripper and compression nut over the tubing, into the white PTFE valve plug and turn the compression nut until the threads engage. Continue turning the compression nut until it contacts the gripper and ferrule, then finger tighten one additional complete turn to fully compress the ferrule onto the pressure tubing. Lightly tug at the pressure tubing to be sure it is held firmly in place.

4. The HPV Valved NMR Tube can also be connected directly to an existing pressure line having 1/8 inch Swagelok® type metallic double-ferrule fittings already installed, but we advise using the Optional Union Adapter (not included but available separately as Item No. HPV-1/8X1/8-UNION) to make a transition to Swagelok® type fittings, as shown in the adjacent illustration. This adapter can be installed to one end of the short piece of included stainless steel tube, allowing the other end to be connected to the HPV Valved NMR Tube using the recommended special compression fittings included with the HPV Valved NMR Tube. The short length of stainless steel tube can also be inserted into, for example, a flexible 1/8 inch ID braid-reinforced pressure hose and secured with a small worm drive hose clamp.

5. Gas pressure can now be applied to the HPV Valved NMR Tube. Turn the top of the white PTFE valve plug counter-clockwise (CCW) to lift the valve plug from its seated, closed position, allowing gas to flow through the central axial passage of the PTFE valve plug, out through the valve flow orifice, into the surrounding annular space of the glass valve shell and finally through the open valve into the interior of the NMR tube. (Note: an optional 1/4 inch open end wrench, not included but available separately as Item No. HPV-1/4-WRENCH, is very helpful to open and close the valve using the wrench flats at the top of the valve plug).

6. After the desired level of pressure has been reached, the HPV Valve can be closed by turning the white PTFE valve plug fully clockwise (CW) until the valve plug is tightly sealed, as shown by the white band of contact then close any additional valve(s) as necessary to the pressure source.

7. To disconnect the HPV Valved NMR Tube from the pressure supply, turn the compression nut counter-clockwise (CCW) until the compression nut, ferrule and pressure line pull free, allowing the HPV Valved NMR Tube to be taken elsewhere as needed.

8. To disassemble the HPV Valved NMR Tube for cleaning, while working in a fume hood, slowly turn the white PTFE valve plug counter-clockwise (CCW) to release any residual pressure contained within, then continue turning the valve plug until the threads disengage, allowing the valve plug to be gently pulled and removed from the glass valve shell.

Copyright ©2016 NORELL® No. 1.7.16