

PD Series

Charging Instructions



PD Series Gas Charged Dampener
Well Service, Drilling, Slurry & Industrial Service



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MATERIALS NEEDED:

- Pure Nitrogen Gas – At greater pressure than desired pre-charge pressure
- Regulator – Must accommodate desired pre-charge pressure
- Charging Hose Kit
- General Hand Tools



WARNING

Verify that your Nitrogen bottles contain pure nitrogen gas. There have been documented reports of both end users and service providers using bottles containing all or up to 30% oxygen to charge their diaphragms/bladders. Both incidents led to catastrophic dampener explosions, resulting in near miss incidents. This type of incident represents a potential loss of life.

The dampener must be isolated from the system (0 PSIG) and fluid drained before pre-charging. Always pre-charge with NITROGEN! Using any other gas, such as compressed air, may cause an explosion and/or serious bodily injury to personnel.

INTRODUCTION:

PPC recommends using a reputable nitrogen gas supplier that can provide written bottle filling procedures and verification for nitrogen gas purity. PPC further recommends that each bottle be clearly marked with an appropriate Compressed Nitrogen Gas Association shoulder label. All nitrogen gas bottles should come with a 580 - type valve unless you are using a bottle with a greater than 3000 psig pressure rating, which will have a 680 - type valve installed. One of the most important factors in proper pulsation dampener performance is establishing the correct pre-charge pressure. Normally, the pre-charge pressure is based on charging the dampener up to 75% of the minimum system operating pressure, to a maximum of 2500 psig (172.4 bar). As a general rule, the pre-charge ratio (pre-charge pressure / operating pressure) should fall between 25% and 75% at system operating conditions. Operating the dampener with a pre-charge ratio outside of this range will have potentially negative effects on the diaphragm service life.

Pre-charging the diaphragm is accomplished by using commercially available nitrogen cylinders. The number of nitrogen cylinders required to pre-charge the diaphragm will depend on dampener capacity and pre-charge pressure. The chart that follows is based on the use of STD 224 cubic feet, 2200 PSI dry nitrogen cylinders.

Cylinders Required		
Unit	Pre-charge Pressure	No. Cylinders Required
PD05 Series	0 - 1400	1
	1400 - 1600	2
	1600 - 2200	3
PD10 Series	0 - 900	1
	900 - 1500	2
	1500 - 2500	3
PD20 Series	0 - 770	1
	770 - 1300	2
	1300 - 2500	3

CHARGING INSTRUCTIONS:

1. Remove the valve cover by locating and removing the two 1/2" bolts located on the valve cover.
2. Ensure that all cover plate nuts are secured and evenly tightened according to the torque table below.

Unit	Bolt Size	UNC	Lubricated Torque	
			in	mm
PD05-5000	1.375	8	600	813
PD05-7500	1.625	8	900	1220
PD05-10000	1.625	8	900	1220
PD05-15000	2.5	8	1500	2034
PD10-5000	1.625	8	930	686
PD10-7500	2	8	1100	1491
PD20-5000	1.875	8	1500	2033
PD20-7500	2.25	8	1500	2033

Note: For PD units equipped with a 1-1/4"-7NC socket head cap screw, the torque for that fastener is 1175ft. lbs.

1. Turn the loading valve clockwise until it stops to ensure full closure; do not over-tighten.
2. Remove protective cap from loading valve.
3. Install regulator onto nitrogen source.
4. Connect the charging hose assembly to the loading valve and the regulator on the nitrogen cylinder.
5. Set regulator to 0-psi.
6. Open the loading valve by turning the 5/8" safety nut three full turns counter-clockwise.
7. Check pre-charge pressure in dampener with charging kit gauge.
NOTE: *Charging hose gauge and dampener gauge should read the same pressure.*
8. Slowly open the nitrogen cylinder valve. With the regulator set to 0-psi there should be little or no flow in the charging hose line.
9. Slowly adjust the regulator to allow nitrogen to flow until the recommended pre-charge pressure shows on the regulator gauge.
10. Allow the pressure in the dampener to build to the proper pre-charge pressure.
NOTE: *Additional cylinders may be required to bring the dampener to proper pressure. If additional cylinders are required, repeat steps #5 through #14 until the desired pressure is obtained.*

NOTE: *When the pre-charge is complete, the regulator pressure, the charging hose pressure, and dampener pressure gauge should read the same. Dampener gauge must read the same as other gauges. If not, replace dampener gauge.*
11. Close the loading valve by turning the safety nut fully clockwise until it stops and is snug.
NOTE: *Failure to properly close the loading valve will result in nitrogen leaking out of the diaphragm and result in poor performance and early diaphragm failure.*
12. Close the nitrogen cylinder valve and reduce the pressure regulator to 0-psi to ensure no additional gas comes out of the cylinder tank.
13. Slowly bleed the pressure from the charging hose by slightly loosening the cylinder connection nut until the charging hose pressure gauge reads zero. This should be done with caution. Release all pressure in the line before fully removing the connection.
14. Apply soapy water or similar leak detection fluid around the fittings, connections, studs, and flange mating areas. Bubbles forming in the applied water indicates a leak. If a leak is detected, re-tighten the connections and check again. Reinstallation of the gauge or loading valve in the dampener may be required to stop a leak.
15. Remove the charging hose assembly and reinstall the loading valve protective cap.
16. Confirm the pre-charge pressure on the dampener pressure gauge.
17. Reinstall the valve cover and securely tighten the 1/2" bolts to 56 ft-lbs of torque. Your pulsation dampener is now ready for operation.

This manual describes operating practices and maintenance procedures applicable to PD Series Pulsation Dampeners manufactured by Performance Pulsation Control, Inc. The information contained herein reflects recommendations based on industry best practices and recognized safety protocols. Use of the information and procedures contained in this manual is voluntary and is to be implemented at the sole discretion of the user. The user is at all times responsible for operating and maintaining pulsation dampeners in a manner that is safe, conforms to the owner's established business practices, and is in conformance with applicable regulations.

Please contact Performance Pulsation Control for assistance or questions concerning the information in this manual.