

# DR Series

Reactive Discharge Dampeners For Drilling



Instruction, Operating & Maintenance Manual

**FPC PERFORMANCE™**  
**PULSATION CONTROL**

Manufacturer of Pulsation Control Products

[www.performancepulsation.com](http://www.performancepulsation.com) | [sales@performancepulsation.com](mailto:sales@performancepulsation.com) | 1.833.PPC.PROD  
3309 Essex Dr. Suite 200, Richardson, Texas 75082 | Phone: 972.699.8600 | Fax: 972.699.8602

2018 All Rights Reserved | Rev10.1.2018

This manual describes operating practices and maintenance procedures applicable to DR Series Discharge Mudpump Dampeners manufactured by Performance Pulsation Control, Inc. (PPC). 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.

**NOTE:** Please read all instructions carefully before proceeding with the installation, operation, and charging of this equipment. Contact Performance Pulsation Control for assistance or questions concerning the information in this manual.

**MATERIALS NEEDED:**

- General Hand Tools

**INSTALLATION INSTRUCTIONS:**

**NOTE:** Before installation, visually check the dampener for damage. For maximum performance, the dampener must be installed as close as possible to the pump on which it is to be used. Verify that the mounting provision location is no more than 10 times the relevant pipe diameter from the pump discharge.

1. Lift the pulsation dampener using the lifting lugs.


**CAUTION**

Only lift the dampener when completely drained.

2. Install the dampener within the piping as indicated by the directional arrow on the inlet connection. Bolting should be per standard piping practices. Flange gaskets should be suitable for the service.

**NOTE:** Dampeners require proper support in order to reduce nozzle and piping loads. Support should be provided with PPC's standard footpads or with special supports as may be specified by user.

**START UP INSTRUCTIONS:**

Be sure that prior to start-up the dampener is fully primed. This will avoid trapped air being absorbed into the fluid flow and increasing the time to achieve maximum performance.


**WARNING**

If the fluid is toxic, flammable, or corrosive, take proper precautions to remove the vapor.

1. Start pump.
2. Slowly open the vent until liquid comes out, then immediately close the vent.


**CAUTION**

Take care to capture any fluid that flows out in order to prevent spillage or area contamination.

**LOW TEMPERATURE OPERATION**

To prevent damaging the dampener or stabilizer from freezing of liquids in the system during operation or shut-down, the dampener should be protected from freezing temperatures or drained if freezing temperatures are expected.

**OVERVIEW**

PPC's Maintenance Free pulsation equipment is intended to be maintenance free, but as with all pressure vessels some general inspection of equipment is necessary over time. Both the discharge dampener and the pump are subjected to the same pressures and effects imposed by the pumped media. This means that over time the effects of the pumping action and pump flow can deteriorate components of the discharge dampener. The following recommendations are made for inspection and or maintenance of PPC Reactive Discharge Dampeners.

General review of all components of the pulsation dampener should be done on the regular scheduled timing of your major component inspection and maintenance – every 12 to 24 months is a general guideline in lieu of no other set standard.

Minimally, the review should consist of inspection of the following items:

1. Pressure Drop Tube Assembly (PDTA),if applicable
2. Vent, if applicable
3. Drain, if applicable
4. Pressure Vessel Body Exterior Surface
5. Footpads
6. Lift Lugs

**INSPECTION PROCEDURE**

1. Isolate the discharge dampener from the discharge system and the discharge manifold of the pump.
2. Relieve pressure off of discharge dampener. Use system vent, dampener vent, or dampener drain, if available.
3. Drain fluid discharge dampener by use of system drain or dampener drain, insuring all possible fluid is removed.

 <b>CAUTION</b>
<p>Refer to standard procedures for proper management of corrosive or otherwise dangerous fluids.</p>

4. Vent and drain openings should be opened to verify that the passages are still clear for the purpose which it was intended.

**NOTE:** *In either case the openings may require periodic cleaning and inspection to keep the openings operational. The openings can plug with the solids present in the drilling process.*

5. See steps 14-28 if PDTA is present.
6. Examine the inner surfaces of the discharge dampener for any solids or drilling mud build-up. Remove any accumulated solids from the unit to insure that the full volume of the dampener is restored for use to maximize performance.
7. Inspect the exterior of the dampener, lifting lugs, and footpads (if present) for damage, cracks, general wear, and corrosion that may compromise the safe operation of the unit.

**NOTE:** *If the dampener has been used when pumping saltwater or any other corrosive fluid mixes, the wall-thickness should be checked using appropriate methods. If the wall thickness is found to be below minimum required, contact PPC for further assistance. Refer to your U1A for required minimum wall thickness.*

8. Ensure all flange grooves and mating surfaces are clean. When the discharge dampener has been fully inspected, cleaned and any ancillary components re-conditioned or received for replacement, the unit is ready for re-assembly and return to service.
9. Re-install the PDTA (if present) using new ring gaskets for both sealing surfaces of the PDTA.
10. Re-connect the system flange to the discharge dampener outlet flange with the existing fasteners (bolts or studs/nuts). Secure studs and nuts using approved procedures and torque levels.
11. Insure that the vent and drain openings are closed and sealed properly.

12. Fill unit with process fluid and vent unit to insure that the unit is full. Reseal vent opening.
13. Prepare discharge dampener for system use by opening the appropriate discharge system valves.

### **REMOVAL, INSPECTION AND RECONDITIONING OF PDTA OR EXTERNAL ORIFICE (EO)**

*\*See steps 1-13 before proceeding.*

*\*Skip steps 14-30 if no PDTA is present.*

14. The Pressure Drop Tube Assembly (PDTA) or External Orifice (EO) located at the discharge dampener outlet connection needs to be removed for inspection.
15. Unbolt the discharge dampener outlet flange from the piping system flange.
16. Remove the PDTA/EO completely from the studded outlet and set on the ground for inspection.
17. Wash the PDTA/EO to remove all mud and solids from all surfaces.
18. Examine the flange surfaces especially in the groove areas to insure that no damage has occurred to these sealing surfaces. Both sides of the plate flange need to be examined for any damage. Note any observations.
19. Examine the outer tube surfaces for any signs of damage. This damage may be pitting, erosion, or mechanical damage. Note any observations.
20. Examine the inner tube surface for any signs of damage. Again, this damage may be pitting, erosion, or mechanical damage. Measurement of the inner diameter of the tube may be necessary to verify if any erosion is occurring. Measurements at the end of the tube and measurements further inside the tube will help to identify how much wear has occurred in the pipe. Note any observations and measurements.

21. If ID is worn greater than 1/8", replace tube.  
The ID can be found in the P/N for the replacement Pressure Drop Tube Assembly (PDTA). It will be the characters that read 3XXH or 3XH or 4XXH. Contact PPC if further clarification is needed.
22. Entrance Edge: If rounded more than 1/32" change or reface the tube. We recommend re-facing of the PDTA by removing no more than 1/8" per re-face operation for no more than four times.  
  
The PDTA is not to be shortened more than 1/2" from its original length. The location within the sphere where the PDTA is located is designed to yield maximum acoustical benefits.
23. If there are any questions based on these observations contact PPC for any action which may be required prior to re-installation of the PDTA.  
  
**NOTE:** *The PDTA is to be replaced if significant damage or wear has occurred. Contact PPC for pricing details.*
24. Examine inside the discharge dampener for any solids or drilling mud build up. Clean any solids out of the unit to insure that the full volume of the dampener is available.
25. When the discharge dampener has been fully inspected, cleaned, and the review process dictates that everything is satisfactory, the unit is ready for re-assembly and to be put back into service.
26. Re-install the PDTA using new ring gaskets for both sealing surfaces of the PDTA.
27. Re-connect the system flange to the discharge dampener outlet flange with the existing fasteners (bolts or studs/nuts). Torque studs and nuts using standard practice of torquing pattern and torque.
28. Ensure that the vent and drain openings are closed and sealed properly.
29. Fill unit with process fluid and vent unit to insure that the unit is full of fluid. Reseal vent opening.
30. Prepare discharge dampener for system use by opening the appropriate discharge system valves.  
  
**NOTE:** *Please use all safety measures required to insure that all procedures which are performed do not put at risk any personnel or equipment.*