



Frostfree Nosepumps Ltd.

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Installation Instructions

The design of the Frostfree Nosepump™ is such that it does not require heating to prevent freezing. However, installing the pump correctly is essential to its operation.

PLEASE FOLLOW INSTRUCTIONS CAREFULLY !

Typical installations include:

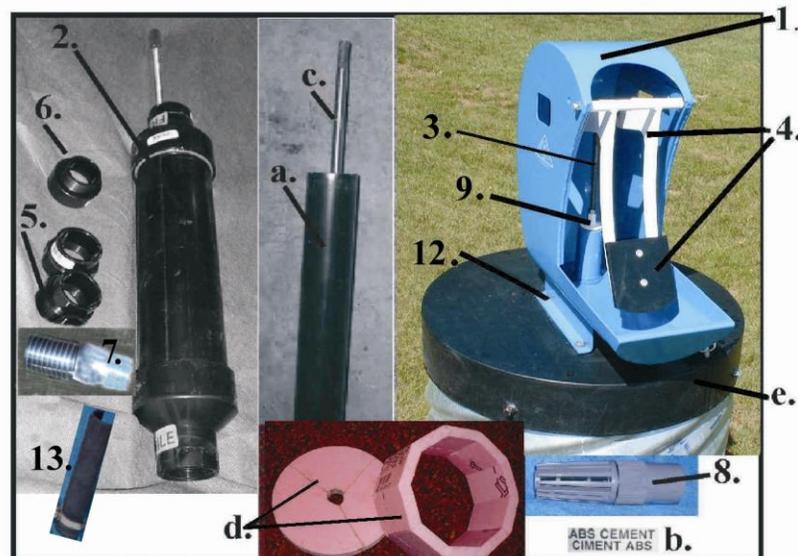
- 1) to draw water from **dugouts, ponds or spring developments** thereby making them become year-round watering sites without livestock accessing the source,
- 2) to draw from a **well** drilled into an underground aquifer, and/or
- 3) to draw from a wet well created by inserting a pressure line into a culvert and using a pitless adapter to regulate the depth of water .

Information regarding these typical installations is located on our website: <http://www.frostfreenosepumps.com> and also attached.

The step-by-step procedure to install the pump is shown on the **enclosed video or DVD**.

The box contains:

- 1) Nosepump
- 2) Cylinder
- 3) 2 lengths of all-thread rod with couplers and nuts
- 4) Pendulum with nose plate & stainless steel pin
- 5) ABS male threaded 1½" fittings (2)
- 6) ABS male threaded 1½" x 1¼" fitting (1)
- 7) Galvanized nipple (1) & clamps (2)
- 8) Foot valve
- 9) White piston stop
- 10) Thread tape (not shown)
- 11) Caulking material (not shown)
- 12) 4 - ⅜" bolts to attach pump to lid
- 13) Diverter & clamp



You will need to purchase:

- a. 12' (depends on depth) length of ABS 1½" pipe
- b. ABS glue to attached enclosed fittings
- c. 10' length (or # of 10 ft. lengths required for individual depth) of ⅜" all thread rod (pull rod)
- d. An insulation sleeve (recommend 2 - 4' lengths) & 2 insulation discs (instructions provided)
- e. Steel lid with 4 - ⅜" bolts (instructions provided)
- f. Washers for leveling (not shown)

The length of ABS pipe is usually 12' to be cut into a 9'10" length above the cylinder (supply pipe) and a 2'2" length below the cylinder (tail pipe) to the foot valve. If this combined assembly does not reach water, then you must increase the length of tail pipe. **Do not have the length below the cylinder (tail pipe) longer than 20'**. If more length is needed, put additional lengths of pipe and rod between the cylinder and nosepump. The longer the distance to static water, the harder the push for the cows. The nosepump has two positions for the pendulum. The back position (on the nosepump) will improve the mechanical advantage for deeper installations, but will give a shorter stroke. For depths to static water of greater than 35', contact Frostfree Nosepumps Ltd. for assistance, if desired. The application is not recommended if static water is below 50'. **If installing more than one pump** on a single culvert, place the pumps side-by-side facing in opposite direction, keeping the holes as close to the centre of the culvert as possible.



Steps:

- 1) Drill a 7/64" hole in supply pipe 5' down. (The lower the hole is in the pipe, the more strokes it will take to bring water up. A hole drilled at 5' will take between four and five strokes.) During the training period, this hole may be closed off temporarily with electrical tape. If you do this, remember to remove the tape prior to freezing temperatures! (A 2nd. 7/64" hole may be drilled 5" down the pipe for training during freezing temperatures. Temporarily close the 5' hole during the training period.)
- 2) Glue 1½" fitting onto ABS supply pipe. (Purchase and assemble additional lengths if more than 10' is required.) Warm top end of ABS pipe with heat gun or hair dryer to receive galvanized barbed nipple. Secure with hose clamps while warm. (See additional diagram below)
- 3) Glue 1½" fitting on top of tail pipe and 1¼" fitting on bottom end of tail pipe.
- 4) Put pull rod into supply pipe.
- 5) Attach long piece (16") of all-thread rod to top of pull rod. (If disconnected in the future, disconnect from the side without the jam nut.)
- 6) Attach all-thread rod in cylinder to bottom of pull rod. (Again disconnect in future from side without jam nut.)
- 7) Wrap male bottom end of supply pipe with teflon tape. (A seal is important.) Attach cylinder to bottom end of supply pipe. The cylinder is fragile in the horizontal position. **Handle carefully. We recommend hand tightening. If using pipe wrench to attach, use very carefully. A cracked ABS fitting will leak.**
- 8) Wrap 1½" end of tail pipe with tape. Attach to bottom end of cylinder.
- 9) Wrap 1¼" end of tail pipe with tape. Attach foot valve to tail pipe.
- 10) Install insulation sleeves (see instructions for making sleeve) in culvert, 4 inches down from the rim.
- 11) Locate (using the lid with 4 pre-drilled holes) & drill holes into top edge of culvert to receive set screw bolts from the lid.
- 12) Lower the cylinder and pipe carefully into the culvert. (DO NOT BUMP THE CYLINDER!)
- 13) Place insulation lids (see instructions for making insulation lid) over pipe.
- 14) Place steel lid (see instructions for making steel lid) over pipe.
- 15) Screw pump unit to the top of the ABS supply pipe (galvanized nipple) and wrap with caulking so that when you lower the unit to the lid it will seal the gap between the pipe and the hole in the lid.
- 16) Bolt down pump to the steel lid. Use washers between lid & pump to level nose pump.
- 17) Bolt steel lid to culvert. Bolts need to penetrate holes drilled in step #11.
- 18) Remove 3 nuts from all-thread rod.
- 19) Screw piston stop onto all-thread rod.
- 20) Screw 2 nuts back onto rod.
- 21) Place short piece (9") of all-thread rod through holes at top front edge of hood and through pendulum, tightening lock nuts until pendulum moves freely. The two hole positions offer a choice of mechanical advantage. The stainless steel pin will need to be moved to the appropriate hole in the back of the pendulum, to match the hole position chosen at the front of the hood. The pull rod should be centred in the riser pipe.
- 22) Slip all-thread rod at back of pump through hole in the stainless steel pin at the back of the pendulum.
- 23) Screw nut on top of all-thread rod, just until rod shows at top of nut. (**All-thread rod extending past nut could eventually damage the underside of hood.**)
- 24) Tighten the jam nuts above and below the stainless steel pin in back of pendulum with wrenches.
- 25) Screw piston stop down until the front of the pendulum is approximately 4" from the front of trough.
- 26) With wrenches, tighten jam nut against piston stop. Clamp water diverter into place. (See diag. below)
- 27) You are ready to pump water. The first time will take extra pumps. If it is a longer pull you may need to prime the first time. **It is important that the stroke is stopped by the pendulum hitting the underside of the hood.**
- 28) Always check that the water is draining down the supply pipe. If it is not, the pipe will freeze.
- 29) Your regular maintenance is to check that the water is draining down the riser pipe and that the cows have not created too much ice around the trough, which could restrict the return of the pendulum. Tap with a deadblow hammer to clear ice away regularly in the winter...and enjoy watching your livestock pump their own water.

Galvanized Adapter



Galvanized nipple

Hose clamps

1 1/2" ABS supply pipe

This nipple can replace a top 1 1/2" ABS male fitting that threads into the bottom of the Frostfree Nosepump to prevent the top ABS fitting from breaking due to any movement or flexing of the lid.



The ABS pipe has to be heated with a heat gun or hair dryer before the ABS will receive the galvanized nipple. Once inserted, the clamps should be tightened quickly while the ABS is soft.

The presence of the hose clamps on the pipe will require an enlarged hole in the steel lid and insulation.

It is important that the 1 1/2" ABS supply pipe, including the galvanized nipple, be the same length as the 3/8" pull rod inside. This requires cutting the 1 1/2" ABS supply pipe to 9' 10" before pressing in the galvanized fitting to identically match the 10' 3/8" pull rod. When assembly of the entire pump is complete, check that the stroke of the pendulum is not causing contact of the piston either at the top or bottom of the cylinder!

Water Diverter



The water diverter will direct the water flow to the back only.

Positioning the opening to the back and securing with one hose clamp will reduce the ice build up on the sides of the hood and back of the pendulum during cold temperatures.

The hose clamp should be mounted as low as possible, to prevent the white washer from binding.

Insulation Sleeves



Assemble so that extended ends are all in the same position so that the top 4' sleeve overlaps the bottom 4' sleeve.



Note how the edges on this sleeve are the opposite of the edges on the sleeve above – making a match when you put one over the other.

We suggest hot glue gun gluing of the strips together so that you are handling one piece instead of many pieces. We use hot glue because it sets fast, but use only several fine lines of glue – too much glue will melt its way into the Styrofoam and not provide any adhesion. Glue one edge and quickly hold it to the next piece and hold for several seconds.



This shows the two 4' sleeves together, making it 8 feet long. The yellow straps are what we use to hold the sleeves while the glue dries.

Push the two sleeves down inside the culvert to approximately 4.5" from the top edge of the culvert so that the 2 insulation discs fit slightly below the rim of the culvert.



LID & INSULATION INSTRUCTIONS

Instructions to build **metal lid for 24" culvert**



1. Cut a 25½" diameter circle (for a 24" culvert) from a sheet of 10 gauge metal. It is safest to verify the outside dimension (OD) of your culvert because they will vary. Make the circle slightly larger than the OD measurement (including the depth of the ribs). A larger culvert will require heavier gauge steel, to reduce flexing. **Always build the lid with the crown up so water flows off.**
2. Cut out a 2½" hole (keyholed to accommodate the clamps on the galvanized adapter) either in the centre of the metal circle for 1 nosepump, OR centred, 8¼" apart for 2 nosepumps. (This places 2 pumps side by side pointing in opposite directions as shown in the diagram above. Detailed instructions for 2 pumps below.)
3. Weld a 3" - 6" flange (of lighter weight metal) perpendicular around the perimeter of the circle. A 25½" circle requires 7' of flange material.
4. Drill 4, 7/16" holes equally spaced around the flange.
5. Weld a ⅜" nut on the outside of the flange, centred over each of the holes, to receive a ⅜" bolt, which will anchor the lid to the culvert.
6. Mount the nosepump on the lid so that you can pre-drill the holes for the bolts that will fasten the nosepump to the lid.
7. Bolt nosepump to lid and weld nuts permanently to the underside of the lid. This will allow you to lift the pump from the lid, without removing the lid or losing the nuts.
8. Paint lid if desired.

Building A Lid for 2 Pumps

1. Once the lid is constructed according to the directions, mark a line across the lid that goes through the centre point.
2. On that line, mark a spot at 4⅛" on each side of the centre point.
3. Centred on each spot, cut 2½" holes (keyholed to accommodate the hose clamps) that will receive the nipple on the underside of each of the Frostfree Nosepumps (FFNP).
4. Once those holes are ready, you can use each nosepump as a template to mark the holes for the bolts that hold the FFNP to the lid.
5. Use the centre line as a guide to square the pumps, facing the pumps 180° from each other.
6. Mark the 4 bolt holes. (Do one pump at a time and use the specific pump for its specific location just in case there are slight differences. Identify the pump to its location.)
7. Take the pump off and drill the holes.
8. Put the pump back on the lid, and using the enclosed bolts and nuts, secure the pump to the lid.
9. Flip the pump and lid over and weld the nuts to the underside of the lid using care not to weld the bolt to the nut.
10. Repeat for the 2nd. FFNP.
11. Be aware that your lid will be crowned and that washers will be required between the lid and the FFNP to level.



Instructions to build *insulation* sleeve and lid for 24" culvert

- 1) Purchase 2 sheets of 2" closed-cell rigid insulation R-10, 4 ft. x 8 ft. (or 4 - 2 ft. x 8 ft. pieces). This will make two - 4' insulation sleeves, and two 24" insulation lids, giving you 8 feet of insulation in your culvert.
- 2) Rip, on a table saw, 10 strips 7¼" wide, with an 18 degree bevel on both edges. 10 strips 4 ft. long will make a 4' sleeve. (By turning the sheet over toward you each time you saw a strip, the angles will all meet correctly when you glue them together, & the top edges will line up.)
- 3) Glue strips together with a glue gun. The sleeve needs to fit tight enough inside the culvert to hang on the culvert wall. If it is too tight, take a sliver out at a joint. If it is too loose, add a sliver into a joint.
- 4) Push the first 4' sleeve down inside the culvert. Push the second 4' sleeve down to a level 4" below the top edge to allow room for two lid insulations.
- 5) Cut two 24" discs of 2" insulation for the lid.
- 6) Cut out a 2¼" hole in the centre of the top insulation lid for a single nosepump, OR centred, 8" apart for a double installation (2 nosepumps). *(For a draft-free installation, the lower insulation lid only should have a 1 7/8" hole - rather than 2¼" - which would fit snugly around the 1 ½" ABS pipe. This lid is then cut in half for ease of installation around the pipe.)* When the insulation lids are installed, they will be flush with the rim of the culvert.

NOTE: If you have difficulty sliding the insulation sleeves into the culvert, a small tire with rim (the diameter of your culvert) works very well as an aid. Tie a rope to the tire. Place the tire on top of the insulation sleeve. Push down carefully with the front-end loader of your tractor. To push the sleeve below the rim of the culvert, place a piece of large pipe onto the rim of the tire and push down to the level necessary to place your insulation lids.

Calculating the *insulation* sleeve and lid for *any sized* culvert

- 1) Measure the inside diameter of the culvert eg. 29.5" . Calculate the inside circumference (C = 3.14 x diameter) eg. 3.14 x 29.5" = 92.6"
- 2) Divide the circumference by 10 eg. 92.6 ÷ 10 = 9.3"
NOTE: You need to make the strips slightly smaller than this calculation. So, in this example we would use 9.12"
- 3) Cut 10 pieces, each 9.12" at an 18 degree bevel using the table saw as described above.
- 4) Follow instructions as above for 24" culvert.