AREO-POWER UNITIZED FUELER INC.

Installation Instructions for Areo Power Oil/Water Separators And Oil Water Separator Cleanout Procedure

Installation Instructions for Areo Power Underground Oil/Water Separators with either the STI-P3 or ACT 100 Corrosion Protection Systems

1.0 Excavation and Bedding

1.1 The excavation shall be free from any hard or sharp material that may cause damage to the separator tank coating. (Care shall be taken during installation that foreign matter is not introduced into the excavation or backfill).

1.2 The bottom of the excavation shall be covered with fine or pea gravel, clean sand, or No. 8 crushed stone (No. 8 coarse aggregate ASTM-448) to a depth of one foot, suitably graded and leveled.

1.3 The excavation shall extend a distance of at least one foot around the perimeter of the separator tank providing sufficient clearance for anodes.

1.4 Where anchoring by means of a concrete slab is required, the separator tank must not be placed directly on the pad. A layer of fine or pea gravel, clean sand, or No. 8 crushed stone at least 6 inches deep must be spread evenly over the dimensions of the pad to separate the separator tank from the pad. The separator tank shall not be placed on any other hard or sharp material that can cause deformation of the separator tank or damage to the coating.

1.5 If installation is in tidal area, tank bedding material should be fine or pea gravel rather than clean sand.

2.0 Above Ground Air Test

2.1 The temporary plugs and thread protectors installed by the manufacturer shall be removed. Apply compatible, nonhardening pipe sealant to internal bushing threads. Permanent metal plugs shall be installed at all unused openings.

2.2 The dielectric bushings in the STI-P3 OR ACT-100 separator tanks shall not be removed for the unused openings. Plugs used to temporarily seal the separator tank for the above ground air test but later removed for pipe installation shall not be over-tightened. Care shall be taken not to cross thread or damage the nonmetallic bushings when replacing plugs or installing required separator tank piping.

2.3 Single Wall Oil Water Separator Tank: An air test of the separator tank above ground is required. Pressure should not exceed 5 pounds per square inch (PSIG) while a soap solution is applied to weld seams.

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2.4 Dual Wall Oil Water Separator Tank: Dual wall oil water separator tanks require different air pressure testing procedures. Do not connect a high pressure air line directly to the interstitial monitoring port! See Areo Power Unitized Fueler, Inc. decal instructions or consult Areo Power Unitized Fueler, Inc. for air test recommendations.

- Pressurize the inner separator tank to a maximum of 5 psig. Seal the inner tank and disconnect the external air supply.

- Monitor the pressure for a period of one hour. While air tests are generally inconclusive without soaping and the careful inspection for bubbles, this step is recommended to detect a very large leak in the inner separator tank and to prepare for the next step.

- Pressurize the interstice with air from the inner separator tank. Use a second gauge for measuring pressure in the interstice.

- Soap the exterior of the separator tank and inspect for bubbles while continuing to monitor the gauges to detect any pressure drop.

- Release the interstice, then the inner separator tank test pressure and vent both spaces.

- Vacuum testing of the interstitial space of the dual wall oil water separator tank can be used in lieu of or in addition to the air test procedure. Do not apply a vacuum to the primary separator tank or a single wall separator tank. PEI/RP 100-90 also provides guidelines.

2.5 Take necessary safety precautions during air tests. Do not leave separator tanks unattended.

3.0 Coating Repair

3.1 Before placing the separator tank in the excavation, all dirt clods and similar foreign matter shall be cleaned from the tank, and areas of coating damage shall be repaired with a touch-up kit provided.

3.2 Clean damaged coating areas through removal of surface rust, dirt, contaminants, and disbonded coating prior to application of touch-up coating (See SSPC SP-2 "Hand Tool Cleanin-3 "Power Tool Cleaning" for additional guidance). Areas of coating damage shall be roughened up with a wire brush approximately 1" around the damaged area and repaired with a touch-up coating provided. Damaged "High-Life" Fiberglass Reinforced Polyester coating shall be repaired with the FRP repair kit, damaged "Corrocote II" Polyurethane coating shall be repaired with a Polyurethane touch-up coating.

4.0 Separator Tank Handling

4.1 Equipment to lift the separator tank shall be of adequate size to lift and lower the separator tank without dragging and dropping to ensure no damage to the separator tank or the coating.

4.2 Separator tanks shall be carefully lifted and lowered by use of cables or chains of adequate length (not less than 45 degrees included angle) attached to the lifting lugs provided. A spreader bar should be used where necessary. Under no circumstances use chains or slings around the separator tank shell which will damage the separator tank and coating.

5.0 Anode Integrity-Not Applicable for Act 100 Separators

5.1 STI-P3 separator tanks may be equipped with either zinc or magnesium anodes. Whereas magnesium anode are designed only for installation in soil resistivities of 2,000 ohms-cm or greater, zinc anodes are most effective in low resistivities.

5.2 When so shipped, remove protective plastic covering from weld-on zinc anodes to assure proper anode operation. Verify integrity of anode connection prior to back fill. Do not remove cloth bag or cardboard box around anode!

5.3 After an STI-P3 separator tank has been placed in the excavation, if magnesium anode is connected by a lead wire, attachment to the separator tank shall be checked to assure this connection has not been damaged. Where damaged, the connection must be reestablished in strict accordance with STI-P3 specifications.

6.0 Placement Of Separator Tank

The separator tank must be installed in a level and plumb position. Check elevations at each end of the separator tank with a transit and adjust as necessary to ½" in 20'-0". Check elevations across the diameter of the separator tank and adjust to ¼" in 10'0".

7.0 Anchoring

7.1 High water tables or partially flooded excavation sites exert significant buoyant forces on separator tanks. Buoyant forces are partially resisted by the weight of the separator tank, the back fill, and the pavement atop the tank. Additional buoyant restraint when required is obtained by using properly designed hold down straps in conjunction with concrete hold down slabs or dead-man anchors.

7.2 Special care should be exercised when installing hold down straps to ensure that the straps are separated from the separator tank by a separating pad made of inert insulating dielectric material. When flat, inert, insulating, dielectric material is used, the material should be at least 2 inches wider than the hold down straps. The isolating straps should be appropriately placed between the hold down strap and the separator tank so as to prevent damage to the coating.

8.0 Back-Filling

8.1 Back-fill consisting of fine or pea gravel, clean sand, or No. 8 crushed stone similar to bedding material shall be installed around the entire separator tank to create a uniform homogenous environment.

8.2 Special care shall be taken when installing back-fill along the bottom sides of the separator tank to ensure that the separator tank is fully and evenly supported around the bottom quadrant. Hand packing or tamping should be done carefully as to avoid damaging the coating on the separator tank or the anodes.

8.3 The back fill should be placed carefully around the separator tank to the top of the tank.

8.4 Fill separator tank with clean water ballast. After ballasting is complete, check elevations for proper tolerances.

9.0 Piping

9.1 Prior to installation of piping, all openings shall be visually inspected to assure that the STI-P3 OR ACT-100 dielectric nylon bushings remain in place. Where flanged openings have been used, the dielectric isolation shall be confirmed with a continuity tester. No current shall pass through the factory installed dielectric flanges. Dielectric isolation is required to assure separator tank integrity!

9.2 Attach inlet and outlet tees (contractor supplied) to flanged isolation spools provided. Attach separator tank inlet and outlet piping to tees. The separator tank inlet and outlet piping must be sloped from 1/8" to 1/16" per foot to maintain gravity flow. Inlet and outlet inverts have been established in the factory-Do not modify without first consulting the manufacturer!

9.3 Attach separator tank manway extensions, taking care not to damage manway gasket between manway necks and extensions.

9.4 Install vent lines from separator tank inlet and outlet tees and manways to atmosphere. The separator inlet, outlet and manways are to be vented independently from one another. Manways ONLY may be manifolded together as one common vent to grade level. Inlet and outlet tees must be fitted with tapped blind flanges to accept vent piping, manway vent connections are installed in the factory. Separator is designed for operation at atmospheric pressure only. Separator tank inlet, outlet and manways must be vented to atmosphere to assure proper operation.

9.5 For separator tanks with gravity oil skimmers, install oil skimmers and piping. Piping between the separator tank and the waste oil tank must be sloped between 1/8" to 1/16" per foot to maintain gravity flow.

9.6 For separator tanks with oil level sensors and pump-out pipes, install riser pipes using compatible non-hardening sealant taking care not to cross thread or damage the nonmetallic bushings. Torque of 400 to 1000 ft.-lbs. may be required to fully insert pipe. Refer to enclosed manufacturers sensor and control panel wiring diagrams and installation instructions for electrical details!

9.7 The thread protectors of unused openings shall be removed. The dielectric bushings shall not be removed from the unused openings! Permanent metal plugs treated with pipe compound shall be installed at all unused openings.

10.0 Final Air Test

Where air or hydrostatic testing is required after installation the pressure applied shall not be in excess of 5 pounds per square inch (PSIG) and measured at the top of the separator tank.

11.0 Separator Tank Monitoring System Installation

11.1 Each separator tank shall have a cathodic protection monitoring station (PP2, PP1 or other) installed in such a way so that there will be at least a separator tank structure lead easily accessible and identifiable at the finish grade and provide easy placement of a reference electrode during monitoring

11.2 If your separator tank is equipped with a PROTECTION PROVER 2, prior to completion of the back-fill, the monitoring terminal located near the top of the separator tank must be positioned as follows:

11.3 Select a terminal location on a pipe near grade that will be accessible through a grade manhole upon completion of installation.

11.4 Loosen the back nylon pipe lashing by releasing the locking tab. Uncoil enough lead wire from the separator tank mounting lug to reach the terminal location with an additional 4 feet of slack.

11.5 Secure the PP2 terminal to the pipe by tightening the black nylon pipe lashing. The lead wire terminations shall remain sealed.

11.6 Route wire to avoid stain or breakage during backfill. Do not cover PP2 terminal with backfill material.

11.7 If separator tank is equipped with a PROTECTION PROVER 1 monitoring system, which includes a monitor station mounted at the end of the separator tank, prior to any back-filling extend the monitoring system to 4" below grade level without pulling it out of the mounting bracket. The PP1 test station shall be protected by a grade manhole of 7½" minimum diameter.

11.8 Contact between the steel separator tank and the following equipment can nullify the cathodic protection design: external or internal piping, pumps, valves, electrical gauging or monitoring equipment, and grounding systems. A simple continuity test between the PP2 lead wire and each connected system will verify the electrical isolation. Continuity should not be present.

12.0 Final Back-Filling

12.1 Homogenous backfill shall be deposited carefully around separator tank and to a depth of at least one foot over tank to avoid damage to coating especially where tamping is required. (See NFPA 30 and state or local codes for minimum depth of cover required).

12.2 Finally, backfill carefully over the separator tank up to grade level.

12.3 Top off the separator tank with clean water until water is discharged from the outlet piping. The separator tank must be full of water to operate!

12.4 For separator tanks with gravity oil skimmers, adjust the skimmer while water is flowing through the separator tank. Adjust so that the openings are not submerged and the weir is set at the water crest.

13.0 Final Separator Tank Monitoring System Check

13.1 After backfill, continuity can be checked with a high impedance volt meter by fixing a copper/copper sulfate reference cell in the soil and contacting all structures with the other voltmeter lead wire. Do not move the reference cell. Potential differences between the separator tank to soil and all other structures to soil must exceed 3 millivolts to verify electrical isolation.

13.2 All separator tanks must be monitored to assure proper installation and ensure cathodic protection of the separator tank. Monitoring shall be accomplished by taking structure to soil potential readings before pouring concrete or asphalt pad atop the separator tank. Follow applicable local, state, and federal regulations for additional separator tank monitoring requirements.

13.3 Obtain separator tank to soil potential readings with a high impedance voltmeter and a copper/copper sulfate reference electrode placed in moist soil directly above the separator tank. A reading of -850 millivolts or more negative must be obtained to indicate the tank is protected from corrosion. Reference NACE RP-02-85 for more specifics on cathodic protection criteria. Record the reading on the Warranty Validation Card, Installer Information Card and other permanent files. Return Installer Information Card to the Steel Tank Institute.

Oil Water Separator Cleanout Procedure

The Areo Power Unitized Fueler, Inc. Oil/Water Separator is designed to receive, directly from the wastewater drains, various kinds of oil, gasolines, grease and other volatile liquid wastes along with heavy oil sludges; they retain this harmful waste matter and prevent its entry into the drainage system. If not properly maintained, the Areo Power Unitized Fueler Oil/Water Separator will clog and malfunction. Attached are instructions for pumping out and cleaning the oil water separator. This procedure will allow maintenance and cleaning from above.

NOTE: If for any reason personnel must enter the separator, follow safety procedures for entering an explosive and dangerous atmosphere established by OSHA and NFPA.

Maintenance procedure for each chamber are as follows:

1. Preseparator Chamber:

Remove the top cover plate from the oil water separator to expose the pre-separator chamber. Gauge the level of sand, dirt, or debris with wooden gauge stick. Remove the accumulated material with a suction hose from a vacuum vehicle or portable sludge pump. Pump-out all accumulated material from the preseparator chamber. While pumping out the chamber, it may be necessary to direct a high pressure hose downward to loosen up any caked oily solids. With an extension nozzle on the high pressure hose, direct a high pressure hose downward and toward the velocity head diffusion baffle to loosen up any caked oily solids that may have accumulated on the inlet head of the oil water separator. Remove the slurry with the suction hose.

2. Separator Chamber:

Disconnect all voltage carrying power lines to the pump. Disconnect all non-voltage carrying sensor lines to the level sensor. Carefully remove the equipment from the oil water separator. Carefully clean the equipment so as to allow any oily water to flow into the oil water separator. Place the equipment in a safe area to prevent damage. Remove the top cover plate from the oil water separator to expose the preseparator chamber. Gauge the level of sand, dirt, or debris with a wooden gauge stick. Remove the accumulated material with a suction hose from a vacuum vehicle or portable sludge pump. Pump-out all accumulated material from the separator chamber. While pumping out the chamber, it may be necessary to direct a high-pressure hose downward to loosen up any caked oily solids. Remove the slurry with the suction hose. With an extension nozzle on the high pressure hose, direct a high pressure hose downward and toward the parallel plate pack to loosen up any caked oily solids that may have accumulated on the top of the plates. Remove the slurry with the suction hose.

NOTE: When pumping out the pre-separator chamber and the separator chamber, alternate pumpout from chamber to chamber so that the solid level is reduced evenly across the oil water separator. This is to prevent damage to the internal parallel plate pack.

3. **Oil Chamber:**

Disconnect all non-voltage carrying sensor lines to the level sensor. Carefully remove the equipment from the oil water separator. Carefully clean the equipment so as to allow any oil water to flow into the oil water separator. Place the equipment in a safe area to prevent damage. Remove the top cover plate from the oil water separator to expose the oil chamber. Gauge the level of oil/water with a wooden gauge stick. Remove the accumulated oil/water with a suction hose from a vacuum vehicle or portable sludge pump. Pump-out all accumulated oil/water from the oil chamber. With an extension nozzle on the high pressure hose, direct a high pressure hose downward and around the chamber to remove any caked oil from the sides of the chamber. Remove the waste with the suction hose.

4. **Coalescer**

The "Coalescer" filter/coalescer packs can be easily removed from above by removing the manhole cover and pulling the cartridges out by use of their lifting hooks. The filter/coalescer packs should be moved to a convenient location upstream of the separator and washed using a high-pressure hose to remove any debris or gummy deposits that have accumlated on the fibers. Remove all traces of any detergent before replacing the coalescer packs. Replace the coalescer packs and manhole cover.

Finally, check the level sensors with an OHM meter to assure proper operation. Install the level sensors and pump in the oil water separator. Fill the oil water separator with clean fresh water. Note that the separator must be free of any detergent before refilling with clean fresh water.

Replace all equipment, manhole covers etc. Reconnect sensors and voltage carrying power lines.
Refer to "Operation and Maintenance Instructions" earlier in this section for routine maintenance.