

Operating & Maintenance

These instructions cover the installation and maintenance of Federal submersible pumping units. By following the outline and suggestions, the life of the pumping unit can be extended and repairs kept to a minimum.

INSPECTION

Immediately upon receipt of the shipment, inspect and check with the packing list and report to the transportation company's local agent any damage or shortage. Inspect car-on and wrappings before discarding. Parts or accessories may sometimes be wrapped individually and packed in the carton.

STORAGE

If the unit is received sometime in advance of when it can be put to use it should be inspected, rewrapped or re-boxed and stored in a dry location. If the unit is to be stored for a long period of time, rotate the shaft periodically to protect the bearings.

Units should not be stored where temperatures will be below 20 F or above 1300 F. VSS motors are designed to withstand normal procedures encountered in transportation, loading, etc. However, severe shocks such as dropping may cause damage.

MOTORS

Type VSS submersible pumps are driven by submersible motors manufactured by Federal Pump Corporation or Reliance Electric Co. Motors must be grounded in accordance with the National Electrical Code and local codes, by trained personnel to prevent electrical shocks.

To service the motor, disconnect power source from the motor and any accessory devices and allow the motor to come to a complete standstill. Motor control must match motor input in full load amperes. Federal VSS motors contain no thermal protection. Separate over current protection must be provided to prevent burn-

out and possible fire hazard.

Lifting rings are intended for lifting the pump and motor unit only and must not be used to lift additional weight. Motors are submersible in water/sewage only. For maximum depth, refer to VSS literature.

The surface temperature of motor enclosures may reach temperatures which can cause discomfort or injury. Motors may contain gas under pressure due to high temperatures from operation without being submerged. Disassemble with caution.

PIPING

All pipes should be supported independently of the pump to avoid putting undue strain on the pumping unit. A union should be installed in the pump discharge line close to the sump cover so that the discharge pipe can be broken and the pump removed from the pit with the discharge pipe intact. A check valve and a gate valve should also be installed in each pump discharge line. If possible, install the check valve in a 45° line to prevent chattering.

Discharge pipe size should be no smaller than the pump discharge connection size, and in cases of long runs, it should be one or two pipe sizes larger.

PITS AND BASINS

Sump pits or basins should be inspected regularly and the sediment cleaned out as often as required.

CONTROLS

Type VSS submersible pumping units are generally controlled by Federal Type SBS Submers-a-bulb Controllers. See the SBS Installation Instructions for details on installing these Controllers.

WIRING THE SUBMERSIBLE MOTOR

It is important to wire the motors correctly so that the



direction of rotation of the pumps is correct. If the motor can be connected temporarily before it is lowered into the sump, a visual check can be made and the terminal marked for correct rotation. The pump should be turned on its side so that the impeller can be viewed from the suction end of the pump. The motor should be started momentarily and the rotation checked. If it is incorrect, interchange any two leads at the starter and the rotation will be correct. The pump can then be installed in the pit. If the pump and motor unit has already been installed in the pit, the rotation can be checked in any of the following ways:

1. Feel the discharge pipe with the hand while the pump is running. The vibration will be substantial if the pump is running in the wrong direction.
2. Check the amperage draw of the pump while operating. Then switch two leads at the starter and check the amperage draw again. The lower amperage draw will indicate the correct direction of rotation.
3. The pump will have less capacity if rotating in the wrong direction. Check the time it takes to pump the pit down from a high point to a low point. Then switch two leads at the starter and check the time again. The connection that requires the least amount of time to pump the pit down is the correct one.

OPERATING PROBLEMS

The following is a list of common pump operating problems and their possible causes:

1. No water delivered.

- A. Water level too low. Pump not submerged.
- B. Pump clogged.
- C. Motor not running at full speed.
- D. Required discharge head too high for the pump.

2. Pump runs continuously.

- A. Inflow into pit is too great for pump.
- B. Controls not operating properly.
- C. Pump is air bound.
- D. Discharge head required is too high.
- E. Pump shut-off level is too low so that pump is running dry.

3. Pump pit or basin overflows.

- A. Control adjustments not properly set.
- B. Defect in float switch or SBS Control.
- C. Pump capacity too small for required inflow rate.
- D. Impeller partially clogged.
- E. Motor not running up to proper speed.
- F. Discharge head higher than calculated.

4. Pump draws too much amperage.

- A. Pump operating at lower head than that specified.
- B. Motor operating with less than the required voltage.
- C. Wrong direction of rotation.

5. Not enough water pumped.

- A. Pump not running at full speed.
- B. Incorrect direction of rotation.
- C. Pump partially airbound.
- D. Impeller partially clogged.
- E. Discharge head higher than specified.
- F. Mechanical defect (worn housing or impeller, broken impeller, leaking pipe joint, etc.)

ORDERING SPARE PARTS: When ordering spare parts for the Type VSS submersible pumps, furnish the record number and model number from the Federal Pump Corporation nameplate.

