

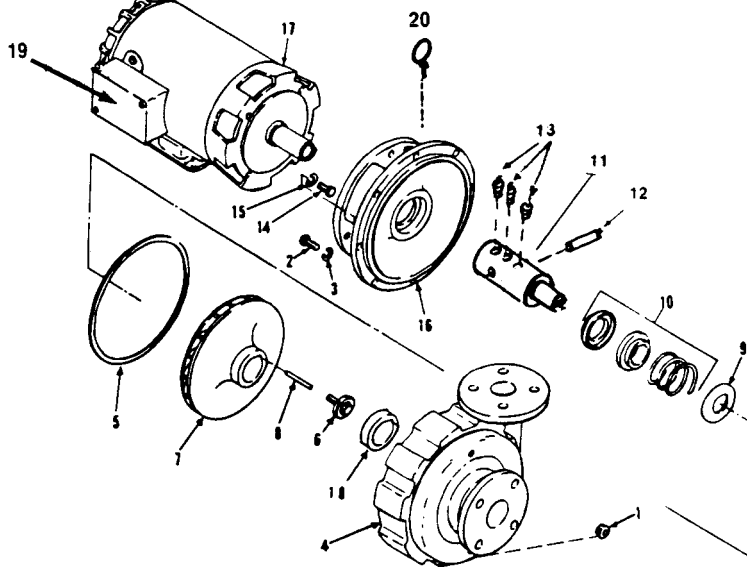
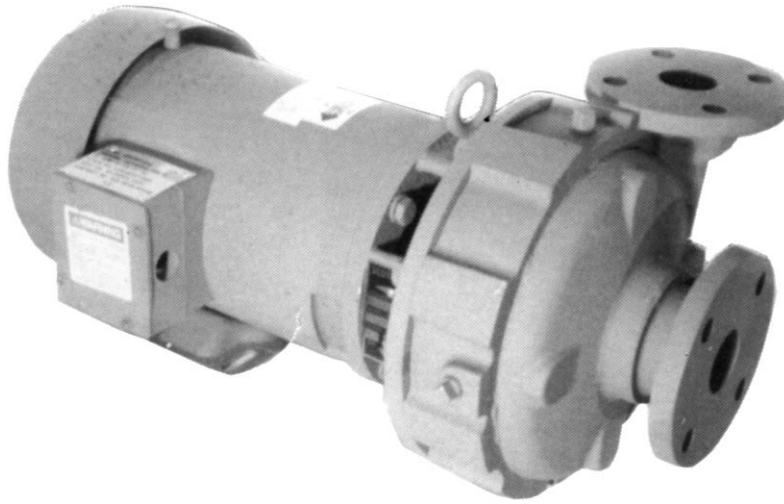
SCOT

INSTALLATION, OPERATION AND MAINTENANCE MANUAL FOR MODEL DCSC 25115A PUMP

BULLETIN 65.000.224

NSN: 4320-00-075-0003

CONTRACT NO. SP0750-03-M-S795



KEY NO.	PART NO.	QTY	PART NAME
1	106.000.286	5	Drain Plug
2	105.000.156	8	Cap Screw
3	104.000.124	8	Lockwasher
4	130.000.281	1	Casing
5	116.000.157	1	Gasket, Casing
6	118.000.163B	1	Imp. Retainer Ass'y
7	131.000.300U	1	Impeller
8	102.000.102	1	Key, Impeller
9	104.000.174	1	Retainer, Seal
10	101.000.168	1	Seal Assembly

KEY NO.	PART NO.	QTY	PART NAME
11	135.000.174	1	Shaft
12	105.000.354	1	Pin
13	105.000.313	3	Set Screw
14	105.000.156	4	Cap Screw
15	104.000.124	4	Lockwasher
16	132.000.235	1	Adapter
17	113.000.516	1	Motor
18	103.000.140	1	Wear Ring
19	117.000.381F	1	Nameplate
20	105.000.270	1	Eye Bolt

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SCOT DIVISION OF
ARDOX CORP.

INSTALLATION, OPERATION AND MAINTENANCE

MODEL DCSC 25115A PUMP

INSPECTION

Check pump for shortage and damage immediately upon arrival. Note damage or shortage on freight bill (bill of lading); immediately file claim with carrier.

Exterior - Pay particular attention to conduit box, external hardware and accessories. Touch up abrasions or scratches with approved paint. By hand, test that shaft rotates freely.

Interior - If extensive or serious external damage is noted, if impeller is damaged (look in ports), or if shaft binds or sticks, disassemble as required to permit internal inspection.

HANDLING

Handle with care. Dropping or jarring can seriously damage motor bearings or break pump parts. Lift with device having capacity for pump weight and use lifting hooks or eye bolts (if provided) or rig double sling around motor frame and pump casing. Do not use sling through pump motor adapter nor around suction and discharge flanges.

STORAGE

Store pump in clean, dry, well-ventilated area, free from rapid or wide changes in temperature. Suitably cover to keep chips, debris, dirt and dust from pump. Make sure heavy objects will not drop or fall on pump. For storage of six months or longer:

1. Coat exposed, machined surface with rust preventative.
2. Consult applicable motor maintenance manual for procedures to follow if atmospheric conditions are poor.
3. Rotate shaft several revolutions at least once each six months; once each month if conditions are poor.
4. At the very least, drain moisture from the TEFC motors regularly. Best to use desiccant or eaters to keep moisture from accumulating.
5. After long storage, particularly if conditions were poor, thoroughly clean and dry motor and pump before placing in service.

INSTALLATION

Location - Pump location should provide the following:

1. Install as close to suction supply as possible.
2. Shortest and most direct suction pipe practical. Suction lift must not exceed limit for pump. NPSH available must equal or exceed pump requirement.

3. Suction port below pumping level provide priming.
4. Plenty of room for inspection and maintenance.
5. Easy protection from freezing when idle in cold weather.
6. Correct power supply to motor; all wiring should meet National Electrical and Local Codes and regulations.
7. If outdoors, protection from the elements.

Piping - Suction and discharge gauges are useful to check pump operation and are excellent trouble indicators. Install gauges in the lines if pump nozzles do not have gauge taps. Observe these precautions when installing piping:

1. Support close to, but independently of pump.
2. Use at least next larger pipe for suction and discharge.
3. Keep as straight as possible, with few or no bends and fittings.
4. Remove burrs, sharp edges, ream pipe cuts and make joints air-tight.
5. Don't "spring" pipe to make connections; strain must not be transmitted to pump.
6. Allow for pipe expansion with hot fluids; expansion joints are not recommended.

Suction - Size and install suction piping to keep pressure loss at minimum and to provide correct NPSH:

1. Straight length not less than ten times suction pipe diameter should be provided at pump connection.
2. Size must never be smaller than suction port; for long runs use one or two sizes larger.
3. Pipe should slope upward to pump, even for horizontal run.
4. Use eccentric reducer at pump, eccentric side down.
5. Use 45° or long-sweep 90° elbows.
6. Use flapper type foot valve, but only to hold prime when pump is shut down and suction level is below pump.
7. Use grate valves only, for parallel connections and for isolating pump when shut down. Stem must be horizontal or slope down. Never use globe valves in suction line.

Discharge - Some close-coupled pumps permit discharge port location at any of four positions, 90° apart. Change by removing cover bolts, rotating casing, and replace bolts. Be sure there is adequate clearance with selected position between wall or tank, motor conduit box and for bearing lubrication. Casing may extend beyond base or feet.

1. If discharge line is short, size may be same as discharge port; if long, use one or two sizes larger.
2. For long horizontal runs keep grade as even as possible; avoid high spots and loops. Trapped air will throttle flow and may result in erratic pumping.
3. Install check and gate valves in discharge line; check valve (if used) between pump and gate valve.

OPERATION

Pre-Start - Before initial start of pump, check as follows:

1. Be sure that pump operates in direction indicated by the arrow on the pump casing (suction cover). Check rotation each time motor leads have been disconnected.
2. Check all connections to motor and starting device with wiring diagram. Check voltage, phase and frequency of line circuit with motor nameplate.
3. Check suction and discharge piping and pressure gauges for proper operation.
4. Turn rotating element by hand to assure that it rotates freely.
5. Assure that pump is full of liquid primed.

Priming - If pump is installed with a positive head on the suction, prime by opening suction valve and allowing liquid to enter the casing, at the same time venting all air out of the top of the casing.

If pump is installed with a suction lift, priming must be done by other methods, such as foot valves, ejectors, or by manually filling casing and suction line.

CAUTION: *Do not run pump dry hoping it will self-prime. Serious damage may result if started dry.*

Starting - Proceed as follows to start pump:

1. Close drain valves and valve in discharge line.
2. Open fully all valves in the suction line.
3. Prime the pump. If pump does not prime properly or loses prime during start-up, shut down and correct condition before repeating procedure.
4. For pumps moving high temperature liquids, open warm-up valve to circulate liquid for preheating. Close valve after pump has warmed up.
5. Start the motor (pump).
6. When pump is operating at full speed, open discharge valve slowly.

Running - Periodically inspect pump while running, but especially after first start and following repair.

1. Check pump and piping for leaks. Repair immediately.
2. Record pressure gauge readings for future reference.
3. Record voltage, amperage per phase and kw (if an indicating wattmeter is available).
4. Adjust pump output (capacity) *only* with discharge valve. *Do not throttle suction line.*

Shutdown -

1. Close discharge valve slowly.
2. Shut down the motor.
3. Open drain valves as required.
4. Close suction line valves to retain prime or to isolate pump.

Freezing Protection - Protect pumps shut down during freezing conditions by one of the following methods:

1. Drain pump; remove all liquid from the casing.
2. Keep fluid moving in pump and insulate or heat the pump to prevent freezing. If heated, do not let temperature go above 100° to 150°
3. Fill pump completely with antifreeze solution.

Troubles - Watch for signs of pump trouble at all times. Immediately correct any trouble to avoid costly shutdown and repair. Refer to applicable maintenance manuals for list of symptoms and cures.

MAINTENANCE

Cleaning - Remove oil, dust, dirt, water and chemicals from exterior of motor and pump. Keep motor air inlet and outlet open. Blow out interior of open motors with clean compressed air at low pressure. Regularly drain moisture from TEFC motors.

Labeled Motors - It is imperative for repair of a motor with Underwriters' Laboratories label that original clearances be held; that all plugs, screws and other hardware be fastened securely and that parts replaced be exact duplicates or approved equals. Violation of any of the above invalidates Underwriters' label.

Temperature - Total temperature, not the rise, is the measure of safe operation for a motor. If temperature by thermometer exceeds limits for insulation class, investigate and change operating conditions.

Foundation - Bolt unit to foundation with removable hold-down bolts for easy dismantling. Foundation surface must be flat so there is no distortion or strain developed when tightening the bolts. The pumps are inherently quiet and smooth running, but rubber mounting is desirable on foundation susceptible to sound effect.

Alignment - No field alignment of these pumps is necessary, since they are close coupled.

Wiring - National Electric Code and local codes should be followed. Motor branch circuit should be protected by a suitable manual or magnetic starter. It is desirable to have low voltage protection. Proper fusing and sufficient time delay for starting must also be selected according to codes.

All pumps are tested at the factory. Upon installation in the field, proper rotation, phase, frequency and voltage of power supply should be checked. The power lines should be of proper size to carry the required amperage.

The rotation must be checked upon installation. Close, then break the contacts quickly and observe rotation of the exposed portion of rotating parts. Rotation must agree with the rotation arrow on the motor. For all pumps, the standard rotation is counter-clockwise when viewed from the suction end. Motor wiring is easily changed in the field by following the wiring diagram on the inside of the terminal box cover, or on the motor nameplate.

LUBRICATION

Pumps should require no maintenance, other than the motor bearings, according to the following instructions:

Double Shielded - When double shielded prelubricated bearings are furnished, no lubrication is required for the life of the bearings. Inspect bearings periodically to determine the condition of the grease and replace the bearings if necessary.

Single Shielded with Grease Fitting Provisions - When single shield bearings are furnished, periodic inspection, cleaning and relubrication is required. See motor manufacturer's specific instructions for lubrication.

REPLACING MECHANICAL SEAL

Disassembly

1. Turn off power.
2. Close suction and discharge valves.
3. Drain system.
4. Remove bolts holding down motor to foundation.
5. Remove casing bolts.
6. Remove motor and rotating element from casing leaving casing and piping undisturbed.
7. Insert a screwdriver in one of the impeller waterway passages and back off the impeller retaining assembly with a socket wrench, as shown in Figure 1.



Figure 1

8. Remove impeller from shaft, being careful not to lose the impeller key, spring and seal retainer. If impeller is difficult to remove, it may be necessary to use a bearing puller to pull off impeller.

9. Pry off rotating member of mechanical seal from stub shaft by using two (2) screwdrivers as shown in Figure 2.



Figure 2

10. Remove bolts holding adapter to motor and take off adapter.
11. Place adapter on flat surface and push out stationary parts of mechanical seal.
12. Inspect stub shaft. If damaged or worn, remove from motor shaft and replace with a new one.

Reassembly

1. Clean gasket and flange faces, seal seat cavity, stub shaft and motor shaft.
2. Lubricate seal seat cavity of adapter and rubber cup or O-ring of stationary seat with a soapy water solution. Press stationary seat in seal seat cavity squarely and evenly, with caution not to chip or scratch the lapped face of seat.
3. With motor preferably in vertical position, remount adapter on motor, making sure the stub shaft does not dislocate or chip the stationary seat of the seal.
4. Apply a soapy water solution to the stub shaft and the rubber bellows of the rotary seal. Slide rotating member of mechanical seal over stub shaft. Replace seal spring and seal retainer. Be sure the rotating seal face stays in the holding collar during installation. Also, take extra care not to chip or scratch the seal lapped faces.
5. Place key in key seat of stub shaft and slide impeller on shaft. Replace impeller retaining nut.
6. Insert a screwdriver in a waterway passage of the impeller holding it against rotation and tighten nut.
7. Remove any burrs caused by screwdriver on the vane of impeller in waterway passage.
8. Slide motor and rotating element in casing. Be sure that any damaged O-ring or gasket is replaced.
9. Tighten casing bolts alternately and evenly.
10. Replace hold-down bolts.
11. Check for free rotation after assembly is completed.
12. Close all drain openings, using pipe sealant on threads.
13. Reprime before starting. Do not start unit until pump is completely filled with water.