OPERATION AND
SERVICE GUIDE
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DRUM & CONTAINER PUMPS

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DRUM PUMPS

BEFORE OPERATING THIS EQUIPMENT, THE OPERATOR SHOULD THOROUGHLY READ AND UNDERSTAND ALL INSTRUCTIONS AND SAFETY WARNING LABELS INCLUDING THE MANUFACTURER'S INSTRUCTIONS ON THE MATERIAL BEING PUMPED.

SECTION 1: GENERAL

1. The operator should wear suitable protective clothing including: face mask, safety shield or goggles, gloves, apron, and safety shoes.
2. Check a chemical resistance chart to be sure the chemical being pumped is compatible with pump construction.
3. Flammable or combustible liquids can only be handled with air driven motors and explosion-proof electric motors in conjunction with stainless steel pump tubes.
4. The use of PP tubes (polypropylene), KY-PVDF (polyvinylidene fluoride), ODP-S motors (open) or ENC-S motors (TEFC) on flammable or combustible liquids is prohibited and could cause fire, injury or death.
5. Bonding and grounding safety procedures as described in National Fire Protection Code 77 must be used when handling flammables, operating in a hazardous duty environment or when the danger of static discharge is present. Avoid liquid splashing. Refer to Section 6.
6. All federal, state and local safety codes should be followed.
7. Make sure nameplate information corresponds to voltage supplied.

PRE-START-UP

1. All connections must be properly in place and tightened securely. Stainless steel hose clamps are required on hose and must be properly tightened. Pump hand wheel must be snug, otherwise pump impeller damage can occur.
2. Since all pump motors and pump tubes are interchangeable, it is necessary for the operator to read and understand operating instructions for both the motor and the pump tube.
3. First use pump on water to be familiar with the assembly and check motor operation, flow rate, security of all hose connections, operation of speed control knob, liquid velocity, pump drainage and flow nozzle.
4. Before starting motor, check to be sure hose is securely fastened in receiving vessel so hose cannot splash chemicals, causing injury. Use of optional spring clamp is recommended.
5. Before connecting motor to power supply, be sure motor switch is OFF ("O" position) and speed control is turned down.
6. Never submerge pump below the hose connection.
7. Never leave unit unattended during operation.
8. Do not use speed control knob as ON/OFF switch.*
9. If liquid appears below discharge assembly, check security of hose clamps and wing nut. If leakage fails to stop, cease operation. Neutralize pump and refer to specific parts list and operating instructions to repair. If unable to repair, contact factory.
10. When finished using pump, drain pump and hose thoroughly and operate on 1-2 gallons of clear water or neutral solution for 15-30 seconds to completely flush and rinse pump and hose assembly.
11. Never store the pump and hose assembly in the container. Always rinse thoroughly and hang on a wall bracket.

* The speed control switch should not be used as the main ON/OFF switch. Using the speed control switch in this manner causes excessive wear to the potentiometer and triac and may result in premature failure. The use of the speed control switch does not cut power to the motor and

inadvertent activation could result in injury or death if the motor is activated when not properly attended and secured.

SECTION 2: INSTRUCTIONS FOR MOTORS - ODP-S, ENC-S and pneumatic motors AIR (B) & AIR (F)

THIS EQUIPMENT (ODP-S, ENC-S) MUST BE CONNECTED TO A GROUND FAULT CURRENT INTERRUPTION DEVICE BEFORE OPERATING.

ODP-S c UL us listed

Open Drip Proof enclosure, 115V/1/60Hz-1.1 HP (825 watts) - 10,000 RPM, thermal overload protection switch, manual reset on switch, 16 ft. SJT U.L. listed, 3 wire cord with 3 prong molded plug.

ODP-S CE listed

Open Drip Proof enclosure (IP 44), 220V/1/50Hz-1.1 HP (825 watts) - 10,000 RPM, thermal overload protection switch, Low Voltage Release (LVR), 16 ft. (5 m) CE listed, Har Ho 7 cable cord without plug.

1. Do not use the ODP-S motor on flammables or in hazardous duty environments.
2. Check nameplate data to verify proper voltage.
3. Before connecting plug to power supply, be sure motor switch is in the OFF position, "O".
4. Never carry motor by or pull on power cord.
5. If the supply cord is damaged, it must be replaced by a special cord or assembly available from the manufacturer or its service agent.
6. If motor stops during operation, place the switch in the OFF position "O" and allow the motor to cool. **Motor will not restart if the switch is not placed in the OFF position.** 220V Models - LVR will release motor switch when voltage is interrupted or stopped. Motor will not turn on once power is restored.
7. Check viscosity and specific gravity limitations before resuming operation.
8. Connect power cord to suitable 3 prong receptacle and never remove ground prong from plug.
9. To engage motor to pump tube, place motor on top of pump tube and turn hand wheel part P-52-1842 clockwise until the motor coupling and pump coupling are completely engaged and secured.
10. To replace cartridge brushes, refer to Section 5.
11. Never submerge motor in liquid or splash motor with liquid. Operation of motor in wet conditions can cause injury or death.
12. **Variable Speed Models (ODP-S)** Make sure the speed control knob is turned in the OFF position before starting operation. Turn switch handle to the ON position and slowly turn the speed control knob to the right. The pump will begin to slowly transfer. The variable speed control should not be used as the main ON/OFF switch. This is considered excessive wear and may result in premature failure. See #8 in the Pre-Start-Up section.
13. Bond and ground where the possibility of static discharge is present.

ENC-S c UL us listed

TEFC enclosure, 115V/1/60Hz - 1.1 HP (825 watts) -10,000 RPM, thermal overload protection switch, manual reset on switch, 16 ft. SJT U.L. listed, 3 wire cord with 3 prong molded plug.

ENC-S CE listed

TEFC (IP 54) enclosure, 220V/1/50Hz - 1.1 HP (825 watts) - 10,000 RPM, thermal overload protection switch, Low Voltage Release (LVR), 16 ft. (5 m) CE listed, Har Ho 7 cable cord without plug.

The ENC-S motor is a totally enclosed fan cooled motor (TEFC). The construction of a TEFC motor minimizes corrosive fumes from entering and damaging the vital internal components of the motor. The ENC-S is ideal where corrosive fumes present a detriment to the operation of open motors. The ENC-S is ideally suited where the motor is exposed for long periods to mildly corrosive fumes.

1. ⚠ Do not use the ENC-S motor on flammables or in hazardous duty environments.
2. Check nameplate data to verify proper voltage.
3. Before connecting plug to power supply, be sure motor switch is in the OFF position, "O".
4. Never carry motor by or pull on power cord.
5. If the supply cord is damaged, it must be replaced by a special cord or assembly available from the manufacturer or its service agent.
6. If motor stops during operation, place the switch in the OFF position "O" and allow the motor to cool. **Motor will not restart if the switch is not placed in the OFF position.** 220V models - LVR will release motor switch when voltage is interrupted or stopped. Motor will not turn on once power is restored.
7. Check viscosity and specific gravity limitations before resuming operation.
8. Connect power cord to suitable 3 prong receptacle and never remove ground prong from plug.
9. To engage motor to pump tube, place motor on top of pump tube and turn hand wheel part P-52-1842 clockwise until the motor coupling and pump coupling are completely engaged and secured.
10. To replace cartridge brushes, refer to Section 5.
11. Never submerge motor in liquid or splash motor with liquid.
12. **Variable Speed Models (ENC-S)** Make sure the speed control knob is turned in the OFF position before starting operation. Turn switch handle to the ON position and slowly turn the speed control knob to the right. The pump will begin to slowly transfer. The variable speed control should not be used as the main ON/OFF switch. This is considered excessive wear and may result in premature failure. See #8 in the Pre-Start-Up section.
13. Bond and ground where the possibility of static discharge is present.

SECTION 3: AIR (B) AND AIR (F) MOTORS

AIR (B)

Pneumatic drum pump motor - 7500 RPM, air consumption: 22 CFM @92 PSI (10.38 liter/sec @ 6.3 bar), the recommended operating inlet pressure. Maximum inlet pressure is 100 PSI. Air Inlet 1/8"

AIR (F)

Pneumatic drum pump motor - 8000 RPM, air consumption: 28 CFM @90 PSI (13.2 liter/sec @ 6.2 bar), the recommended operating inlet pressure. Maximum inlet pressure is 100 PSI. Air inlet 3/8"

1. Always use a filter, lubricator, regulator (FLR) on the intake side of the unit. Failure to provide an FLR will result in premature failure of the air motor. A filter is necessary to provide moisture free air and avoid rust build up. A lubricator using SAE 10 wt. oil is necessary to provide internal lubrication. The regulator assures proper air pressure.
2. Daily normal maintenance is recommended.
3. When pumping flammables or in a hazardous duty environment, proper bonding and grounding is required according to NFPA 77 to avoid static electric discharge. See Section 6 for proper method.
4. ⚠ Never use the AIR (B) or AIR (F) motors in conjunction with plastic pump tubes, PP or KY-PVDF, when pumping flammables or in a hazardous duty environment.
5. If motor slows down or stops, remove motor from pump and air supply. Turn the motor shaft with your finger; it should turn easily. If it does not, check your lubricator to be sure air motor is receiving proper lubrication.
6. Check the muffler to make sure it is not clogged. A safety solvent can be used to clean the clogged muffler. A clogged muffler will cause back pressure and prevent the unit from working freely.
7. Never stand directly in path of muffler exhaust.
8. Never operate the air motor without the muffler in place and tightened properly.
9. Before operation make sure the motor is securely fastened to the pump with the handwheel, part P-52-1842. Improper connection will result in damage to the pump coupling and possibly the pump shaft.

SECTION 4: INSTRUCTIONS FOR PP, KY-PVDF AND SS PUMP TUBES

Lengths available - 27" (700 mm) for carboys, 39" (1000 mm) for drums, 47" (1200 mm) for plating tanks, 60" (1500 mm) for IBCs and 72" (1800 mm) for storage vessels.

PP

Polypropylene construction - Hastelloy C276 drive shaft -Viton V-seal - Viton sealed ball bearings - TFE guide sleeve - pure carbon grade 6038C carbon bushing - hose connection 1", ¾" available - 39" length for normal 55 gallon drums - 47" length for deeper drums. Temperature limitation 130°F maximum.

1. ⚠ Do not use PP pump tubes on flammables or in hazardous duty environments. The insulating nature of plastic prevents proper bonding and grounding. A static electric discharge can take place and ignite fumes resulting in fire, injury or death.
2. PP pumps can be run dry without damaging the structural integrity of the unit. Prolonged periods of dry running should be avoided.
3. Always check the chemical compatibility of the liquid being pumped with pump construction and hose you have selected.
4. Securely tighten all connections before beginning operation. Use only stainless steel hose clamps to secure hose and tighten securely.
5. Before starting motor, check to be sure hose is securely fastened in receiving vessel so hose cannot splash chemicals, causing injury. Use of optional clamp is recommended. See Catalog.
6. Check temperature limitation, pressure rating and chemical compatibility of the hose you have selected.
7. Never submerge pump below the hose connection.
8. If liquid appears below discharge housing, part P-52-1028, check security of hose clamps and wing nut, part P-52-1106. If leakage fails to stop, cease operation. Neutralize pump and return unit to an authorized SERFILCO Pump distributor for inspection and possible repair.

KY-PVDF

PVDF (polyvinylidene fluoride) construction - natural PVDF contains no pigment or color and is ideal for the transfer of ultra pure chemicals - Hastelloy® C-276 drive shaft - TFE V-seal -Viton sealed ball bearings -TFE guide sleeve - pure carbon grade 6038C carbon bushing - hose connection 1", ¾" available - 39" length for normal 55 gallon drums - 47" length for deeper drums. Temperature limitation 180°F maximum.

1. ⚠ Do not use KY-PVDF pump tubes on flammables or in hazardous duty environments. The insulating nature of plastic prevents proper bonding and grounding. A static electric discharge can take place and ignite fumes resulting in fire, injury or death.
2. KY-PVDF pump can be run dry without damaging the structural integrity of the unit. Prolonged periods of dry running should be avoided.
3. Always check the chemical compatibility of the liquid being pumped with pump construction and hose you have selected.
4. Securely tighten all connections before beginning operation. Use only stainless steel hose clamps to secure hose and tighten securely.
5. Before beginning operation, check to be sure hose is securely fastened in receiving vessel. Failure to secure hose properly will allow hose to splash chemicals, causing injury. Use of optional hand clamp is recommended. See Catalog.
6. Check temperature limitation, pressure rating and chemical compatibility of the hose you have selected.
7. Never submerge pump below the hose connection.
8. If liquid appears below discharge housing, part P-52-4028, check security of hose clamps and wing nut, part P-52-4106. If leakage fails to stop, cease operation. Neutralize pump and return unit to an authorized SERFILCO pump distributor for inspection and possible repair.

SS

Stainless steel 316 construction - TFE rotor - TFE V-seal - TFE guide sleeve - pure carbon grade 6038C carbon bushing - Viton sealed ball bearings - 1" hose connection. Maximum temperature 180°F.

1. SS pumps can be run dry without damaging the structural integrity of the unit. Prolonged periods of dry running should be avoided.
2. Always check the chemical compatibility of the liquid being pumped with pump construction and hose you have selected.
3. Check temperature limitation, pressure rating and chemical compatibility of the hose you have selected.
4. Securely tighten all connections before beginning operation. Use only stainless steel hose clamps to secure hose and tighten securely. Use of optional hand clamp is recommended. See Catalog.
5. The SS requires a TFE seal P-52-2195 between the wing nut and pump body. Be sure this "O"-ring is in place or leakage of chemicals will occur.
6. When using the SS on flammables or in hazardous duty environments, it is always necessary to bond and ground as per NFPA 77. See Section 6 for illustration.
7. An electrically conductive hose may be employed with the SS tube when pumping flammables. Installation must be exactly to manufacturer's installation instructions. Bonding and grounding must also be used in conjunction with hose to prevent static electric discharge.
8. If liquid appears below the bearing housing, re-check security of all fittings. Re-check to be sure the TFE seal P-52-2195 is in place. If leakage continues, cease operation, neutralize the pump and return it to an authorized SERFILCO pump distributor for inspection and possible repair.

PPP

Polypropylene construction, Hastelloy C 276 drive shaft, TFE V-seal. Viton sealed ball bearings, TFE guide sleeve, carbon bushing, 1" (25mm) or ¾" (22mm) hose barb available. Temperature limitation 190° F (90°C)

1. Do not use SP-PHT pump tubes on flammables or in hazardous duty environments. The insulating nature of plastic prevents proper bonding and grounding. A static electric discharge can take place and ignite fumes resulting in fire, injury or death.
2. SP-PHT pumps can be run dry without damaging the structural integrity of the unit. Prolonged periods of dry running should be avoided.
3. Always check the chemical compatibility of the liquid being pumped with pump construction and hose you have selected.
4. Securely tighten all connections before beginning operation. Use only stainless steel hose clamps to secure hose and tighten securely.
5. Before starting motor, check to be sure hose is securely fastened in receiving vessel so hose cannot splash chemicals, causing injury.
6. Check temperature limitation, pressure rating and chemical compatibility of the hose you have selected.
7. Never submerge pump below the hose connection.
8. If liquid appears below discharge housing, part #6028, check security of hose clamps and wing nut, part #6106. If leakage fails to stop, cease operation. Neutralize pump and return unit to an authorized Standard Pump distributor for inspection and possible repair.

REPAIR SECTION

All PP, KY-PVDF and SS pumps are repaired in the same steps.

Impeller, Pump Coupling (P-52-1004) and Pump Foot (1609) replacement

1. Unplug motor, remove motor from pump and store safely. Remove pump from solution and neutralize or flush with water.

2. Unscrew pump foot P-52-1609 (PP pumps) or P-52-2708 (SS pumps) or P-52-4608 (PVDF pumps) in a clockwise direction. (NOTE: left handed threads). This will expose the impeller.
3. Secure P-52-1004 pump coupling on opposite end. Use a flat head screwdriver to unscrew the P-52-1608 (PP pumps) or P-52-2706 (SS pumps) or P-52-4608 (PVDF pumps) in a counter-clockwise direction.
4. Replace impeller and pump foot in opposite order. NOTE: If P-52-1004 pump coupling loosens instead of the impeller, simply hold shaft with pliers and unscrew impeller. Take care not damage threads on shaft.

Pump Housing Replacement

1. Unplug motor, remove motor from pump and store safely. Remove pump from solution and neutralize or flush with water.
2. Unscrew pump foot P-52-1609 (PP pumps) or P-52-2708 (SS pumps) or P-52-4608 (PVDF pumps) in a clockwise direction. (NOTE: left handed threads). This will expose the impeller.
3. Secure P-52-1004 pump coupling on opposite end. Use a flat head screwdriver to unscrew the P-52-1608 (PP pumps) or P-52-2706 (SS pumps) or P-52-4608 (PVDF pumps) in a counter- clockwise direction. NOTE: If P-52-1004 coupling loosens instead of the impeller, simply hold the shaft with pliers, taking care not to damage the shaft threads.
4. Unscrew the pump housing in a clockwise direction. P-52-1524 (PP pumps) or P-52-2704 (SS pumps) or P-52-4607 (PVDF pumps). NOTE the left handed threads.
5. Replace new components in opposite order.

SECTION 5: REPLACEMENT OF CARTRIDGE BRUSHES - ODP-S AND ENC-S MOTORS

THE REPLACEMENT OF BRUSHES OR ANY ELECTRICAL WORK SHOULD ONLY BE PERFORMED BY A LICENSED ELECTRICIAN OR BY PLANT PERSONNEL FULLY TRAINED IN ELECTRICAL REPAIR.

1. Disconnect motor from power supply and pump tube.
2. Place motor on a flat table in the upright position.
3. Remove fan cover screws. Be careful not to lose the wave washer or drop it into motor windings.
4. On the ENC-S (TEFC), it is necessary to next remove the fan and the bearing cover. Again, be careful of the wave washer.
5. Back out screw holding the clamp over the brush cartridge. Do not fully remove the screw or clamp.
6. Gently push brush cartridge toward the armature and lift up from the motor housing side.

TO INSTALL NEW BRUSH CARTRIDGE:

7. Check to be sure the brush plate is properly located in the brush channel. The brush plate has a tab that sits on the armature side of the brush holder. Do not allow the brush plate to come in contact with the armature or a short circuit will occur. Do not position the brush plate where it will contact the motor housing or an electrical short circuit will occur, causing injury or death.
8. Push cartridge gently forward and down in the brush channel. The brass locator pins will fit into the locking channel. The cartridge can only go in one way. Re-check the connector plate below the brush cartridge.
9. Tighten the screw on the cartridge clamp. Be sure the clamp is not in contact with the armature.
10. On the ENC-S, re-install the bearing cover. Check the wave washer on top of the bearing.
11. Re-install fan on the ENC-S.
12. Re-install fan cover.

SECTION 6:

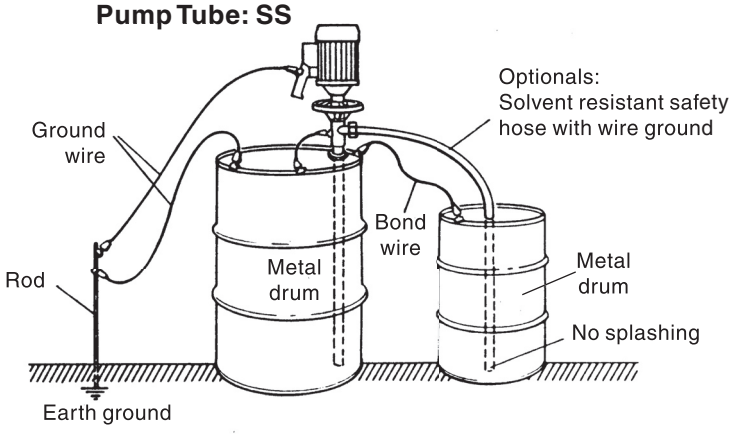
TRANSFERRING OF FLAMMABLES OR USE IN HAZARDOUS DUTY ENVIRONMENTS

Bonding is an electrical connection between a primary metal vessel and a metal receiving vessel. See schematic.

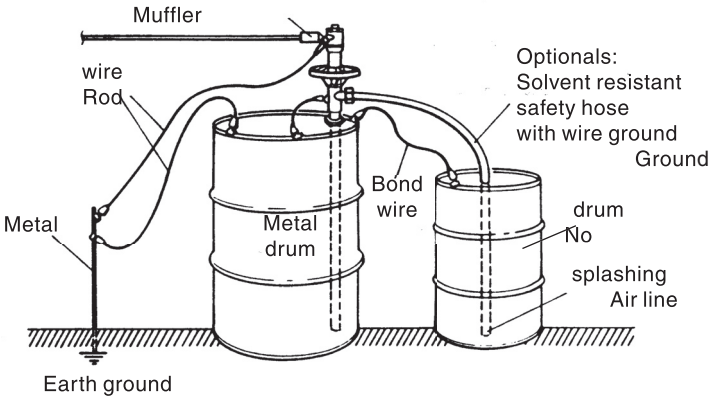
Grounding is an electrical connection between a metal vessel, pump, motor and a constant ground; i.e. a metal rod driven into the earth.

Bonding and grounding are required when pumping flammable materials or in hazardous duty environments. Failure to bond and ground properly can cause a discharge of static electricity resulting in fire, injury or death. Follow NFPA 77 and 30 procedures at all times. If in doubt, do not start pump! Be sure bonding and grounding wires are secure before starting operation. (Ground and bond wires must have less than one ohm resistance for safe usage. Check continuity before starting.) Always check with a safety engineer when any question arises and periodically check safety procedures with a safety engineer.

Motor: Explosion-Proof
Pump Tube: SS



Air Motor: AIR (B) or AIR (F)
Pump Tube: SS



LIMITED WARRANTY

These products have a limited warranty against manufacturer's defects in materials or construction for 1 year from the date of sale. Do not modify this product or change physical construction without the written permission of SERFILCO. This limited warranty is automatically void if improper selection, installation, unauthorized modifications or physical abuse beyond the manufacturer's control has occurred. Manufacturer's responsibility is strictly limited to repair or replacement of defective components. The manufacturer assumes no further liability.