STERLING

Installation, Operation and Maintenance Manual

CONDENSATE RETURN UNITS

Sterlco® Steam Control Products
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Shipping Information

Unpacking and Inspection

You should inspect your equipment for possible shipping damage. Thoroughly check the equipment for any damage that might have occurred in transit, such as broken or loose wiring and components, loose hardware and mounting screws, etc.

In the Event of Shipping Damage

According to the contract terms and conditions of the Carrier, the responsibility of the Shipper ends at the time and place of shipment.

Notify the transportation company's local agent if you discover damage

Hold the damaged goods and packing material for the examining agent's inspection. **Do not return any goods before the transportation company's inspection and authorization.**

File a claim with the transportation company. Substantiate the claim by referring to the agent's report. A certified copy of our invoice is available upon request. The original Bill of Lading is attached to our original invoice. If the shipment was prepaid, write us for a receipted transportation bill.

Advise customer service regarding your wish for assistance and to obtain an RMA (return material authorization) number.

If the Shipment is Not Complete

Check the packing list as back-ordered items are noted on the packing list. In addition to the equipment itself, you should have:

- Bill of lading
- Packing list
- Operating and Installation packet
- Electrical schematic and panel layout drawings
- Component instruction manuals (if applicable)

Re-inspect the container and packing material to see if you missed any smaller items during unpacking.

If the Shipment is Not Correct

If the shipment is not what you ordered, **contact the shipping department immediately**. For immediate assistance, please contact the correct facility located in the technical assistance section of this manual. Have the order number and item number available. *Hold the items until you receive shipping instructions.*

Returns

Do not return any damaged or incorrect items until you receive shipping instructions from the shipping department.

Credit Returns

Prior to the return of any material, **authorization** must be given by **the manufacturer.** A RMA number will be assigned for the equipment to be returned.

Reason for requesting the return must be given.

ALL returned material purchased from **the manufacturer** returned is subject to 15% restocking charge.

ALL returns are to be shipped prepaid.

The invoice number and date or purchase order number and date must be supplied.

No credit will be issued for material that is not within the manufacturer's warranty period and/or in new and unused condition, suitable for resale.

Warranty Returns

Prior to the return of any material, authorization must be given by **the manufacturer.** A RMA number will be assigned for the equipment to be returned.

Reason for requesting the return must be given.

All returns are to be shipped prepaid.

The invoice number and date or purchase order number and date must be supplied.

After inspecting the material, a replacement or credit will be given at **the manufacturer's** discretion. If the item is found to be defective in materials or workmanship, and it was manufactured by our company**,** purchased components are covered under their specific warranty terms.

Safety

Safety Symbols Used in this Manual

The following safety alert symbols are used to alert you to potential personal injury hazards. Obey all safety messages that follow these symbols to avoid possible injury or death.

⚠DANGER ***DANGER indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.***

⚠WARNING ***WARNING indicates a potentially hazardous situation or practice which, if not avoided, could result in death or serious injury.***

⚠CAUTION ***CAUTION indicates a potentially hazardous situation or practice which, if not avoided, may result in minor or moderate injury or in property damage.***

Description

General Description

This manual provides operation, installation, and maintenance instructions for all condensate return units. On a condensate return unit the pump/s are controlled by an internal float switch to return the collected condensate back to a boiler feed, surge tank or deaerator.

Selection

Be sure to select a pump that is big enough for the job. Select a capacity rating adequate for the maximum amount of condensate expected under the most severe conditions. Remember that pressure rating must be sufficient to operate against any system back pressure, plus lift and friction loss in piping between the pump and boiler feed unit.

Usually the best discharge pipe size will be at least one size, sometimes two sizes larger than the pump discharge tapping. In some cases using larger discharge piping will make it possible to use a less expensive pump with a lower pressure rating. In all cases, adequate discharge piping will mean longer life and better service from your pump.

Sterlco® pumps have rated capacities of three times the maximum flow of condensate for the specified amount of radiation (EDR); in other words, when the heating system is running at maximum capacity, the pump should not be operating more than one-third of the time. This is a minimum factor of safety. If heavy loads are possible an oversize condensate pump should be selected.

For most applications, where the pump is above floor level and in a reasonably dry location, Sterlco ® 4100, 4200, 4300 (for smaller jobs) and 5000 and 3500 series pumps (for larger capacity and higher pressure) with ODP and NEMA 1 float switch will suffice. For other classifications, TEFC, Wash-down Duty, Explosion Proof or NEMA 4 and NEMA 7 & 9 are available. When the return is below floor level, 3700 series pumps with epoxy steel tanks are recommended.

Before a condensate pump can operate satisfactorily, the heating plant itself must be in good order.

The most important point to remember is that all heating units and return lines must be equipped with proper steam traps in good working order. With improper or malfunctioning steam traps, steam or water above 190°F may return to the condensate pump. For best operation, condensate should be 160°F or less. Sterlco ® pumps can operate at higher temperatures but we cannot guarantee full capacity or satisfactory operation if condensate is allowed to go above 190°F.

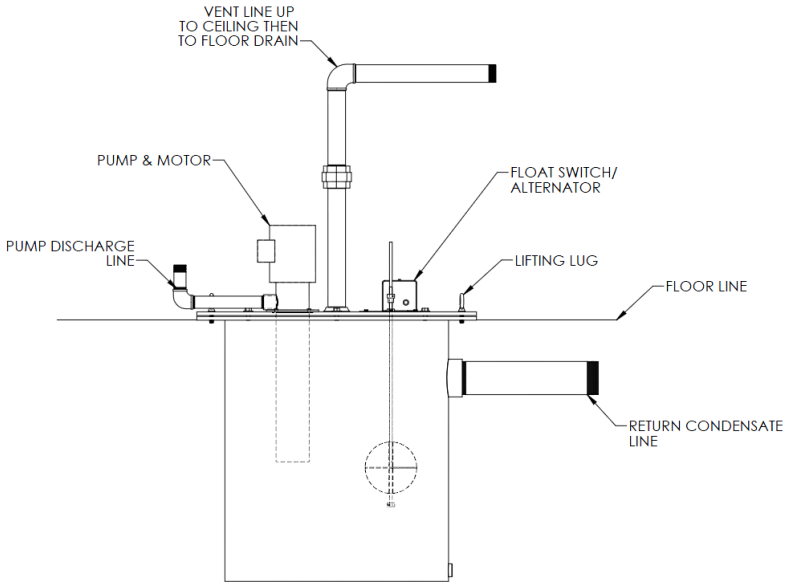
For unusually hot condensate above 200°F, a 4600, 4700 or 4800 series unit should be selected as pumps are consider low NPSH and will be able to handle hot condensate without cavitating up to 210°F (floor mounted) and 212°F (elevated)

It is equally important to provide strainers on all lines, to keep scale and dirt out of the tank and pumps.

Installation

Location

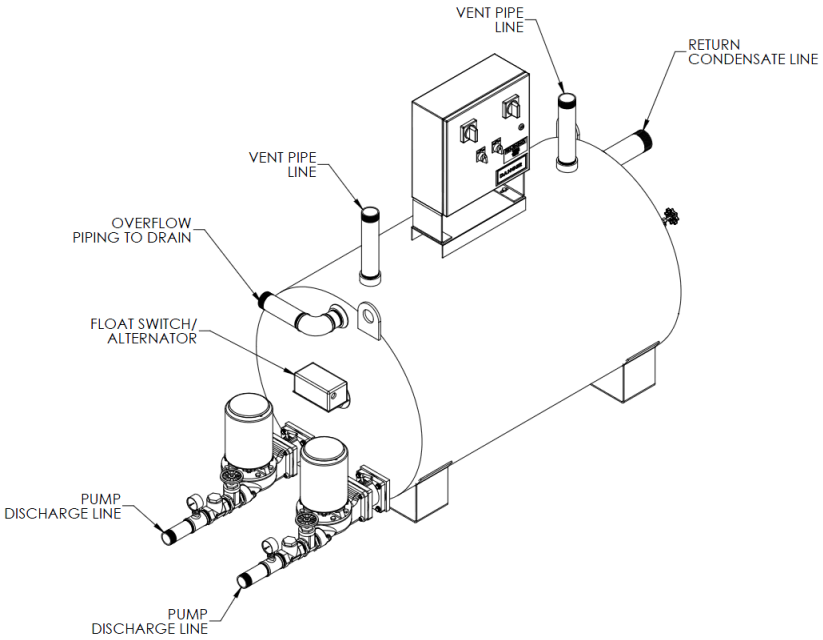
Locate pump above the floor if possible in a position where it will be clean, dry and easily accessible. Locate the tank inlet below the lowest point of return lines. If the pump must be below floor level, use a 3700 series unit with epoxy coated steel tank and take all possible precautions to keep the motor and electrical equipment dry. Set the pump on a substantial, level foundation – preferable off the floor on a raise concrete base.



3700 SERIES

Pipe Connection

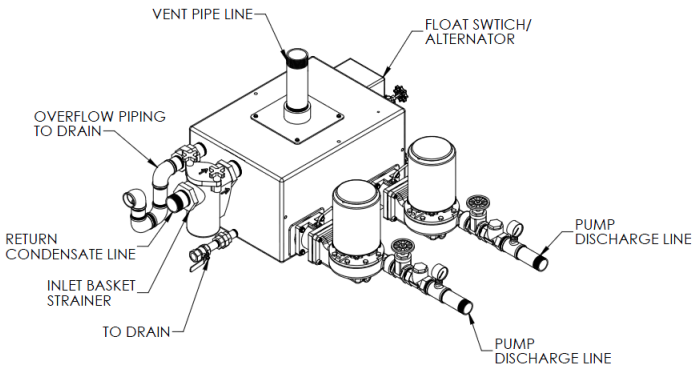
Typical condensate pump hookups are shown in the diagrams. No two individual installations will be exactly alike, but certain essentials apply to all. Discharge piping should be supported so not all the load will be on the pump discharge. Teflon tap or thread sealant is recommended on discharge piping when connecting to threaded pumps.



5000 SERIES

PIPING (Return):
The condensate return inlet should be equipped with a strainer to keep scale and dirt out of the tank, unless all return lines are exceptionally well protected with strainers. Isolation valve should be installed for disposing of condensate temporarily when servicing. Return line should be trapped to prevent steam entry into the unit.

PIPING (Overflow):
Pipe the overflow opening to a drain. An overflow loop can be installed to prevent venting through the overflow.



4200 SERIES

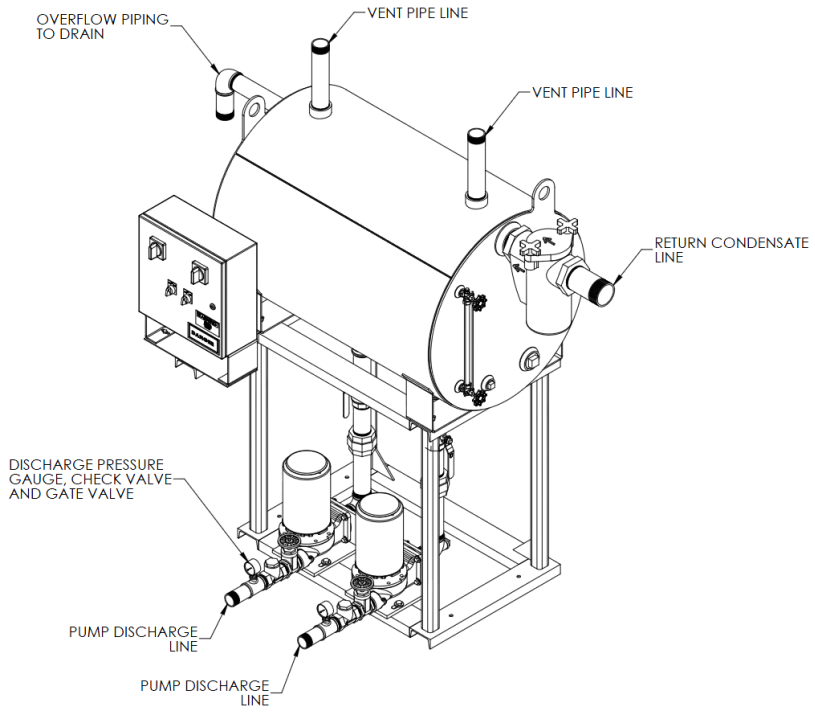
PIPING (Vent):

⚠WARNING Do not pressurize the receiver. Failure to do so could result in injury or death

The vent opening at the top of tank must be left open to atmosphere. Good practice is to run a pipe from the vent up to the ceiling then down to a point near the floor drain. This keeps dirt out of the tank and helps keep the motor dry. For priming the pump when starting up or

testing, a union or plugged tee at the vent opening is desirable. Do not reduce or restrict the vent by installing any shut off valve in the vent line.

PIPING (Discharge):
At the pump discharge, there should be a check valve (reasonably close to the pump) to prevent condensate from flowing back into the unit. In addition, an isolation valve should be provided for use when the pump is disconnected. A flow control valve should be installed after the check valve to balance the pump with the system. It is recommended that a discharge pressure gauge is installed in the discharge piping to monitor pump performance and for troubleshooting.



3500 SERIES

Electrical Connections

⚠WARNING Disconnect power before servicing unit. Failure to do so could result in injury or death.

Check the motor characteristics (phase, voltage) to be certain they are correct for your power supply; otherwise you may burn out the motor by running it on too high a voltage. Be sure that only a qualified electrician makes the electrical connections to the pump. Units should be wire in accordance with the National Electrical Code, state and local codes where applicable. With small, single phase units, the pump motor is commonly controlled directly by the float switch. On three phase units, the float switch operates a motor starter, which starts and stops the pump motor

Basic Operation

Starting a Unit

⚠CAUTION Do note run pumps dry. Pump seal may leak.

1. Float switches and alternators are provided with a shipping bracket to prevent damage during shipment. Shipping bracket must be removed before operation. Float switches and alternators have been factory set to operate at max capacity. They can be adjusted for various levels of operation. (Reference the float switch instruction)
2. Do note pressurize the receiver. Vent should be open to atmosphere.
3. Check power connection and wiring to make sure it complies with National Electric Code.
4. When staring up a pump, always rotate it by hand to be sure it turns freely before turning on power.
5. Check for proper motor rotation. Most motors are supplied with a directional arrow sticker indicating the correct rotation.
6. Do not operate the pumps without priming. If pumps are run dry, even for a very short time, they may be severely damage.
7. Be sure to keep the motor dry.
8. Adjust balancing valve in pump discharge to meet system design conditions.
9. Allow pumps to run and observe for a few cycles.

Operation

1. When condensate inside the receiver reaches high level, the float switch will turn on the pump. A mechanical alternator or electrical alternator will replace a float switch on a duplex unit.
2. Once condensate reaches low level the float switch will turn off the pump.
3. Pumps will alternate on every cycle. (Only applies to alternator)
4. If one pump cannot handle the load the second pump will turn on. (Only applies to alternator)

Troubleshooting

Troubleshooting Check List

PUMP WILL NOT START:

1. Check power supply. Check the disconnect switch or selector switch if in the ON position.
2. Check control panel for incorrect or loose wiring.
3. Inspect motor starter to see if it has tripped.

PUMP DOES NOT DELIEVER ENOUGH CONDENSATE:

1. Pump is air bind. Release any entrap air through the seal flush line.
2. Clogged impeller or impeller is loose on shaft.
3. Discharge head is too high.
4. Pump is not properly throttle to meet design condition of system.
5. Pump inlet strainer is dirty and is reducing flow.
6. Motor is running backward. Check motor for correct rotation.
7. Excessive temperatures due to failed steam trap installed before unit. Steam trap should be replaced.

PUMP USES TOO MUCH POWER:

1. Excessive flow. Throttle the balancing valve.
2. Incorrect motor rotation.
3. Speed too high
4. Mechanical defect; motor shaft is bent.
5. Impeller is clogged.

PUMP MAKES EXCESSIVE NOISE:

1. Motor shaft is bent or bearing is worn out.
2. Magnetic hum – consult motor manufacture.
3. Pump is cavitating. Condensate temperature is too hot.
4. Pump is not on a level foundation.
5. Piping is not fully supported. Noise is being transmitted through piping.

PUMP LEAKS:

1. Pump may have been disassembled and reassembly improperly.
2. The rotary seal maybe worn or scored or may have been installed improperly.

PUMP RUNS CONTINOUSLY:

1. Pump is running backward.
2. Check discharge line to see if throttle valve is closed or check valve is installed backwards.
3. Loose or clogged impeller
4. Check suction isolation valve if closed.
5. Discharge head is too high
6. Float switch or alternator is hung up

Appendix

Maintenance

1. Keep motor and float switches clean from moisture and dirt.
2. Check motor nameplate for lubrication requirements.
3. Provide periodic cleaning of inlet strainer.
4. See instruction for mechanical seal replacement.

Ordering Replacement Parts and Servicing

When ordering replacement parts for Sterlco® condensate pumps only the following information is needed:

1. The name of the part assembly.
2. The pump model number and serial number from the nameplate on the tank.

Note: if you believe that your trouble is caused by defective equipment, please turn the complete pump and motor unit or other assembly to us AS-IS. An attempt to adjust or repair such equipment on the job may destroy evidence of defective workmanship or material, thus making it difficult or impossible for us to handle your claim properly.

Float Switch Settings

When condensate pumps are tested in our factory, float switches are set according to the capacity rating. At the time of installation, the float switch should be checked to see that settings have not been disturbed during shipment and that they are correct for the particular job.

The travel of the float switch between the upper (ON) position and the lower (OFF) position determines the amount of condensate delivered to the boiler feed each time the pump operates. At our test, the float switch is set so that the amount is equal or a little less than the GPM rating of the pump. Depending upon the water capacity of the boiler and the other characteristic of the heating system, this float switch setting may require modification for best results.

If the float switch travel is too short for the job, only a small amount of condensate will be discharged each time the pump operates and consequently the motor will have to start and stop too frequently. In normal operation, it is usually undesirable for a condensate pump to start and stop more than once every three minutes.

If the float switch travel is too long for the job, too much water will be discharge at each cycle. In this case, the boiler water level may fall too low before the pump starters. Then the boiler low-water cutoff will operate unnecessarily, or if there is a boiler device it will supply make-up water unnecessarily and the heating system will become water-logged.

If the lower (OFF) position of the float switch is too low, the pump may continue running until it loses its prime and the rotary seal maybe damages by running dry. When staring up a new pump, always check the lower float switch position to be sure that the inlet from the tank to the pump is covered with water at all times.

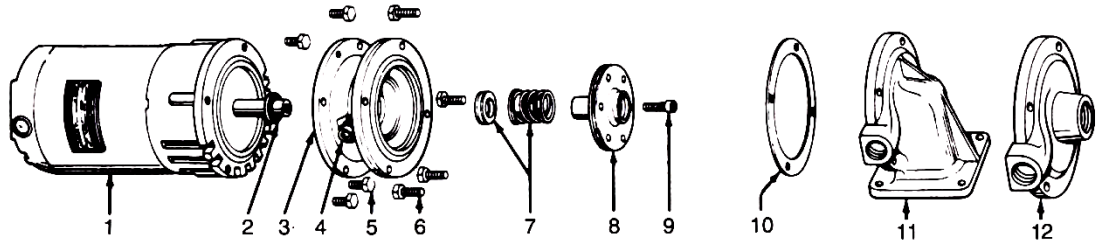
Any condensate pump can be used for a smaller capacity than its nameplate rating decreasing the travel of the float switch.

STERLING

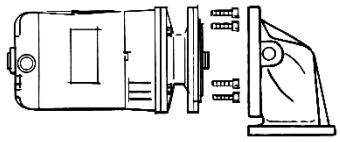
Installation, Operation & Maintenance

Replacing the Rotary Seal Assembly on G Series Sterlco® Pumps: 1/3, 1/2, and 3/4 HP

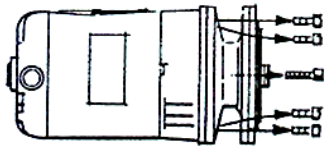
1. Motor	**4. Tube Fitting**	**7. Rotary Seal Assembly**	**10. Housing Gasket**
2. Water Slinger	**5. Motor Screws (4)**	**8. Impeller**	**11. Pump Housing**
3. Motor Bracket	**6. Pump Screws (4)**	**9. Impeller Screw**	**12. Threaded Inlet Casting**



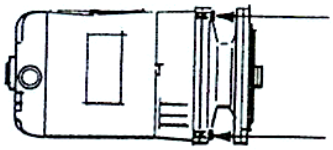
REMOVAL OF OLD SEAL ASSEMBLY



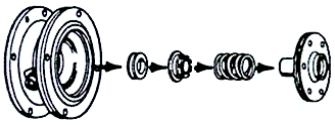
A) Remove pump housing from motor bracket and impeller assembly by removing pump screws.



B) Remove impeller screw and motor screws. (Note: opposite end of motor shaft is fitted with screwdriver slot to hold shaft securely while impeller screw is being removed.)

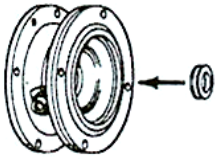


C) Insert two of the pump screws into the two threaded holes in the bracket. Tighten them slowly and evenly to force the impeller and bracket off the shaft. ***Do not pry the impeller or bracket!***

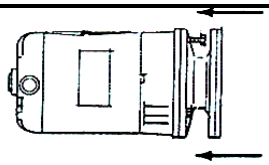


D) Remove old seal parts from impeller hub and bracket. Be sure water slinger is in place.
E) Clean impeller hub thoroughly…remove all loose particles of dirt, grease, etc. Use fine emery cloth if necessary. Also clean the recess in the bracket so the new seat will fit perfectly. Remove all particles and dirt on gasket surfaces of the two castings.

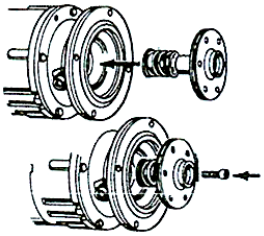
INSTALLATION OF NEW SEAL ASSEMBLY



F) Coat outside edge of new seat with seal lubricant and slip it into the bracket. Press into bracket with thumbs or wooden dowel. Handle seat carefully so seating surfaces are not scratched or chipped . . . be sure it is squarely seated.

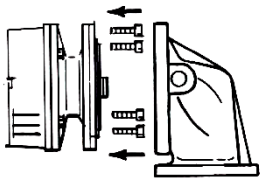


G) Remount bracket on motor.



H) Lubricate impeller hub with seal lubricant. Slip new bellows and spring onto impeller hub. Be sure bellows slides freely on impeller hub.

I) Replace impeller on motor shaft and secure with impeller screw. Hold shaft with screw driver slot while tightening screw.



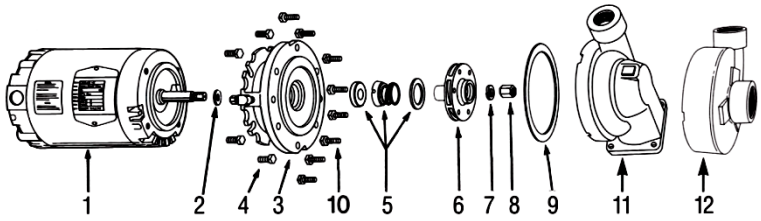
J) Replace pump housing onto bracket, using a new housing gasket. Secure with pump screws. Be certain gasket is seated properly.

Replacing the Rotary Seal Assembly On J Series Sterlco® Pumps: ½ HP – 3 HP

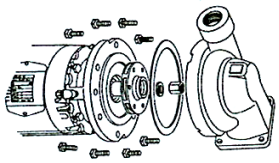
1. Motor	*5. Rotary Seal Assembly*	*9. Housing Gasket*
2. Water Slinger	*6. Impeller*	*10. Pump Screws (8)*
3. Bracket	*7. Lock Washer*	*11. Vertical Inlet Casting*
4. Motor Screws (4)	*8. Impeller Nut*	*12. Horizontal Inlet Casting*

Tools Needed:

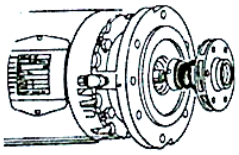
Large Screwdriver
7/16" Wrench
9/16" Wrench
5/8" Socket
1" Socket



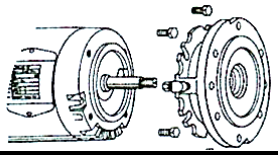
REMOVAL OF OLD SEAL ASSEMBLY



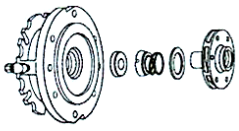
A) **Remove 8 pump screws and lift out pump and motor; remove drip cover. Insert large screwdriver into slot at end of motor shaft; hold shaft steady and remove impeller nut and washer from nose of impeller by turning counterclockwise.**



B) **While still holding motor shaft steady with screwdriver, use 1" socket to remove impeller by turning counterclockwise.**

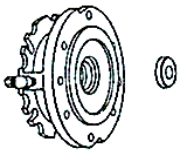


C) **Remove the 4 motor screws and separate the bracket from the motor.**

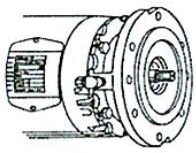


D) **Remove old seal parts from impeller hub and bracket. Be sure water slinger is in place. Clean the recess in the bracket so that the new seat will fit perfectly and make a watertight joint. If bracket is badly eroded at recess, through severe use, casting should be replaced. Clean all gasket surfaces. Clean impeller hub thoroughly; remove loose particles of dirt, etc. Check prime tube or seal flush line and clean as required.**

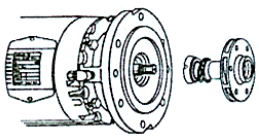
INSTALLATION OF NEW SEAL ASSEMBLY



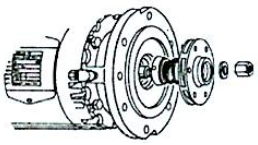
E) **Coat outside edge of new seat with seal lubricant and slip it into the bracket. Press into bracket with thumbs or wooden dowel. Handle seat carefully so sweating surfaces are not scratched or chipped…be sure it is squarely seated.**



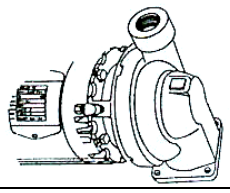
F) **Remount bracket on motor.**



G) **Lubricate impeller hub with seal lubricant, Slip new bellows and spring onto impeller hub. Be sure bellows slide freely on impeller hub.**

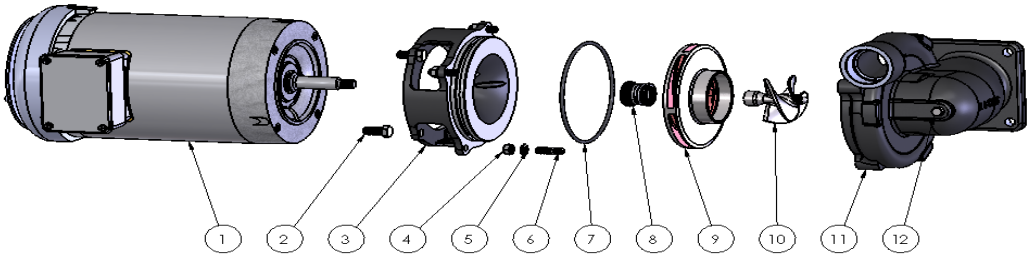


H) **Thread impeller on motor shaft extension and secure with washer and impeller nut. Hold shaft with screwdriver slot while tightening.**



I) **Replace motor assembly onto volute; using new housing gasket. Secure with pump screws. Be certain gasket is seated properly.**

Replacing the Rotary Seal Assembly On K Series Sterlco® Pumps: ½ HP – 3 HP



1. MOTOR
2. CAPSCREW
3. ADAPTER
4. HEXNUT
5. LOCKWASHER
6. STUD
7. O-RING
8. SEAL ASY
9. IMPELLER
10. INDUCER
11. HOUSING
12. PIPE PLUG

Removal

A) Place a mark or line using a sharpie on the motor to the bracket and also on the bracket to the housing for rotational reference when rebuilding. Remove 4 nuts that hold the housing to the bracket and remove the housing. Remove the motor drip cover.

B) While holding the end of the motor shaft use a 3/8" socket to remove the inducer counter clockwise. Remove the impeller with a screw driver or rod inside the impeller passage. Heat may be required to breakdown the thread locker for removal.

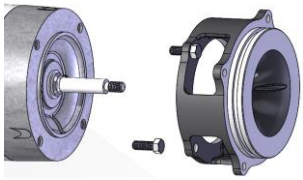
C) Remove 4 motor screws and separate the bracket from the motor. The rotating portion of the seal will unseat when the bracket is removed.

D) Remove the seal seat by pushing it out with a screw driver from the motor side. Remove the o-ring from the groove in the bracket. Clean and inspect mating surfaces. If the bracket is badly corroded it should be replaced. Clean the motor shaft and the housing bore o-ring surfaces.

Installation

A) Coat the seal seat outer diameter and the bore in the bracket with a suitable lubricant and press the seat into the bracket making sure that it's completely square with the bottom.

B) Install the bracket onto the motor using the previous alignment marks for orientation. Clean the seal seat face.



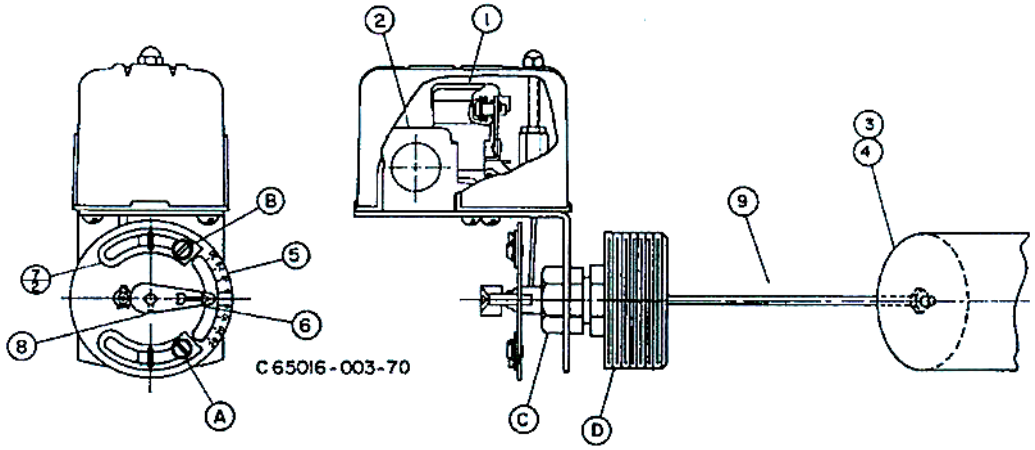
C) Lubricate the motor shaft and rotary portion of the seal bellows and slide the rotary onto the shaft to bottom out with seals faces in contact. Place the seal spring onto the seal.

D) Use 2 drops of thread locker on the motor shaft and thread the impeller onto the shaft to seat against the shaft shoulder while holding the motor shaft. Use 2 more drops of thread locker on the motor shaft exposed threads. Thread the inducer onto the shaft and tighten it against the impeller.

E) Snap the o-ring into place on the bracket and coat with a lubricant. Lubricate the housing bore surface that the o-ring contacts. Install the housing onto the assembly using the alignment marks previously made and tighten the 4 nuts securing the housing to the bracket.

9037-891
SERVICE
BULLETIN

Class 9037 Type HG Series A
FLOAT SWITCH



CAUTION: Switches are shipped with a bracket attached to the mounting plate. This bracket prevents the float and rod from moving in the tank during shipment. When installing the system, this clearly marked shipping bracket must be removed and discarded.

APPLICATIONS: For automatically controlling the liquid level in a closed tank by float movement.

MOUNTING: The Type HG Screw-in Tank Float Switches are mounted directly to the tank by means of the 2 ½" I.P.S. threaded fitting (D). Before screwing this fitting into the tank, loosen Nut (C) so that the fitting (D) is free to rotate in the switch bracket. Tighten the fitting (D) so that there will be no leak past the threads. Then revolve the switch case until it is horizontal and tighten Nut (C).

ENCLOSURE RATING: NEMA 1 ENCLOSURES ARE INTENDED FOR INDOOR USE PRIMARILY TO PROVIDE A DEGREE OF PROTECTION AGAINST CONTACT WITH THE ENCLOSED EQUIPMENT IN LOCATIONS WHERE UNUSUAL SERVICE CONDITIONS DO NOT EXIST.

WARNING: TO AVOID SHOCK HAZARD, DISCONNECT ALL POWER BEFORE INSTALLING OR SERVICING DEVICE.

ADJUSTMENTS: Switches are shipped from the factory set for a specified float travel. Reasonable adjustment of float travel can be made in the field by moving adjusting strips (7) which are held in place by Screws (A) and (B). Loosening Screw (B) and moving upper adjustment strip (7) will affect the upper limit of float travel only. Loosening Screw (A) and moving lower adjusting strip (7) will affect the lower limit of float travel.

REPLACEMENT PARTS LIST

Item Number	Description	Number Req'd.	Part Number
1	Set of Moveable and Stationary Contacts	2	9998 PC-242
2	Switch Mechanism	1	65079-502-51
3	Float (304 SS)	1	9049 HF3
4	Float (316 SS)	1	9049 HF4
5	Adjusting Plate Assembly	1	2810-D7-G1
6	Operating Lever	1	65079-042-01
7	Adjusting Strip	2	2810-X8
8	Set Screw	1	21801-14080
9	45° - Connector and Rod Assy	1	2810-C3-G9
9	90° Offset 3" Connector and Rod Assy	1	2810-C3-G15
9	90° Offset 4-1/4" Connector and Rod Assy	1	2810-C3-G19
9	90° Offset 5" Connector and Rod Assy	1	2810-C3-G18
9	90° Offset 7" Connector and Rod Assy	1	2810-C3-G6
-	Seal and Installation Kit (BUNA-N)	1	9998 PC-337
-	Seal and Installation Kit (VITON)	1	9998 PC-338

 Orders for mechanisms must show Class and Type so nameplate on replacement can be correctly stamped.

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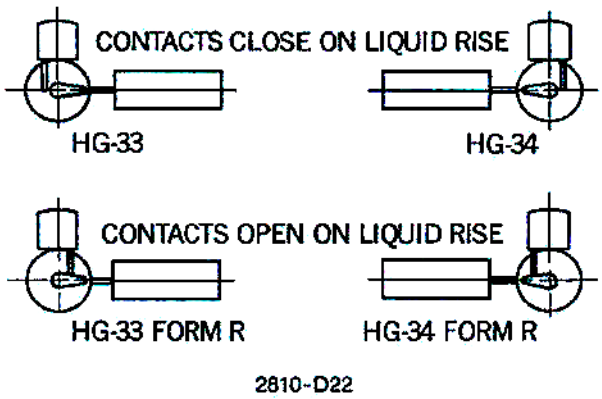
SERVICE
BULLETIN

FLOAT & LINK POSITIONS



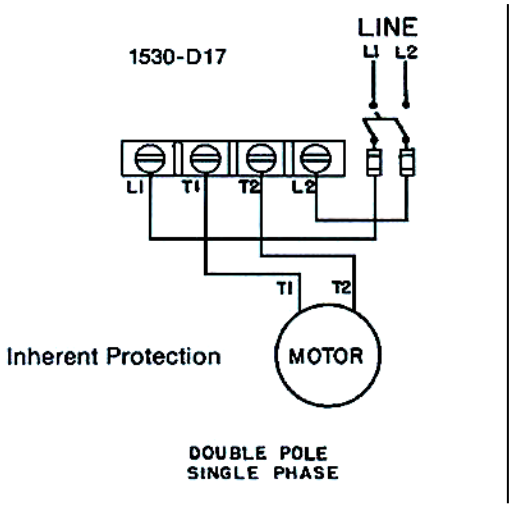
2810-D22

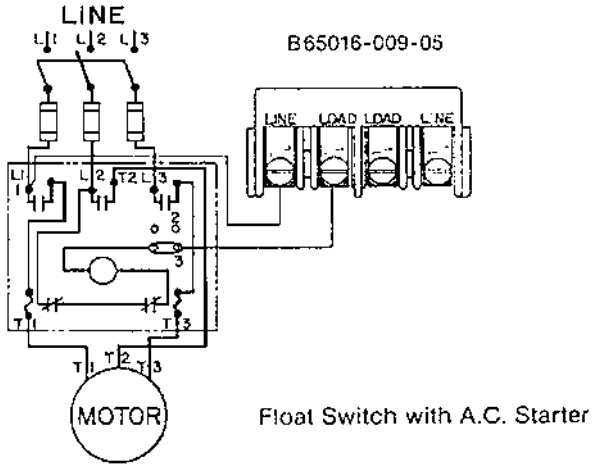
PRESSURE: In the use of any of these Float Switches, the pressure limit within the closed tank must not exceed 100 lbs.

MOTOR PROTECTION: A float switch of this type does not afford motor protection; however, it is quite frequently used as a pilot to operate a starter providing these desirable features. The Square D Co. manufactures a complete line of motor protective switches, information on which will be sent upon request.

REVERSE ACTION: To change, relocate operating link as shown in table 2810-D22 above to the opposite slot in base plate and corresponding hole in adjusting plate (Item 5).

TYPICAL WIRING DIAGRAMS





Float Switch with A.C. Starter

ELECTRICAL RATINGS (HORSEPOWER)

Voltage	Single Phase AC	Polyphase AC	DC
115	2 HP	3 HP	½ HP
230	3 HP	5 HP	½ HP
460/575		1 HP	
32			¼ HP

Control Circuit Rating: A600

9038-893
SERVICE
BULLETIN

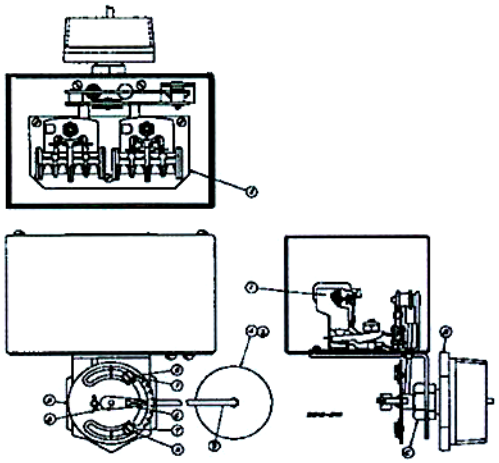
Class 9038 Type CG Series A
MECHANICAL ALTERNATOR

CAUTION: Switches are shipped with a bracket attached to the mounting plate. This bracket prevents the float and rod from moving in the tank during shipment. When installing the system, this clearly marked shipping bracket must be removed and discarded.

APPLICATIONS: The Class 9038 Type C Mechanical Alternators serve to open and close an electric circuit by an upward and downward float movement. The forces are applied by means of a float operating between different fluid levels. The action is such that two switch units are alternated on successive cycles. If the liquid level continues to rise or fall with one pump in operation, the lever will continue to travel to a further position at which point the "second" switch will be operated, throwing the stand-by pump across the line.

MOUNTING: The Class 9038 Type C Mechanical Alternators are mounted directly to the tank by means of the 2 ½" NPT threaded fitting (D). Before screwing this fitting into the tank, loosen Nut (C) so that the fitting (D) is free to rotate in the switch bracket. Tighten the fitting (D) so that there will be no leak past the threads. Then revolve the switch case until it is horizontal and tighten Nut (C).

PRESSURE: In the use of the CG Alternators, the pressure limit within the closed tank must not exceed 100 psi.



ELECTRICAL RATINGS (HORSEPOWER)

Voltage	Single Phase AC	Polyphase AC	DC
115 ……..	2 HP	……..3 HP	…… ½ HP
230 ……..	3 HP	……..5 HP	…… ½ HP
460/575 ……..		……..1 HP	……
32 ……		……..	…… ¼ HP

Control Circuit Rating: A600

REVERSE OPERATION: Form R controls are arranged for reverse action. In this form, the contacts will open on increase in liquid level. It is not recommended that a change be made in the field from standard to reverse operation or vice versa.

MANUAL TRANSFER (LEAD-LAG) SELECTOR: Form N3 switches have a manually engaged selector which voids alternation. The pump selected to lead always comes on first. With selector disengaged, the unit reverts to normal alternation.

MOTOR PROTECTION: A control of this type does not afford motor protection. However, it is quite frequently used as a pilot to operate a starter providing this desirable feature. The Square D Company manufactures a complete line of motor protective devices, information on which will be sent upon request.

ENCLOSURE RATING: NEMA 1 ENCLOSURES ARE INTENDED FOR INDOOR USE PRIMARILY TO PROVIDE A DEGREE OF PROTECTION AGAINST CONTACT WITH THE ENCLOSED EQUIPMENT IN LOCATIONS WHERE UNUSUAL SERVICE CONDITIONS DO NOT EXIST.

WARNING: TO AVOID SHOCK HAZARD, DISCONNECT ALL POWER BEFORE INSTALLING OR SERVICING DEVICE.

ADJUSTMENTS: Switches are shipped from the factory set for a specified float travel. Reasonable adjustment of float travel can be made in the field by moving adjusting strips (7) which are held in place by Screws (A) and (B). Loosening Screw (B) and moving upper adjusting strip (7) will affect the upper limit of float travel only. Loosening Screw (A) and moving lower adjusting strip (7) will affect the lower limit of float travel.

REPLACEMENT PARTS LIST

Item Number	Description	Number Req'd.	Part Number
1	Set of Movable and Stationary Contacts ……...	2	9998 PC-242
2	Switch Mechanism CG Types (including Form R) ……...	1	1551-C7-G1
3	Float (304 SS) ……	1	9049 HF3
4	Float (316 SS) ……	1	9049 HF4
5	Adjusting Plate Assembly ……	1	2810-D7-G1
6	Operating Lever ……	1	65079-042-01
7	Adjusting Strip ……	2	2810-X8
8	Set Screw ……...	1	21801-14080
9	4½" ……Connector and Rod Assy ……	1	2810-C3-G19
9	5" ……Connector and Rod Assy ……	1	2810-C3-G18
9	7" ……Connector and Rod Assy ……	1	2810-C3-G6
-	Seal and Installation Kit (Buna-N) ……...	1	9998 PC-337
-	Seal and Installation Kit (Viton) ……...	1	9998 PC-338

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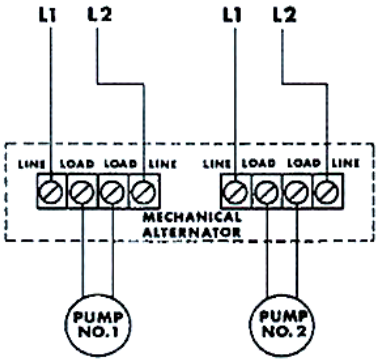
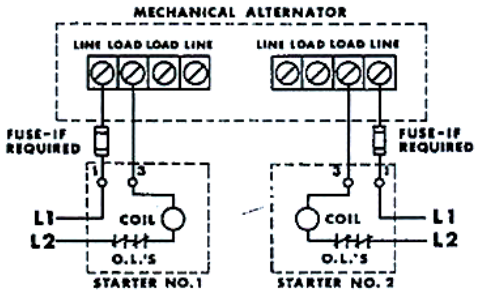
***WHERE SEPARATE POWER SUPPLIES ARE PROVIDED, THE DISCONNECT MEANS FOR EACH MOTOR MUST BE GROUPED TOGETHER AND PROVIDED WITH SUITABLE WARNINGS IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE AND ALL OTHER APPLICABLE CODES AND STANDARDS.**

CLASS 9038 MECHANICAL ALTERNATOR – WIRING DIAGRAMS*



SINGLE PHASE MOTOR CONTROL



AC OPERATION OF MOTOR STARTERS

C65016-004-33

ELECTRICAL RATING OF ALARM SWITCH ONLY
CLASS 9007 TYPE AO1

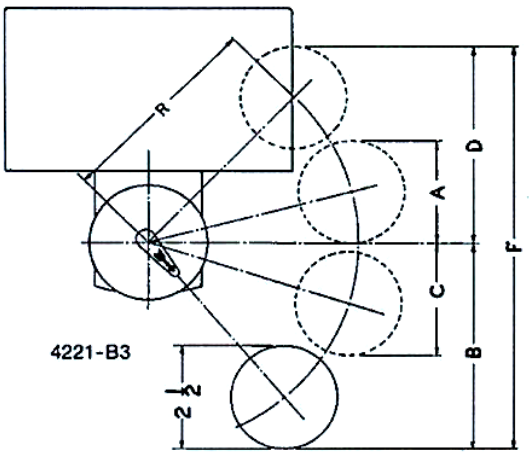
AC PILOT DUTY		
VOLTS	BREAK	MAKE
110	15A	40A
220	10A	30A
440	6A	10A
600	5A	8A

D.C. PILOT DUTY SINGLE THROW			
VOLTS	115	220	600
AMPS	0.5 A	0.25A	0.05A
DOUBLE THROW			
VOLTS	115	220	600
AMPS	0.25A	0.1	—

CIRCUIT A CLOSES ON FALLING LIQUID LEVEL
CIRCUIT B CLOSES ON RISING LIQUID LEVEL
(SWITCH CONTACTS MUST BE SAME POLARITY)

FORM N5 HIGH LEVEL ALARM

C65016-004-33



EXPLANATION OF FLOAT TRAVEL AND POSITION

NORMAL OPERATION: Switches will cut in and out at the high point and low point of distance A plus B, given in the tables. Under normal conditions, as long as one pump alone is able to handle the incoming water, the pumps will alternate at this distance. With the water level continuing to rise, the second switch will cut in and start the second pump when the float reaches the top of distance D. Both pumps will continue to run until the float returns to the low point of distance D plus C, where one pump will cut out. The other pump will continue until the float reaches the low point of distance B.

Type CG

Float Switch/Alternator Adjustment Instructions

Figure 1-A

Warning: Switch is shipped with a bracket attached to a mounting plate to prevent the float from moving in the tank during shipment. When installing the unit, this bracket, clearly marked with a tag, MUST be removed for float switch to operate.

Figure 1

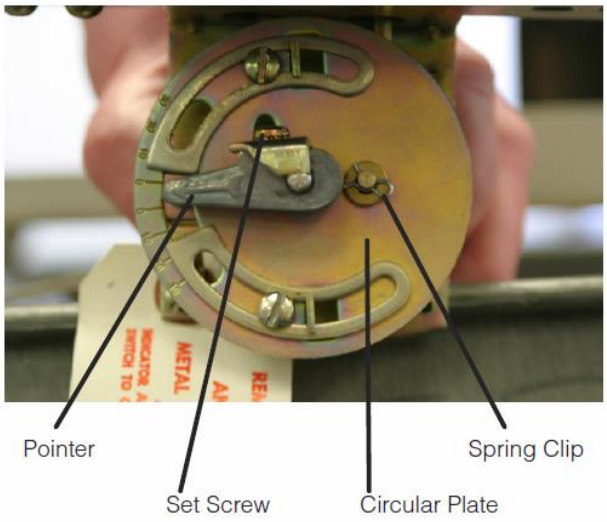


Figure 2

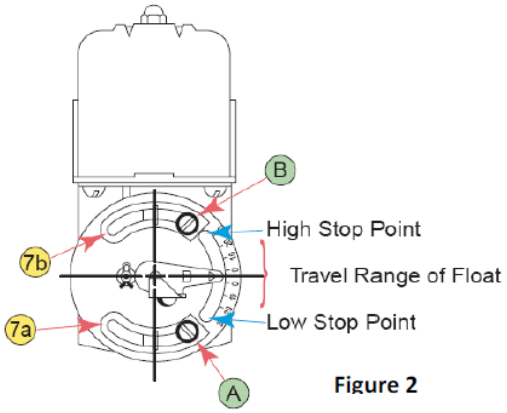


Figure 2

Figure 1 comes with a shipping bracket (Figure 1-A) towards the bottom; make sure to remove that bracket before start up.

Figure 2 above shows a left-hand dial, but also shows the (2) "0" points on the typical scale.

- 7b designates the upper scale.
- B designates the set screw to be loosened to adjust upper scale.

Set the upper scale to 7 before you start the pump. (Minor adjustments may be needed after start up.)

- 7a designates the lower scale.
- A designates the set screw to adjust the upper scale.

Set the upper scale to 7 before you start the pump. (Minor adjustments may be needed after start up.)