STERLCO TEMPERATURE CONTROL UNIT

MODEL 6411-FX

RAMROD
MODEL: 6411-FX

STERLING, INC.
5200 West Clinton Ave.
Milwaukee, Wisconsin 53223

Please note that our address and phone information has changed. Please reference this page for updated contact information.

⚠CAUTION These manuals are obsolete and are provided only for their technical information, data and capacities. Portions of these manuals detailing procedures or precautions in the operation, inspection, maintenance and repair of the products may be inadequate, inaccurate, and/or incomplete and shouldn't be relied upon. Please contact the ACS Group for more current information about these manuals and their warnings and precautions.

Parts and Service Department

The ACS Customer Service Group will provide your company with genuine OEM quality parts manufactured to engineering design specifications, which will maximize your equipment's performance and efficiency. To assist in expediting your phone or fax order, please have the model and serial number of your unit when you contact us. A customer replacement parts list is included in this manual for your convenience. ACS welcomes inquiries on all your parts needs and is dedicated to providing excellent customer service.

For immediate assistance, please contact:

- North, Central and South America, 8am – 5pm CST +1 (800) 483-3919 for drying, conveying, heating and cooling and automation. For size reduction: +1 (800) 229-2919.
  North America, emergencies after 5pm CST (847) 439-5855
  North America email: acsuscanadacustserv@corpemail.com
- Mexico, Central & South America
  Email: acslatinamericacustserv@corpemail.com
- Europe, Middle East & Africa +48 22 390 9720
  Email: acseuropecustserv@corpemail.com
- India +91 21 35329112
  Email: acsindiacustserv@corpemail.com
- Asia/Australia +86 512 8717 1919
  Email: acsasiacustserv@corpemail.com

Sales and Contracting Department

Our products are sold by a worldwide network of independent sales representatives. Contact our Sales Department for the name of the sales representative nearest you.

Let us install your system. The Contract Department offers any or all of these services: project planning; system packages including drawings; equipment, labor, and construction materials; and union or non-union installations.

For assistance with your sales or system contracting needs please Call:
North, Central and South America +1 (262) 641-8600 or +1 (847) 273-7700 Monday–Friday, 8am–5pm CST

Europe/Middle East/Africa +48 22 390 9720
India +91 21 35329112
Asia/Australia +86 512 8717 1919

Facilities:
ACS offers facilities around the world to service you no matter where you are located. For more information, please visit us at www.acscorporate.com

United States:

ACS Schaumburg – Corporate Offices
1100 E. Woodfield Road
Suite 588
Schaumburg, IL 60173
Phone: + 1 847 273 7700
Fax: + 1 847 273 7804

ACS New Berlin – Manufacturing Facility
2900 S. 160th Street
New Berlin, WI 53151
Phone : +1 262 641 8600
Fax: + 1 262 641 8653

Asia/Australia:

ACS Suzhou
109 Xingpu Road SIP
Suzhou, China 215126
Phone: + 86 8717 1919
Fax: +86 512 8717 1916

Europe/Middle East/Africa:

ACS Warsaw
Ul. Działkowa 115
02-234 Warszawa
Phone: + 48 22 390 9720
Fax: +48 22 390 9724

India
ACS India
Gat No. 191/1, Sandbhor Complex
Mhalunge, Chakan, Tal Khed,
Dist. Pune 410501, India
Phone: +91 21 35329112
Fax: + 91 20 40147576

PRESSURE SWITCH: (Continued)

The final measure of protection must come from the operator in venting before start-up. The pressure switch itself is set at approximately 25 PSI prior to leaving Sterling.

INSTALLATION:

INITIAL PROCEDURE:

These units are supplied for three phase operation for a selected voltage. Caution must be taken to provide a correctly sized power supply to the unit. These units must be correctly grounded.

All connections must be secure and should be checked before starting.

ELECTRICAL:

Knockouts are provided for entry for electrical service on each side of the cabinet. Check unit name plate for total unit amps and voltage rating.

HEATER CAP EACH CIRCUIT KW	TOTAL AMPS 3/60/240	TOTAL AMPS 3/60/480
4 1/2 KW	10.8 AMPS	5.4 AMPS
9 KW	21.6 AMPS	10.8 AMPS
12 KW	28.8 AMPS	14.4 AMPS

R.P.M. Listed for 60 HZ Application
Full Load AMPS @ 50 HZ 2% More Than Listed

HP	RPM	208V	230V	380V	415V	460V	575V
3/4	1800	3.32	3.0	1.02	1.66	1.5	1.2
1-1/2	3500	5.09	4.6	2.78	2.55	2.3	1.85
1-1/2	1800	5.31	4.8	2.91	2.66	2.4	1.92
1-1/2	1200	5.09	4.6	2.78	2.55	2.3	1.84
2	3500	5.97	5.4	3.27	.30	2.7	2.16
2	1000	6.75	6.1	.369	3.38	3.05	2.44
2	1200	6.86	6.2	2.75	3.44	3.1	2.48
2	900	8.85	8.0	4.84	4.4	4.0	3.2
3	3500	8.07	7.3	4.42	4.05	3.65	2.92
3	1800	9.95	9.0	5.45	4.98	4.5	3.6
3	1200	10.6	9.6	5.81	5.32	4.8	3.84
3	900	13.3	12.0	7.3	6.6	.60	4.2

MODEL 6411-FX

MODEL 6411-FX

(HIGH CAPACITY-MUSCLE PUMP)

INTRODUCTION

We are pleased to provide a Water Circulating Temperature Control Unit for your application. It is built by skilled craftsmen with the most modern and precision machines available today. The simplicity of design and compactness engineered into the unit resulted in less maintenance and less floor space.

The sterltronic Hagh Temperature Control unit, designed and tested over a period of many years, represents one of the most significant advances ever in the field of self-contained, closed systems - portable units for heating water and circulating it at controlled temperatures - through molds, rolls or jackets of processing equipment.

The 6411-FX Model is a complete dual zone (1 zone heating and 1 zone cooling) circulating and control units, with one delivery and one return line, plus a water supply line and a drain line for cooling.

C= 3/4 H.P. PUMP & MOTOR
D= 1 H.P. PUMP & MOTOR
E= 1/2 H.P. PUMP & MOTOR
F= 2 H.P. PUMP & MOTOR
G= 3 H.P. PUMP & MOTOR

The Sterl-Tronic temperature control unit is designed to circulate water through your process and to precisely, automatically, and reliably maintain this water at the selected temperature. The operating range of the Sterl-Tronic unit is from supply water temperature up to 350°F. maximum. The unit is used with chillers, towers or with well water.

The relatively small total amount of water, rapidly recirculated by the Sterl-Tronic, provides assurances of a close and uniform temperature relationship between the delivery and return lines of the unit. This assures uniform and stable temperature control as well as a very even temperature throughout the work area.

Also, the high rate of recirculation, combined with the large immersion heater and high cooling rate, gives the unit exceptionally fast response in bringing the process up to temperature and in making changes of settings when necessary.

The illustrations used are to help you identify certain parts by name and to understand our explanations - which will assist you later on in the Trouble Shootin sections.

The unit is warranted against defects in materials and workmanship for one year from date of shipment.

INTRODUCTION
(Continued)

Any sterlco unit which has been used contrary to specific operation instructions or materially altered, will not be covered by the warranty. Final determination of defects must be made at Sterling, Inc.

The units can easily be moved from one location to another, simply by removing the circulating connection lines.

By following the instructions in the manual and treating your equipment with care and respect due any precision equipment, you will be rewarded with years of uninterrupted, trouble free service.

MODEL 6411-FX

DESCRIPTION

WATER HEATING:

Heating of the water is accomplished through the specially designed low watt density electrical immersion heater inserted into the heater tank; the immersion heater temperature is controlled by the manual indicating thermostat mounted on the front of the control panel.

These models can be supplied with either 4-1/2, 9 or 12 KW low watt density immersion heaters; the higher the ratings, the faster the fluid will heat up - relative to the setting of the indicating thermostat.

KW ratings of the immersion heaters are rated at the following standard voltages.

	208V, 240V, 480V, 600V,
4-1/2 KW	15,368 BTU/hr.
9 KW	30,717 BTU/hr.
12 KW	40,968 BTU/hr.

CIRCULATION:

PUMP:

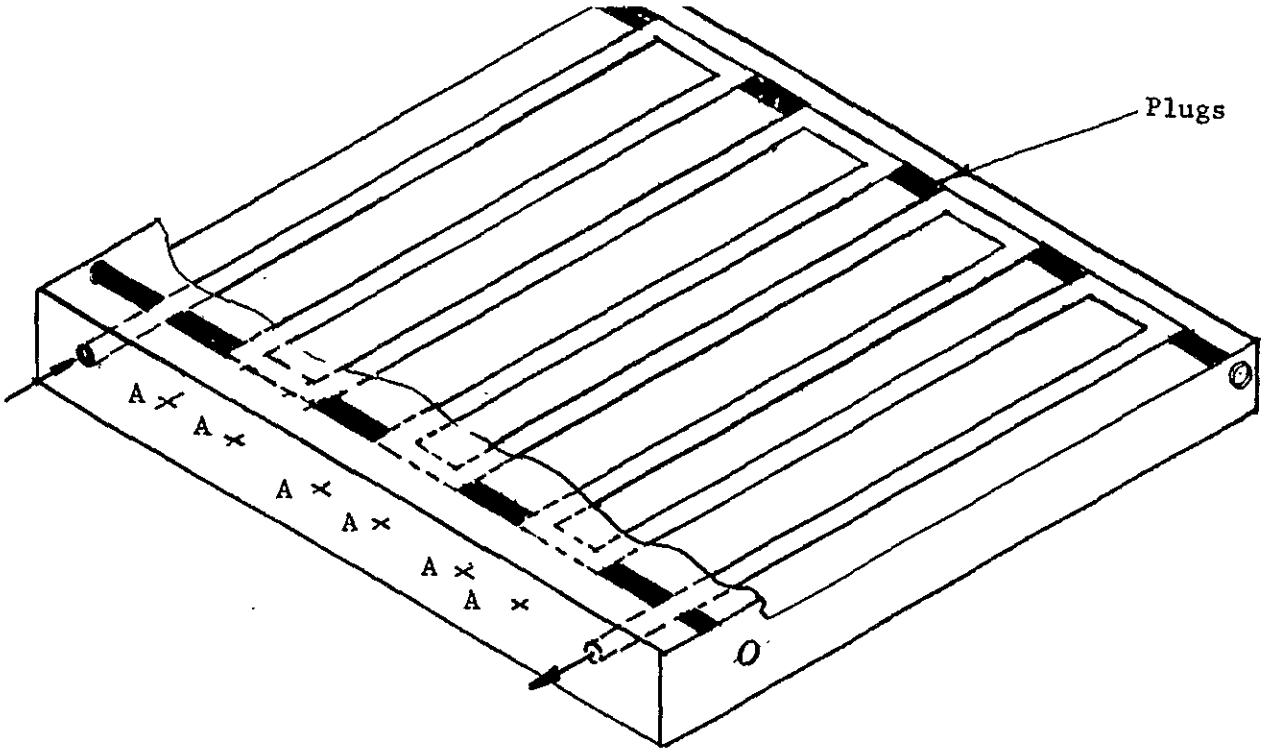
The pump is a straight centrifugal type, bronze-fitted. It has a high output capacity with good discharge pressure and is well suited for the conditions under which the unit is designed to operate. The circulating capacity available to the user, outside the unit is as stated below. A special seal-flush system is the pump helps keep the seal clean thereby extending seal life. The seal itself is the finest type available for this type of service and provides an excellent combination of long wearing ability, high abrasing resistance and heat resistance.

1 HP	30 GPM @ 25 PSI
1-1/2 HP	40 GPM @ 30 PSI
2 HP	50 GPM @ 35 PSI
3 HP	45 GPM @ 40 PSI

COOLING:

Cooling is accomplished by the automatic release of cooling water through specially designed piping in zone 2. The process fluid, i.e. water, gycol or other similar fluid is circulated through piping for control.

Naturally the plant water supply temperature will govern the minimum operating temperature of the unit.



Modification of Platen
For Manifold

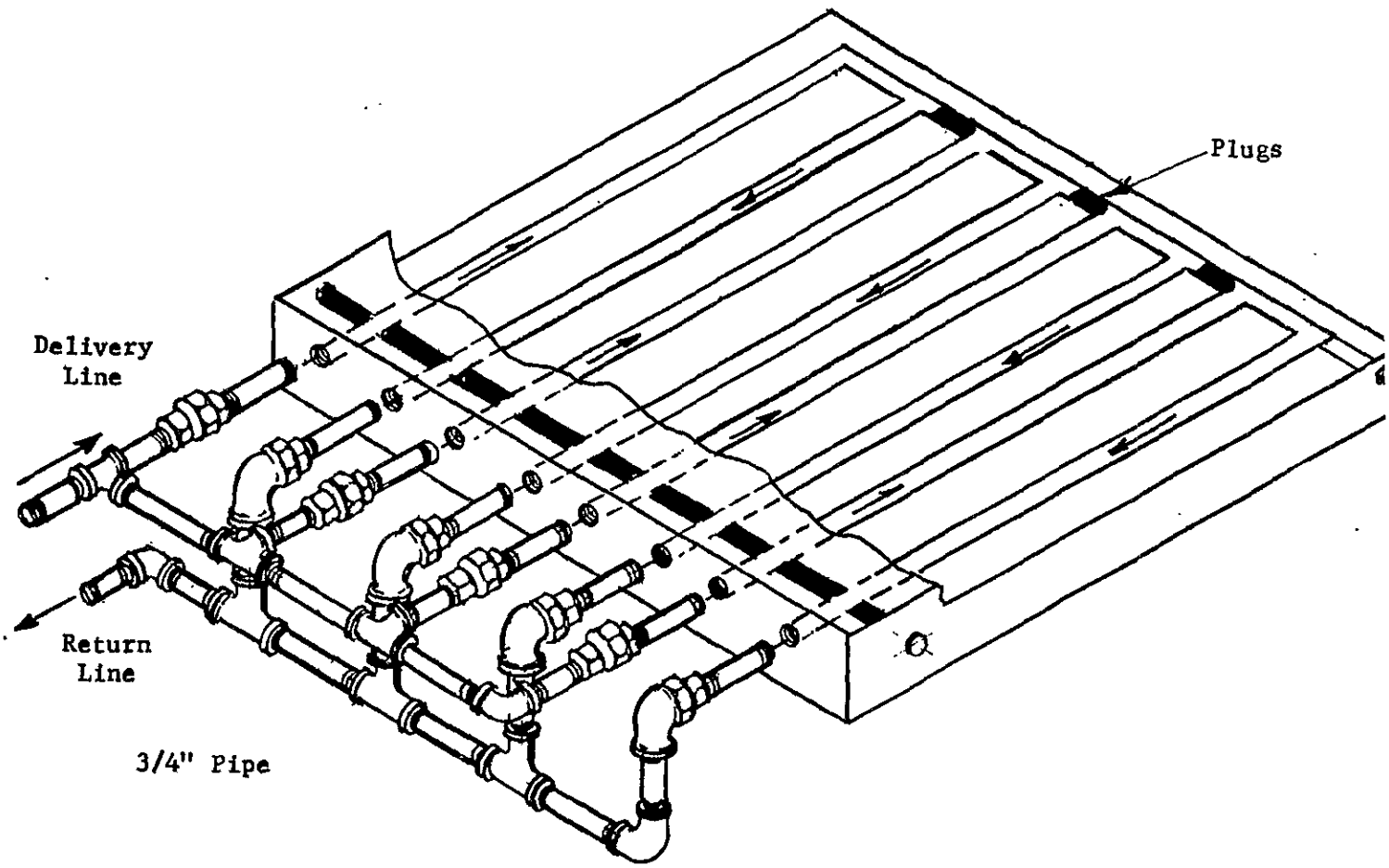


Fig.1

A-682-03842

PRESSURE SWITCH: (Continued)
The final measure of protection must come from the operator in venting before start-up. The pressure switch itself is set at approximately 10 PSI prior to leaving Sterling.

INSTALLATION:

INITIAL PROCEDURE:

These units are supplied for three phase operation for a selected voltage. Caution must be taken to provide a correctly sized power supply to the unit. These units must be correctly grounded.

All connections must be secure and should be checked before starting.

ELECTRICAL:

Knockouts are provided for entry for electrical service on each side of the cabinet.

HEATER CAP EACH CIRCUIT KW	TOTAL AMPS 3/60/240	TOTAL AMPS 3/60/480
4 1/2 KW	10.8 AMPS	5.4 AMPS
9 KW	21.6 AMPS	10.8 AMPS
12 KW	28.8 AMPS	14.4 AMPS

R.P.M. Listed for 60 HZ Application
Full Load AMPS @ 50 HZ 2% More Than Listed

HP	RPM	208V	230V	380V	415V	460V	575V
3/4	1800	3.32	3.0	1.02	1.66	1.5	1.2
1 1/2	3500	5.09	4.6	2.78	2.55	2.3	1.85
1 1/2	1800	5.31	4.8	2.91	2.66	2.4	1.92
1 1/2	1200	5.09	4.6	2.78	2.55	2.3	1.84
2	3500	5.97	5.4	3.27	.30	2.7	2.16
2	1800	6.75	6.1	.369	3.38	3.05	2.44
2	1200	6.86	6.2	2.75	3.44	3.1	2.48
2	900	8.85	8.0	4.84	4.4	4.0	3.2
3	3500	8.07	7.3	4.42	4.05	3.65	2.92
3	1800	9.95	9.0	5.45	4.98	4.5	3.6
3	1200	10.6	9.6	5.81	5.32	4.8	3.84
3	900	13.3	12.0	7.3	6.6	.60	4.8

Since the corrective maintenance and downtime often caused by bad water are costly, it is well worthwhile to treat that water. In general, we have found that people with good water seldom buy parts. Industrial water treatment to neutralize these conditions is relatively inexpensive and in many cases is truly a wise investment.

HEATER:

Heater is a three phase immersion heater of low watt density construction to minimize fouling and to promote longer heater life.

ELECTRICAL:

The control circuit and pump operate on 115 volt, single plase current. A single phase transformer provides 115 volt single phase current for the control circuit and motor. A manual starting switch with an electrical overload protects the motor.

VENT PUSHBUTTON:

This pushbutton permits quick and complete purge of air from the operator's panel, before the unit is started. The "VENT" pushbutton actuates the solenoid valve which permits the flow of trapped air and water out through the drain, insuring that the unit is properly filled and primed prior to start-up.

PRESSURE SWITCH:

The Pressure Switch is built into each unit to insure that the unit will not start until the water supply has been turned "ON" and the unit subjected to water supply pressure. This is intended to provide a strong measure of protection for the pump seal and the heater so that they will not be damaged through operation without water.

CIRCULATION:

FLOW DIAGRAM:

With the "START-STOP" switch in the "START" position and the temperature controller set to the required heat, the water is drawn into the pump out into the bottom of the tank.

AS the water is circulated up through the tank, it is heated by the immersion heater, where it passes the temperature sensor, which is recorded on the temperature controller and out to the delivery line.

CIRCULATION: (Continued)

After it is routed through the process supply, the heated water, which has cooled down a bit, comes back into the return line for recirculation, through the pump and back down into the tank, where it is reheated.

The by-pass line is a safety feature in the event there is a malfunction in the system, external of the unit proper. The by-pass line allows a small amout of water to recirculate internally to the unit.

OPERATION:

Vent to the unit as described on page , position the "START-STOP" switch to the "START" Position.

Set the control knob on the temperature controller to the desired heat.

As the unit is in the heating cycle, the Heat Indicator Light will illuminate if the heat of the water travels above the set point, the unit will automatically switch to the cooling cycle and the Cooling Indicator Light will illuminate.

SHUTDOWN:

Prior to shutdown, the water supply to the unit should be shut off.

Depress the "VENT" button for a few seconds to relieve the internal pressure. Water supply and drain lines, delivery and return lines and the electrical supply may then be disconnected.

DRAINING:

If your Sterl-Tronic is to be taken out of service for a long time or it will be exposed to freezing, it should be thoroughly drained. Drain plugs are provided at the base of the heater tank and water supply and drain lines.

PREVENTIVE MAINTENANCE:

Every 6 Months:

Inspect all electrical connections for secure attachment and for safe and secure ground connection. Inspect the power cable especially at entrance point to the unit.

Every 4 Months:

Check to be sure that all removable panels are in place and securely attached, especially those which enclose the electricals

TROUBLE SHOOTING

TEMPERATURE FLUCTUATIONS - Alternate overheating and overcooling:

While the user might be inclined to believe the trouble to be in the thermostat, this fluctuation can most always be traced to poor water flow, resulting from one or more of the following conditions. Before doing anything to the thermostat, please check for the presence of one or more of the following troublesome conditions.

A. Small hose and fittings, or small water passages. Slow water flow will create a long reaction time which causes overheating and overcooling.

B. Very long lengths of hose or long serpentine flow of water in and out of the mold in series rather than in parallel. Refer to the page on installation.

C. Blocked water line in the mold. New molds sometimes contain metal chips or other foreign particles inside the water lines. Old molds sometimes contain lime or rust accumulation.

D. Quick-disconnect fittings with check valves (a source of very serious obstruction). The check valves should be removed.

E. Lime buildup in the piping or fittings.

NOTE: The unit itself can be checked out for normal control by the use of a short line of 3/4" or 1/2" hose connected directly from the delivery to the return line. This will provide a condition of very good flow and will establish whether the blockage is in the unit or in the piping.

RAPID CYCLING FROM HEAT TO COOL

This condition is traceable to the same causes as the temperature fluctuations indicated above.

"SET" TEMPERATURE NOT SAME AS "INDICATED" TEMPERATURE

Through rough handling in transit the "set" calibration of the potentiometer may be shifted slightly. This will cause the unit to control at an indicated temperature slightly different than the "set." The thermostat knob may be loosened and reset to agree with the temperature being maintained on the thermometer. This should only be done with a condition of good water flow and preferably near mid-range of the thermostat.

UNABLE TO PROPERLY HEAT

When the water temperature will not rise above a certain temperature, the cause will generally be traced to continuous loss of water from the system (allowing cooling water to enter). This can be checked by observing the drain. Under some conditions it is possible to have the solenoid valve closed on a particle of grit which, of course, will allow the valve to continuously leak. This solenoid valve can be flushed out easily by having the operator push the vent button several times to open and close the solenoid. If it continues to leak, the unit should be stopped and the electric power and water turned off, and the solenoid valve should be taken apart and cleaned or replaced as required.

Another cause would be traceable to a leaking hose or fitting somewhere in the system. It is also possible that the immersion heater might be inoperative or defective, and most any competent electrician can check this out readily. Heater terminals are readily accessible for checking.

NO HEAT AT ALL

Check to be sure that the contactor goes "in" and "out" in response to signals from the thermostat. This can be done by turning the thermostat up and down the scale. The contactors should be made to go in and out as the dial passes unit temperature. If it does not function, the thermostat may be faulty and the section of this manual dealing with thermostat diagnosis should be studied and followed. If the contactor does function, but if no heat is produced, the problem is likely within the heater itself assuming, of course, that the steps listed under "Unable to Properly Heat" have been followed first.

UNABLE TO COOL

In order to cool, the unit must discharge water to the drain and simultaneously allow tap water to enter. Therefore, if your unit does not provide cooling, the following steps should be taken to help locate the cause.

1. Check to see if water flows to the drain when the unit calls for cooling.

2. Check to see that the water supply is open at all times while the unit is in operation.

3. Check the solenoid valve for proper operation - observe the drain. Water should flow to drain in response to solenoid action. If the drain cannot be seen, a simple method of check is by "feel" of the drain piping at the unit, with the solenoid alternately open and closed.

4. Perhaps it might be well to check the water supply pressure. If the water supply pressure drops below the setting of the pressure switch, the unit will stop.

5. High back pressure from the drain could easily cause a limited ability to cool, since the unit depends upon the pressure differential between the water supply and drain for the amount of cooling which it can provide.

HEATER BURN-OUT

A direct visual indication of heater burn-out is the presence of scorched or discolored paint on the heater tank. In most cases the water level inside the tank at the time of burn-out can be determined because the paint on the exterior of the tank below the water level will not be scorched. Causes of heater burn-out are generally traceable to:

1. The unit not being filled with water and purged of air prior to startup.
2. A faulty heater (tank discoloration not always present).
3. A plugged system or badly obstructed flow.

PUMPS AND SEALS

Before leaving our factory, each unit is operated for some considerable period of time and calibrated. After this test the unit is drained and blown out with warm air to remove most of the water from the piping system. If the unit is allowed to sit for a long period of time before being installed in your factory, the housing gasket at the pump can dry out and will possibly leak when the unit is started. In many cases these gaskets will soon swell and form a tight seal, while in other cases it may be necessary for you to make a partial turn on the pump screws to stop a leaking condition.

In some cases it is possible to have the pump seal surfaces separate slightly because of rough handling or considerable vibration during transit from our plant to yours. This, of course, would cause a leak at the pump seal when the pump is started, and in most cases the surfaces will mate again after the pump is allowed to run for short periods of time. If they do not mate, you might find it necessary to open up the pump and free the seal by hand. It is seldom necessary to install a replacement seal in a new unit unless the unit has been started without water.

Our pump seals should give a long period of service life. There are conditions, of course, which tend to shorten the seal life - such as presence of grit, operation of the unit without water, sustained high

water temperatures, or the presence of certain chemicals in the water. Our ceramic and carbon type seal, J-81-M, has been developed to resist abrasive tendencies which we find present in many water systems. It is also fitted with high temperature flexible components for a maximum amount of heat resistance. These same components remain flexible even at low temperatures. Thus the standard J-81-M seal has a fine combination of heat resistance and abrasion resistance.

After the unit has been in service for a period of years where abrasive conditions are present, you may find that the pump casting, which is designated as our "bracket" can be eroded away in the area around the seat of the rotary seal. This area should provide a straight, smooth surface against which the O-ring of the seal seat should bear. Should your castings show signs of erosion in this area, we would strongly recommend that the casting be replaced, since the replacement cost of the casting is a very modest investment when compared with down-time and maintenance cost for replacing a seal which has been installed in a worn out pump. A small puddle underneath the unit is a sign of rotary seal wear and if your investigation confirms the pump as the source of the leak, we would recommend that the seal be replaced as soon as practical. If allowed to leak, the water will eventually find its way to the lower motor bearing and cause further damage. The water slinger is intended to provide temporary protection against this possibility, but a continued and substantial leak will undoubtedly ruin the motor bearings.

Even though your maintenance people may have had years of experience in dealing with pumps in general, we would strongly suggest that they follow our form I-4100-EI when overhauling the pumps. Careful attention to these instructions will help assure a proper installation and minimum down-time.

Under some conditions users find that the pump will not start. After turning off the power supply it would be well to check the motor shaft to be certain that it is free to turn. By removing the drip cover atop the motor, access is provided to the end of the shaft, which has been slotted so that it might be turned with a screwdriver. If the shaft is found free to turn, we would suggest that the power supply to the unit be checked on all legs to be certain that power is available to the motor. If these two items have been checked, we would then recommend that a competent electrician be called upon to check the motor and its circuit.

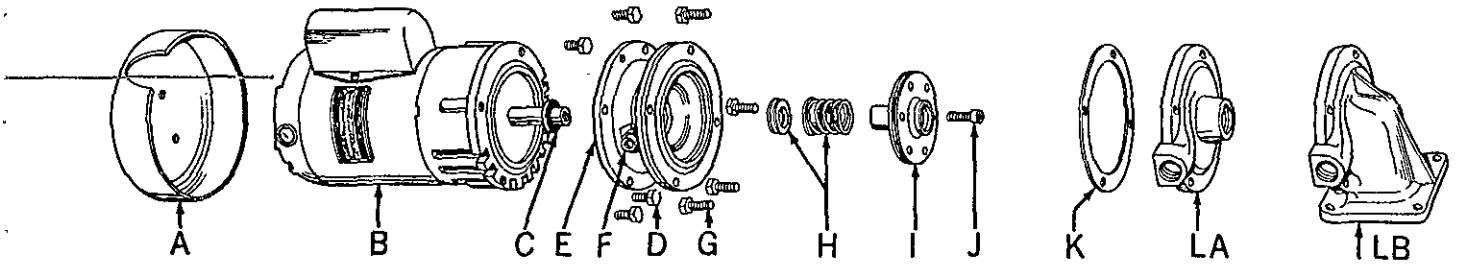
THERMOSTAT CALIBRATION

Each Sterlco unit is operated for a considerable time at our plant and is carefully calibrated and checked as part of our final test. However, the unit can arrive with a thermostat out of calibration because of a rough ride or rough handling in transit. Also, the thermostat can come out of calibration after a long period of service, and it is helpful therefore to reset the dial. The best method of correction is to loop a short length of 1/2 or 3/4 inch hose between the delivery and return lines (to insure good water flow) and to bring the water temperature to mid-scale, where it should be allowed to stabilize. By loosening the set screw of the thermostat dial, the dial can then be set to agree with the temperature being maintained on the thermometer.

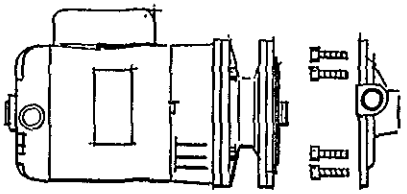
REPLACING ROTARY SEAL ASSEMBLY ON STERLCO PUMP AND MOTOR

PARTS

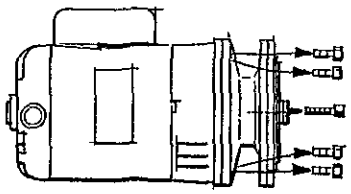
A. Drip Cover
B. Motor
C. Water Slinger
D. Motor Screws
E. Bracket
F. Prime Cock
G. Pump Screws
H. Rotary Seal Assembly
I. Impeller
J. Impeller Screw
K. Housing Gasket
L. Volute - A or B



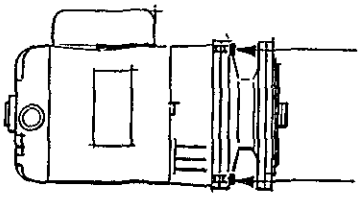
Step No. 1 — Dis-assembling (Removal of old seal assembly)



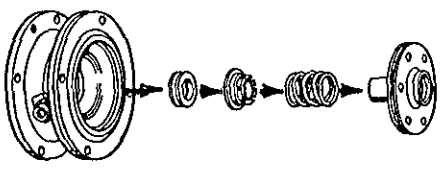
a) Remove volute from motor bracket and impeller assembly by removing pump screws.



b) Remove impeller screw and motor screws. (Note: opposite end of motor shaft is fitted with screw driver slot to hold shaft securely while impeller screw is being removed. Drip cover must be removed to get at screwdriver slot).



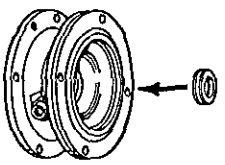
c) Insert two of the pump screws into the two threaded holes in the bracket. Tighten them slowly and evenly to force the impeller and bracket off the shaft. **Do not pry the impeller or bracket!**



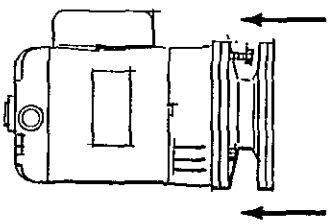
d) Remove old seal parts from impeller hub and bracket. Be sure water slinger is in place.

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.

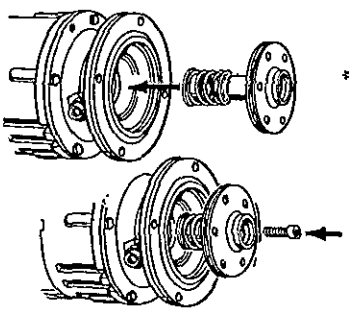
Step No. 2 — Re-assembly (Installation of new seal assembly)



f) Coat outside edge of new seat with 3% detergent solution 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.

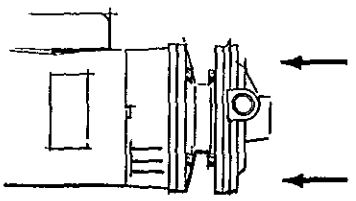


g) Remount bracket on motor.



h) Lubricate impeller hub. 3% detergent solution . . . slip new bellows and spring onto impeller hub. Be sure bellows slides freely on impeller hub.

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



j) Replace volute onto bracket, using new housing gasket. Use one gasket for condensate pump and for temperature control units. Secure with pump screws. Be certain gasket is seated properly.

NOTE: When ordering parts please indicate pump model number and serial number.

STERLING, INC. 5200 W. Clinton Ave., Milwaukee, Wisconsin 53223

Form 1-4100-E1

Litho in U.S.A. 6/62

STERLING, INC.
PARTS LIST (D-G)
STERLCO PUMP 1 TO 3 HP

ITEM	PART NO.	DESCRIPTION
O	001-05915	Motor Screw, (4) Required
P	542-10404	Water Slinger
O	615-00001	Bracket
R	081-00024	Rotary Seal Assembly
S		*Impeller-specify part no. and diagram (See pump nameplate)*
T	525-00001	Lock Washer
U	535-00001	Impeller Nut
V	545-00002	Housing Gasket
W-A	615-00003	Threaded Inlet Casting
W-B	615-00002	Tank Inlet Casting
X-A	001-05915	Pump Screw for pump w/threaded suction (8) required
X-B	001-05915	Pump Screw for pump w/tank suction (6) required
X-B	001-05923	Pump Screw for pump w/tank suction (2) required
		(Above parts illustrated on Form MP-1)
	M-160-00005	Motor Drip Cover (**)
	N-720-09003	Electric Motor 1 HP - 3/60/230-460V Open (#)
	N-720-09009	Electric Motor 1 HP - 3/60/230-460V TEFC (#¢)
	N-720-09004	Electric Motor 1-1/2 HP - 3/60/230-460V Open (#)
	N-720-09010	Electric Motor 1-1/2 HP - 3/60/230-460V TEFC (#¢)
	N-720-09005	Electric Motor 2 HP - 3/60/230-460V Open (#)
	N-720-09011	Electric Motor 2 HP - 3/60/230-460V TEFC (#¢)
	N-720-09006	Electric Motor 3 HP - 3/60/230-460V Open (#)
	N-720-09012	Electric Motor 3 HP - 3/60/230-460V TEFC (#¢)

**Used only on drip proof motors
* State Motor Manufacturer
# State Motor Manufacturer if preferred
¢ State special specification (i.e. 7EQ-Spec., 7E-Spec., etc.)

Sterling part numbers apply to non-special motors. Consult Parts List in your unit manual for specific motor requirements.

STERLING, INC., 5200 West Clinton Avenue, Milwaukee, Wisconsin 53223-0435
Phone: (414) 354-0970 Telex: 2-6805 P.O. Box 23435

STERLING, INC.
PARTS LIST (D-G)
STERLCO PUMP 1 TO 3 HP

COMPLETE PUMP & MOTOR ASSEMBLY

Open Drip Proof 3450 RPM, 3/60/230-460V

605-00083-11	1 HP
605-00084-07	1-1/2 HP
605-00065-03	2 HP
605-00086-01	3 HP

*TEFC 3450 RPM, 3/60/230-460V

605-00083-01	1 HP
605-00084-02	1-1/2 HP
605-00065-09	2 HP
605-00086-03	3 HP

*7EQ and Explosion Proof Not Included
605-00085-01 2HP 3/60/460V

STERLING, INC., 5200 West Clinton Avenue, P.O. Box 23435, Milwaukee, Wisconsin 53223-0435
Phone: (414) 354-0970 Telex: 2-6805

STERLING, INC.

SPARE PARTS LIST

MODEL 6411-FX

PART NO.	DESCRIPTION
729-00088	Contactor, Immersion Heater
724-00168	Controller, Thermostat
725-00512	Fuse, Control
722-00044-04	Heater, Electric Immersion, 12KW @ 480V.
720-09005	Motor, Electric
715-10002	Pilot Light, Heat
715-10003	Pilot Light, Cool
715-10022	Pilot Light, Pump
605-00085-01	Pump & Motor Assembly Complete
721-00107	Push Button, Start
721-00107	Push Button, Stop
721-00107	Push Button, Vent
714-00009	Relay, Plug-In Controller "Type N" 6 Pole
726-00005	Starter, Motor Control,
733-00010	Switch, Pressure
717-04001	Switch, Selector
704-00015	Transformer, Control
732-00013	Valve, Solenoid with coil 3/4"
732-00024	Valve, Solenoid with coil 1/4"
732-00032	Valve, Solenoid with coil 1"
732-00033	Valve, Solenoid with coil
732-00034	Valve, Solenoid with coil
044-00138	Valve, Safety Pressure Relief

NOTE: PLEASE GIVE MODEL AND SERIAL NUMBERS WHEN ORDERING PARTS. PART NUMBERS ARE LISTED AS A GUIDE, BUT MANY UNITS HAVE SPECIAL PARTS OR FEATURES NOT COVERED BY THIS LIST. PRICES ARE SUBJECT TO CHANGE WITHOUT NOTICE.

TERMS: Net 30 days F.O.B. Milwaukee, Wisconsin

STERLING, INC.
5200 West Clinton Ave.
Milwaukee, Wisconsin 53223

September 21, 1979