STERLCO TEMPERATURE CONTROL UNIT

SERVICE AND INSTRUCTION MANUAL

MODEL 6131

STERLING, INC.
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DESCRIPTION

The Model 6131-D Sterlco unit is a high capacity, triple zone, water circulating temperature control unit of the closed-circuit type. Unique features of this unit are its high pumping capacity and its large capacity for cooling. The unit is specifically designed for high-output, sheet extrusion rolls.

THE PUMPS are | HP straight centrifugal pumps intended to give high gallonage with good discharge pressure and suitable for most operating conditions which we expect to encounter.

HEATERS are 3 phase, 9 kilowatt immersion heaters of low-watt density. The low watt-density provides maximum life and minimum fouling.

COOLING is accomplished by the passage of water thru a shell and tube heat exchanger which is part of the circulating system. The left zone, intended for the top roll of the 3 roll stack, has a heat exchanger of 7.4 sq. ft. area. The middle and right hand zones have heat exchangers of 18.1 sq. ft. area. The cooling for each zone is controlled by the thermostat, which energizes a solenoid valve on demand. Aside from the thermostat there are no other controls or adjustments to make.

THERMOSTATIC CONTROL is provided by an agile, accurate, one-set thermostat of the non-indicating type. The thermostat actuates the heater or the cooling system whenever required. A small neutral zone between the heating and cooling is provided and this neutral zone can be adjusted if necessary to provide closer control or to conserve water and electricity. The operating temperature is easily read on the large diameter thermometer.

PILOT LIGHTS and selector switches are provided. The pilot lights indicate when the unit is heating or cooling. The selector switches provide the ability to cut out the heating or cooling when one or the other is not needed. Under some conditions this can reduce the consumption of water or electricity. Under other conditions their use can help stabilize the temperature swing resulting from a strangulated flow of water.

PRIMING. Provision is made for the operator to make a quick and complete purge of air from the unit, hoses and rolls for startup. The air is expelled through the vent valve by the operator. This Sterlco feature will insure that the unit is properly purged and completely filled with water before the pump is started.

INSTALLATION

To give the user the value he paid for, three important phases of the installation become quite important. First, a safe, well-grounded electrical power connection must be made; secondly, the hoses and fittings must be large enough to allow plenty of water to flow; and thirdly, a suitable water supply connection must be made so that the unit has an adequate supply of water with sufficient pressure. All three factors serve important functions in giving you safe, efficient and low maintenance operation.

DELIVERY AND RETURN CONNECTION

For yourrconvenience the delivery and return lines are brought out near the bottom of the rear panel to 1-1/2" connections. This makes it possible for the user to use large diameter hoses (which are very desirable), and to have a neat, simple installation. For best results and performance, the rotary joints and hoses should be 1-1/2" size or larger.

WATER SUPPLY

While appearing simple at the outset, the water supply to the unit is highly important. We recommend a full 1-1/2" supply without small connections or other fittings. We also recommend a usable water supply pressure of at least 25 lbs., as measured at the unit. The water supply line should be "ON" whenever the unit is running. Supply pressures over 50 to 60 psi serve no useful purpose and can shorten the life off the unit. While the unit is built for a 125 lb. maximum pressure, it would be well to install a pressure regulator in the supply line if the water pressure is high.

Hard or corrosive water can be damaging to the unit and to your equipment since the unit operates at temperatures which would accelerate these conditions if present. Bad water can also build layers of scale or lime on the heat transfer surfaces of your process andtthereby impede production. Since maintenance and downtime are costly, it is well to treat the water supply if that water is bad. In general, we can say that people with good water seldom buy parts. Industrial water treatment to minimize this condition is relatively inexpensive, and in many cases is a truly wise investment.

DRAIN

A 1-1/4" drain connection is provided and it is best to have this pass to an open drain where the operator can tell when the unit is cooling. If it is not possible to flow to an open drain, the unit may be connected to a closed system as long as approximately 25 psi differential exists between the water supply pressure and the back pressure from the drain.

ELECTRICAL POWER

The brass nameplate attached to the Sterlco unit will indicate the voltage and current requirements. The three conductors of the three phase power supply should be connected to the three contactor terminals which are marked for this purpose. A ground connection is provided and should be used to insure that the unit is positively grounded. In general, the power requirements for this unit are approximately as follows:

Model 6131-D	3/60/220 85 amps	3/60/440 45 amps

OPERATION

After all hose, piping, and electrical connections are made, the following sequence of steps should be followed to put the unit into operation. All switches should be off, and all manual valves closed before starting.

1. Turn on your water supply valve to allow water to enter the unit and fill the circuits through the rolls. THIS VALVE SHOULD BE KEPT FULL OPEN AT ALL TIMES. Open the fill valve for each zone, if they exist.

2. Open the vent valve for each of the three zones. Allow each vent to remain open until a good, steady stream of water flows out. This step is quite important to the removal of all air from the system, since the unit will not release entrapped air once the pump has been started. When a steady flow of water shows at the vent, it should be closed. After the vent valve of each zone is closed, the fill valve for that same zone should be closed, if they exist.
3. Turn on the pump switches to start water circulating. Check immediately for proper pump rotation.

(NOTE: IF EITHER THE PUMPS OR THE HEATERS ARE OPERATED WHEN THE UNIT IS NOT FULL OF WATER, DAMAGE TO THE UNIT MAY RESULT. PLEASE REFER TO PRESSURE SWITCH OPTION UNDER "OTHER STERLCO FEATURES AND UNITS.")

4. Set the thermostat knob at desired temperature and turn on the heater and cooling switches. The heater will operate until the temperature setting is reached, and the heater pilot light will indicate when it is operating. If the thermostat requires recalibrating, this can be done by merely removing the thermostat dial and replacing it to make the thermostat dial markings agree with thermometer readings. For recalibrating differential, see Bulletin #F43A.

5. DRAINING When the unit is not in use, or if it is to be temporarily exposed to freezing weather, it should be thoroughly drained. After the delivery and return hoses or piping have been disconnected from the unit, remove the pipe plugs in the union tees below the connections of the pump and tank.

TROUBLE SHOOTING

TEMPERATURE FLUCTUATIONS - Overheating and overcooling

While the general reaction is to adjust the thermostat, this fluctuation can most always be traced to poor water flow resulting from one or more of the following conditions:

A. Small hoses and fittings, or small water passages.

B. Very long lengths of small diameter hose.

C. Clogged strainer on the water supply line. The strainer blowoff valve should be used regularly to clean the strainer. In cases of doubt we recommend that the strainer screen be removed and checked.

D. Blocked water line in the hose or roll. New rolls sometimes contain chips or other foreign particles inside the water lines. Old rolls sometimes contain lime or rust accumulation.

E. Quick disconnect fittings with check valves (a source of serious obstruction).

F. Lime buildup in the piping or fittings.

The unit itself can be checked out by the use of a short length of 1-1/2" or 1-1/4" 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. This will also provide a strong indication as to whether a thermostat adjustment is required.

RAPID CYCLING FROM HEAT TO COOL

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

UNABLE TO PROPERLY HEAT

When the water temperature will not rise above a certain temperature, the cause can generally be traced to a continuous loss of water from the system (allowing cooling water to enter). This can be checked by observing the drain. It is possible to have grit lodged under the seat of the solenoid valve which is used for the cooling control. This solenoid valve can be flushed out easily by having the operator run the thermostat dial up and down several times to open and close the solenoid. Another cause could be traceable to a leaking hose or fitting somewhere else 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.

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 checked to help locate the cause.

1. Check to see if water flows to the drain when the cooling pilot is "on".

2. Check to see that the water supply or fill valve is opened and allowed to remain open at all times while the unit is in operation.

3. Check the solenoid valve for proper operation.

4. Check the strainer screen on the water supply line. We would suggest that you use the blow-off valve to blow down the strainer and if there is any doubt as to the condition of the strainer, then it would be well to remove the strainer screen and clean it as required.

5. Perhaps it might be well to check the water supply pressure to be certain that it hasn't dropped.

6. A 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 before startup.

HEATER BURN-OUT (continued)

2. A condition of low water supply pressure at the unit.

3. A faulty heater.

4. A plugged system or generally obstructed flow.

PUMP 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 gaskets at the pump can dry out and will possibly leak when the unit is started. In many cases these gaskets 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.

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 seal when the pump is started, and in most cases the surfaces will mate again after the pump is allowed to run for a short period of time. If they do not mate you may 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 the presence of grit, operation of the unit without water, sustained high water temperatures, or the presence of certain chemicals in the water.

The pump seals are water cooled to give long service life. The amount of cooling can be regulated with the throttle valve, if it exists.

After the unit has been in service for a period of years and particularly 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.

PUMP AND SEALS (continued)

Should your casting 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.

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 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.

THERMOSTAT ADJUSTMENT

Under some conditions it may be necessary to adjust the span between heating and cooling. However, before starting this adjustment the operator should check to see that the unit has proper water flow (see Temperature Fluctuation under "Trouble Shooting"). The calibration can be accomplished by first removing the thermostat dial which exposes the positioning screws of the thermostat. Refer to form F43A for illustration. By adjusting only the switch on your left as you face the unit, the temperature tolerance can be set to any desire amount. Do not attempt to work both positioning screws. After this adjustment has been made the dial can be replaced and reset.

PARTS LIST # 119
January 31, 1980

MODEL 6131

PART NO.	DESCRIPTION
724-00025 724002602500	Thermostat thermostat, bulb, 50-300, 6'
~~162-00012-05~~	~~Bulb, capillary & plunger assembly~~
722-00051-08	Immersion Heater 9 KW, 220V
722-00051-09	Immersion Heater 9 KW, 440V
717-04001	Heater switch
715-10020	Pilot light, red
715-10012	Pilot light, amber
729-00013	Contactor, Size "0"
729-00012	Contactor, Size "1"
726-00005	Motor Starter 120V
726-00003	Motor Starter 220V
704-00027	Transformer
106-00013	Heat Exchanger 18.1 Sq. Ft.
106-00014	Heat Exchanger 7.4 Sq. Ft.
721-00107	Push Button, Start-Stop
732-00016	Solenoid Valve, 3/4"
732-00013	Solenoid Valve, 3/4"
081-00024	Rotary Seal Assembly

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