

STERLCO
HIGH CAPACITY HEAT EXCHANGER
SERVICE AND INSTRUCTION MANUAL
MODEL: 7210-B

Engineered and Manufactured by INDUSTRIAL CONTROL DIVISION
STERLING, INC.
5200 West Clinton Avenue, P.O. Box 23435, Milwaukee, Wisconsin 53223-0435
Manufacturers of Temperature Control Equipment Since 1916

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MODEL 7210-B

INDEX

	<u>PAGE NO.</u>
INTRODUCTION	i, 1
ELECTRICAL CONNECTIONS	1
DELIVERY & RETURN CONNECTION	1
WATER SUPPLY & DRAIN	1
VENTING THE UNIT	2
Vent Blow-Off Valves	2
CIRCULATION	2 & 3
Flow Diagram (Dwg. D682-04500)	4
OPERATION	5
GETTING RESULTS WITH THE EXTRACTOR	5
PREVENTATIVE MAINTENANCE	6
TROUBLE SHOOTING	6 & 7
STERLCO PUMP	MP/MS
STERLCO PUMP & MOTOR	I-4100-E1
PUMP PARTS LIST	111
ASCO BULLETIN	8210
A-B START SWITCH	609
ELEMENTARY DIAGRAM 3/50-60/208-600 V	A682-01666
FLOW SCHEMATIC	A682-02451
PARTS LIST	172
WARRANTY	

MODEL 7210-B

INTRODUCTION

We are pleased to provide a High Capacity Heat Extractor 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 floor space.

The Sterlco High Capacity Heat Extractor Unit, designed and tested over a period of many years, represents one of the most significant advances ever in the field of self-contained portable units for cooling and circulating fluid at controlled temperatures, through molds, rolls or jackets of processing equipment.

The Heat Extractor is a water circulating temperature control unit which forces a torrent of turbulent water, action that pulls heat from molds or rolls faster than laminar fluid flow produced by regular units.

By washing away the insulating laminations of fluid from the inner wall of the fluid passages, heat is transferred at much faster rates, this means faster cycles, increased production plus temperature uniformity in the process areas.

Turbulent flow has the capability of removing more heat at the same temperature at which you are now operating, or the same amount of heat at a higher temperature setting. This can eliminate mold sweating without adding cycle time.

The 7210-B can save dollars because it makes all the fluid work for you instead of having an open system where you use cold water straight through, even though you desire a mold temperature much above that of your water supply.

Heat Extractors are carefully engineered for specific applications or range of applications to produce a very high "Reynolds Number" for the fluid flow. Not only the special high capacity pump and impeller, but the entire system is designed to give the user the fastest possible rate of heat transfer in his process area.

The unit is well suited for use with chillers, towers or municipal water supplies or with well water.

These standard units may have many variations of optional features added to them relative to the customers application or specific desires.

The illustrations are used to help you identify certain parts by name and to understand our explanations, which we will assist you later on in the Trouble Shooting section.

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

MODEL 7210-B

INTRODUCTION - Continued

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

ELECTRICAL CONNECTIONS:

A three phase electrical power supply should be brought to the motor starter.

We require a four wire connection, L1, L2 and L3 plus a ground. It is very important that all connections are secure.

It is very important that your power supply be hooked up correctly to the motor starter, so that the motor runs in the correct direction.

Terminals L1 and L3 are the terminals to hook up to; if after hooking up the power supply, and the motor is running in the opposed direction of the indicating arrow, reverse wires to terminals L1 and L3. Using a flashlight, look at the rotation of the shaft, the motor must run in the same direction as the arrow.

DELIVERY AND RETURN CONNECTIONS:

The Delivery and Return connections are 1-1/4" unions. Success of the Heat Extractor installation depends greatly upon the users selection of hoses and fitting sizes. It is strongly urged that:

1. If the mold has more than one inlet and outlet, run a separate line from the Heat Extractor to each inlet and outlet.

Simple manifolds or headers can be easily assembled and installed to permit the largest possible number of lines to be used. (See Dwg. A682-03844) This is imperative to obtain a high volume of fluid in the mold. Provisions must be made to get it there and back in the shortest time possible.

2. Hoses and fittings should be the largest size possible. Small fittings and quick-disconnect fittings should not be used. It is very important that the power of the pump be used inside the mold itself. This will not happen if the power is used just to get fluid through the hoses and fittings. In many cases the user will have to change from their usual type of mold hook-up.

WATER SUPPLY AND DRAIN:

The unit is equipped with 1" union connections.

Unless the cooling load is extremely heavy, a 3/4" hose for the water supply and drain lines would be ample.

MODEL 7210-B

WATER SUPPLY AND DRAIN: (Continued)

If there is a back pressure on the drain line, caution must be taken to be sure the water supply pressure is substantially higher in pressure.

VENTING THE UNIT:

The unit should always be vented before initial start-up procedures.

The Vent Switch on the front panel is used to completely vent the entire system of any air trapped in the lines; it can also be used for a fast cool down of the circulating water.

VENT BLOW-OFF VALVES:

These Vent Blow-Off valves are used to clean out the brass filter screen in the "Y" Strainers of the "Return and Water Supply" lines of any foreign materials brought into the system.

CIRCULATION:

FLOW DIAGRAM (See Dwg. D682-04500)

The unit cools by mixing fresh cold water with the warmer circulating water.

With the "START" button depressed, the motor will run.

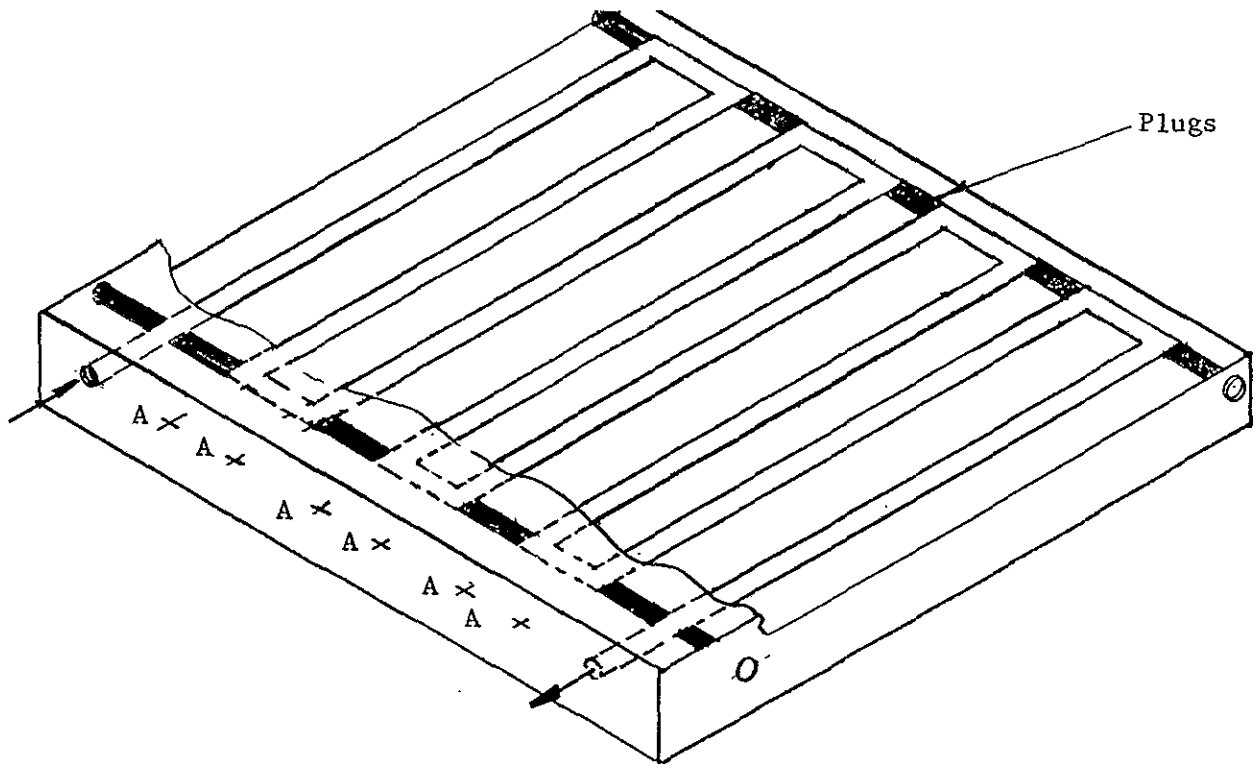
The fresh water enters through the Water Supply Line into the Pump where it is circulated up through the Delivery Line and is recorded on the Thermometer.

After the water leaves the process and is circulated into the Return line, it enters a "Y" Strainer until the water temperature exceeds the Thermostat setting; it continues down through check valve and is recirculated back into the pump and out the delivery line.

As the water temperature reaches the setting of the Thermostat, the solenoid valve will open. Then, as the recirculated water comes into the return line, part of the recirculated water will be diverted through the open solenoid valve and out the drain line. At the same time the same amount of fresh water enters the system from the water supply.

The hot water in the system is mixed with the colder fresh water coming in through the water supply line to satisfy the thermostat.

This modulating and mixing action conserves heat and water to provide prompt, effective and efficient control of the temperature of the work area.



Modification of Platen
For Manifold

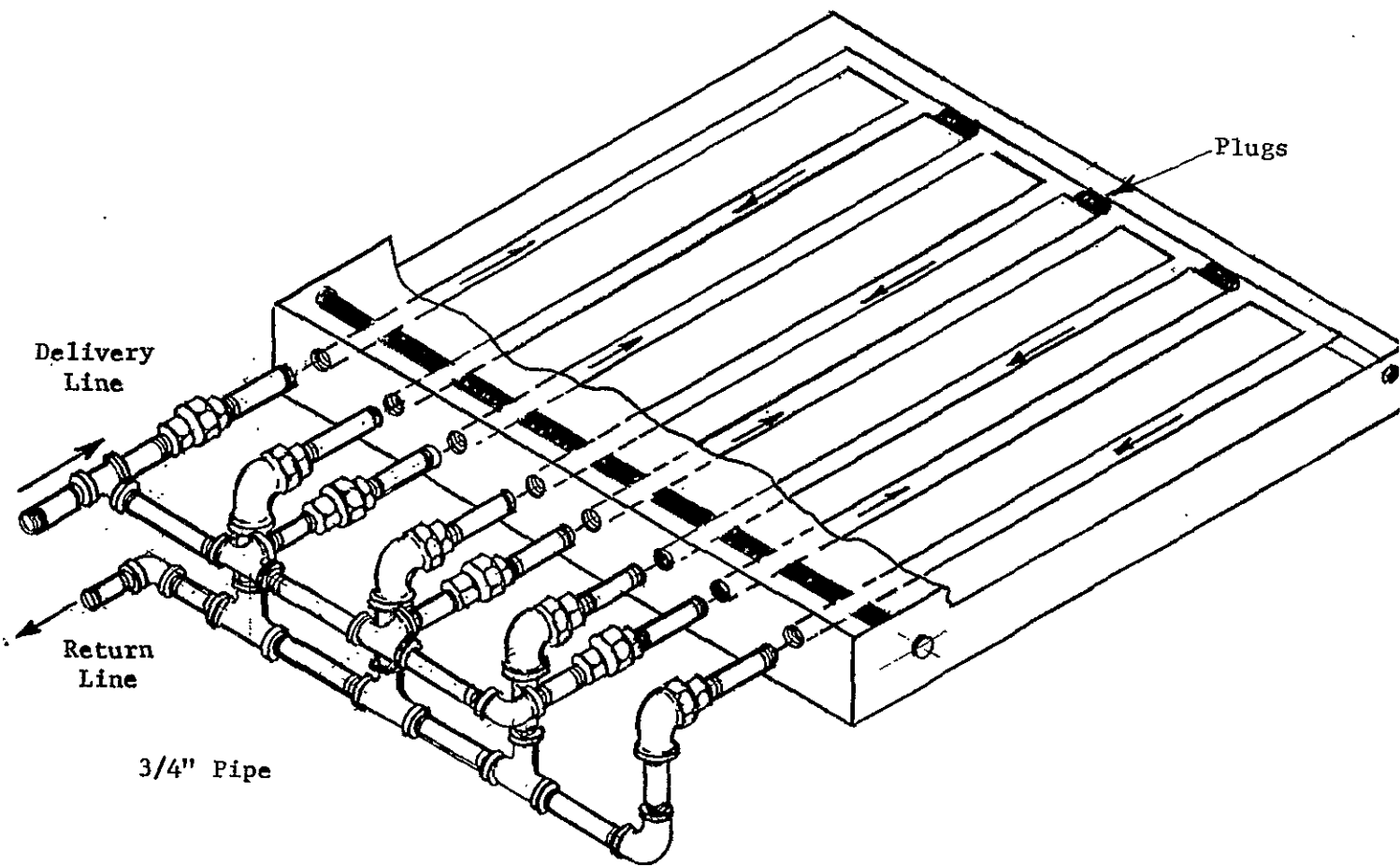


Fig.1

MODEL 7210-B

CIRCULATION: (Continued)

This is accomplished by eliminating mold sweating and icing of hoses and fittings even under extremely humid conditions. The most effective use of available water from the plant supply (either chilled or well water) is provided by the simple engineered equipment.

OPERATION:

With the "START" Switch in the "OFF" position, the following steps should be taken:

1. Turn on the water supply to the unit.
2. Open the two Blow-Off valves and allow them to blow for approximately one minute. Then, close them securely.
3. Set the temperature dial for a temperature of approximately 100° F (or 10-15 degrees above the cooling water temperature.)
4. Depress the "START" button.
5. After the water is circulating to further "vent" the unit of all air, switch on the vent toggle switch, let it vent for approximately one minute, then shut it off.

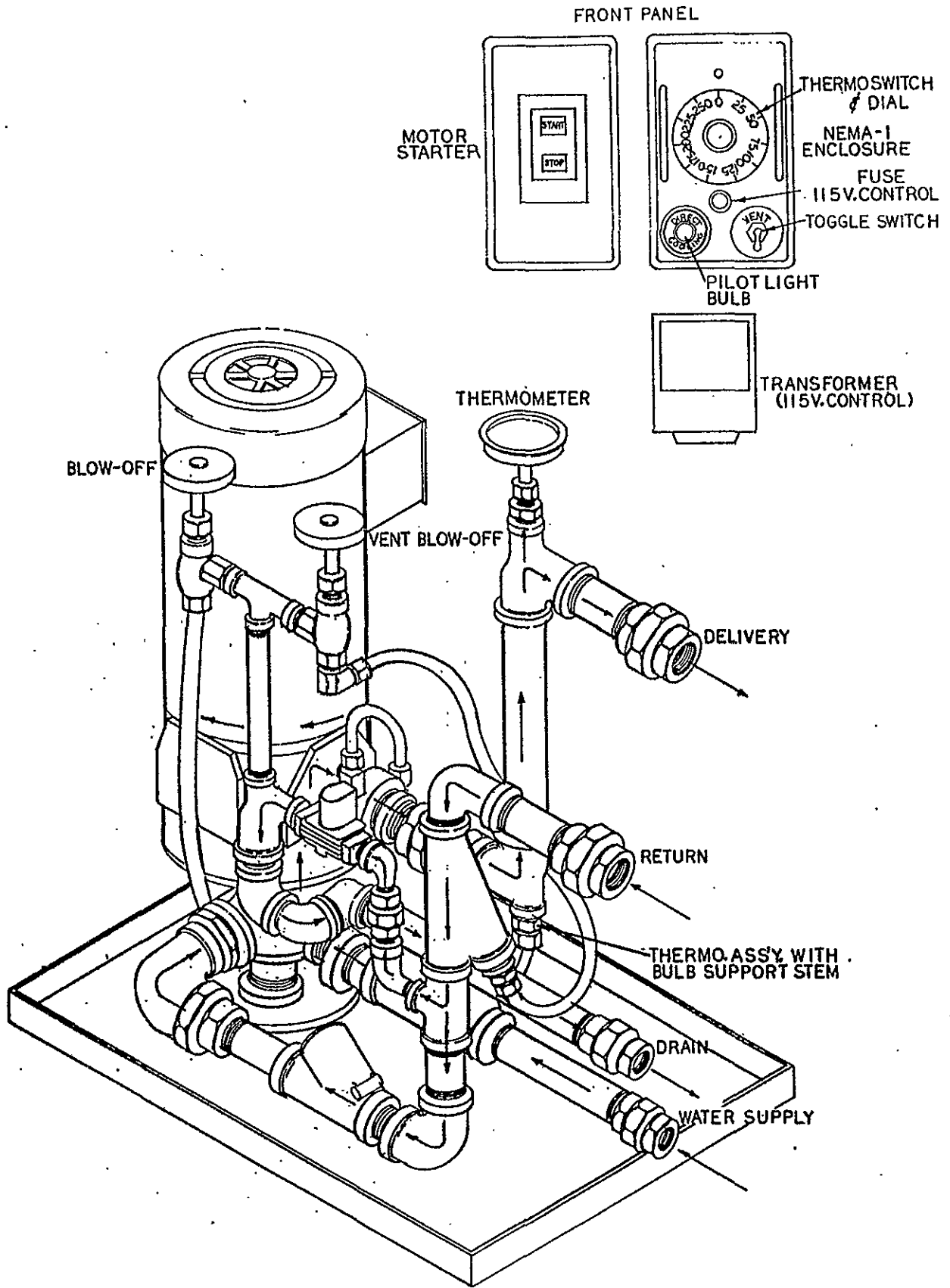
The Heat Extractor is now ready for operation.

GETTING RESULTS WITH THE EXTRACTOR

OBJECTIVE - The heat extractor should enable the user to draw heat from his mold at a faster rate than before. This can allow a higher mold temperature than before (to overcome condensation), or it can allow faster cycles, or a combination of both.

HIGHER MOLD TEMPERATURE TO STOP CONDENSATION - With the plastic process in production, the initial tests should be run at same fluid temperature as used previously. Then the thermostat setting should be set up to 100 and the unit allowed to run for approximately ten minutes. If process conditions remain stable, the thermostat should be set up another ten degrees and allowed to stabilize. After a few of these increases a maximum allowable water temperature should become apparent.

FASTER CYCLES - In the case of injection molding, the cylinder heats and injection pressures should be reduced, after the steps above have established the most suitable water temperature. Because the mold is now warmer, it should be easier to fill and would not require the same high injection pressure and cylinder heat as before. All this means less heat input, and less need for heat removal. Therefore, faster cycles should be sought.



MODEL 7210-B

D-682-04500

MODEL 7210-B

PREVENTATIVE MAINTENANCE

Periodic inspection of the following equipment must be made to maintain optimum performance of your Heat Extractor.

MOTOR:

1. Clean out the motor air/intake grill of any dust and oil accumulation.
2. Check bolts that hold the pump to the motor.

DRAINLINE:

1. Check outlet of drain line for any obstructions or back-pressure.

STRAINERS:

1. Clean out the strainers frequently, depending upon usage and operating conditions.

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:

1. Small hoses or fittings or small water passages. Slow water flow will create a long reaction time which causes overheating and overcooling.
2. 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 page on "Delivery and Return Connections".
3. Blocked water lines 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.
4. Quick disconnect fittings with check valves (a source of very serious obstructions.)
5. Lime build-up in the piping or fittings.

MODEL 7210-B

TROUBLE SHOOTING

ALTERNATE OVERHEATING AND OVERCOOLING: (Continued)

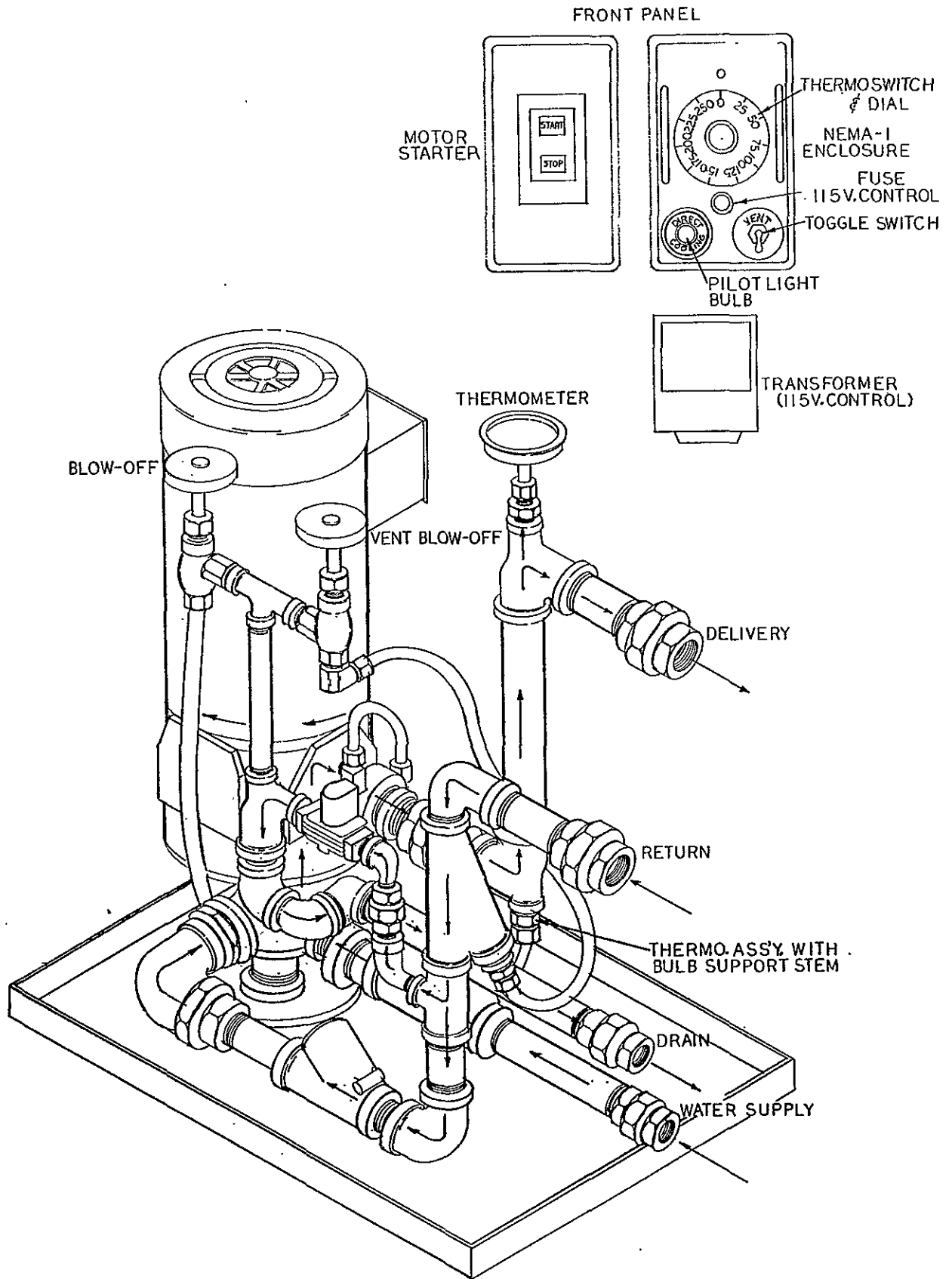
NOTE:

The unit itself can be checked out for normal control by the use of a short line of 1-1/4" nose connected directly from the Delivery Line to the Return Line. This will provide a condition of very good flow and will establish whether the blockage is in the unit or the piping.

UNABLE TO COOL:

In order to cool, the unit must discharge water to the drain and simultaneously allow fresh 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 the drain in response to the solenoid valve action. If the drain cannot be seen, a simple method of checking is by "feel" of the drain piping at the unit, with the solenoid valve alternately opening and closing.
4. Perhaps it might be well to check the water supply pressure. If the 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 the drain line for the amount of cooling which it can provide.



MODEL 7210-B

D-682-04500

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