BERG
Chilling Systems Inc.

INSTALLATION, OPERATION
&
MAINTENANCE MANUAL

BERG TEMPERATURE CONTROL UNIT

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INTRODUCTION

On behalf of everyone at Berg Chilling Systems, thank you for purchasing this equipment. With over 35 years experience in developing and implementing customized Process Cooling solutions for customers around the world, we firmly believe that our equipment is second to none and that the solution provided for you in this equipment has been engineered and manufactured using only the highest quality, state of the art components, to give trouble free service with a minimum of maintenance. It is in everyone's best interest if you read this manual thoroughly and where applicable, familiarize yourself with the checklists and tips contained here, and adhere to the safety and maintenance schedules outlined. Proper care and attention to maintenance and operating procedures will ensure an extended service life and minimum downtime of your equipment.

Berg will not be liable for errors contained in this manual or any damages in connection with the use of this manual.

CUSTOMER SUPPORT

If you have any questions in regards to this manual or if you have any problems with your unit, consult the factory at 416-755-2221.

For 24 hour service inquiries, Please call (416) 755 - 2226

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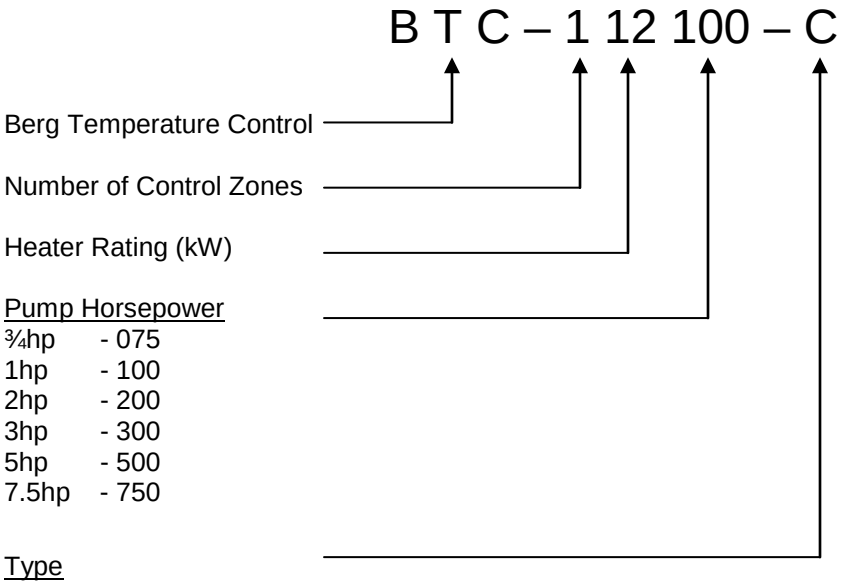
MODEL NUMBER NOMENCLATURE



For the direct injection style, the D may be left off the model number.

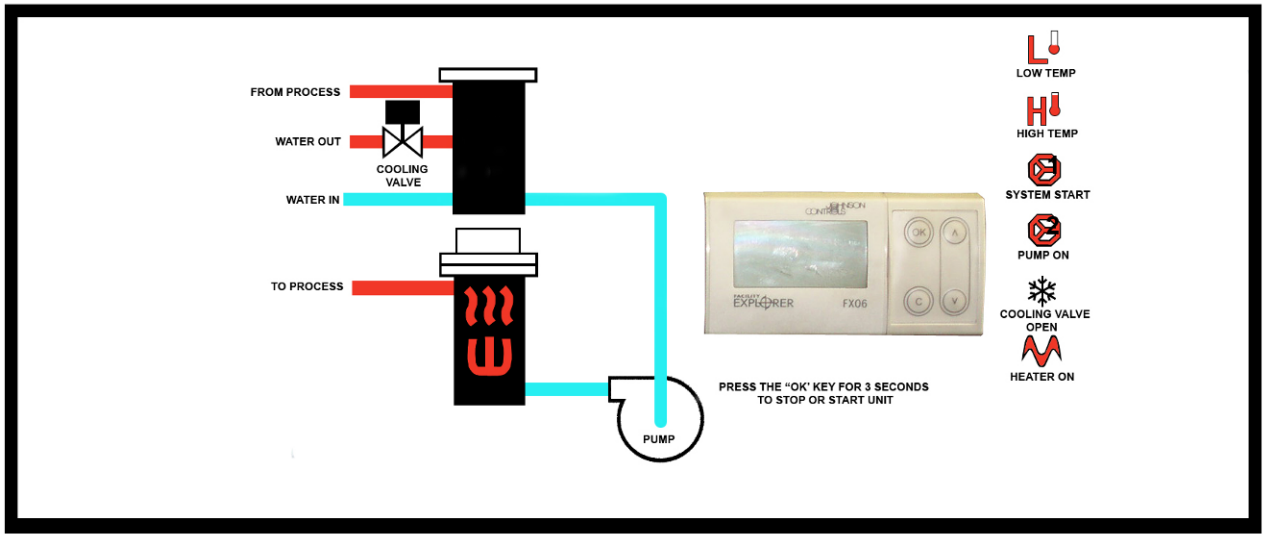


Figure 1

Control Panel

OK — 1. Toggle Stop/Start (hold for 3 sec)
2. Accept data entry

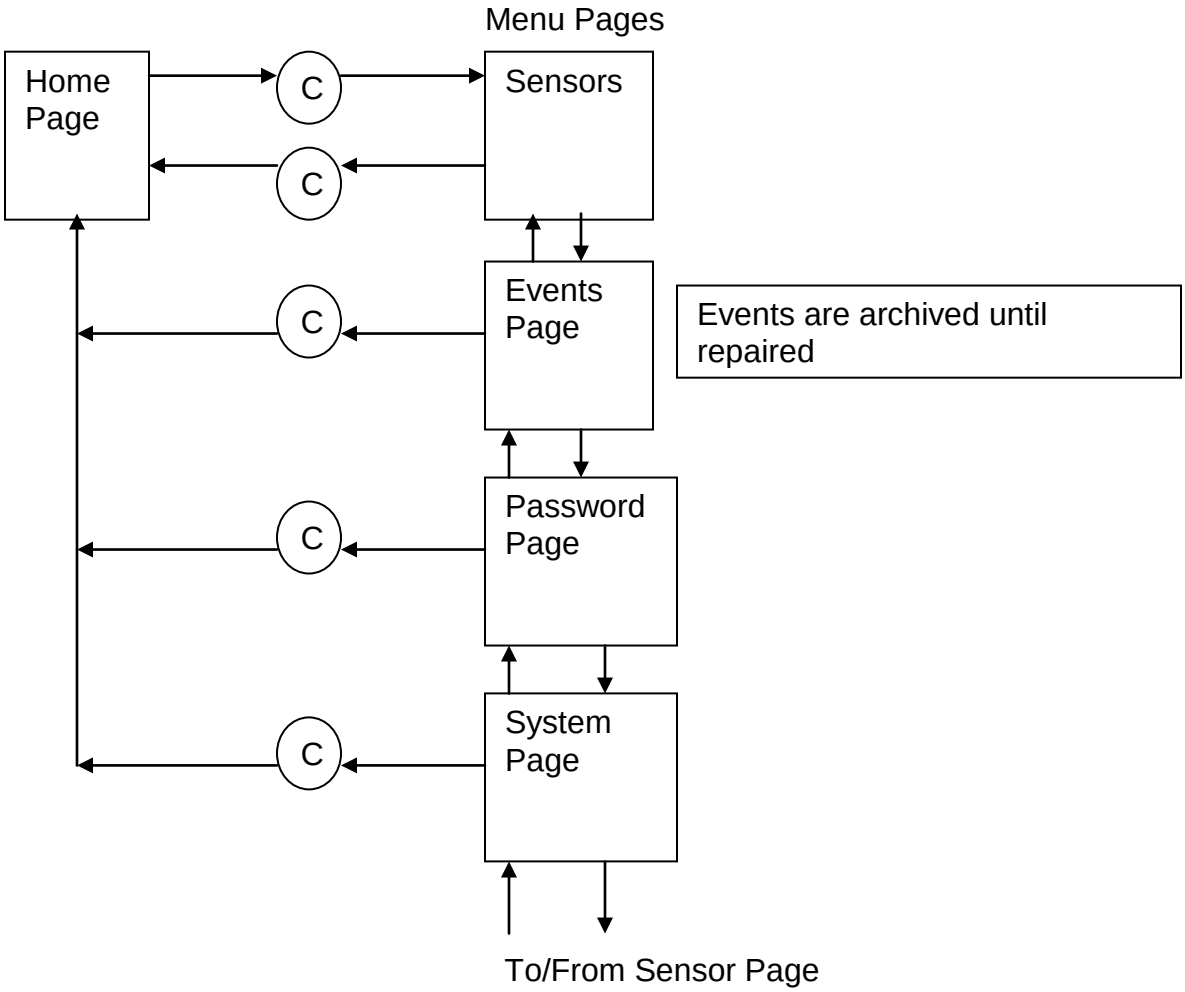
C — 1. Cancel data entry/operation
2. Silence Alarm output relay (hold for 2 sec)

^ — Scroll / Increase data value

v — Scroll / Decrease data value

Menu Navigation

Using “C” and scroll keys

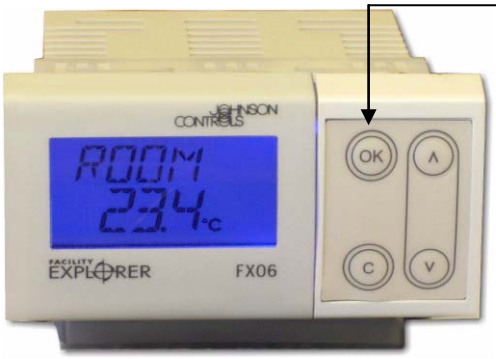


Active alarm events are displayed until any key is pressed.

Controller Home Page

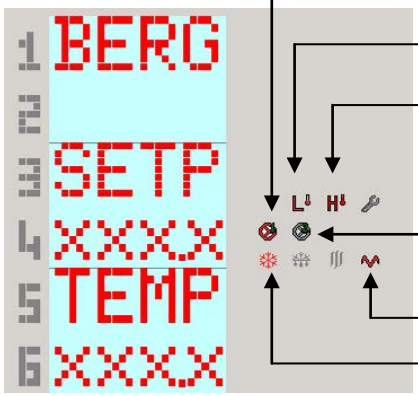
TEMP
TEMP SETPOINT
$^{O}C/^{O}F$
WATER PRESSURE
PSI
SUPPLY
$^{O}C/^{O}F$
RETURN
$^{O}C/^{O}F$
PUMP
ON/OFF
HI TEMP
ALAR
LO TEMP
ALAR
UNITS OF MEASURE
PRI (^{O}C)
SECO (^{O}F)
ALARM
ON/OFF
Sensors Page
PROCESS
OK/BAD
RETURN
OK.BAD
PRESSURE
OK/BAD
System Page
LCD CONTRAST
BACKLIGHT
DEFAULT COLOR
Blue (Red)
ALARM COLOR
Red/Blue
Address
255
HOUR
MINUTES
DAY OF WEEK
DAY
MONTH
YEAR

Controller Display



PRESS “**OK**” FOR 2 SECONDS TO STOP OR START THE UNIT

DISPLAY ICON LEGEND



SYSTEM START

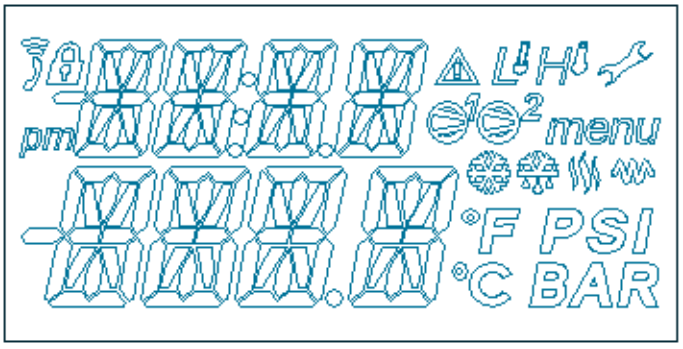
LOW TEMP ALARM

HIGH TEMP ALARM

PUMP STATUS

HEATER STATUS

COOLING/VENT STATUS



Events

System Error
High Temp
Low Temp
Pump Fail
Low Press
Process Sensor Fail
Supply Sensor Fail
Pressure Sensor Fail

Parameters (Password protected page)

Return Sensor Offset
Process Sensor Offset
Hi Temp Alarm Shift
Lo Temp Alarm Shift
Heater Differential
Heater Setpoint Offset
Vent Time
Period
Percent Open
Prop Band
Integral
Heater Control sensor selection
SV Control sensor selection
Pressure sensor offset
Pressure sensor Upper Range Value
Pressure sensor Lower Range Value
Lo Pressure Trip Setpoint
DAT Output
PT Filter Weight

SET UP PROCECURE

Location
The Berg Temperature Controller Unit should be located as close to the process machine as possible. A minimum footprint of 16-1/4" wide and 28" deep is required on a level surface. Rear clearance is only required to make the necessary water line hookups.

Air Temperature and Humidity
The Temperature Controller should be in a clean, well ventilated area with a maximum room temperature of 120°F with 95% relative humidity, non-condensing and a minimum air temperature of 32°F.

WATER HOOK-UP

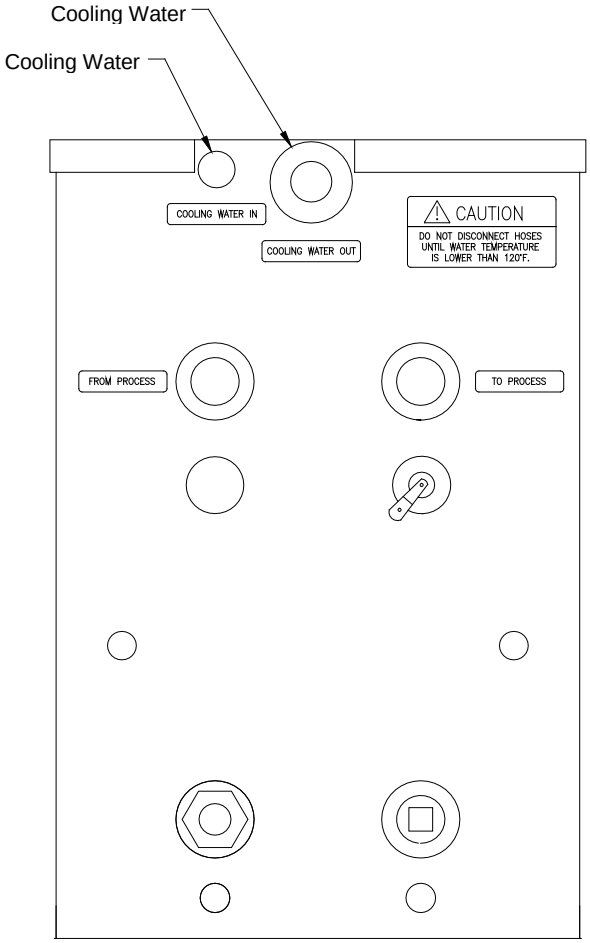
(SEE FIGURE 3)

Pressure Requirements

The Berg Temperature Control Units require a minimum of 25 PSI on the cooling water input and accommodate a maximum of 85 PSI.
Note: 30 PSI to 50 PSI provides the optimum operation of the unit.

To and From Process

The *to process* and *from process* hookups should be connected in the back of the unit with 1¼" NPT piping. Both hookups are clearly marked on the back of the unit.



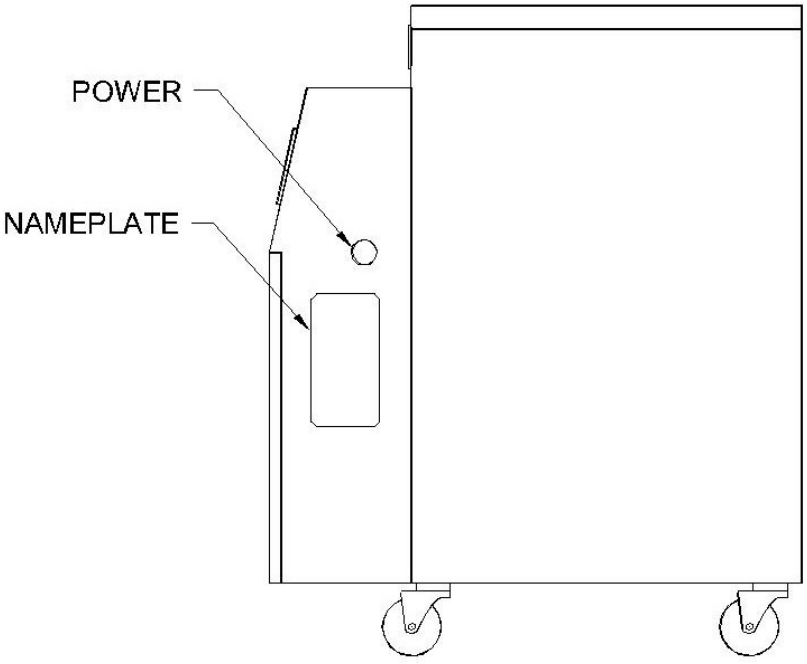
Cooling Water In and Out

The *cooling water in* and *cooling water out* hookups should be connected in the back of the unit with ¾" NPT piping. Both hookups are clearly marked on the back of the unit.

ELECTRICAL HOOK-UP

Always maintain a safe ground and always disconnect incoming power before you open the unit or perform any nonstandard operating procedures, such as routine maintenance. Improper power supply could result in damage to the unit as well as serious injury to the operator!

1. Before power is initiated to the unit, make sure the specifications stated on the nameplate are met. See Figure 4 for the location of the nameplate. The electrical hookup should be identical with a maximum of ±10% variance in voltage. The electrical hookup should also run through a fused disconnect, sized in accordance with the nameplate amperage and conforming to *Article 250 of the National Electrical Code.*
2. Connect the power feed to the right side of the unit. Bring the four wires through the hole on the right side of the electrical enclosure. See Figure 4.



3. Connect the three hot wires to L1, L2 and L3 on the terminal block in the upper right hand corner of the electrical enclosure. See Figure 5.
4. Connect the ground wire to the copper grounding mount to the left of the terminal block. See Figure 5.

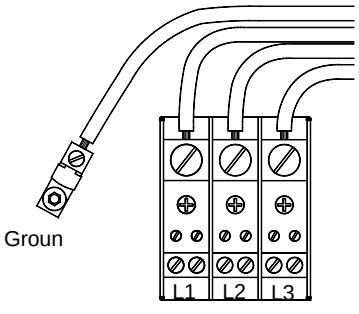


Figure 5

BASIC START UP PROCEDURES

1. After you have completed the Set Up Procedures, initiate the cooling water supply. Note: *If the water supply is less than 25 PSI, the unit will not function and the low water pressure alarm will be annunciated.* (Correct the water pressure if necessary and proceed with the start up.)
2. Check for leaks in your cooling water connections.
3. Initiate power from the fused disconnect.
4. Remove the top panel. Open the front door of the unit and tap the pump contactor with an insulated non-conducting device. Look down at the pump and check the rotation. The pump should be rotating in the same direction as the rotation sticker on the top or side of the pump (clockwise). If the rotation is correct, proceed with the start up.

   If the rotation is incorrect, stop operation and disconnect the power supply. After the power is disconnected, swap two of the three power source wires connected to the terminal block. Reinitiate power and check the pump rotation again. The pump should now be rotating correctly.

Note: The unit is now ready for operation.

5. Press the "*OK*" key to start the unit. Each time the unit is started, the venting sequence will be engaged ensuring that the process water has filled the unit piping before the pump or heater turns on. The venting sequence time will vary depending on the timer settings (*approximately 30 seconds*). (*The Cooling Valve* icon will be displayed.)

Quick Startup Procedure

- Hook-up the lines as per the labels on the unit.
- Remove the cover of the unit.
- Turn the water on and check for leaks.
- The make-up water pressure must be above 15 psi.
- Turn the power on to the unit.
- Using the C key will scroll between the home page and the menu pages.
- The home page displays the temperature.
- With the temperature displaying us the arrow keys to display set-point.
- To change set-point to desired value push the OK key the set-point will flash.
- Use the arrow keys to change the value to the require setting.
- Push OK to accept the value.
- To start the unit push and hold the OK key for 5 seconds an icon 1 will display.
- The unit will start a auto vent for 30 seconds. Then the pump will start.
- Shut the unit off by pushing the OK key for 5 seconds check the pump for proper rotation as it shuts off.
- If incorrect change the incoming power leads.
- If correct start unit again with the ok key and the unit will auto vent again the pump will run. If the unit requires to be warmed up to set-point the heater will come on and then shut off just before set-point. At set-point the controller will cycle the cooling solenoid on and off to control your set-point.
- All control values are preset and any adjustments should not be required.

SHUT DOWN PROCEDURES

Shut Down to Change Water Line Hook-Up
Allow the process temperature to cool to at least 120°F. Press the *stop button* to stop operation of the unit. Close the *cooling process water input*. Press the *start button* or open the relief valve on the back of the unit to relieve pressure. Drain the water from the unit using both 1/4" plugs on the lower back of the unit. See Figure 8. Once the unit is cooled to at least 120° and the water is drained, the water hook-ups can be removed.

Shut Down for Mold Purge (Option)
To prepare for mold purge, just press the *stop button* to stop operation of the unit and close the *cooling process water input*. Connect the compressed air (80 to 100 PSI recommended) and hit the *mold purge button*. The mold purge will continue until timer 2 is timed out.

Shut Down for Relocation
When relocating the unit within the same general area, press the *stop button*. The water feeds may or may not need to be disconnected depending on the new location.

Shut Down for Storage or Shipment
Shut down the unit as you would for changing the water line hook-up. Then loosen the compression fitting at the pump volute. See Figure 9. Take extra care to make sure all trapped water is drained from the bottom of the mixing/heater tubes and the pump volute. This trapped water will freeze at 32° or below. The expansion of this freezing water can/will damage the equipment.

Note: The Temperature Controller Unit can withstand temperatures as low as -40°F when shipping and storing the completely drained unit.

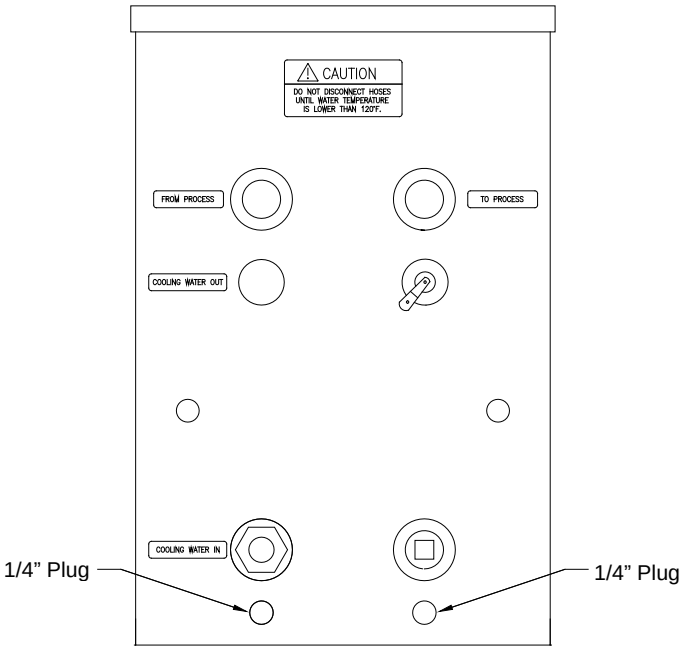


Figure 8

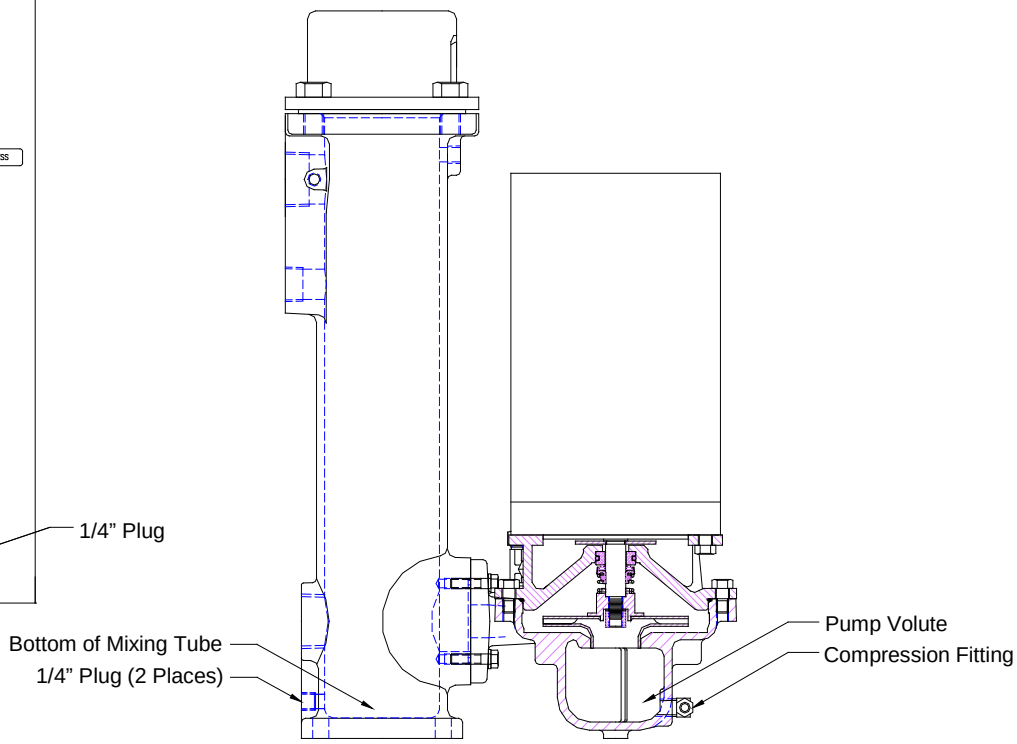
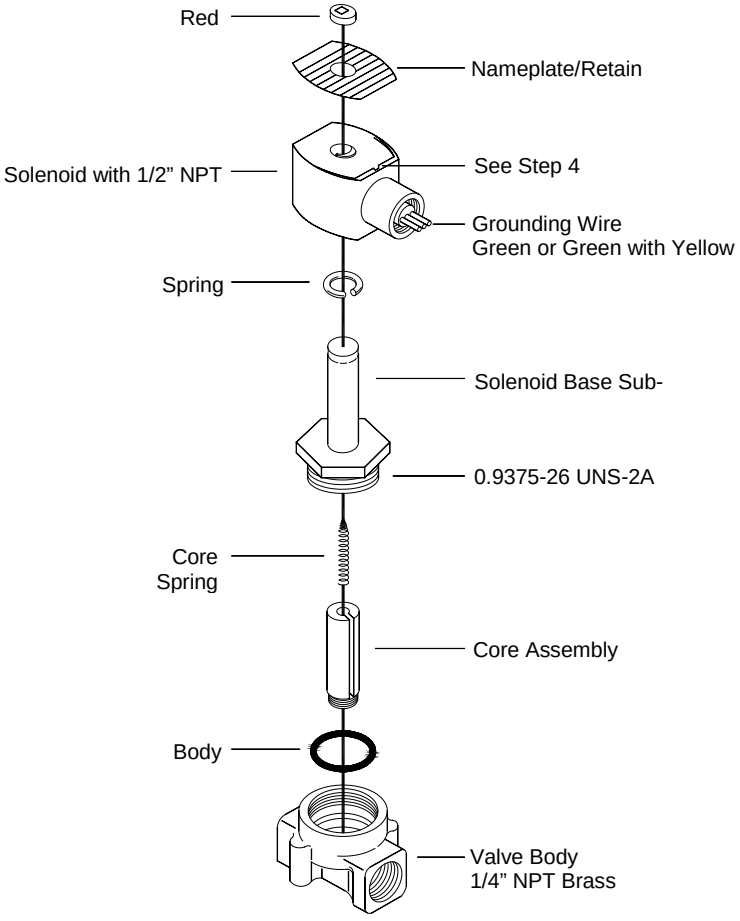


Figure 9
Side View of Pump

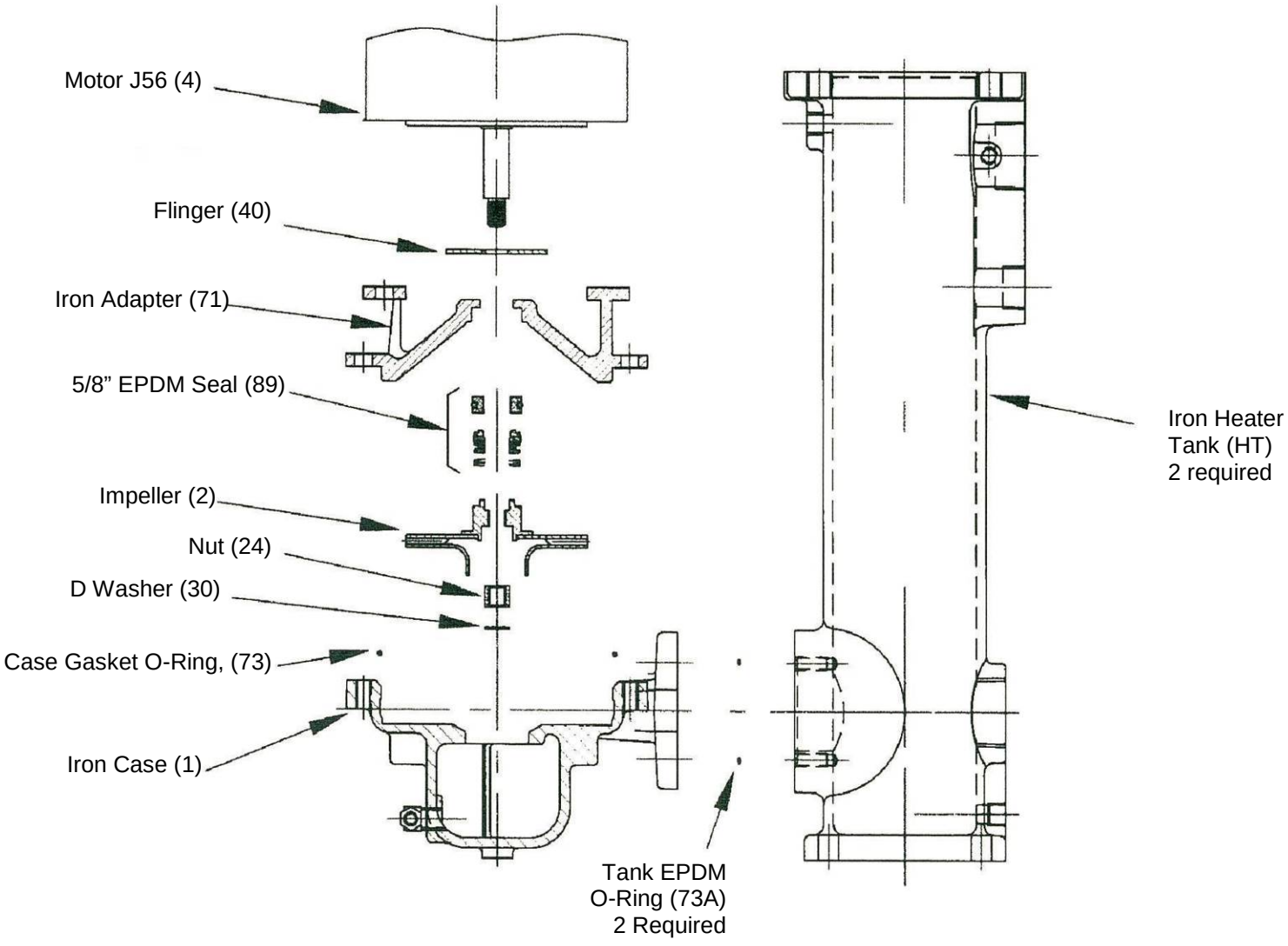
DISASSEMBLY AND REASSEMBLY PROCEDURES

Cooling Solenoid

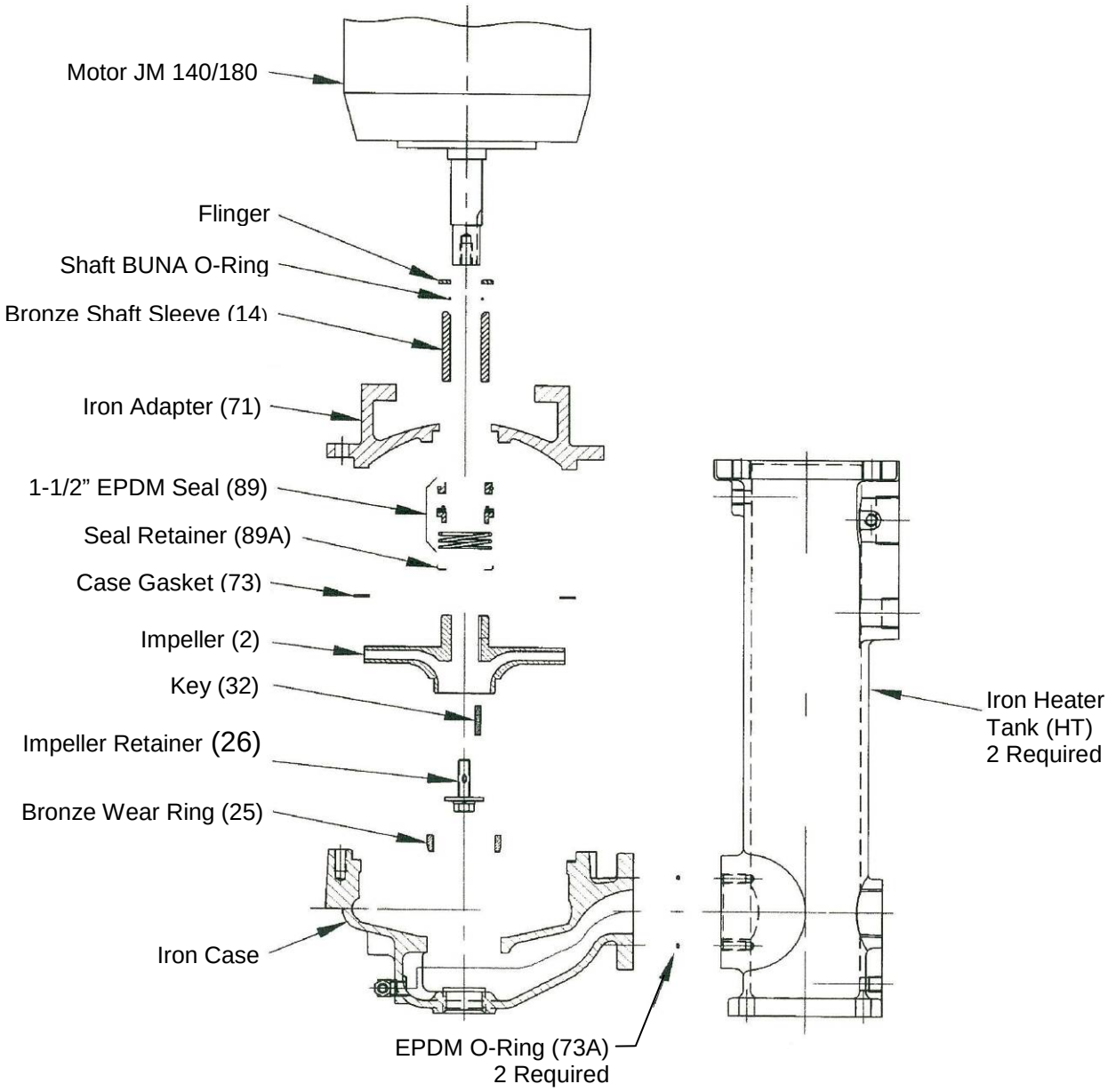
1. Disconnect the water connections and drain the unit completely.
2. Remove the red cap.
3. Push the solenoid down.
4. With a flathead screwdriver, remove the nameplate/retainer by prying under and pushing the nameplate/retainer.
5. For reassembly, make sure to put the wide end of the core spring into the core first. The closed end protrudes from the top of the core.



SCOTT PUMP (12R)



SCOTT PUMP (50R)



Troubleshooting

When an error occurs, the display1 will alternate back and forth from the error code and current display readout. This section will describe the error codes and any actions you need to take to correct the problem.

Problem	Possible Cause	Solution
Nothing happens, Display does not light up	Power feed is not connected correctly	Re-wire power feed
	Power disconnect is off	Turn on power disconnect
	Power fuses or breakers are open	Check fuse/breaker status
	Control transformer fuses are blown	Check fuse continuity
Pump does not engage after vent sequence	Improperly set time delay ITD	Reset the ITD to 30 seconds
	Defective time delay ITD	Replace the ITD
	Pump overload tripped	Reset overload if tripped
	Pump starter defective	Replace the pump starter
	Pump motor defective	Replace the pump motor
The power is on but the unit does not start or vent	Insufficient cooling water pressure	Water pressure must be 25 to 80 PSI
	Defective water pressure switch	Replace the water pressure switch
Unit will not heat to set point	Cooling solenoid is leaking	Clean seat or replace
	Heater or heater contactor failure	Check the amperage (each leg should be equal). Replace as required.
	Optional high temp safety tripped	Preset 260°F cutout. Replace if required.