ASPHALT STORAGE TANK
Operation, Safety and Parts Manual

M-501-T1099Hz-99
TEXAS
A1099

How To Order Parts

To assure prompt delivery when ordering parts, please furnish the following information: **1)** Complete name and address of consignee. **2)** Method of shipment preferred. **3)** Is shipment to be prepaid or collect? **4)** Serial numbers of units to which parts apply. **5)** Complete part numbers and descriptions. **6)** Any special instructions.

Specify unit serial number when ordering parts!

Warranty

E.D. Etnyre & Co. warrants to the original Purchaser, it's new product to be free from defects in material and workmanship for a period of twelve (12) months after date of delivery to original Purchaser. The obligation of the Company is limited to repairing or replacing any defective part returned to the Company and will not be responsible for consequential damages or any further loss by reason of such defect.

The company excludes all implied warranties of merchantability and fitness for a particular purpose. There are no warranties, express or implied, which extend beyond the description of the goods contained in this contract.

This warranty does not obligate the Company to bear the cost of machine transportation in connection with the replacement or repair of defective parts, nor does it guarantee repair or replacement of any parts on which unauthorized repairs or alterations have been made or for components not manufactured by the Company except to the extent of the warranty given by the original Manufacturer.

This warranty does not apply to:

(1) Normal start-up services, normal maintenance services or adjustments usually performed by the selling dealer, factory service representative or customer personnel.

(2) Any product manufactured by E.D. Etnyre & Co. purchased or subjected to rental use.

(3) Any product or part thereof which shows improper operation, improper maintenance, abuse, neglect, damage or modification after shipment from factory.

(4) Any product or part thereof damaged or lost in shipment. Inspection for damage should be made before acceptance or signing any delivery documents releasing responsibility of the de livering carrier.

This warranty and foregoing obligations are in lieu of all other obligations and liabilities including negligence and all warranties of merchantability or otherwise, express or implied in fact or by law.

E. D. ETNYRE & CO., Oregon, Illinois 61061-9778

1333 South Daysville Road Phone: 815/732-2116 Fax: 815-732-7400

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Reporting Safety Defects

If you believe that your vehicle has a defect which could cause a crash, injury, or death, you should immediately inform the National Highway Traffic Safety Administration (NHTSA) in addition to notifying E.D. Etnyre & Co.

If NHTSA receives similar complaints, it may open an investigation. If it finds a safety defect exists in a group of vehicles, it may order a recall and remedy campaign. However, NHTSA cannot become involved in individual problems between you, your dealer, or E.D. Etnyre & Co.

To contact NHTSA, you may call the Auto Safety Hotline too-free at 1-800-424-9393 (or 366-0123 in the Washington, D.C. area). Or, you may write to: U.S. Department of Transportation, Washington, D.C. 20696. You may also obtain other information about motor vehicle safety from the Auto Safety Hotline.

E.D. Etnyre & Co., Oregon, Illinois 61061, Phone Area Code 815/732-2116, Cable Address "EDECO".CALIFORNIA

⚠ WARNING

Do not attempt any operation which is not described in the manuals.

Other operations could cause serious injury or death.

Read, understand and follow the manuals when operating or performing maintenance.

⚠ WARNING

Unsafe operation of equipment may cause injury or death.
Read and understand the manuals before operating or performing maintenance.

⚠ WARNING

To avoid serious injury or death always have shields in place when operating.

⚠ IMPORTANT

When filling the storage tank for the first time, carefully fill until the material level raises to the top of the manhole collar. This will cost the interior of the tank with a thin film of asphalt that will deter corrosion.

Safety Instructions

Safety warnings have been provided to call attention to any potentially hazardous situation that may cause property damage, personal injury or death to the operator or bystanders. Theses safety warnings are identified by the following warning symbol.

The **DANGER** symbol alerts you to immediate hazards which WILL result in servere personal injury or death.

The **WARNING** symbol alerts you to hazards which may cause severe personal injury or death.

A **CAUTION** alerts you to procedures that may result in damage to the equipment if not followed properly.

An **IMPORTANT** provides general information that the operator should be aware of when performing an operation.

All of these warnings appear throughout the manual.
As with any type of equipment, there are certain hazards associated with improper or careless operation. The ability to read and understand the instructions in this manual should be a required qualification to become an operator.

HOT SURFACES

Since this tank is intended to store hot liquid asphalt, the surfaces of the tank and equipment may be hot. All surfaces and equipment should be considered to be hot. Wear insulated gloves and protective clothing to prevent burns. The piping is heated with electric heat tape, it will be hot even though it has not been used recently.

HOT LIQUIDS

The liquids stored in this tank are hot. The piping and hoses used to transfer the liquids are hot. Wear insulated gloves, protective clothing and a face shield when transferring hot liquids, or handling hot liquid hoses to avoid burns. Stay clear of piping that may contain hot liquids. Leave all valves closed unless you are performing an operation which requires a valve to be opened. Do not open valves unless you are prepared for asphalt to flow.

ELECTRICAL SHOCK

This equipment is powered by high voltage electricity. To avoid electrical shock causing personal injury or death, so not attempt to make repairs or adjustments without turning the main power off at the control panel. Do not attempt to operate this equipment with the control panel door open.

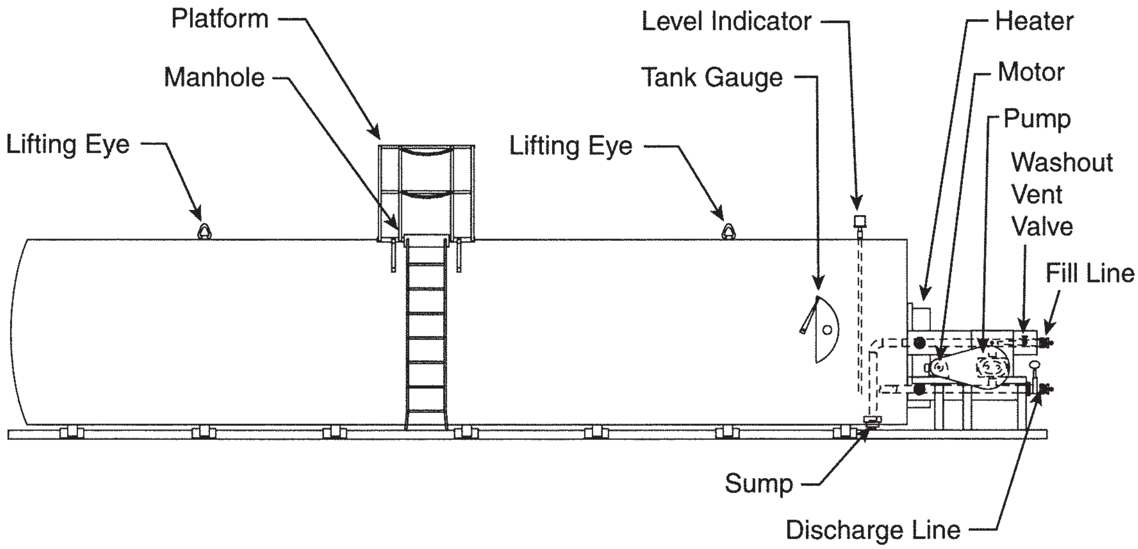
MOVING PARTS

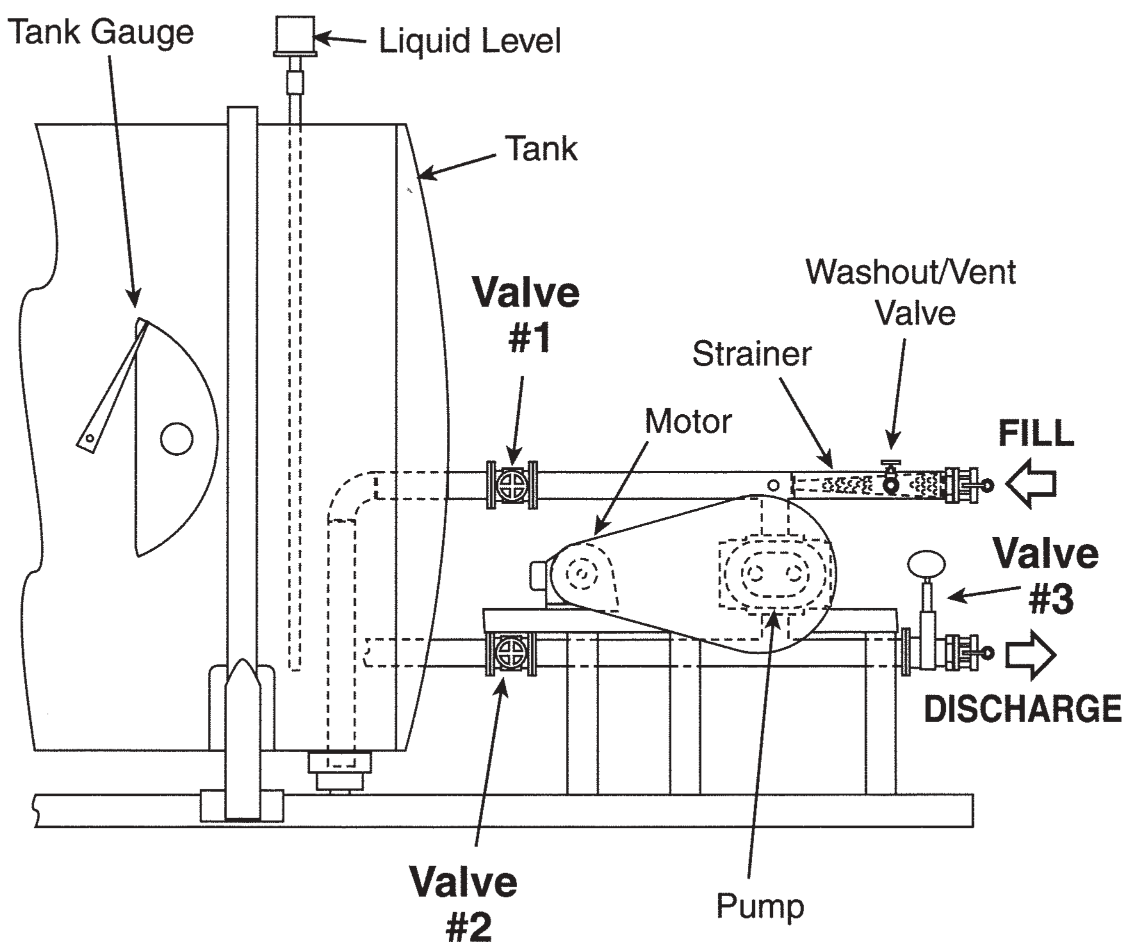
This equipment contains moving parts, turning shafts, pulleys and belts. Keep all guards in place when operating. The agitator is controlled by a timer and may start unexpectedly. To avoid entanglement, do not attempt to make repairs or adjustments without turning the main power off at the control panel.

FALLS

To avoid falls that could result in death or serious injury, do not climb over the guard rails on to top of the tank for any reason. Be careful when working on top of the tank to avoid dropping tools or parts that could strike someone on the ground.

General Identification





INSULATION

The tank is covered with fiberglass insulation, four inches thick. The insulation is intended to maintain the temperature of the heated asphalt. The insulation is covered with .040 Min. aluminum sheeting for weather protection.

ELECTRIC HEATERS

The tank is heated with a 28KW Unitized Heater. The heater is located inside the bottom of the tank, it is controlled by a thermostat located in the control box. A light in the control box door indicates when the heater is on.

FLOAT GAUGE

The tank is equipped with a float type level gauge. The white line on the indicator weight aligns the tank.

ELECTRIC POWER

Tanks with pumps require 240/480 volt, three phase power, with four wire (neutral wire) system. Conversion to other voltages is done with wiring inside the control box.

⚠ WARNING

This equipment is powered by high voltage electricity. Turn main power off at control panel before making repairs or adjustments.

THERMOMETER

A dial thermometer is located in a dry well in the side of the tank. The thermometer indicates the temperature of the asphalt in the tank. The thermometer may be removed from the well with asphalt in the tank.

⚠ WARNING

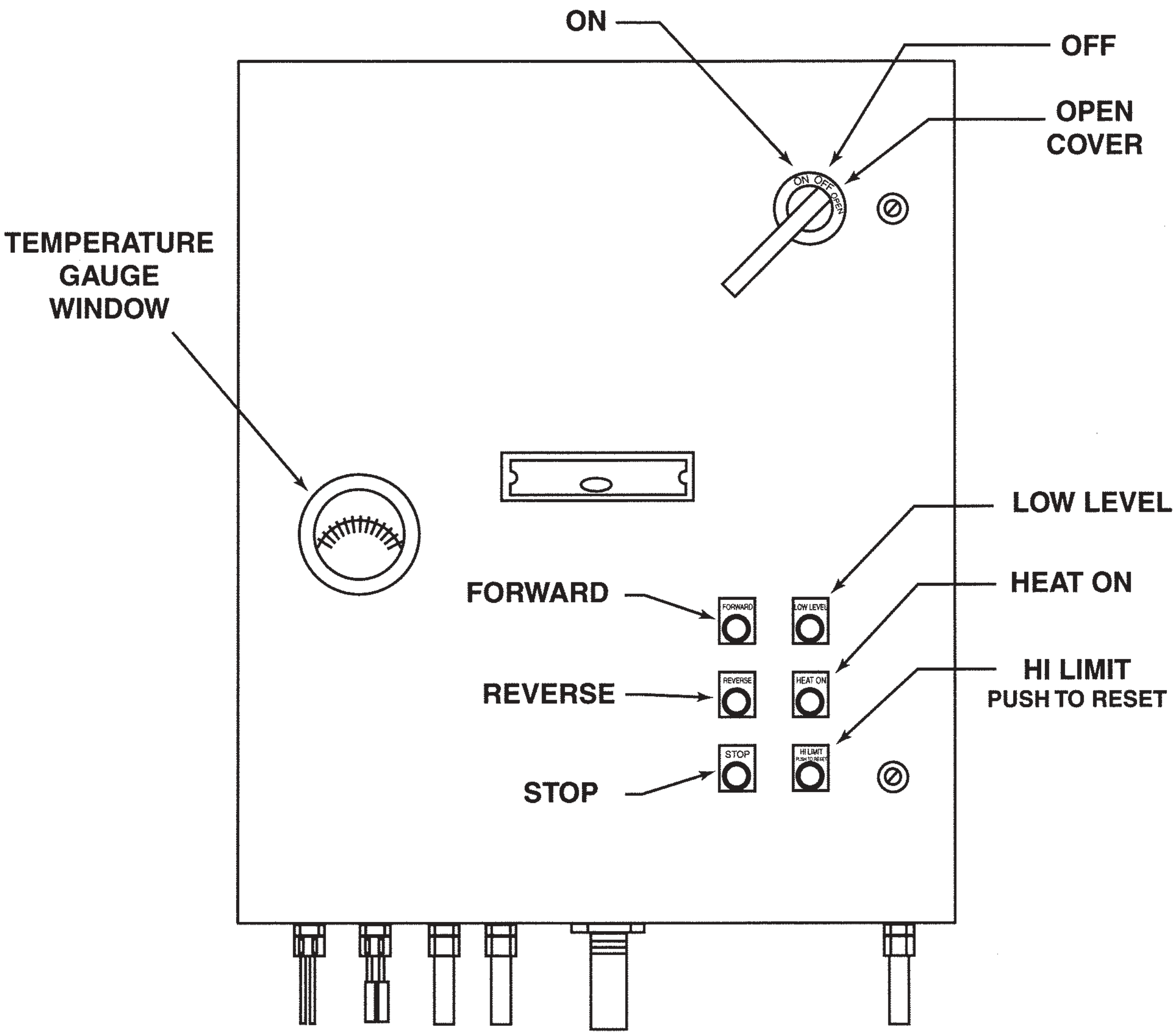
All surfaces and equipment should be considered to be hot. Wear insulated gloves and protective clothing to prevent burns.

PLUMBING

Three inch diameter lines run from the bottom of the tank to the pump. The pump is belt driven by a five horsepower 240/480 volt three phase electric motor. It may be used to pump out of the storage tank into other small tanks, or used to pump into the storage tank from transport tanks. The system may also be used to recirculate the product in the storage tank. All lines are insulated and heated with 115 volt heat tape.

CONTROL BOX

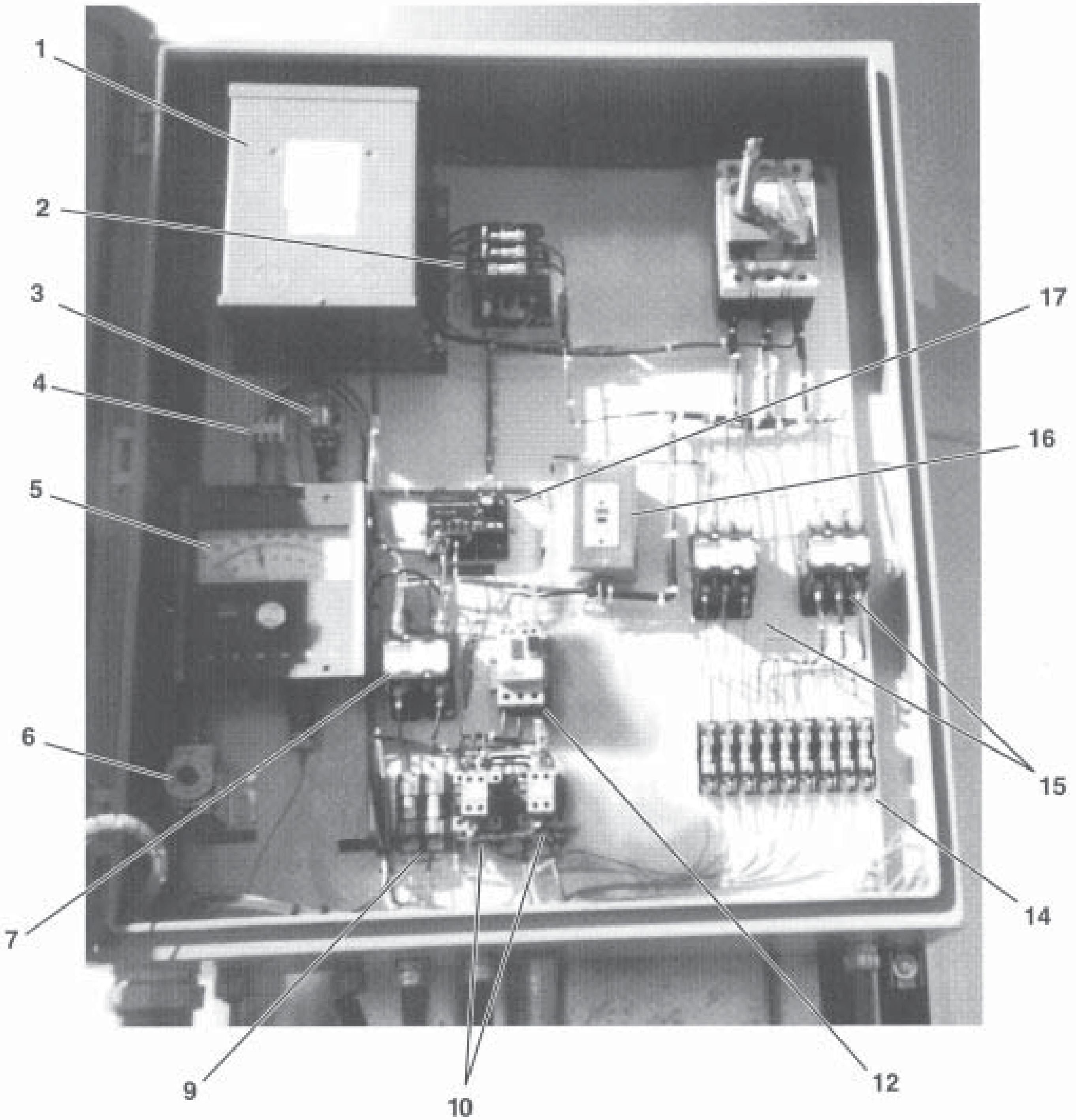
The control box is located on the side opposite the ladder. In the door of the control box is a master disconnect or switch which controls power for all of the electrical functions. A heater indicator light is also located in the door, indicating when the heaters are on. A pump, forward, off, and reverse switch will be located in the control box door as well. Inside the box are the various fuses and contactors to operate the electrical equipment. A timer for the agitator and the thermostat for the heaters are located inside the control box. Also located inside the control box is a 115 volt receptacle (GFI), that may be used for powering lights or hand tools up to 15 amp capacity.



Storage Tank Control Panel
Outside View

⚠ DANGER
This equipment is powered by high voltage electricity.

CONTROL PANEL INSIDE



1. GFCI/Heat Trace Transformer
2. Control Power Transformer
3. ICE Relay
4. Sectional Terminal Block (3-sections)
5. Main Tank Temperature Control
6. Tank High Limit Temperature Control
7. Heat Trace Contactor

9. Heat Trace Fuse Block
10. Reversing Motor Start-up Pump
12. Motor Protection Reversing Starter
14. Tank Heater Fuse Blocks
15. Tank Heater Contactors
16. GFCI Receptacle
17. Heat Trace Temperature Control

PREPARATION FOR USE

INSPECTION

Unpack the ladder, ladder cage and handrail. Check for damage that may have occurred during shipment. Visually inspect the tank, particularly the tank jacket and insulation for damage that may have occurred during shipment. Report any damage to the driver delivering the tank.

SETTING TANK IN PLACE

1. The tank level gauge float has been secured to the roof of the tank for shipment.
2. Install ladder, ladder cage, handrails and platform. Securely tighten all fasteners.

⚠ WARNING

To avoid falls that could result in death or serious injury, do not climb over the guard rails on top of the tank for any reason.

⚠ WARNING

Keep all guards in place when operating.

CONNECTING POWER

480 volt three phase power with a neutral wire is required for power. Power connection and wiring should be done by a qualified electrician to conform to local and national electric codes.

⚠ DANGER
This equipment is powered by high voltage electricity.

⚠ IMPORTANT
When filling the storage tank for the first time, carefully fill until the material level raises to the top of the manhole collar. This will cost the interior of the tank with a thin film of asphalt that will deter corrosion.

⚠ WARNING
Keep all guards in place when operating.

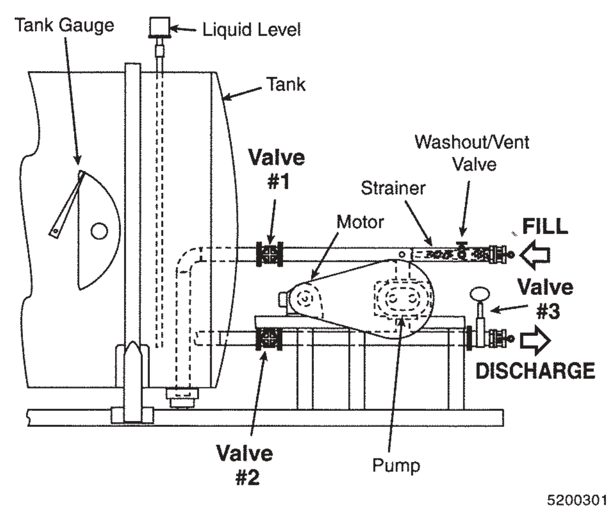
⚠ WARNING
To avoid falls that could result in death or serious injury, do not climb over the guard rails on top of the tank for any reason.

GENERAL OPERATING INSTRUCTIONS

HEATER OPERATION

1. Do not operate the heaters unless there is at least 700 gallons of asphalt in the tank.
2. Turn the master power switch off and open the contro box door.
3 Set the desired temperature on the thermostat knob.
4. Close the control box door and turn the master power switch on.
5. The heaters will turn on and off automatically to maintain the set temperature.
6. The indicator light on the control box door will turn on whenever the heaters are on.

OPERATING INSTRUCTIONS



Operation	Valve 1	Valve 2	Valve 3
Fill Using Storage Tank Pump	Close	Open	Close
Unloading Storage Tank	Open	Close	Open
Recirculation	Open	Open	Close

⚠ WARNING

This equipment is powered by high voltage electricity. Turn main power off at control panel before making repairs or adjustments.

⚠ WARNING

All surfaces and equipment should be considered to be hot. Wear insulated gloves and protective clothing to prevent burns.

⚠ WARNING

Keep all guards in place when operating.

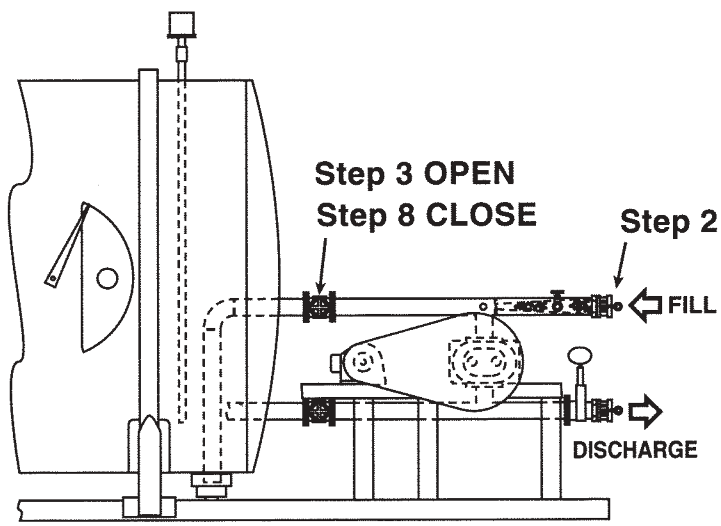
⚠ WARNING

The liquids stored in this tank are hot. Wear gloves and protective clothing when transferring or handling hoses.

PUMP TANK OPERATING INSTRUCTIONS

Fill from Transport Tanker Using Storage Tank Pump

1. Connect the transport's hose to the outlet line on the transport tanker.
2. Connect the hose from the transport tanker to the 3 inch fill line on the storage tank. *Be sure Fill Line Valve is closed.*
3. Open the Valve on the storage tank and on the transport tanker.
4. Start the pump on storage tank.
5. Watch the tank level gauge on the storage tank to protect against over filling the storage tank.
6. Close the valve on the transport tanker.
7. Clean the hoses as directed by the transport tanker operating instructions.
8. Close Valve on storage tank.
9. Shut off pump.
10. Disconnect the hose from the storage tank and install cap.



Fill from Transport Tanker

⚠ WARNING

Do not open valves unless you are prepared for asphalt to flow. The liquids stored in this tank are hot.

⚠ WARNING

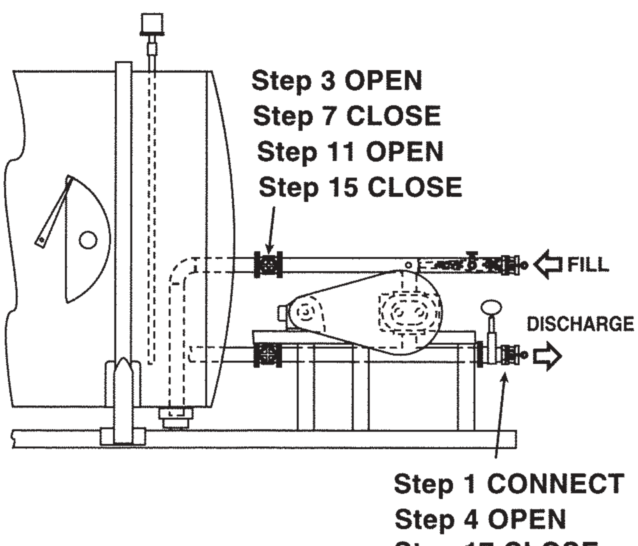
All surfaces and equipment should be considered to be hot. Wear insulated gloves and protective clothing to prevent burns.

⚠ WARNING

The liquids stored in this tank are hot. Wear gloves and protective clothing when transferring or handling hoses.

Unloading Storage Tank With Storage Tank Pump Into Asphalt Distributors Or Kettles

1. Connect the hose to the discharge pipe on the storage tank pump.
2. Connect the other end to the distributor or kettle being loaded.
3. Open the valve between the storage tank and the pump on the storage tank.
4. Open the valve between pump and the hose.
5. Open the valve on the distributor or kettle being loaded if there is one.
6. Turn the pump switch forward.
7. Before the distributor or kettle is completely full, close the valve on the storage tank.
8. Shut off pump.
9. If there is a valve on the distributor or kettle, close it.
10. If you are loading the distributor or kettle through a top opening, raise the end of the hose above the level of the liquid in the distributor or kettle.
11. Open the valve between the storage tank and the pump.
12. Turn the pump switch to reverse, and draw the material from the hose and pump it back into the storage tank to clean the hose.
13. If the hose is connected to piping on the distributor or kettle, crack open the hose connection or open the breather vent valve on the distributor or kettle if there is one. This will allow air to flow through the hose to clean it.
14. Disconnect the hose from the distributor or kettle and raise the end so that any asphalt remaining in the hose can drain back to the pump.
15. Once the hose is clean, close the valve between the storage tank and the pump.
16. Shut off pump.
17. Close the valve between the pump and the hose.



Unloading Storage Tank

⚠ WARNING

Do not open valves unless you are prepared for asphalt to flow. The liquids stored in this tank are hot.

⚠ WARNING

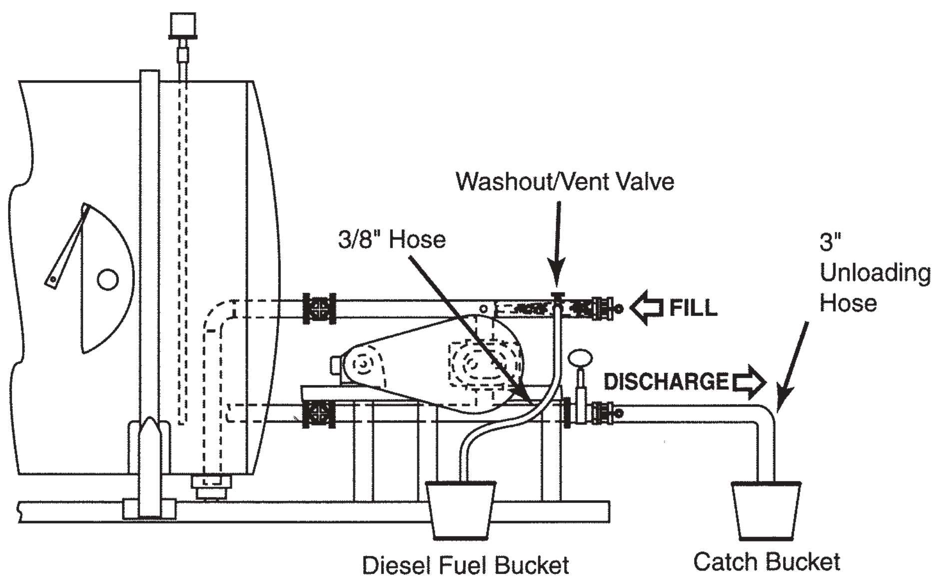
All surfaces and equipment should be considered to be hot. Wear insulated gloves and protective clothing to prevent burns.

⚠ WARNING

The liquids stored in this tank are hot. Wear gloves and protective clothing when transferring or handling hoses.

Cleaning Asphalt Pump

1. With the 3” unloading hose connected to the pump discharge pipe, put the loose end of the hose in a bucket
2. Check the area for sources of flame, lit cigarettes, torches or lighters. Extinguish all sources of flame.
3. Put the end of the small (3/8”) hose which is attached to the breather vent valve in a bucket of diesel fuel or kerosene.
4. Open the breather vent valve between the pump and the hose.
5. Hold both hoses to avoid being splashed.
6. While holding the hoses securely, turn the pump switch to *forward* momentarily. This will draw the solvent from the diesel fuel bucket, pump it through the pump and out into the catch bucket.
7. Shut pump off.
8. Drain the remaining solvent from the three inch hose into the catch bucket.
9. Close the breather vent valve between the pump and the 3/8” hose.



Cleaning Asphalt Pump

WARNING

Extinguish all sources of flame, lit cigarettes, torches or lighters.

WARNING

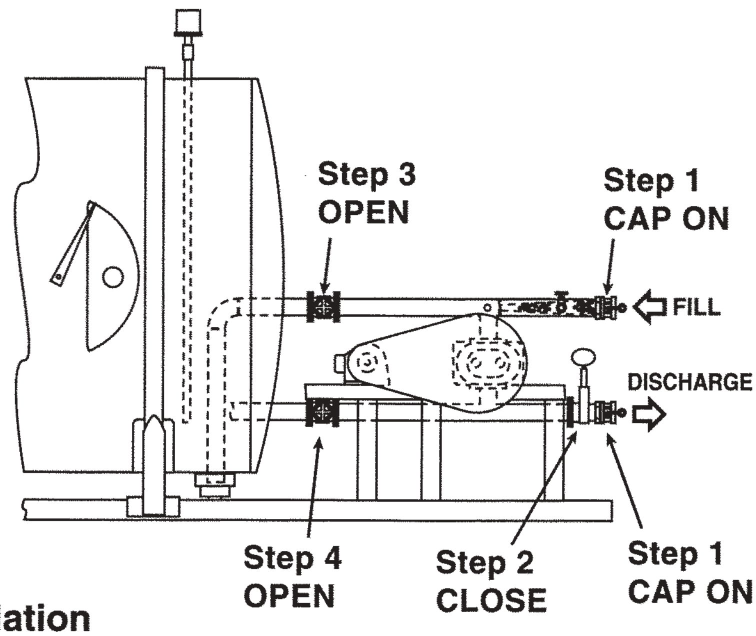
All surfaces and equipment should be considered to be hot. Wear insulated gloves and protective clothing to prevent burns.

WARNING

Do not open valves unless you are prepared for asphalt to flow. The liquids stored in this tank are hot.

Recirculation

1. Check that the caps are on and locked on the fill and discharge lines.
2. Close the valve at the end of discharge line.
3. Open the valve in the fill line between the tank and pump.
4. Open the valve in the discharge line between the tank and pump.
5. Start pump.



Recirculation

WARNING

Extinguish all sources of flame, lit cigarettes, torches or lighters.

WARNING

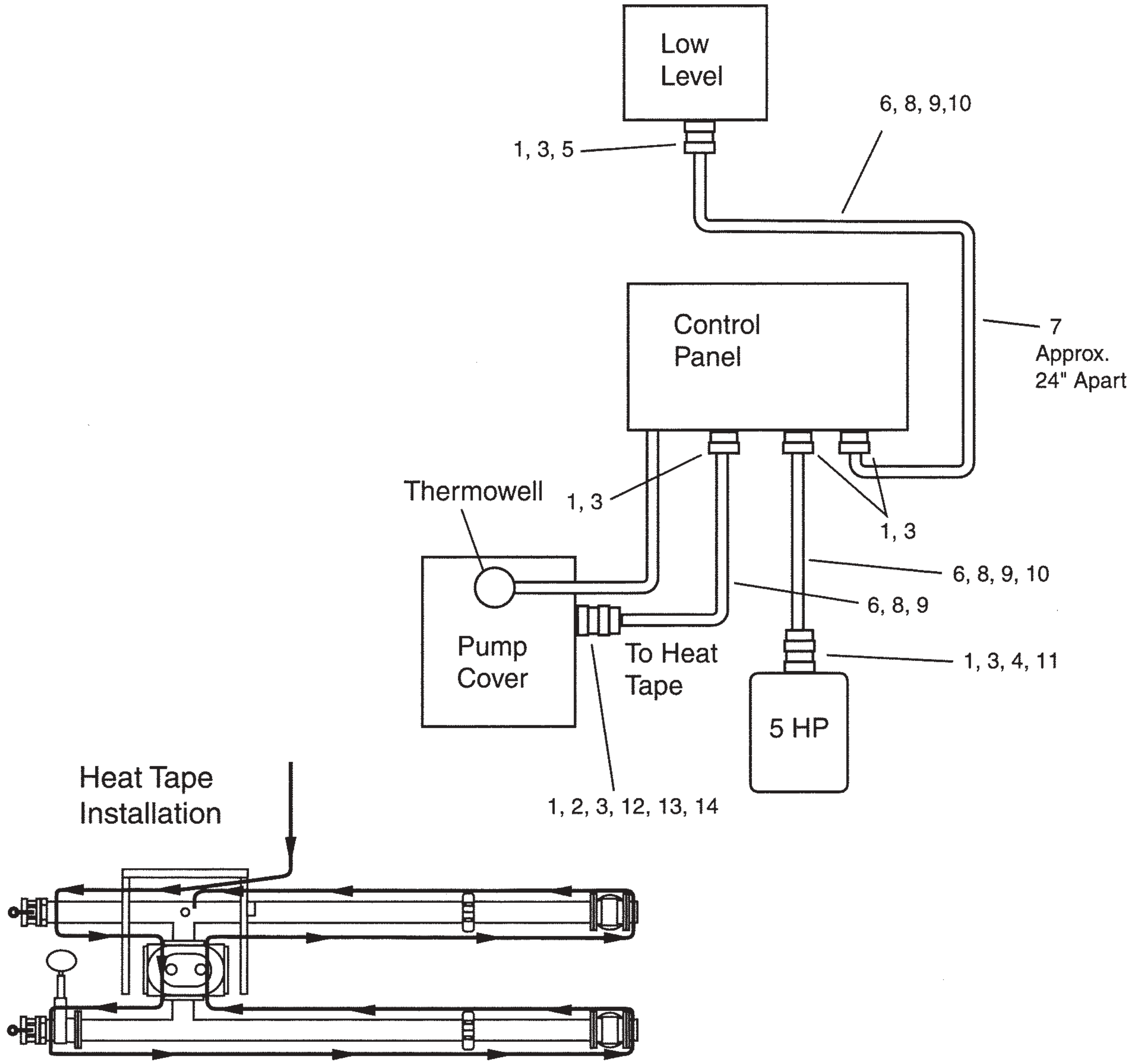
Do not open valves unless you are prepared for asphalt to flow. The liquids stored in this tank are hot.

WARNING

All surfaces and equipment should be considered to be hot. Wear insulated gloves and protective clothing to prevent burns.

WIRING - MOTORS CONTROL PANEL

5200299

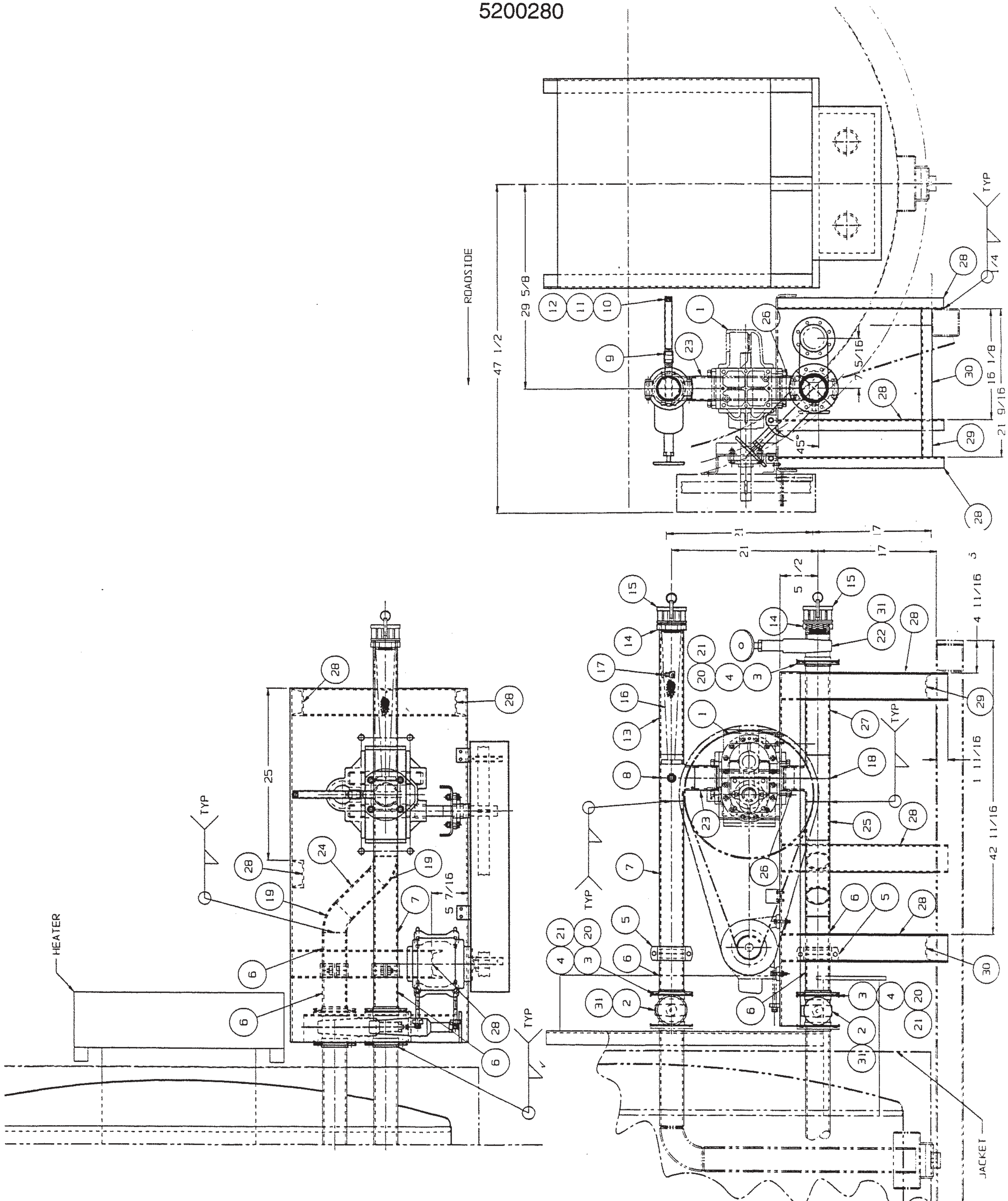


REF	PART NO.	QTY	DESCRIPTION	REF	PART NO.	QTY	DESCRIPTION
1	6700969	6	Connector-FEMT, 0.50IN, Lqd, Res.	10	6702499	25ft	Wire-10Ga AWG, Green, Type THWN
2	6700858	1	Cord Grip-Male, 0.50x90, Lqd, Res.	11	A100107	6	Wire Nut-10GA
3	6702282	7	Nut-Conduit, 1/2 In Sealing	12	6700349	1	Cover-Unilet K50 Form 35
4	6700970	1	Connector-Femt, 0.50x90, Lqd. Res.	13	6700023	1	Gasket-0.5 In Box #GK50-N
5	0144042	1	Bushing-Pipe, 0.75x0.50NPT, PD	14	A100105	1	Unilet-1/2 LB50-M
6	6700710	25ft	Conduit-FEMT, 0.50, Sealtite EF				
7	6000698	6	Clamp-Tube, 15/16, Berg#1511-7				
8	6702304	25ft	Wire-10Ga AWG, White, Type THWN				
9	A100110	25ft	Wire-10Ga AWG, Black, Type THWN				

Specify Unit Serial No., Part No., & Part Description

PIPING, MOTOR & P200 PUMP INSTALLATION

5200280



PIPING, MOTOR & P200 PUMP INSTALLATION

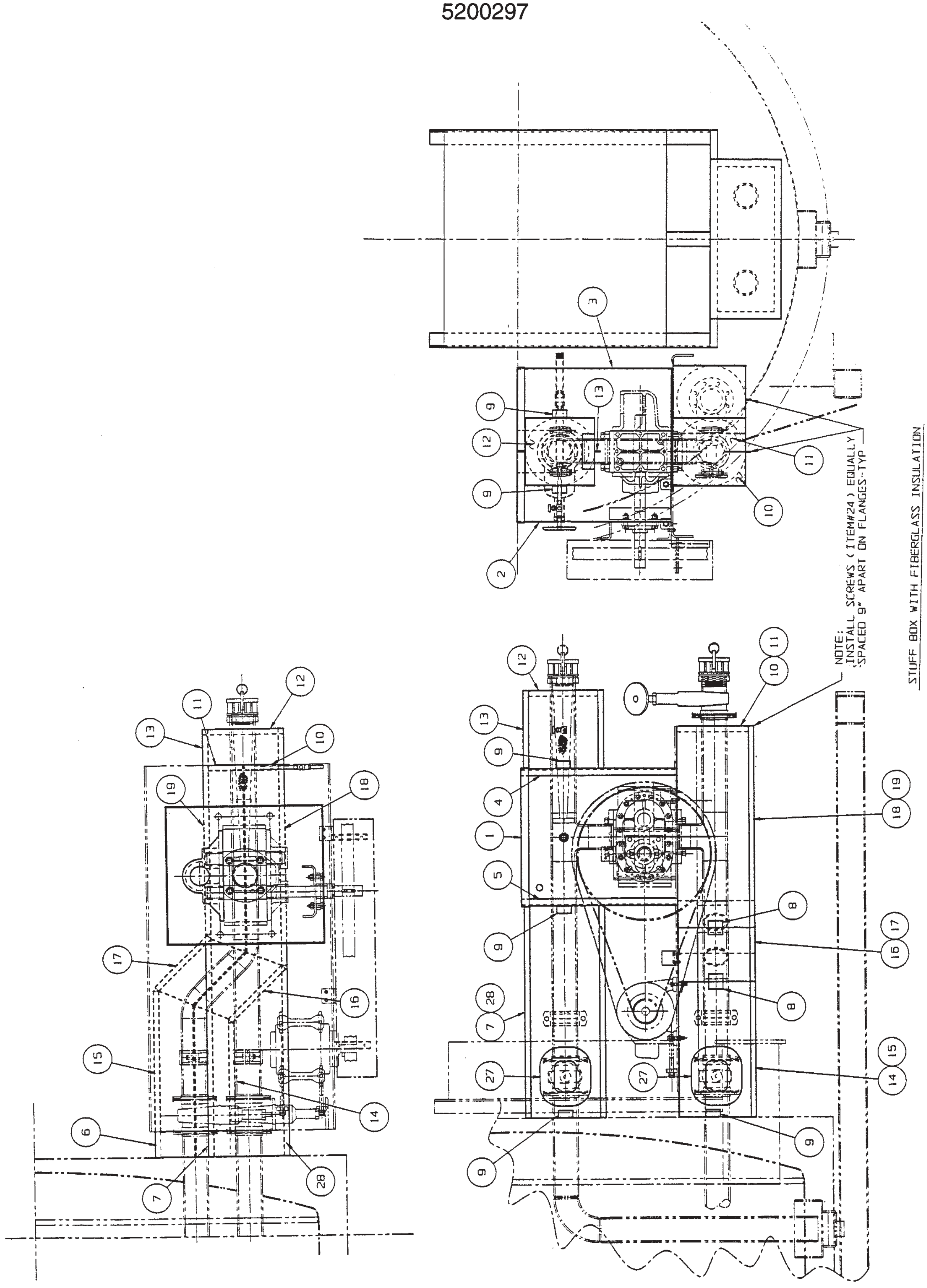
5200280

REF	REQ	PART NO	DESCRIPTION
31	3	S1176AG	VALVE MARKER-TRANSFER
30	1	5200283	CHANNEL-MTR&PUMP MTG,HORIZ.,16-1/8
29	1	5200282	CHANNEL-MTR&PUMP MTG,HORIZ.
28	4	5200281	CHANNEL-MOTOR & PUMP MOUNTING
27	1	5200054	PIPE-3" X 13-9/16, RECRG
26	1	5200056	PIPE-3" X 1-1/2, RECRG
25	1	5200276	PIPE-SCH40,3" X 5-5/8 LG.
24	1	5200275	PIPE-SCH40,3" X 6-11/16 LG.
23	1	5200274	PIPE-SCH40,3" X 3-1/8 LG.
22	1	6600051	VALVE-GATE,HOSE,3 INCH
21	40	0274993	NUT-HEX,LOCK,0.38NC,EA,PD
20	40	0122145	SCREW-HEX,0.38NCX1.25,GR2,PD
19	2	6200619	ELBOW-WELD,45,3.00,LG RAD
18	1	6200514	TEE-STRAIGHT,3IN,PART NO 20
17	1	5200196	WASHOUT/VENT VALVE INSTL
16	1	3340004	STRAINER ASSEMBLY
15	2	6600281	CAP-DUST,3 IN,ALUM, W/CHAIN
14	2	6600277	ADAPT-3 IN,ALUM,PRT A,EVR-TITE
13	1	5200053	PIPE-3" X 19-1/16" SUCTION
12	1	6500079	BOX-STUFFING GE #6A440
11	1	3360479	CAP-THERMO WELL,TEMP CONTROL
10	1	5200062	WELL ASM-THERMOCOUPLE,8 1/4"
9	1	0144071	COUPLING-PIPE,0.75,PD
8	1	5200063	TEE & THERMOCOUPLE WELL ASM
7	1	5200279	PIPE-SCH40,3" X 22-1/8 LG. VIC
6	3	A1077PM	PIPE-SCH40,3" X 5-7/16 VIC
5	2	6445059	COUPLING-GROOVE TYPE 3IN,77
4	3	6000068	FLG#20056A,3FLUED ALEGNY CPLG
3	5	6000071	GASKET-3 FLANGE,AV#10233B,ASB.
2	2	6600045	VLV-GATE,G1013,3 ALLEGHENY VLV
1	1	5200262	PUMP UNIT ASM-P200 PUMP,5HP

GENERAL NOTES: REMOVE ALL BURRS BREAK SHARP EDGES MINIMUM BEND RAD. UNLESS SPECIFIED BEND RELIEF SHOP OPTION	DFTR TJK CHKR ENGR APPD DB	E.D.ETNYRE&CO. OREGON, IL. 61061 ALL DIMENSIONS IN INCHES DO NOT SCALE DWG DRAWING TITLE PIPING/MOTOR & P200 PUMP INSTAL.
SER.NO: A1099 SIM.TO: A1077PH WEIGHT:	TOLERANCE UNLESS SPECIFIED FRACTIONAL ±1/32 DECIMAL .X± .1 .XX± .03 .XXX± .010	DWG SIZE D DRAWING NO. 5200280 REV
FINISH CHART	ANGLES± 0° 30'	SCALE 1/8 | DATE 9/11/98 | SHEET 1 OF 1

INSULATION & HEAT SHIELD INSTALLATION

5200297



INSULATION & HEAT SHIELD INSTALLATION

5200297

REF	REQ	PART NO	DESCRIPTION
28	1	5200298	SHIELD-HEAT,UPPER,LONG,LH
27	2	5200201	RING-FINISHING,VALVE BODY
26	2	6700858	CORD GRIP-MALE,0.5X0.375,#1206
25	1	6702462	CHROMALOX #RTRES END SEAL KIT
24	40	6702495	WIRE-HEAT TRACE,10W /FT
23	5	6000753	INSULATION-FBRGLASS,2IN THK/SF
22	1	6001230	INSULATION-ELBOW 3"THKFOR3"ELB
21	50	6000550	SCREW-HEX,0.25-14X0.75,TEK3,PD
20	13	6001229	INSULATION-PIPE 3"THKFOR3"PIPE
19	1	5200290	SHLD-HEAT,LOWER,BEVELED,SHT,RH
18	1	5200291	SHLD-HEAT,LOWER,BEVELED,SHT,LH
17	1	5200292	SHLD-HEAT,LOWER,BEVELED,SHT,RH
16	1	5200293	SHLD-HEAT,LOWER,BEVELED,SHT,LH
15	1	5200294	SHLD-HEAT,LOWER,BEVELED,SHT,RH
14	1	5200295	SHLD-HEAT,LOWER,BEVELED,SHT,LH
13	2	5200082	SHIELD-HEAT,UPPER,SHORT
12	1	5200079	PLATE-END,HEAT SHIELD,UPPER
11	1	5200081	PLATE-END,HEAT SHIELD,LOWER,RH
10	1	5200080	PLATE-END,HEAT SHIELD,LOWER,LH
9	8	5200076	ANGLE-HEAT SHIELD,2"
8	4	5200296	ANGLE-HEAT SHIELD,2",45 DEG
7	1	5200289	SHIELD-HEAT,UPPER,LONG
6	1	5200288	PLATE-COVER,HEAT SHIELD,LOWER
5	1	5200287	PLATE-HEAT BOX,SIDE,RH
4	1	5200286	PLATE-HEAT BOX,SIDE,LH
3	1	5200285	PLATE-HEAT BOX,FRONT
2	1	5200284	PLATE-HEAT BOX,REAR
1	1	5200067	COVER-HEAT BOX

GENERAL NOTES:
REMOVE ALL BURRS
BREAK SHARP EDGES
MINIMUM BEND RAD.
UNLESS SPECIFIED
BEND RELIEF SHOP
OPTION

DFTR TJK
CHKR
ENGR
APPD DB.

E.D.ETNYRE&CO.
OREGON, IL. 61061

ALL DIMENSIONS IN INCHES DO NOT SCALE DWG

DRAWING TITLE
INSULATION & HEAT SHIELD INSTAL.

SER.NO: A1099
SIM.TO: 5200091
WEIGHT:

TOLERANCE
UNLESS SPECIFIED
FRACTIONAL ±1/32
DECIMAL
.X± .1
.XX± .03
.XXX± .010
ANGLES± 0° 30'

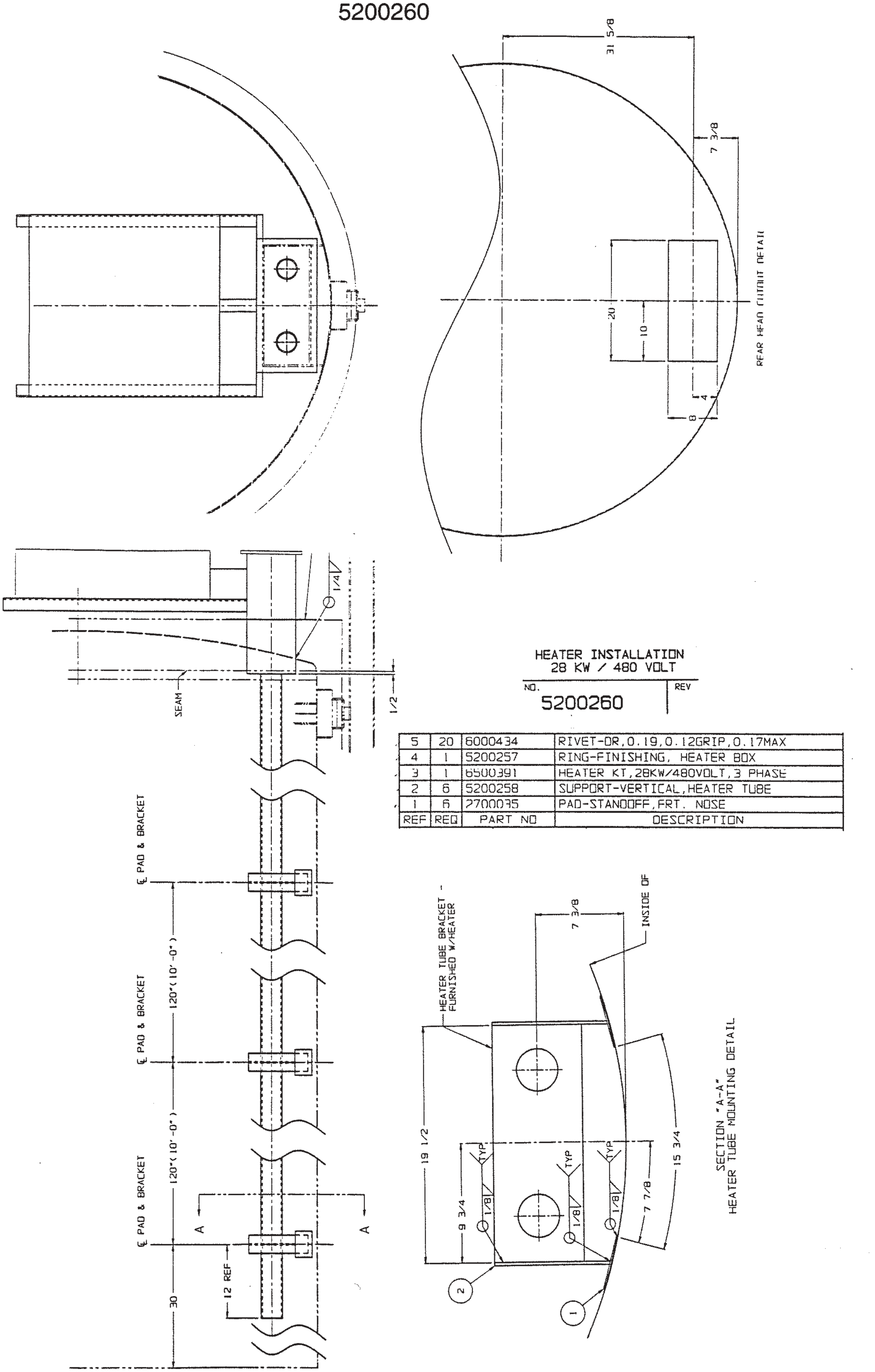
DWG SIZE D | DRAWING NO. 5200297 | REV

FINISH CHART

SCALE 1/8 | DATE 9/15/98 | SHEET 1 OF 1

HEATER INSTALLATION

5200260



HEATER INSTALLATION
28 KW / 480 VOLT

NO. 5200260 REV

REF	REQ	PART NO	DESCRIPTION
5	20	6000434	RIVET-DR,0.19,0.12GRIP,0.17MAX
4	1	5200257	RING-FINISHING, HEATER BOX
3	1	6500391	HEATER KT,28KW/480VOLT,3 PHASE
2	6	5200258	SUPPORT-VERTICAL,HEATER TUBE
1	6	2700035	PAD-STANDOFF,FRT. NOSE

HEATER KIT - 28KW/480 VOLT

6500391

REVISIONS			
REV	DESCRIPTION	DATE	APPROVED

28kW UNITIZED HEATER KIT

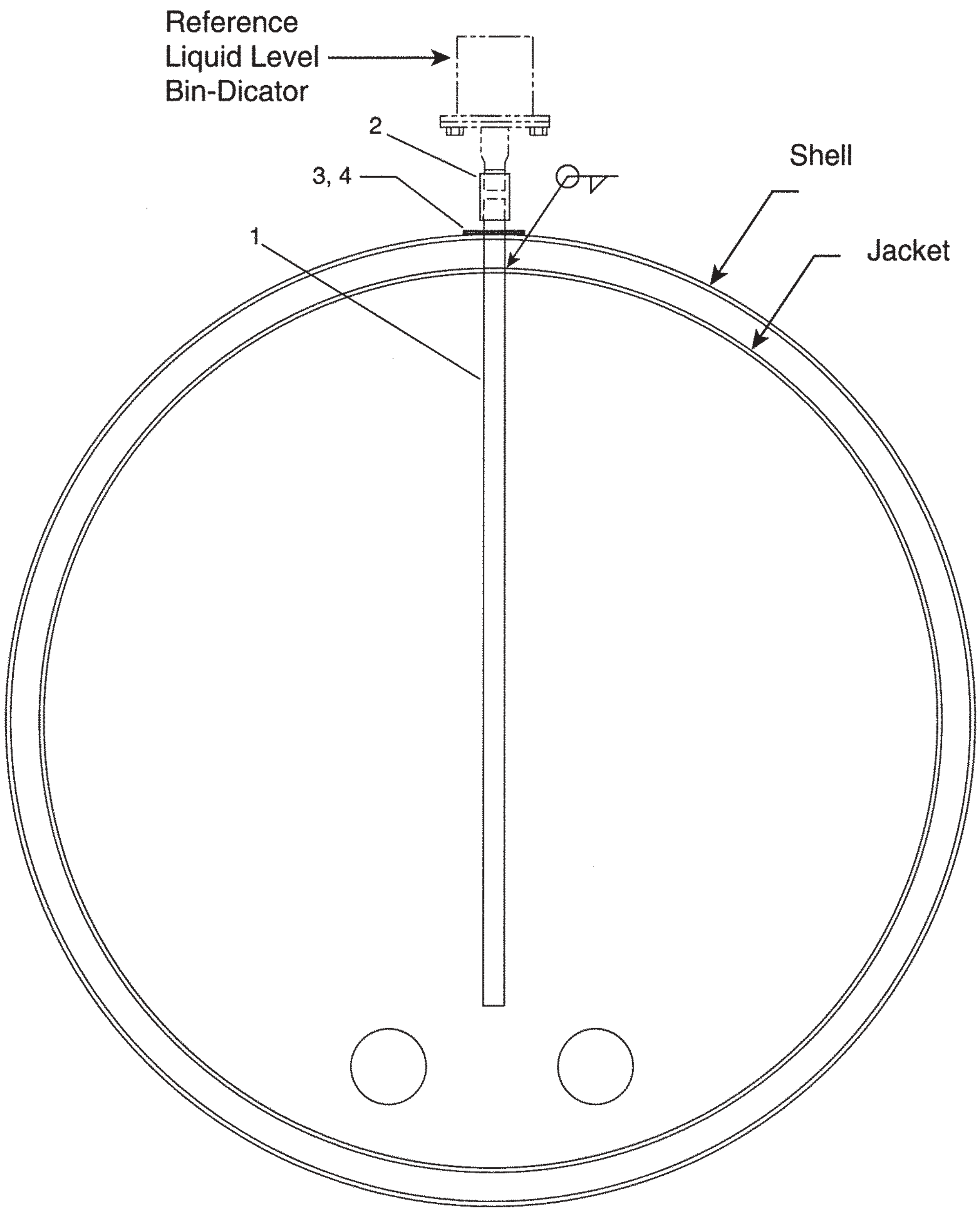
WITH CONTROLS MOUNTED AND PREWIRED TO HEATER
LOW LEVEL SENSOR SWITCH
CONTROL PANEL TO INCLUDE:
MAIN DISCONNECT SWITCH WITH THROUGH DOOR OPERATOR
CONTROL POWER TRANSFORMER(FUSED)
HEATER CONTACTORS AND INDIVIDUAL LOAD FUSES FOR EACH ELEMENT
HEATER TEMPERATURE AND HI-LIMIT CONTROLS
5 HP REVERSING STARTER WITH OVERLOAD PROTECTION FOR PUMP MOTOR
FWD/REV/STOP PUSH BUTTONS FOR PUMP
ALL COMPONENTS MOUNTED, PREWIRED AND FUNCTIONALLY TESTED
U.L. LISTING AS INDUSTRIAL CONTROL PANEL
120V TEMPERATURE CONTROL FOR HEAT TAPE SOLID STATE W/4" PROB
115V RECEPTACLE(GIF), 15 AMP
FOR 78" I.D. X 390" (SHELL) TANK
6" HEIGHT BETWEEN HEATER AND CONTROL BOX

PROCESS HEATING COMPANY, INC. PART NO.   28KW/480 VOLT, 3 PHASE

GENERAL NOTES: REMOVE ALL BURRS BREAK SHARP EDGES MINIMUM BEND RAD. UNLESS SPECIFIED BEND RELIEF SHOP OPTION	DFTR JRB CHKR ENGR APPD	E.D.ETNYRE&CO OREGON IL 61061 ALL DIMENSIONS IN INCHES DO NOT SCALE DWG
SER.NO: A1099 SIM.TO: 6500385 WEIGHT:	TOLERANCE UNLESS SPECIFIED FRACTIONAL ±1/32 DECIMAL .X±.1 .XX±.03 .XXX±.010 ANGLES±0° 30'	DRAWING TITLE HEATER KIT, 28KW/480 VOLT DWG SIZE A · DRAWING NO. 6500391 · REV
FINISH CHART		SCALE NONE · DATE 7/17/98 · SHEET 1 OF 1

PIPE-LEVEL INDICATOR INSTALLATION

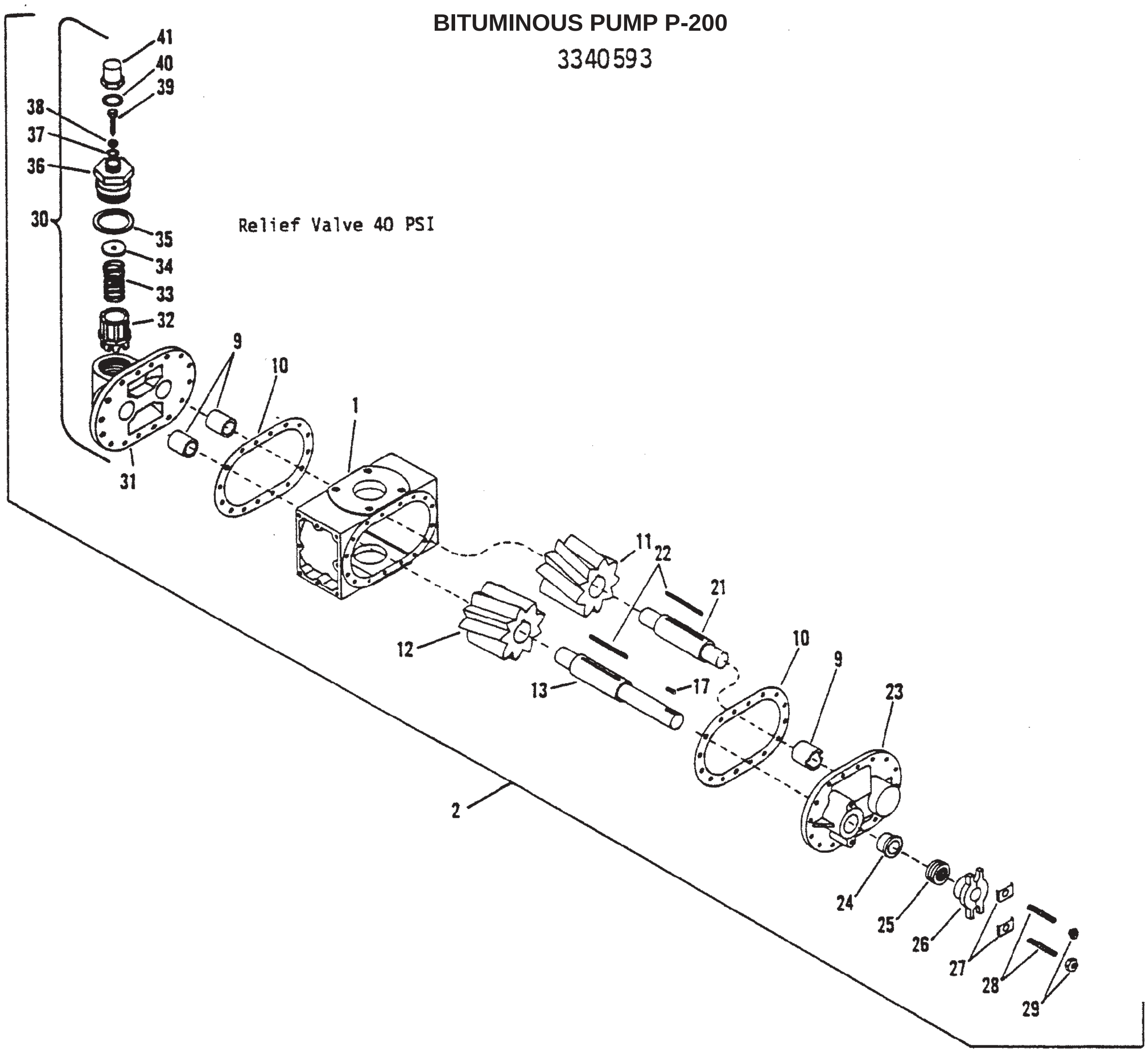
5200254



REF	PART NO.	QTY	DESCRIPTION	REF	PART NO.	QTY	DESCRIPTION
1	5200253	1	Pipe-liquid Level, Bin-dicator				
2	0187399	1	Coupling-pipe, 1.00npt, Steel				
3	5200048	1	Ring-finishing, 1" Pipe				
4	6000434	6	Rivet-dr, 0.19, 0.12 Grip, 0.17 Max				

BITUMINOUS PUMP P-200

3340593

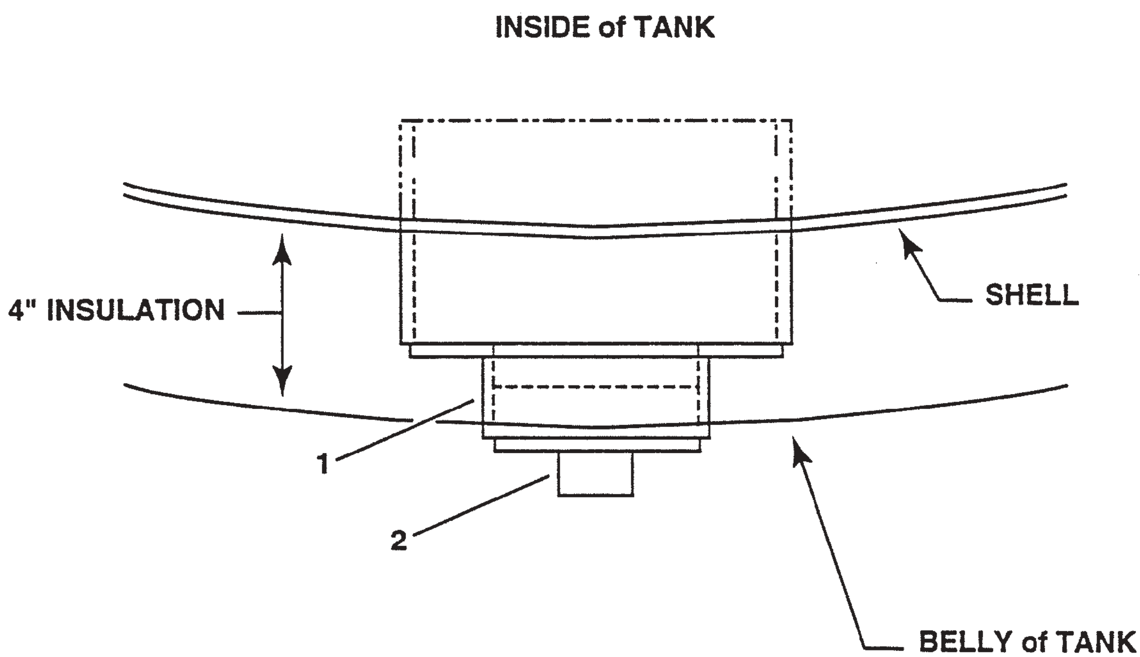


REF.	PART NO.	QTY.	DESCRIPTION
1	3340331	1	CASE
2	3340593		PUMP ASM-200 GAL,LG RD SHAFT,NO HEAT JACKET,REL VLV
7	0122145	32	HEX BOLT 3/8 X 1 1/4
8	0103615	4	PIN-NO 5 X 1 1/4
9	3340314	3	BEARING
10	3340573	2	GASKET
11	3340335	1	IMPELLER
12	3340334	1	IMPELLER
13	3340340	1	DRIVE SHAFT
17	6000468	1	KEY 3/8 X 1 7/8
21	3340337	1	SHAFT
22	6000469	2	KEY 3/8 X 5
23	3340312	1	FACE PLATE
24	3340294	1	SLEEVE-WEARING
25	6600310	1	PACKING
26	3340307	1	GLAND
27	3340308	2	CLIP
28	3340949	2	STUD-PACKING GLAND
29	0124843	2	NUT-HEX, JAM, 0.56NC
30	3340342	1	BY-PASS VALVE ASSEMBLY
31	3340343	1	BY-PASS VALVE FACE PLATE

REF.	PART NO.	QTY.	DESCRIPTION
32	3340344	1	VALVE BODY
33	3340345	1	SPRING
34	3340346	1	SPRING BEARING
35	6600208	1	GASKET
36	3340347	1	PLUG
37	6600264	1	GASKET
38	0271501	1	HEX NUT 7/16
39	3340348	1	ADJUSTING BOLT
40	3340349	1	GASKET
41	3340350	1	CAP

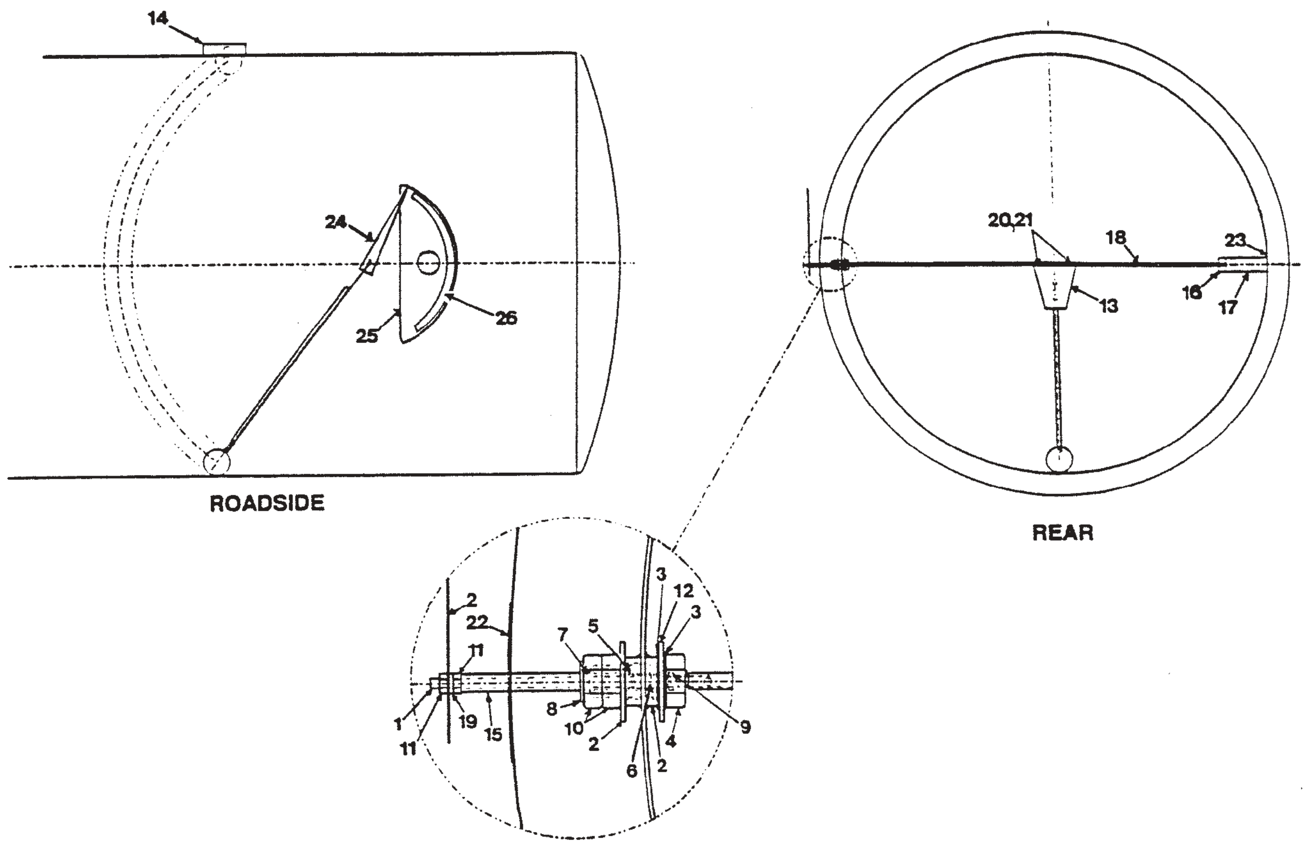
Specify Unit Serial No., Part No., & Part Description

SUMP INSTALLATION - 4”



REF.	PART NO.	QTY	DESCRIPTION	REF.	PART NO.	QTY	DESCRIPTION
1	2600262	1	Sump Asm-4” Cleanout				
2	6200155	1	Plug-PP, SqHd, 4.00NPT,PN				

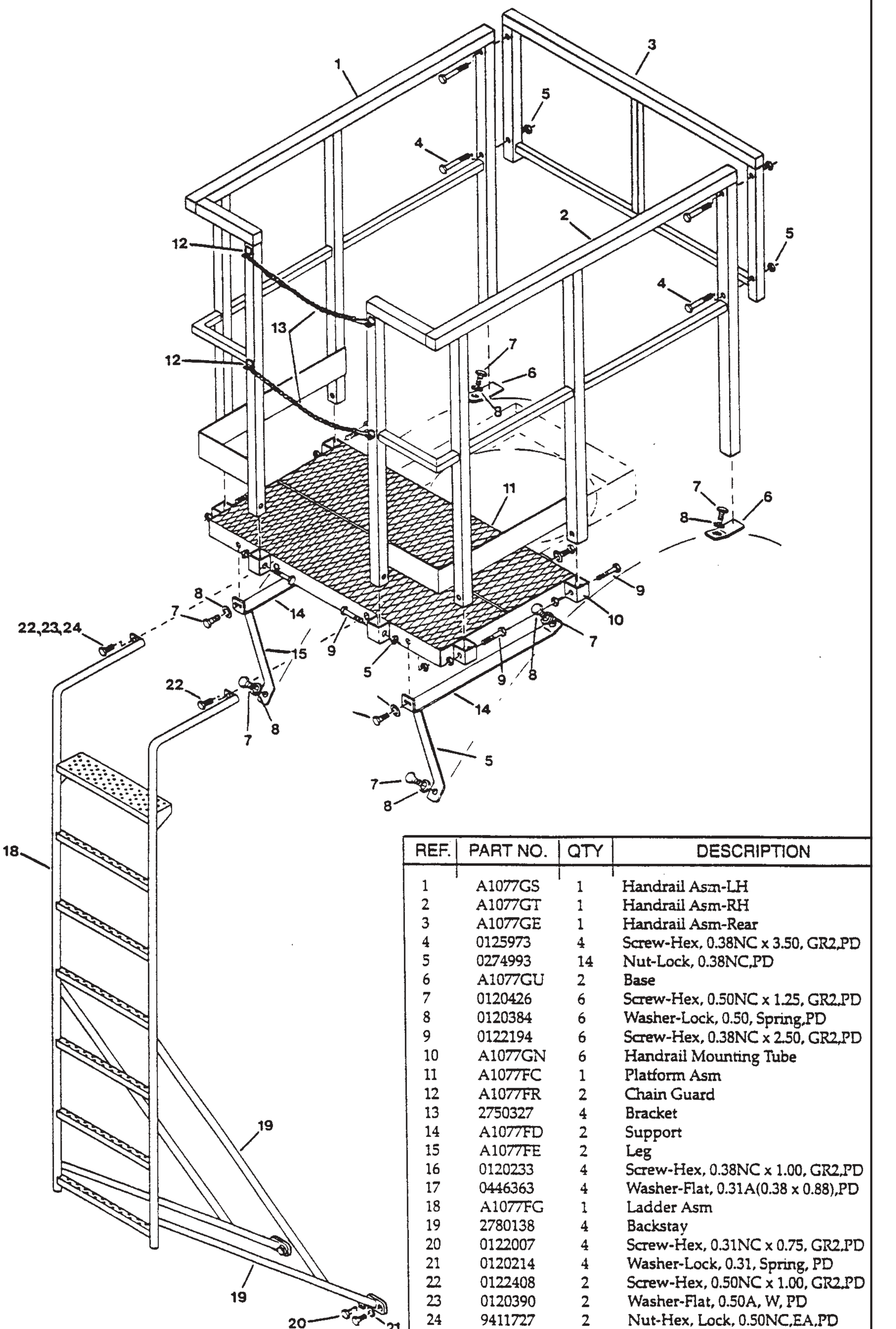
TANK GAGE ASSEMBLY



REF.	PART NO.	QTY.	DESCRIPTION
1	A1077EE	1	Shaft
2	3301165	1	Spacer
3	3360825	2	Gasket
4	3301163	1	Screw-1"NC
5	3360192	1	Spring
6	3360187	1	Sleeve
7	3301164	1	Spacer
8	3360828	1	Nut Asm
9	3360204	1	Packing
10	0426899	2	Nut-Hex, JAM, 1.00NC,PD
11	0120376	2	Nut-Hex, 0.31NC,PD
12	0131002	2	Washer-Flat, 1.00A(1.06 x 2.50)PD
13	A1077EC	1	Stem Asm, 78" Dia Tank
14	3360196	1	Dome Asm
15	A1077EF	1	Spacer
16	3361167	1	Socket
17	3361166	2	Leg
18	A1077EA	1	Shaft
19	0120214	1	Washer-Lock, 0.31, Spring,PD
20	0121900	2	Screw-Hex, 0.25NC x 1.00,GR2,PD
21	9416509	2	Nut-Hex, Lock, 0.25, GR2,PD
22	3341199	1	Cover-Jacket
23	2750593	1	Pad-Ring
24	3360851	1	Pointer Asm
25	3380578	1	Dial Blank-Trailer Distributer
26	2377	1	Dial

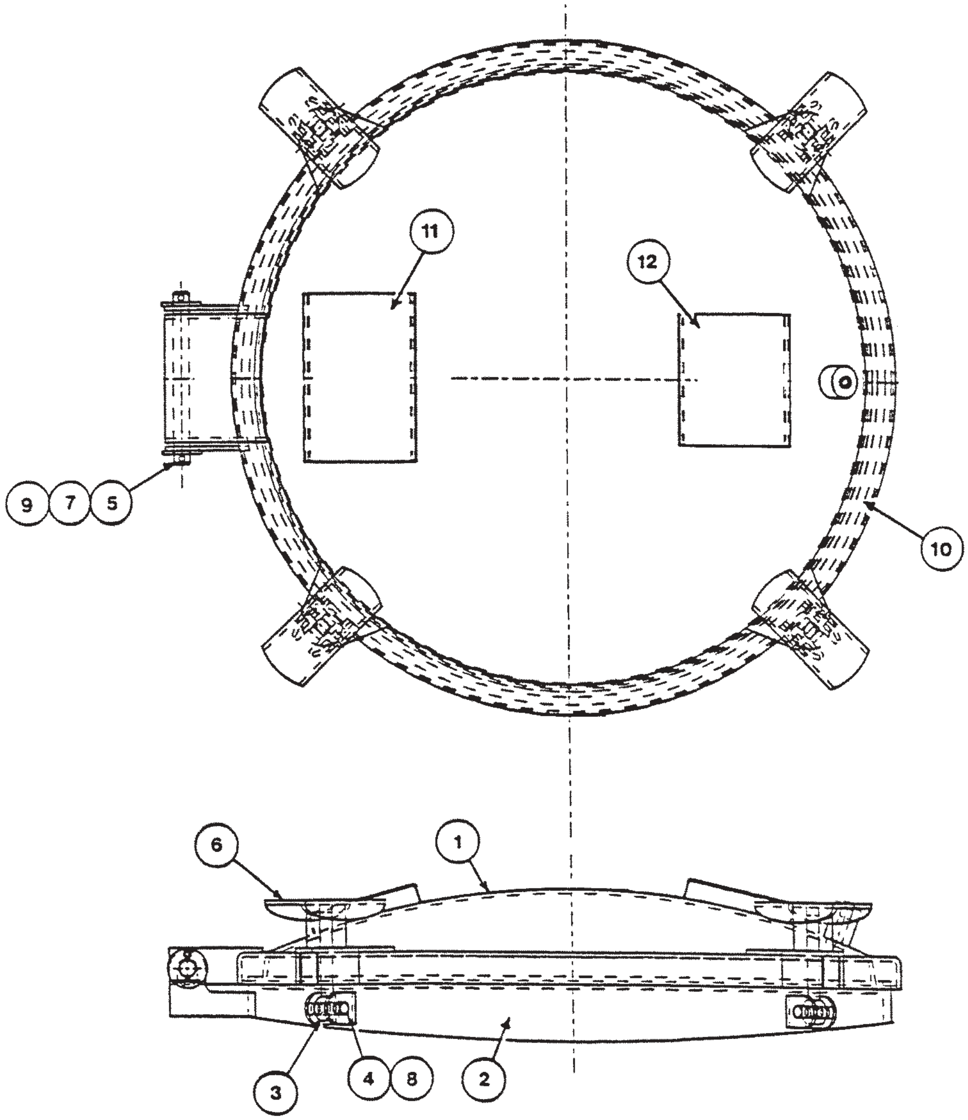
Specify Unit Serial No., Part No., & Part Description

HANDRAIL, PLATFORM & LADDER ASSEMBLY



REF.	PART NO.	QTY	DESCRIPTION
1	A1077GS	1	Handrail Asm-LH
2	A1077GT	1	Handrail Asm-RH
3	A1077GE	1	Handrail Asm-Rear
4	0125973	4	Screw-Hex, 0.38NC x 3.50, GR2,PD
5	0274993	14	Nut-Lock, 0.38NC,PD
6	A1077GU	2	Base
7	0120426	6	Screw-Hex, 0.50NC x 1.25, GR2,PD
8	0120384	6	Washer-Lock, 0.50, Spring,PD
9	0122194	6	Screw-Hex, 0.38NC x 2.50, GR2,PD
10	A1077GN	6	Handrail Mounting Tube
11	A1077FC	1	Platform Asm
12	A1077FR	2	Chain Guard
13	2750327	4	Bracket
14	A1077FD	2	Support
15	A1077FE	2	Leg
16	0120233	4	Screw-Hex, 0.38NC x 1.00, GR2,PD
17	0446363	4	Washer-Flat, 0.31A(0.38 x 0.88),PD
18	A1077FG	1	Ladder Asm
19	2780138	4	Backstay
20	0122007	4	Screw-Hex, 0.31NC x 0.75, GR2,PD
21	0120214	4	Washer-Lock, 0.31, Spring, PD
22	0122408	2	Screw-Hex, 0.50NC x 1.00, GR2,PD
23	0120390	2	Washer-Flat, 0.50A, W, PD
24	9411727	2	Nut-Hex, Lock, 0.50NC,EA,PD

MANHOLE ASSEMBLY

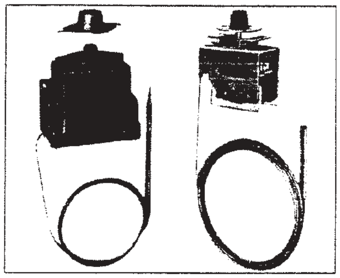


REF.	PART NO.	QTY.	DESCRIPTION
1	2600379	1	Cover Asm
2	A1077EX	1	Collar Asm
3	2600371	4	Bolt-Eye
4	2600372	4	Hinge Pin
5	2600373	1	Shaft
6	2600376	4	Handle Asm
7	0137204	2	Cotter Pin, 0.12 x 1.50,PD
8	0103364	8	Cotter Pin, 0.06 x 1.25,PD
9	0120390	2	Washer-Flat, 0.50A, W,PD
10	2700248	1	Gasket
11	3390535	1	Plate-WARNING, MANHOLE SAFETY
12	3561030	1	Plate-CAUTION, HOT SURFACE

Specify Unit Serial No., Part No., & Part Description

APPENDIX I

Remote Bulb Temperature Control



55 Series

Remote Bulb Temperature Controllers

UNITED ELECTRIC CONTROLS

Installation and Maintenance Instructions

Please read all instructional literature carefully and thoroughly before starting. Refer to the final page for the listing of Recommended Practices, Liabilities and Warranties.

GENERAL

Temperature variations sensed by the liquid-filled bulb are hydraulically transmitted through the capillary to a stainless steel diaphragm capsule. The capsule operates a lever to actuate one or two snap-action switches.

Part I - Installation

Tools Needed

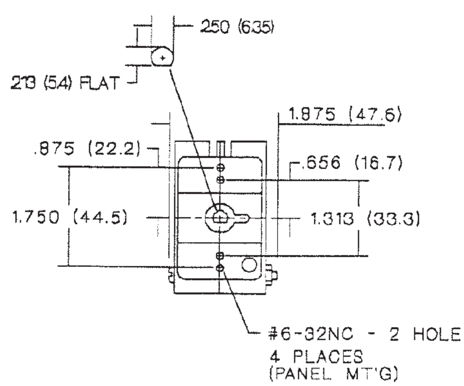
Drill with #25 (.1495) and 5/16" bits
Flatblade screwdriver

MOUNTING

LOCATE THE CONTROL WHERE SHOCK, VIBRATION AND AMBIENT TEMPERATURE FLUCTATIONS ARE MINIMAL.

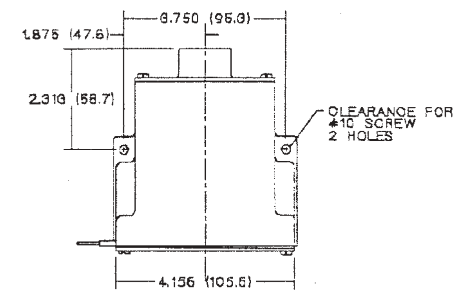
The control can be mounted in any position.

Panel Mounting (Types E55S and E55AS)
Drill panel to accommodate #6-32 screws (2 each). Hole locations should align with tapped holes in mounting bracket (see figure below). Also, drill 5/16" diameter hole to accommodate control adjustment shaft. Note: maximum panel thickness is 1/2 inch.



Type E55AS (Mounting)
Top View

Surface Mounting (Types E55 and E55A)
Mount using two enclosure mounting holes as shown.



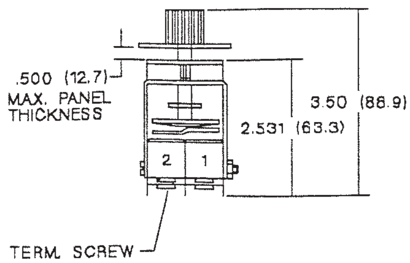
INSTALLING BULB AND CAPILLARY

Fully immerse the bulb and 6" capillary in the control zone. For best results it is generally desirable to place the bulb close to (but not touching) the heating or cooling source in order to sense temperature fluctuations quickly. Place the remaining capillary adjacent to the control head so that it will sense the same ambient temperatures. Factory calibration, unless specified otherwise, allows for 6" capillary tube in the sensed medium. If more than 6" will be immersed in the media, recalibration may be necessary, in which case follow procedures outlined in Part II.

"C" style bulbs (1/8" OD) can be coiled or shaped to fit the installation. Avoid sharp bends and coils smaller than 2" radius. Do not bend "B" style bulbs (3/8" OD). Avoid bending or coiling the capillary tube smaller than 1/2" radius. Exercise caution when making bends near the capillary ends. If a separable well or union connector is used follow separate instructions included.

Making Wiring Connections
Wire directly to switch terminals according to particular requirements of the application. For dual switch Types E55A and E55AS, if switches are to be set apart, connect wiring so that switch No. 2 will function at the higher temperature.

ALL LIVE SUPPLY CIRCUITS MUST BE DISCONNECTED BEFORE WIRING THE CONTROL. WIRE IN ACCORDANCE WITH



NATIONAL AND LOCAL WIRING CODES. MAXIMUM RECOMMENDED WIRE SIZE IS #14 AWG.

Switch Settings
On dual switch units, both switches are factory set to actuate together within 5% of range (switch No. 2 set on dial) but may be set to actuate up to 100% of scale range apart. Either switch may be set to agree with the dial. See Part II-Adjustments.

Start-Up Process
Turn dial and knob to the desired temperature setting. Controller is ready for operation. Minor adjustments may be necessary to obtain better set point accuracy after installing the unit in a particular process. See Part II-Adjustments.

Part II - Adjustments

Tools Needed

1/16" Allen wrench
Small screwdriver

IF THE UNIT IS BEING USED TO CONTROL A PROCESS, PERFORM CALIBRATION TEST AFTER ADJUSTMENT. UNIT MUST REPEAT ON SUCCESSIVE ON-OFF CYCLES.

Calibration Bath
Place the sensing bulb and the amount of capillary to be exposed to process temperature into the bath, preferably circulating liquid. Bath temperature should be where the greatest setting accuracy is desired or approximately mid-range.

Test Thermometer
Use an accurate test thermometer (such as a thermocouple) with its sensing area located next to the sensing bulb.

Stabilization
Before making adjustments allow 5 minutes for the thermal system to adjust to the bath temperature.

Set Point Reference
Connect test lights to the terminals to indicate switch operation.

Adjusting Single Switch Types E55 and E55S

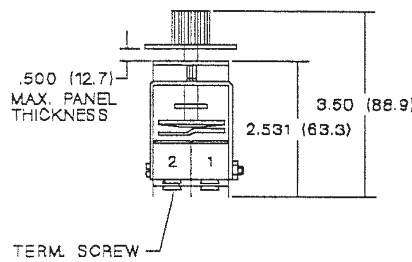
Set point adjustment is made by rotating the knob and dial to the desired temperature setting. Controls are factory calibrated, and do not normally require recalibration in the field. However, should this become necessary, follow the recalibration procedure.

Adjusting Dual Switch Types E55A and E55AS

55 Series controllers are standardly supplied with the No. 2 (higher temperature) switch set to the dial. To adjust switch settings for these controllers, follow the recalibration procedure.

RECALIBRATION PROCEDURE

Set the dial to the same temperature as the test bath. Using 1/16" allen head wrench, loosen knob set screw and remove dial, taking care not to rotate the shaft.



Shaft has calibrated flat for easy dial replacement. Using 1/16" allen wrench, turn zero adjustment, located inside adjustment shaft, until switch No. 2 actuates. Turn counter clockwise for higher setting, clockwise for lower setting.

Replace dial on shaft. Do not secure. Turn dial to a higher setting equal to temperature differential (°F or °C) desired between switches No. 1 and No. 2. Remove dial for access to the No. 1 switch adjustment screw. Using a small screwdriver turn in or out the No. 1 switch adjustment screw (accessible through opening behind dial). Replace dial, tighten dial set screw to calibrated flat. Controller is ready for operation.

For single switch units the only adjustment needed is the set screw adjustment in the middle of the adjacent shaft.

Part III - Replacements

Tools Needed

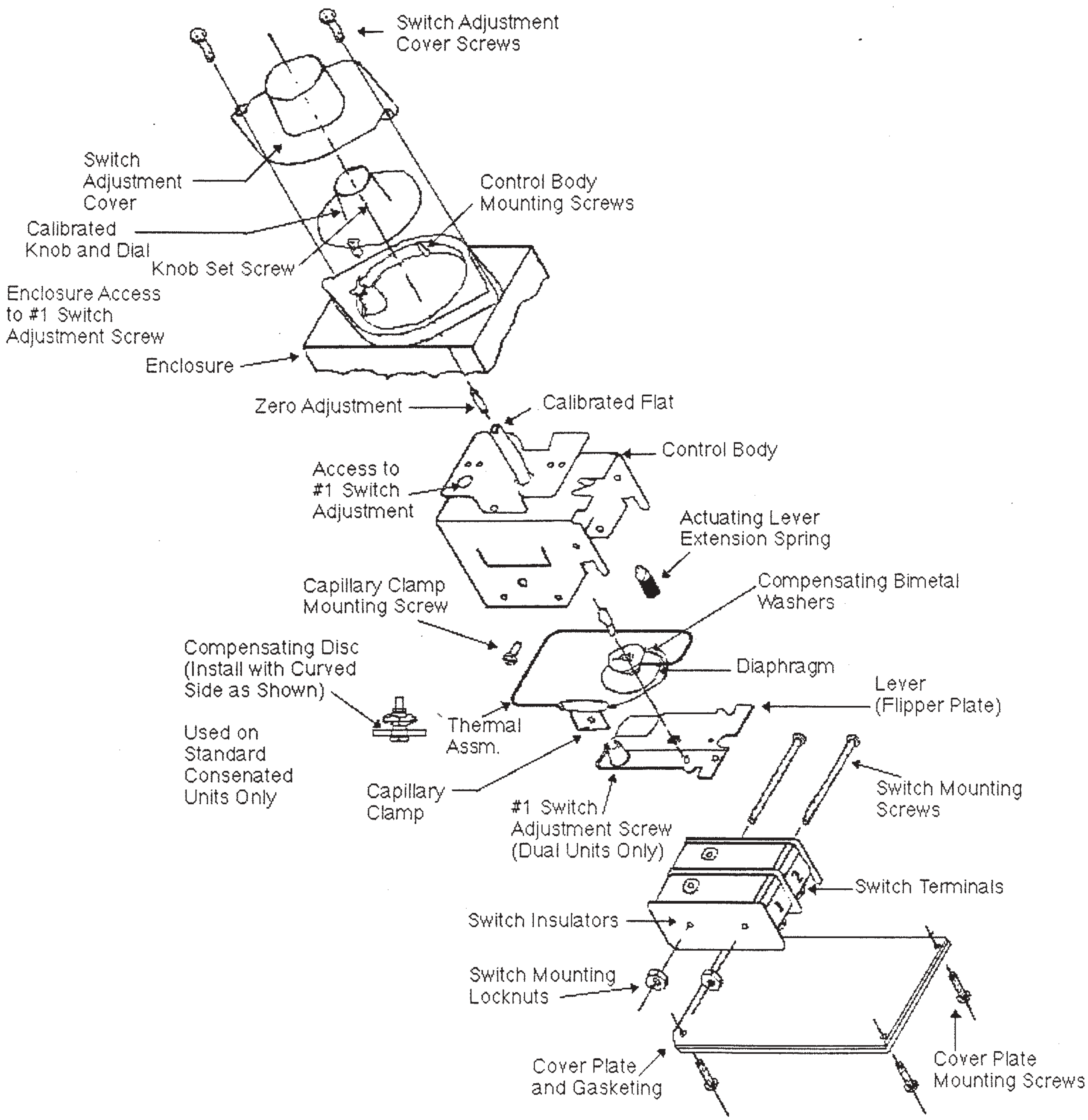
1/16" Allen wrench
Small screwdriver

DISCONNECT ELECTRICAL SUPPLY SO THAT SWITCH CONTACTS AND TERMINALS ARE NOT ALIVE. REPLACE WITH IDENTICAL SWITCHES ONLY.

Enclosed Types

Remove cover and adjustment dial; then remove two (2) flat head screws to dismount control body from enclosure. Remove the large rectangular cover plate and rubber gasket from the bottom of the enclosure, and disconnect wiring from the switch terminals. Insert the new switch(es) and tighten screws. Recalibrate set-

General Layout, Exploded View

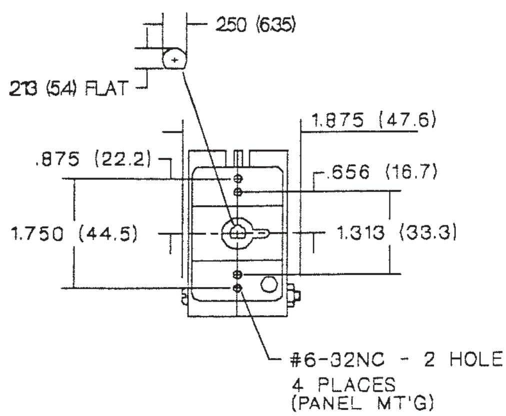


ting(s). See Part II-Adjustments. Rewire the new switch(es) and place unit back in its enclosure. Reconnect electrical supply.

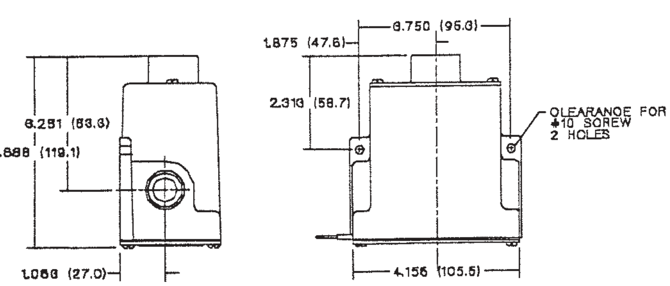
Skeleton Types

Remove the two (2) switch mounting screws; remove the switch(es). Insert the new switch(es) and tighten screws. Recalibrate setting(s). See Part II-Adjustments. Rewire the new switch(es) and place unit back in its enclosure. Reconnect electrical supply.

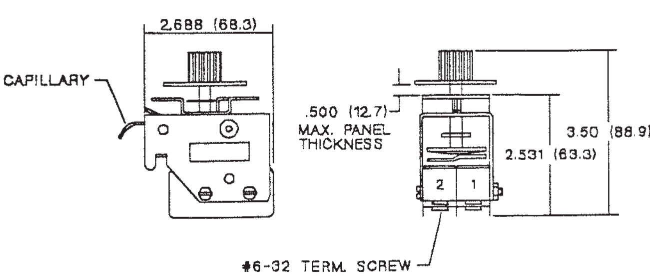
Dimensions



Type E55AS (Mounting)



Type E55, E55A



Type E55AS

RECOMMENDED PRACTICES

United Electric Controls Company recommends careful consideration of the following factors when specifying and installing UE pressure and temperature units. Before installing a unit, the Installation and Maintenance instructions provided with unit must be read and understood.

- To avoid damaging unit, proof pressure and max temperature limits stated in literature and on nameplates must never be exceeded, even by surges in the system. Operation of the unit up to proof pressure or max temperature is acceptable on a limited basis (i.e.start-up, testing) but continuous operation must be restricted to the designated adjustable range. Excessive cycling at proof pressure or maximum temperature limits could reduce sensor life.
- A back-up unit is necessary for applications where damage to a primary unit could endanger life, limb or property. A high or low limit switch is necessary for applications where dangerous runaway condition could result.
- The adjustable range must be selected so that incorrect, inadvertent or malicious setting at any range point can not result in an unsafe system condition.
- Install unit where shock, vibration and ambient temperature fluctuations will not damage unit or affect operation. Orient unit so that moisture does not enter the enclosure via the electrical connection.
- Unit must not be altered or modified after shipment. Consult UE if modification is necessary.
- Monitor operation to observe warning signs of possible damage to unit, such as drift in set point. Check unit immediately.
- Preventative maintenance/periodic testing is necessary for critical applications where damage could endanger property/ personnel.
- For all applications, a factory set unit should be tested before use.

Electrical ratings stated in literature and on nameplate must not be exceeded. Overload on a switch can cause damage, possible on the first cycle. Wire unit according to local and national electrical codes, using wire size recommended in installation sheet.

- Use only factory authorized replacement parts and procedures.
- Do not mount unit in ambient temp. exceeding published limits.
- For remote mounted temperature units, capillary lengths beyond 10 feet can increase chance of error, and may require re-calibration of set point and indication.

LIMIT WARRANTY

UE warrants that the product thereby purchased is, upon delivery, free from defects in material and workmanship and that any such product which is found to be defective in such workmanship or material will be repaired or replaced by UE (F.O.B. UE); provided, however, that this warranty applies only to equipment found to be so defective within a period of 12 months after installation by buyer but not to exceed 18 months after delivery by the seller. Except for the limited warranty of repair and replacement stated above, UE disclaims all warranties whatsoever with respect to the product, including all implied warranties of merchantability or fitness for any particular purpose.

LIABILITY LIMITATION

The sole and exclusive remedy of buyer for any liability or seller for any claim, including incurred in connection with (I) breach of any warranty whatsoever expressed or implied, (II) a breach of contract, (III) a negligent act or acts (or negligent failure to act) committed by seller, or (IV) an act for which strict liability will be imputed to seller, is limited to the limited warranty or repair and replacement stated herein. In no event shall the seller be liable for any special, indirect, consequential or other damages or like general nature, including, without limitation, loss of profits or production, or loss or expenses of any nature, incurred by the buyer or any third party.

UE

UNITED ELECTRIC CONTROLS

P.O. Box 9143, Watertown, MA 02272-9143 USA

617 926-1000 Fax 617 926-2568

MAP10M696

APPENDIX II

Temperature Controller, Fenwal

FENWAL®

SERIES 400

INDICATING TEMPERATURE CONTROLLER

INSTALLATION INSTRUCTIONS

PRINCIPLE OF OPERATION

Control action of these mechanical indicating temperature controllers is provided through the principle of liquid volume change. See Figure 1. With a change in temperature, the liquid in the sensing bulb expands and contracts, causing the bellows to actuate the switching mechanism. Ambient compensation is provided by an expandable push rod assembly mounted on top of the lever arm which moves the pointer and switching mechanism. Changes in ambient temperatures through a range of 0 to 150°F (−18 to +65°C) expand or contract this push rod assembly to provide an operating balance for the expansion and contraction of the bellows assembly within the actuator housing.

PROCESS DIFFERENTIAL

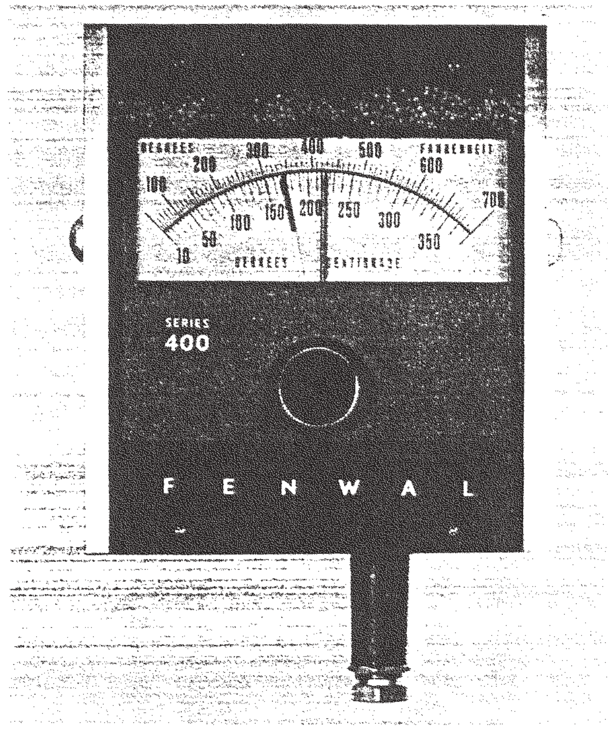
The process differential is minimum when the narrow differential switch is used, when the fastest responding (smallest diameter) bulb is used, when the narrowest scale range is used, and when the sensing bulb is installed in a suitably designed process and in a location which is close enough to the heater or cooling device to sense temperature changes quickly.

In general, it is difficult to predict the operating differential of a given process. The differential can either be increased or decreased within limits by changing one or more of the variables previously mentioned. An easy way to achieve this is to change the snapswitch since the the snapswitches are all mechanically interchangable.

SPECIFICATIONS

HOUSING

The housing (and cover assembly) is made of die cast aluminum with a gray baked enamel finish. It is designed to meet the requirements of NEMA Type 4 and 12 (IEC IP65 and IP62). Neoprene or cork neoprene gaskets seal all ports and covers. Even though the housing is watertight, a separate cover or shield is recommended to protect the controller from exposure in outdoor applications.



SNAPSWITCH ELECTRICAL RATINGS

Standard Differential
15 A, 125-250 VAC
0.50 A, 125 VDC
0.25 A, 250 VDC
Narrow Differential: 15 A, 125-250 VAC
Dielectric Strength: Not less than 1500 VDC or 1500 RMS-AC for one minute between the case and terminals connected in parallel

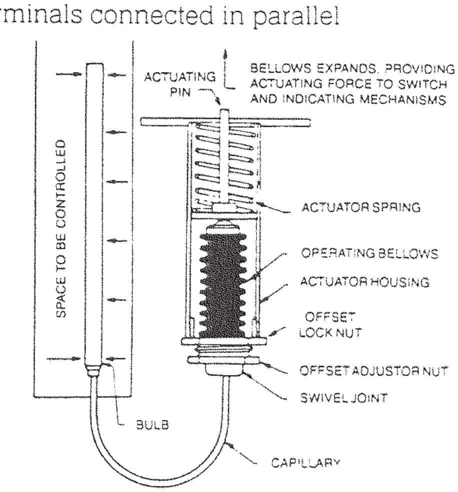


Figure 1

BULB AND CAPILLARY

Material: Type 316 Stainless Steel bulb and capillary are standard. Copper capillary is available upon request.

SPECIFICATIONS Continued

Temperature Exposure Limits

- −175°F (−115°C) minimum for instruments with a top range limit of up to and including 200°F (100°C)
- −100°F (−75°C) minimum for instruments with a top range limit of 300 through 500°F (150 through 260°C)
- 25°F (5°C) minimum for instruments with a top range limit of 700°F (370°C)
- Maximum temperature is 25F° (15C°) above the top range limit

Pressure Exposure Limit: Bulb will withstand 400 psi (2.75 MPa) over any temperature range

INSTALLATION

CONTROLLER LOCATION

The Series 400 Controller housing (including the controller mechanism and actuator assembly) should be mounted where the ambient temperature is within the limits of −65 and +150°F (−55 and +65°C). The controller is ambient temperature compensated from 0 to 150°F (−18 to +65°C). The controller has high resistance to vibration. However, avoid mounting the unit in areas of extreme vibration if possible. If it is necessary to mount the controller in such a location, use a snapswitch with a maximum acceptable operating differential.

CONTROLLER MOUNTING

The controller can be surface mounted by using the three adjustable mounting brackets attached to the case sides and bottom. Fasten with #10 hardware. Series 400 Controllers (except those with Modification 110, Explosion-proof Housing) can also be panel mounted. The panel cutout should be 6.500 in (165.10 mm) wide by 6.625 in (168.28 mm) high. Four mounting holes are provided in the overhanging portion at the top and bottom of the case. The holes will accept #8 hardware and will be hidden by the cover. A template for the cutout and holes is located on Page 7.

BULB INSTALLATION

Temperature limitations for the bulb and capillary are listed in the SPECIFICATIONS section. For optimum control, the bulb and 6 in (15 cm) of capillary should be immersed in the process.

⚠WARNING

In controllers with upper range limits of 700°F (370°C), plunging the bulb from a very cold temperature into a hot process could cause the bulb to stretch or even rupture. since the fluid is very viscous at temperatures below 25°F (−4°C).

⚠CAUTION

Do not expose bulb to pressures greater than 400 psi (2.75 MPa). Beyond this point some creep in the bulb structure occurs which introduces offset into the system.

CAPILLARY INSTALLATION

1. Minimum bending radius is 1/4 inch (6 mm).
2. Do not bend capillary closer than 1/4 inch (6 mm) to the bulb-capillary weld.
3. Do not bend capillary closer than 1 1/4 inch (32 mm) to the actuator assembly. However, the capillary may be rotated 360° at the actuator assembly.
4. Where necessary, allow sufficient length to provide strain relief loops in the capillary.
5. Mount bulb and capillary so as to avoid flexing due to vibration.

WIRING

⚠WARNING

High voltages may be present in the controller that could cause severe injury or death. Wiring should only be performed by qualified personnel. Turn off power before wiring. Wire in accordance with local codes.

Wiring Entrance

Entrance for wiring is provided by a knockout on each side of the housing. Remove knockout by applying one or two sharp blows with a metal or wooden dowel. Be careful not to damage switches.

To maintain the watertight and dusttight feature of the Series 400 Controller, proper conduit connector fittings should be used.

In controllers with Explosion-proof Housing (Modification 110), a separate housing for the snapswitches and wiring is located on top of the controller. To maintain the explosion-proof feature of the housing (Class I, Groups C and D, or Class II, Groups E, F, and G, Division 1 or 2), wiring must enter the housing through a pipe that is screwed into the 1/2 NPT port on the side of the housing. For additional moisture proofing, use a waterproof compound on the pipe threads. To gain access to the snapswitches in the housing, remove the knob and front panel of the controller to expose the four screws on the front of the housing. Remove these screws and the housing cover.

Wiring Connections

See Figures 2A and 2B for examples of wiring single and dual switch units respectively. Connections should be made with generous loops of wire so as not to impair switch operation or adjustment. Terminals are marked NO (open below set point), C (common), and NC (closed below set point). Avoid excessive force on snapswitch when making connections.

Controllers with additional snapswitches in the lower compartment (S.F. 75) have prewired and marked connections as follows:

Switch Number	Closed Circuit Above Setting Between Wires	Closed Circuit Below Setting Between Wires
1	1 and 3	2 and 3
2	4 and 6	5 and 6
3	7 and 9	8 and 9
4	10 and 12	11 and 12

Note: *Switch 1 is nearest front of controller.*

WIRING Continued

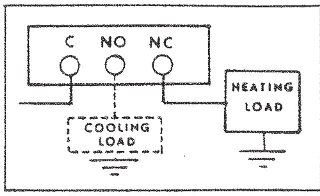


Figure 2A

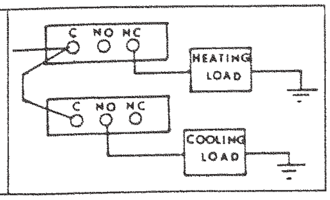


Figure 2B

ADJUSTMENTS

KNOB TORQUE ADJUSTMENT

Knob torque is adjustable by means of the set screw A in the front shaft bearing. See Figure 3, 4, 5, or 6.

SWITCH ADJUSTMENTS

⚠WARNING

Disconnect power when adjusting snapswitches to avoid possible electric shock.

Model 40-702 (See Figure 3)

When the set pointer is in exact alignment with the temperature indicating pointer, the switch should be midway between the Operate and Reset positions. The Operate position is the point where the switch clicks on; the Reset positions is the point where the switch clicks off. The relationship will usually be upset if the snapswitch is replaced, but it can be easily restored as follows:

1. Remove top cover.
2. Bring set pointer (B) in alignment with indicating pointer (C).
3. Adjust screw (E) midway between the two positions where switch (F) clicks.
4. Check the setting by placing a screwdriver under lever (D) and simulate temperature changes by moving the lever.
5. If necessary, trim the setting by slight adjustment of screw (E).

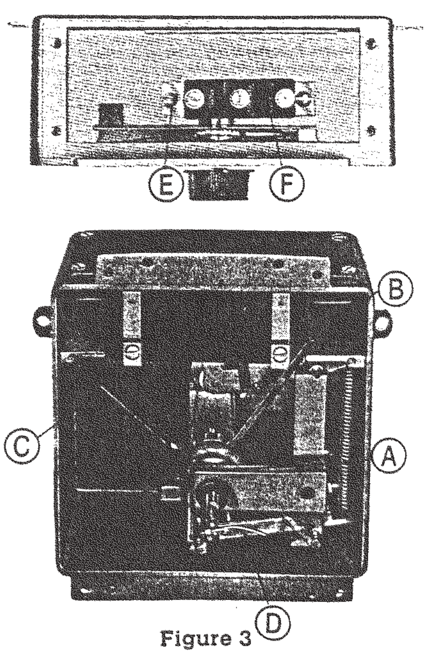


Figure 3

Model 40-703 (See Figure 4)

This controller has two switches, either one of which can be adjusted to operate when the pointers are in alignment. The other switch will either be above or below the indicated setting, depending on whether it is used for overheat alarm, warm-up heat, or some other auxiliary function. The procedures are as follows:

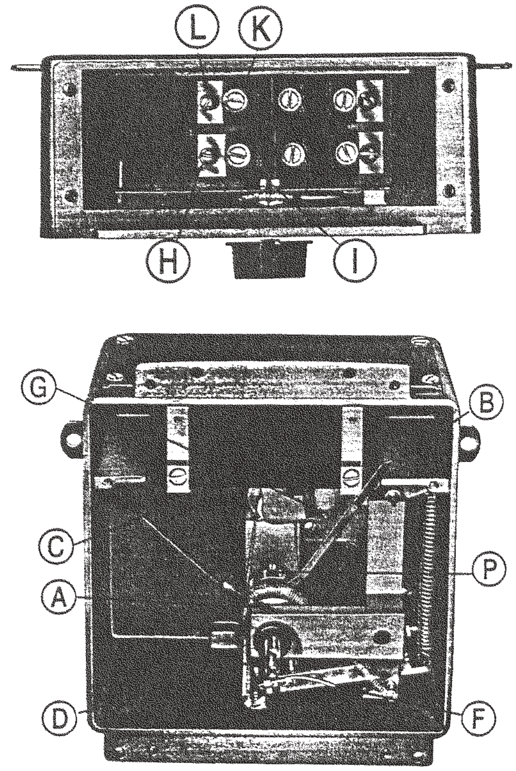


Figure 4

For Differential Up To ±15% of Scale Length

A. When the upper setting is indicated by the set pointer:
   1. Remove top cover.
   2. Bring set pointer (B) in alignment with indicating pointer (C).
   3. Adjust screw (H) on the front switch to a point midway between the two positions where switch (I) clicks. This switch must always be the upper of the two settings. An attempt to do otherwise will cause the rear switch to be inoperative.

B. When the lower setting is indicated by the set pointer:
   1. Remove top cover.
   2. Adjust set pointer (B) the differential amount lower than the indicating pointer (C).
   3. Adjust screw (H) on the front switch to a point midway between the two positions where switch (I) clicks.

ADJUSTMENTS Continued

4. Bring set pointer (B) in alignment with indicating pointer (C).
5. Adjust screw (L) on the rear switch to a point midway between the two positions where switch (K) clicks.

For Wider Differentials (Up to 1/2 Scale Length)

1. Remove front cover, top cover, and temperature scale.
2. Adjust screws (H) and (L) to achieve 1/8 in (3 mm) between switch bracket and case shelf.
3. Turn set pointer (B) to extreme left.
4. Raise lever (F) with a screwdriver to move indicating pointer (C) to midscale.
5. Turn wide differential screw (G) so that rear switch just actuates.
6. Turn screw (G) counter-clockwise amount shown in Table 1.

Table 1

Differential	Screw Turns
3-15%	1/2
12-23%	1
23-41%	2
41-52%	2 1/2

Example: 125°F diferential in an instrument with 50-700°F scale is approximately 20% of scale length, since (125/650)(100%) = approximately 19%. Therefore turn screw 1 turn.

7. Replace temperature scale.
8. Align set pointer (B) with indicating pointer (C).
9. Determine which switch is to be indicated.
10. Loosen set screw (P) and rotate pulley on shaft until the switch to be indicated just actuates. Tighten set screw.
11. Check settings by simulating temperature changes with the screwdriver under lever (F). Trim by adjustments to screws (H) and (L).

Model 40-704 (See Figure 5)
When set pointer (B) is in exact alignment with temperature indicating pointer (C), the REAR switch should be midway between the Operate and Reset positions. When set pointer (J) is in exact alignment with temperature indicating pointer (C), the FRONT switch should be midway between the Operate and Reset positions. The Operate position is the point where the switch clicks on; the Reset positions is the point where the switch clicks off. The relationship will usually be upset if the snapswitch is replaced. but is easily restored as follows:

1. Remove top cover.
2. Bring set pointer (B or J) in alignment with indicating pointer (C).
3. Adjust screws (E) midway between the two positions where each switch clicks.
4. Check the setting by placing a screwdriver under lever (D) and simulate temperature changes by moving the lever.
5. If necessary, trim the setting by slight adjustment of screws (E).

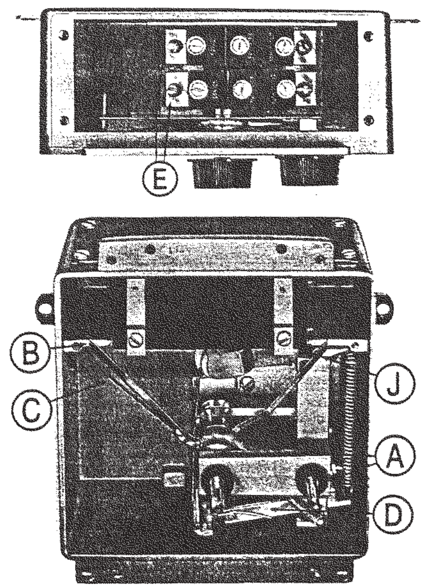


Figure 5

Explosion-proof Housing (See Figure 6)
When the set pointer (B) is in exact alignment with indicating pointer (C), switch (J) should be midway between the Operate and Reset positions. The Operate position is the point where the switch clicks on; the Reset positions is the point where the switch clicks off. This relationship will usually be upset if the snapswitch is replaced, but is easily restored as follows:

1. Remove knob, front cover, and dial. Use care in removing dial so as not to deform pointers.
2. Bring the set pointer (B) into alignment with indicating pointer (C).
3. Adjust hex head screw (D) to a position midway between the two positions where the switch clicks.
4. Check the setting by placing a screwdriver under lever (F) and simulating temperature changes by movement of this lever.
5. If necessary, trim the setting by slight readjustment of screw (D).

ADJUSTMENTS Continued

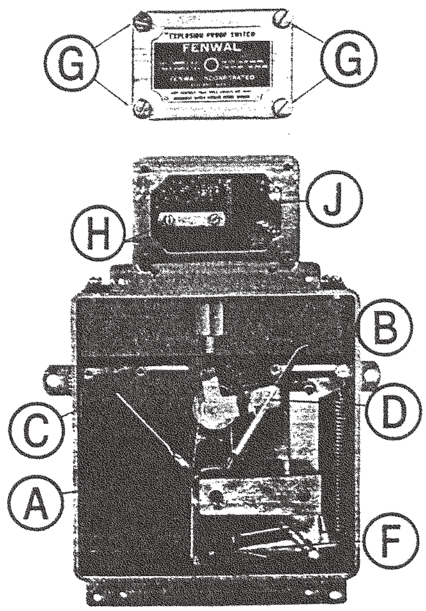


Figure 6

CALIBRATION (See Figure 7)
Every Series 400 Controller is carefully calibrated and tested before shipment, but recalibration may be required to nullify offsets resulting from differences between bench calibration and actual process measurement.

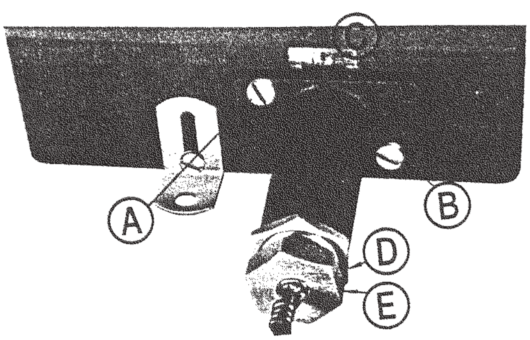


Figure 7

The entire actuator assembly (C) can be moved to the right or left to increase or decrease, respectively, the rate of travel of the indicating pointer. This is done by loosening screws (A) and (B). Adjustment of nut (E), after loosening locknut (D), raises or lowers the entire bellows by a fixed amount.

To calibrate the controller, use one of the following methods:

Method 1 (When the controller is normally used within a narrow range of temperatures)
1. With the process (or calibration bath) at the desired temperature, loosen locknut (D).
2. Adjust nut (E) until the indicating pointer agrees with the process temperature.
3. Tighten locknut (D).

Method 2 (For maximum calibration accuracy over the full temperature range)
1. With the process temperature (or calibration bath) near the center of the scale range, loosen locknut (D).
2. Adjust nut (E) until the indicating pointer agrees with the process temperature.
3. Tighten locknut (D).
4. With the process temperature (or calibration bath) near one end of the scale range, loosen screws (A) and (B) and move the actuator assembly left or right until the indicating pointer agrees with the process temperature.
5. Repeat steps 1 - 3.

MAINTENANCE

LUBRICATION
No lubrication is required.

GLASS REPLACEMENT
1. Remove broken glass and excess cement.
2. Line window frame with Dow Corning 732 RTV Rubber Cement.
3. Insert glass and apply light even pressure.
4. Allow cement to cure before subjecting controller to vibration or shock.

SNAPSWITCH REPLACEMENT
Snapswitches are unlikely to need replacement except when operated in a short circuit or continuously in a contaminated atmosphere. The procedures for replacing snapswitches are as follows:

In Standard Housing (See Figure 8)
1. Remove top cover.
2. Remove switch and mounting bracket by removing screw (A) and sliding switch to the right (away from screw (B).
3. If the switch will not easily slide away from screw (B), reduce compression on the switch by depressing lever (F) in Figure 4.
4. Insert new switch. Ensure that insulation remains intact and in position.

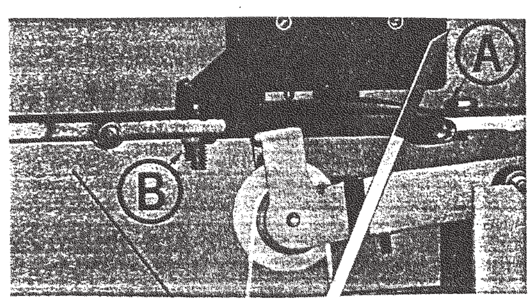


Figure 8

MAINTENANCE Continued

In Explosion-proof Housing (See Figure 6)

1. Remove knob and front cover to expose screws (G).
2. Remove four screws (G).
3. Remove two screws (H), switch, and mounting bracket.
4. Insert new switch. Ensure that insulation remains intact and in position.

ACTUATOR ASSEMBLY REPLACEMENT

In the event that the liquid filled assembly has been damaged, it is necessary to replace the entire actuator assembly. See Figure 7.

1. Remove old assembly by removing screws (A) and (B).
2. Install new assembly. Tag on replacement assembly shows proper positioning to provide 1% accuracy. Position groove on actuator housing in relation to scale on housing as indicated on tag.

Note: *If the original actuator asssembly has a bulb larger than 0.375 in (9.53 mm), e.g., a "C" style (coiled) bulb, it is necessary to specify a packing gland (if required) when reordering the actuator assembly.*

REPLACEMENT PARTS (See Figure 9)

Code	Description	Part Number
A	Snapswitch (Narrow Differential)	06-125723-004
B	Snapswitch (Standard Differential)	06-125723-005
C	Self Tapping Screw	06-250112-011
D	Locknut	06-133426-000
E	Adjusting Nut	06-250025-030
F	Glass Window	06-231187-001
G	Front Cover Gasket	06-231193-001
H	Front Cover Screws	06-250025-049
I	Top Cover	06-231869-001
J	Top Cover Gasket	06-231835-002
K	Top Cover Screw	06-250042-047
L	Mounting Bracket	06-136919-000
M	Mounting Bracket Screw	06-114829-000
N	Indicator Knob	06-114789-003
O	Temperature Dial	State complete model number and temp. range
P	Actuator Assembly	See Table 2.

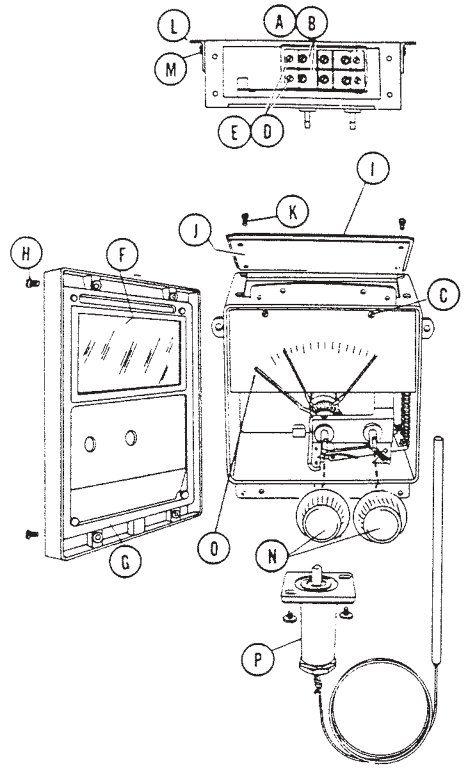


Figure 9

Table 2

Range °F	Range °C	Catalog Number
−150 to +200	−100 to +100	40-10001X-001
−30 to +170	−35 to +75	40-10001X-008
−20 to +120	−30 to +50	40-10001X-002
50 to 200	10 to 95	40-10001X-003
50 to 300	10 to 150	40-10001X-024
50 to 400	10 to 200	40-10001X-025
50 to 500	10 to 260	40-10001X-029
50 to 700	10 to 370	40-10001X-016

Where X = the following (See Figure 10):

0 = Style A Bulb; 6 ft (2 m) capillary
1 = Style B Bulb; 6 ft (2 m) capillary
2 = Style C Bulb; 6 ft (2 m) capillary
3 = Style D Bulb; 6 ft (2 m) capillary
4 = Style A Bulb; 10 ft (3 m) capillary
5 = Style B Bulb; 10 ft (3 m) capillary
6 = Style C Bulb; 10 ft (3 m) capillary
7 = Style D Bulb; 10 ft (3 m) capillary

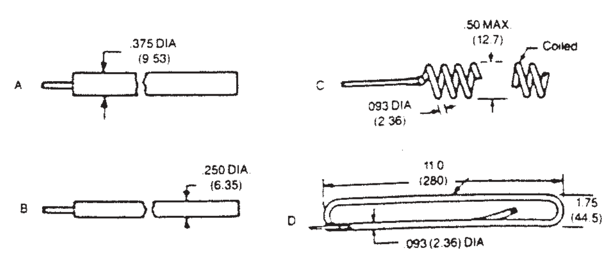
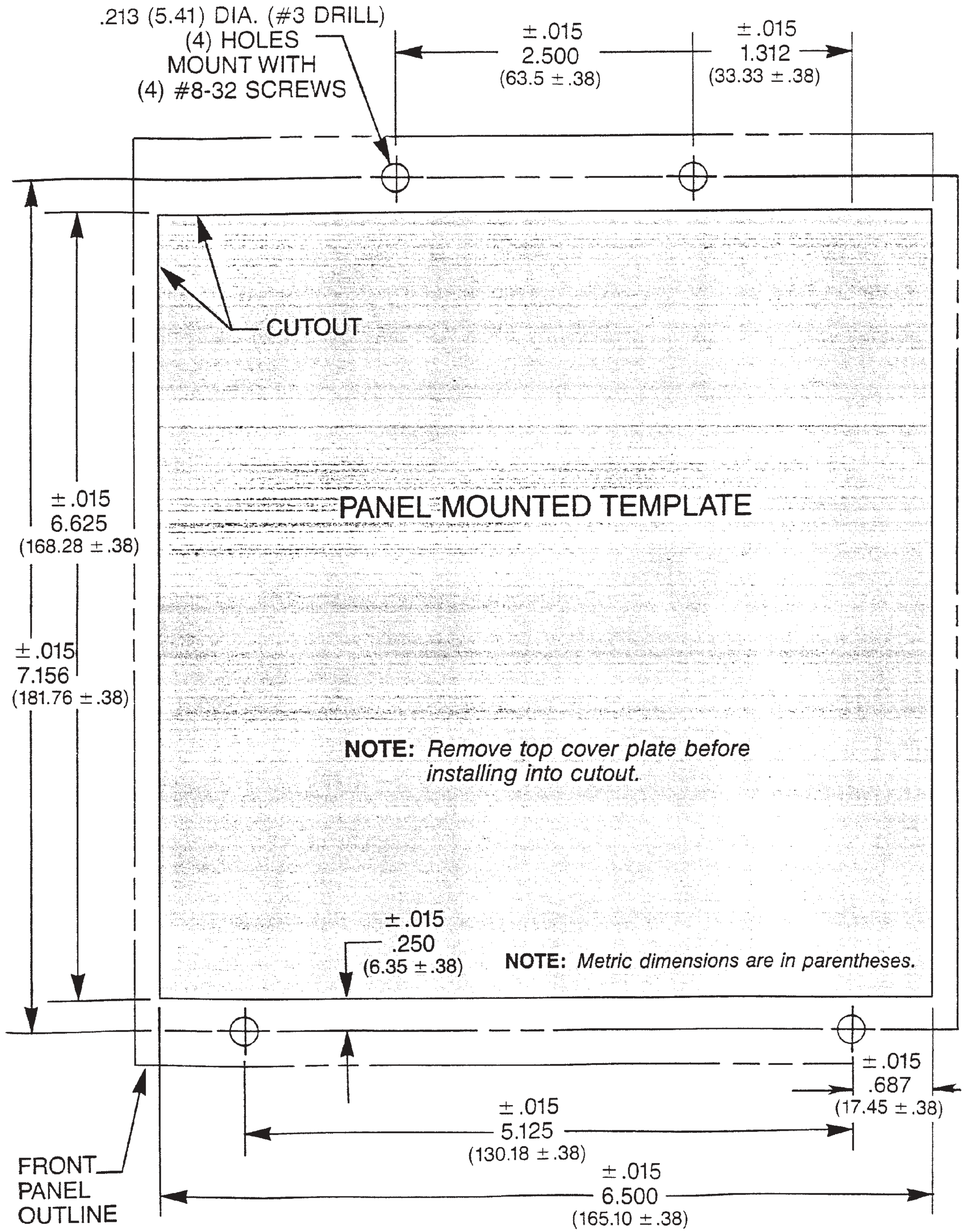


Figure 10


.213 (5.41) DIA. (#3 DRILL)
(4) HOLES
MOUNT WITH
(4) #8-32 SCREWS
±.015
2.500
(63.5 ±.38)
±.015
1.312
(33.33 ±.38)
CUTOUT
±.015
6.625
(168.28 ±.38)
±.015
7.156
(181.76 ±.38)
PANEL MOUNTED TEMPLATE
NOTE: Remove top cover plate before installing into cutout.
±.015
.250
(6.35 ±.38)
NOTE: Metric dimensions are in parentheses.
±.015
.687
(17.45 ±.38)
±.015
5.125
(130.18 ±.38)
±.015
6.500
(165.10 ±.38)
FRONT PANEL OUTLINE

FENWAL®

KIDDE-FENWAL, INC.
400 MAIN STREET, ASHLAND, MA 01721
TEL: (508) 881-2000 FAX: (508) 881-6729

APPENDIX III

Unitized Heater Kit

Process Heating Company, Inc.
2732 3rd Ave.South
P.O. Box 84585
Seattle, WA 98124

Unitized Heater Kit
Installation and Operation

Every Process Heating Company (PHCo) product is efficient, safe and reliable. If properly installed and maintained PHCo products will give you many years of dependable service. Should your heater be damaged when received, file a claim with the carrier immediately.

WARNING!!!!!!! DANGER!!!!!!!

1. Read and understand all tags and installation and operating instructions before commencing.

2. Welding area on tank should be thoroughly cleaned.

3. Work area should be well ventilated.

4. Check that the electrical service will handle the load Unit must be adequately grounded.

5. All wiring should conform to requirements of national and local electrical codes and or standards.

   Only a licensed electrician should connect power to panel and system.

6. Never expose heater tubes to air with power on. DANGER OF EXPLOSION MAY EXIST.

7. Care should be used when working around tubes when cleaning or installing. Walls are only 1/4" thick.

8. If there are any questions concerning the ratings or instructions please contact your distributor or the factory. Phone (206) 682-3414 Fax (206) 682-1582

101-p1

1. These instructions cannot possibly cover every situation concerning the operation, inspection adjustment and test of the equipment furnished. Process Heating Company (PHCo), in the furnishing of this equipment and these instructions, must presume that the operating and maintenance personnel using this equipment have sufficient technical knowledge and experience to apply sound safety and operational practices which may not be mentioned.

2. In applications where PHCo furnished equipment is to be integrated with a process or other equipment, these instructions should be thoroughly reviewed to determine the proper integration of the equipment into the overall plant or system operational procedures.

3. PHCo does not supply, recommend, or approve the various systems in which its products are or may be used. Unless designed, manufactured, and used properly, various systems may be inherently unsafe or dangerous. The user should check and comply with all federal, state and local regulations and other regulations and recommendations such as: NFPA, UL, API, OSHA, etc.

UNITIZED HEATER KIT-INSTALLATION & OPERATION

Preparation

1. Remove jacketing and insulation from section of tank heater is to be installed through.

2. Mark location of opening of tank. Heater should be kept as low as possible in tank.

CAUTION!
BEFORE BURNING OR WELDING ON TANK CLEAN THOROUGHLY AND KEEP WELL VENTILATED

Installation

1. Burn opening in tank slightly larger than heater terminal box (snug fit). Remove slag and grind opening smooth.
2. Remove blocking and slide heater through opening in tank. Stop at marked "weld line" on heater terminal box.
3. Heater tube support plates should be attached to tank bottom. Level heater tubes and weld supports to tank. DO NOT weld heater tubes to support plates.
4. Weld heater terminal box to tank. Terminal box is 1/4" thick steel plate. Weld must be liquid tight.
5. Tank discharge should be kept 2" to 3" above heater tubes. Never expose heater tubes to air with power on. DANGER OF EXPLOSION MAY EXIST.
6. Re-install insulation and jacketing around heater terminal box.
7. Have licensed electrician connect proper voltage and phase with properly sized conductors to main power switch. Unit must be adequately grounded. Check all electrical connection for tightness.

Operation

1. Fill tank with desired material. Turn on power at main switch.

2. Set main indicating temperature control to proper tank holding temperature.

3. Set Hi-Limit control 20 to 30 degrees above main control set point. Hi-Limit will act only in event of main control failure. Heater will continue to cycle at Hi-Limit set point and red light on panel door will indicate "Hi-Limit" condition. Press light to reset when condition is remedied.

4. If unit is equipped with a time clock, see instruction sheet for proper clock setting.

5. Heater operation is now completely automatic. Check electrical connections periodically for tightness. Keep panel door closed tightly at all times.

6. Clean tank at regular intervals. Heater tubes are 1/4" thick steel pipe. Use care with jack hammers and chisels so as not to rupture tube wall.

*****Note*****
Terminal block if provided is to inter-lock heat "off" while other loads are running.
(Remove jumper and connect to terminals #1 & #2.)

CONTROL PANEL

ALL WIRING SHOULD CONFORM TO REQUIREMENTS OF APPLICABLE NATIONAL AND LOCAL ELECTRICAL CODES AND OR STANDARDS.

Rating and voltage of the unit will be found on the name plate located on the inside of door in the control panel, and conduit enclosed insulated conductors of the proper gauge should be brought from the main circuit breaker or fused disconnect switch.

The controlling thermostat can be pre-set to any desired temperature within the thermostat dial range.

If the control panel has been equipped with a time clock please refer to the separate instructions enclosed for proper clock setting.

Your unit has also been equipped with an over-temperature thermostat that should be set 20 - 30 degrees above main temperature control. Its primary function is to protect against over heating in the event of main temperature control malfunction. The unit will cycle at this new temperature and a red Hi-Limit warning light, on the outside of the control panel will light. This light will remain on until the limit circuit is reset to alert personnel that there is a malfunction.

The cause of the malfunction should be investigated at once. Possible reasons are:

1. Capillary rupture on the main temperature controller (indicated by temperature indicating pointer at far left hand position).

2. "Over Ranging" of the main temperature controller (indicated by incorrect temperature reading on the scale).

3. Thermostat temperature setting is too high.

4. Main temperature controller out of calibration.

5. Over-Temperature thermostat out of calibration.

6. Heater magnetic contactor locked in closed position because of "welded" contacts or mechanical bind.

For Unitized Heaters

Maintenance checklist

1. Check electrical connections for tightness.
2. Tank should be cleaned at regular intervals.
3. Check to be sure the control panel door is tightly closed at all times.
4. Be sure to see that tank has adequate insulation. Insulation tends to break down in time thus costing dollars in lost efficiency

DATE	DESCRIPTION OF MAINTENANCE	INITIALS

Process Heating Company, Inc.

P.O. Box 84585 * Seattle, Washington 98124-5885 * Phone: (206) 682-3414 * Fax: (206) 682-1582

List of part #s used on the 28kW 240V 3Ph heat kit:

Our Model # for this heater kit is U-2892724-2-3

Description	Part#
1 - Temperature Control	Fenwall 400, 0°-500°
1 - Hi Limit Control-Tank heat	UE E55S-E23BC
1 - Low Limit Control	UE E55S-E22BC
1 - Heat Trace Temp Control	Zytron - 120-7-Z152-056
1 - Heat Trace Thermocouple	Type J - 10' TFE
1 - Heat Trace/GFCI Transformer	Square "D" - 9740-2S1F
1 - Contactor-Heat trace	Square "D" 8910 DPA12
1 - Heat Trace Fuse Block	Bussman H250-30
2 - Heat Trace Fuse	Bussman NON-10A
1 - GFCI Receptacle	Leviton - 125V,60HZ,20A
1 - Control Relay	RH2B-120VAC
1 - Disconnect	C/H CC 3150
1 - Contactor-Tank heat	Square "D" 8910 DPA23
1 - Contactor-Tank heat	Square "D" 8910 DPA53
1 - Control Transformer	Square "D" - TF100D1
2 - Transformer Primary Fuse	Bussman FNQ-R, 1.5A
1 - Transformer Secondary Fuse	Bussman FNM, 1A
1 - Reset Light	Telemecanique ZB2-BW062
1 - Light-Low Level	Telemecanique ZB2-BV06
1 - Light-Heat On	Telemecanique ZB2-BV03
1 - Push Button-Forward	Telemecanique ZB2-BA2
1 - Push Button-Reverse	Telemecanique ZB2-BA5
1 - Push Button-Stop	Telemecanique ZB2-BL4
3 - Tank Heat Fuse Blocks	Bussman H250-30
9 - Tank Heat Load Fuse	Bussman NON-30A
9 - Heating Elements	PHCo R-3.192724-3
1 - 5HP Reversing Motor Starter	Square "D" LC2D1801G6
1 - 5HP Overload	Square "D" GV2-M20
1 - 7.5HP Motor Starter	Square "D" LC1D2510G6
1 - 7.5HP Overload	Square "D" GV2-M22
1 - Time Clock	Tork E100
1 - Enclosure	Electromate E36L3008

NOTES:

Post-it® Fax Note 7671	Date 1/8	# of pages ▸ 2
To GARY CHRISTIAN	From RICK JAY	
Co./Dept. ETNYRE	Co. PHCo	
Phone #	Phone #	
Fax #	Fax #	

Process Heating Company, Inc.

P.O. Box 84585 * Seattle, Washington 98124-5885 * Phone: (206) 682-3414 * Fax: (206) 682-1582

****

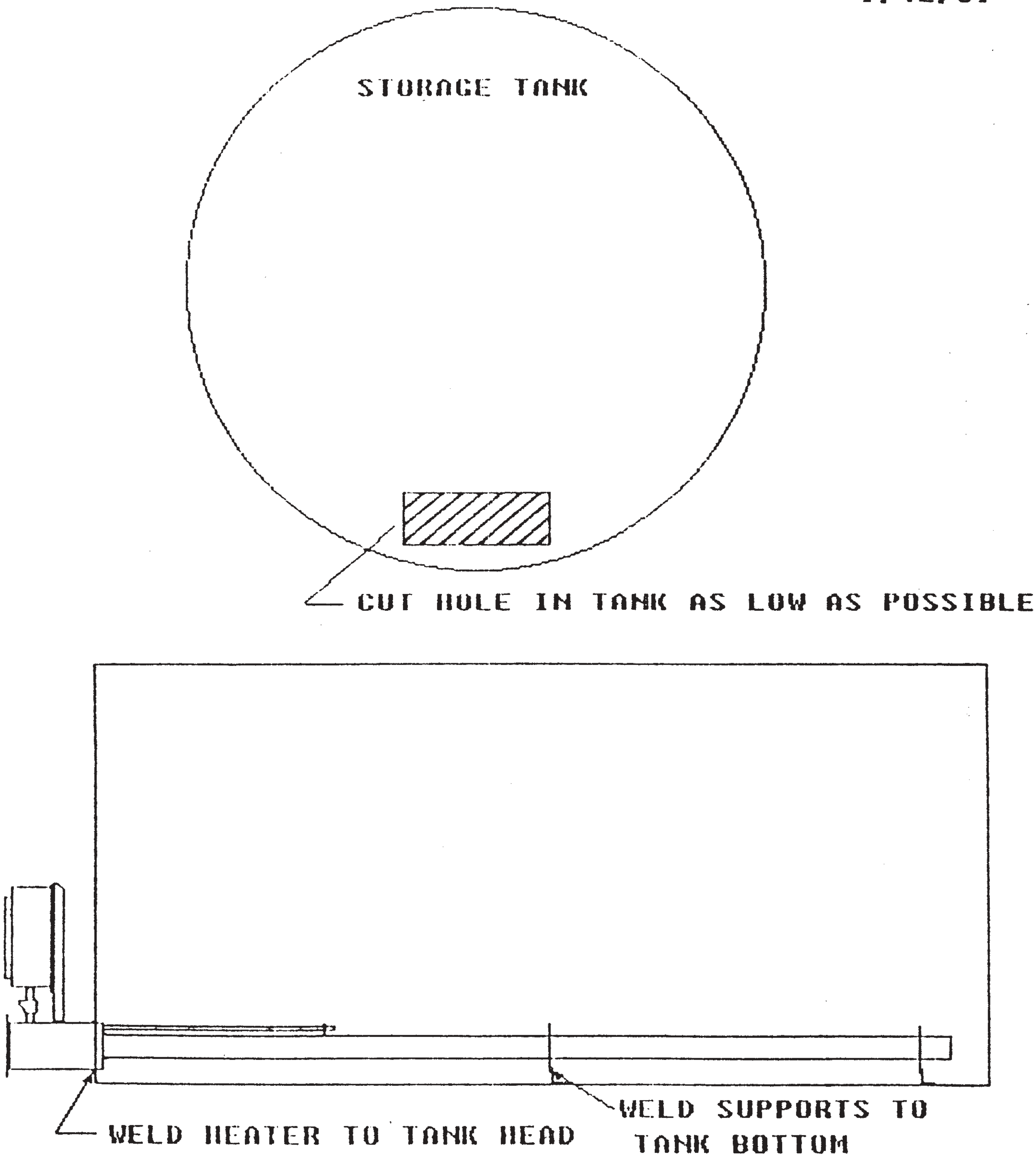
List of part #s used on the 28kW 480V 3Ph heat kit:

Our Model # for this heater kit is U-2892748-2-3

Description	Part#
1 - Temperature Control	Fenwall 400, 0°-500°
1 - Hi Limit Control-Tank heat	UE E55S-E23BC
1 - Low Limit Control	UE E55S-E22BC
1 - Heat Trace Temp Control	Zytron - 120-7-Z152-056
1 - Heat Trace Thermocouple	Type J - 10' TFE
1 - Heat Trace/GFCI Transformer	Square "D" - 9740-2S1F
1 - Contactor-Heat trace	Square "D" 8910 DPA12
1 - Heat Trace Fuse Block	Bussman H250-30
2 - Heat Trace Fuse	Bussman NON-10A
1 - GFCI Receptacle	Leviton - 125V,60HZ,20A
1 - Control Relay	RH2B-120VAC
1 - Disconnect	C/H EHD3080
1 - Contactor-Tank heat	Square "D" 8910 DPA13
1 - Contactor-Tank heat	Square "D" 8910 DPA23
1 - Control Transformer	Square "D" - TF100D1
2 - Transformer Primary Fuse	Bussman FNQ-R, .8A
1 - Transformer Secondary Fuse	Bussman FNM, 1A
1 - Reset Light	Telemecanique ZB2-BWO62
1 - Light-Low Level	Telemecanique ZB2-BV06
1 - Light-Heat On	Telemecanique ZB2-BV03
1 - Push Button-Forward	Telemecanique ZB2-BA2
1 - Push Button-Reverse	Telemecanique ZB2-BA5
1 - Push Button-Stop	Telemecanique ZB2-BL4
3 - Tank Heat Fuse Blocks	Bussman BM603PQ
9 - Tank Heat Load Fuse	Bussman KTK-15A
9 - Heating Elements	PHCo R-3.192748-3
1 - 5HP Reversing Motor Starter	Square "D" LC2D1801G6
1 - 5HP Overload	Square "D" GV2-M14
1 - 7.5HP Motor Starter	Square "D" LC1D2510G6
1 - 7.5HP Overload	Square "D" GV2-M16
1 - Time Clock	Tork E100
1 - Enclosure	Electromate E36L3008

NOTES:

9/12/89



PROCESS HEATING COMPANY

APPENDIX IV

Process Heating Co. Warranty

Five Year Warranty

on
Products
Manufactured by
Process Heating Company
PHCo

and delivered to the initial user are subject to the following limited warranty: **PHCo** warrants its Patented Heating Elements to be free from defects in workmanship and materials for a period of five (5) years (one [1] year for drop-in-style) after the date of delivery to the initial user when operated under normal use and service and in accordance with printed instructions provided by **PHCo.** All other parts and components provided by **PHCo** as part of the unit are warranted to be free from defects in material and workmanship for a period of one (1) year from date of delivery to the initial user.

THE ABOVE WARRANTY IS SUBJECT TO THE TERMS AND CONDITIONS ON THE REVERSE SIDE OF THIS DOCUMENT.

Unless otherwise agreed in writing by Process Heating Company ("PHCo"), all of the following terms and conditions shall apply to its transaction with you (the "buyer"):

1. LIMITED WARRANTY; DISCLAIMERS. PHCo warrants that the goods sold under this contract shall be free from defects in workmanship and materials at the time delivery is tendered. If there is discovered any failure of goods to conform to this limited warranty within one (1) year after tender of delivery (five (5) years in the case of immersion type heating elements other than drop-in style elements), and if Buyer notifies PHCo in writing of such fact within thirty (30) days following such discovery, PHCo at its own expense either will repair the defective item, or replace it, or refund to Buyer the purchase price paid for that item (with the choice between repair, replacement or refund to be made solely by PHCo). The foregoing limited warranty and remedy are exclusive of all other warranties, express or implied, and constitute PHCo's exclusive liability, and Buyer's exclusive remedy, on account of any claim relating to any item sold. PHCo DISCLAIMS ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE. If PHCo should elect to repair or replace a defective item and if for any reason the repair of replacement should fail in its essential purpose (which is to provide Buyer with a non-defective item), then PHCo's liability nevertheless shall be limited to the purchase price charged by PHCo for the goods. PHCo shall have no liability on account of any claim asserted under principles of negligence or other tort, breach of any statutory duty, indemnity or contribution, or on any other basis, if PHCo's liability on account of such claim would exceed or in any respect differ from its liability under the forgoing limited warranty and exclusive remedy.

2. LIABILITY OF PHCo UNDER THE FOREGOING LIMITED WARRANTY SHALL EXIST ONLY IF:
a. The goods are installed, operated and tested in accordance with the PHCo approved installation and operation instruction.
b. The goods are used and maintained in conformity with installation and operation instructions approved or published by PHCo.
c. Written authorization must be given by PHCo before any warranty work is done.
The above limited warranty shall be void and no further in effect if the goods are subject to abuse, strain, impact or loading that is greater than their normal

3. LIMITATION OF LIABILITY. UNDER NO CIRCUMSTANCES SHALL PHCo OR ANYONE ELSE INVOLVED IN THE MANUFACTURE OR SALE OF THE GOODS BE LIABLE TO BUYER OR OTHERS FOR ANY SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES, INCLUDING BUT NOT LIMITED TO LOST PROFITS, EVEN IF PHCo HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES, OR FOR ANY DAMAGES OR SUMS PAID BY BUYER OR OTHER TO THIRD PARTIES. THE FOREGOING LIMITATION OF LIABILITY SHALL APPLY WHETHER ANY CLAIM FOR ANY SUCH DAMAGES IS BASED UPON PRINCIPLES OF CONTRACT, WARRANTY, NEGLIGENCE OR OTHER TORT, BREACH OF ANY STATUTORY DUTY, PRINCIPLES OF INDEMNITY OR CONTRIBUTION, THE FAILURE OF ANY LIMITED OR EXCLUSIVE REMEDY TO ACHIEVE ITS ESSENTIAL PURPOSE, OR ANY OTHER BASIS.

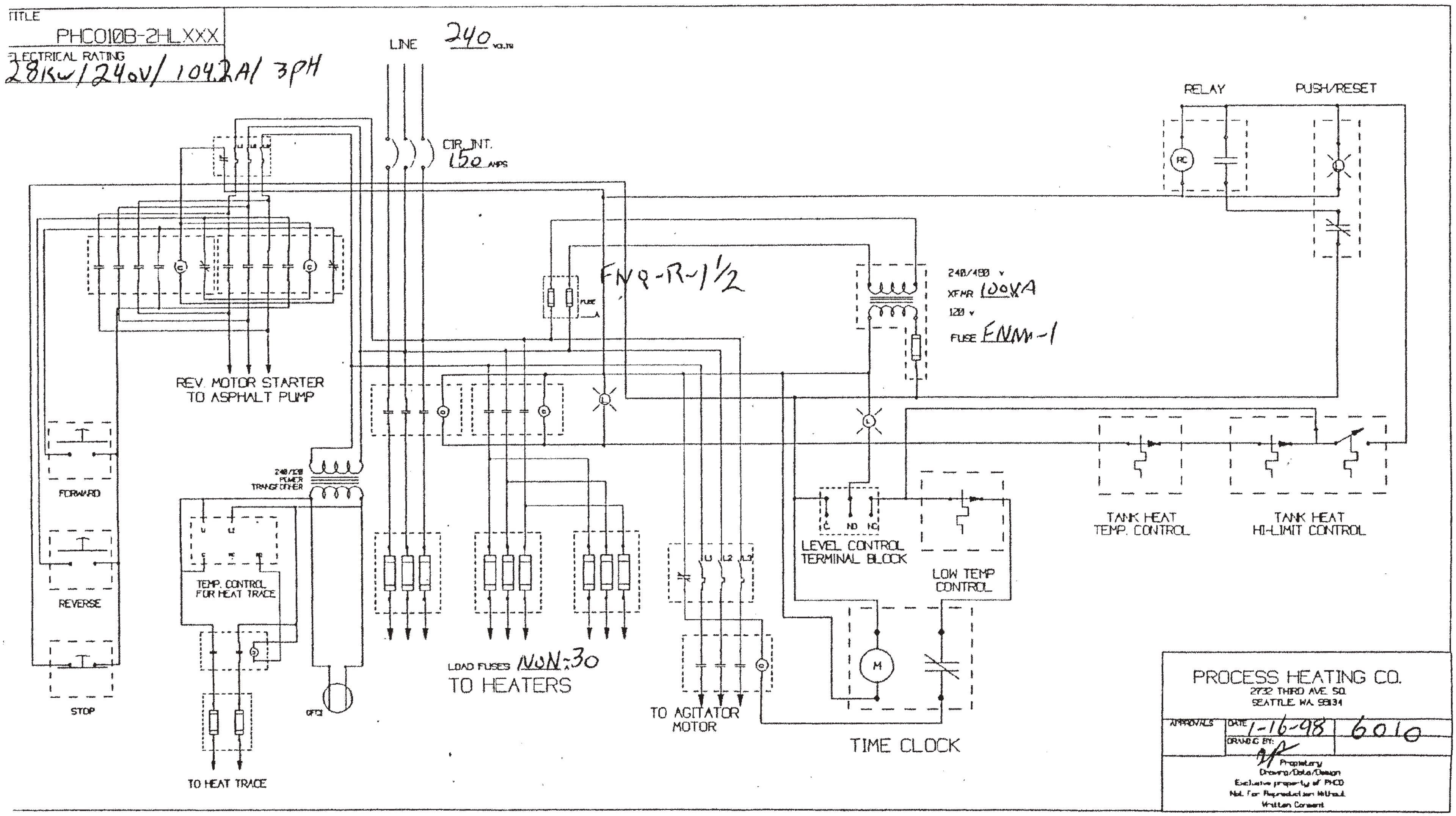
4. AUTHORITY OF PHCo'S AGENTS. No agent, employee or representative of PHCo has any authority to bind PHCo to any other affirmation, representation, promise or warranty concerning the goods sold under this contract, unless it is in writing and included as part of the terms of this a contract.

5. MODIFICATION OF WAIVER. No subsequent waiver or modification of this Limited Warranty and Liability shall be effective unless the same is in writing and signed by the party against whom such waiver or modification is asserted. No waiver in any one instance shall constitute a waiver of the same or any other term or condition on any subsequent occasion. None of the express terms of this Limited Warranty and Liability may be waived or varied by course of dealing or usage of trade.

6. DISPUTES. This agreement shall be governed by the laws of the State of Washington without reference to its choice of law rules. Any action to enforce any of the terms or conditions of this agreement may be commenced or maintained at the option of either party in any federal or state court located in King County, Washington having jurisdiction over the matter, and both parties consent in advance to the exercise by such courts of jurisdiction over them personally. No action by either party arising out of or relating to this contract (including any action based upon principles of contract, tort or otherwise) may be commenced more than one (1) year after the cause of action has accrued, and any action commenced by a party thereafter shall be dismissed at the instance of the other party.

APPENDIX V

Control Panel Wiring Schematic



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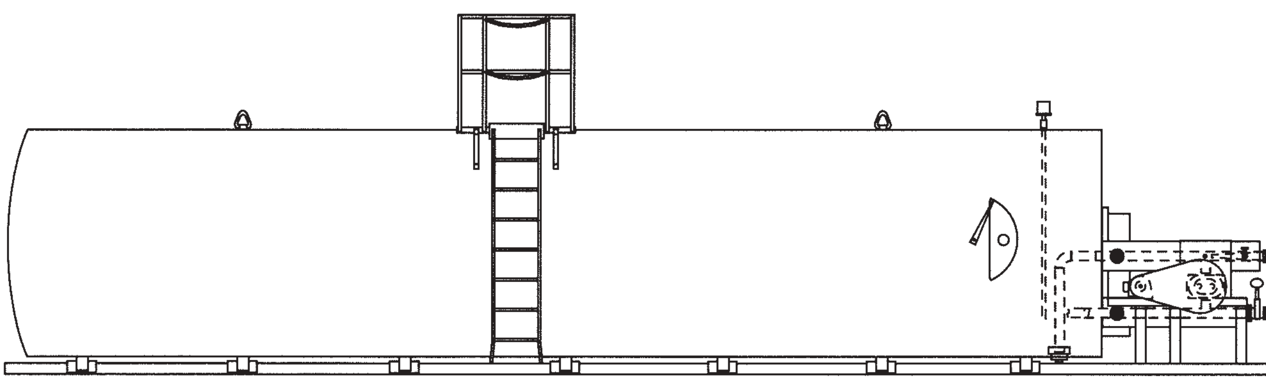
PHC010B-2HLXXX
ELECTRICAL RATING
28KW/240V/104.2A/ 3PH
LINE
240 VOLTS
CIR. INT.
150 AMPS
FNQ-R-1 1/2
FUSE
240/480 V
XFMR 100VA
120 V
FUSE FNM-1
RELAY
PUSH/RESET
REV. MOTOR STARTER
TO ASPHALT PUMP
240/120 POWER TRANSFORMER
FORWARD
REVERSE
STOP
TEMP. CONTROL FOR HEAT TRACE
TO HEAT TRACE
LOAD FUSES NON-30
TO HEATERS
TO AGITATOR MOTOR
LEVEL CONTROL TERMINAL BLOCK
LOW TEMP CONTROL
TIME CLOCK
TANK HEAT TEMP. CONTROL
TANK HEAT HI-LIMIT CONTROL
PROCESS HEATING CO.
2732 THIRD AVE. SO.
SEATTLE, WA. 98134
APPROVALS
DATE 1-16-98
6010
DRAWING BY:
Proprietary Drawing/Data/Design
Exclusive property of PHCO
Not For Reproduction Without Written Consent

M-501-T1099Hz-99
TEXAS
Serial Number: A1099

Storage Tank

OPERATION, MAINTENANCE, SAFETY and PARTS MANUAL



E. D. ETNYRE & CO., Oregon, Ill 61061