Chromalox®

Installation, Operation

and

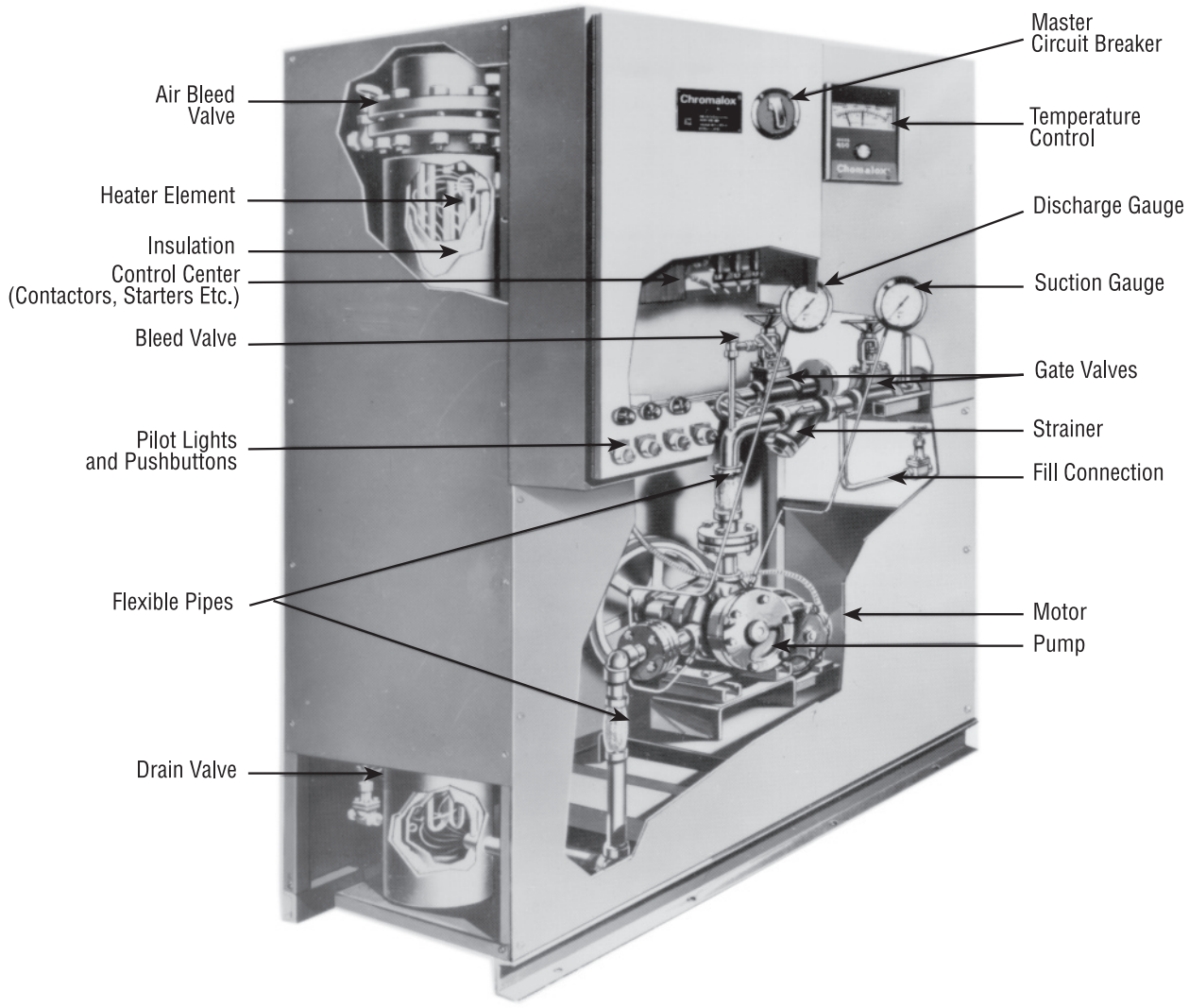
RENEWAL PARTS IDENTIFICATION

SERVICE REFERENCE	
DIVISION 4	SECTION COS
SALES REFERENCE	PQ425
	161-057986-001
DATE MAY, 1985	

Electric Fluid Heat Transfer Systems

Temperatures to 650°F* at Atmospheric Pressure – For Heat Transfer Oils – Catalog Numbers as Listed on Page 2. 9 kW thru 400 kW Systems

Manufacturing Data	
	System Catalog Number and Rating ..... System Serial Number .....
	Customer's Name .....
	Customer's Order Number ..... Date .....



*Depends upon heat transfer fluid properties.

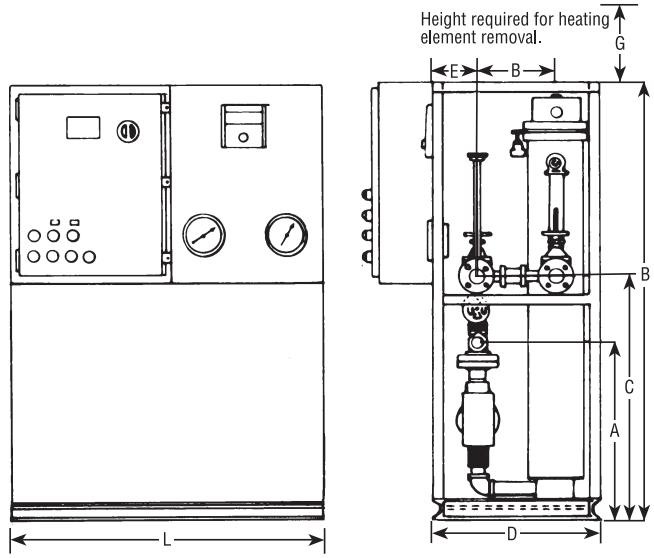
SPECIFICATIONS

kW Rating	Amperes** 240V	Amperes** 480V	150# Flanged Piping Connection	System Volume* (Gals.)	Expansion Tank † (Gals.)	Pump ‡ GPM	Pump ‡ HP	Catalog Number Standard NEMA I	Catalog Number Oil & Dust Tight NEMA XIII	Catalog Number Weather-resistant NEMA IV	Approx. Net Wt., Lbs.	Catalog Number Explosion-resistant Class 1, Group D	Approx. Net Wt., Lbs.
9	29.2	14.6	1-1/2	4	12	35	2	COS-650-9	COSO-650-9	COSW-650-9	1000	COSX-650-9	1700
12	37.4	18.7	1-1/2	7	12	35	2	COS-650-12	COSO-650-12	COSW-650-12	1100	COSX-650-12	2000
15	44.6	22.3	1-1/2	7	18	35	2	COS-650-15	COSO-650-15	COSW-650-15	1100	COSX-650-15	2000
20	56.6	28.3	1-1/2	7	18	35	2	COS-650-20	COSO-650-20	COSW-650-20	1200	COSX-650-20	2000
30	81.6	40.6	1-1/2	7	18	35	2	COS-650-30	COSO-650-30	COSW-650-30	1300	COSX-650-30	2200
40	105.6	52.6	2	10	30	60	3	COS-650-40	COSO-650-40	COSW-650-40	1400	COSX-650-40	2300
60	159.7	79.2	2	16	42	80	5	COS-650-60	COSO-650-60	COSW-650-60	1700	COSX-650-60	2600
80	207.9	103.9	2	20	42	80	5	COS-650-80	COSO-650-80	COSW-650-80	1800	COSX-650-80	3100
100	260.0	130.0	3	30	80	120	7-1/2	COS-650-100	COSO-650-100	COSW-650-100	1900	COSX-650-100	3400
125	310.0	155.0	3	42	80	150	7-1/2	COS-650-125	COSO-650-125	COSW-650-125	2000	COSX-650-125	3500
150	385.0	192.0	3	42	80	150	7-1/2	COS-650-150	COSO-650-150	COSW-650-150	2000	COSX-650-150	3500
200	–	255	3	55	80	150	7-1/2	COS-650-200	COSO-650-200	COSW-650-200	2100	COSX-650-200	3800
250	–	315.0	3	76	115	200	10	COS-650-250	COSO-650-250	COSW-650-250	3100	COSX-650-250	4800
300	–	375.0	3	76	115	200	10	COS-650-300	COSO-650-300	COSW-650-300	3200	COSX-650-300	5000
350	–	435.0	3	100	115	200	10	COS-650-350	COSO-650-350	COSW-650-350	3400	COSX-650-350	5200
400	–	495.0	3	100	115	200	10	COS-650-400	COSO-650-400	COSW-650-400	3500	COSX-650-400	5300

‡ Horsepower and GPM ratings are based on a cold start with a heat transfer medium having a viscosity of approximately 700 SSU at 70°F and 50 PSI total delivery head.
* Excludes expansion tank and volume in customer's equipment.
**All amperes based on 3ph 60 cycle power.
† Recommended minimum size.

kW Rating	Dimensions (Inches) L	D**	H	A	B	C	E	G
9-40	48	25	65	24	12	36	6	50
60	48	25	65	24	11-1/4	36	5-1/2	50
80	48	25	84	35	11-1/4	45	5-1/2	66
100	54	32	84	36	13-1/2	48	6-1/2	66
125 & 150	54	32	84	45	12	54	8	66
200	54	32	84	45	12	57	8	66
250 & 300	62	47	84	42	22	54	12	66
350 & 400	62	47	92	42	22	54	12	66

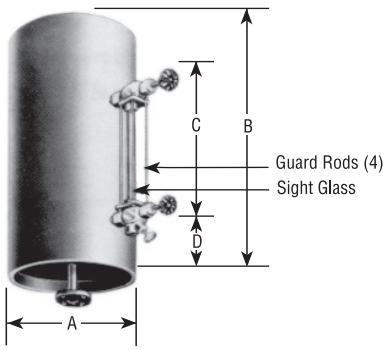
**Add 10" to depth of COS, COSO, and COSW and 15" to depth of COSX for control box overhang.
H – Height excludes expansion tank.



Expansion tank specifications and dimensions

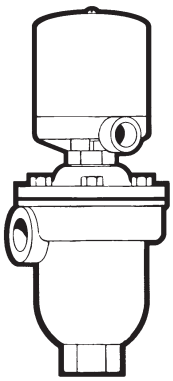
The expansion tanks used with the COS line of hot oil heat transfer systems are non-coded pneumatic type designed for 75 psi. They are made of carbon steel and come complete with ¾" – 150 lb. flanged inlet connections. 1" NPT vent connection and a sight glass assembly.

Size Gal.	Dimensions A (ID)	B	C	D	Wt. (Lbs.)
12	12	25½	14	5¾	32
18	12	37½	20	8¾	44
30	16	38¼	20	9⅛	65
42	20	35	20	7½	80
80	20	63	38	12½	120
115	24	63⅜	38	12½	145
215	30	73⅜	38	17½	345



Optional Liquid Level Control for Expansion Tank

This optional liquid level control or float switch is mounted on the expansion tank and is used for automatic shutdown of the heat transfer system in case of low liquid level. It can be used with most of the heat transfer fluids having a minimum specific gravity of 0.85.



GENERAL

The Chromalox Heat Transfer Unit is a thoroughly engineered, pretested package, designed to give years of service, virtually maintenance free if properly installed. The COS series can operate at 650°F at atmospheric pressure (depending upon heat transfer fluid properties) and is available in four models, each with basic features that comply with the National Electrical Code. Model COS has general-purpose NEMA I construction and can be used where no hazards exist. Model COSW can be used where weather-resistant construction is required and is constructed according to NEMA IV specifications. Model COSO is oil and dust tight as specified by NEMA XII standards. Model COSX, Class I, Group D, Division I is explosion resistant and is constructed to operate in hazardous or explosive areas. (**Warning:** Pipe surfaces could achieve temperatures higher than allowed for Class I, Group D, Division 1 hazardous areas). Common to all four models: steel heater sheath, maximum density 22 watts per square inch; cast iron, positive displacement pump; power requirements 208, 240, 480 and 550 volts, 3 phase, 60 cycles, 9 thru 400kW.

INSTALLATION

CAUTION: *This system is not for use with water, ethylene glycol and water mixture or some of the synthetic heat transfer fluids. Check with your local Chromalox Sales and Application Engineer to be sure you are using an accepted heat transfer medium in this system and request PQ301.*

Note: When installing system allow sufficient room to remove element if and when necessary. (See dimensional table column G Page 2)

HYDRAULIC:

Note: The COSW systems should be mounted so the control box does not fall in direct sunlight.

The bed plate should be mounted on a solid foundation, preferably level.

The pipe size should be the same as the system piping connections. All piping must be supported so the pump is not carrying any of the pipe weight. If these instructions are **not** followed, distortion in the pump may cause unnecessary wear and faulty operation.

1. The piping of the entire system should be arranged to minimize pockets where air may be trapped. Manual air vents or bleeder valves should be provided in the system where air pockets may occur and every time the flow of fluid drops.

2. Mount the expansion tank so it is the highest point in the system and if possible at least 15 foot above the height of the pump. Connect the fluid level sight glass to the expansion tank. To safeguard employees and equipment, run the vent line either out of the building or down into a 55 gallon drum. This vent line should be a minimum of 1/2" internal pipe size.

CAUTION: *To avoid possible rupture of expansion tank due to pressure, vent line should be checked on a regular basis to be sure it is always open to the atmosphere. Failure to do so may result in rupture of the expansion tank or other parts of the system causing injury or hazard of fire.*

Note: If the expansion tank cannot be mounted above the highest point in the system, or if the system is going to operate above THE boiling temperature of the heat transfer fluid, the expansion tank will have to be pressurized with air or nitrogen. This eliminates the possibility of heat transfer fluid flashing into vapor in the heater, at the point of high velocity in the system, at the suction of the pump or causing the pump to vapor lock due to inusfficient NPSH (net positive suction head). On hot oil heat transfer system, this pressurizing is usually done with nitrogen as this eliminates the possibility of the hot fluid coming in contact with oxygen thus reducing the possibility of oxidation, extending the life of the heat transfer fluid. This pressure should be 5-10 PSI above the vapor pressure of the heat transfer fluid at its operating temperature.

WARNING: *If expansion tank is to be pressurized, then it must be equipped with safety relief valve(s). If this pressure exceeds 15 PSIG, then the heat transfer system and expansion tank should be ASME coded.*

3. CHECK PUMP SEAL:

(A) Mechanical Seal Type (Optional): Designed for a maximum working temperature to 650°F. Do not rotate pump when the seal is dry as seal could be damaged. There should be no leakage at the stuffing box when a mechanical seal is used. Cooling water at a rate of 1/8 GPM is required through the mechanical seal's cooling collar at pumping temperature above 350°F.

(B) Oil Packing Type (Stuffing Box Standard): Designed for a maximum working temperature to 650°F. Packing is placed in stuffing box in single rings; adjoining rings have joints that are rotated 180° to seal the joint. The pump packing gland should be only finger tight. Packed stuffing boxes must have oil leakage at a rate of 1-2 drops per minute for shaft lubrication.

4. Note: All flanged connections, motor mounts and motor pump belt should be checked and tightened if necessary. These sometimes loosen during transit.

ELECTRIC:

CAUTION: ***Hazard of Electric Shock. The heat transfer system must be grounded using grounding means provided in control box and employing wiring in accordance with National Electrical Code.***

1. The unit is completely wired. The only wiring necessary is to terminals L1, L2, and L3 on the main circuit breaker and the ground lug in the control panel.

CAUTION: ***Hazard of Electric Shock. Disconnect all power before servicing the heat transfer system.***

2. Turn the thermostat(s) to the lowest temperature possible and the ON-OFF Selector Switch(es) to the OFF position. Start the unit by pushing the push button marked START, located on the front of the panel. This test is to check pump rotation and the unit should be turned off immediately upon learning the direction of rotation.

3. The pump rotation should be as indicated by arrows on motor. If direction of rotation is wrong, reverse the input leads (L1 and L3) at the master circuit breaker. Momentarily start the pump to check rotation.

4. All electrical connections should be checked and tightened if necessary. These sometimes loosen during transit.

OPERATION

CAUTION: *To avoid possible damage to the heaters, DO NOT energize the heater until the system is filled with fluid.*

1. All systems are pretested using Mobiltherm®. (System can be pretested with other fluids. Check with your local Chromalox Sales and Application Engineer) Check to insure your fluid is compatible with fluid used in pretest.

2. On systems equipped with a float switch on the expansion tank it will be necessary to bypass this switch until the system is filled in order to operate the pump. After system is filled remove bypass jumper to obtain protection of float switch. This switch will shut the system down in the event of a low liquid level or loss of heat transfer liquid thus preventing damage to system.

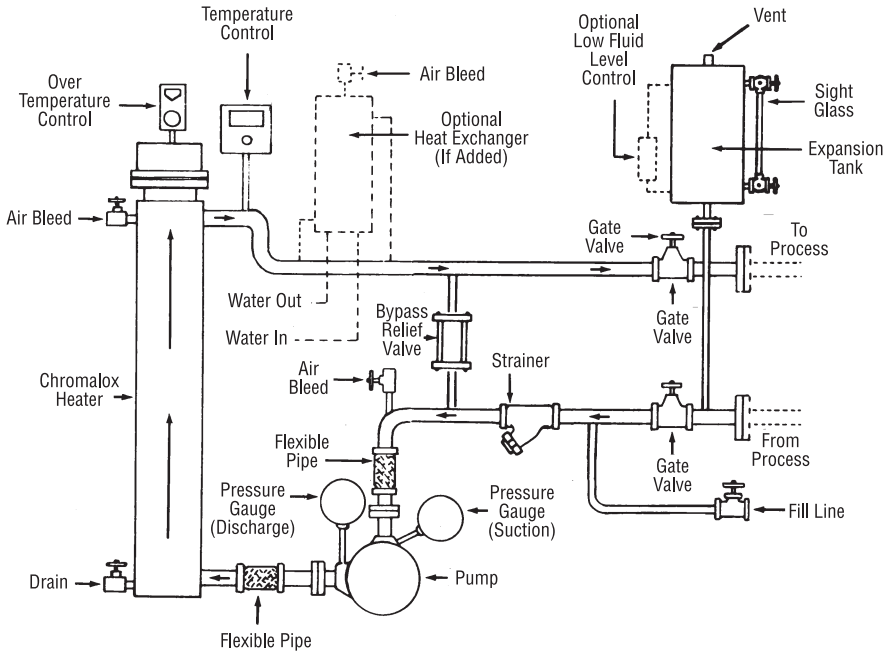
® Mobile Oil Corp.

3. You are now ready to start filling the system with heat transfer fluid. Close the system inlet gate valve and open the outlet and fill line gate valves and heater bleed valve on all heaters. Prime the pump by pouring approximately 1 pint to 1 quart of fluid through the 1/4" air bleed valve located above pump. (Close this 1/4" air bleed valve *and leave closed while pump is in operation.*)

4. The system is then filled directly from the 55 gallon drum(s) by connecting a hose to fill line and inserting it into the drum.

5. Next energize the pump to pull the fluid into the complete system and up into the expansion tank. When the fluid reaches the heater bleed valve, it should then be closed, and accordingly the bleeds on the customer's process closed when the fluid reaches them.

Typical piping schematic of a Chromalox heat transfer system



The fill line remains open until the expansion tank sight glass indicates being 1/3 full. After the system is filled, shut down the pump and close the fill valve. Open system inlet valve.

WARNING: *Avoid having the heat-transfer fluid spilled or leaked into the pipeline insulation as it has been found that spontaneous ignition of this fluid may result at elevated temperatures.*

6. Turn master circuit breaker off. Bleed air from all lines (including one located above pump) and reclose all bleed valves.

7. At this time, the pressure switch, located inside the control panel should be set approximately three pounds higher than that indicated by the suction gauge. The pressure switch is a safety control which will automatically de-energize the heaters if the pump belt should break and stop the flow of fluid.

8. The overheat thermostats, also located inside the control panel should be checked to insure manual reset buttons are in the closed position. They should be set approximately 50°F higher than the control thermostat during normal operation.

9. Close control box door and turn circuit breaker on. Start pump – do not be alarmed if the pump is noisy during the initial start-up operation since it is due to air in the system.

10. At the beginning of the pump operation, allow the packing box to leak liberally. Tighten packing gland nuts evenly, one flat at a time, until there are only a few drops of leakage per minute; a reasonable leakage is 5 drops per minute cold which should decrease to approximately 2 drops per minute when at operating temperature. This procedure may require two to three hours but will lengthen the life of the pump. Keep packing gland snug at all times but not tight enough to bind the shaft.

CAUTION: *Packing gland nuts must be tightened evenly to assure even pressure on pump shaft. Packing gland nuts unevenly tightened can cause misalignment and undue wear on pump shaft and bushings. Do not overtighten or shaft damage will occur.*

11. Bleed out all air by opening bleeder valves. The pump should become quiet.

CAUTION: *During the initial start-up operation, the liquid level in the expansion tank must be checked continually. This level should not exceed the three-quarter mark on the glass nor drop below the one-quarter mark.* **Note:** If abnormal expansion of fluid is detected, this is probably due to a pocket of air or steam still present in the system. Check all bleed valves for air or steam and bleed if necessary. If problem continues, de-energize pump and bleed again.

12. Set indicating or controlling thermostat at 220°F.

13. To energize the heater, turn the ON-OFF selector switch to the ON position after starting the pump. The heater is interlocked with the pump motor starter so that, in the event of motor failure, the heating elements will shut off automatically.

14. Run the system until 220°F is reached. Periodically open the bleeder valves to remove air from the system. At 220°F, any moisture trapped in the system will flash into steam as it goes through the heater and can be bled out through the bleeder valves.

15. Excessive moisture and air in the system will cause the heat transfer liquid to back up into the expansion tank, thus evacuating the heating chamber or chambers. If this happens, shut the system down, bleed off the steam and air and allow liquid to return to the heating chamber(s). Drain the system and recharge with new moisture-free heat transfer liquid. If pump continues to be noisy and cavitates or if abnormal expansion persists there is excessive moisture in the fluid.

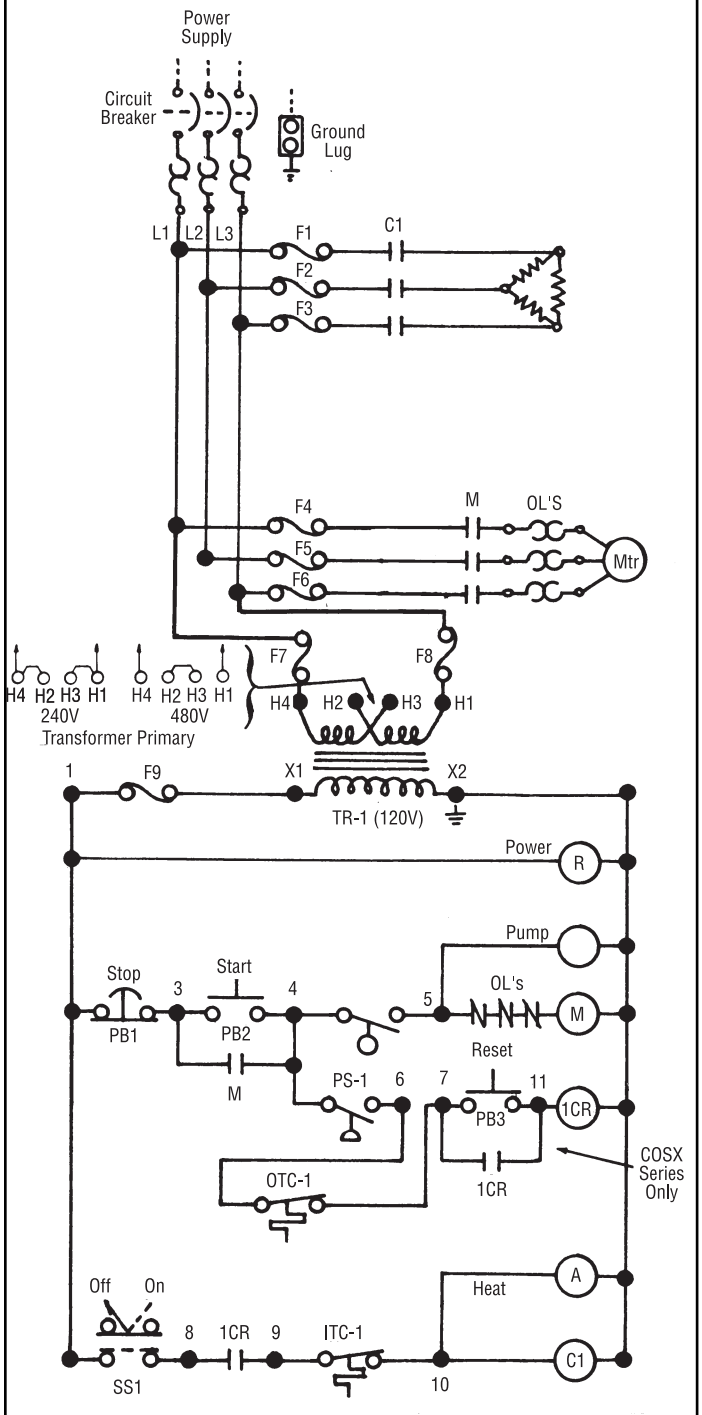
16. After the system has been completely charged and free of air and steam pockets, set controlling thermostat at the desired temperature.

17. If there is an abnormally low reading (less than zero) on the suction gauge, the strainer should be cleaned to remove all foreign material which may have accumulated during assembly. After the system is in operation, the strainer should be checked and cleaned (if necessary) once a year or more frequently if system operating conditions dictate.

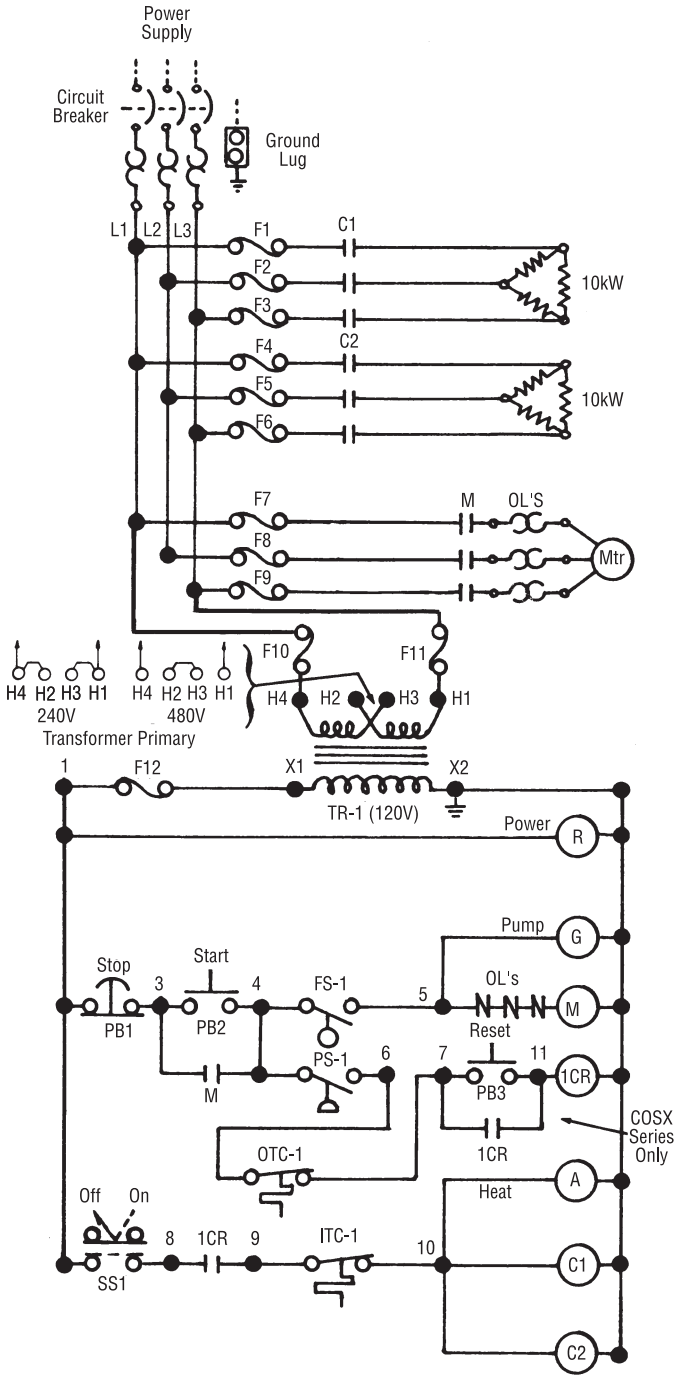
Note: Consult Service Manual PQ410 for additional aid to help start-up and to service Chromalox Heat Transfer Systems.

WIRING DIAGRAMS

9 kW to 15 kW, 208V thru 575V
20 kW, 240V thru 575V

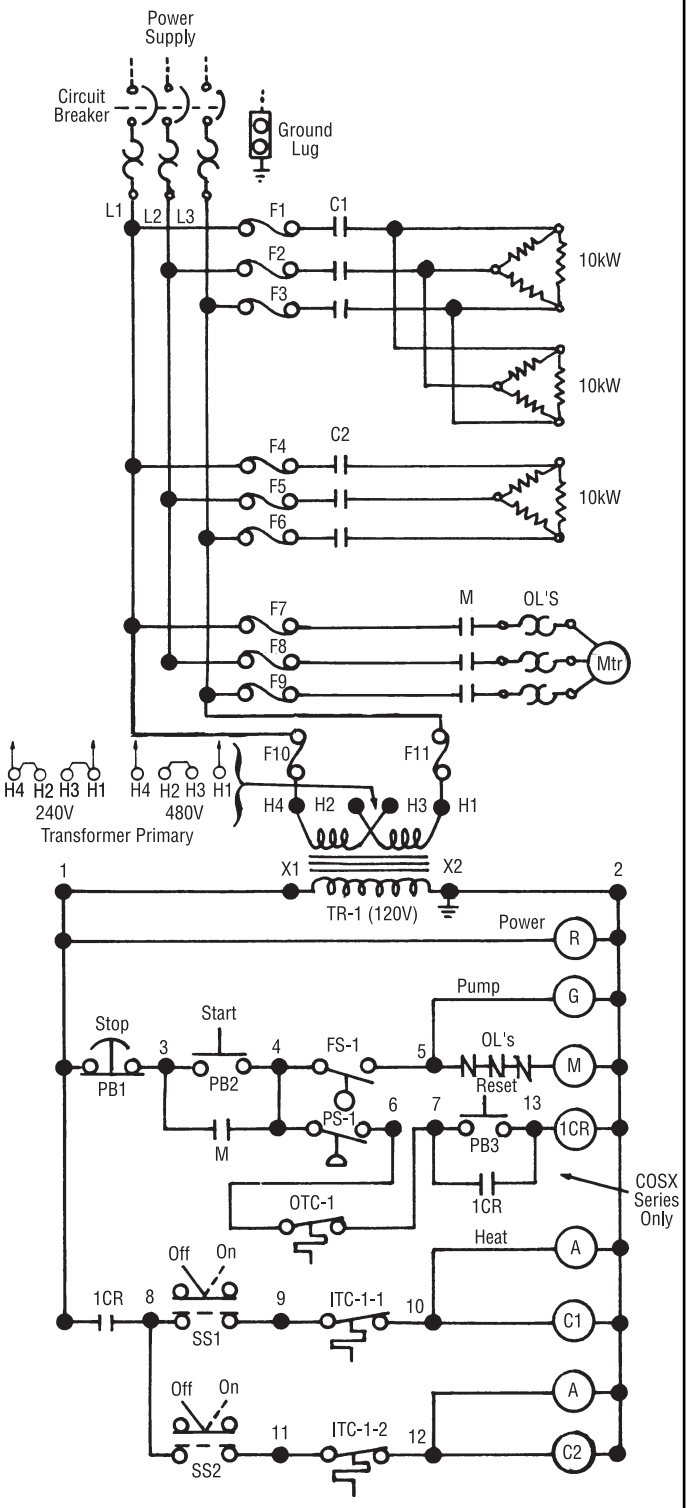


20 kW, 208V

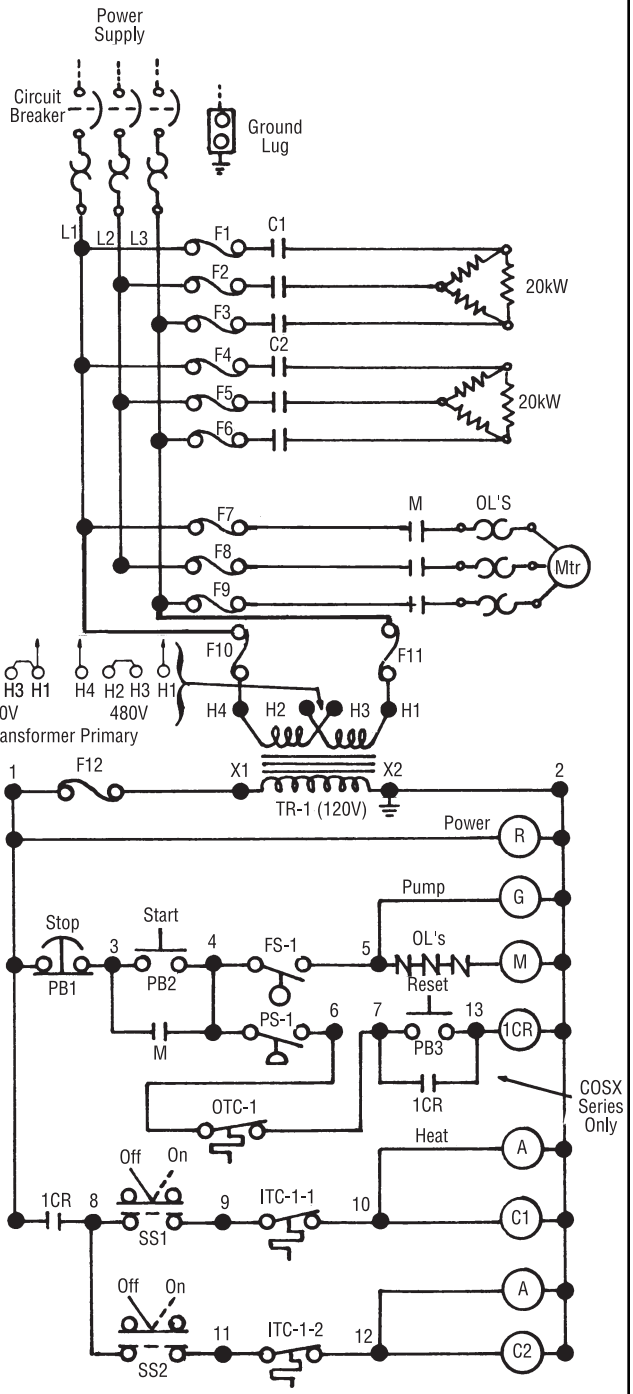


WIRING DIAGRAMS

30 kW, 240V thru 575V

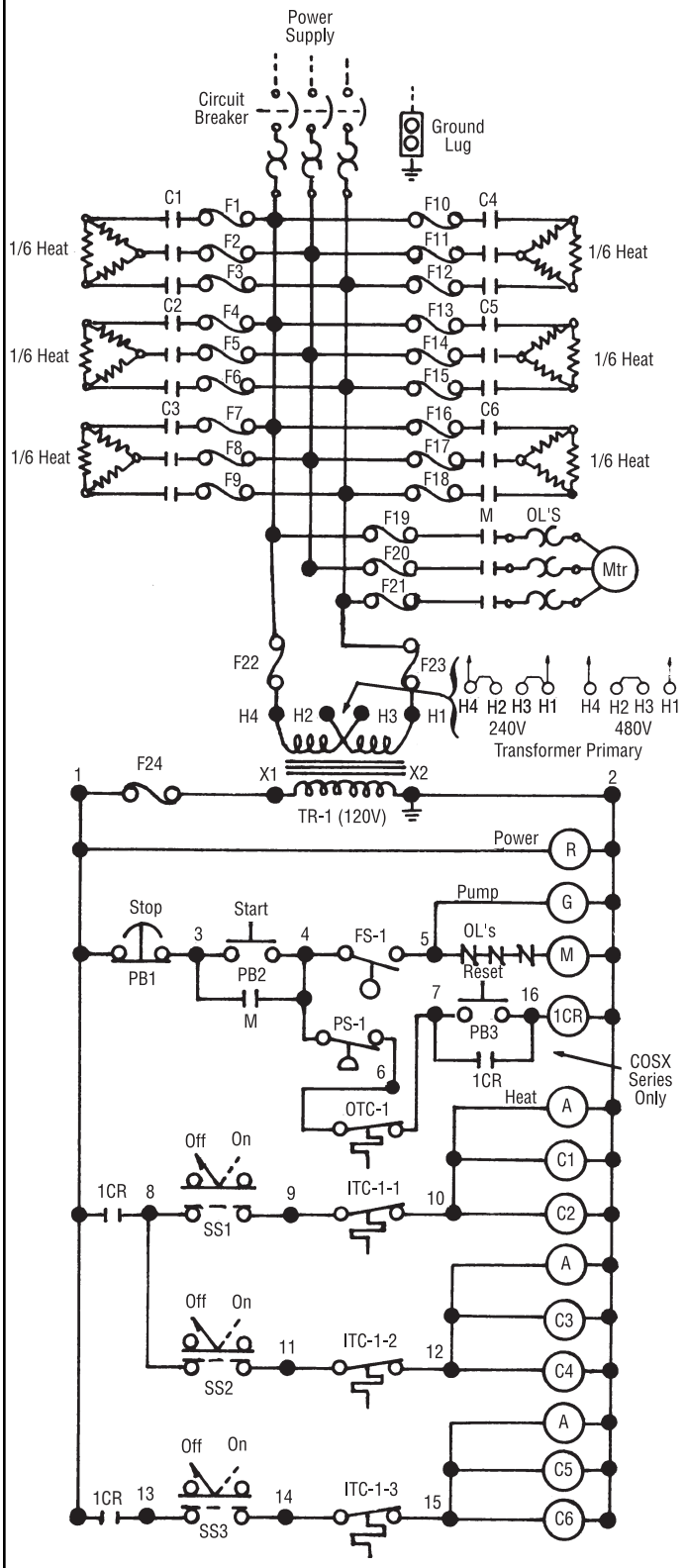


40 kW, 240V thru 575V

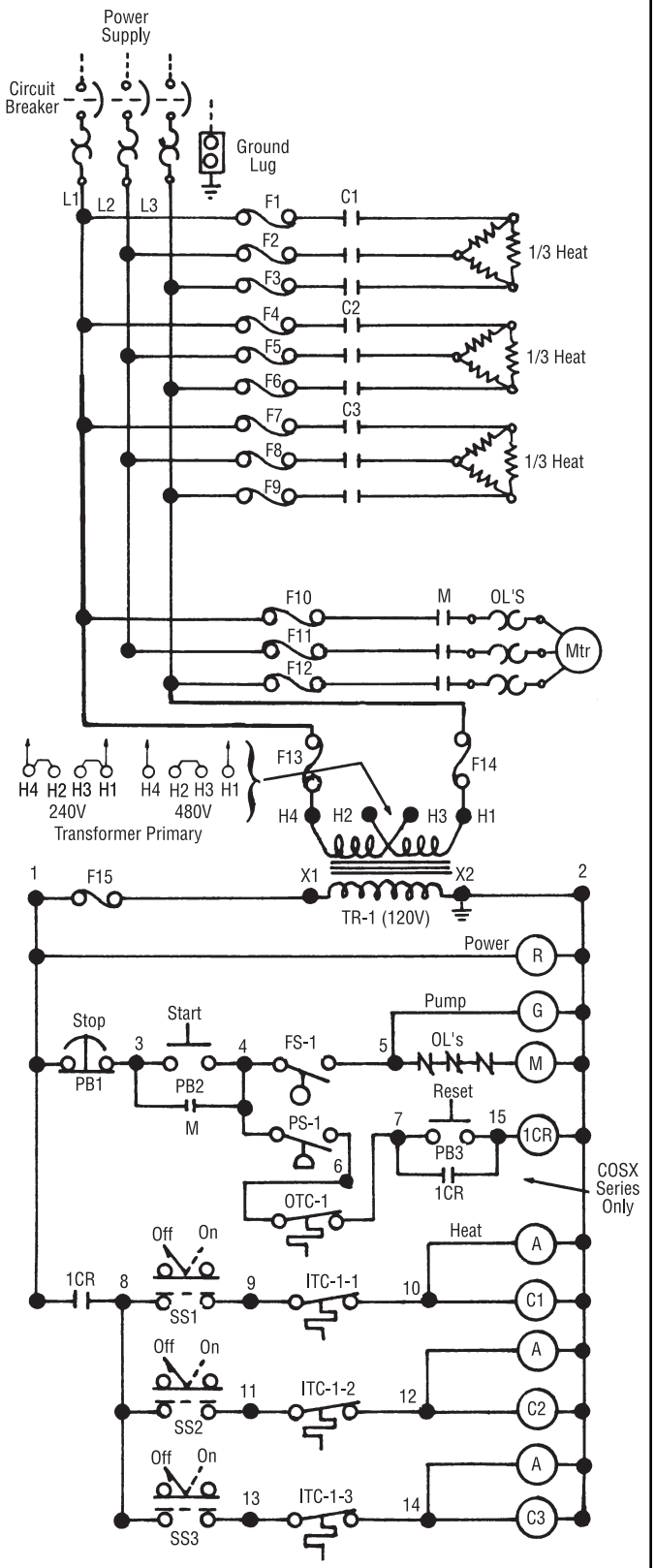


WIRING DIAGRAMS

60 kW 208V
80 kW 208V
80 kW 240V

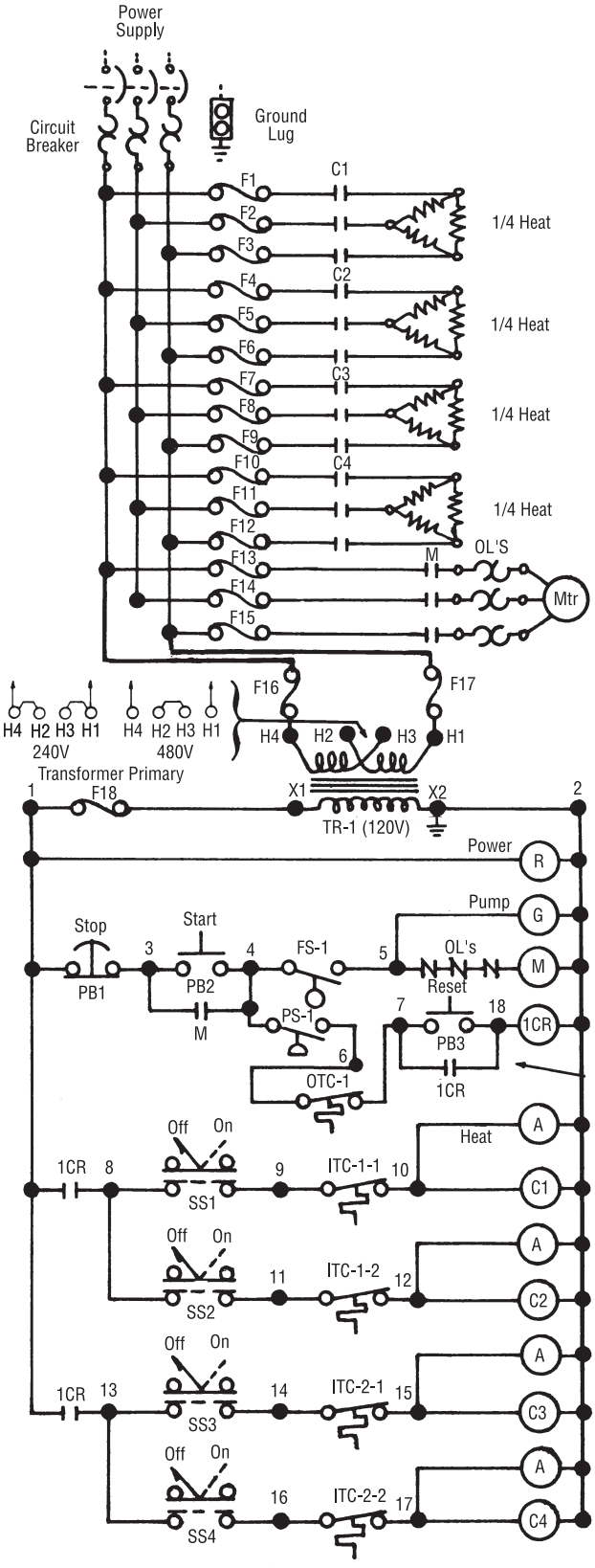


60 kW, 240V thru 575V
80 kW, 480V thru 575V

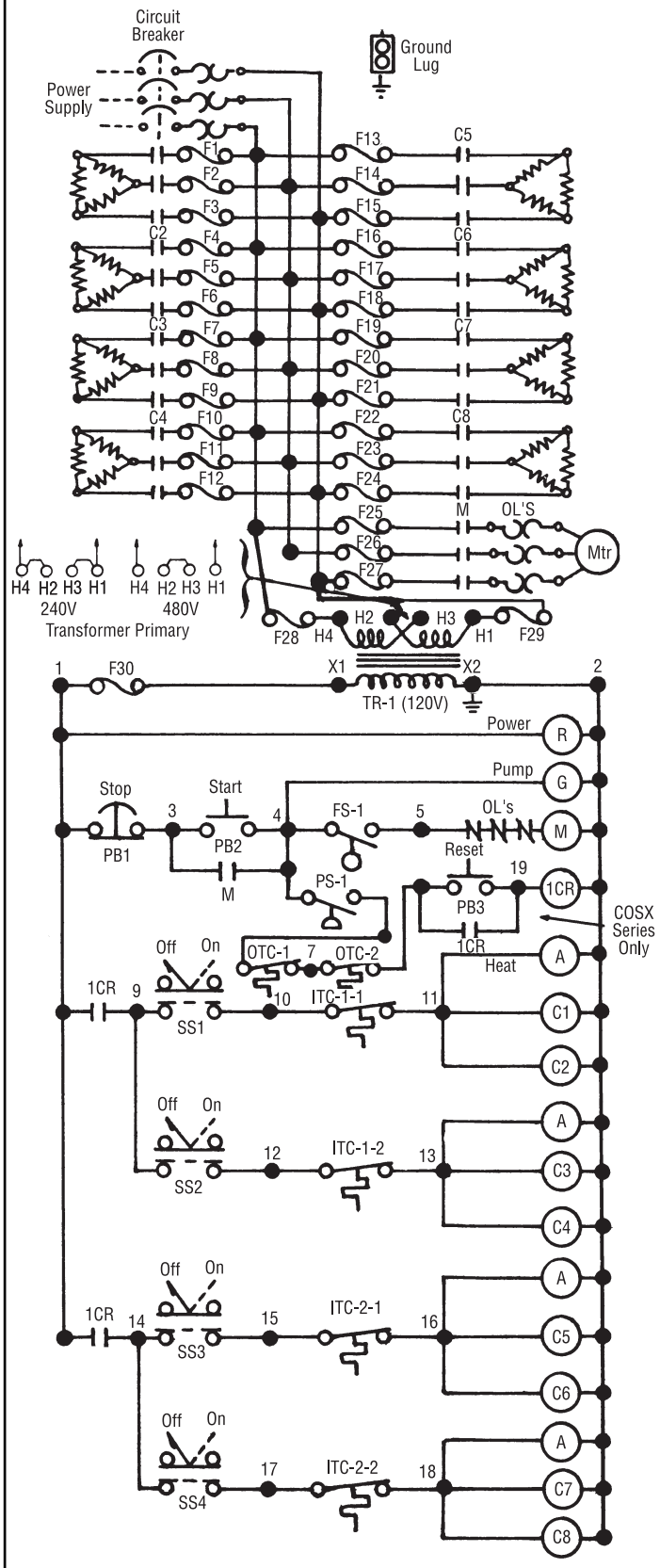


WIRING DIAGRAMS

100, 125, 150 kW, 480V and 575V

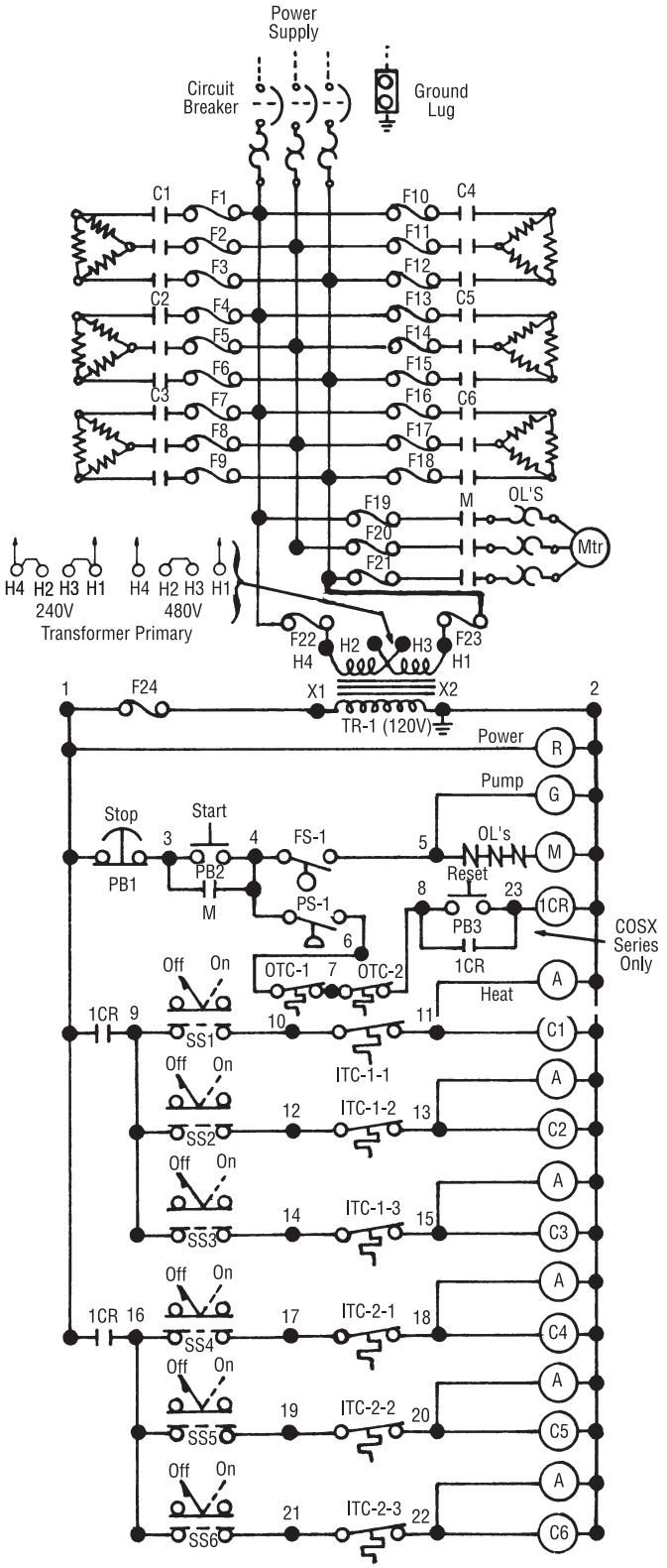


100 kW, 208V and 240V
200 kW, 480V and 575V

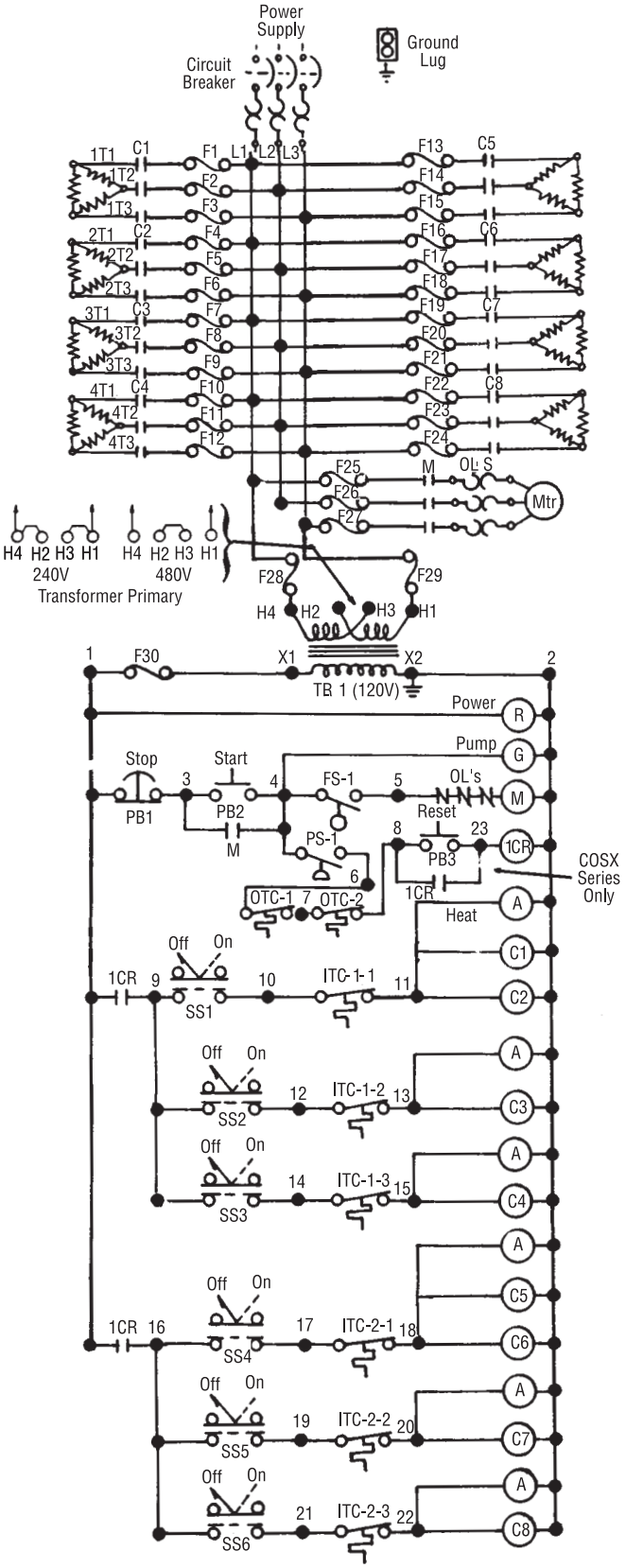


WIRING DIAGRAMS

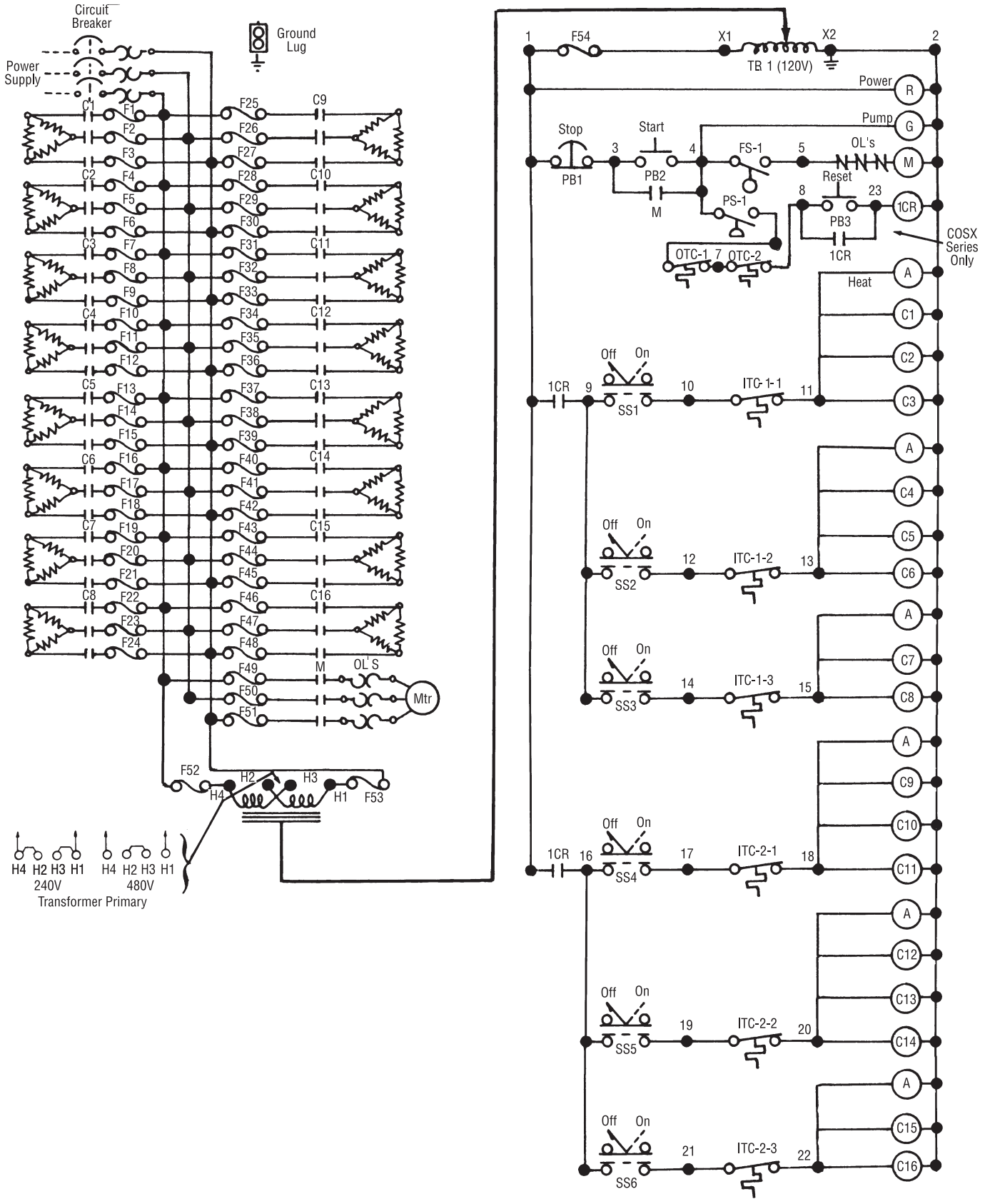
250 kW, 480V and 575V



300 kW, 480V and 575V
350 kW, 575V



350 kW, 480V
400 kW, 480V and 575V



RENEWAL PARTS IDENTIFICATION

FUSES*

SYSTEM RATING		FUSES (128)		Primary	Secondary
Voltage	kW	Heater	Motor (3)	Control (2)	Control (1)
208	9	121133-076 (3)	121133-059	114696-012	072576-015
	12	121133-078 (3)	121133-059	114696-012	072576-015
	15	121133-080 (3)	121133-059	114696-012	072576-015
	20	121133-076 (6)	121133-059	114696-012	072576-015
	30	121133-076 (9)	121133-059	114696-012	072576-015
	40	121133-076 (12)	121133-060	114696-012	072576-015
	60	121133-076 (18)	121133-061	114696-013	072576-018
	80	121133-079 (18)	121133-061	114696-013	072576-018
	100	121133-078 (24)	121133-062	114696-013	072576-018
220/240	9	121133-075 (3)	121133-058	114696-012	072576-015
	12	121133-077 (3)	121133-058	114696-012	072576-015
	15	121133-078 (3)	121133-058	114696-012	072576-015
	20	121133-080 (3)	121133-058	114696-012	072576-015
	30	121133-080 (3)	121133-058	114696-012	072576-015
	30	121133-075 (3)	121133-058	114696-012	072576-015
	40	121133-080 (6)	121133-059	114696-013	072576-015
	60	121133-080 (9)	121133-060	114696-013	072576-018
	80	121133-077 (18)	121133-060	114696-013	072576-018
	100	121133-077 (24)	121133-062	114696-013	072576-018
	125	121133-079 (24)	121133-062	114696-013	072576-018
440/480	9	121133-059 (3)	121133-052	114696-010	072576-015
	12	121133-060 (3)	121133-052	114696-010	072576-015
	15	121133-061 (3)	121133-052	114696-010	072576-015
	20	121133-062 (3)	121133-052	114696-010	072576-015
	30	121133-062 (3)	121133-052	114696-010	072576-015
	30	121133-059 (3)	121133-052	114696-010	072576-015
	40	121133-062 (6)	121133-056	114696-010	072576-015
	60	121133-062 (9)	121133-059	114696-010	072576-015
	80	121133-064 (9)	121133-059	114696-010	072576-018
	100	121133-064 (12)	121133-060	114696-005	072576-018
	125	121133-066 (12)	121133-060	114696-005	072576-018
	150	121133-067 (12)	121133-060	114696-005	072576-018
	200	121133-064 (24)	121133-060	114696-005	072576-018
	250	121133-066 (24)	121133-061	114696-005	072576-018
	300	121133-067 (24)	121133-061	114696-005	072576-018
	350	121133-063 (48)	121133-061	114696-011	072576-020
	400	121133-064 (48)	121133-061	114696-011	072576-020
550/575	9	121133-059 (3)	121133-052	121133-034	072576-015
	12	121133-059 (3)	121133-052	121133-034	072576-015
	15	121133-060 (3)	121133-052	121133-034	072576-015
	20	121133-061 (3)	121133-052	121133-034	072576-015
	30	121133-061 (3)	121133-052	121133-034	072576-015
	30	121133-059 (3)	121133-052	121133-034	072576-015
	40	121133-061 (6)	121133-054	121133-034	072576-015
	60	121133-061 (9)	121133-056	121133-034	072576-015
	80	121133-063 (9)	121133-056	121133-034	072576-015
	100	121133-063 (12)	121133-059	121133-035	072576-018
	125	121133-064 (12)	121133-059	121133-035	072576-018
	150	121133-066 (12)	121133-059	121133-035	072576-018
	200	121133-063 (24)	121133-059	121133-035	072576-018
	250	121133-064 (24)	121133-060	121133-035	072576-018
	300	121133-066 (24)	121133-060	121133-035	072576-018
	350	121133-067 (48)	121133-060	121133-035	072576-018
	400	121133-063 (48)	121133-060	121133-037	072576-020

MOTOR

System Model	kW	Motor Voltage & Part Number		
		208V	240/480V	550/575
COS-650	9 thru 30	193-120834-208	193-120834-008	193-120834-508
	40	193-120834-211	193-120834-011	193-120834-511
	60 & 80	193-120834-214	193-120834-014	193-120834-514
	100 thru 200	193-120834-217	193-120834-017	193-120834-517
	250 thru 400	193-120834-220	193-120834-020	193-120834-520
COSO-650 COSW-650	9 thru 30	193-120835-208	193-120835-008	193-120835-508
	40	193-120835-211	193-120835-011	193-120835-511
	60 & 80	193-120835-214	193-120835-014	193-120835-514
	100 thru 200	193-120835-217	193-120835-017	193-120835-517
	250 thru 400	193-120835-220	193-120835-020	193-120835-520
COSX-650	9 thru 30	193-120836-208	193-120836-008	193-120836-508
	40	193-120836-212	193-120836-012	193-120836-512
	60 & 80	193-120836-215	193-120836-015	193-120836-515
	100 thru 200	193-120836-218	193-120836-018	193-120836-518
	250 thru 400	193-120836-221	193-120836-021	193-120836-521

System kW	Standard Pump	Pump with Mech. Seal	Belt*	Relief Valve	Relief Valve Gasket* (2)
9 thru 30	226-122768-001	226-122768-011	017-056981-003 (1)	344-122411-001	132-073008-003
40	226-122768-001	226-122768-011	017-056981-004 (2)	344-122411-002	132-073008-004
60 & 80	226-122768-002	226-122768-012	017-056981-001 (2)	344-122411-003	132-073008-005
100	226-122768-003	226-122768-013	017-056981-001 (3)	344-122411-004	132-073008-006
125 thru 200	226-122768-004	226-122768-014	017-056981-005 (2)	344-122411-004	132-073008-006
250 thru 400	226-122768-005	226-122768-015	017-056981-001 (2)	344-122411-005	132-073008-007

Note: 1. Number in ( ) indicates quantity of same part number used.

Note: 2. *Astericked parts are recommended spare parts for critical or overseas installations.

HEATING ELEMENTS*

Voltage	kW	COS (NEMA I)	COS (NEMA XII) COSW (NEMA IV)	COSX Class I GROUP C & D
208V	9	155-122210-019	155-122210-031	155-022210-009
208V	12	155-122212-028	155-122212-032	155-122212-041
208V	15	155-122212-018	155-122212-014	155-122212-045
208V	20	155-122212-015	155-122212-037	155-122212-057
208V	30	155-122431-009	155-122431-010	155-122431-011
208V	40	155-122711-005	155-122711-006	155-122711-007
208V	60	155-122701-005	155-011701-014	155-122701-022
208V	80	155-122701-003	155-122701-012	155-122701-020
208V	100	155-123087-005	155-123087-006	155-123087-007
240V	9	155-122210-020	155-122210-010	155-122210-043
240V	12	155-122212-029	155-122212-033	155-022212-042
240V	15	155-122212-019	155-122212-020	155-122212-046
240V	20	155-122212-062	155-122212-017	155-122212-058
240V	30	155-122431-012	155-122431-013	155-122212-014
240V	40	155-122711-001	155-122711-008	155-122711-009
240V	60	155-122701-006	155-122701-015	155-122701-023
240V	80	155-122701-002	155-122701-011	155-122701-019
240V	100	155-123087-001	155-123087-008	155-123087-003
240V	125	155-122800-017	155-122800-018	155-122800-019
480V	9	155-122210-021	155-122210-008	155-122210-044
480V	12	155-122212-030	155-122212-034	155-122212-043
480V	15	155-122212-022	155-122212-023	155-122212-047
480V	20	155-122212-063	155-122212-025	155-122212-059
480V	30	155-122431-004	155-122431-005	155-122431-015
480V	40	155-122711-002	155-122711-003	155-122711-010
480V	60	155-122701-007	155-122701-016	155-122701-024
480V	80	155-122701-001	155-122701-010	155-122701-018
480V	100	155-123087-002	155-123087-009	155-123087-004
480V	125	155-122800-002	155-122800-004	155-122800-010
480V	150	155-122800-001	155-122800-003	155-122800-005
480V	200	155-122836-001	155-122836-002	155-122836-003
480V	250	155-122800-002 (2)	155-122800-004 (2)	155-122800-010 (2)
480V	300	155-122800-001 (2)	155-122800-003 (2)	155-122800-005 (2)
480V	350	155-123098-001 (2)	155-123098-002 (2)	155-123098-003 (2)
480V	400	155-122836-001 (2)	155-122836-002 (2)	155-122836-003 (2)
575V	9	155-122210-022	155-122210-034	155-122210-045
575V	12	155-122212-031	155-122212-035	155-122212-044
575V	15	155-122212-026	155-122212-036	155-122212-048
575V	20	155-122212-027	155-122212-039	155-122212-060
575V	30	155-122431-016	155-122431-017	155-122431-018
575V	40	155-122711-011	155-122711-012	155-122711-013
575V	60	155-122701-008	155-122701-017	155-122701-025
575V	80	155-122701-004	155-122701-013	155-122701-021
575V	100	155-123087-010	155-123087-011	155-123087-012
575V	125	155-122800-011	155-122800-013	155-122800-015
575V	150	155-122800-012	155-122800-014	155-122800-016
575V	200	155-122836-004	155-122836-005	155-122836-006
575V	250	155-122800-011 (2)	155-122800-013 (2)	155-122800-015 (2)
575V	300	155-122800-012 (2)	155-122800-014 (2)	155-122800-016 (2)
575V	350	155-123098-004 (2)	155-123098-005 (2)	155-123098-006 (2)
575V	400	155-122836-004 (2)	155-122836-005 (2)	155-122836-006 (2)

EXPANSION TANK

Expansion Tank Part	Tank Size (Gals.)	Part Number
Valves (Pair)	All Tanks	344-120970-001
Sight Glass	12	374-121046-001
	18, 30 & 42	374-121046-002
	80, 115 & 215	374-121046-003
Guard Rods (4)	12	272-121047-001
	18, 30, 42	272-121047-002
	80, 115 & 215	272-121047-003

Inlet and Outlet Pump Gaskets	Part Number
9 – 30kW	132-073008-006
40 – 80kW	132-073008-007
100 – 400kW	132-073008-009

PARTS COMMON TO ALL SYSTEMS

Description	Part Number All Systems
Discharge Gauge	130-121200-001
Suction Gauge	130-121200-002
Expansion Tank Line Gasket	132-073008-003
Pump Packing	251-121946-002
Relay	072-120461-018
Pressure Switch	072-120790-002
Pilot Light (less lens)	213-122884-003
Selector Switch	292-122885-001
Start Push Button (green)	292-122882-001
Stop Push Button (red)	292-122882-002
Contact Block (NO) †	071-122886-001
Contact Block (NC) ‡	071-122886-002
Overtemperature Cutout (OTC)	300-057515-006

† Use with Start Push Button and Selector Switches

‡ Use with Stop Push Button only.

ELECTRICAL COMPONENTS

SYSTEM RATING									
Voltage (3 phase)	kW	Circuit Breaker*	Circuit Breaker Handle†	Motor Starter*	Motor Overload Heaters	Contactor*	Transformer	Indicating Temp. Controls (ITC)	Heater Gaskets
208	9	104-071818-005	139-071820-006	358-122687-001	359-122688-038	072-122686-004 (1)	315-048507-019	300-121011-002	132-073008-009
	12	104-071818-007	139-071820-006	358-122687-001	359-122688-038	072-122686-005 (1)	315-048507-019	300-121011-002	132-073008-013
	15	104-071818-009	139-071820-006	358-122687-001	359-122688-038	072-122686-007 (1)	315-048507-019	300-121011-002	132-073008-013
	20	104-071818-011	139-071820-006	358-122687-001	359-122688-038	072-122686-004 (2)	315-048507-019	300-121011-002	132-073008-013
	30	104-071818-014	139-071820-006	358-122687-001	359-122688-038	072-122686-004 (3)	315-048507-019	300-121011-027	132-073008-013
	40	104-071818-055	139-071820-006	358-122687-001	359-122688-043	072-122686-004 (4)	315-048507-019	300-121011-027	132-073008-014
	60	104-071819-021	139-071820-010	358-122687-001	359-122688-047	072-122686-004 (6)	315-048507-025	300-121011-028	132-073008-015
	80	104-071817-017	139-071820-012	358-122687-001	359-122688-047	072-122686-005 (6)	315-048507-025	300-121011-028	132-073008-015
	100	104-071817-018	139-071820-012	358-122687-003	359-122688-050	072-122686-005 (8)	315-048507-025	300-121011-027 (2)	132-073008-016
220/240	9	104-071818-005	139-071820-006	358-122687-001	359-122688-036	072-122686-001 (1)	315-048507-018	300-121011-002	132-073008-009
	12	104-071818-007	139-071820-006	358-122687-001	359-122688-036	072-122686-004 (1)	315-048507-018	300-121011-002	132-073008-013
	15	104-071818-009	139-071820-006	358-122687-001	359-122688-036	072-122686-005 (1)	315-048507-018	300-121011-002	132-073008-013
	20	104-071818-010	139-071820-006	358-122687-001	359-122688-036	072-122686-007 (1)	315-048507-018	300-121011-002	132-073008-013
	30	104-071818-013	139-071820-006	358-122687-001	359-122688-036	072-122686-004 (1)	315-048507-018	300-121011-027	132-073008-013
	40	104-071818-055	139-071820-006	358-122687-001	359-122688-040	072-122686-007 (2)	315-048507-018	300-121011-027	132-073008-013
	60	104-071818-052	139-071820-010	358-122687-001	359-122688-045	072-122686-007 (3)	315-048507-018	300-121011-027	132-073008-014
	80	104-071817-016	139-071820-012	358-122687-001	359-122688-045	072-122686-005 (6)	315-048507-024	300-121011-028	132-073008-015
	100	104-071817-017	139-071820-012	358-122687-002	359-122688-049	072-122686-005 (8)	315-048507-024	300-121011-028	132-073008-015
	125	104-071817-019	139-071820-012	358-122687-002	359-122688-049	072-122686-005 (8)	315-048507-024	300-121011-027 (2)	132-073008-016
440/480	9	104-071818-018	139-071820-006	358-122687-001	359-122688-027	072-122686-002 (1)	315-048507-018	300-121011-002	132-073008-009
	12	104-071818-018	139-071820-006	358-122687-001	359-122688-027	072-122686-002 (1)	315-048507-018	300-121011-002	132-073008-013
	15	104-071818-019	139-071820-006	358-122687-001	359-122688-027	072-122686-002 (1)	315-048507-018	300-121011-002	132-073008-013
	20	104-071818-022	139-071820-006	358-122687-001	359-122688-027	072-122686-002 (1)	315-048507-018	300-121011-002	132-073008-013
	30	104-071818-024	139-071820-006	358-122687-001	359-122688-027	072-122686-002 (2)	315-048507-018	300-121011-027	132-073008-013
	40	104-071818-026	139-071820-006	358-122687-001	359-122688-032	072-122686-002 (2)	315-048507-018	300-121011-027	132-073008-014
	60	104-071818-029	139-071820-006	358-122687-001	359-122688-037	072-122686-002 (3)	315-048507-018	300-121011-028	132-073008-015
	80	104-071818-050	139-071820-006	358-122687-001	359-122688-037	072-122686-006 (3)	315-048507-018	300-121011-028	132-073008-015
	100	104-071818-050	139-071820-006	358-122687-001	359-122688-043	072-122686-006 (4)	315-048507-024	300-121011-027 (2)	132-073008-016
	125	104-071818-021	139-071820-010	358-122687-001	359-122688-043	072-122686-006 (4)	315-048507-024	300-121011-027 (2)	132-073008-017
	150	104-071817-016	139-071820-012	358-122687-001	359-122688-043	072-122686-009 (4)	315-048507-024	300-121011-027 (2)	132-073008-017
	200	104-071817-018	139-071820-012	358-122687-001	359-122688-043	072-122686-006 (8)	315-048507-024	300-121011-027 (2)	132-073008-018
	250	104-071817-019	139-071820-012	358-122687-001	359-122688-045	072-122686-006 (8)	315-048507-024	300-121011-027 (2)	132-073008-017 (2)
	300	104-071817-026	139-071820-012	358-122687-001	359-122688-045	072-122686-009 (8)	315-048507-024	300-121011-027 (2)	132-073008-017 (2)
	350	104-071817-027	139-071820-012	358-122687-001	359-122688-045	072-122686-003 (16)	315-048507-030	300-121011-027 (2)	132-073008-018 (2)
	400	104-071817-028	139-071820-012	358-122687-001	359-122688-045	072-122686-006 (16)	315-048507-030	300-121011-027 (2)	132-073008-018 (2)
550/575	9	104-071818-031	139-071820-006	358-122687-001	359-122688-022	072-122686-002 (1)	315-048507-020	300-121011-002	132-073008-009
	12	104-071818-031	139-071820-006	358-122687-001	359-122688-025	072-122686-002 (1)	315-048507-020	300-121011-002	132-073008-013
	15	104-071818-032	139-071820-006	358-122687-001	359-122688-025	072-122686-002 (1)	315-048507-020	300-121011-002	132-073008-013
	20	104-071818-033	139-071820-006	358-122687-001	359-122688-025	072-122686-002 (1)	315-048507-020	300-121011-002	132-073008-013
	30	104-071818-036	139-071820-006	358-122687-001	359-122688-025	072-122686-002 (2)	315-048507-020	300-121011-027	132-073008-013
	40	104-071818-038	139-071820-006	358-122687-001	359-122688-028	072-122686-002 (2)	315-048507-020	300-121011-027	132-073008-014
	60	104-071818-041	139-071820-006	358-122687-001	359-122688-034	072-122686-002 (3)	315-048507-020	300-121011-028	132-073008-015
	80	104-071818-043	139-071820-006	358-122687-001	359-122688-034	072-122686-003 (3)	315-048507-020	300-121011-028	132-073008-015
	100	104-071818-045	139-071820-006	358-122687-001	359-122688-040	072-122686-003 (4)	315-048507-026	300-121011-027 (2)	132-073008-016
	125	104-071818-051	139-071820-010	358-122687-001	359-122688-040	072-122686-006 (4)	315-048507-026	300-121011-027 (2)	132-073008-017
	150	104-071818-052	139-071820-010	358-122687-001	359-122688-040	072-122686-006 (4)	315-048507-026	300-121011-027 (2)	132-073008-017
	200	104-071817-016	139-071820-012	358-122687-001	359-122688-040	072-122686-003 (8)	315-048507-026	300-121011-027 (2)	132-073008-018
	250	104-071817-018	139-071820-012	358-122687-001	359-122688-043	072-122686-006 (8)	315-048507-026	300-121011-027 (2)	132-073008-017 (2)
	300	104-071817-019	139-071820-012	358-122687-001	359-122688-043	072-122686-006 (8)	315-048507-026	300-121011-027 (2)	132-073008-017 (2)
	350	104-071817-025	139-071820-012	358-122687-001	359-122688-043	072-122686-009 (8)	315-048507-026	300-121011-027 (2)	132-073008-018 (2)
	400	104-071817-026	139-071820-012	358-122687-001	359-122688-043	072-122686-003 (16)	315-048507-032	300-121011-027 (2)	132-073008-018 (2)

Limited Warranty:
Please refer to the Chromalox limited warranty applicable to this product at http://www.chromalox.com/customer-service/policies/termsofsale.aspx.

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