

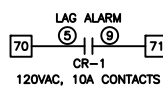
NOTES:

1. MAIN DISCONNECT PROVIDED BY OTHER.
2. FIELD WIRING TO BE COPPER RATED FOR 75°C MINIMUM.
3. — — — INDICATES FIELD WIRING OUTSIDE OF CABINET.
4. ADJUSTABLE MINIMUM RUN TIMER IS PROVIDED IN THE PLC PROGRAM. SEE PLC DETAIL FOR ADJUSTING POT AND CHART FOR CORRECT SETTINGS.
5. 20HP 208 / 230V AND 25 - 50HP PANEL LAYOUTS NOT SHOWN.
6. THE AMPACITY OF CONDUCTORS SUPPLYING THE CONTROL PANEL TO BE ROUNDED UP TO THE NEXT SIZE LARGER STANDARD WIRE GAUGE.
7. MOP VALUES TO BE ROUNDED DOWN TO THE NEAREST STANDARD RATING OF THE OVERCURRENT PROTECTION DEVICE.
8. SHORT CIRCUIT CURRENT RATING (SCCR): 5 kA

208 - 460 V
3 Ø
60 Hz
SCCR: 5 kA

NOTE:
AUXILIARY CONTACTS 70-71 ARE
"CLASS 1 CONTROL CIRCUITS,
USE CLASS 1 CONDUCTORS"
ALL OTHERS ARE
"CLASS 2 CONTROL CIRCUITS,
USE CLASS 2 CONDUCTORS"

AUXILIARY CONTACTS



CONTACTS CLOSED DURING NORMAL OPERATION

VACUUM SWITCH SETTINGS

| ALTITUDE | VS-1 | VS-2 | RELIEF VALVE SETTING |
|-------------|----------|----------|----------------------|
| 0-3000' | 20-23"Hg | 17-21"Hg | 25"Hg |
| 3001'-4000' | 19-22"Hg | 17-20"Hg | 24"Hg |
| 4001'-5000' | 18-21"Hg | 16-19"Hg | 23"Hg |
| 5001'-6000' | 17-20"Hg | 15-18"Hg | 22"Hg |

OPERATION:

DURING NORMAL OPERATION, THE HOA SWITCHES SHOULD BE IN THE AUTO POSITION. THE PLC WILL SIGNAL THE LEAD PUMP TO START WHEN VS-1 CLOSURES WITH FALLING VACUUM LEVEL. AFTER VS-1 OPENS AND THE ADJUSTABLE MINIMUM RUN TIMER (SEE NOTE 4) HAS EXPIRED, THE PUMP THAT IS RUNNING WILL TURN OFF. WHEN VS-1 CLOSURES AGAIN, THE PLC WILL SEQUENCE THE LEAD ROLE TO THE OTHER PUMP AND IT WILL START. IF LEAD PUMP RUNS FOR MORE THAN 17 MINUTES AND CANNOT REACH THE VS-1 CUT-OFF SETTING, THE PLC WILL TURN OFF THE PUMP THAT IS RUNNING AND SEQUENCE TO THE OTHER PUMP. IF DURING OPERATION VS-2 CLOSURES, THE OTHER PUMP WILL COME ON AND THE PLC WILL TURN ON THE "LAG ALARM".

HAND OPERATION:

(EMERGENCY/TROUBLE SHOOTING MODE ONLY)

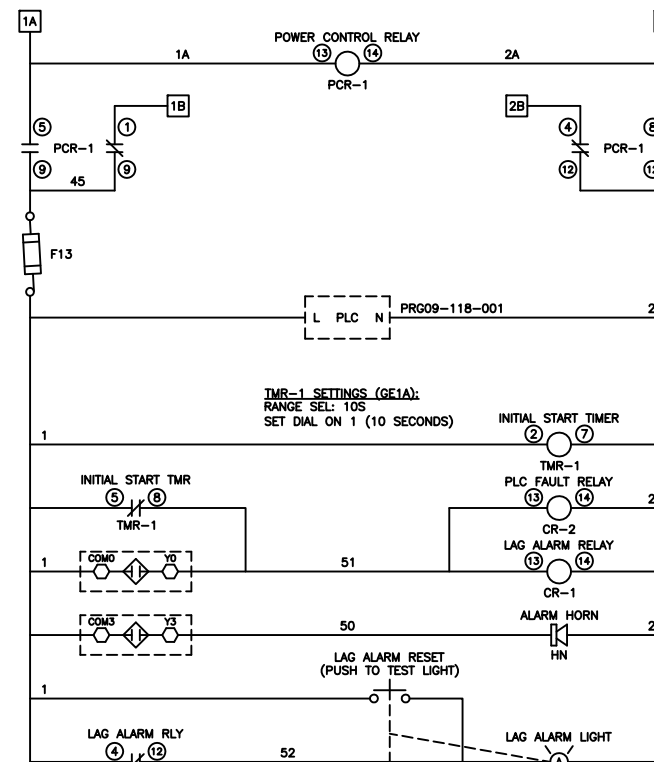
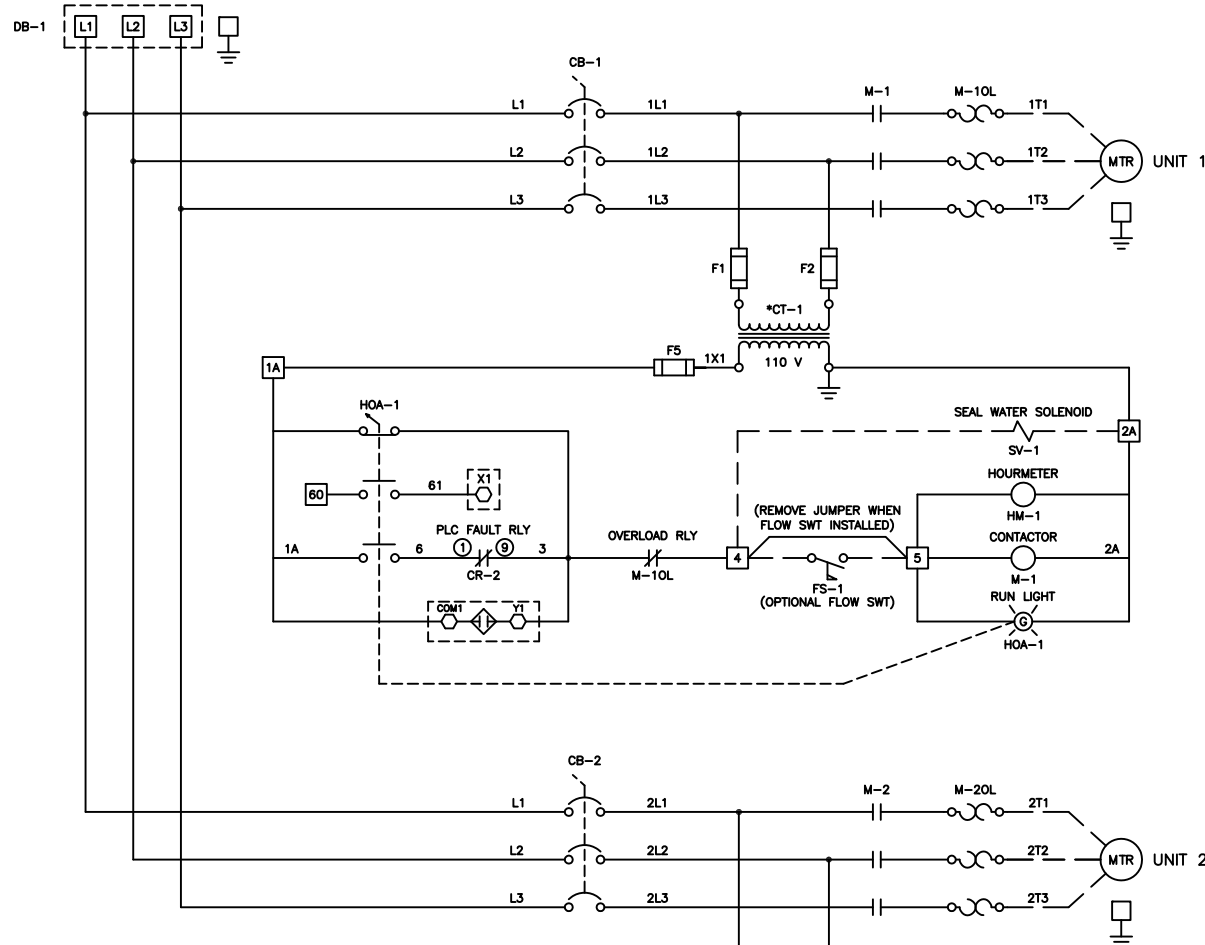
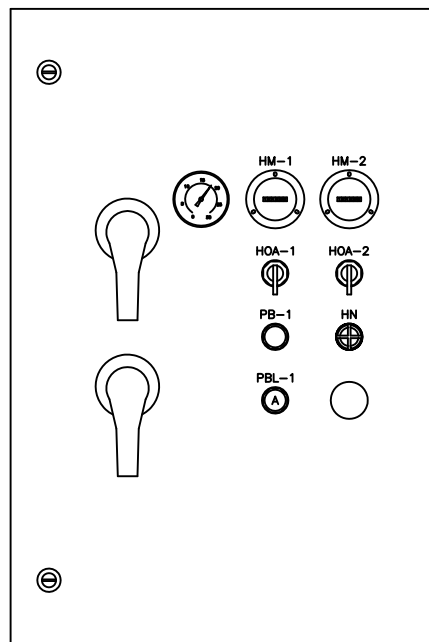
PUMPS WITH THE HOA SWITCH IN THE HAND POSITION WILL START AND RUN CONTINUOUSLY.

PLC FAULT:

IF A PLC FAULT OCCURS AND HOA SWITCHES ARE IN THE AUTO POSITION, PUMPS WILL START AND RUN CONTINUOUSLY; A LAG ALARM WILL ALSO OCCUR. PUMPS CAN OPERATE IN THIS CONDITION UNTIL PLC FAULT IS REPAIRED.

OFF DELAY:

THE PLC WILL RUN EACH PUMP AN ADDITIONAL 10 SECONDS AFTER IT MEETS THE REQUIREMENTS TO BE TURNED OFF. THIS ALLOWS THE OTHER PUMP TO BE COMING ONLINE, TO BUILD VACUUM, HELPING LIMIT ANY MOMENTARILY SHARP FALLS IN VACUUM LEVEL AND NUISANCE TRIGGERING OF THE LAG ALARM. BOTH PUMPS RUNNING BRIEFLY AT THE SAME TIME WILL NOT RESULT IN A LAG ALARM; ONLY CLOSING OF VS-2 WILL TRIGGER THE ALARM.



MINIMUM CIRCUIT AMPACITY (MCA)

| SYSTEM HP | 208 V | 230 V | 460 V |
|-----------|------------|------------|------------|
| 15 HP | 108.4 AMPS | 95.6 AMPS | 47.9 AMPS |
| 20 HP | 137.9 AMPS | 122.6 AMPS | 61.4 AMPS |
| 25 HP | 171.0 AMPS | 154.1 AMPS | 77.1 AMPS |
| 30 HP | 207.0 AMPS | 182.8 AMPS | 90.6 AMPS |
| 40 HP | 264.1 AMPS | 236.8 AMPS | 118.4 AMPS |
| 50 HP | --- | 295.3 AMPS | 147.7 AMPS |

MAXIMUM OVERCURRENT PROTECTION (MOP)

| SYSTEM HP | 208 V | 230 V | 460 V |
|-----------|------------|------------|------------|
| 15 HP | 150.1 AMPS | 136.5 AMPS | 68.2 AMPS |
| 20 HP | 193.0 AMPS | 175.5 AMPS | 87.7 AMPS |
| 25 HP | 243.1 AMPS | 221.0 AMPS | 110.5 AMPS |
| 30 HP | 286.0 AMPS | 260.0 AMPS | 130.0 AMPS |
| 40 HP | 370.5 AMPS | 338.0 AMPS | 169.0 AMPS |
| 50 HP | --- | 422.5 AMPS | 211.2 AMPS |

DUPLEX SYSTEM FULL LOAD AMPERES

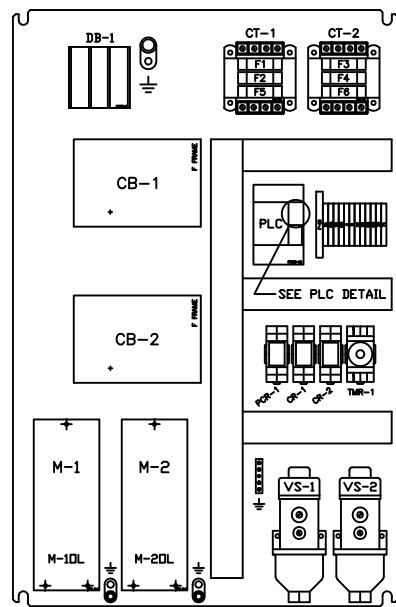
| SYSTEM HP | 208 V | 230 V | 460 V |
|-----------|------------|------------|------------|
| 15 HP | 96.2 AMPS | 83.7 AMPS | 41.9 AMPS |
| 20 HP | 122.4 AMPS | 106.5 AMPS | 53.3 AMPS |
| 25 HP | 151.8 AMPS | 132.1 AMPS | 66.5 AMPS |
| 30 HP | 183.7 AMPS | 159.8 AMPS | 79.3 AMPS |
| 40 HP | 234.5 AMPS | 204.2 AMPS | 101.9 AMPS |
| 50 HP | --- | 250.2 AMPS | 125.1 AMPS |

INDIVIDUAL MOTOR FULL LOAD AMPERES

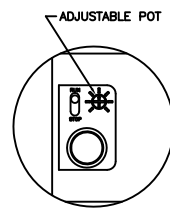
| SYSTEM HP | 208 V | 230 V | 460 V |
|-----------|------------|------------|-----------|
| 15 HP | 47.6 AMPS | 41.4 AMPS | 20.7 AMPS |
| 20 HP | 60.7 AMPS | 52.8 AMPS | 26.4 AMPS |
| 25 HP | 75.4 AMPS | 65.6 AMPS | 32.8 AMPS |
| 30 HP | 90.6 AMPS | 78.8 AMPS | 39.4 AMPS |
| 40 HP | 116.0 AMPS | 101.0 AMPS | 50.4 AMPS |
| 50 HP | --- | 124.0 AMPS | 62.0 AMPS |

*TRANSFORMER SIZING CHART

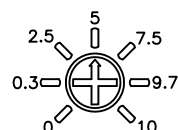
| SYSTEM HP | 208 V | 230 V | 460 V |
|-----------|--------|--------|--------|
| 15-25 HP | 100 VA | 100 VA | 100 VA |
| 30 HP | 250 VA | 250 VA | 100 VA |
| 40-50 HP | 250 VA | 250 VA | 250 VA |



PLC DETAIL



PLC DETAIL W/LID OPEN



ADJUSTABLE POT

MINIMUM RUN TIMER SETTINGS

| SYSTEM HP | SETTING |
|-----------|---------|
| 15-30 | 5 |
| 40-50 | 6 |

FUSE SELECTION CHART (MAX FUSE SIZES SHOWN)

| SYSTEM HP | FUSE | 208 V | 230 V | 460 V |
|-----------|-------------|-----------|-----------|-----------|
| 15-25 HP | F1/F2/F3/F4 | 1.6 AMPS | 1.4 AMPS | 0.6 AMP |
| | F5/F6 | 1.25 AMPS | 1.25 AMPS | 1.25 AMPS |
| 30 HP | F1/F2/F3/F4 | 3.5 AMPS | 3.5 AMPS | 0.6 AMP |
| | F5/F6 | 3.5 AMPS | 3.5 AMPS | 1.25 AMPS |
| 40-50 HP | F1/F2/F3/F4 | 3.5 AMPS | 3.5 AMPS | 1.6 AMPS |
| | F5/F6 | 3.5 AMPS | 3.5 AMPS | 3.5 AMPS |
| ALL | F13 | 0.7 AMP | 0.7 AMP | 0.7 AMP |

F1/F2/F3/F4 ARE LITTELFUSE KLDOR 600V TYPE
F5/F6 ARE LITTELFUSE FLM 250V TYPE
F13 IS LITTELFUSE 2AG 250V TYPE



TITLE
DUPLEX LIQUID RING VACUUM BASEMOUNT
15-50 HP 208/230/460 VOLTS

| DESIGNED BY | DATE | CHECKED BY | DATE | REVISIONS | DATE | DRAWING NO. | REV. |
|-------------|----------|------------|------|-----------|------|-------------|------|
| H. BURNS | 10/8/00 | | | | | | |
| DWG | 04/09/15 | | | | | | |
| SCALE | NTS | D | DIA | 02 | 414 | | N |