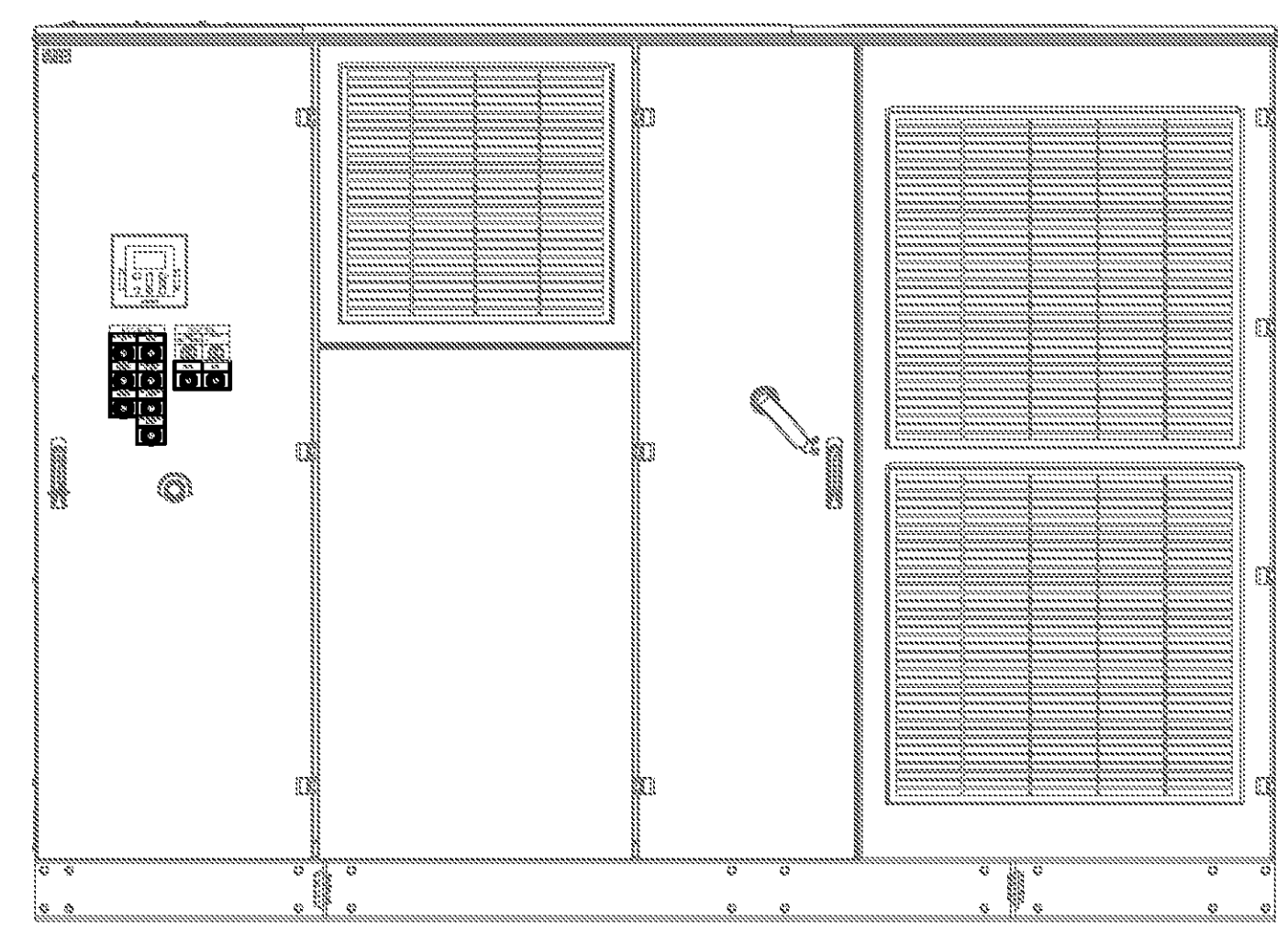
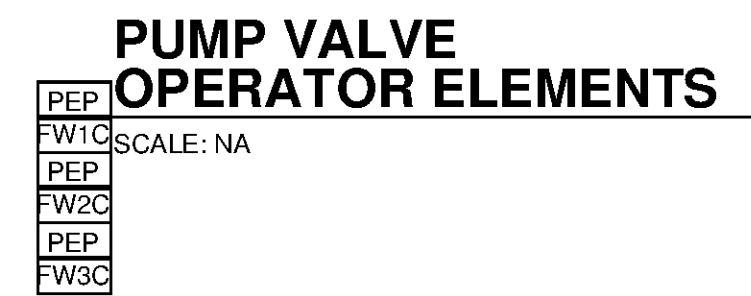
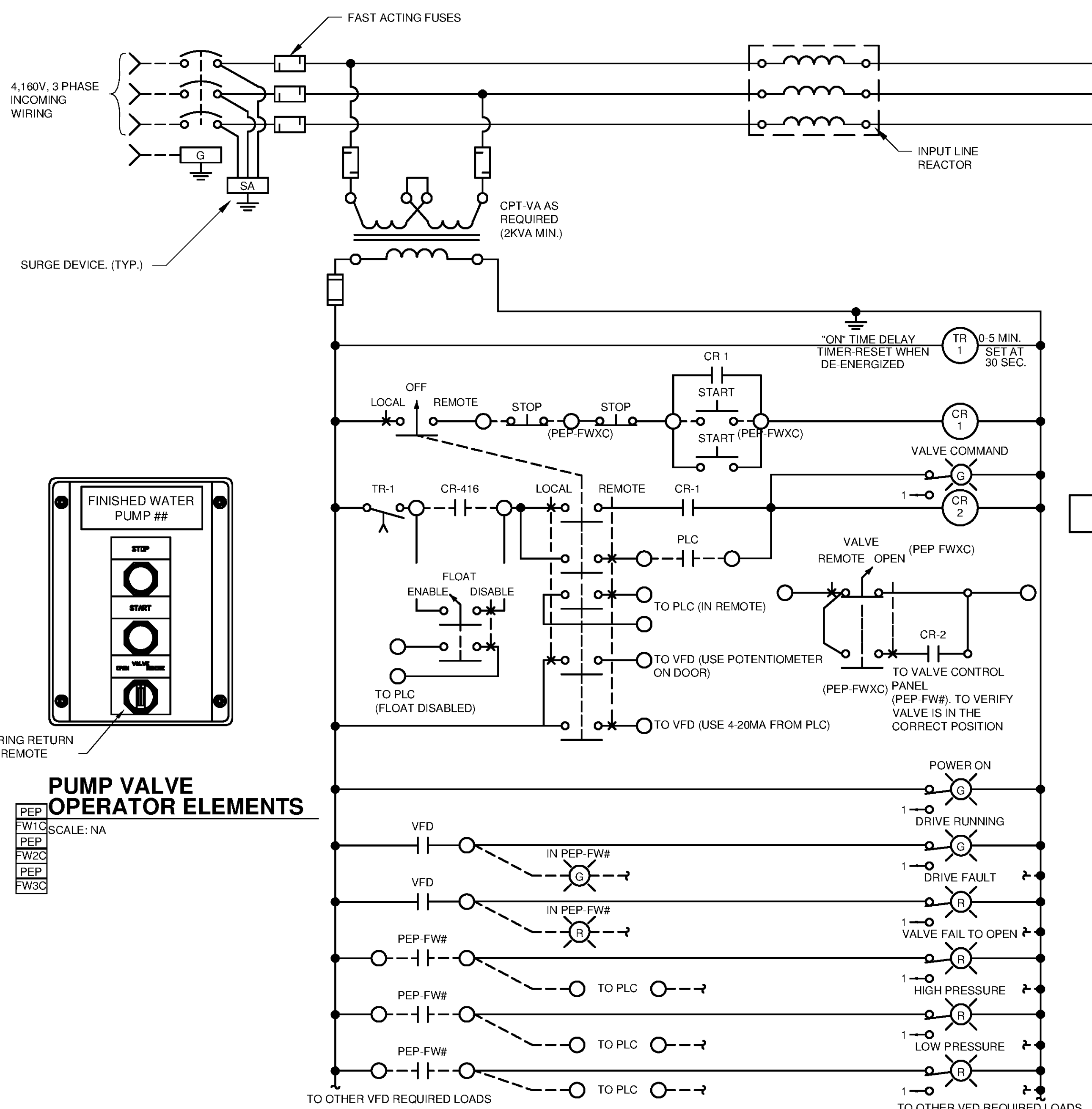
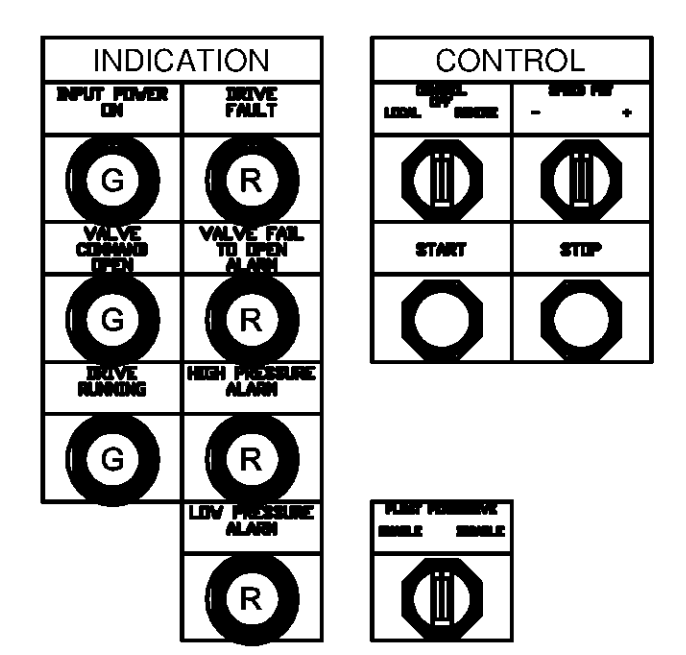
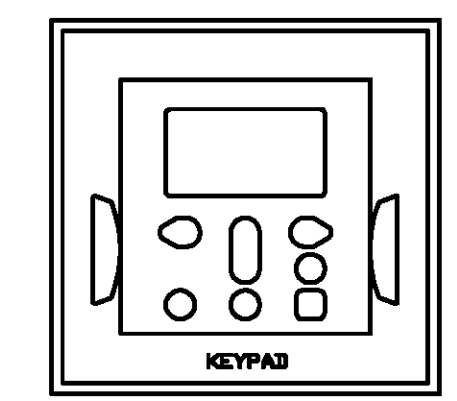


10/17/2014 10:55:20 AM P:\IER11740\200-11740-10003\CAD\SHEETFILES\TREATMENT PLANT\WTP E 0602 E 0606 WIRING DIAGRAMS.DWG CALZARETTA, TIMOTHY

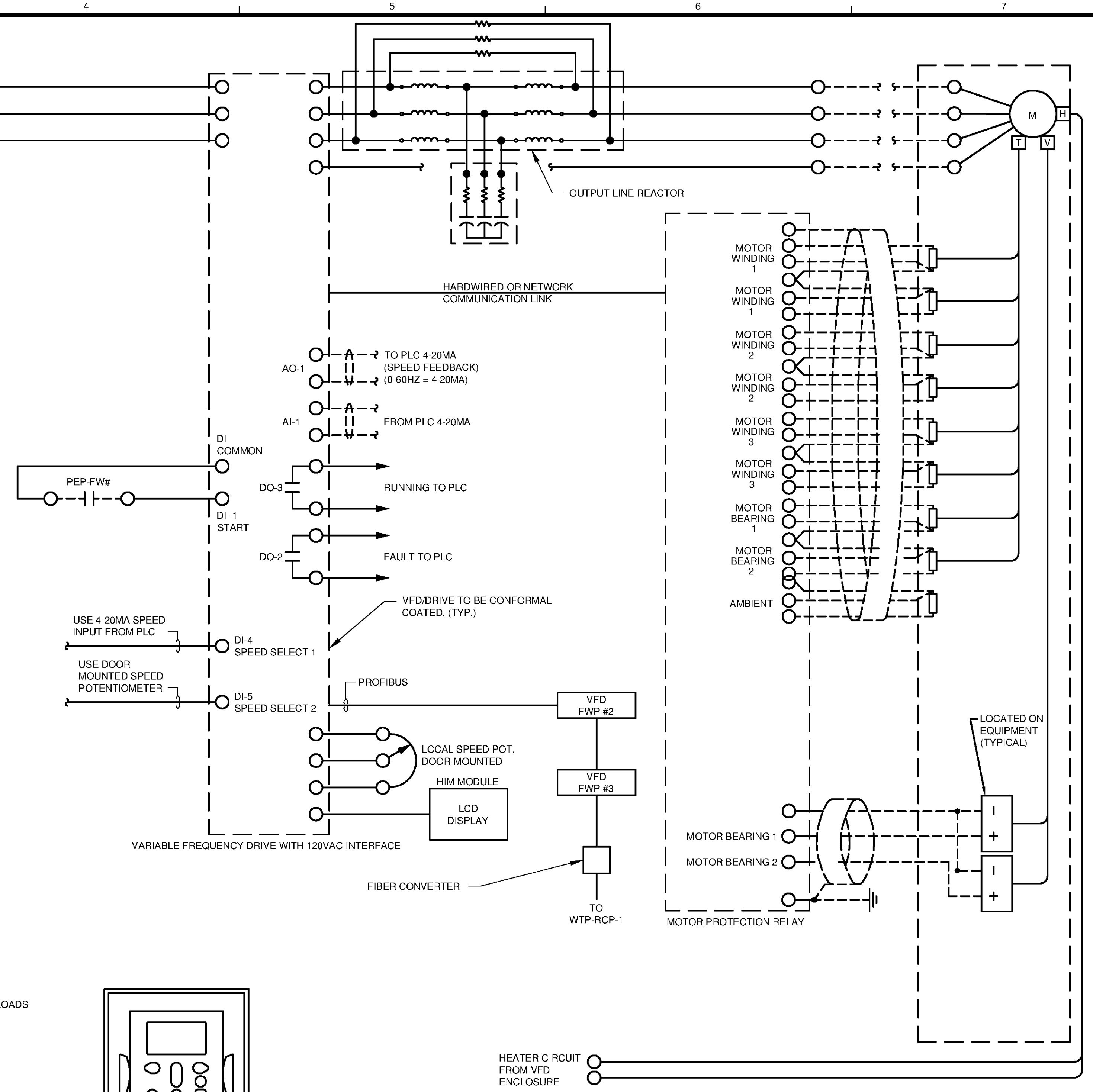


**VFD ELEVATION VIEW**  
SCALE: NA

NOTES:  
DESIGN BASED ON  
• 450HP; 104" H x 74" W x 46" D  
• 1000HP; 104" H x 122" W x 46" D



**VFD OPERATOR ELEMENTS**  
SCALE: NA



**FINISHED WATER PUMP VFD PARTIAL WIRING DIAGRAM**  
SCALE: NA

- NOTES:
- PUMP START
- THE VALVE IS CLOSED.
  - A MAINTAINED PUMP SIGNAL IS GIVEN TO THE VALVE CONTROL PANEL CR-2.
  - THE VALVE CONTROL PANEL CONFIRMS THAT THE VALVE IS CLOSED AND SIGNALS TO THE VFD TO START.
  - AS PUMP DISCHARGE PRESSURE RISES A PRESSURE SWITCH CLOSES, ENERGIZING A SOLENOID AND OPENING THE PUMP CHECK VALVE.
- PUMP STOP
- THE PUMP RUN SIGNAL IS REMOVED FROM CR-2.
  - THE PUMP REDUCES ITS SPEED TO AN OPERATOR ADJUSTABLE MINIMUM SPEED LIMIT OR MAINTAINS SPEED DEPENDING ON HMI ADJUSTABLE SETTING (ENABLE/DISABLE REDUCED CLOSING SPEED SELECTOR SWITCH)
  - A SOLENOID IS DE-ENERGIZED, STARTING PUMP CHECK VALVE CLOSURE.
  - THE PUMP CONTINUES TO RUN, POWERED THRU THE CONTACT FROM THE VALVE CONTROL PANEL.
  - WHEN THE PUMP CHECK VALVE IS 70-95% CLOSED, A LIMIT SWITCH OPENS MOMENTARILY AND DE-ENERGIZES THE VFD RUN COMMAND.
- PUMP SAFETY STOP
- UPON LOSS OF ALL ELECTRICAL POWER, SOLENOIDS ARE DE-ENERGIZED, CLOSING THE PUMP CHECK VALVE AT THE EMERGENCY RATE.
  - IF THE VFD OVERLOADS OPEN, SOLENOIDS ARE DE-ENERGIZED, CLOSING THE PUMP CHECK VALVE AT THE EMERGENCY RATE.
  - LINE PRESSURE AND VALVE POSITION ARE CONTINUOUSLY MONITORED BY PRESSURE SWITCHES AND LIMIT SWITCHES. PUMP SAFETY SHUT DOWN BEGINS BY OPENING ONE OF THE ALARM CONTACTS. THE PUMP CAN NOT BE RE-STARTED UNTIL "RESET" IS PRESSED ON THE LOCAL VALVE CONTROL PANEL. THE PUMP SAFETY STOP SEQUENCE WILL BE INITIATED UNDER THE FOLLOWING CONDITIONS:
- IF THE VALVE FAILS TO BEGIN OPENING IN A PRESET TIME.
  - IN CASE OF LINE BLOCKAGE OR INADVERTENT VALVE CLOSURE, THE PUMP DISCHARGE PRESSURE WILL RISE TO THE PUMP SHUT-OFF PRESSURE AND ACTIVATE THE PRESSURE SWITCH.
  - IN CASE OF LINE BREAK OR PARALLEL PUMP TRIP, THE PUMP DISCHARGE PRESSURE WILL FALL BELOW NORMAL PRESSURE AND ACTIVATE THE PRESSURE SWITCH.

100Ω PLATINUM RTD, 3 WIRE RESISTORS  
SELF POWERED VIBRATION TRANSDUCERS

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**BID SET**  
REGISTERED PROFESSIONAL ENGINEER  
No. 21938  
ALABAMA  
LICENSED PROFESSIONAL ENGINEER  
IN MECHANICAL ENGINEERING

MARK	DATE	DESCRIPTION	BY

HUNTSVILLE UTILITIES  
SOUTHEAST WATER TREATMENT PLANT  
WIRING SCHEMATICS

Project No.: 200-11740-10003  
Designed By: CSW  
Drawn By: TAC  
Checked By: DAB

**E-0604**