

The **NORCHEM POWDERCAT MODEL NP-4100** automatic dry polymer system is designed to process 400 to 2000 lbs/day of dry polymer at 0.1 to 0.5 % solution concentrations. The NP-4100 system is modular in design consisting of polymer wetting module, control panel, volumetric feeder and booster assembly.

POWDERCAT MODEL NP-4100 DRY POLYMER SYSTEM SPECIFICATIONS

| | | |
|-------------------------|--|--|
| FRAME: | BASE: CONSTRUCTION: | 36" W x 50" L x 38" H 304SS BASE |
| DRY FEEDER: | TYPE: DRIVE / MOTOR: | VOLUMETRIC w/FLEXLINER AGITATION, 0.0 TO 12.0 CU/FT HR 1/2 HP AC DRIVE, 1/2 HP, 0-160 RPM TENV MOTOR |
| PROCESS MODULE: | PPM: MOTOR RATING: | STAINLESS STEEL UPPER / LOWER HOUSING, ROTOR AND DRIVE STAINLESS STEEL HERMETICALLY SEALED CHEMICAL SERVICE 1 1/2 HP, 3450 RPM, STAINLESS STEEL ROTOR AND HOUSING |
| SYSTEM CAPACITY: | WETTING RATE: DRY LBS/DAY: PRIMARY FILL: SECONDARY FILL: TOTAL FILL RATE: | 0 TO 12.0 LBS/MIN 400 LBS @ 0.1% / 2000 LBS @ 0.5% SOLUTION CONCENTRATION 100 GPM NONE 100 GPM |
| PANEL/CONTROLS: | NEMA 12: | ALLEN-BRADLEY 1500 PLC, CONTACTORS, SWITCHES, RELAYS; CONDUCTIVITY LEVEL CONTROL, WATER PRESSURE SWITCH |
| UTILITIES: | ELECTRICAL: WATER: | 480/3/60 60 AMP 50 – 100 PSI, 150 GPM CLEAN SOURCE |
| OPTIONS: | PANEL: LEVEL: STORAGE: LOW POLYMER: | NEMA 4X, PANELVIEW INTERFACE, LOCAL/REMOTE STATIONS ANALOG 4-20 mA, NON-CONTACT LEVEL CONTROLLERS 1.0 THRU 10.0 CU/FT EXTENTION HOPPERS, DUSTLESS BAG LOADERS, FBIC INTERFACE HOPPER W/ IRIS VALVE, BAG FRAME CAPACITANCE SENSOR WITH SS HOPPER PROBE |

Dry capacities are based on a polymer hydration time of 50 minutes. This processing model achieves 24 cycles within a 24-hour period. Increased mix times will decrease daily capacities. Factors affecting polymer solubility (mix time) are water temperature, molecular weight/charge and particle rheology.

ENGINEERING SPECIFICATIONS:

POWDERCAT Model NP-4100 shall be provided to meter, dynamically wet and transfer dry form polymer using a motorized disperser capable of processing 0-12 lbs/min of dry polymer and transferring the mixture at 100 gpm to an agitated mix tank. The NP-4100 shall be modular in design consisting of a volumetric feeder, motorized polymer processing module, secondary motive dilution header, inlet water valve and pressure sensor all of which is integrally mounted to a stainless steel frame. The volumetric polymer feeder shall be modular in design with a stainless steel exterior frame and a mechanically agitated flex liner. The system shall be designed to feed and transfer polymer/polymer mixture without the use of reserve pumps or pneumatic blowers. The polymer-processing module shall consist of an all stainless steel housing with an upper and lower flow chamber. The lower chamber shall contain a hermetically sealed stainless steel motor and housing assembly designed for chemical duty service. The upper chamber shall contain a flow divider, weir and induced air scrubber to contain small polymer dust particles. The polymer shall fall directly into the center of the rotor for rapid dispersion and wetting. No pre-wetting of the polymer is permitted. At no time shall the rotor become hydraulically enveloped. The control panel shall include a programmable logic controller, contactors for all motors, agitators and transfer devices, circuit breakers, phase loss monitors, motor drives, relays, timers and level control circuits necessary for the proper operation of the system.

**PLAN &
ELEVATION**

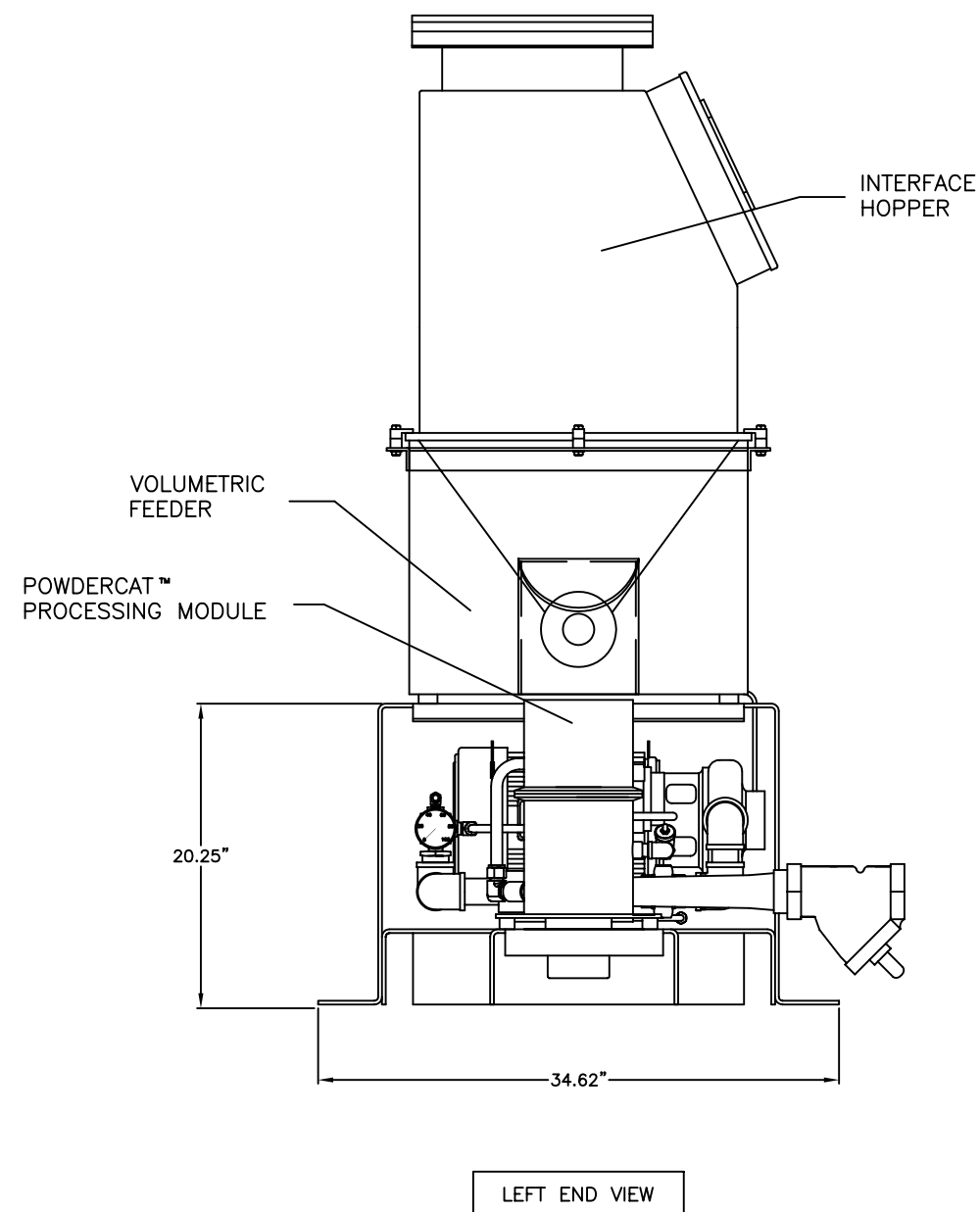
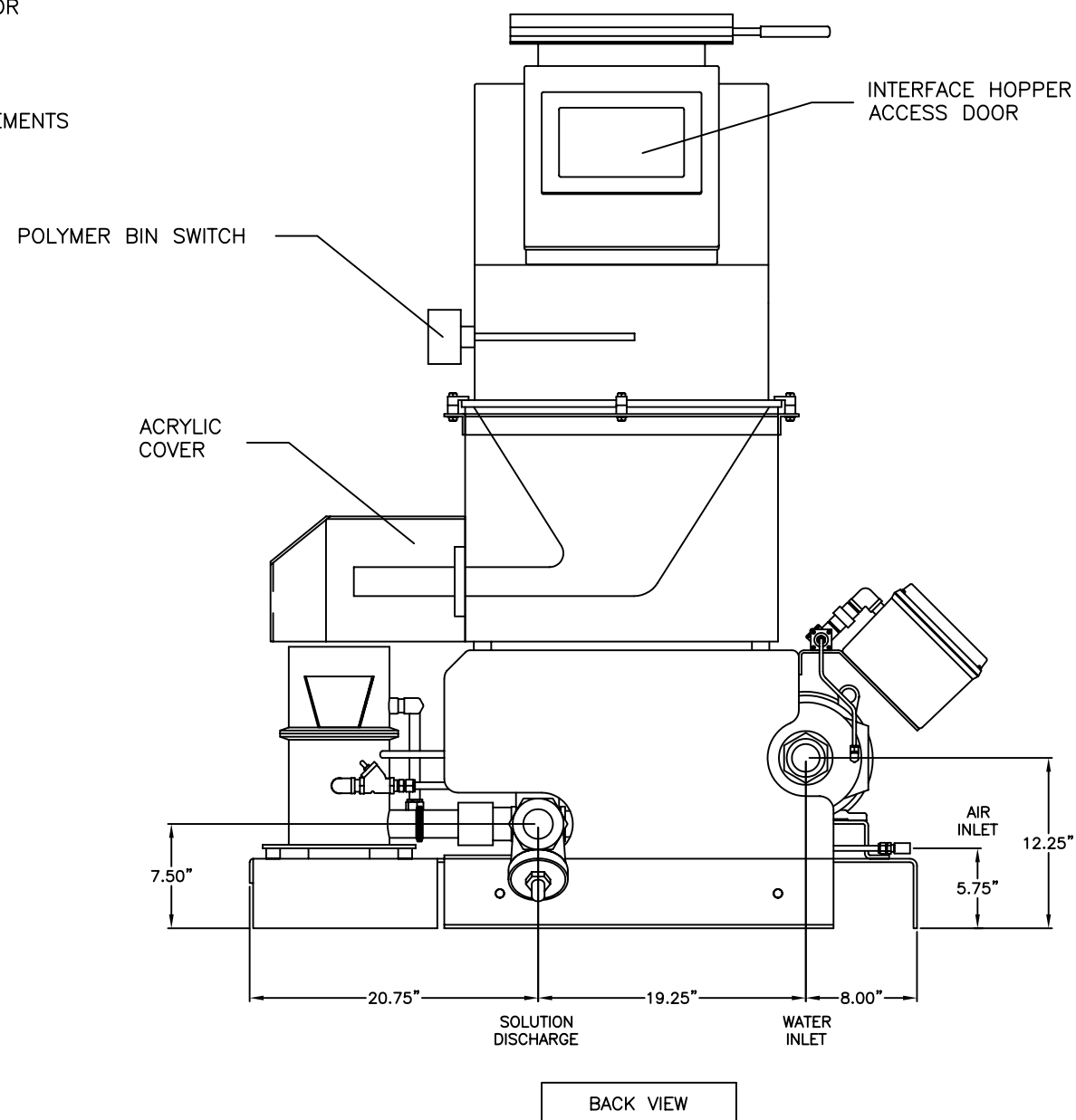
NP4000_SPEC_A

**POWDERCAT SERIES
NP-4000**

ELECTRICAL CONDUITS NOT SHOWN

ALL DIMENSIONS +/- 1/4"
CHANGES IN LAYOUT OR DIMENSIONING MAY
VARY DUE TO MODIFICATIONS AND/OR
DESIGN UPGRADE

EXTENSION HOPPER ORIENTATION
CAN BE ROTATED 90 DEGREE INCREMENTS



**PLAN &
ELEVATION**

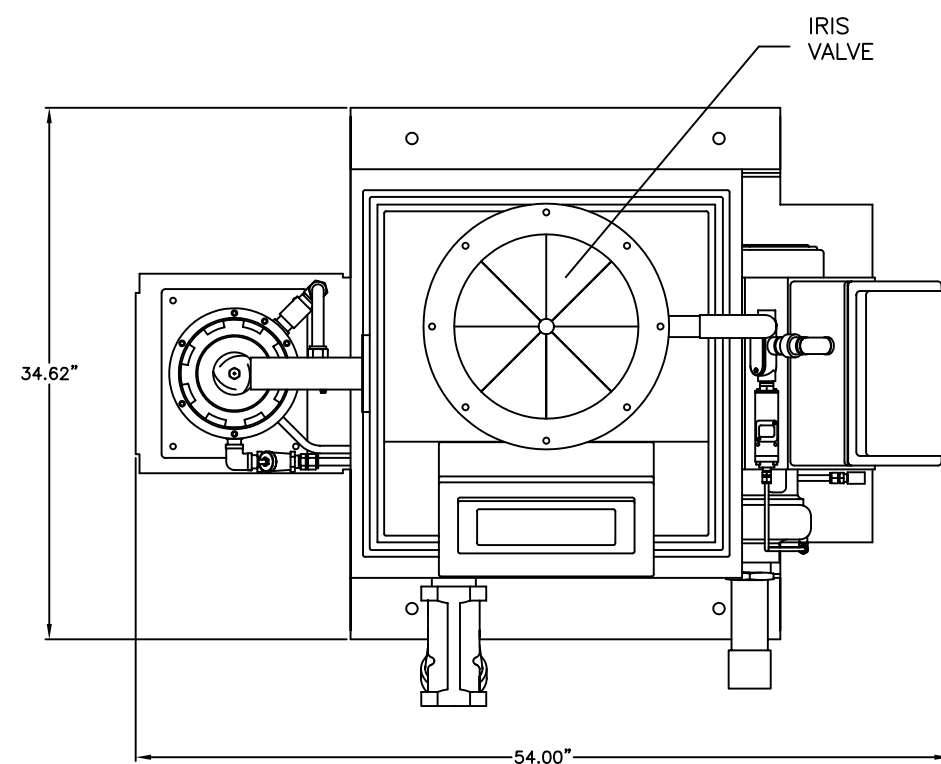
NP4000_SPEC_B

**POWDERCAT SERIES
NP-4000**

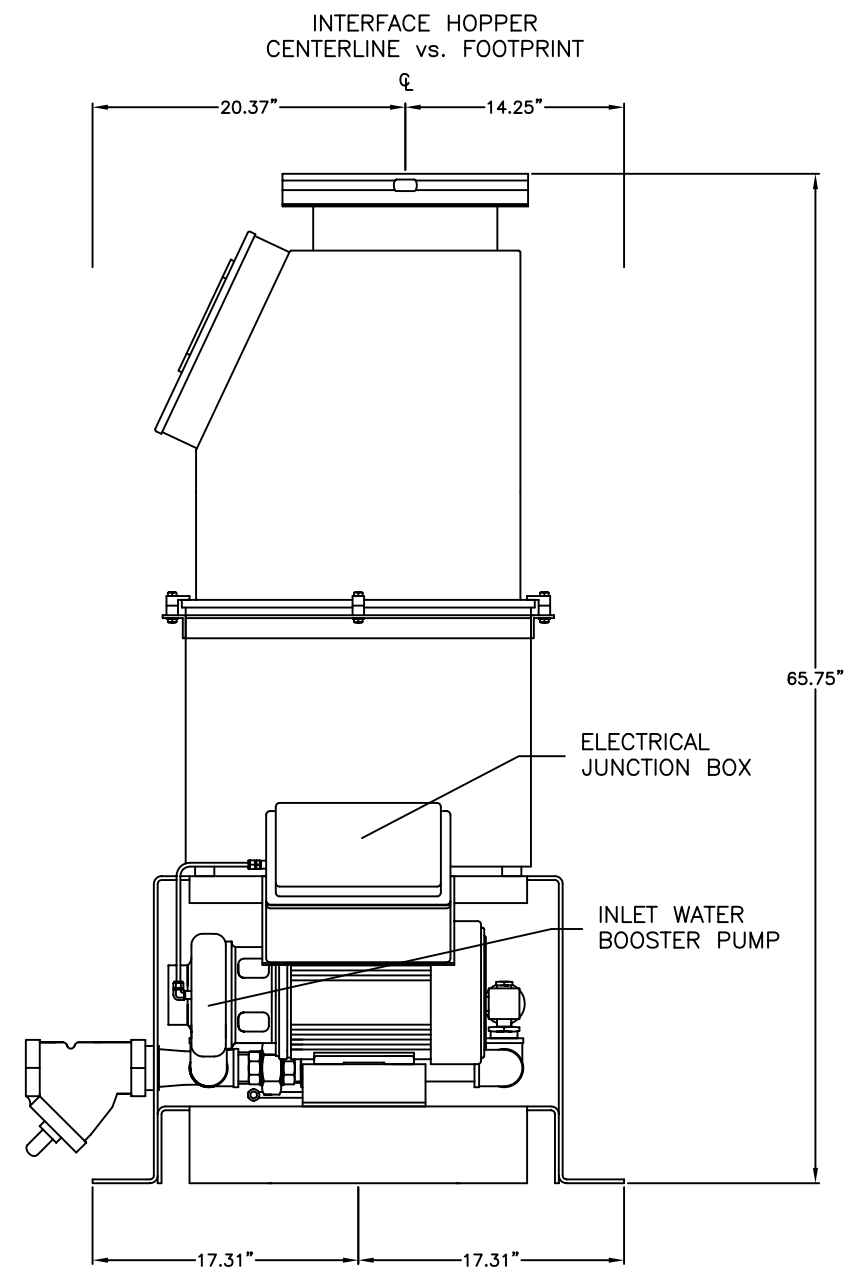
ELECTRICAL CONDUITS NOT SHOWN

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TOP VIEW

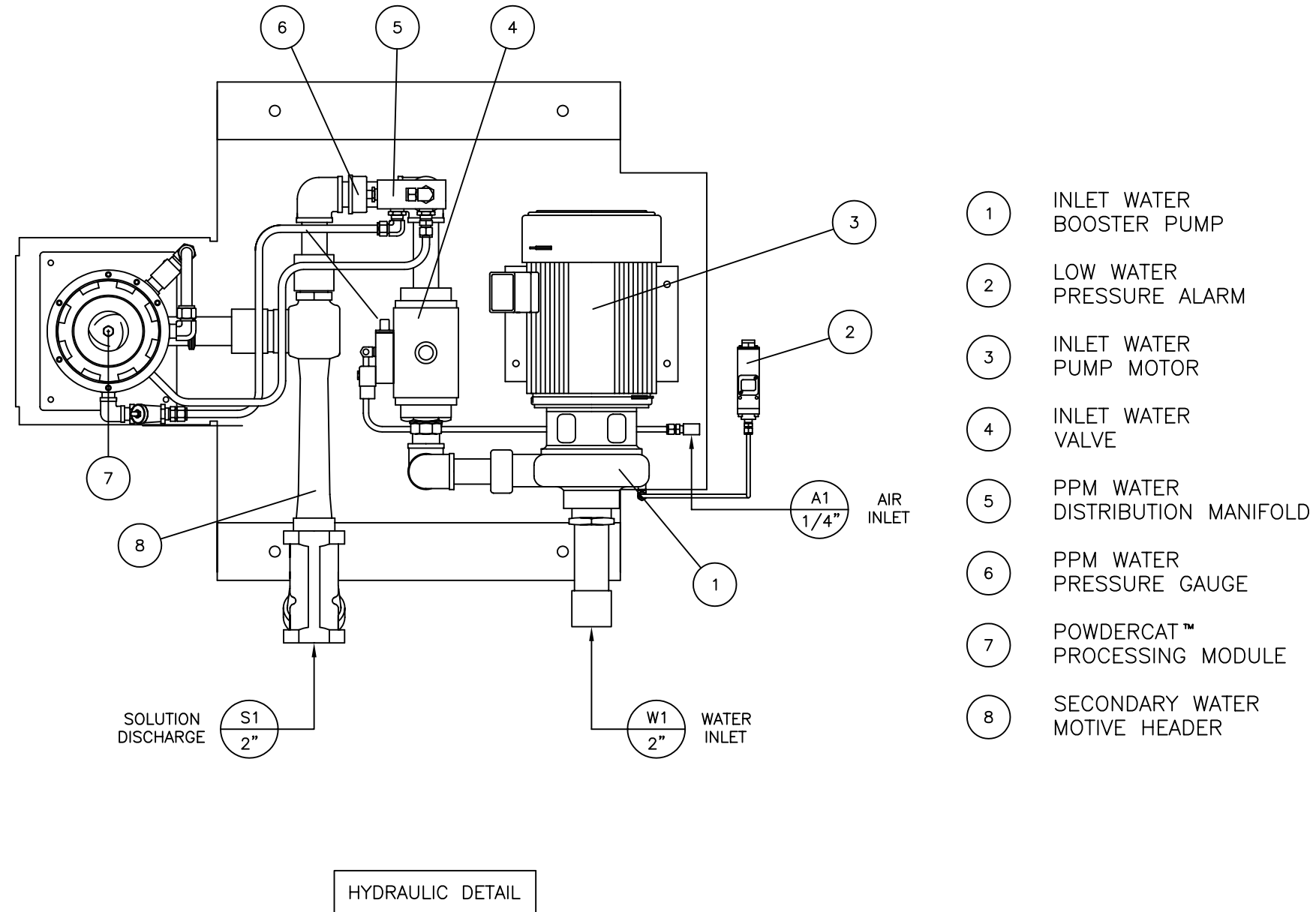


RIGHT END VIEW

POWDERCAT SERIES NP-4000

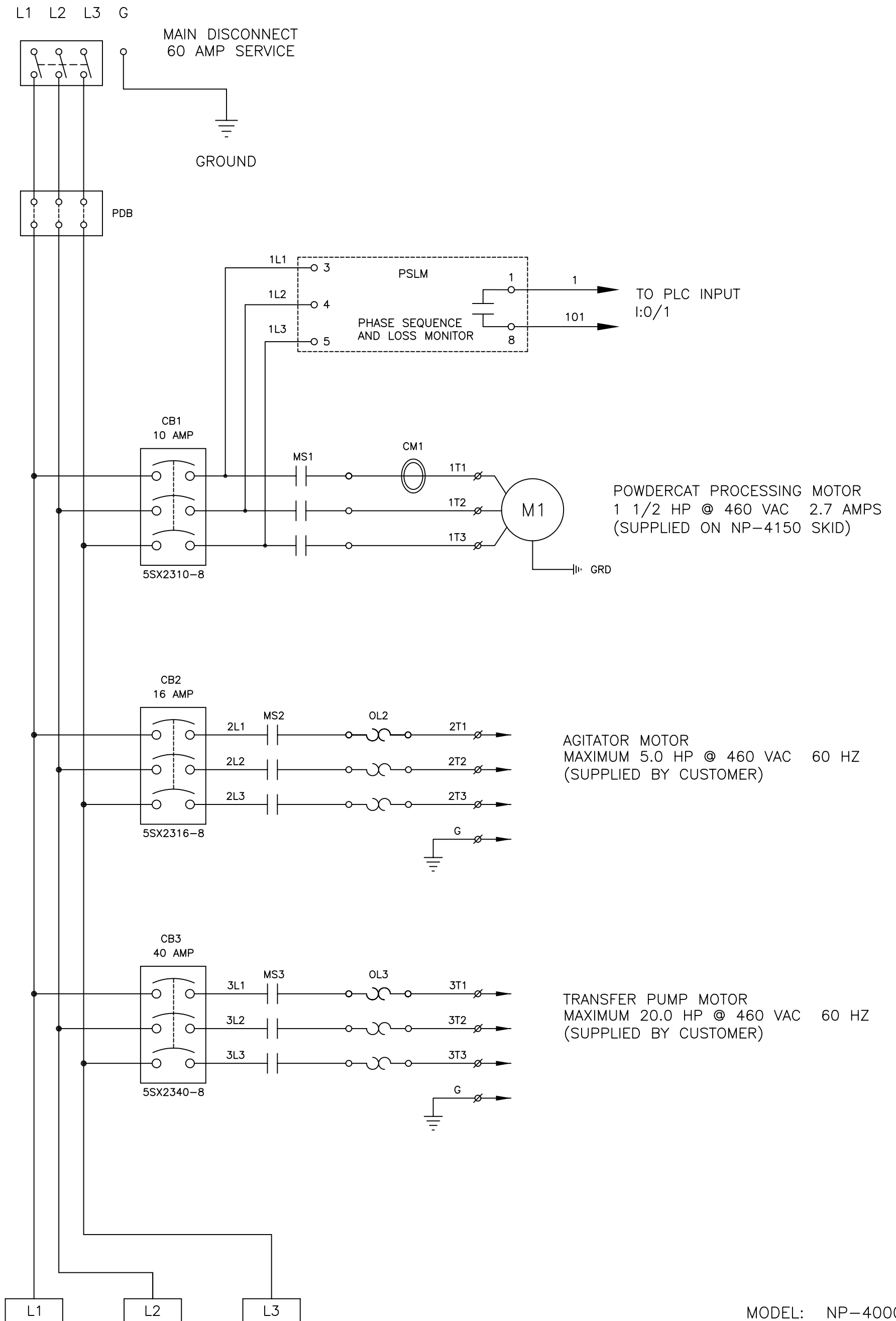
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INCOMING POWER (A) POWDERCAT PROCESSING SYSTEM CONTROL PANEL

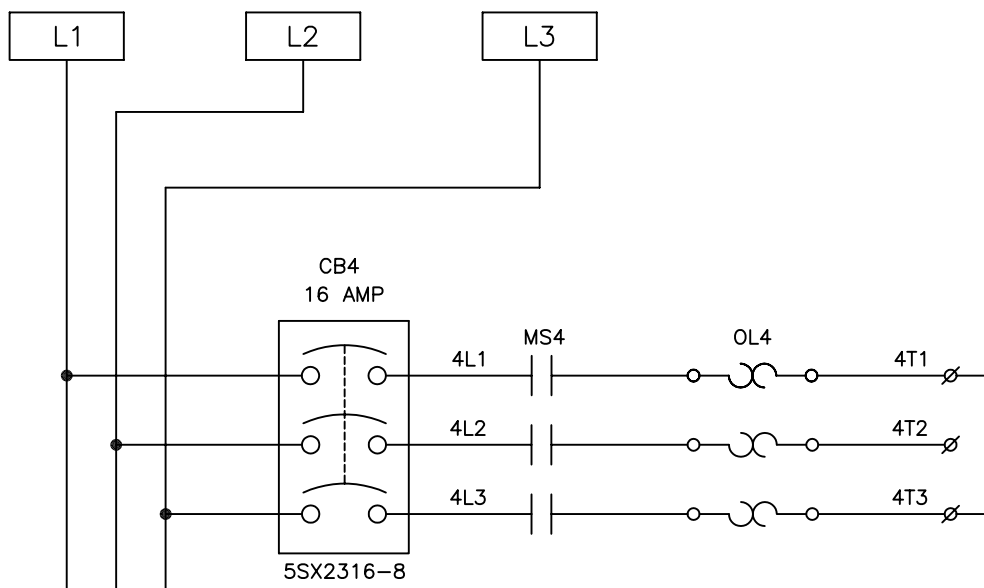
460 VAC/3 PH/60 HZ



POWDERCAT PROCESSING MOTOR
1 1/2 HP @ 460 VAC 2.7 AMPS
(SUPPLIED ON NP-4150 SKID)

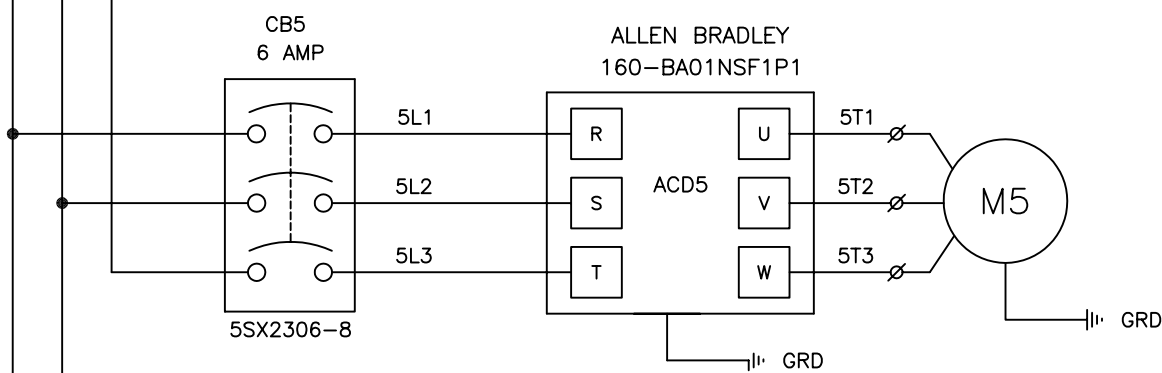
AGITATOR MOTOR
MAXIMUM 5.0 HP @ 460 VAC 60 HZ
(SUPPLIED BY CUSTOMER)

TRANSFER PUMP MOTOR
MAXIMUM 20.0 HP @ 460 VAC 60 HZ
(SUPPLIED BY CUSTOMER)



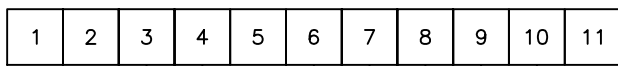
INLET WATER BOOSTER PUMP MOTOR
5.0 HP @ 460 VAC 6.4 AMPS
(SUPPLIED BY CUSTOMER)

BIOCIDE PUMP
START CONTACT

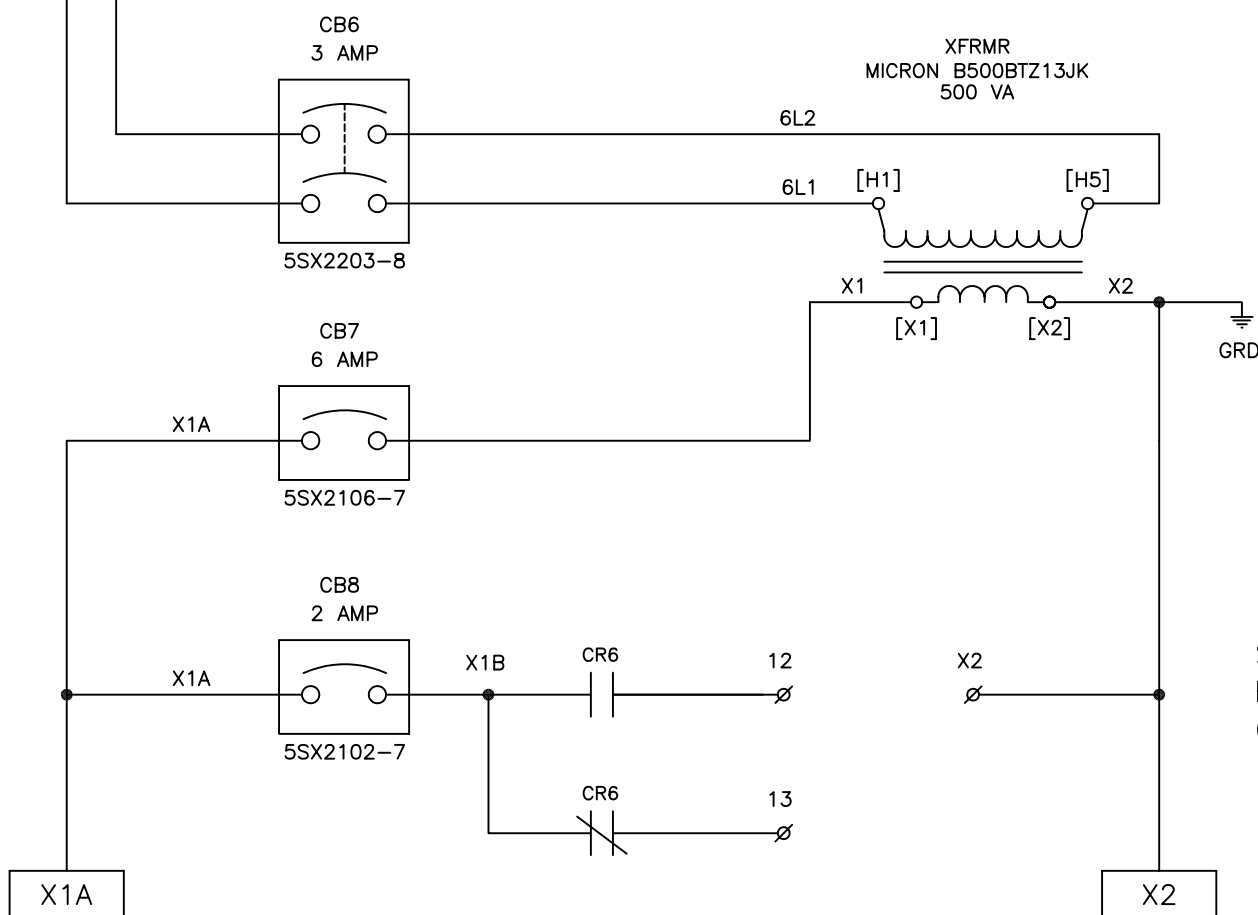


VOLUMETRIC FEEDER MOTOR
1/2 HP @ 460 VAC .75 AMPS
(SUPPLIED ON NP-4150 SKID)

DRIVE CONNECTION DETAILS



- 1 AC COM
- 110 DRIVE FAULT I:0/10
- 4 DRIVE RESET (FROM RELAY R7)
- 7 DRIVE COMMON
- 6 DRIVE RUN (FROM RELAY R5)
- 400+ VOLUMETRIC FEEDER SPEED REFERENCE
4-20 mA OUTPUT FROM 0:2.0/0
4 mA = 0.0 %
20 mA = 100.0 %
- 400- SHLD GROUND

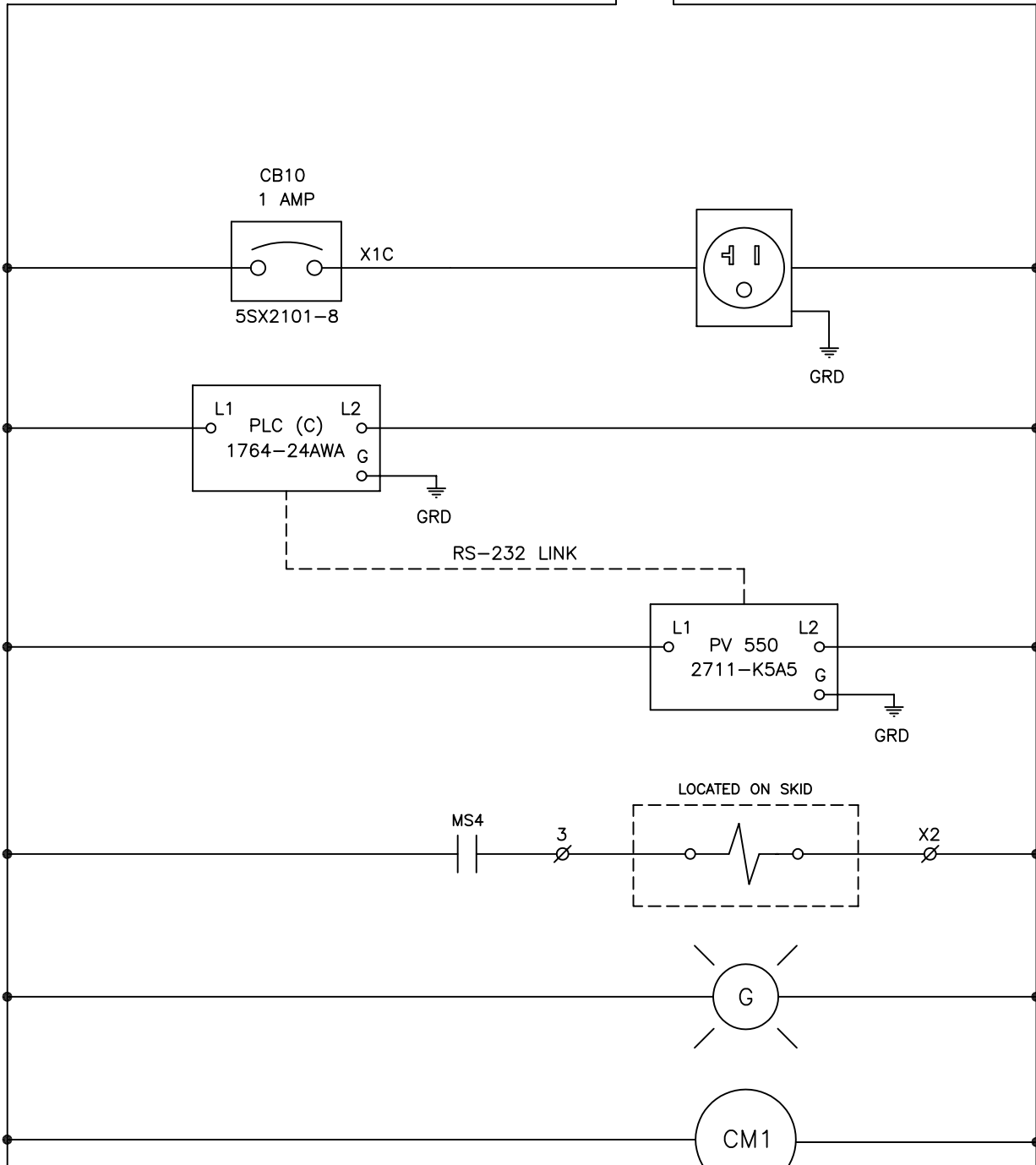


SECONDARY FILL VALVE
RUN CONTACT(S)
(OPTIONAL)

MODEL: NP-4000
CUSTOMER: NORCHEM INDUSTRIES
CUSTOMER P.O. NO.: xxxxx
NCI PROJECT: xxxxx
SCHEMATIC NO.: NCI-040203-1A REV. A
SHEET 2 OF 8

X1A

X2



COMPUTER POWER INTERFACE TERMINAL

PROGRAMMABLE CONTROLLER

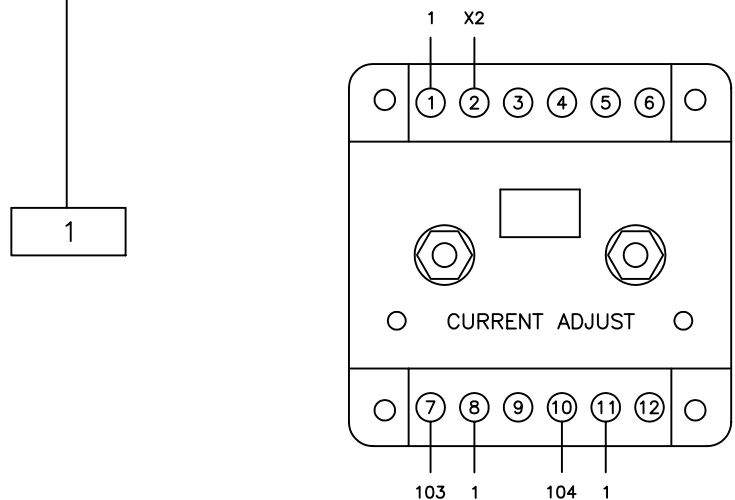
PROGRAMMABLE CONTROLLER

INLET WATER VALVE AIR ACTUATOR VALVE

"POWER ON" INDICATOR

PROCESSING MODULE CURRENT MONITOR

PROCESSING MODULE CURRENT MONITOR (CM1)

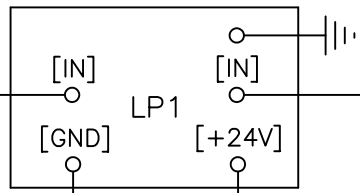


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 SHEET 3 OF 8

1

X2

TANK LEVEL CONTROLS
LOOP-POWER SUPPLY
(LOCATED IN CONTROL PANEL)

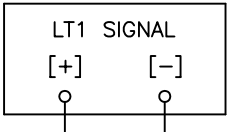


+24V

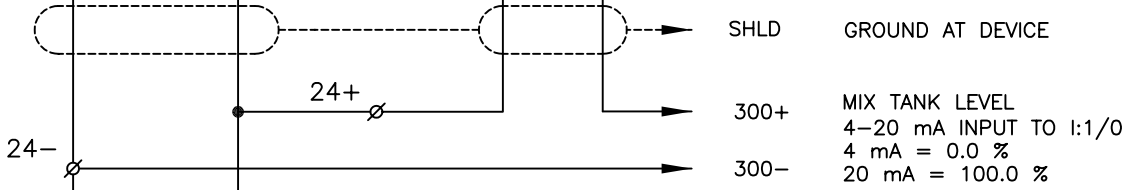
5SX2101-7

CB9
1 AMP

LOCATED ON MIX TANK

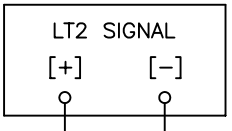


POLYMER MIX TANK
LEVEL TRANSMITTER

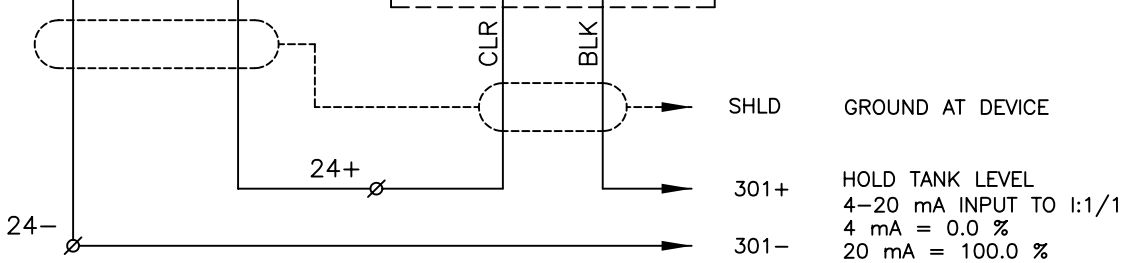


HOLD TANK TRANSMITTER
POWER SUPPLY
(LOCATED IN CONTROL PANEL)

LOCATED ON HOLD TANK



POLYMER HOLD TANK
LEVEL TRANSMITTER



NOTES: ANALOG LEVEL PROBE WIRING

FOR LOOP-POWERED LEVEL TRANSMITTERS
CONNECT AS SHOWN ON SCHEMATIC

+ TERMINAL OF TRANSMITTER TO PANEL TERMINAL 24+

- TERMINAL OF TRANSMITTER TO PANEL TERMINAL 300+ (OR 300-)

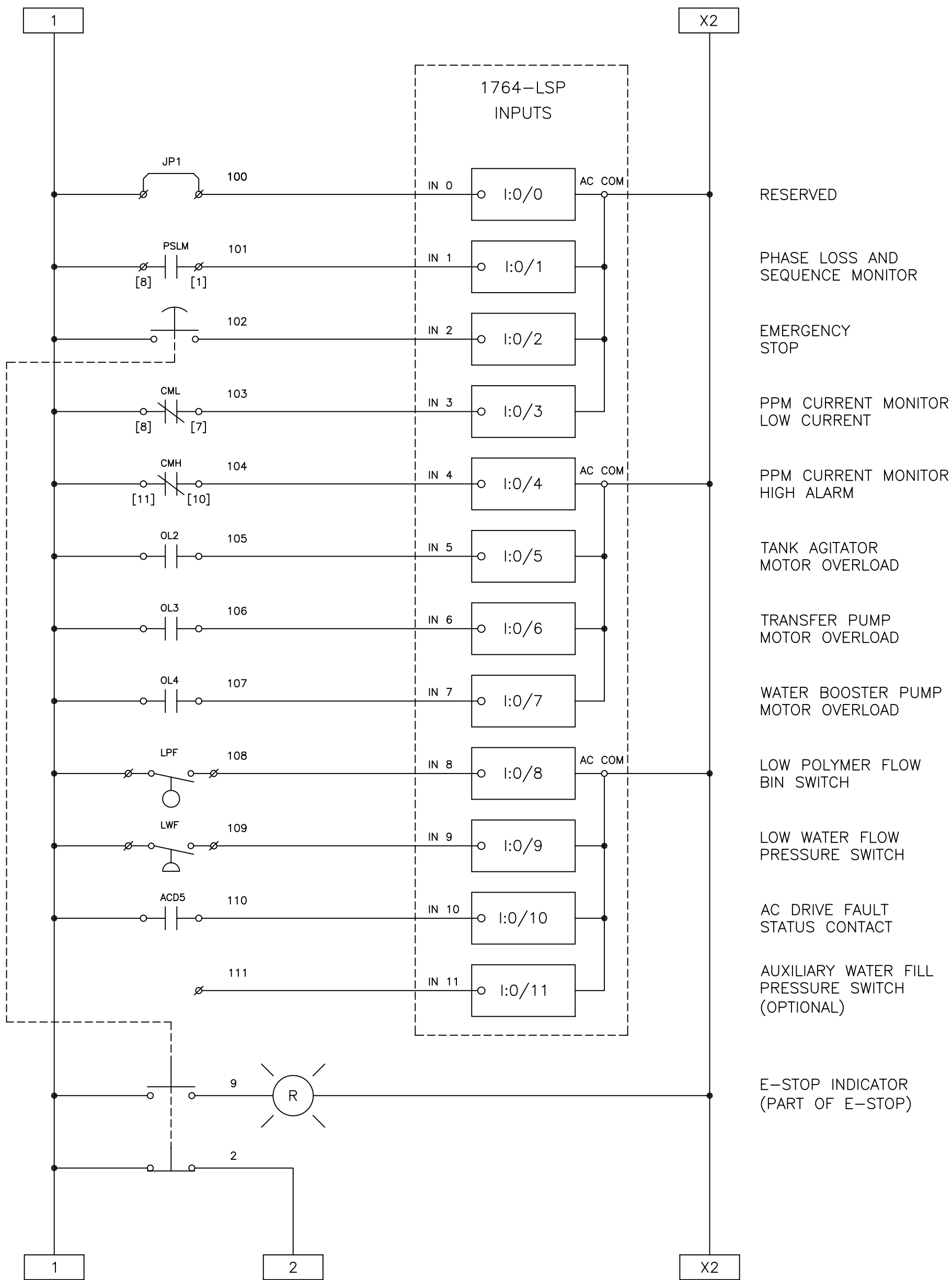
FOR TRANSMITTERS GENERATING 4-20 mA
SWITCH CIRCUIT BREAKER CB9 OFF

+ TERMINAL OF TRANSMITTER TO PANEL TERMINAL 300+ (OR 301+)

- TERMINAL OF TRANSMITTER TO PANEL TERMINAL 300- (OR 301-)

1

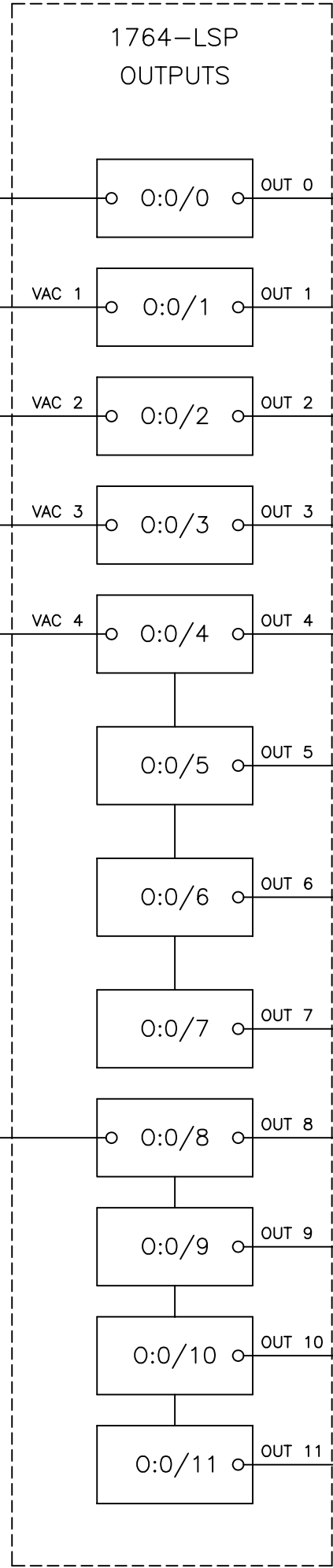
X2



MODEL: NP-4000
 CUSTOMER: NORCHEM INDUSTRIES
 CUSTOMER P.O. NO.: xxxxx
 NCI PROJECT: xxxxx
 SCHEMATIC NO.: NCI-040203-1A REV. A
 SHEET 5 OF 8

2

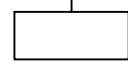
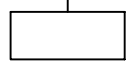
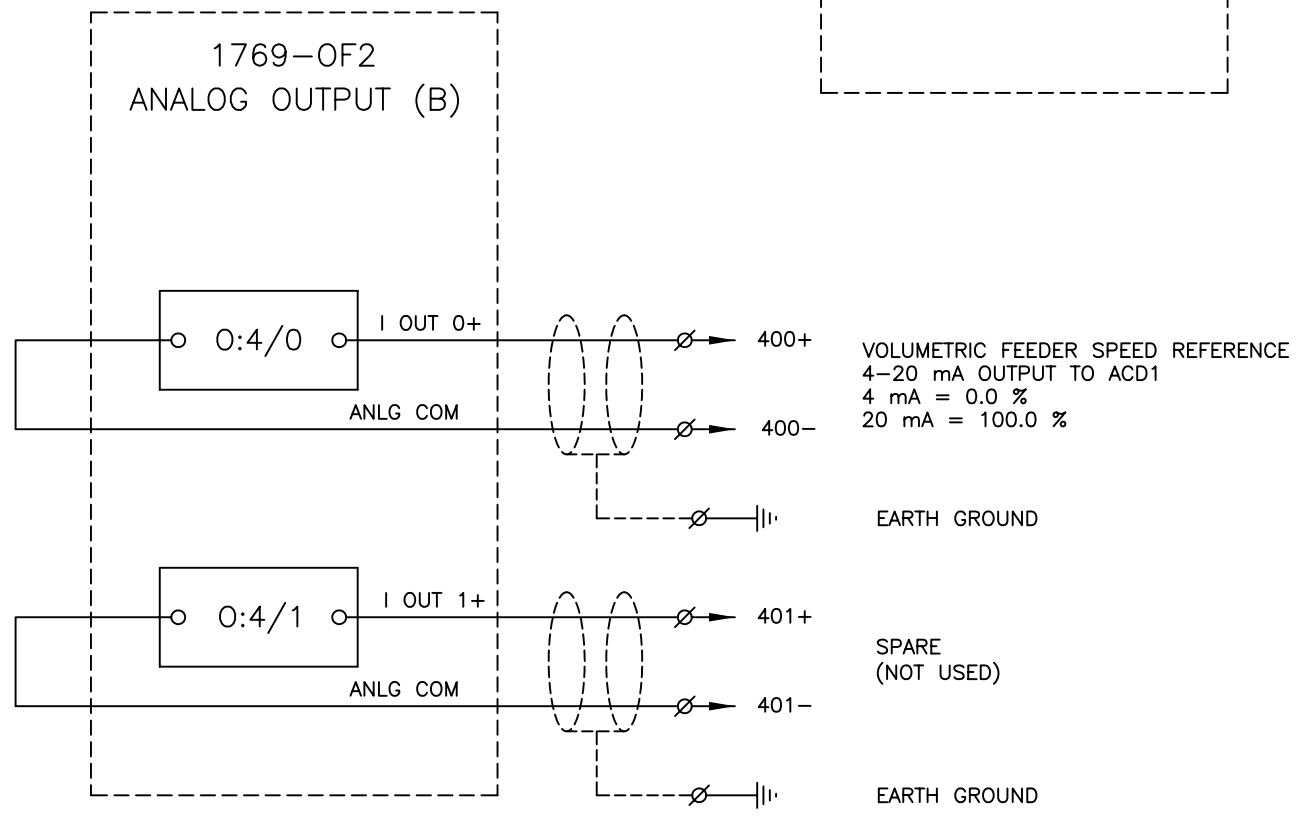
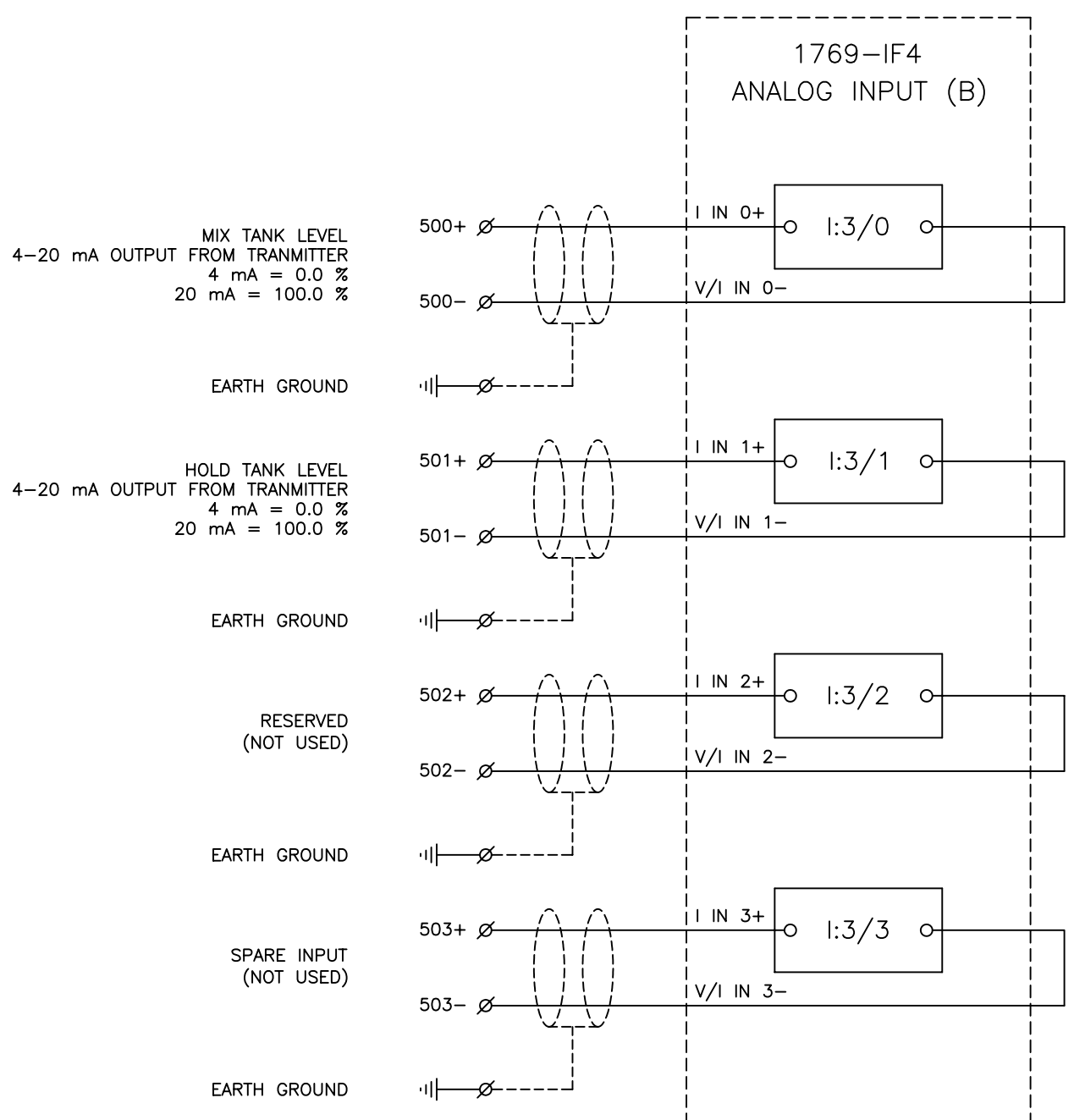
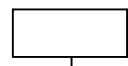
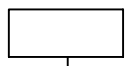
X2



- VOLUMETRIC FEEDER DRIVE RESET RELAY (TO ACD5)
- VOLUMETRIC FEEDER DRIVE RUN CONTACT (AT ACD5)
- SECONDARY FILL VALVE CONTROL RELAY
- AUXILIARY PPM FILL SOLENOID VALVE (OPTIONAL)
- PROCESSING MODULE MOTOR CONTACTOR [5 HP]
- MIX TANK AGITATOR MOTOR STARTER [5 HP]
- TRANSFER PUMP MOTOR STARTER [20 HP]
- WATER BOOSTER PUMP MOTOR STARTER [5 HP]
- DCS INPUT COMMON FAULT
- DCS INPUT COMMON ALARM
- DCS INPUT PLC POWER OK
- DCS INPUT LOW HOLD TANK LEVEL

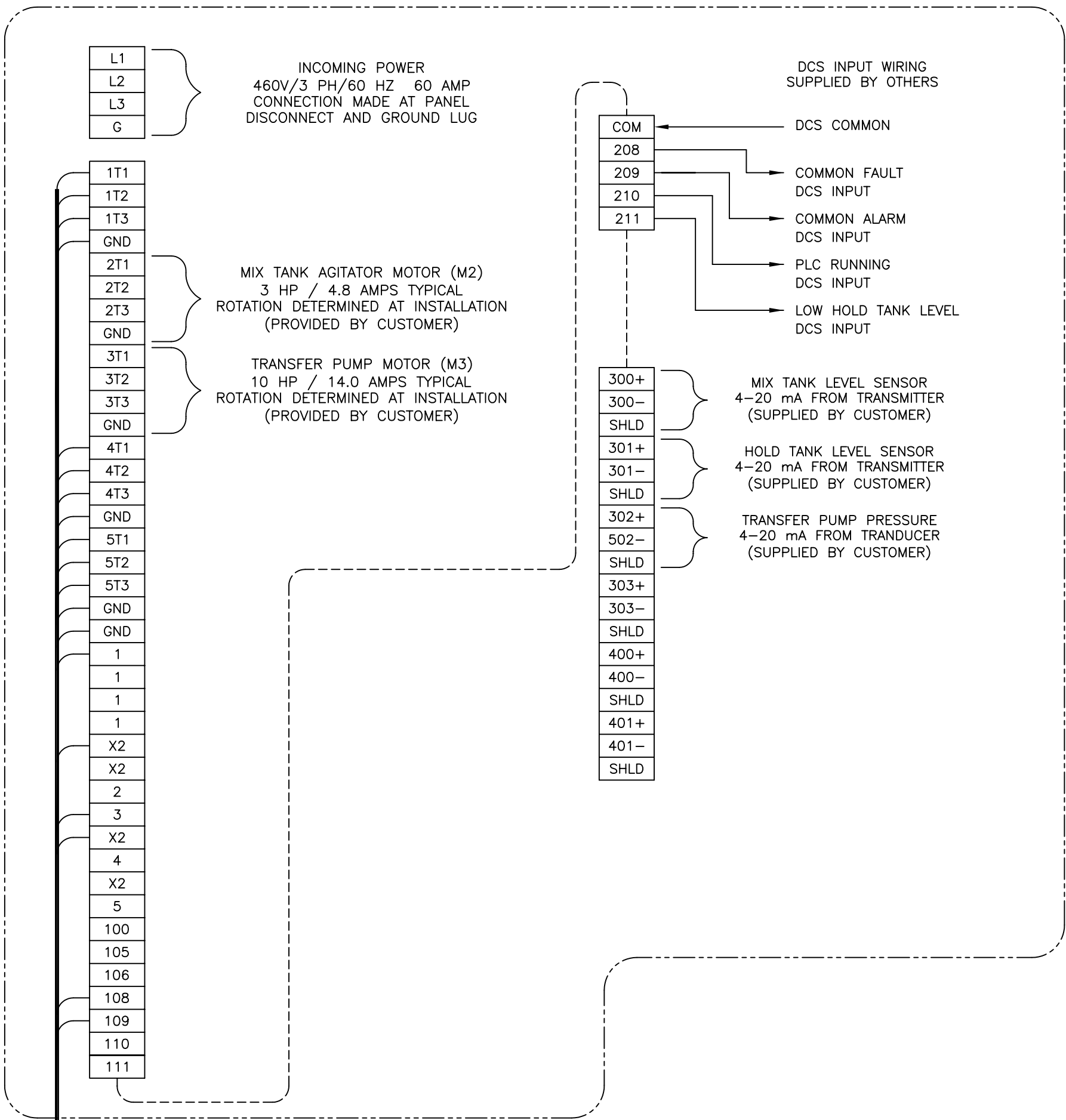
2

X2

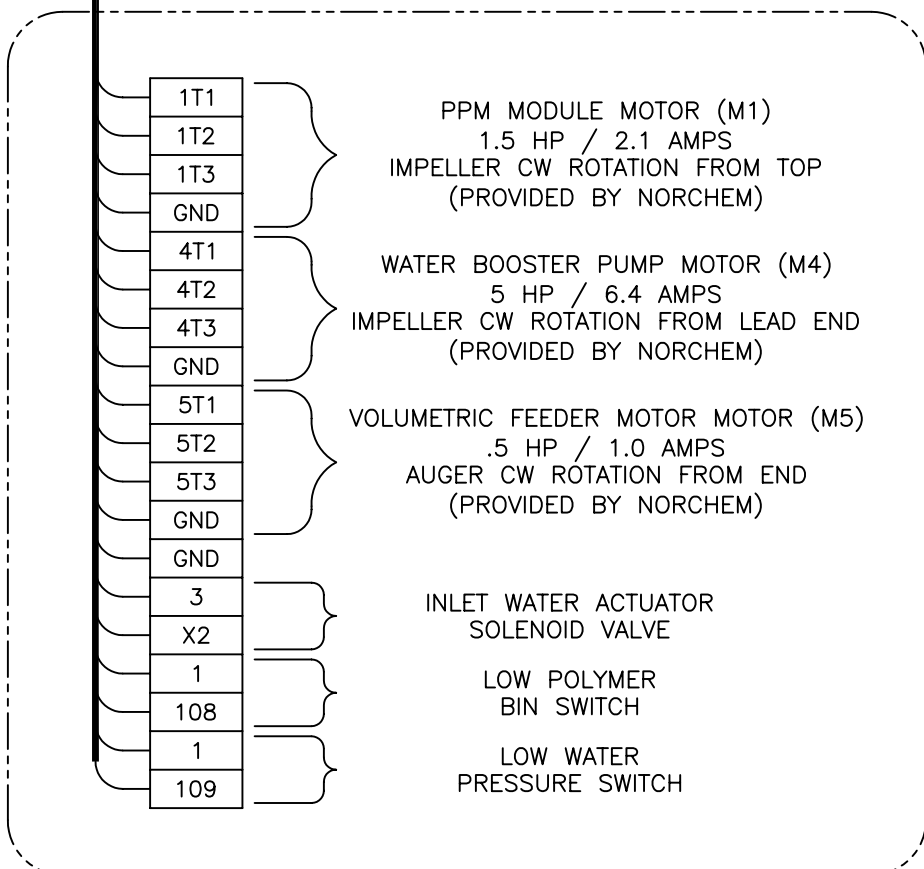


MODEL: NP-4000
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 NCI PROJECT: xxxxx
 SCHEMATIC NO.: NCI-040203-1A REV. A
 SHEET 7 OF 8

TERMINAL LAYOUT FOR NP-4000 SERIES MAIN CONTROL PANEL

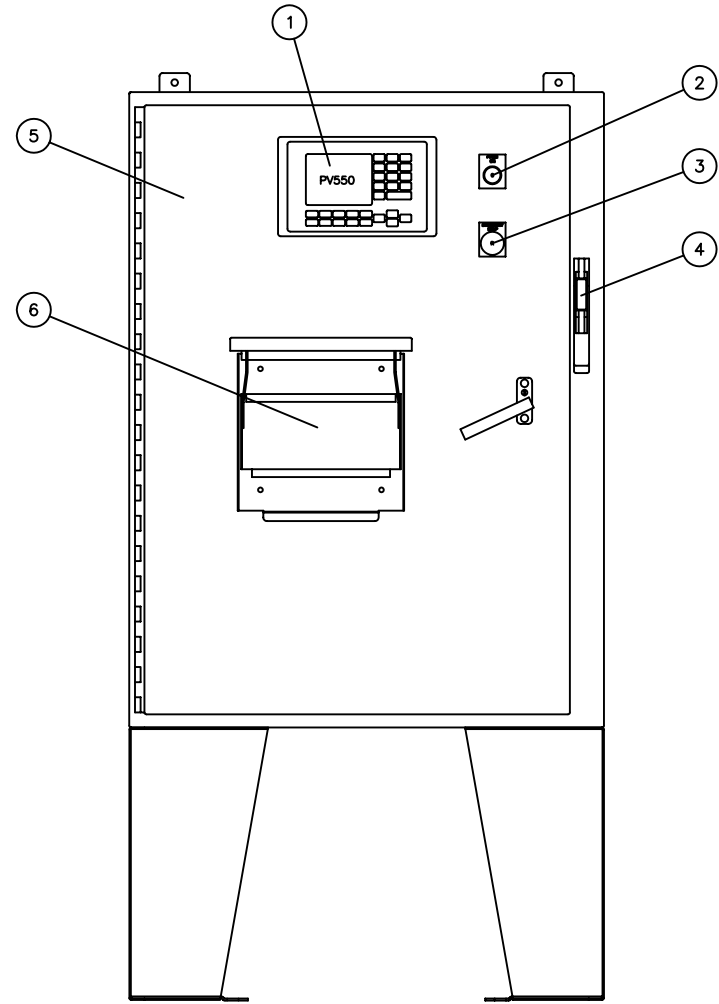


TERMINAL LAYOUT FOR NP-4000 SERIES PROCESSING MODULE



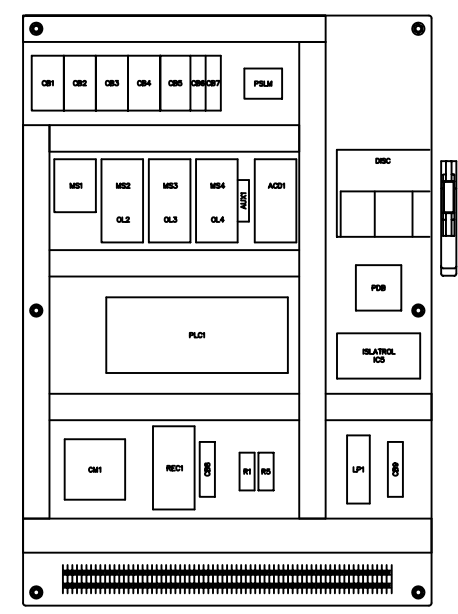
MODEL: NP-4000
 CUSTOMER: NORCHEM INDUSTRIES
 CUSTOMER P.O. NO.: xxxxx
 NCI PROJECT: xxxxx
 SCHEMATIC NO.: NCI-040203-1A REV. A
 SHEET 8 OF 8

| REVISIONS | | | | |
|-----------|-----|-------------|------|----------|
| ZONE | REV | DESCRIPTION | DATE | APPROVED |



DOOR LAYOUT
(NORCHEM CUSTOM 42" x 31" x 12" ENCLOSURE)
NEMA 12
OPERATOR AND DISPLAY LISTING

- | | |
|-------------------------------|---|
| ① OPERATOR INTERFACE | ④ SYSTEM PANEL DISCONNECT 600 VOLTS/60 AMPS |
| ② "POWER ON" INDICATOR | ⑤ CONTROL PANEL ENCLOSURE RATED NEMA 12 w/PAINT |
| ③ "EMERGENCY STOP" PUSHBUTTON | ⑥ PROGRAMMER COMPUTER TABLE |




SUBPANEL LAYOUT

| NORCHEM NP-4150 SERIES DRY POLYMER SYSTEM CONTROL PANEL FACE & SUBPANEL LAYOUT | | |
|--|--|---------------------|
| ITEM | DESCRIPTION | DESCRIPTION |
| MS1 | PROCESSING MODULE CONTACTOR | 100-C09D10 |
| MS2 | MIX TANK AGITATOR MOTOR STARTER | 100-C16D10 |
| MS3 | TRANSFER PUMP MOTOR STARTER | 100-C23D10 |
| MS4 | WATER BOOSTER PUMP MOTOR STARTER | 100-C16D10 |
| OL2 | MIX TANK AGITATOR MOTOR OVERLOAD | 193-EA2FB |
| OL3 | TRANSFER PUMP MOTOR OVERLOAD | 193-EA2GB |
| OL4 | WATER BOOSTER PUMP MOTOR OVERLOAD | 193-EA2FB |
| CB1 | CIRCUIT BREAKER - PROCESSING MODULE | SIEMENS 5SX2110-8 |
| CB2 | CIRCUIT BREAKER - MIX TANK AGITATOR | SIEMENS 5SX2310-8 |
| CB3 | CIRCUIT BREAKER - TRANSFER PUMP | SIEMENS 5SX2320-8 |
| CB4 | CIRCUIT BREAKER - BOOSTER PUMP | SIEMENS 5SX2310-8 |
| CB5 | CIRCUIT BREAKER - SECONDARY DISCONNECT | SIEMENS 5SX2201-8 |
| CB6 | CIRCUIT BREAKER - VOLUMETRIC FEEDER | SIEMENS 5SX2110-8 |
| CB7 | CIRCUIT BREAKER - CONTROL LOGIC | SIEMENS 5SX2106-8 |
| CB8 | CIRCUIT BREAKER - 115V COMPUTER RECEPTACLE | SIEMENS 5SX2101-7 |
| CB9 | CIRCUIT BREAKER - MIX TANK LEVEL 24 VDC | SIEMENS 5SX2101-7 |
| SPD | SURGE PROTECTION DEVICE | ISOLATROL IC+105 |
| PSLM | PHASE SEQUENCE & LOSS MONITOR | DIV SLA-440-ASA |
| PDB | POWER DISTRIBUTION BLOCK | A-B 1492-PD3141 |
| CM1 | PROCESSING MODULE CURRENT MONITOR | CBA-120-ALE-5 |
| ACD1 | VOLUMETRIC FEED AC DRIVE | A-B 160-BA01NSF1P1 |
| R1 | AUXILIARY FILL CONTROL RELAY | A-B 700-HK32A1 |
| R5 | VOLUMETRIC FEED DRIVE RESET RELAY | A-B 700-HK32A1 |
| LP1 | MIX TANK LEVEL CONTROLLER POWER SUPPLY | SCP30S24B-DN |
| PLC1 | PROGRAMMABLE LOGIC CONTROLLER | MICROLOGIX 1500 |
| PV550 | PANELVIEW 550 OPERATOR TERMINAL | A-B 2711-K5A5 |
| CABLE | PLC TO PANELVIEW CABLE | A-B 1761-CBL-PM02 |
| DISC | SYSTEM DISCONNECT 60 AMP | A-B 1494V-DS60 |
| TB1 | INTERFACE TERMINAL BLOCKS | A-B 1492-W10 SERIES |
| LT1 | GREEN LIGHT LENS | A-B 800EP-PL3 |
| LT1 | LIGHT ASSEMBLY WITH NAME TAG | A-B 800E-3DL5 |
| LT1 | LIGHT BULB | A-B 800E-N130 |
| AUX1 | AUXILIARY CONTACT BLOCK | A-B 100-SA10 |
| REC1 | RECEPTACLE - 115V COMPUTER POWER | PHOENIX 5600461 |
| PB1 | EMERGENCY STOP PUSHBUTTON WITH NAME TAG | A-B 800H-FRXTQ10RA |

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| | |
|----------|---------------|
| OWN | RWD |
| CHK'D | RWD |
| APP'D | RWD |
| CDR/FILE | CTL_4150_TYP1 |
| SHT. OF | 1 1 |
| SCALE | NONE |

| | | | |
|---|----------------------|---|--------------|
|  | | NORCHEM INC. 8910 W. 192nd STREET MOKENA, ILLINOIS 60448 | |
| A | CONTROL PANEL LAYOUT | 04-XX-03 | |
| SYM. | | REVISIONS | DATE |
| CUSTOMER: NORCHEM INDUSTRIES, MOKENA, IL 60448 | | | |
| DESCRIPTION: NORCHEM NP-4150 DRY POLYMER SYSTEM CONTROL PANEL & SUBPANEL LAYOUT | | | |
| CONTRACT NUMBER: . | | | |
| PROJECT NUMBER | SPEC | DRAWING NUMBER | NCI-04XX03-2 |
| REV | A | | |