

NORCHEM Model A*3000VS ASA emulsification unit is designed to meter and emulsify ASA (alkenyl succinic anhydride) with an emulsifying polymer or modified grafted liquid starch at emulsion flow rates up to 30 gpm (1800 GPH) @ 1-5% concentration and up to 48 GPH (3000 ml/min) of neat ASA. The **A*3000VS** is modular in design consisting of a stainless steel emulsifier manifold block, neat ASA and Polymer/Starch metering modules, variable speed stainless steel turbine pump, primary and secondary magnetic flow meters, Panelview 550 interface screen, control panel, SS base, and DP transmitter.

MODEL A*3000VS SYSTEM SPECIFICATIONS:

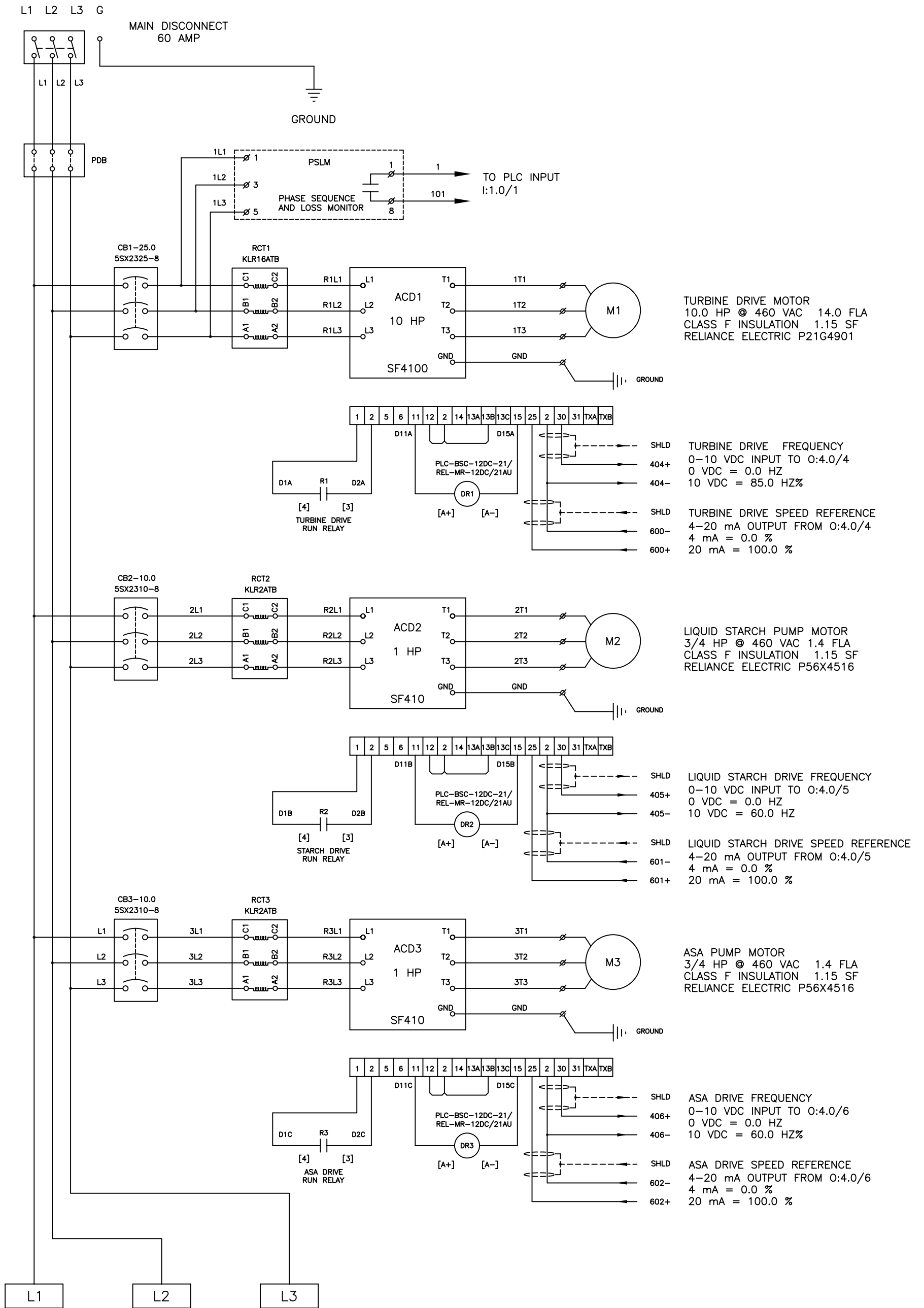
FRAME:	BASE:	48" W X 48" L X 64" H	(SERVICE AREA: 72"X 72"X 72")
	CONSTRUCTION:	304 SS Welded Frame	
PANEL:	ENCLOSURE:	NEMA 4X W/ PNEUMATIC VORTEX COOLER / ALARM STROBE	
TURBINE MODULE:	PUMP:	STAINLESS STEEL, 300 PSI OPERATING PRESSURE	
	DRIVE:	10 HP AC FREQUENCY	
	MOTOR:	460/3/60, 10 HP, 12.5 AMP, 0-4800 RPM, TENV, WASHDOWN DUTY	
	SEAL:	PROPRIETARY FLOW THRU ENCAPSULATED CARBIDE/GRAPHITE	
FLOWMETERS:	WATER:	PRIMARY/SECONDARY MAGNETIC FLOWMETERS	
	ASA:	OPTIONAL MASS FLOW	
	STARCH:	OPTIONAL MAGNETIC FLOW	
ASA:	PUMP:	ROTARY GEAR, STAINLESS STEEL, CHEMICAL SERVICE	
	DRIVE:	AC TECH FREQUENCY DRIVE	
	MOTOR:	460/3/60, 0.5 HP, 1.2 AMP, 0-1000 RPM, TEFC, WASHDOWN DUTY	
	CAPACITY:	0-3000 ML/MIN @ 80 PSI	
STARCH:	PUMP:	ROTARY GEAR, STAINLESS STEEL, CHEMICAL SERVICE	
	DRIVE:	AC TECH FREQUENCY DRIVE	
	MOTOR:	460/3/60, 0.5 HP, 1.2 AMP, 0-1000 RPM, TEFC, WASHDOWN DUTY	
	CAPACITY:	0-3000 ML/MIN @ 80 PSI	
WATER:	PRIMARY FLOW:	0.25 – 2.0 GPM (PID CONTROLLED SS INLET BOOSTER PUMP)	
	SECONDARY FLOW:	1 – 30 GPM (60-1800 GPH)	
CONCENTRATION:	SOLUTION:	PRIMARY: 5 - 50%, VOLUME ON VOLUME	
		SECONDARY: 0.2 TO 5.0%, VOLUME ON VOLUME	
CONTROLS:	PLC:	ALLEN-BRADLEY MICROLOGIX 1500	
	SCREEN:	ALLEN BRADLEY 550 MONOCHROME PANELVIEW	
	ASA:	RATIO CONTROLLED FUNCTION	
	LEVEL:	DIFFERENTIAL PRESSURE TRANS; 4-20mA ANALOG OUTPUT	
UTILITIES:	ELECTRICAL:	460 VAC, 3 PHASE, 60 HERTZ, 30 AMP	
	WATER:	50 GPM @ 80 PSI, CLEAN SOURCE	

ENGINEERING SPECIFICATIONS:

The NORCHEM Model A*3000VS ASA emulsification unit is designed to meter and emulsify ASA and polymer or modified liquid starch on a batch basis to create a stable emulsion with proper particle size and distribution for good sizing reactivity. The Model A*3000VS features a dual element starch pre-conditioning injection system and internal auto flow functions to preserve emulsion formation and performance. The emulsifier system consists of a variable speed, single stage frame mounted stainless turbine with a stainless manifold emulsifier block, AC variable speed ASA and Polymer / Starch injection pumps with analog following capabilities, inlet water solenoid valve with PRV, ratio control loops for ASA, polymer/starch, Allen-Bradley PLC for DCS integration, primary and secondary water flow dilution headers. Primary water flow is controlled via a single loop PID interfaced to a variable speed SS inlet water booster. Additional instrumentation includes low water flow alarm, common fault and summary alarms and Norchem's FQM Emulsion Quality Monitor real time laser monitor.

INCOMING POWER

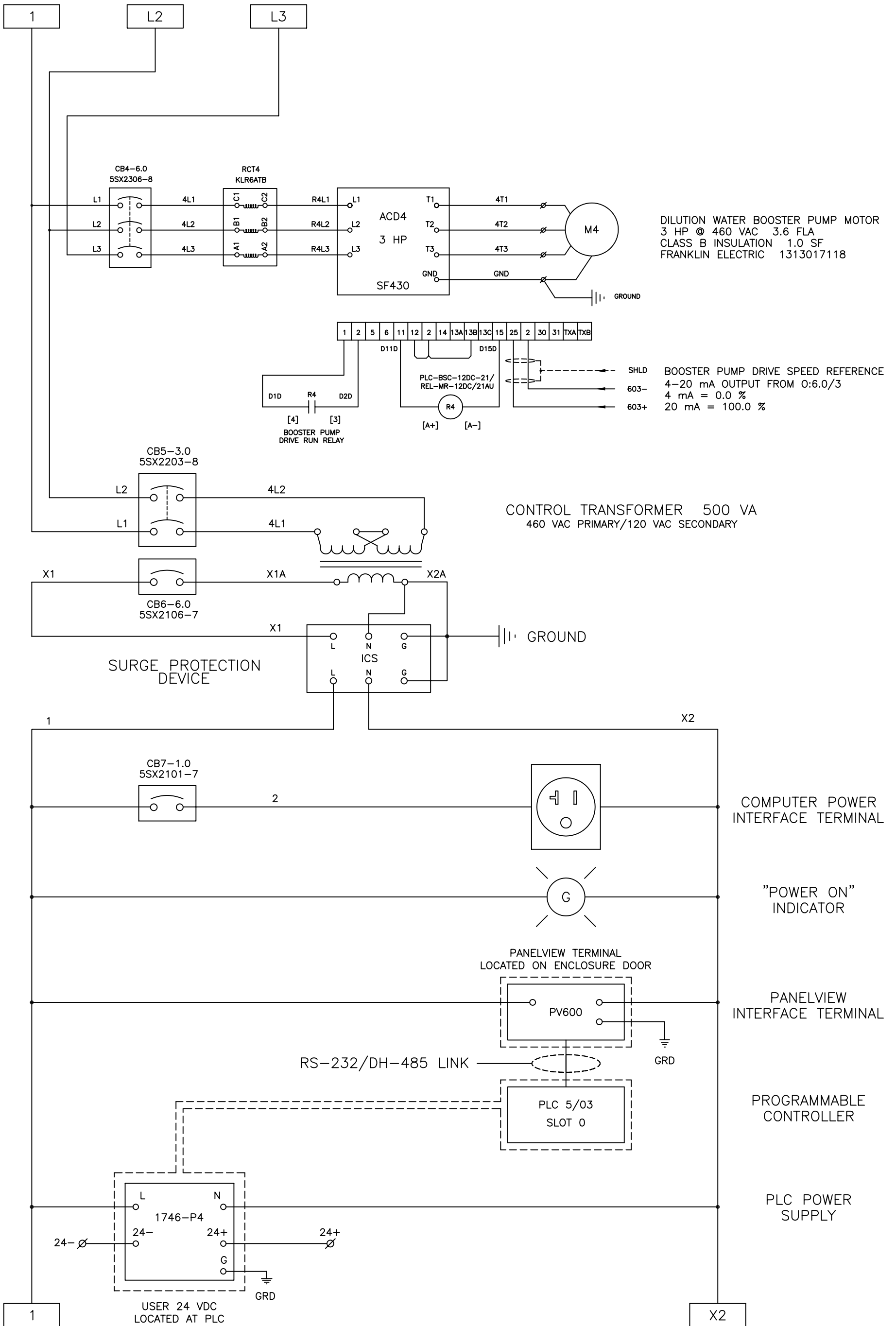
460 VAC/3 PH/60 HZ



TURBINE DRIVE MOTOR
10.0 HP @ 460 VAC 14.0 FLA
CLASS F INSULATION 1.15 SF
RELIANCE ELECTRIC P21G4901

LIQUID STARCH PUMP MOTOR
3/4 HP @ 460 VAC 1.4 FLA
CLASS F INSULATION 1.15 SF
RELIANCE ELECTRIC P56X4516

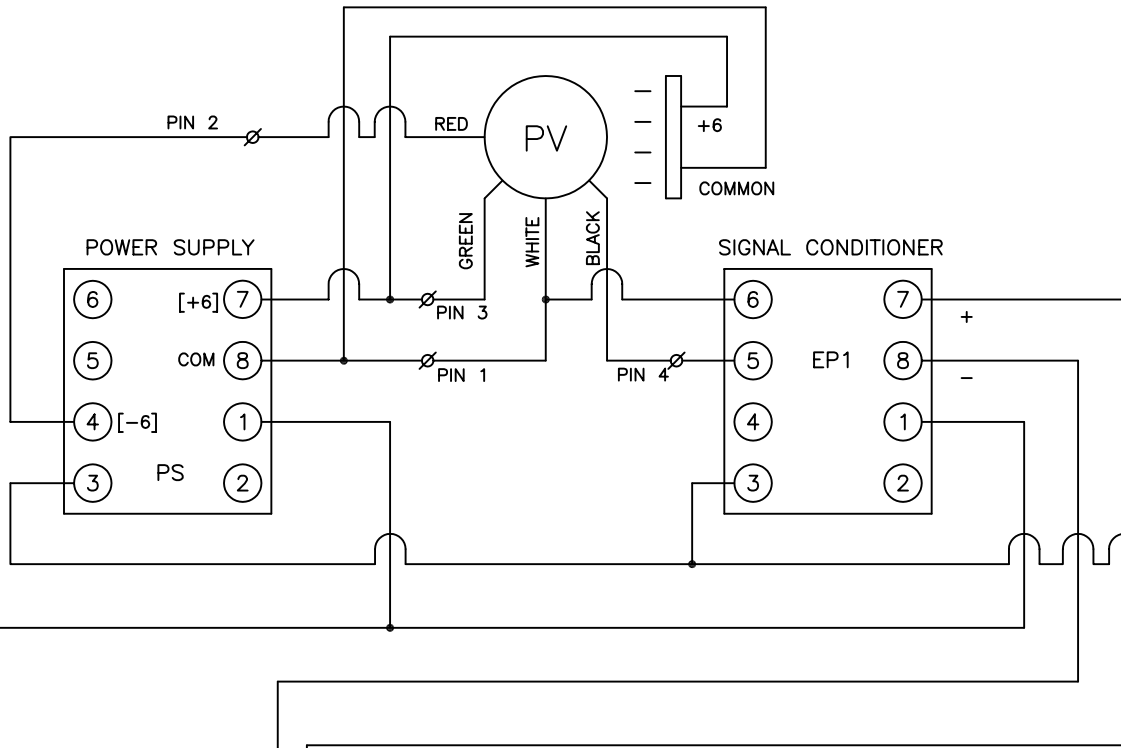
ASA PUMP MOTOR
3/4 HP @ 460 VAC 1.4 FLA
CLASS F INSULATION 1.15 SF
RELIANCE ELECTRIC P56X4516



MODEL: A*-3000/CS-3000IL
 CUSTOMER: xxxxx
 CUSTOMER P.O. NO.: xxxxx
 NCI PROJECT: TYPICAL
 SCHEMATIC NO.: NCI-091703-1A REV. A
 SHEET 2 OF 7

1

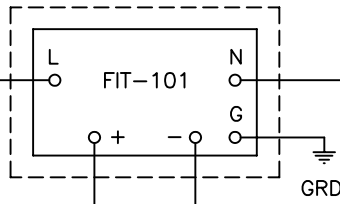
X2



EMULSION QUALITY SENSOR ELECTRONICS

SHLD EMULSION QUALITY MONITOR
 403+ 4-20 VDC INPUT TO 0:4.0/2
 403- 4 mA = 6.00
 20 mA = 0.00

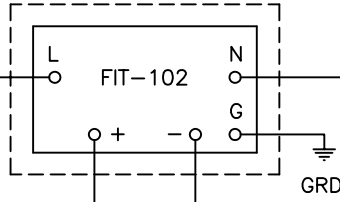
LOCATED ON SKID



PRIMARY WATER FLOW
 4-20 mA INPUT TO 1:4.0/0
 4 mA = 0.0 GPM
 20 mA = 3.0 GPM

SHLD
 400+
 400-

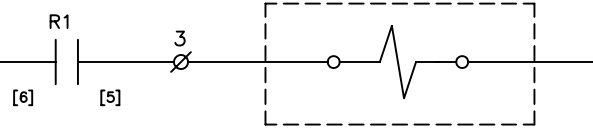
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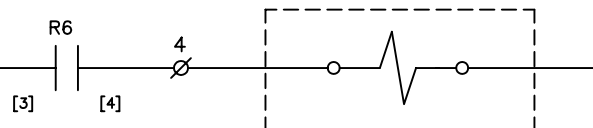
SECONDARY WATER FLOW
 4-20 mA INPUT TO 1:4.0/1
 4 mA = 0.0 GPM
 20 mA = 36.0 GPM

SHLD
 401+
 401-

DILUTION WATER VALVE
LOCATED ON SKID

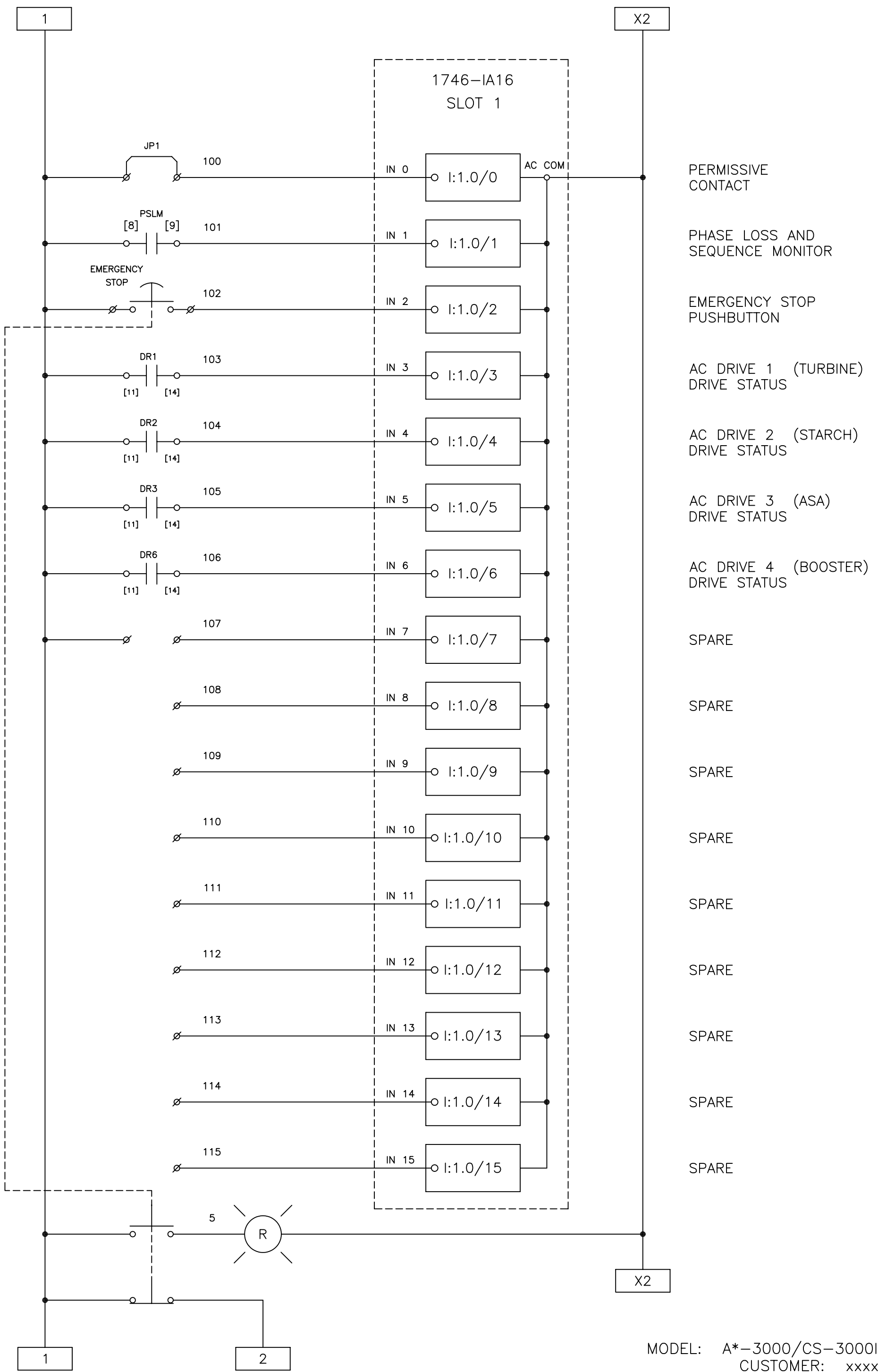


INSTRUMENT AIR VALVE
LOCATED ON SKID

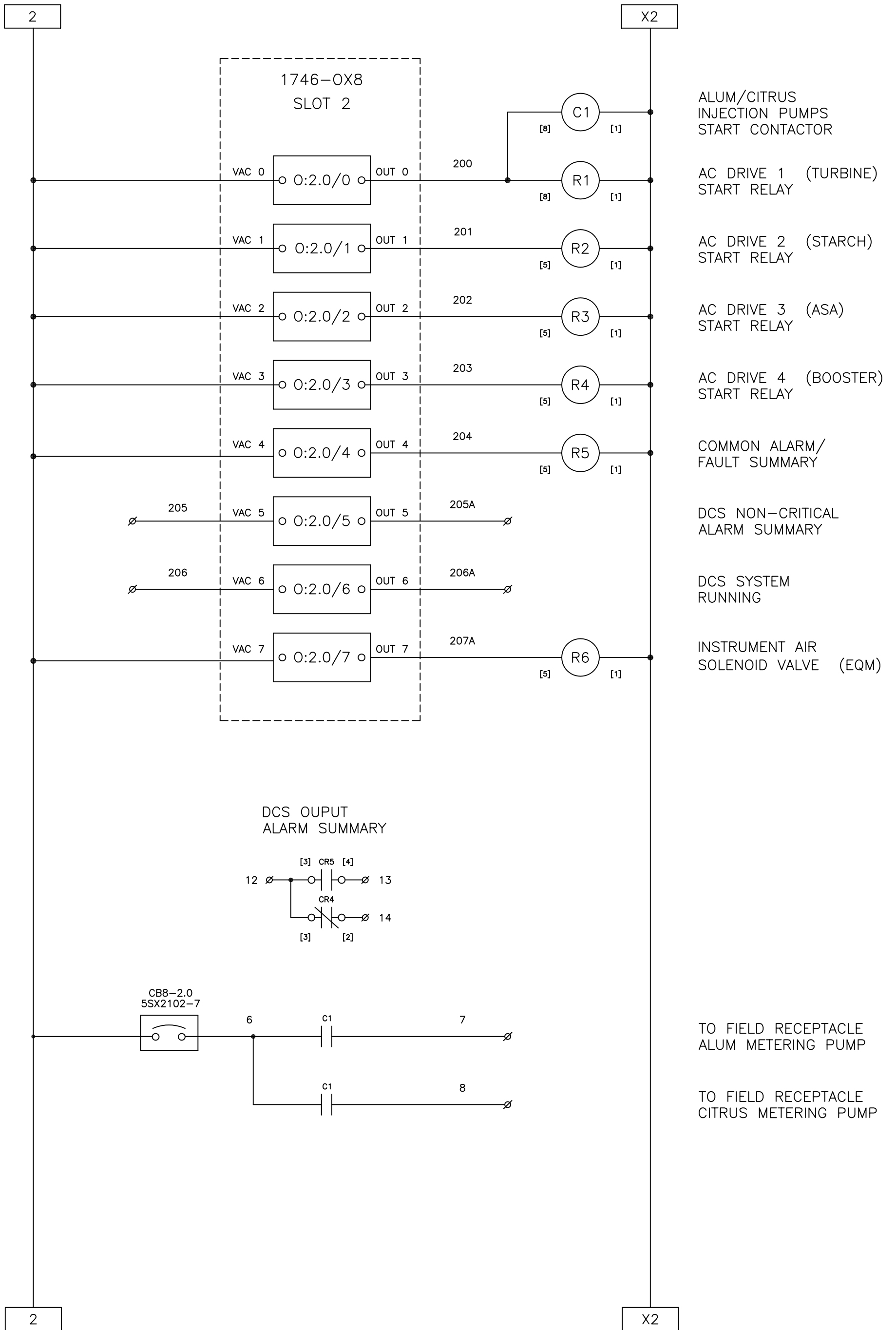


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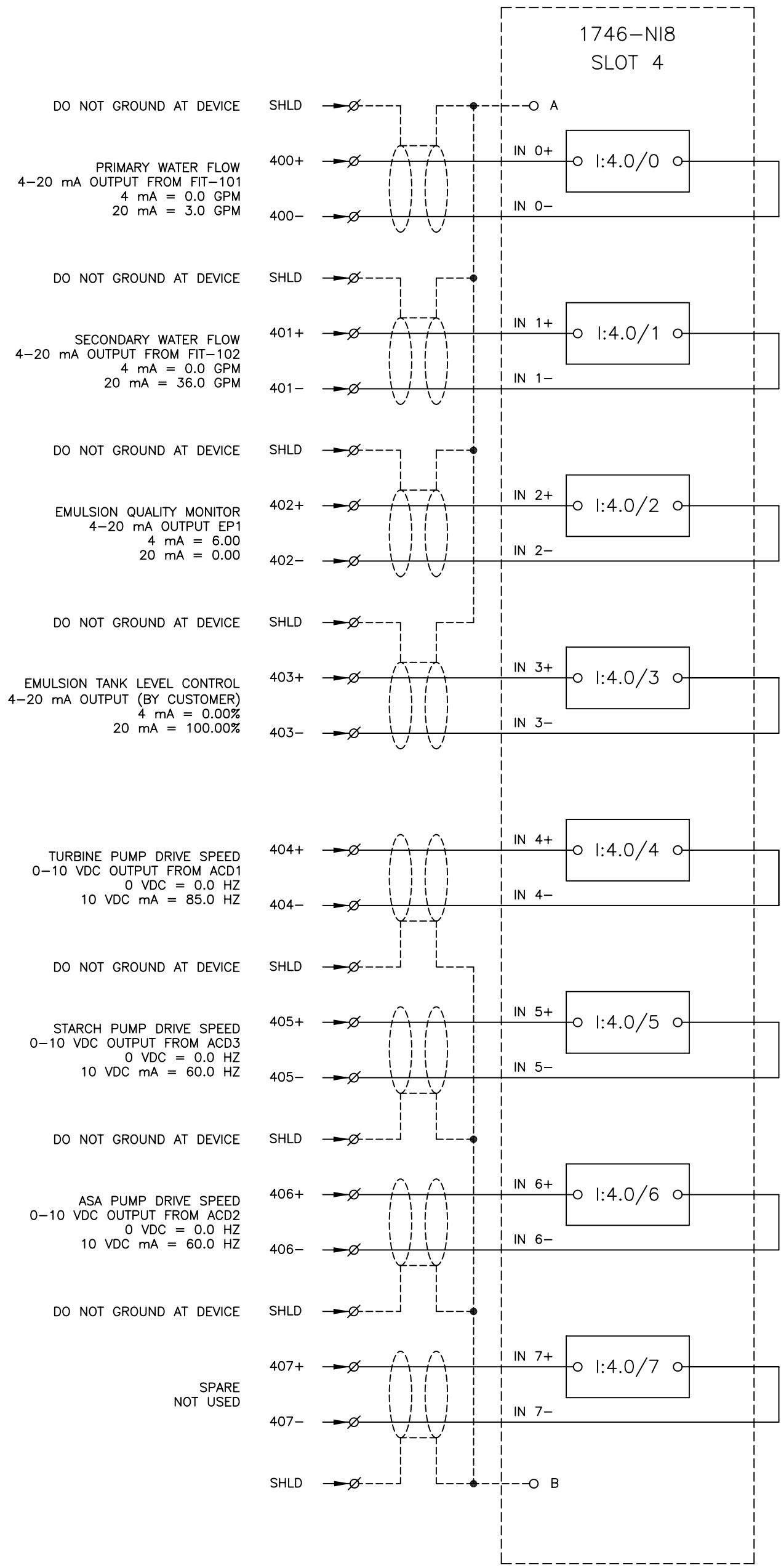
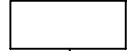
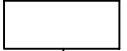
X2



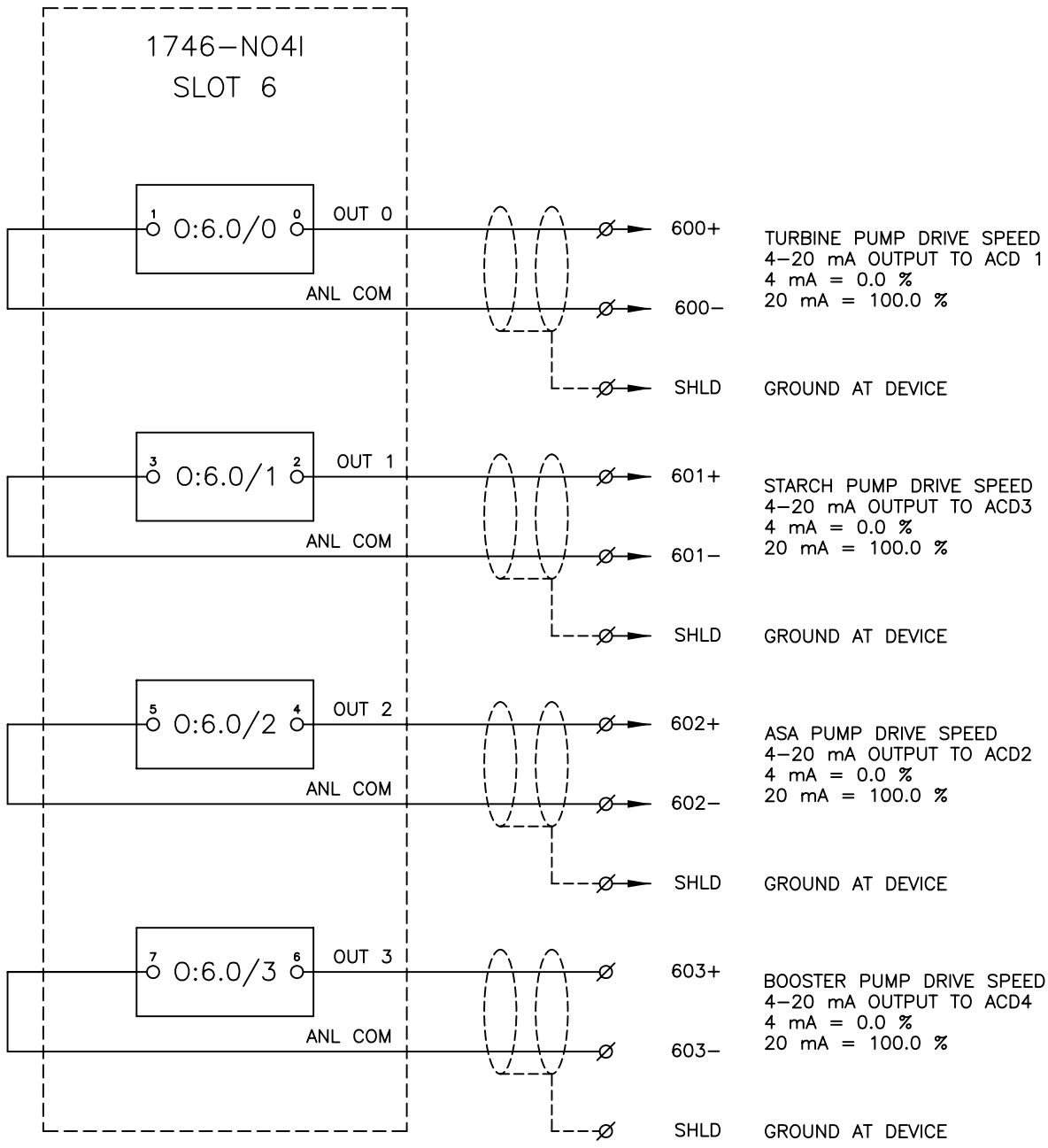
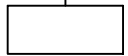
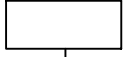
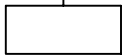
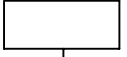
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 SHEET 4 OF 7

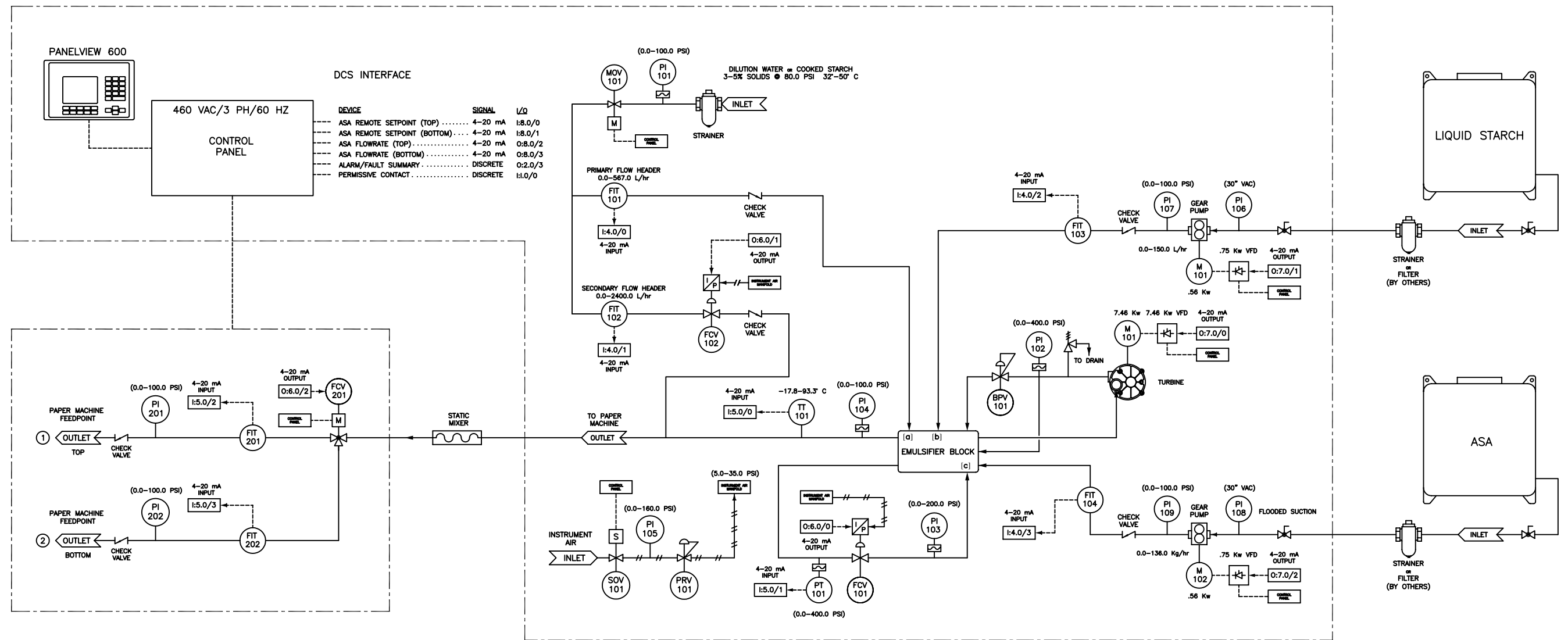


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 SHEET 5 OF 7



MODEL: A*-3000/CS-3000IL
 CUSTOMER: xxxxx
 CUSTOMER P.O. NO.: xxxxx
 NCI PROJECT: TYPICAL
 SCHEMATIC NO.: NCI-091703-1A REV. A
 SHEET 6 OF 7





PIPING AND INSTRUMENTATION DIAGRAM

A*3000/CS-3000-IL EMULSIFICATION SYSTEM (100)

DEVICES

- PI-101 WATER/COOKED STARCH INLET PRESSURE GAUGE
- PI-102 TURBINE PUMP DISCHARGE PRESSURE GAUGE
- PI-103 PRIMARY WATER/COOKED STARCH PRESSURE GAUGE
- PI-104 EMULSION DISCHARGE PRESSURE GAUGE
- PI-105 INSTRUMENT AIR INLET PRESSURE GAUGE
- PI-106 LIQUID STARCH PUMP INLET SUCTION GAUGE
- PI-107 LIQUID STARCH PUMP DISCHARGE GAUGE
- PI-108 ASA PUMP INLET SUCTION GAUGE
- PI-109 ASA PUMP DISCHARGE GAUGE
- M-101 TUBINE PUMP MOTOR
- M-102 LIQUID STARCH PUMP MOTOR
- M-103 ASA PUMP MOTOR
- MOV-1 INLET WATER/COOKED STARCH MOTORIZED VALVE
- SOV-1 INSTRUMENT AIR SOLENOID VALVE
- FIT-101 PRIMARY WATER/COOKED STARCH FLOW INDICATING TRANSMITTER
- FIT-102 SECONDARY WATER/COOKED STARCH FLOW INDICATING TRANSMITTER
- FIT-103 LIQUID STARCH FLOW INDICATING TRANSMITTER
- FIT-104 ASA FLOW INDICATING TRANSMITTER
- FCV-101 PRIMARY WATER/COOKED STARCH FLOW CONTROL VALVE
- FCV-102 SECONDARY WATER/COOKED STARCH FLOW CONTROL VALVE
- BPV-101 TURBINE BACK PRESSURE REGULATOR VALVE
- PRV-101 INSTRUMENT AIR PRESSURE REGULATOR VALVE
- TT-101 EMULSION TEMPERATURE TRANSMITTER
- PT-101 TURBINE PRESSURE TRANSMITTER

DISCRETE INPUTS

I:1.0/0 DCS PERMISSIVE CONTACT (RELAY INPUT)

DISCRETE OUTPUTS

O:2.0/3 DCS FAULT/ALARM SUMMARY (RELAY OUTPUT)

ANALOG INPUTS

- I:4.0/0 PRIMARY WATER/COOKED STARCH FLOW 4-20 mA SIGNAL (FIT-101)
- I:4.0/1 SECONDARY WATER/COOKED STARCH FLOW 4-20 mA SIGNAL (FIT-102)
- I:4.0/2 LIQUID STARCH FLOW 4-20 mA SIGNAL (FIT-103)
- I:4.0/3 ASA FLOW 4-20 mA SIGNAL (FIT-104)
- I:4.0/4 EMULSION TEMPERATURE 4-20 mA SIGNAL (TT-101)
- I:4.0/5 TURBINE PRESSURE 4-20 mA SIGNAL (PT-101)

ANALOG OUTPUTS

- O:6.0/0 PRIMARY WATER/COOKED STARCH FLOW CONTROL VALVE 4-20 mA SIGNAL (FCV-101)
- O:6.0/1 SECONDARY WATER/COOKED STARCH FLOW CONTROL VALVE 4-20 mA SIGNAL (FCV-102)
- O:7.0/0 TURBINE PUMP AC FREQUENCY DRIVE 4-20 mA SIGNAL (ACD1)
- O:7.0/1 LIQUID STARCH PUMP AC FREQUENCY DRIVE 4-20 mA SIGNAL (ACD2)
- O:7.0/2 ASA PUMP AC FREQUENCY DRIVE 4-20 mA SIGNAL (ACD3)

FEEDPOINT DISTRIBUTION SKID (200)

DEVICES

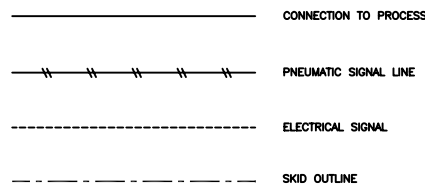
- PI-201 FEEDPOINT DISTRIBUTION PRESSURE GAUGE (TOP)
- PI-202 FEEDPOINT DISTRIBUTION PRESSURE GAUGE (BOTTOM)
- FCV-201 FEEDPOINT DISTRIBUTION 3-WAY MOTORIZED CONTROL VALVE
- FIT-201 FEEDPOINT DISTRIBUTION FLOW INDICATING TRANSMITTER (TOP)
- FIT-202 FEEDPOINT DISTRIBUTION FLOW INDICATING TRANSMITTER (BOTTOM)

ANALOG INPUTS

- I:4.0/6 FEEDPOINT DISTRIBUTION FLOW (TOP) 4-20 mA SIGNAL (FIT-201)
- I:4.0/7 FEEDPOINT DISTRIBUTION FLOW (BOTTOM) 4-20 mA SIGNAL (FIT-202)

ANALOG OUTPUTS

- O:6.0/2 EMULSION DOSING 3-WAY FLOW CONTROL VALVE 4-20 mA SIGNAL (FCV-201)
- I:8.0/0 DCS ASA CHEMICAL SETPOINT (TOP) 4-20 mA SIGNAL
- I:8.0/1 DCS ASA CHEMICAL SETPOINT (BOTTOM) 4-20 mA SIGNAL
- O:8.0/2 DCS ASA CHEMICAL FLOWRATE (TOP) 4-20 mA SIGNAL (FIT-201)
- O:8.0/3 DCS ASA CHEMICAL FLOWRATE (BOTTOM) 4-20 mA SIGNAL (FIT-202)



NORCHEM INC. 8910 W. 192nd STREET MOKENA, ILLINOIS 60448		
A	FOR INFORMATION ONLY	01-30-03
SYM.	REVISIONS	DATE
CUSTOMER	NORCHEM INC. MOKENA, IL 60448	
DESCRIPTION	NORCHEM A*3000/CS-3000-IL ASA EMULSIFIER PIPING & INSTRUMENT DIAGRAM	
CONTRACT NUMBER	-	
PROJECT NUMBER	TYPICAL	DRAWING NUMBER NCI-0505000-1
REV	A	

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DRAWN	RWD
CHECKED	RWD
APP'D	RWD
CADFILE	A_3000_PID_SPEC
SHT. OF	1 1
SCALE	NONE