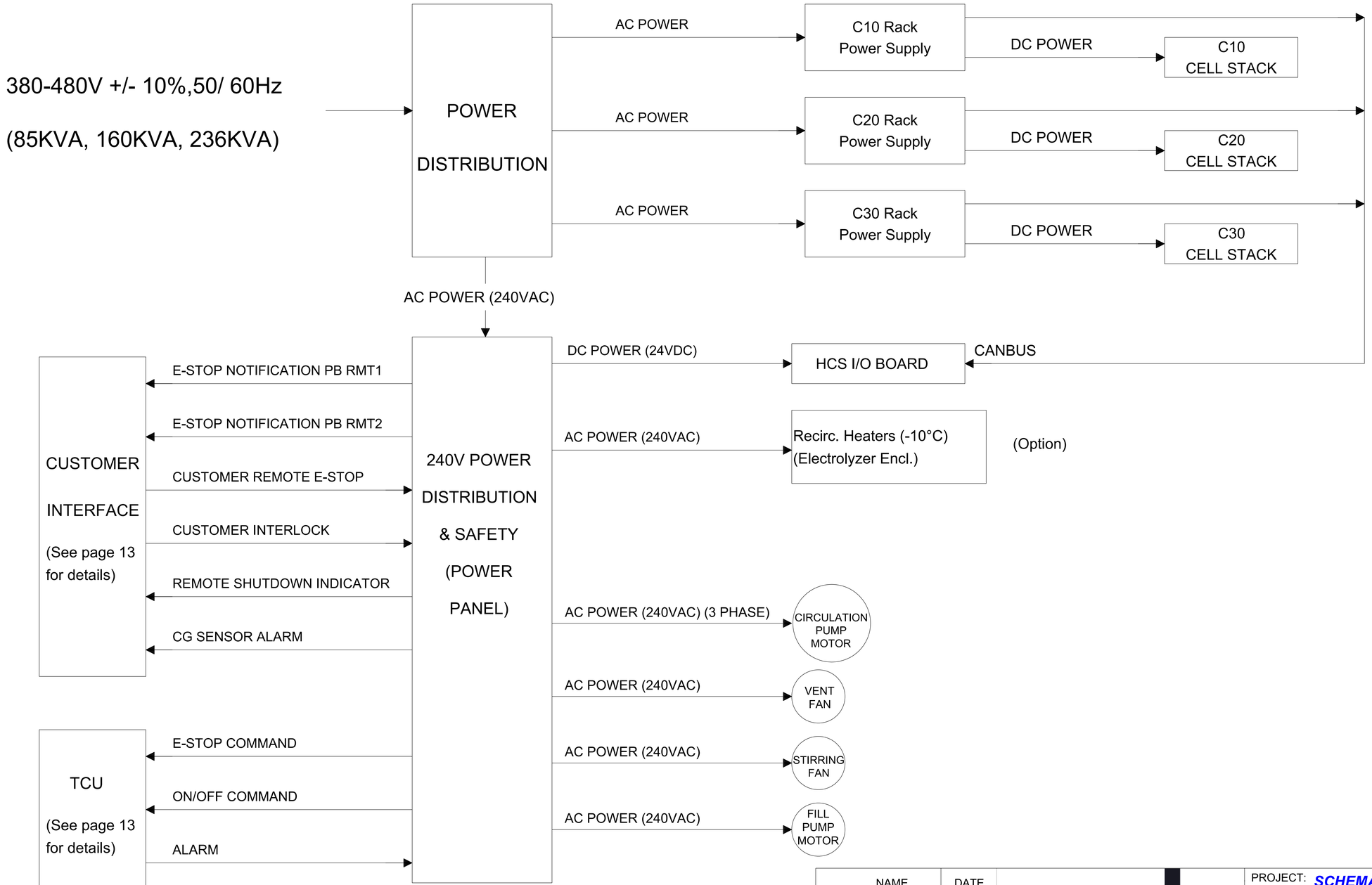
CRP:	Rev:	Date:	Description:	By:
010650	1	05-01-2018	Initial Release - Pre-Production	Zawacki K.
010926	A	10-19-2018	Initial Release	Zawacki K.
011122	B	03-08-2019	Pre-production redlines	Zawacki K.
011417	C	11-21-2019	TR1 and TR2 terminal update, update OL4 setpoint, correct Ref. table	Zawacki K.



	NAME	DATE
DRAWN:	**Zawacki K.**	**11/21/19**
CKD:	**Morson A.**	**11/21/19**
APPR:	**Bailey B.**	**11/21/19**

nel

PROJECT: ***SCHEMATIC ELECTRICAL C SERIES 3***

SUB-SYSTEM: ***SYSTEM_DIAGRAM*** | DRAWING-NO.: ***XPE2871***

PAGE DESCRIPTION: ***SYSTEM_DIAGRAM*** | REV.: ***C*** | SIZE: ***D***

PAGE: ***1*** OF ***24***

ELECTROLYZER ENCLOSURE

ELECTROLYZER SIDE

CONTROLLER PANEL
P/N: 54-0502-0135
(See Page 14-20)

TB17
Internal Sig. & 24VDC

TB18 & TB19
Internal Sig. & 24VDC RTN

HCS CTRL BOARD

J12 — P12
J14 — P14
P/N: 54-0401-0145

ETHERNET

P/N: 54-0401-0171
P15 — J15
P16 — J16
P17 — J17

P/N: 54-0401-0170

P/N: 54-0401-0173 (AC POWER HARNESS)

POWER PANEL
P/N: 54-0502-0134
(See Page 6-13)

Internal AC
TB7
TB8
TB9

TB10
HTR

TB15
Internal Sig/24VDC

TB11A, TB11B TB11C
Internal 24VDC RTN

TB14
TB for Laptop

TB12
To CTRL Panel

TB16
Customer Interface

TB13
Sig. & DC Pwr

OL4 - OL6, OL9

TB1A — TB1B
P/N: 54-0401-0147

CB1

POWER SUPPLY ENCLOSURE
P/N: 54-0502-0136
(See Page 5 & 12)

TB5
Internal Sig/24VDC

TB6
Internal 24VDC RTN

TB2
TB3
TB4
External AC

	NAME	DATE
DRAWN:	**Zawacki K.**	**11/21/19**
CKD:	**Morson A.**	**11/21/19**
APPR:	**Bailey B.**	**11/21/19**

PROJECT: ***SCHEMATIC ELECTRICAL C SERIES 3***

SUB-SYSTEM: ***SYSTEM_DIAGRAM*** | DRAWING-NO.: ***XPE2871***

PAGE DESCRIPTION: ***TBs & CONNECTORS LOCATION*** | REV.: ***C*** | SIZE: ***D***

PAGE: ***2*** OF ***24***

1. AC wires are 14AWG, DC wires are 16AWG and instrumentation cables are 22AWG unless otherwise noted. Ground wires are the same gauge as the supply wire unless otherwise noted.

2. AC wires are black, DC wires are blue or white/blue, instrumentation cables are various color and ground wires are green/yellow unless otherwise noted

3. All conductors copper & rated greater or equal to 90°C unless otherwise noted

4. System temp. rating 5°C to 50°C

5 CG121 (MSA) Program Status/Setup Notes: (Page 8)

1. ALM1: 25% LATCHING UP ENERGIZED
2. ALM2: 25% NON-LATCHING UP ENERGIZED
3. FAULT: LATCHING ENERGIZED
4. SPAN GAS LEVEL @ XX%: 50

Reference: Consult MSA ULTIMAX Instruction Manual for Setup Instructions

6 Water Flow Switch: (Page 8) Set at C10, C20, and C30 lower level assembly.

7 Transformer Voltage Lines On H1, H2, H3 Configuration: (Page 6)
This table is for reference, refer to transformer installation instructions:

INPUT VOLT.	CONNECT TAPS	LINES IN
380V	H1 to 9, H2 to 1, H3 to 5	H1 - H2 - H3
400V	H1 to 10, H2 to 2, H3 to 6	H1 - H2 - H3
415V	H1 to 11, H2 to 3, H3 to 7	H1 - H2 - H3
480V	H1 to 12, H2 to 4, H3 to 8	H1 - H2 - H3

8 DS1 FUSES CONFIGURATION: (Page 5)

C10 =	200A
C20 =	350A
C30 =	500A

9. Device settings:

* TR1: % = 30, X = 100s
* TR2: % = 20, X = 300m
* R2 = INST
* OL2 = 0.5 Amps
* OL4: 60 HZ: 4.8 Amps, except C30 = 6 Amps
  50 HZ: 5.4 Amps, except C30 = 6 Amps
* OL5 = 0.5 Amps
* OL7 = 8.5 Amps
* OL6 = 2.7 Amps (60 Hz System) / 4.0 Amps (50 Hz System)
* OL9 = 0.5 Amps
* OL12 = 4.0 Amps
* CR1: Low Voltage = (<U = 215V);Asym = 10%;Dip1 = Off
  High Voltage = (>U = 265V); T = 0 sec;Dip2 = Off

10 Configuration options for Heater HTR126A, B, C, D (Page 7 & 11). TAS164 and TAS167 used with heater option. If heater option not installed, remove wire 242 from TB13-22 and label "spare" (-5°C to 40°C)

11 TAS102F, TAS102P, TAS166A, TAS166B & TAS166C = 82° C+/-5°C (Page 11, 12)

12. Page and Line Numbering Guide:

13 TB1A-20, 21; TB1B-20, 21 (Page 11); TB12-33_36; TB13-31_34 (Page 20) are spare terminal blocks

14 Units upgraded with kit do not use bulkhead connector (Page 18)

15 Jumper required if not in use (Page 13)

16 C20 and C30 power supply racks and components are installed only with C20 or C30 cell stacks.
Wire 318 not used in C10. Wire 322 connects directly to M21 via terminal 32. (Page 12)
Wire 320 not used in C20. Wire 322 connects directly to M21 via terminal 32. (Page 12)

17 Set M21, M22, M23 PLC enable switch to ON (Page 6)

	NAME	DATE
DRAWN:	Zawacki K.	11/21/19
CKD:	Morson A.	11/21/19
APPR:	Bailey B.	11/21/19

nel

PROJECT: *SCHEMATIC ELECTRICAL C SERIES 3*

SUB-SYSTEM: *SYSTEM_DIAGRAM* | DRAWING-NO.: *XPE2871*

PAGE DESCRIPTION: *NOTES* | REV.: *C* | SIZE: *D*

PAGE: *3* OF *24*

380-480V +/- 10%, 50/60Hz

8

DS1 Main Disconnect Switch

L1 T1
L2 T2
L3 T3

2L1 /10AWG
2L2 /10AWG
2L3 /10AWG
TB_G 10AWG

SUP1
3 Phase Surge Protector
277/480V 3ph Wye

Part Ref.:		L1-1 L1-2	L2-1 L2-2	L3-1 L3-2
SUP1		L1-2 L1-3 1100	L2-2 L2-3 1100	L3-2 L3-3 1102

Rack C10 Power Supply

TB_L1 3L1 CBA L1 T1 4L1 M21 1L1 2T1 1/0 AWG L1
TB_L2 3L2 L2 T2 4L2 3L2 4T2 1/0 AWG L2
TB_L3 3L3 L3 T3 175A 4L3 5L3 6T3 523 1/0 AWG L3
TB_G 3G /6AWG GND
Rack C10 Circuit Breaker
RJ45 Location:
TB_G 6AWG

500kcmil + + + + - - - -
500kcmil

CELL STACK
DC(+)
DC(-)
C10/C20/C30

ELECTROLYZER ENCLOSURE

Rack C 20 Power Supply

TB_L1 5L1 CBB L1 T1 6L1 M22 1L1 2T1 1/0 AWG L1
TB_L2 5L2 L2 T2 6L2 3L2 4T2 1/0 AWG L2
TB_L3 5L3 L3 T3 175A 6L3 5L3 6T3 524 1/0 AWG L3
TB_G 5G /6AWG GND
Rack C20 Circuit Breaker
RJ45 Location: 1821

+ + + + - - - -

Rack C30 Power Supply

TB_L1 7L1 CBC L1 T1 8L1 M23 1L1 2T1 1/0 AWG L1
TB_L2 7L2 L2 T2 8L2 3L2 4T2 1/0 AWG L2
TB_L3 7L3 L3 T3 175A 8L3 5L3 6T3 525 1/0 AWG L3
TB_G 7G /6AWG GND
Rack C30 Circuit Breaker
RJ45 Location: 1825

+ + + + - - - -

CBD

9L1 /10AWG L1 T1 11L1 10AWG T1_L1/5.03
9L2 /10AWG L2 T2 11L2 10AWG T1_L2/5.03
9L3 /10AWG L3 T3 11L3 10AWG T1_L3/5.03
25A 10AWG T1_GND/5.03

TXFM Circuit Breaker

POWER SUPPLY ENCLOSURE

	NAME	DATE
DRAWN:	**Zawacki K.**	**11/21/19**
CKD:	**Morson A.**	**11/21/19**
APPR:	**Bailey B.**	**11/21/19**

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PROJECT: ***SCHEMATIC ELECTRICAL C SERIES 3***

SUB-SYSTEM: ***PS_ENCLOSURE*** | DRAWING-NO.: ***XPE2871***

PAGE DESCRIPTION: ***AC DISTRIBUTION*** | REV.: ***C*** | SIZE: ***D*** | PAGE: ***4*** OF ***24***

T1_GND/4:34
T1_L3/4:33
T1_L2/4:32
T1_L1/4:31
10AWG
11L3 10AWG
11L2 10AWG
11L1 10AWG

TXFM1 480 (or 380/400/415V) TO 240V

H1 X1 H2 X2 H3 X3

12L1 /10AWG
12L2 /10AWG
12L3 /10AWG

FU1-1 L1 T1
FU1-2 L2 T2
FU1-3 L3 T3
30AMP

13L1 /10AWG
13L2 /10AWG
13L3 /10AWG

TB2-1
TB3-1
TB4-1

18L3 /10AWG
18L2 /10AWG
18L1 /10AWG

7

4 Cond. 10AWG Cable
4 Cond. 10AWG Cable
4 Cond. 10AWG Cable

14L1
14L2

FU2-1 L1 T1
FU2-2 L2 T2
4AMP

15L1
15L3

M2
1L1 2T1 3L2 4T2 5L3 6T3
1106

OL2
2T1 1L1 2T1
4T2 3L2 4T2
6T3 5L3 6T3
0.5A Setting
HX Overload RLY

16L1
16G
16L3

TB20-1
TB20-3
TB20-2

17L1
17G
17L3

FAN161
BLK
GND
YEL
PS Encl. HX

Part Ref.: OL2	97 98	95 96
		1104

54L1
54L2
54L3

CB1 L1 T1, L2 T2, L3 T3
30A
240VAC

19L1 /10AWG
19L2 /10AWG
19L3 /10AWG

EMI1 L1 L2 L3 LINE — L1' L2' L3' LOAD
EMI Filter, 3PH, 30A

20L1 /10AWG
20L2 /10AWG
20L3 /10AWG

TB7-1
TB8-1
TB9-1

21L1
21L2
21L3

FU3-1 L1 T1
FU3-2 L2 T2
FU3-3 L3 T3
0.5AMP

22L1
22L2
22L3

CR1
L1
L2
L3
Under/Over Volt. RLY

Part Ref.: CR1	15 18	25 28
	1614	
	16 18	26 28

CONTACTOR SUPPLY VOLTAGE

C10 Contactor
C20 Contactor
C30 Contactor

FU13-1 L1 T1
FU13-2 L2 T2
FU13-3 L3 T3
4AMP

55L1
55L2
55L3

TB22-1
TB22-2
TB23-1
TB23-2
TB24-1
TB24-2

56L1 **M21** A1 A2 56L2
57L2 **M22** A1 A2 57L3
58L3 **M23** A1 A2 58L1

17

Part Ref.: M21	1L1 3L2 5L3	2T1 4T2 6T3	408	13 14	43 44	21 22	31 32	1117	C	+ -	1118
Part Ref.: M22	1L1 3L2 5L3	2T1 4T2 6T3	416	13 14	43 44	21 22	31 32	1117	C	+ -	1120
Part Ref.: M23	1L1 3L2 5L3	2T1 4T2 6T3	424	13 14	43 44	21 22	31 32	1117	C	+ -	1121

Part Ref.: OL4	97 98	95 96
		915
Part Ref.: OL5	97 98	95 96
		1733
Part Ref.: OL6	97 98	95 96
		1730

TB7-2
TB8-2
TB9-2

23L1
23L2
23L3

FU4-1 L1 T1
FU4-2 L2 T2
FU4-3 L3 T3
20AMP

24L1
24L2
24L3

M4
1L1 2T1 3L2 4T2 5L3 6T3
915

OL4
2T1 1L1 2T1
4T2 3L2 4T2
6T3 5L3 6T3
4.25A/5.7A Setting
Circul. Pump Overload RLY

14 AWG
14 AWG
14 AWG
14 AWG

CP205
U1
W2
V1
U2
W1
V2
GND
M

Circulation Pump 60Hz/50Hz

Grundfos - C10 50/60Hz, C20 50/60Hz, and C30 60Hz

Goulds - C30 50Hz
Goulds Wiring:

Jump wires 4, 5, and 6 together
U1 = 3
W2 = 9
V1 = 2
W2 = 8
W1 = 1
V2 = 7

TB7-2
TB8-2

26L1
26L2

FU5-1 L1 T1
FU5-2 L2 T2
4AMP

27L1
27L2

M5
1L1 2T1 3L2 4T2 5L3 6T3
1733

OL5
2T1 1L1 2T1
4T2 3L2 4T2
6T3 5L3 6T3
0.5A Setting
Ventilation Fan Overload RLY

28L1 /14AWG
28G /14AWG
28L2 /14AWG

FAN132
L
GND
N
Ventilation Fan

TB7-3
TB9-2

29L1
29L3

FU6-1 L1 T1
FU6-2 L2 T2
10AMP

30L1
30L3

M6
1L1 2T1 3L2 4T2 5L3 6T3
1728

OL6
2T1 1L1 2T1
4T2 3L2 4T2
6T3 5L3 6T3
2.7/4.0A Setting
Fill Pump Overload RLY

TB8/6.00
TB7/6.01
TB9/6.01

31L1 /14AWG
31L3 /14AWG
31G /14AWG

P505 A200 Fill Pump
1
2
A_BLK
5_RED
5_WHT
4_BRW
M
GND
1/3 HP (60/50Hz)
1725/1425 RPM
3.3/4.2 AMP

	NAME	DATE
DRAWN:	**Zawacki K.**	**11/21/19**
CKD:	**Morson A.**	**11/21/19**
APPR:	**Bailey B.**	**11/21/19**

nel

PROJECT: ***SCHEMATIC ELECTRICAL C SERIES 3***

SUB-SYSTEM: ***POWER_PANEL***

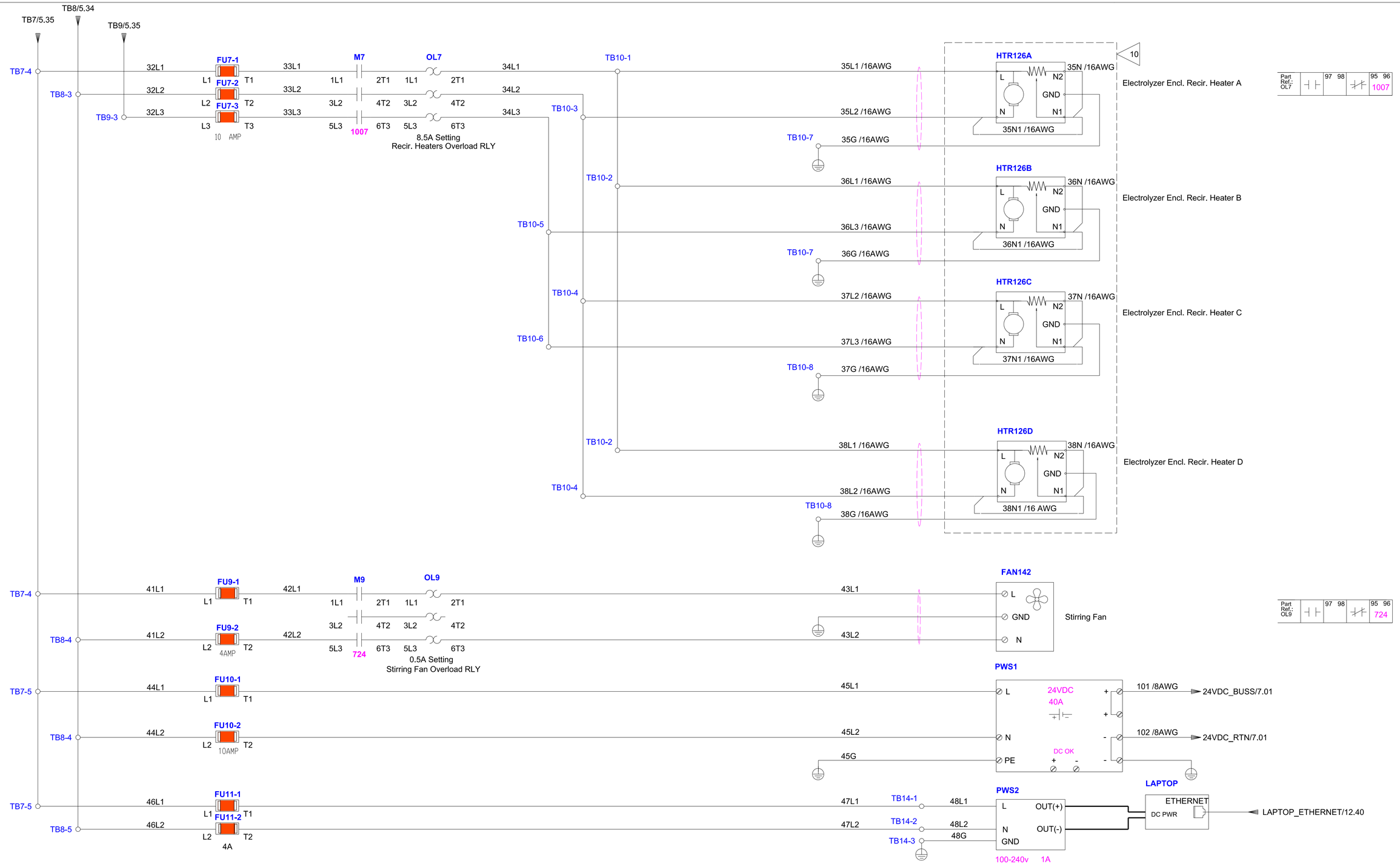
DRAWING-NO.: ***XPE2871***

PAGE DESCRIPTION: ***240VAC***

REV.: ***C***

SIZE: ***D***

PAGE: ***5*** OF ***24***



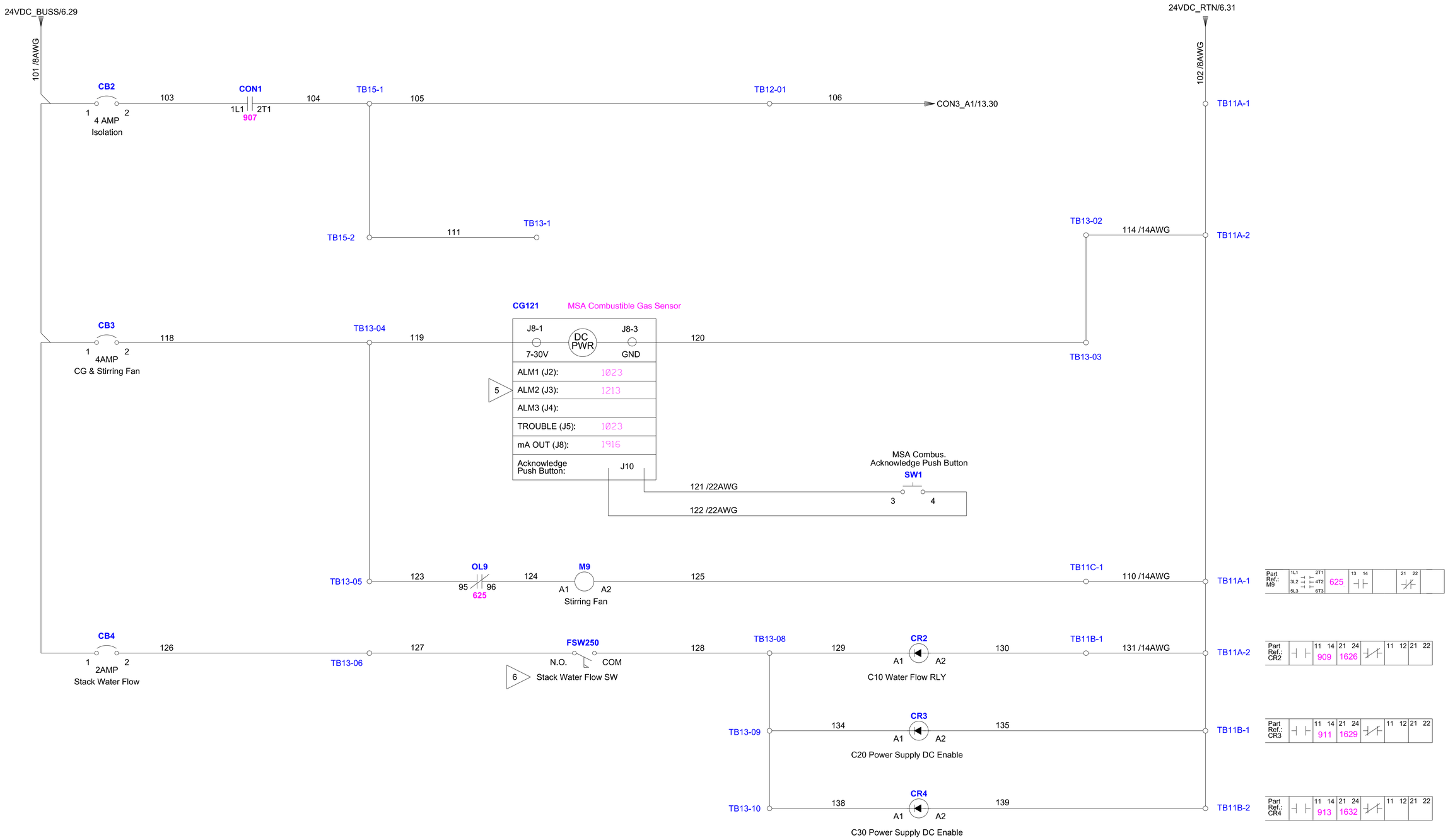
	NAME	DATE
DRAWN:	**Zawacki K.**	**11/21/19**
CKD:	**Morson A.**	**11/21/19**
APPR:	**Bailey B.**	**11/21/19**

PROJECT: ***SCHEMATIC ELECTRICAL C SERIES 3***

SUB-SYSTEM: ***POWER_PANEL*** | DRAWING-NO.: ***XPE2871***

PAGE DESCRIPTION: ***240VAC*** | REV.: ***C*** | SIZE: ***D***

PAGE: ***6*** OF ***24***



	NAME	DATE
DRAWN:	**Zawacki K.**	**11/21/19**
CKD:	**Morson A.**	**11/21/19**
APPR:	**Bailey B.**	**11/21/19**

PROJECT: ***SCHEMATIC ELECTRICAL C SERIES 3***

SUB-SYSTEM: ***POWER_PANEL***

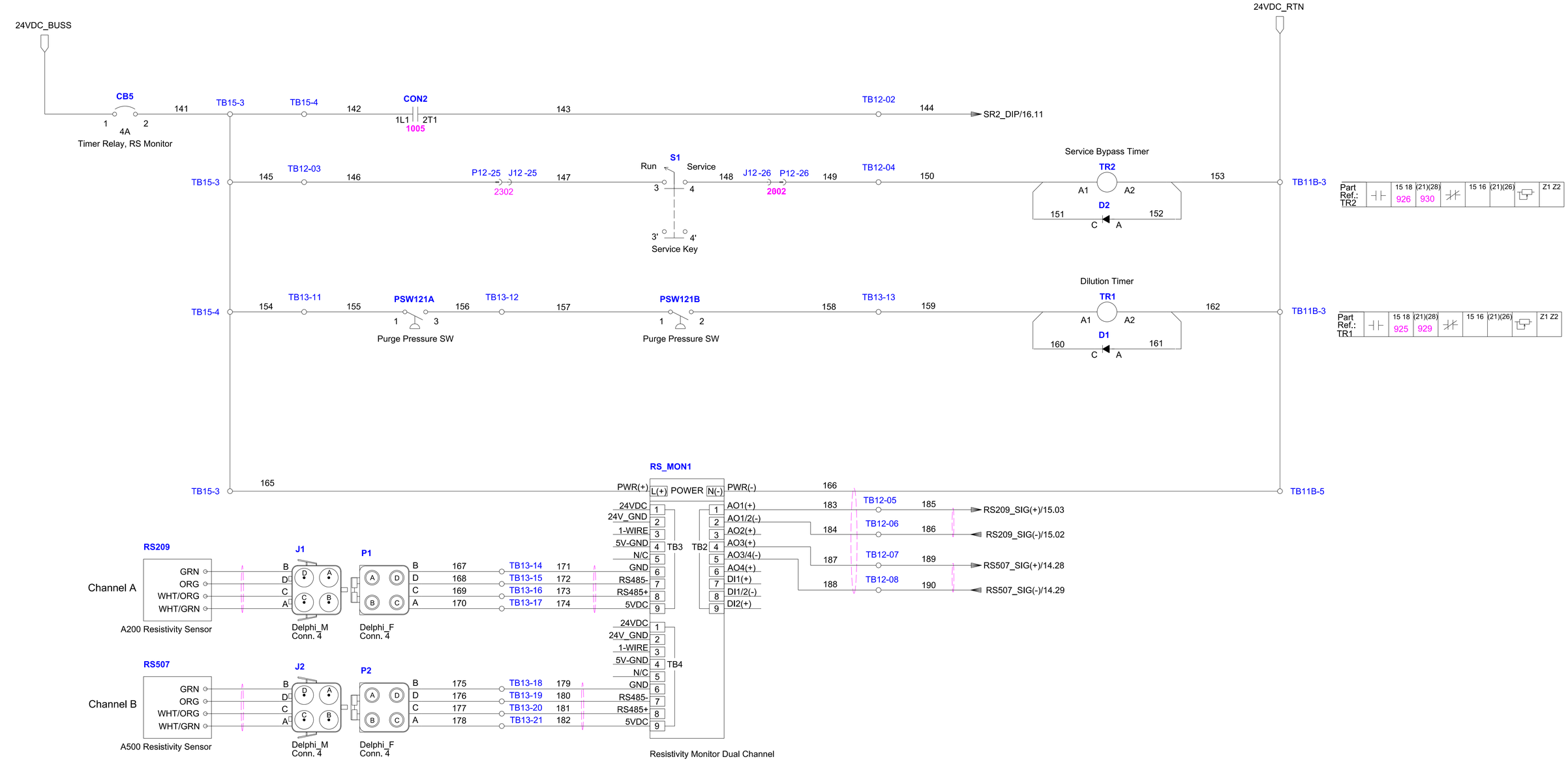
DRAWING-NO.: ***XPE2871***

PAGE DESCRIPTION: ***DC***

REV.: ***C***

SIZE: ***D***

PAGE: ***7*** OF ***24***



	NAME	DATE
DRAWN:	**Zawacki K.**	**11/21/19**
CKD:	**Morson A.**	**11/21/19**
APPR:	**Bailey B.**	**11/21/19**

PROJECT: ***SCHEMATIC ELECTRICAL C SERIES 3***

SUB-SYSTEM: ***POWER_PANEL***

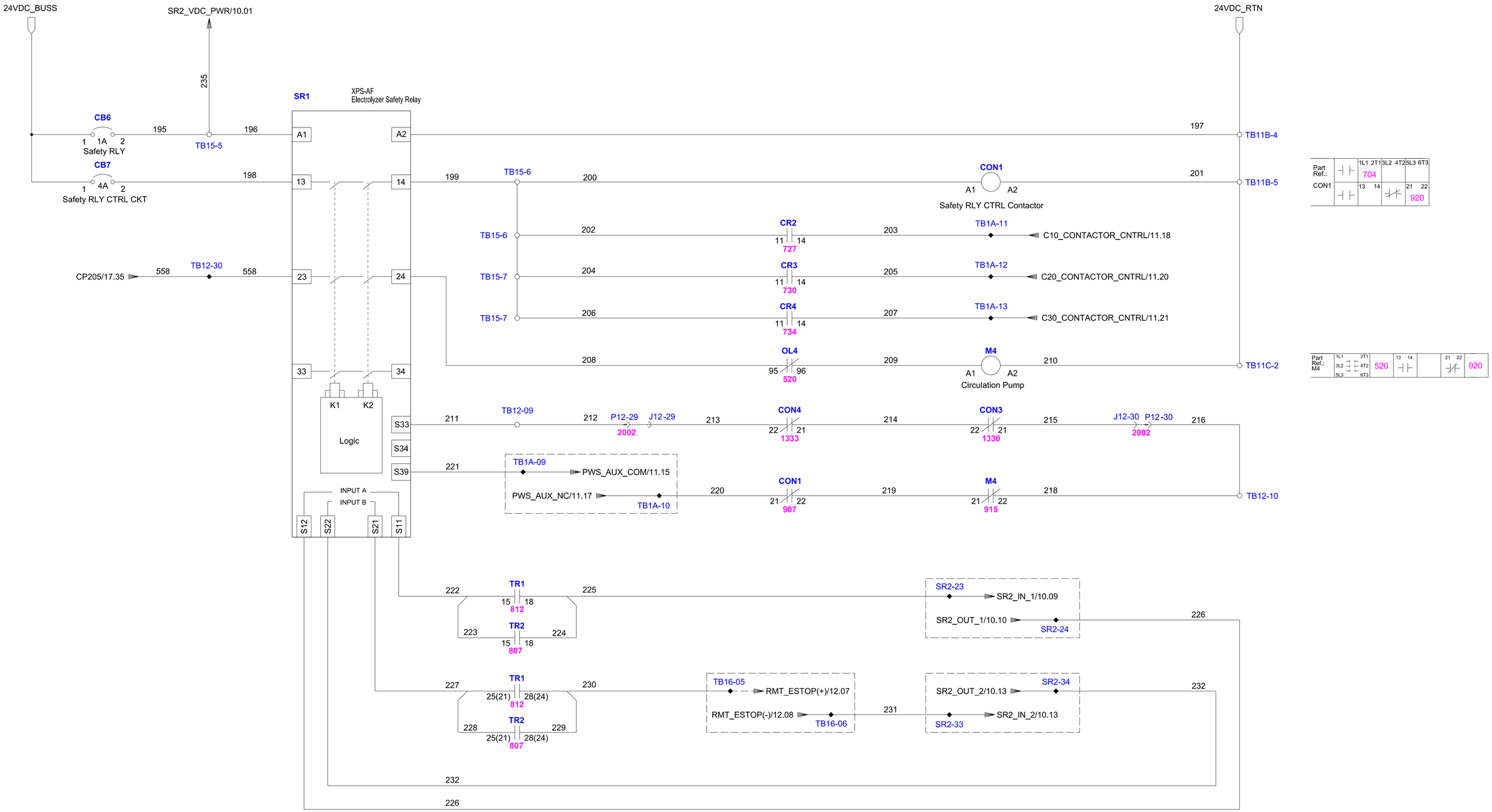
DRAWING-NO.: ***XPE2871***

PAGE DESCRIPTION: ***DC CIRCUITRY***

REV.: ***C***

SIZE: ***D***

PAGE: ***8*** OF ***24***



	NAME	DATE
DRAWN:	**Zawacki K.**	**11/21/19**
CKD:	**Morson A.**	**11/21/19**
APPR:	**Bailey B.**	**11/21/19**

PROJECT: ***SCHEMATIC ELECTRICAL C SERIES 3***

SUB-SYSTEM: ***POWER_PANEL***

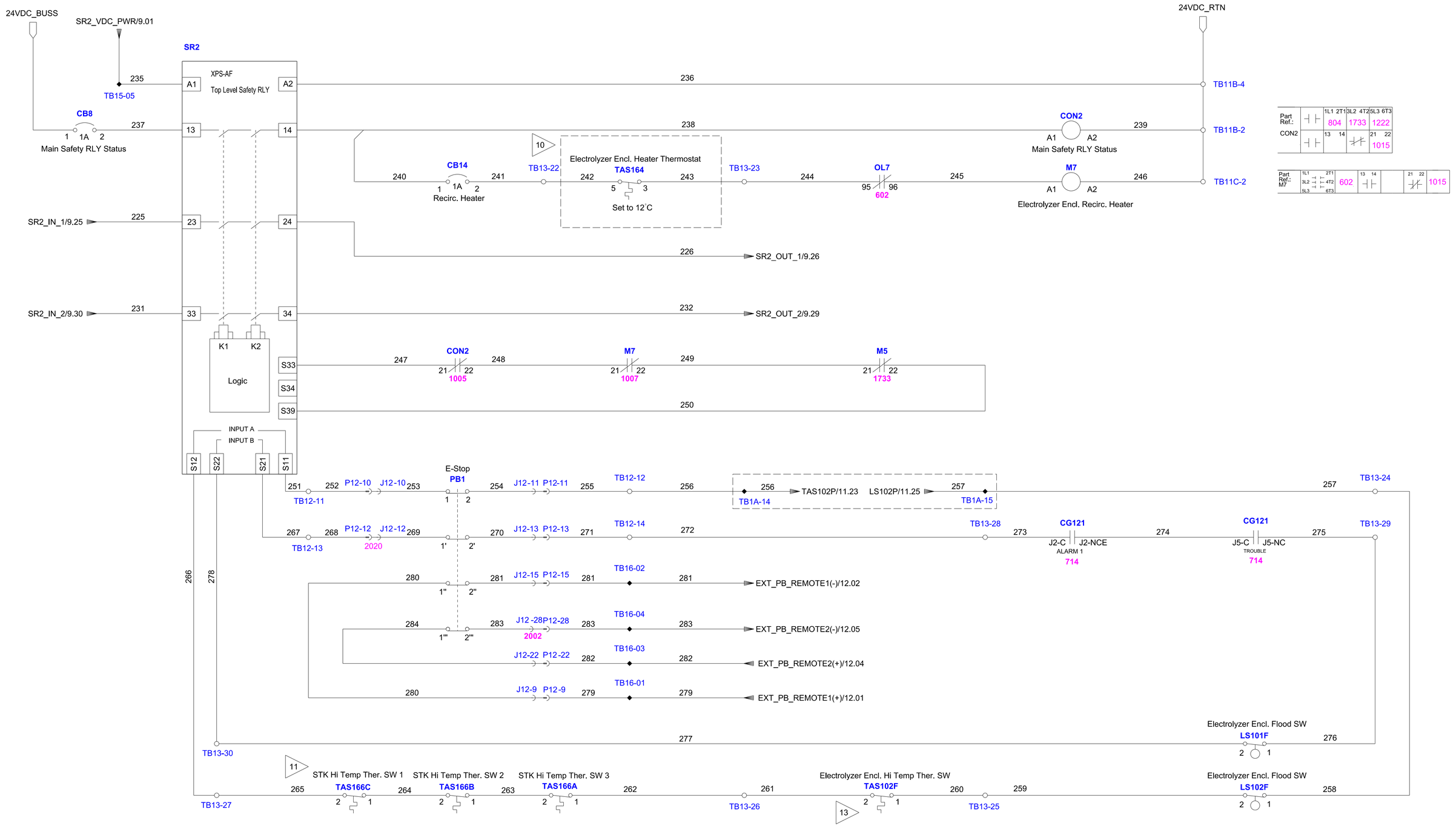
DRAWING-NO.: ***XPE2871***

PAGE DESCRIPTION: ***SAFETY_CIRCUIT_1***

REV.: ***C***

SIZE: ***D***

PAGE: ***9*** OF ***24***



	NAME	DATE
DRAWN:	**Zawacki K.**	**11/21/19**
CKD:	**Morson A.**	**11/21/19**
APPR:	**Bailey B.**	**11/21/19**

PROJECT: ***SCHEMATIC ELECTRICAL C SERIES 3***

SUB-SYSTEM: ***POWER_PANEL***

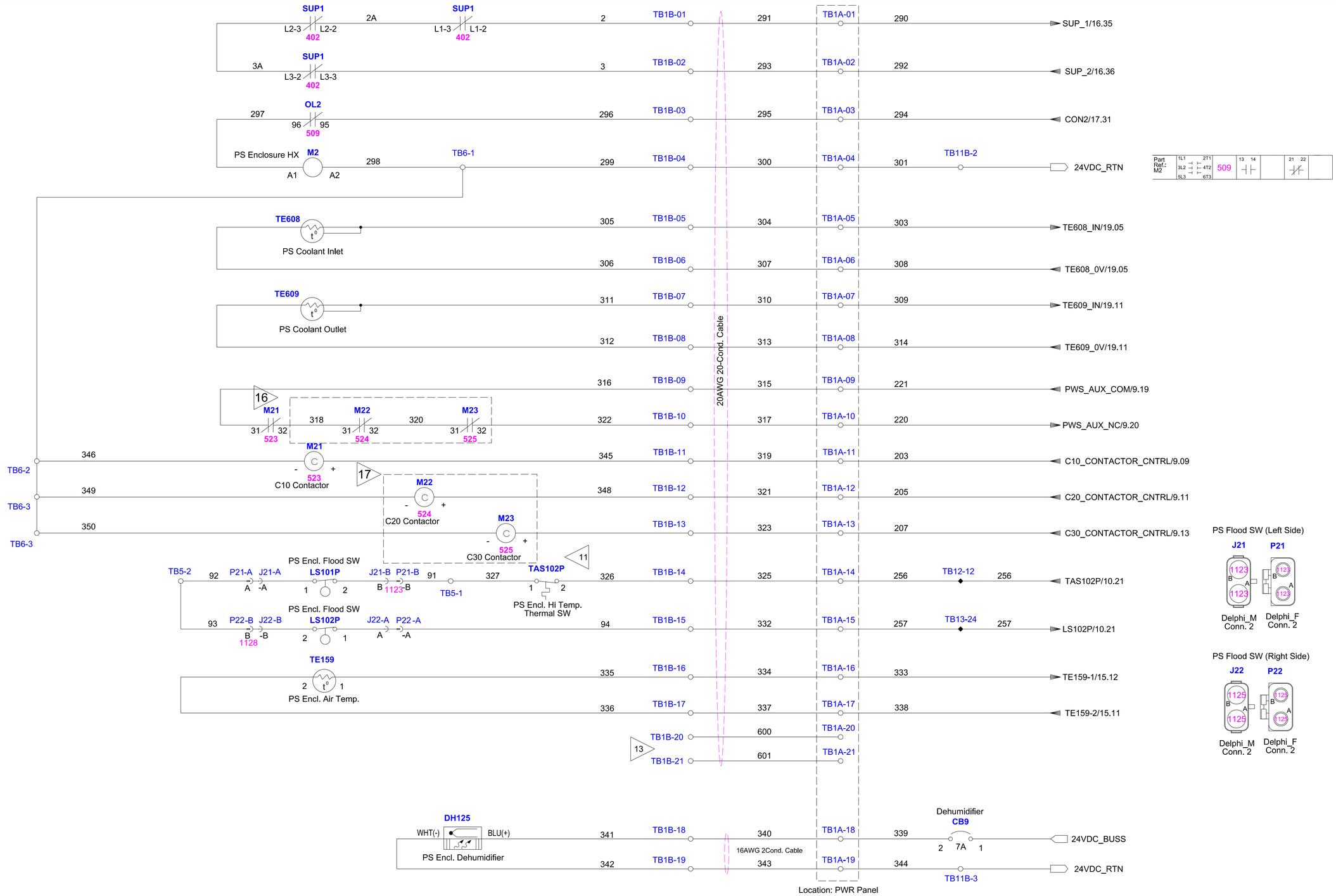
DRAWING-NO.: ***XPE2871***

PAGE DESCRIPTION: ***SAFETY_CIRCUITRY_2***

REV.: ***C***

SIZE: ***D***

PAGE: ***10*** OF ***24***



	NAME	DATE
DRAWN:	**Zawacki K.**	**11/21/19**
CKD:	**Morson A.**	**11/21/19**
APPR:	**Bailey B.**	**11/21/19**

PROJECT: ***SCHEMATIC ELECTRICAL C SERIES 3***

SUB-SYSTEM: ***PS_ENCLOSURE*** | DRAWING-NO.: ***XPE2871***

PAGE DESCRIPTION: ***PS PANEL & PWR PANEL CONNECTIONS*** | REV.: ***C*** | SIZE: ***D*** | PAGE: ***11*** OF ***24***

ELECTROLYZER E-STOP NOTIFICATION 1 Open Circuit = Stop	Output	Dry Contact 240Vac, 3A max 24VDC, 2A max	TB16-01	279	EXT_PB_REMOTE1(+)/10.30	
			TB16-02	281	EXT_PB_REMOTE1(-)/10.25	
ELECTROLYZER E-STOP NOTIFICATION 2 Open Circuit = Stop	Output	Dry Contact 240Vac, 3A max 24VDC, 2A max	TB16-03	282	EXT_PB_REMOTE2(+)/10.28	
			TB16-04	283	EXT_PB_REMOTE2(-)/10.27	
15 CUSTOMER REMOTE E-STOP Open Circuit = Stop	Input	24V, 0.5A Signal	TB16-05	230	RMT_ESTOP(+)/9.29	
			TB16-06	231	RMT_ESTOP(-)/9.30	
REMOTE SHUTDOWN INDICATOR Open Circuit = Electrolyzer Offline	Output	Dry Contact 240Vac, 5A max 30VDC, 5A max	TB16-07	360	RMT_SHUTDWN_INDICATOR(+)/14.01	
			TB16-08	361	RMT_SHUTDWN_INDICATOR(-)/14.02	
ENCLOSURE CG SENSOR ALARM Open Circuit = >25% LFL Hydrogen	Output	Dry Contact 240Vac, 0.3A max 24VDC, 3A max	TB16-09	362	CG121 J3-C / J3-NCE, ALARM 2 714	
			TB16-10	363		
REMOTE STOP Close Circuit = Stop Electrolyzer	Input	24V, 0.5A Signal	TB16-11	364	Customer Interlock CB10 (1, 1A, 2)	24VDC_BUSS
			TB16-12	365	REMOTE_STOP(+)/14.33	
15 TCU ALARM Open Circuit = Alarm	Input	24V, 0.5A Signal	TB16-13	366	TCU_ALM_+24VDC/16.17	
			TB16-14	367	TCU_ALM_SIG/16.18	
TCU E-STOP Open Circuit = Stop	Output	Dry Contact 240Vac, 5A max 24VDC, 5A max	TB16-15	368	CON2 5L3 / 6T3, 1005	
			TB16-16	369		
TCU ON/OFF Open Circuit = Stop	Output	Dry Contact 240Vac, 3A max 24VDC, 4A max	TB16-17	370	CR5 21 / 24, 1230	
			TB16-18	371		
TCU ISOLATION VALVES	Output	+24VDC	TB16-19	372	M5 13 / 14, 1733	373 CB11 (1, 4A, 2) TCU Isolation Valves — 24VDC_BUSS
			TB16-20			
			TB16-21	376	CR5 A1 / A2, TCU ON/OFF	
	Return	24VDC_RTN	TB16-22	375		
			TB16-23	374		TB11C-2 — 24VDC_RTN
			TB16-24			
REMOTE START Close Circuit = Start Electrolyzer	Input	24V, 0.5A Signal	TB16-25	586	REMOTE_START_24VDC(+)/16.21	
			TB16-26	587	REMOTE_START_SIG/16.23	

Part Ref.: CR5 — 11 14 | 21 24, 1225 | 11 12 | 21 22

E_SUP1: LAPTOP_ETHERNET/6.34 — LINE / EQUIP — BECKHOFF_ETHERNET/13.21
Ethernet Surge Protector

PROJECT: **SCHEMATIC ELECTRICAL C SERIES 3**

SUB-SYSTEM: *POWER_PANEL*	PAGE DESCRIPTION: ***CUSTOMER INTERFACE***
DRAWN: **Zawacki K. 11/21/19**	DRAWING-NO.: ***XPE2871***
CKD: **Morson A. 11/21/19**	REV.: ***C*** SIZE: ***D***
APPR: **Bailey B. 11/21/19**	PAGE: ***12*** OF ***24***

CB12
1 10A 2
HCS DC PWR
380 TB12-15 381 P12-1 J12-1 2302 382 TB17-1 383

PCB101
CN12-2 24VDC
DC PWR
CN12-1 24V-RTN

CONNECTORS' LOCATION:	
CN1 1501	CN6 1804
CN2 1829	CN9 1804
CN3 1602	CN10 1804
CN4 1700	CN13
CN5 1405	CN14 1401

HCS_IO BOARD
Ref. XPE2825

384 TB18-1 385 J12-2 P12-2 2020 386 TB12-17 387 TB11B-4 24VDC_RTN

389 J12-4 P12-4 2020 388 TB12-18

CB13
1 5A 2
Beckoff & Isolation Valve
390 TB12-16 391 P12-3 J12-3 2020 392 TB17-2

24VDC_BUSS

TB17-2
TB17-3
TB17-3
TB17-4
TB17-4
TB17-5
TB17-5

TB19-1
TB19-1
TB19-2
TB19-2
TB19-3
TB19-3
TB19-4
TB19-4

411 CR9 11 14 1731 412 J16-16 P16-16 2020 P57-1 SV348 1 2 Pre-Pressurization Valve P57-2 P16-17 J16-17 2020 413

414 CR9 21 24 1731 415 J16-23 P16-23 2020 P58-1 SV349 1 2 Pre-Pressurization Valve P58-2 P16-24 J16-24 2020 416

P57
1317 1 1317 2 SV348 Connector

P58
1319 1 1319 2 SV349 Connector

Part Ref.: CON3		1L1 2T1	3L2 4T2	5L3 6T3	13 14	53 54
		1701	1703	1705	1731	
		63 64	73 74	83 84		21 22
						917

Part Ref.: CON4		1L1 2T1	3L2 4T2	5L3 6T3	13 14	53 54
		1707	1709	1711	1720	
		63 64	73 74	83 84		21 22
		1727	1729	1737		917

MOD.1
BK9100 Ethernet TCP/IP Bus Coupler
BECKHOFF_ETHERNET/12.40
HCS_ETHERNET/18.13
24V 0V
Bus Coupler Supp.
PE
PE
PWR Input Contact
S 1 2 3 4 5 6 7 8 9 10
Address Selector

Ethernet TCP/IP

Note: * Mod. 1 Address Selector:
On Position: SW1-4, SW6-7
Off Position: SW5, SW8-10
*See page 19 for Mod.2-Mod.5

TB17-5 417 418 TB19-4

CON3_A1/7.04 106 TB12-01 106 P12-27 J12-27 2020 419 CON3 A1 A2 420
Safety RLY CTRL Contactor

423 CON4 A1 A2
Safety RLY CTRL Contactor

424 ELEC_SR_STATUS/16.12

421 TB19-3 TB19-2 422 REMOTE_STOP (-)/14.35

	NAME	DATE
DRAWN:	Zawacki K.	11/21/19
CKD:	Morson A.	11/21/19
APPR:	Bailey B.	11/21/19

PROJECT: *SCHEMATIC ELECTRICAL C SERIES 3*

SUB-SYSTEM: *CONTROLLER PANEL*

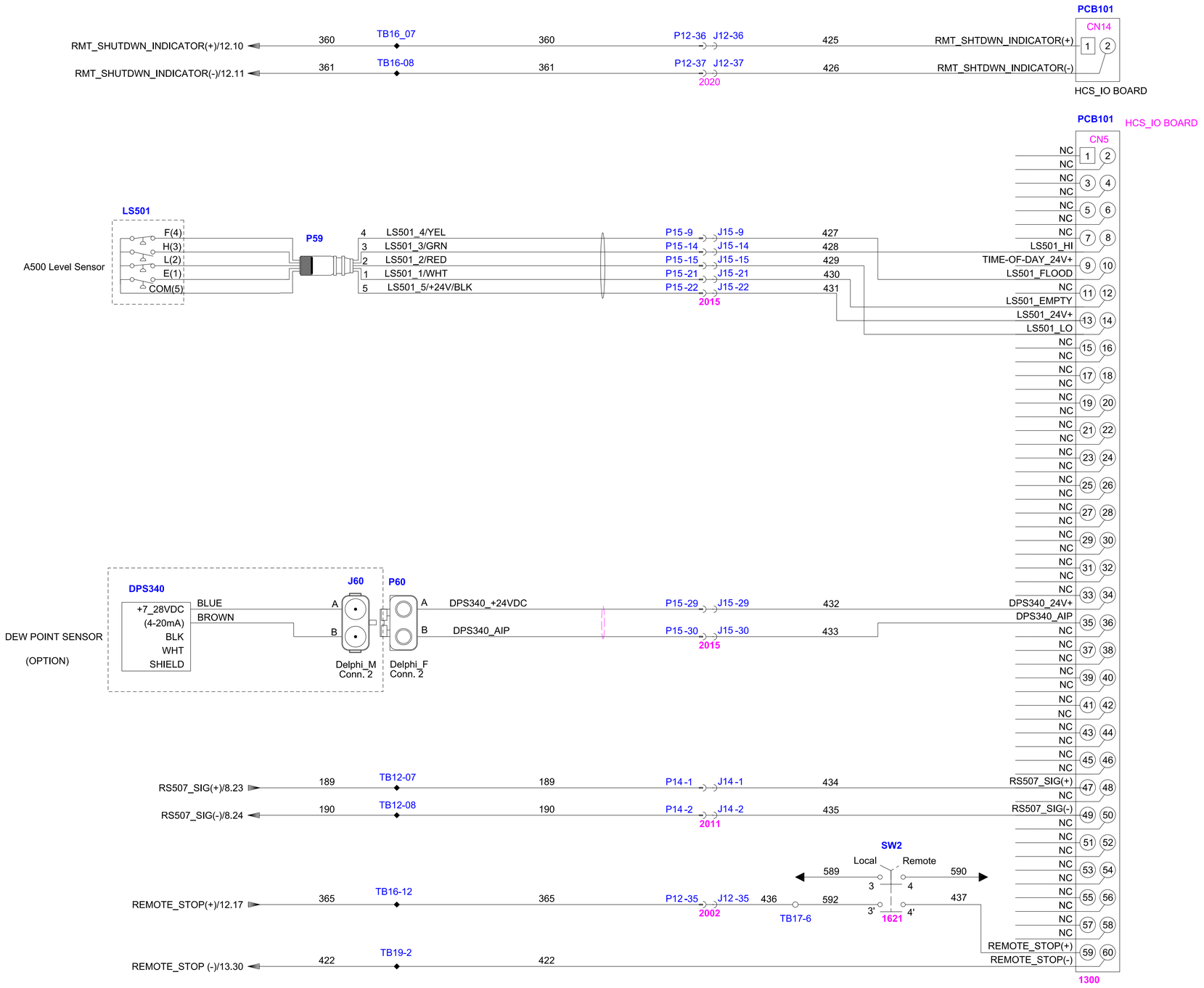
DRAWING-NO.: *XPE2871*

PAGE DESCRIPTION: *IO_BOARD_DC_INPUT*

REV.: *C*

SIZE: *D*

PAGE: *13* OF *24*



	NAME	DATE
DRAWN:	**Zawacki K.**	**11/21/19**
CKD:	**Morson A.**	**11/21/19**
APPR:	**Bailey B.**	**11/21/19**

PROJECT: ***SCHEMATIC ELECTRICAL C SERIES 3***

SUB-SYSTEM: ***CONTROLLER PANEL***

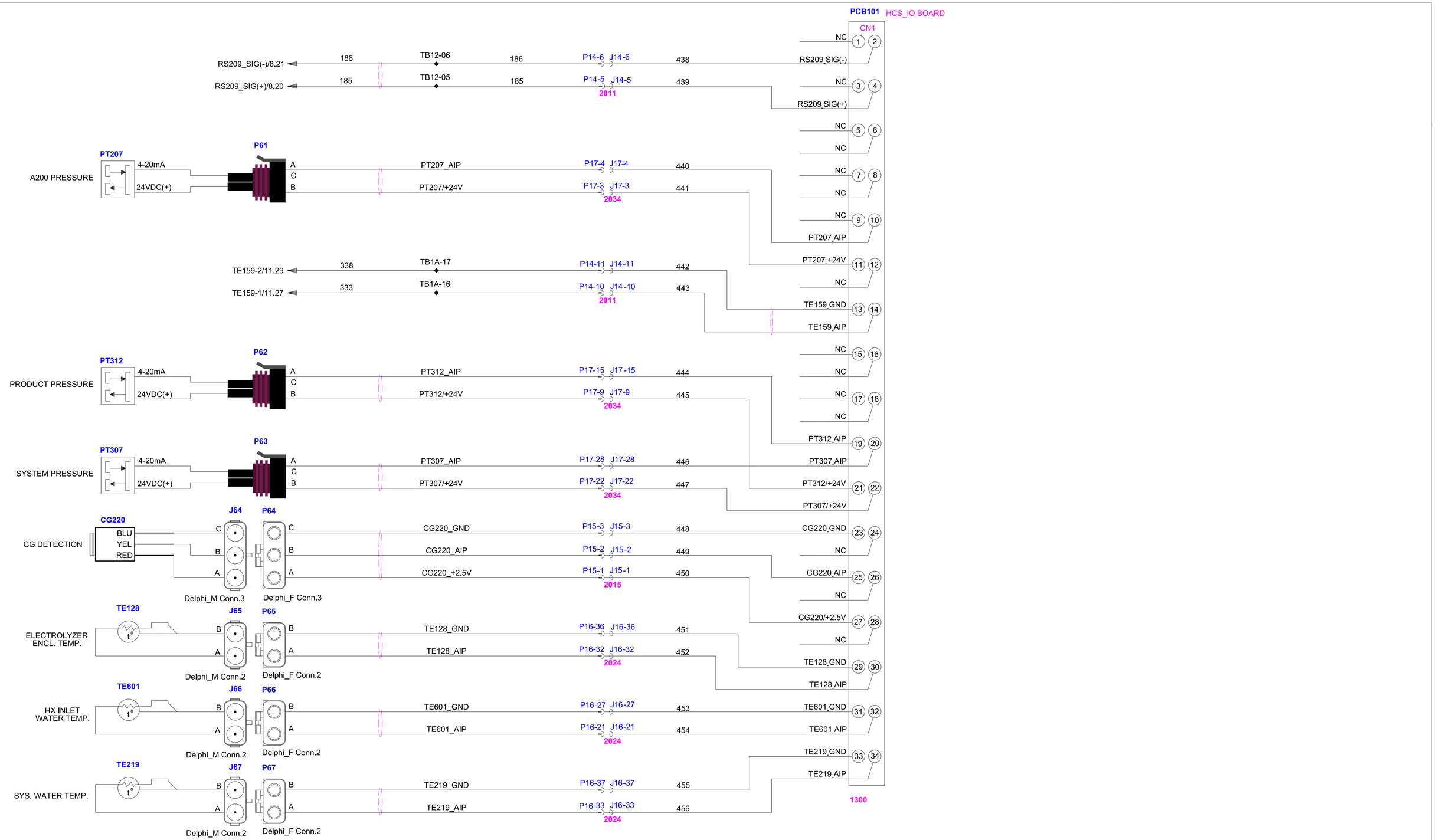
DRAWING-NO.: ***XPE2871***

PAGE DESCRIPTION: ***IO_BOARD_DC_INPUT***

REV.: ***C***

SIZE: ***D***

PAGE: ***14*** OF ***24***



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	NAME	DATE
DRAWN:	**Zawacki K.**	**11/21/19**
CKD:	**Morson A.**	**11/21/19**
APPR:	**Bailey B.**	**11/21/19**

PROJECT: ***SCHEMATIC ELECTRICAL C SERIES 3***

SUB-SYSTEM: ***CONTROLLER PANEL***

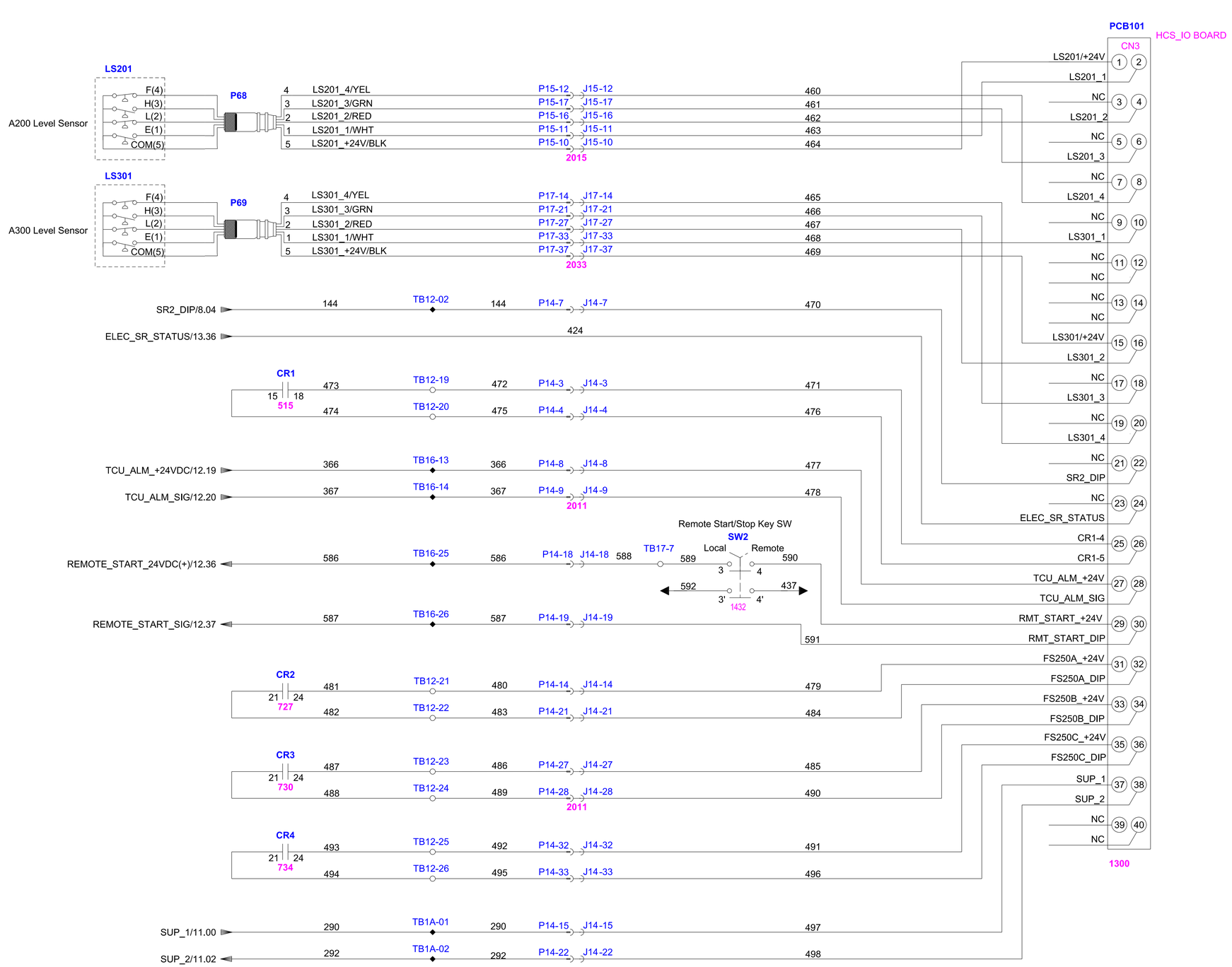
DRAWING-NO.: ***XPE2871***

PAGE DESCRIPTION: ***IO_SIGNALS_ANALOG_INPUTS***

REV.: ***C***

SIZE: ***D***

PAGE: ***15*** OF ***24***



	NAME	DATE
DRAWN:	**Zawacki K.**	**11/21/19**
CKD:	**Morson A.**	**11/21/19**
APPR:	**Bailey B.**	**11/21/19**

PROJECT: ***SCHEMATIC ELECTRICAL C SERIES 3***

SUB-SYSTEM: ***CONTROLLER PANEL***

DRAWING-NO.: ***XPE2871***

PAGE DESCRIPTION: ***IO_SIGNALS_DIGITAL_INPUTS***

REV.: ***C***

SIZE: ***D***

PAGE: ***16*** OF ***24***

PCB101 — CN4

2	1	SV329_GND	500		J17-1	P17-1	2033	SV329_GND 2 / SV329 1	P71	SV329	Vent Valve
		SV329_DOP	501	CON3 1L1 2T1 1330	502	J17-2	P17-2				
4	3	SV211_GND	503		J15-23	P15-23		SV211_GND B / SV211 A	P72 / J72	SV211	Drain Valve
		SV211_DOP	504	CON3 3L2 4T2 1330	505	J15-24	P15-24				
6	5	SV510_GND	506		J15-27	P15-27					
		SV510_DOP	510	CON3 5L3 6T3 1330	509	J15-28	P15-28	2015	SV510_GND B / SV510 A	P73 / J73	SV510	Water Inlet Valve
8	7	SV341_GND	515								
		SV341_DOP	516	CON4 1L1 2T1 1333	517						
10	9	SV343_GND	518			J17-23	P17-23		SV341_GND 2 / SV341 1	P75	SV341	Dryer Valve 1
		SV343_DOP	519	CON4 3L2 4T2 1333	520	J17-24	P17-24				
12	11	SV344_GND	521			J17-10	P17-10		SV343_GND 2 / SV343 1	P76	SV343	Dryer Valve 3
		SV344_DOP	522	CON4 5L3 6T3 1333	523	J17-11	P17-11	2033				
14	13	SV371_GND	593			J17-16	P17-16		SV344_GND 2 / SV344 1	P77	SV344	Dryer Valve 4
		SV371_DOP	594			J17-17	P17-17					
16	15	SV307A_GND				J17-18	P17-18		SV371_GND 2 / SV371 1	P84	SV371	Idle CG Valve
		SV307A_DOP				J17-19	P17-19					
18	17	SV342_GND	527									
		SV342_DOP	528									
20	19	SV307B_GND				J17-5	P17-5		SV342_GND 2 / SV342 1	P79	SV342	Dryer Valve 2
		SV307B_DOP		CON4 13 14 1333	529	J17-6	P17-6					
22	21	SV307C_GND										
		SV307C_DOP										
24	23	NC										
		NC										
26	25	NC										
		NC										

14

28	27	SV303B_GND	536			J17-29	P17-29		SV303B_GND 2 / SV303B 1	P80	SV303B	A300 Drain Valve
		SV303B_DOP	537	CON4 63 64 1333	538	J17-30	P17-30					
30	29	P505_GND	539		J14-16	P14-16	540	TB12-27 541	M6 A2 A1	542	A200 Fill Pump - P505	
		P505_DOP	546	CON4 73 74 1333	545	J14-17	P14-17 2011	544	TB12-28 543	OL6 95 96 532		
32	31	SV348_GND	547									
		SV348_DOP	549	CON3 13 14 1330	548	CR9 A1 A2		Dryer Purge RLY				
34	33	NC										
		FAN132_DOP	550		J14-23	P14-23	551	TB12-29 552	CON2 3L2 4T2 1005	553	OL5 95 96 526	554
36	35	CP205_GND										
		CP205_DOP	556		J14-29	P14-29	557	TB12-30 558	CP205/9.11			
38	37	SV303A_GND	559			J17-34	P17-34		SV303A_GND 2 / SV303A 1	P81	SV303A	A300 Drain Valve
		SV303A_DOP	560	CON4 83 84 1333	561	J17-35	P17-35					
40	39	TCV602_GND	562		J16-9	P16-9	TCV602_GND B		P82 / J82	B	COM_BLK(1)	
		TCV602_+24V	563		J16-14	P16-14	TCV602_+24V A			A	+_RED(2)	
1300 HCS_IO BOARD		TCV602_AOP/18.29	564		J16-15	P16-15 2024	TCV602_AOP C			C	Y_WHT(3) / U_WHT(5)	

Delphi_F Conn.3 — Delphi_M Conn. 3

TCV602: Common; 24VAC/DC; 2...10VDC Input; 2...10VDC Feedback — Thermal CTRL Valve

Delphi_F Conn 2 — Delphi_M Conn 2

Part Ref.: M6 — 1L1 3L2 5L3 / 2T1 4T2 6T3 — 532 — 13 14 — 21 22

Part Ref.: CR9 — 11 14 1317 — 21 24 1319 — 11 12 — 21 22

Part Ref.: M5 — 1L1 3L2 5L3 / 2T1 4T2 6T3 — 526 — 13 14 1228 — 21 22 1015

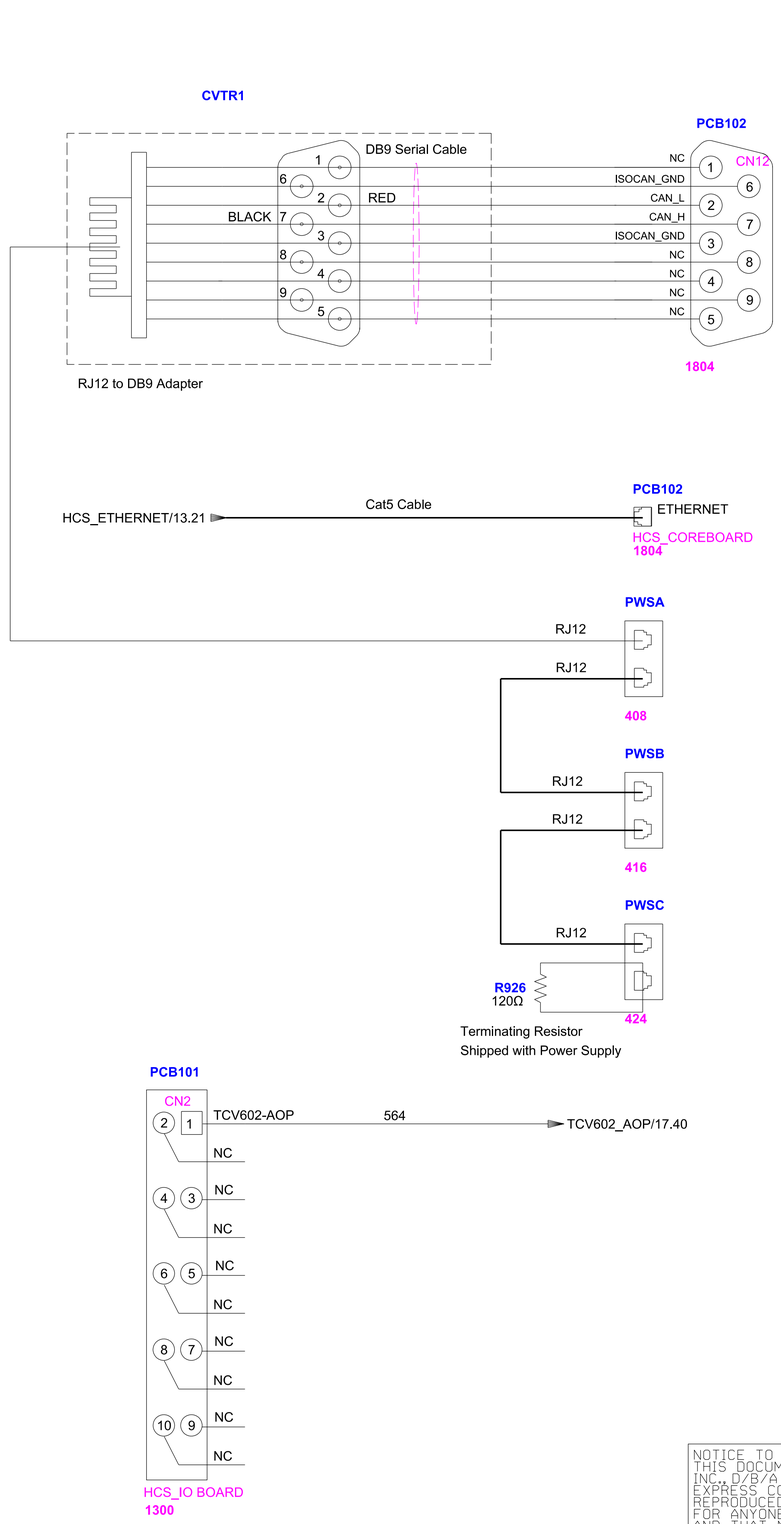
TB1A-03 294 → CON2/11.04

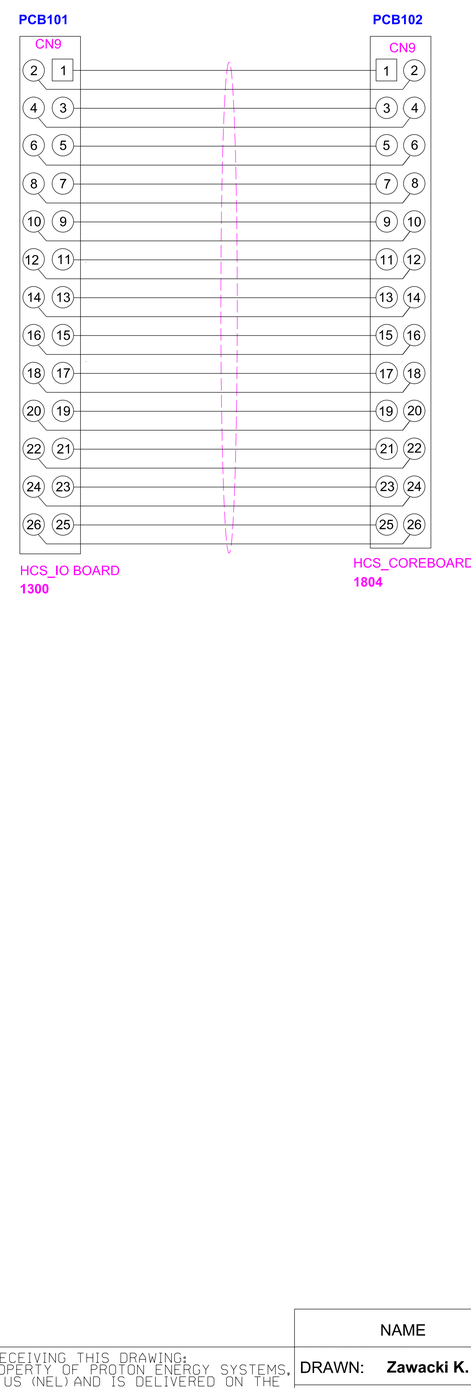
TB11C-3 555 → 24VDC_RTN

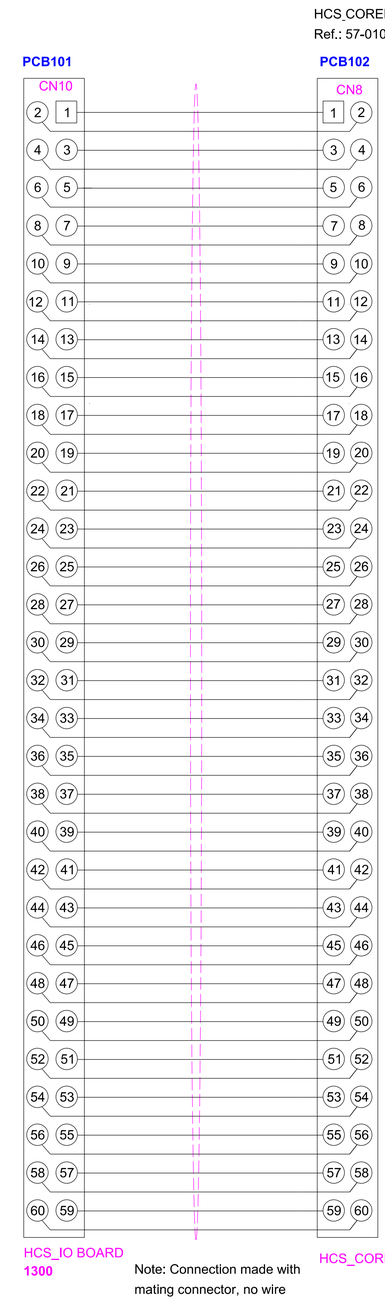
M5: A1 A2 — Ventilation Fan - Fan132

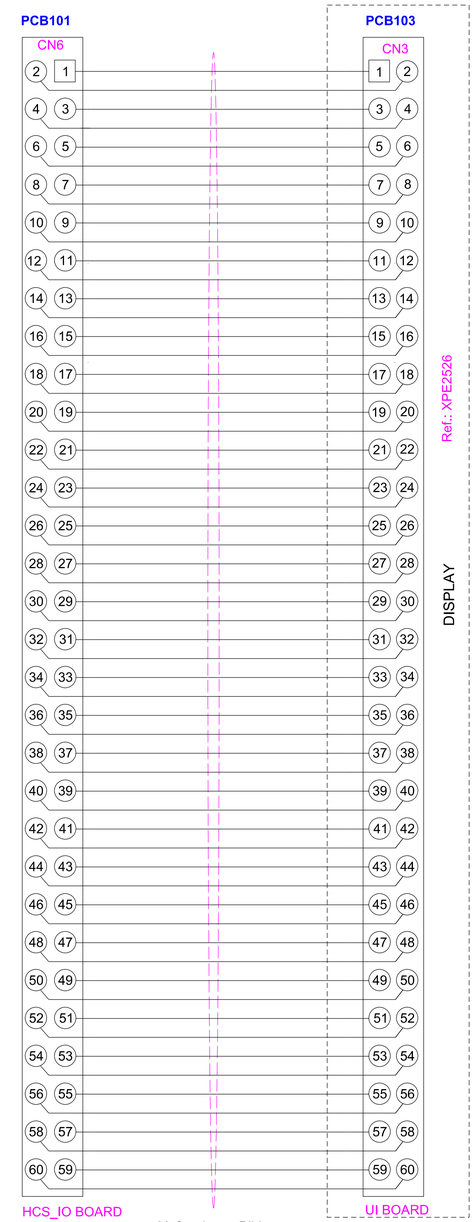
PROJECT: **SCHEMATIC ELECTRICAL C SERIES 3**

SUB-SYSTEM: *CONTROLLER PANEL*	PAGE DESCRIPTION: ***IO_SIGNALS_DIGITAL_OUTPUTS***
DRAWN: **Zawacki K. 11/21/19**	DRAWING-NO.: ***XPE2871***
CKD: **Morson A. 11/21/19**	REV.: ***C*** SIZE: ***D***
APPR: **Bailey B. 11/21/19**	PAGE: ***17*** OF ***24***









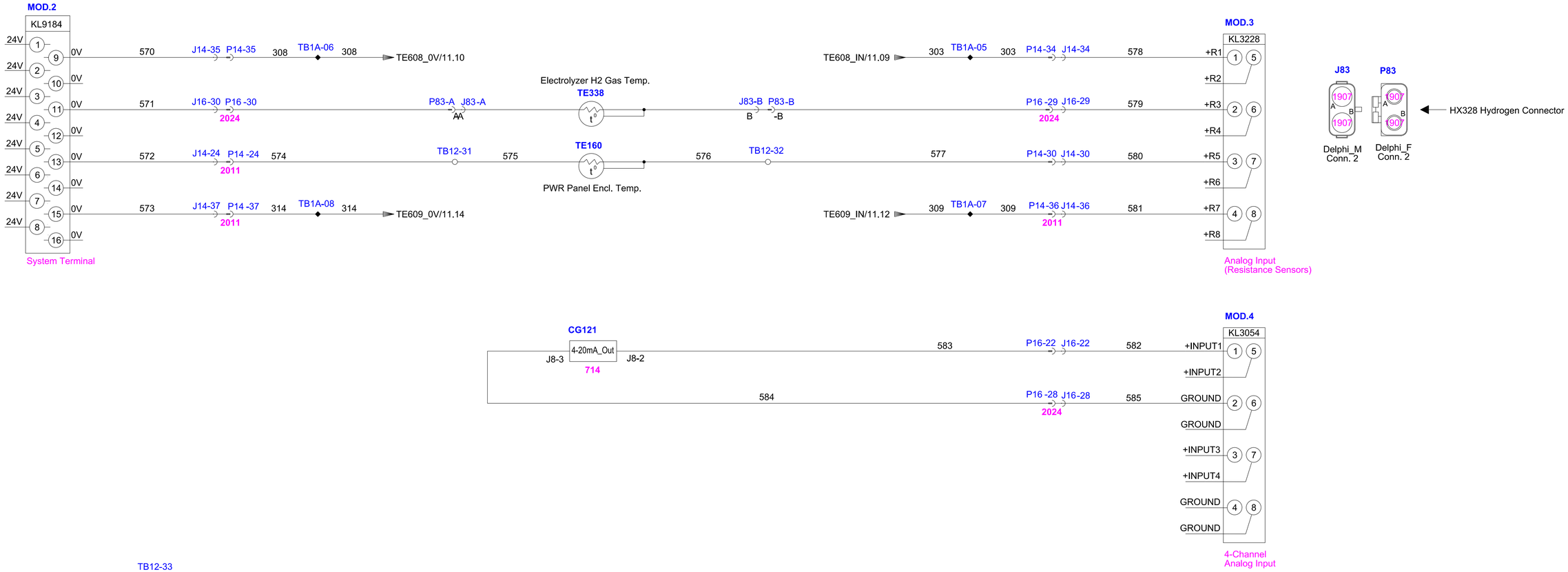
	NAME	DATE
DRAWN:	**Zawacki K.**	**11/21/19**
CKD:	**Morson A.**	**11/21/19**
APPR:	**Bailey B.**	**11/21/19**

PROJECT: ***SCHEMATIC ELECTRICAL C SERIES 3***

SUB-SYSTEM: ***CONTROLLER PANEL*** | DRAWING-NO.: ***XPE2871***

PAGE DESCRIPTION: ***I/O INTERFACE & DISPLAY*** | REV.: ***C*** | SIZE: ***D***

PAGE: ***18*** OF ***24***



	NAME	DATE
DRAWN:	**Zawacki K.**	**11/21/19**
CKD:	**Morson A.**	**11/21/19**
APPR:	**Bailey B.**	**11/21/19**

PROJECT: ***SCHEMATIC ELECTRICAL C SERIES 3***

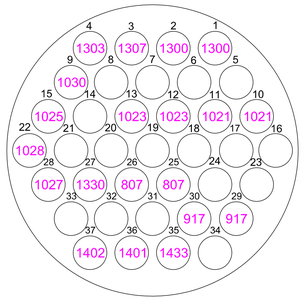
SUB-SYSTEM: ***CONTROLLER PANEL*** | DRAWING-NO.: ***XPE2871***

PAGE DESCRIPTION: ***BECKHOFF I/O EXTENDER*** | REV.: ***C*** | SIZE: ***D***

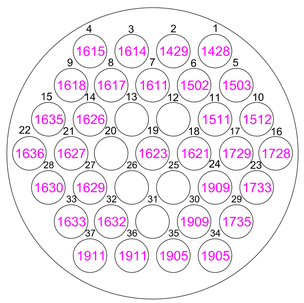
PAGE: ***19*** OF ***24***

ELECTROLYZER ENCLOSURE

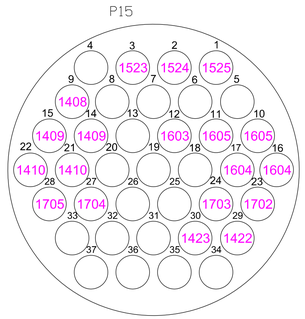
P12



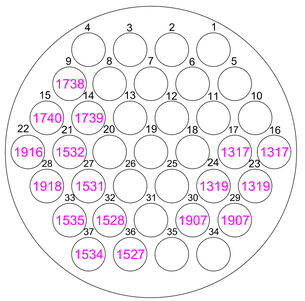
P14



P15



P16



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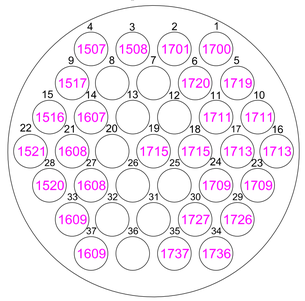
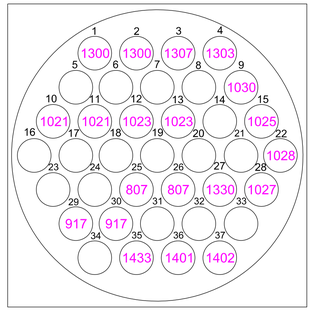
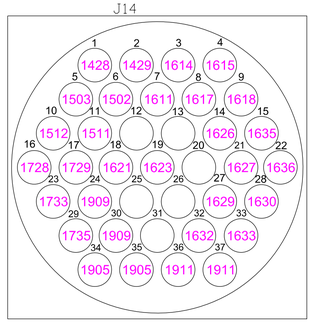


CONTROL PANEL SIDE

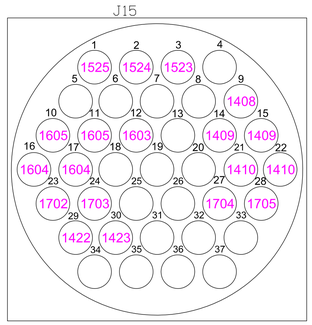
J12



J14



J15



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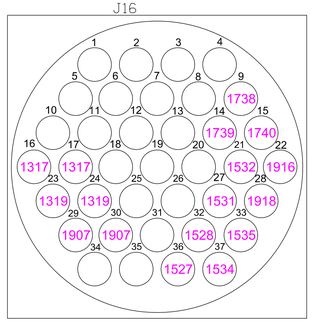
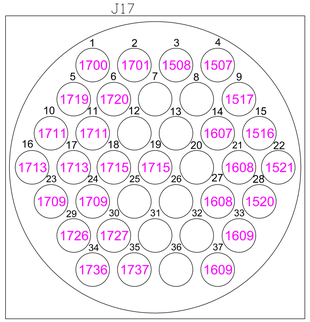


J17



PROJECT: **SCHEMATIC ELECTRICAL C SERIES 3**

SUB-SYSTEM: *CONTROLLER PANEL*

PAGE DESCRIPTION: ***CONNECTORS' REF,***

DRAWN:	**Zawacki K.** **11/21/19**	DRAWING-NO.: ***XPE2871***
CKD:	**Morson A.** **11/21/19**	REV.: ***C*** SIZE: ***D***
APPR:	**Bailey B.** **11/21/19**	PAGE: ***20*** OF ***24***

DEVICE ID	LOCATION	Page#	Line#	FUNCTION TEXT
CB1	PWR_PANEL	5	15	240VAC
CB2	PWR_PANEL	7	04	Isolation
CB3	PWR_PANEL	7	14	CG & Stirring Fan
CB4	PWR_PANEL	7	27	Stack Water Flow
CB5	PWR_PANEL	8	04	Timer Relay, RS Monitor
CB6	PWR_PANEL	9	05	Safety RLY
CB7	PWR_PANEL	9	07	Safety RLY CTRL CKT
CB8	PWR_PANEL	10	05	Main Safety RLY Status
CB9	PWR_PANEL	11	34	Dehumidifier
CB10	PWR_PANEL	12	16	Customer Interlock
CB11	PWR_PANEL	12	28	TCU Isolation Valves
CB12	PWR_PANEL	13	00	HCS DC PWR
CB13	PWR_PANEL	13	07	Beckoff & Isolation Valve
CB14	PWR_PANEL	10	07	Recirc. Heater
CBA	PS_ENCLOSURE	4	08	PWS A Circuit Breaker
CBB	PS_ENCLOSURE	4	16	PWS B Circuit Breaker
CBC	PS_ENCLOSURE	4	24	PWS C Circuit Breaker
CBD	PS_ENCLOSURE	4	31	TXFM Circuit Breaker
CG121	FLUID_ENCLOSURE	7	14	MSA Combustible Gas Sensor
CG220	FLUID_ENCLOSURE	15	23	CG DETECTION
CON1	PWR_PANEL	9	07	Safety RLY CTRL Contactor
CON2	PWR_PANEL	10	05	Main Safety RLY Status
CON3	CTRL_PANEL	13	30	Safety RLY CTRL Contactor
CON4	CTRL_PANEL	13	33	Safety RLY CTRL Contactor
CP205	FLUID_ENCLOSURE	5	20	Circulation Water Pump
CR1	PWR_PANEL	5	15	Under/Over volt. RLY
CR2	PWR_PANEL	7	27	ST Water Flow RLY
CR3	PWR_PANEL	7	30	C20 Power Supply DC Enable
CR4	PWR_PANEL	7	34	C30 Power Supply DC Enable
CR5	PWR_PANEL	12	30	TCU ON/OFF
CR9	CTRL_PANEL	17	31	Dryer Purge RLY

DEVICE ID	LOCATION	Page#	Line#	FUNCTION TEXT
D1	PWR_PANEL	8	14	TR1 Diode
D2	PWR_PANEL	8	09	TR2 Diode
DH125	PS_PANEL	11	34	PS Encl. Dehumidifier
DPS340	FLUID_ENCLOSURE	14	22	DEW POINT SENSOR (OPTION)
DS1	PS_ENCLOSURE	4	02	MAIN DISCONNECT
E_SUP1	PWR_PANEL	12	40	Ethernet Surge Protector
CELL STACK	FLUID_ENCLOSURE	4	08	CELL STACK
EMI1	PWR_PANEL	5	15	EMI Filter, 3PH, 30A
FAN132	FLUID_ENCLOSURE	5	26	Ventilation Fan
FAN142	FLUID_ENCLOSURE	6	25	Stirring Fan
FAN161	PS_ENCLOSURE	5	09	PS Encl. HX
FSW250	FLUID_ENCLOSURE	7	27	Stack Water Flow SW
FU1	PS_PANEL	5	09	30 Amp TXFM1 Fuse
FU2	PS_PANEL	5	09	4 Amp FAN161 Fuse
FU3	PWR_PANEL	5	15	0.5 Amp CR1 Fuse
FU4	PWR_PANEL	5	20	20 Amp CP205 Fuse
FU5	PWR_PANEL	5	26	4 Amp FAN132 Fuse
FU6	PWR_PANEL	5	32	10 Amp P505 Fuse
FU7	PWR_PANEL	6	02	10 Amp HTR126A-C Fuse
FU9	PWR_PANEL	6	25	4 Amp FAN142 Fuse
FU10	PWR_PANEL	6	29	10 Amp PWS1 Fuse
FU11	PWR_PANEL	6	34	4 Amp PWS2 Fuse
FU13	PS_PANEL	5	23	4 Amp AC CONTACTOR SUPPLY Fuse
HTR126A	FLUID_ENCLOSURE	6	02	Electrolyzer Encl. Recir. Heater A (Option)
HTR126B	FLUID_ENCLOSURE	6	07	Electrolyzer Encl. Recir. Heater B (Option)
HTR126C	FLUID_ENCLOSURE	6	12	Electrolyzer Encl. Recir. Heater C (Option)
HTR126D	FLUID ENCLOSURE	6	18	Electrolyzer Encl. Recir. Heater D (Option)
J12	CTRL_PANEL	20	02	Controller Panel Connector
J14	CTRL_PANEL	20	11	Controller Panel Connector
J15	CTRL_PANEL	20	15	Controller Panel Connector

DEVICE ID	LOCATION	Page#	Line#	FUNCTION TEXT
J16	CTRL_PANEL	20	24	Controller Panel Connector
J17	CTRL_PANEL	20	34	Controller Panel Connector
LS101F	FLUID_ENCLOSURE	10	32	Electrolyzer Encl. Flood SW
LS101P	PS_ENCLOSURE	11	23	PS Encl. Flood SW
LS102F	FLUID_ENCLOSURE	10	34	Electrolyzer Encl. Flood SW
LS102P	PS_ENCLOSURE	11	25	PS Encl. Flood SW
LS201	FLUID_ENCLOSURE	16	03	A200 Level Sensor
LS301	FLUID_ENCLOSURE	16	07	A300 Level Sensor
LS501	FLUID_ENCLOSURE	14	08	A500 Level Sensor
M2	PS_PANEL	11	06	FAN161 Coil
M4	PWR_PANEL	9	15	CP205 Coil
M5	PWR_PANEL	17	33	FAN132 Coil
M6	PWR_PANEL	17	28	P505 Coil
M7	PWR_PANEL	11	07	HTR126A-C, HTR125A-B Coil
M9	PWR_PANEL	7	24	FAN142 Coil
M21	PS_PANEL	5	23	PWSA AC Coil
M22	PS_PANEL	5	24	PWSB AC Coil
M23	PS_PANEL	5	25	PWSC AC Coil
MOD.1	CTRL_PANEL	13	21	Ethernet TCP/IP
MOD.2	CTRL_PANEL	19	04	System Terminal
MOD.3	CTRL_PANEL	19	05	Analog Input (Resistance Sensors)
MOD.4	CTRL_PANEL	19	16	4-Channel Analog Input
MOD.5	CTRL_PANEL	19	27	End Terminal
OL2	PS_PANEL	5	09	FAN161 OL
OL4	PWR_PANEL	5	20	CP205 OL
OL5	PWR_PANEL	5	26	FAN132 OL
OL6	PWR_PANEL	5	32	P505 OL
OL7	PWR_PANEL	6	02	HTR126A-C, HTR125A-B OL
OL9	PWR_PANEL	6	25	FAN142 OL
P12	FLUID_ENCLOSURE	20	02	Electrolyzer Enclosure Connector
P14	FLUID_ENCLOSURE	20	11	Electrolyzer Enclosure Connector
P15	FLUID_ENCLOSURE	20	15	Electrolyzer Enclosure Connector

	NAME	DATE
DRAWN:	**Zawacki K.**	**11/21/19**
CKD:	**Morson A.**	**11/21/19**
APPR:	**Bailey B.**	**11/21/19**

PROJECT: ***SCHEMATIC ELECTRICAL C SERIES 3***

SUB-SYSTEM: ***MASTER_LIST*** | DRAWING-NO.: ***XPE2871***

PAGE DESCRIPTION: ***MASTER_LIST_1*** | REV.: ***C*** | SIZE: ***D***

PAGE: ***21*** OF ***24***

DEVICE ID	LOCATION	Page#	Line#	FUNCTION TEXT
P16	FLUID_ENCLOSURE	20	24	Electrolyzer Enclosure Connector
P17	FLUID_ENCLOSURE	20	33	Electrolyzer Enclosure Connector
P505	FLUID_ENCLOSURE	5	32	A200 Fill Pump
PB1	FRONT_DISPLAY	10	21	E-Stop
PCB101	CTRL_PANEL	13	00	HCS_IO BOARD
PCB102	CTRL_PANEL	18	04	HCS_COREBOARD
PCB103	FRONT DISPLAY	18	04	UI BOARD
PSW121A	FLUID_ENCLOSURE	8	12	Purge Pressure SW
PSW121B	FLUID_ENCLOSURE	8	12	Purge Pressure SW
PT207	FLUID_ENCLOSURE	15	07	A200 PRESSURE
PT307	FLUID_ENCLOSURE	15	20	SYSTEM PRESSURE
PT312	FLUID_ENCLOSURE	15	16	PRODUCT PRESSURE
PWS1	PWR_PANEL	6	29	AC to DC PS (24V, 40A)
PWS2	PWR_PANEL	6	34	Laptop/Netbook PS (100-240V, 1A)
PWSA	PS_ENCLOSURE	4	08	C10 Power Supply
PWSB	PS_ENCLOSURE	4	16	C20 Power Supply
PWSC	PS_ENCLOSURE	4	24	C30 Power Supply
RS_MON1	PWR_PANEL	8	20	Resistivity Monitor
RS209	FLUID_ENCLOSURE	8	23	A200 Resistivity Sensor
RS507	FLUID_ENCLOSURE	8	28	A500 Resistivity Sensor
S1	FRONT_DISPLAY	8	07	Service Key
SR1	PWR_PANEL	9	05	Electrolyzer Safety Relay
SR2	PWR_PANEL	10	03	Top Level Safety RLY
SUP1	PS_ENCLOSURE	4	02	3 Phase Surge Protector 277/480V 3ph Wye
SV211	FLUID_ENCLOSURE	17	02	Drain Valve
SV303A	FLUID_ENCLOSURE	17	36	A300 Drain Valve
SV303B	FLUID_ENCLOSURE	17	26	A300 Drain Valve
SV329	FLUID_ENCLOSURE	17	00	Vent Valve
SV341	FLUID_ENCLOSURE	17	09	Dryer Valve 1
SV342	FLUID_ENCLOSURE	17	19	Dryer Valve 2
SV343	FLUID_ENCLOSURE	17	11	Dryer Valve 3
SV344	FLUID_ENCLOSURE	17	13	Dryer Valve 4
SV348	FLUID_ENCLOSURE	13	17	Pre-Pressurization Valve
SV349	FLUID_ENCLOSURE	13	19	Pre-Pressurization Valve
SV371	FLUID_ENCLOSURE	17	15	Idle CG Valve
SV510	FLUID_ENCLOSURE	17	05	Water Inlet Valve

DEVICE ID	LOCATION	Page#	Line#	FUNCTION TEXT
SW1	FLUID_ENCLOSURE	7	20	MSA Combus. Acknowledge Push Button
SW2	CTRL_PANEL	16	21	Remote Start/Stop Key SW
TAS102F	FLUID_ENCLOSURE	10	34	Electrolyzer Encl. Hi Temp Ther. SW
TAS102P	PS_ENCLOSURE	11	23	PS Encl. Hi Temp. Thermal SW
TAS164	FLUID_ENCLOSURE	10	07	Electrolyzer Encl. Heater Thermostat
TAS166A	FLUID_ENCLOSURE	10	34	STK Hi Temp Ther. SW 1
TAS166B	FLUID_ENCLOSURE	10	34	STK Hi Temp Ther. SW 2
TAS166C	FLUID_ENCLOSURE	10	34	STK Hi Temp Ther. SW 3
TB1A-01	PWR_PANEL	11	00	SUP TB
TB1A-02	PWR_PANEL	11	02	SUP TB
TB1A-03	PWR_PANEL	11	04	FAN161 Control TB
TB1A-04	PWR_PANEL	11	06	24VDC_RTN_TB
TB1A-05	PWR_PANEL	11	09	TE608 TB
TB1A-06	PWR_PANEL	11	10	TE608 TB
TB1A-07	PWR_PANEL	11	12	TE609 TB
TB1A-08	PWR_PANEL	11	14	TE609TB
TB1A-09	PWR_PANEL	11	15	M21, M22, M23 NC Contactor Status TB
TB1A-10	PWR_PANEL	11	17	M21, M22, M23 NC Contactor Status TB
TB1A-11	PWR_PANEL	11	18	M21 Control TB
TB1A-12	PWR_PANEL	11	20	M22 Control TB
TB1A-13	PWR_PANEL	11	21	M23 Control TB
TB1A-14	PWR_PANEL	11	23	TAS102P, LS101P, LS102P TB
TB1A-15	PWR_PANEL	11	25	TAS102P, LS101P, LS102P TB
TB1A-16	PWR_PANEL	11	27	TE159 TB
TB1A-17	PWR_PANEL	11	29	TE159 TB
TB1A-18	PWR_PANEL	11	34	24VDC TB (CB9)
TB1A-19	PWR_PANEL	11	35	24VDC RTN TB
TB1A-20	PWR_PANEL	11	30	Spare TB
TB1A-21	PWR_PANEL	11	31	Spare TB
TB1B-01	PS_PANEL	11	00	SUP TB

DEVICE ID	LOCATION	Page#	Line#	FUNCTION TEXT
TB1B-02	PS_PANEL	11	02	SUP TB
TB1B-03	PS_PANEL	11	04	FAN161 Control TB
TB1B-04	PS_PANEL	11	06	24VDC_RTN_TB
TB1B-05	PS_PANEL	11	09	TE608 TB
TB1B-06	PS_PANEL	11	10	TE608 TB
TB1B-07	PS_PANEL	11	12	TE609 TB
TB1B-08	PS_PANEL	11	14	TE609TB
TB1B-09	PS_PANEL	11	15	M21, M22, M23 NC Contactor Status TB
TB1B-10	PS_PANEL	11	17	M21, M22, M23 NC Contactor Status TB
TB1B-11	PS_PANEL	11	18	M21 Control TB
TB1B-12	PS_PANEL	11	20	M22 Control TB
TB1B-13	PS_PANEL	11	21	M23 Control TB
TB1B-14	PS_PANEL	11	23	TAS102P, LS101P, LS102P TB
TB1B-15	PS_PANEL	11	25	TAS102P, LS101P, LS102P TB
TB1B-16	PS_PANEL	11	27	TE159 TB
TB1B-17	PS_PANEL	11	29	TE159 TB
TB1B-18	PS_PANEL	11	34	24VDC TB (CB9)
TB1B-19	PS_PANEL	11	35	24VDC RTN TB
TB1B-20	PS_PANEL	11	30	Spare TB
TB1B-21	PS_PANEL	11	31	Spare TB
TB2-1	PS_PANEL	5	09	AC_PWR TB
TB2-2	PS_PANEL	5	14	AC_PWR TB
TB3-1	PS_PANEL	5	10	AC_PWR TB
TB3-2	PS_PANEL	5	15	AC_PWR TB
TB4-1	PS_PANEL	5	11	AC_PWR TB
TB4-2	PS_PANEL	5	16	AC_PWR TB
TB5-1	PS_PANEL	11	23	TAS102P and LS101P Interconnect TB
TB5-2	PS_PANEL	11	23	TAS101P and LS102P Interconnect TB

	NAME	DATE
DRAWN:	**Zawacki K.**	**11/21/19**
CKD:	**Morson A.**	**11/21/19**
APPR:	**Bailey B.**	**11/21/19**

PROJECT: ***SCHEMATIC ELECTRICAL C SERIES 3***

SUB-SYSTEM: ***MASTER_LIST*** | DRAWING-NO.: ***XPE2871***

PAGE DESCRIPTION: ***MASTER_LIST_2*** | REV.: ***C*** | SIZE: ***D***

PAGE: ***22*** OF ***24***

DEVICE ID	LOCATION	Page#	Line#	FUNCTION TEXT
TB6-1	PS_PANEL	11	06	24VDC_RTN TB
TB6-2	PS_PANEL	11	18	24VDC_RTN TB
TB6-3	PS_PANEL	11	20	24VDC_RTN TB
TB6-3	PS_PANEL	11	22	24VDC_RTN TB
TB7-1	PWR_PANEL	5	15	AC_PWR CR1 TB
TB7-2	PWR_PANEL	5	20	AC_PWR CP205, FAN132 TB
TB7-3	PWR_PANEL	5	32	AC_PWR P505 TB
TB7-4	PWR_PANEL	6	02	AC_PWR HTR125, HTR126, FAN142 TB
TB7-5	PWR_PANEL	6	29	AC_PWR PWS1, PWS2 TB
TB8-1	PWR_PANEL	5	16	AC_PWR CR1 TB
TB8-2	PWR_PANEL	5	28	AC_PWR CP205, FAN132 TB
TB8-3	PWR_PANEL	6	03	AC_PWR HTR125, HTR126 TB
TB8-4	PWR_PANEL	6	27	AC_PWR FAN142, PWS1 TB
TB8-5	PWR_PANEL	6	35	AC_PWR PWS2 TB
TB9-1	PWR_PANEL	5	17	AC_PWR CR1 TB
TB9-2	PWR_PANEL	5	22	AC_PWR CP205, P505 TB
TB9-3	PWR_PANEL	6	04	AC_PWR HTR125, HTR126TB
TB10-1	PWR_PANEL	6	02	HTR126A TB
TB10-2	PWR_PANEL	6	07	HTR126B, HTR126D TB
TB10-3	PWR_PANEL	6	04	HTR126A TB
TB10-4	PWR_PANEL	6	12	HTR126C, HTR126D TB
TB10-5	PWR_PANEL	6	09	HTR126B TB
TB10-6	PWR_PANEL	6	14	HTR126C TB
TB10-7	PWR_PANEL	6	05	HTR126A, HTR126B GND TB
TB10-8	PWR_PANEL	6	15	HTR126C GND TB
TB11A-1	PWR_PANEL	7	24	24VDC RTN TB
TB11A-2	PWR_PANEL	7	10	24VDC RTN TB
TB11B-1	PWR_PANEL	7	30	24VDC RTN TB
TB11B-2	PWR_PANEL	7	34	24VDC RTN TB
TB11B-3	PWR_PANEL	8	07	24VDC RTN TB
TB11B-4	PWR_PANEL	9	05	24VDC RTN TB
TB11B-5	PWR_PANEL	8	20	24VDC RTN TB
TB11C-1	PWR_PANEL	7	24	24VDC RTN TB
TB11C-2	PWR_PANEL	10	07	24VDC RTN TB
TB11C-3	PWR_PANEL	17	33	24VDC RTN TB

DEVICE ID	LOCATION	Page#	Line#	FUNCTION TEXT
TB12-01	PWR_PANEL	7	04	
TB12-02	PWR_PANEL	8	04	
TB12-03	PWR_PANEL	8	07	
TB12-04	PWR_PANEL	8	07	
TB12-05	PWR_PANEL	8	20	
TB12-06	PWR_PANEL	8	21	
TB12-07	PWR_PANEL	8	23	
TB12-08	PWR_PANEL	8	24	
TB12-09	PWR_PANEL	9	17	
TB12-10	PWR_PANEL	9	20	
TB12-11	PWR_PANEL	10	21	
TB12-12	PWR_PANEL	10	21	
TB12-13	PWR_PANEL	10	23	
TB12-14	PWR_PANEL	10	23	
TB12-15	PWR_PANEL	13	00	24VDC TB (CB12)
TB12-16	PWR_PANEL	13	07	24VDC TB (CB13)
TB12-17	PWR_PANEL	13	00	24VDC_RTN TB
TB12-18	PWR_PANEL	13	03	24VDC_RTN TB
TB12-19	PWR_PANEL	16	14	
TB12-20	PWR_PANEL	16	15	
TB12-21	PWR_PANEL	16	26	
TB12-22	PWR_PANEL	16	27	
TB12-23	PWR_PANEL	16	29	
TB12-24	PWR_PANEL	16	30	
TB12-25	PWR_PANEL	16	32	
TB12-26	PWR_PANEL	16	33	
TB12-27	PWR_PANEL	17	28	
TB12-28	PWR_PANEL	17	30	
TB12-29	PWR_PANEL	17	33	
TB12-30	PWR_PANEL	17	35	
TB12-31	PWR_PANEL	19	09	
TB12-32	PWR_PANEL	19	09	
TB12-33	PWR_PANEL	19	25	Spare TB
TB12-34	PWR_PANEL	19	26	Spare TB
TB12-35	PWR_PANEL	19	27	Spare TB
TB12-36	PWR_PANEL	19	28	Spare TB

DEVICE ID	LOCATION	Page#	Line#	FUNCTION TEXT
TB13-1	PWR_PANEL	7	10	SPARE 24VDC
TB13-02	PWR_PANEL	7	10	24VDC_RTN TB
TB13-03	PWR_PANEL	7	14	24VDC_RTN TB
TB13-04	PWR_PANEL	7	14	24VDC TB (CB3)
TB13-05	PWR_PANEL	7	24	24VDC TB (CB3)
TB13-06	PWR_PANEL	7	30	24VDC TB (CB4)(Unused)
TB13-07	PWR_PANEL	7	34	24VDC TB (CB4)
TB13-08	PWR_PANEL	7	27	
TB13-09	PWR_PANEL	7	30	
TB13-10	PWR_PANEL	7	34	
TB13-11	PWR_PANEL	8	12	
TB13-12	PWR_PANEL	8	12	
TB13-13	PWR_PANEL	8	12	
TB13-14	PWR_PANEL	8	23	
TB13-15	PWR_PANEL	8	23	
TB13-16	PWR_PANEL	8	24	
TB13-17	PWR_PANEL	8	24	
TB13-18	PWR_PANEL	8	28	
TB13-19	PWR_PANEL	8	28	
TB13-20	PWR_PANEL	8	29	
TB13-21	PWR_PANEL	8	29	
TB13-22	PWR_PANEL	10	07	
TB13-23	PWR_PANEL	10	07	
TB13-24	PWR_PANEL	10	21	
TB13-25	PWR_PANEL	10	34	
TB13-26	PWR_PANEL	10	34	
TB13-27	PWR_PANEL	10	34	
TB13-28	PWR_PANEL	10	23	
TB13-29	PWR_PANEL	10	23	
TB13-30	PWR_PANEL	10	32	
TB13-31	PWR_PANEL	19	31	Spare TB
TB13-32	PWR_PANEL	19	32	Spare TB
TB13-33	PWR_PANEL	19	33	Spare TB
TB13-34	PWR_PANEL	19	35	Spare TB

	NAME	DATE
DRAWN:	**Zawacki K.**	**11/21/19**
CKD:	**Morson A.**	**11/21/19**
APPR:	**Bailey B.**	**11/21/19**

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PROJECT: ***SCHEMATIC ELECTRICAL C SERIES 3***

SUB-SYSTEM: ***MASTER_LIST*** | DRAWING-NO.: ***XPE2871***

PAGE DESCRIPTION: ***MASTER_LIST_3*** | REV.: ***C*** | SIZE: ***D***

PAGE: ***23*** OF ***24***

DEVICE ID	LOCATION	Page#	Line#	FUNCTION TEXT
TB14-1	PWR_PANEL	6	34	PWS2 AC PWR TB
TB14-2	PWR_PANEL	6	35	PWS2 AC PWR TB
TB14-3	PWR_PANEL	6	36	PWS2 GND TB
TB15-1	PWR_PANEL	7	04	
TB15-2	PWR_PANEL	7	10	SPARE 24VDC
TB15-3	PWR_PANEL	8	04	24VDC TB (CB5)
TB15-4	PWR_PANEL	8	12	24VDC TB (CB5)
TB15-5	PWR_PANEL	9	05	24VDC TB (CB6)
TB15-6	PWR_PANEL	9	07	
TB15-7	PWR_PANEL	9	11	
TB16-01	PWR_PANEL	12	01	Customer Electrolyzer E-Stop Notification 1 TB
TB16-02	PWR_PANEL	12	02	Customer Electrolyzer E-Stop Notification 1 TB
TB16-03	PWR_PANEL	12	04	Customer Electrolyzer E-Stop Notification 2 TB
TB16-04	PWR_PANEL	12	05	Customer Electrolyzer E-Stop Notification 2 TB
TB16-05	PWR_PANEL	12	07	Customer Remote E-Stop TB
TB16-06	PWR_PANEL	12	08	Customer Remote E-Stop TB
TB16-07	PWR_PANEL	12	10	Customer Remote Shutdown Indicator TB
TB16-08	PWR_PANEL	12	11	Customer Remote Shutdown Indicator TB
TB16-09	PWR_PANEL	12	13	Customer Enclosure CG Sensor Alarm TB
TB16-10	PWR_PANEL	12	14	Customer Enclosure CG Sensor Alarm TB
TB16-11	PWR_PANEL	12	16	Customer Remote Stop TB
TB16-12	PWR_PANEL	12	17	Customer Remote Stop TB
TB16-13	PWR_PANEL	12	19	Customer TCU Alarm TB
TB16-14	PWR_PANEL	12	20	Customer TCU Alarm TB
TB16-15	PWR_PANEL	12	22	Customer TCU E-Stop TB
TB16-16	PWR_PANEL	12	23	Customer TCU E-Stop TB
TB16-17	PWR_PANEL	12	25	Customer TCU On/Off TB
TB16-18	PWR_PANEL	12	26	Customer TCU On/Off TB
TB16-19	PWR_PANEL	12	28	Customer TCU Isolation Valves Output TB
TB16-20	PWR_PANEL	12	29	Customer TCU Isolation Valves Output TB
TB16-21	PWR_PANEL	12	30	Customer TCU Isolation Valves Output TB
TB16-22	PWR_PANEL	12	32	Customer Interface TB (24VDC_RTN)
TB16-23	PWR_PANEL	12	33	Customer Interface TB (24VDC_RTN)
TB16-24	PWR_PANEL	12	34	Customer Interface TB (24VDC_RTN)
TB16-25	PWR_PANEL	12	36	Customer Remote Start TB

DEVICE ID	LOCATION	Page#	Line#	FUNCTION TEXT
TB16-26	PWR_PANEL	12	37	Customer Remote Start TB
TB17-1	CTRL_PANEL	13	00	24VDC TB (CB12)
TB17-2	CTRL_PANEL	13	09	24VDC TB (CB13)
TB17-3	CTRL_PANEL	13	12	24VDC TB (CB13)
TB17-4	CTRL_PANEL	13	16	24VDC TB (CB13)
TB17-5	CTRL_PANEL	13	17	24VDC TB (CB13)
TB17-6	CTRL_PANEL	14	33	REMOTE STOP(+) TB
TB17-7	CTRL_PANEL	16	21	REMOTE START/+24V TB
TB18-1	CTRL_PANEL	13	00	24VDC RTN TB
TB19-1	CTRL_PANEL	13	07	24VDC RTN TB
TB19-2	CTRL_PANEL	13	10	24VDC RTN TB
TB19-3	CTRL_PANEL	13	14	24VDC RTN TB
TB19-4	CTRL_PANEL	13	17	24VDC RTN TB
TB19-5	CTRL_PANEL	13	28	24VDC RTN TB
TB20-1	PS_ENCLOSURE	5	09	FAN161 TB
TB20-2	PS_ENCLOSURE	5	11	FAN161 TB
TB20-3	PS_ENCLOSURE	5	10	FAN161 GND TB
TCV602	FLUID_ENCLOSURE	17	38	Thermal CTRL Valve
TE128	FLUID_ENCLOSURE	15	27	ELECTROLYZER ENCL. TEMP.
TE159	PS_PANEL	11	27	PS Encl. Air Temp.
TE160	PWR_PANEL	19	09	PWR Panel Encl. Temp.
TE219	FLUID_ENCLOSURE	15	34	SYS. WATER TEMP.
TE338	FLUID_ENCLOSURE	19	07	Electrolyzer H2 Gas Temp.
TE601	FLUID_ENCLOSURE	15	31	HX INLET WATER TEMP.
TE608	PS_ENCLOSURE	11	09	PS Coolant Inlet Temp.
TE609	PS_ENCLOSURE	11	12	PS Coolant Outlet Temp.
TR1	PWR_PANEL	8	12	Dilution Timer
TR2	PWR_PANEL	8	07	Service Bypass Timer
TXFM1	PS_ENCLOSURE	5	09	480 (or 380/400/415V) TO 240V Transformer
TB22-1	PS_PANEL	5	23	M21 and M23 AC COIL TB
TB22-2	PS_PANEL	5	22	M21 and M23 AC COIL TB

DEVICE ID	LOCATION	Page#	Line#	FUNCTION TEXT
TB23-1	PS_PANEL	5	24	M21 and M22 AC COIL TB
TB23-1	PS_PANEL	5	23	M21 and M22 AC COIL TB
TB23-1	PS_PANEL	5	25	M22 and M23 AC COIL TB
TB23-1	PS_PANEL	5	24	M22 and M23 AC COIL TB

	NAME	DATE
DRAWN:	**Zawacki K.**	**11/21/19**
CKD:	**Morson A.**	**11/21/19**
APPR:	**Bailey B.**	**11/21/19**

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PROJECT: ***SCHEMATIC ELECTRICAL C SERIES 3***

SUB-SYSTEM: ***MASTER_LIST*** | DRAWING-NO.: ***XPE2871***

PAGE DESCRIPTION: ***MASTER_LIST_4*** | REV.: ***C*** | SIZE: ***D***

PAGE: ***24*** OF ***24***