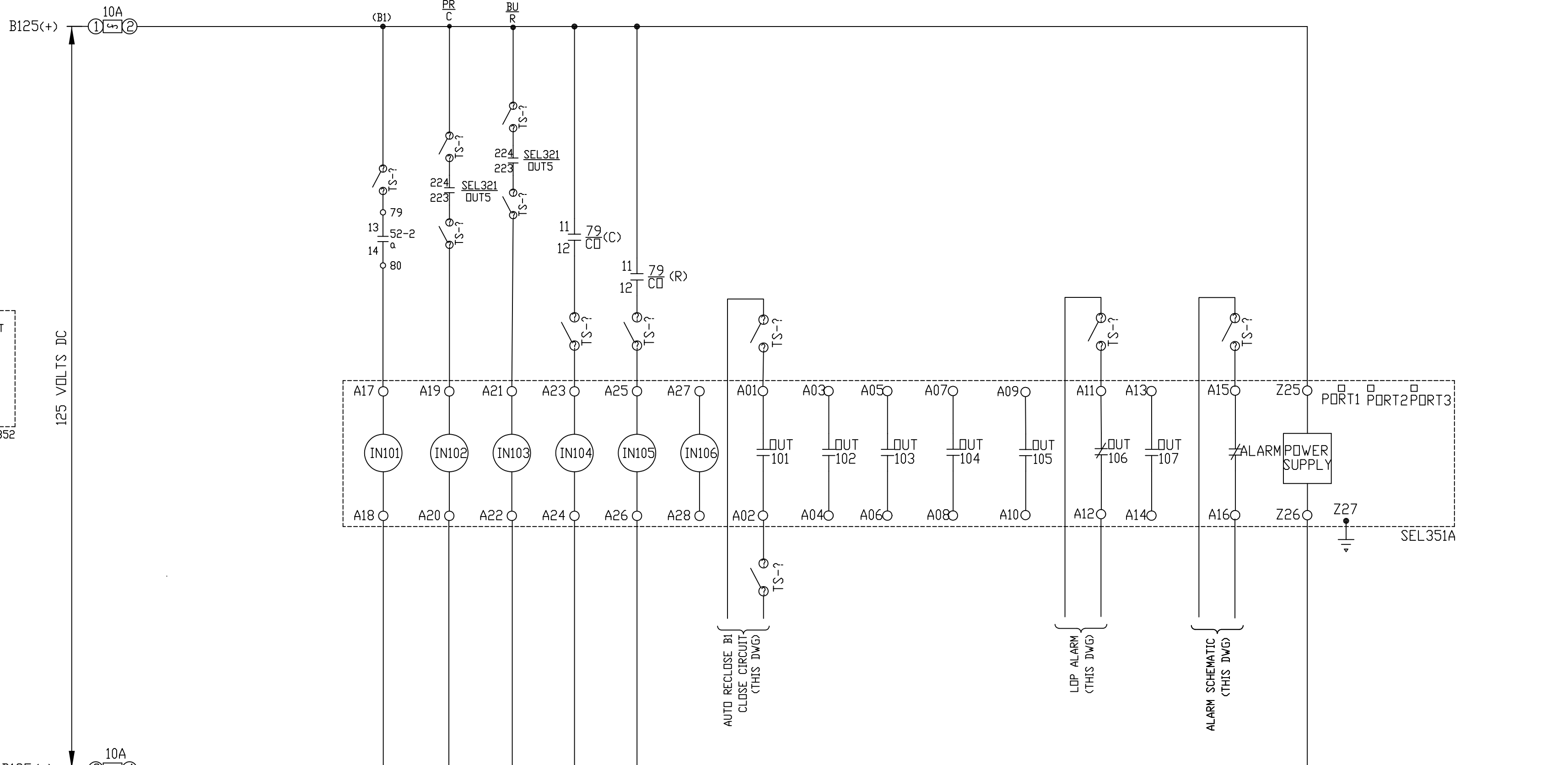
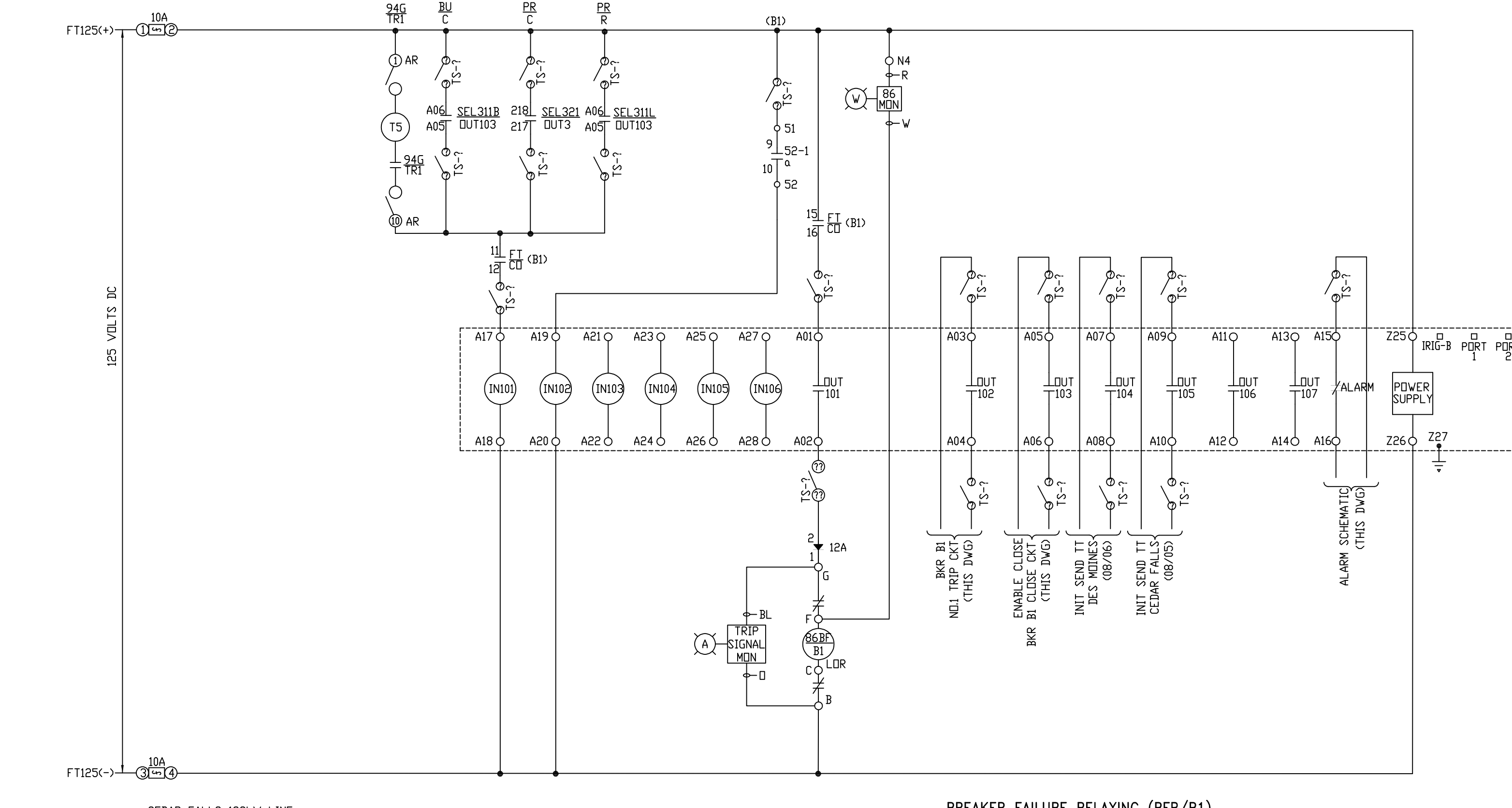


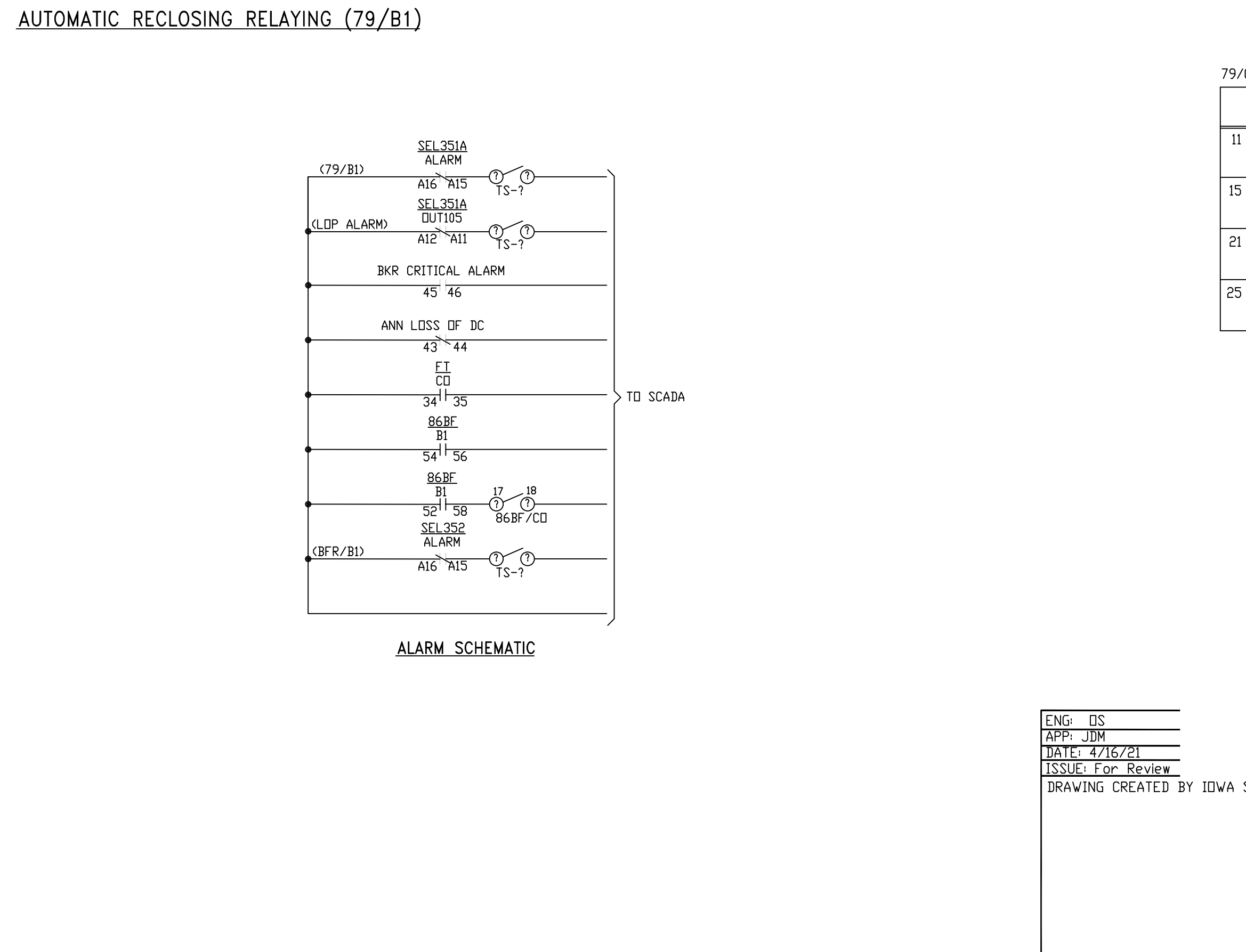
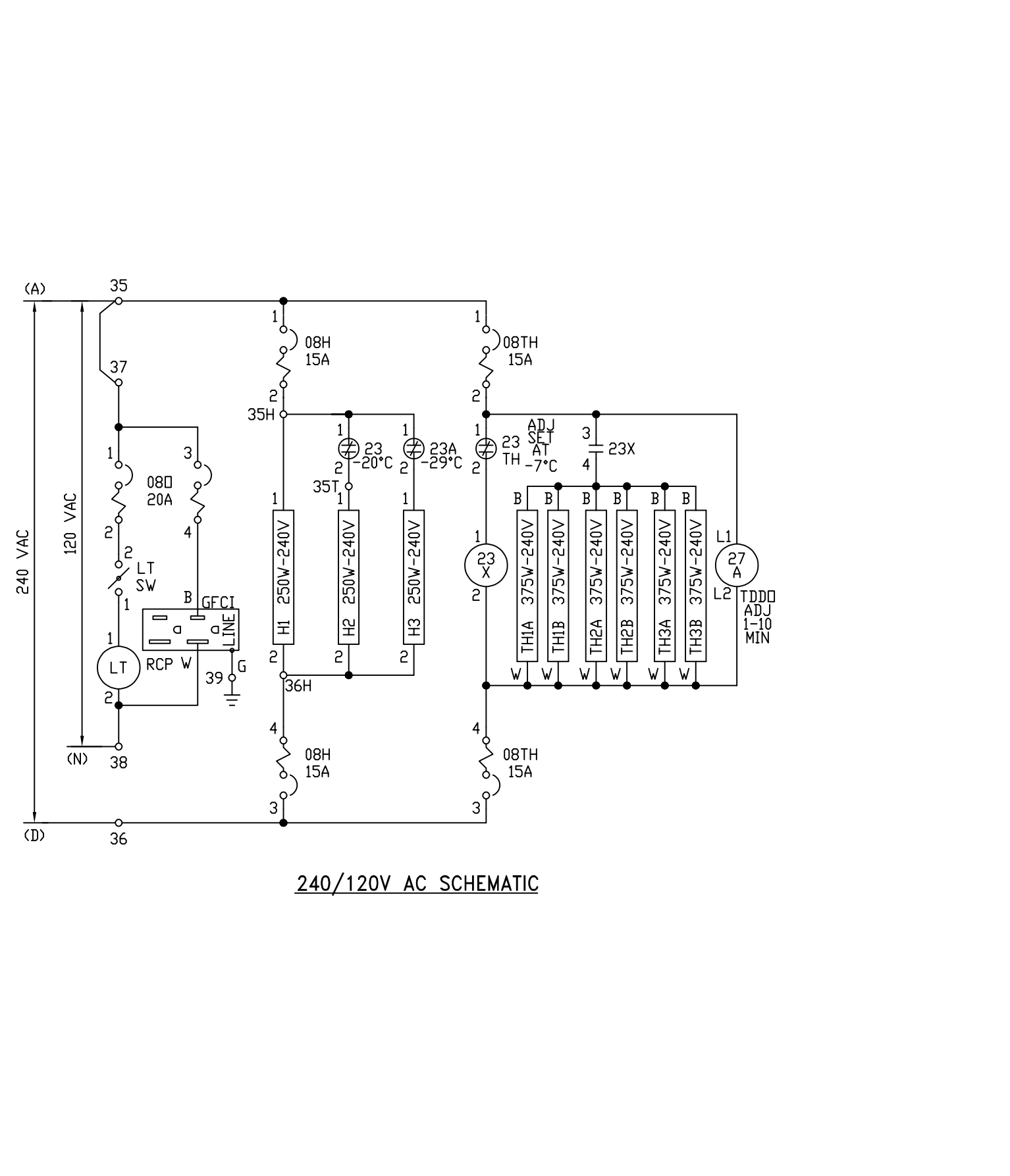
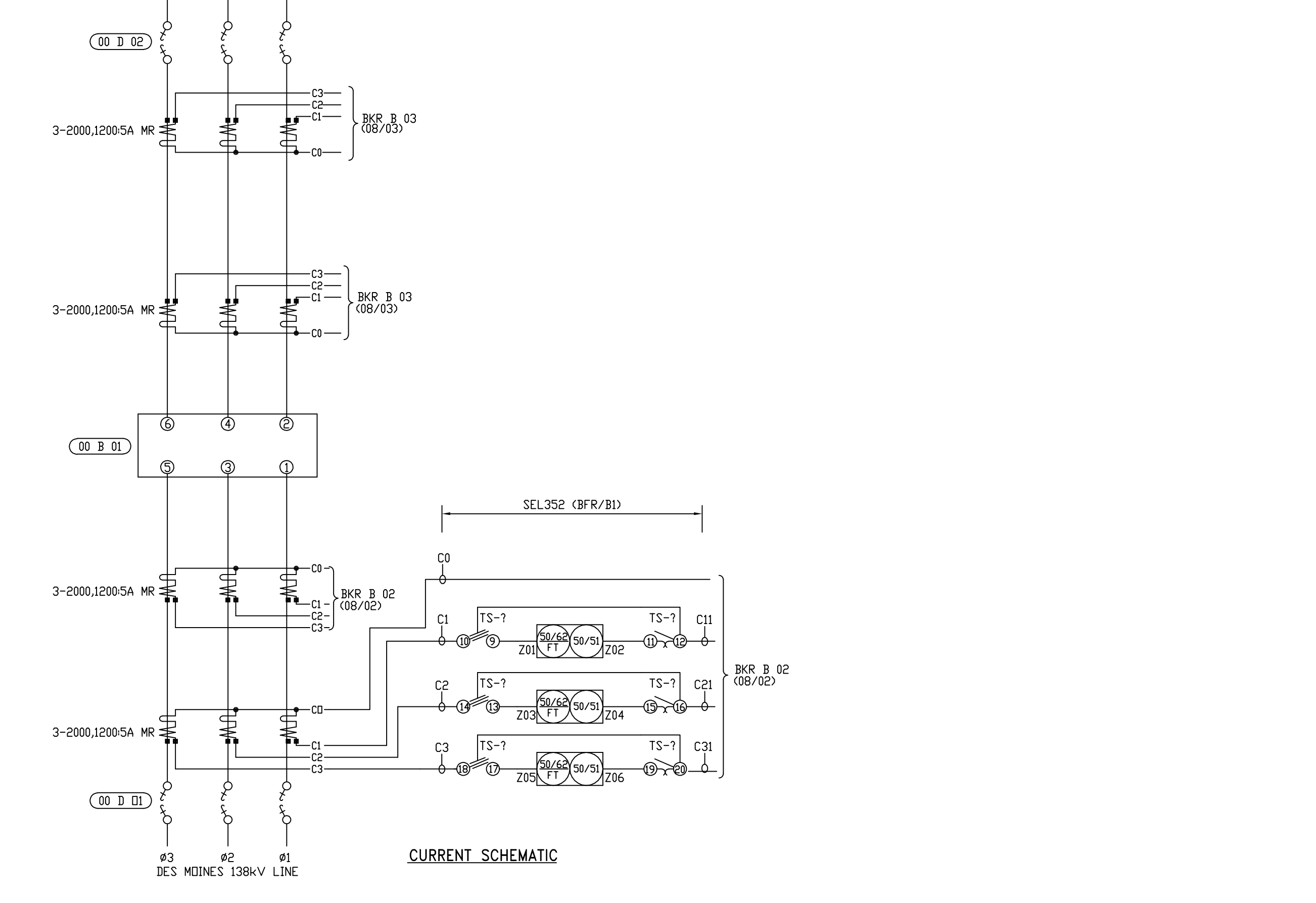
LEGEND

OBC CONTROL POWER DISCONNECT
 OBH HEATER POWER DISCONNECT
 OBM MOTOR POWER DISCONNECT
 OBD RECEPTACLE & LIGHT POWER DISCONNECT
 OBT TRIP POWER DISCONNECT
 OBT2 TRIP #2 POWER DISCONNECT
 OBTH TANK HEATER POWER DISCONNECT
 O23 CONTROL HOUSING THERMOSTAT
 O23A CONTROL HOUSING THERMOSTAT
 O23TH TANK HEATER THERMOSTAT
 O23X TANK HEATER STARTING RELAY
 O27A NO VOLTAGE RELAY (AC TANK HTR)
 O27D NO VOLTAGE RELAY (DC MOTOR)
 O30 ANNUNCIATOR
 O30R ANNUNCIATOR LOSS OF DC RELAY
 O52a BKR AUX. SW. - OPEN WHEN BKR. OPEN
 O52b BKR. AUX. SW. - CLOSED WHEN BKR. OPEN
 O52c BKR. CLOSE COIL
 O52d BKR. TRIP COIL
 O52e BKR. TRIP COIL
 O52f BKR. CLOSING CUTOFF RELAY (ANTI-PUMP)
 O52g BKR. CLOSING CUTOFF RELAY (ANTI-PUMP)
 O63G SW#1 LOW PRESSURE ALARM-(SF6)
 O63G SW#2 LOW PRESSURE CUTOFF-(SF6)
 O63X INTERRUPTER SF6 LOW PRESSURE CUTOFF AUX. RELAY
 O74X SPRING DISCHARGE ALARM
 O79X TIME DELAY RELAY
 O88 MOTOR
 G GREEN INDICATOR LIGHT (REMOTE)
 H1, 2, 3 CABINET HEATERS
 LT HOUSING LIGHT
 LTSW HOUSING LIGHT TOGGLE SWITCH
 MS SPRING CHARGE MOTOR SWITCH
 PB PUSHBUTTON CONTROL SWITCH
 PR REMOTE PROTECTIVE RELAY
 R23 RED INDICATOR LIGHT (REMOTE)
 RCP DUPLEX RECEPTACLE (GFCI)
 TH1 TANK HEATERS (POLE 1)
 TH2 TANK HEATERS (POLE 2)
 TH3 TANK HEATERS (POLE 3)

- NOTES:**
- ALL EQUIPMENT SHOWN WITH CIRCUIT BREAKER OPEN, CONTROL VOLTAGE DEF. SF6 PRESSURE LOW, SPRING DISCHARGED, TEMPERATURE LOW.
 - DENSITY SWITCH (63G) IS SOLID PART NO. 6TC/102



CONTACTS	TRIP	RESET	FUNCTION	DWG. NO.
11-13	X		BLOCK CLOSE BKR B2	(08/02)
14-18	X		TRIP BKR B2	(08/02)
19-23	X		BLOCK CLOSE BKR B3	(08/03)
24-28	X		TRIP BKR B3	(08/03)
29-33	X		BLOCK CLOSE BKR B1	(THIS DWG)
34-38	X		SEND DTT DES MOINES PR	(08/06)
39-43	X		SPARE	
44-48	X		SEND DTT DES MOINES BU	(08/06)
49-53	X		SPARE	
54-58	X		STOP CARRIER CEDAR FALLS	(08/05)
59-63	X		SPARE	
64-68	X		SPARE	
69-73	X		SPARE	
74-78	X		RELAY FAILURE ALARM	(THIS DWG)
79-83	X		SPARE	
84-88	X		SCADA INDICATION	(THIS DWG)



79/CD		CONTROL SWITCH (CS)		FT/CD	
CONTACTS	POS	CONTACT	POSITION	CONTACTS	POS
11-12	X	12-13	C	11-12	X
13-14	X	14-15	T	13-14	X
15-16	X	16-17	N	15-16	X
17-18	X	18-19	X	17-18	X
19-20	X	20-21	X	19-20	X
21-22	X	22-23	AC	21-22	X
23-24	X	24-25	N	23-24	X
25-26	X	26-27	X	25-26	X
27-28	X	28-29	AC	27-28	X
29-30	X	30-31	X	29-30	X
31-32	X	32-33	AC	31-32	X
33-34	X	34-35	X	33-34	X
35-36	X	36-37	AC	35-36	X
37-38	X	38-39	X	37-38	X
39-40	X	40-41	AC	39-40	X

FOR REVIEW

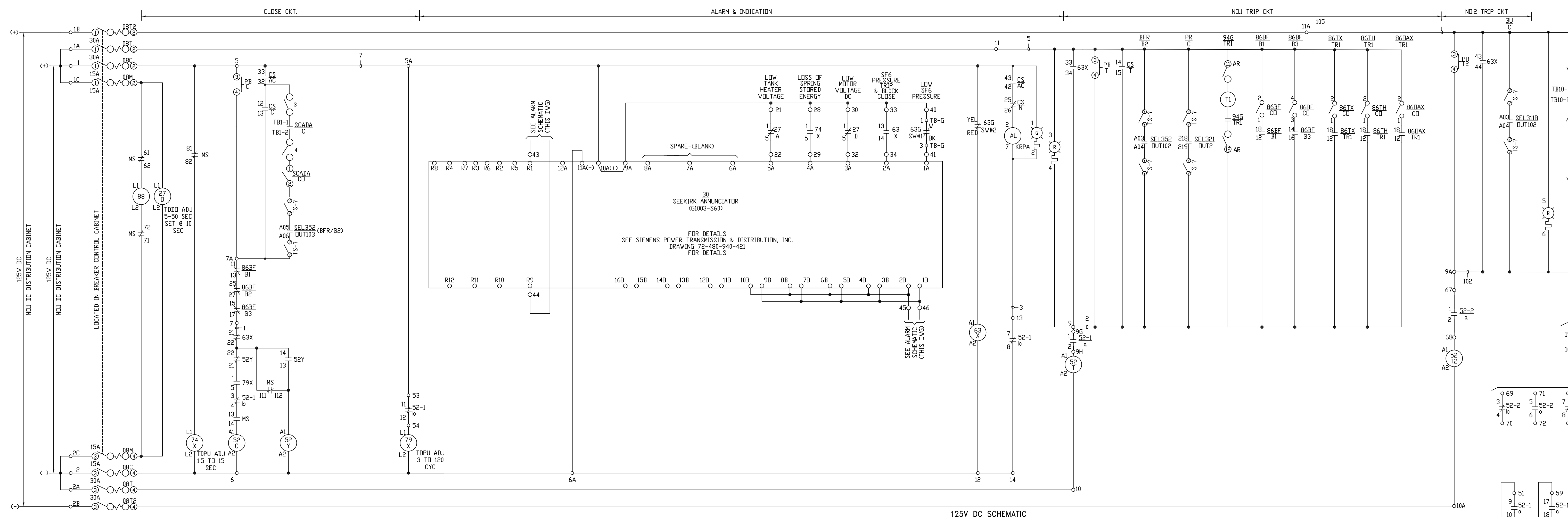
NOT FOR CONSTRUCTION

ENG: DS
 APP: JUM
 DATE: 4/16/21
 ISSUE: For Review
 DRAWING CREATED BY IDWA STATE SENIOR DESIGN 2021

CYCLONE
 CITY: AMES STATE: IDWA ZIP: 50014

DES MOINES/CEDAR FALLS
 138 kV BREAKER 1
 AC/DC SCHEMATIC

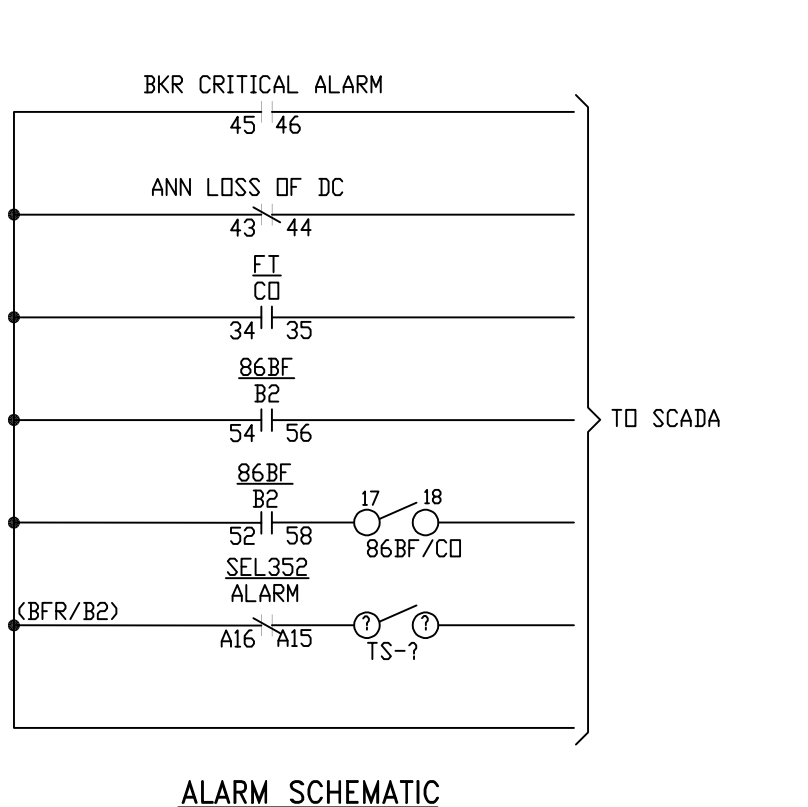
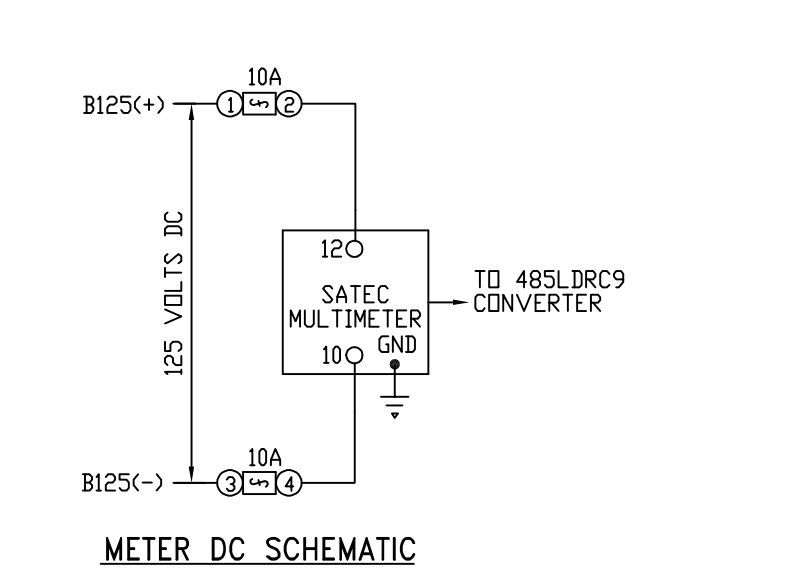
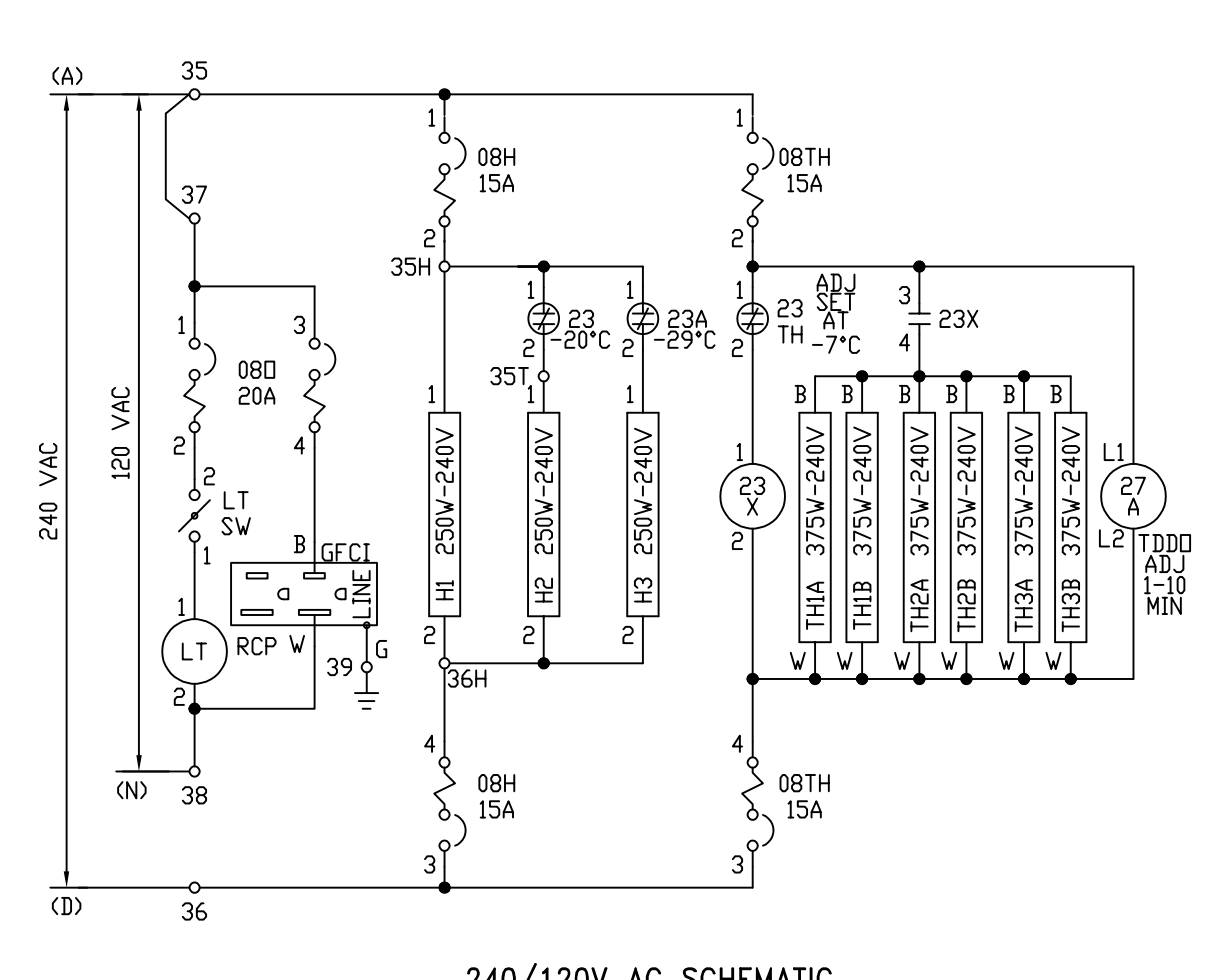
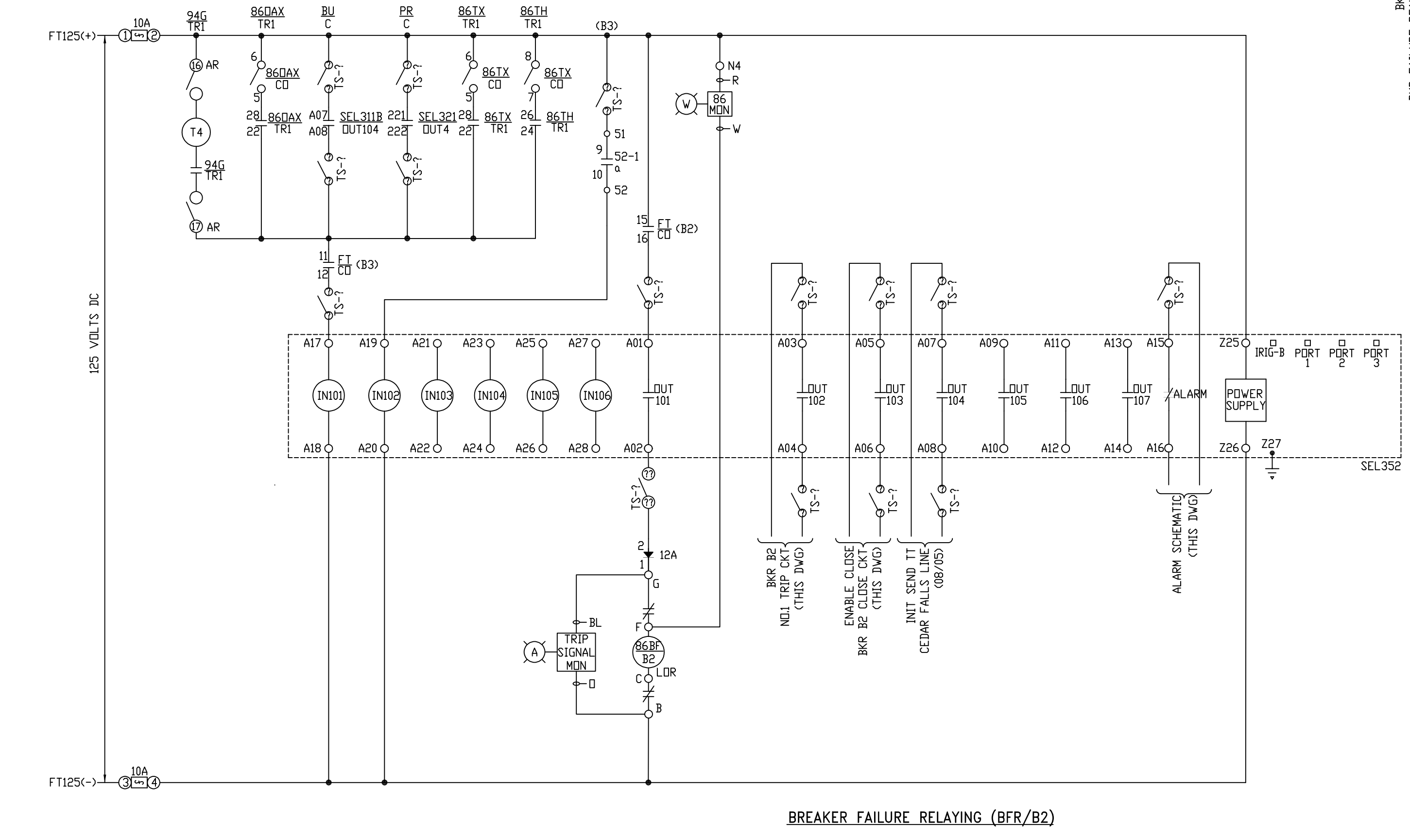
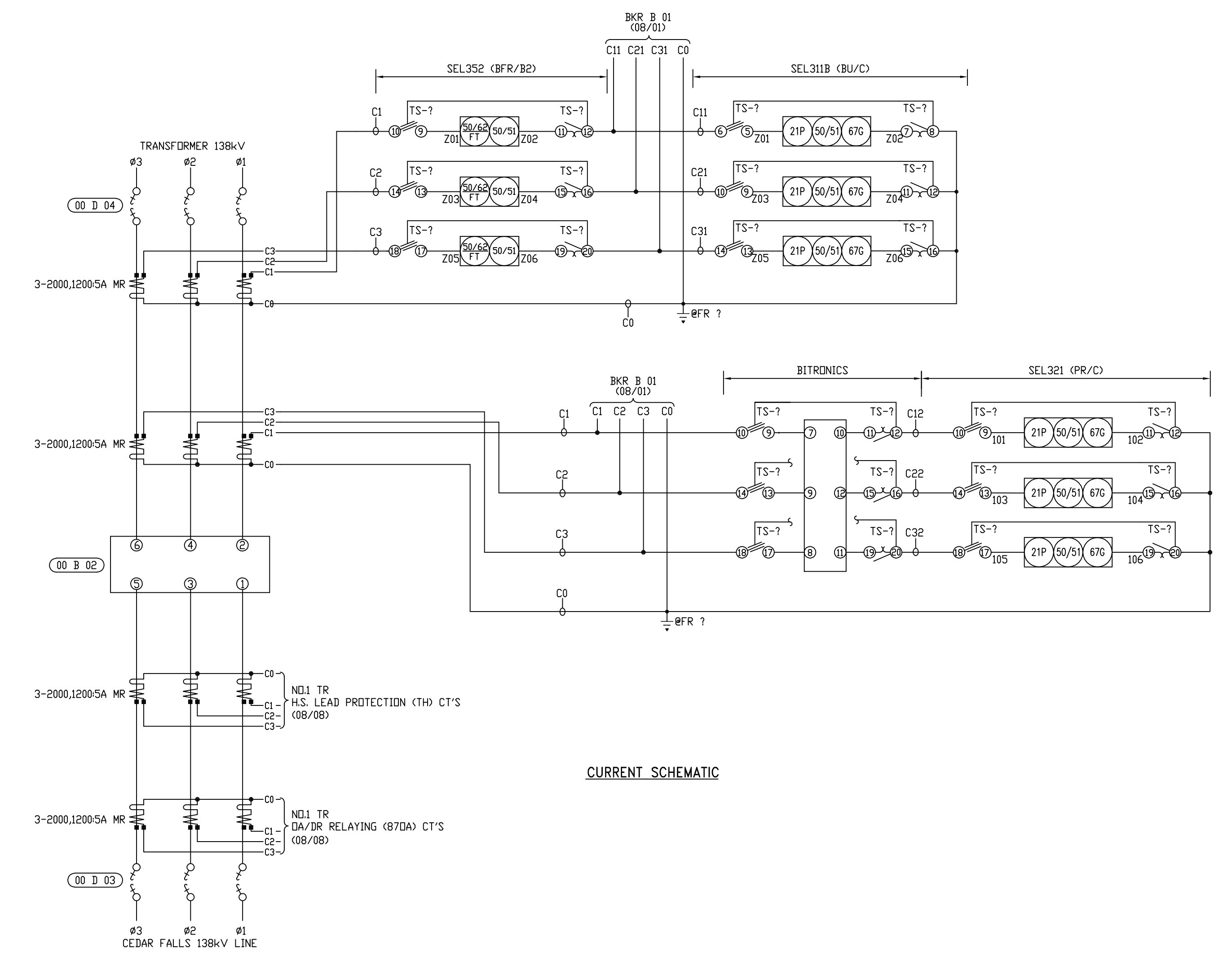
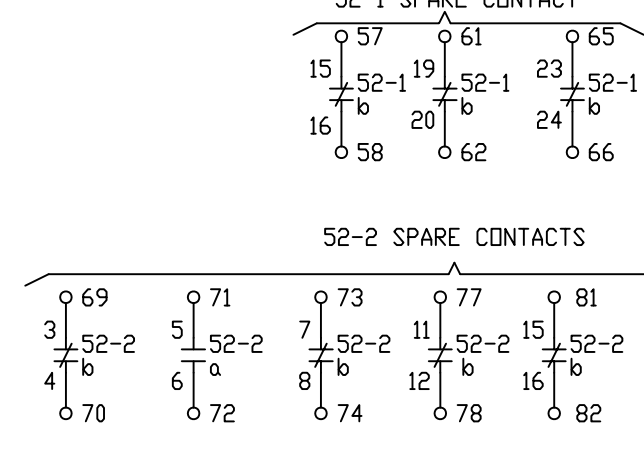
ISU-SD-04 1A-000-08-01



- LEGEND**
- OBC CONTROL POWER DISCONNECT
 - OBH HEATER POWER DISCONNECT
 - OBM MOTOR POWER DISCONNECT
 - OBP RECEPTACLE & LIGHT POWER DISCONNECT
 - OBT TRIP POWER DISCONNECT
 - OBT2 TRIP #2 POWER DISCONNECT
 - OBTH TANK HEATER POWER DISCONNECT
 - OBTH2 CONTROL HOUSING THERMOSTAT
 - OBTH3 TANK HEATER THERMOSTAT
 - OBTH4 TANK HEATER THERMOSTAT
 - OBTH5 TANK HEATER THERMOSTAT
 - OBTH6 TANK HEATER THERMOSTAT
 - OBTH7 TANK HEATER THERMOSTAT
 - OBTH8 TANK HEATER THERMOSTAT
 - OBTH9 TANK HEATER THERMOSTAT
 - OBTH10 TANK HEATER THERMOSTAT
 - OBTH11 TANK HEATER THERMOSTAT
 - OBTH12 TANK HEATER THERMOSTAT
 - OBTH13 TANK HEATER THERMOSTAT
 - OBTH14 TANK HEATER THERMOSTAT
 - OBTH15 TANK HEATER THERMOSTAT
 - OBTH16 TANK HEATER THERMOSTAT
 - OBTH17 TANK HEATER THERMOSTAT
 - OBTH18 TANK HEATER THERMOSTAT
 - OBTH19 TANK HEATER THERMOSTAT
 - OBTH20 TANK HEATER THERMOSTAT
 - OBTH21 TANK HEATER THERMOSTAT
 - OBTH22 TANK HEATER THERMOSTAT
 - OBTH23 TANK HEATER THERMOSTAT
 - OBTH24 TANK HEATER THERMOSTAT
 - OBTH25 TANK HEATER THERMOSTAT
 - OBTH26 TANK HEATER THERMOSTAT
 - OBTH27 TANK HEATER THERMOSTAT
 - OBTH28 TANK HEATER THERMOSTAT
 - OBTH29 TANK HEATER THERMOSTAT
 - OBTH30 TANK HEATER THERMOSTAT
 - OBTH31 TANK HEATER THERMOSTAT
 - OBTH32 TANK HEATER THERMOSTAT
 - OBTH33 TANK HEATER THERMOSTAT
 - OBTH34 TANK HEATER THERMOSTAT
 - OBTH35 TANK HEATER THERMOSTAT
 - OBTH36 TANK HEATER THERMOSTAT
 - OBTH37 TANK HEATER THERMOSTAT
 - OBTH38 TANK HEATER THERMOSTAT
 - OBTH39 TANK HEATER THERMOSTAT
 - OBTH40 TANK HEATER THERMOSTAT
 - OBTH41 TANK HEATER THERMOSTAT
 - OBTH42 TANK HEATER THERMOSTAT
 - OBTH43 TANK HEATER THERMOSTAT
 - OBTH44 TANK HEATER THERMOSTAT
 - OBTH45 TANK HEATER THERMOSTAT
 - OBTH46 TANK HEATER THERMOSTAT
 - OBTH47 TANK HEATER THERMOSTAT
 - OBTH48 TANK HEATER THERMOSTAT
 - OBTH49 TANK HEATER THERMOSTAT
 - OBTH50 TANK HEATER THERMOSTAT
 - OBTH51 TANK HEATER THERMOSTAT
 - OBTH52 TANK HEATER THERMOSTAT
 - OBTH53 TANK HEATER THERMOSTAT
 - OBTH54 TANK HEATER THERMOSTAT
 - OBTH55 TANK HEATER THERMOSTAT
 - OBTH56 TANK HEATER THERMOSTAT
 - OBTH57 TANK HEATER THERMOSTAT
 - OBTH58 TANK HEATER THERMOSTAT
 - OBTH59 TANK HEATER THERMOSTAT
 - OBTH60 TANK HEATER THERMOSTAT
 - OBTH61 TANK HEATER THERMOSTAT
 - OBTH62 TANK HEATER THERMOSTAT
 - OBTH63 TANK HEATER THERMOSTAT
 - OBTH64 TANK HEATER THERMOSTAT
 - OBTH65 TANK HEATER THERMOSTAT
 - OBTH66 TANK HEATER THERMOSTAT
 - OBTH67 TANK HEATER THERMOSTAT
 - OBTH68 TANK HEATER THERMOSTAT
 - OBTH69 TANK HEATER THERMOSTAT
 - OBTH70 TANK HEATER THERMOSTAT
 - OBTH71 TANK HEATER THERMOSTAT
 - OBTH72 TANK HEATER THERMOSTAT
 - OBTH73 TANK HEATER THERMOSTAT
 - OBTH74 TANK HEATER THERMOSTAT
 - OBTH75 TANK HEATER THERMOSTAT
 - OBTH76 TANK HEATER THERMOSTAT
 - OBTH77 TANK HEATER THERMOSTAT
 - OBTH78 TANK HEATER THERMOSTAT
 - OBTH79 TANK HEATER THERMOSTAT
 - OBTH80 TANK HEATER THERMOSTAT
 - OBTH81 TANK HEATER THERMOSTAT
 - OBTH82 TANK HEATER THERMOSTAT
 - OBTH83 TANK HEATER THERMOSTAT
 - OBTH84 TANK HEATER THERMOSTAT
 - OBTH85 TANK HEATER THERMOSTAT
 - OBTH86 TANK HEATER THERMOSTAT
 - OBTH87 TANK HEATER THERMOSTAT
 - OBTH88 TANK HEATER THERMOSTAT
 - OBTH89 TANK HEATER THERMOSTAT
 - OBTH90 TANK HEATER THERMOSTAT
 - OBTH91 TANK HEATER THERMOSTAT
 - OBTH92 TANK HEATER THERMOSTAT
 - OBTH93 TANK HEATER THERMOSTAT
 - OBTH94 TANK HEATER THERMOSTAT
 - OBTH95 TANK HEATER THERMOSTAT
 - OBTH96 TANK HEATER THERMOSTAT
 - OBTH97 TANK HEATER THERMOSTAT
 - OBTH98 TANK HEATER THERMOSTAT
 - OBTH99 TANK HEATER THERMOSTAT
 - OBTH100 TANK HEATER THERMOSTAT

NOTES:

- ALL EQUIPMENT SHOWN WITH CIRCUIT BREAKER OPEN. CONTROL VOLTAGE OFF, SF6 PRESSURE LOW, SPRING DISCHARGED, TEMPERATURE LOW.
- DENSITY SWITCH (63G) IS SOLID PART NO. 6TC/102



CONTACTS	TRIP	RESET	FUNCTION	DWG NO.
11-13		X	BLOCK CLOSE BKR B1	(08/01)
12-18	X		TRIP BKR B1	(08/01)
13-17		X	BLOCK CLOSE BKR B3	(08/03)
15-14	X		TRIP BKR B3	(08/03)
21-23		X	BLOCK CLOSE BKR B4	(08/04)
22-18	X		TRIP BKR B4	(08/04)
25-27		X	BLOCK CLOSE BKR B2	(THIS DWG)
26-14	X		STOP CARRIER CEDAR FALLS	(08/05)
31-23		X	SPARE	
32-18	X		SPARE	
35-27		X	SPARE	
36-14	X		SPARE	
41-43		X	SPARE	
42-18	X		SPARE	
45-47		X	SPARE	
46-14	X		SPARE	
51-23		X	SPARE	
52-18	X		RELAY FAILURE ALARM	(THIS DWG)
55-27		X	SPARE	
56-14	X		SCADA INDICATION	(THIS DWG)

ELECTROSWITCH TYPE "LDR"

CONTROL SWITCH (CS)				FT/CD	
CONTACT	SYMBOL	POSITION	TRIP	CONTACTS	POS OFF ON
12-13	C	T	X	11-18	X
14-15	T	X		15-18	X
21-22	N	X	X	14-14	X
25-26	N	X	X	21-22	X
32-33	AC	X	X	25-28	X
35-36	AT	X	X	25-26	X
42-43	AC	X	X	31-32	X
46-47	AC	X	X	38-38	X
				35-36	X

FOR REVIEW

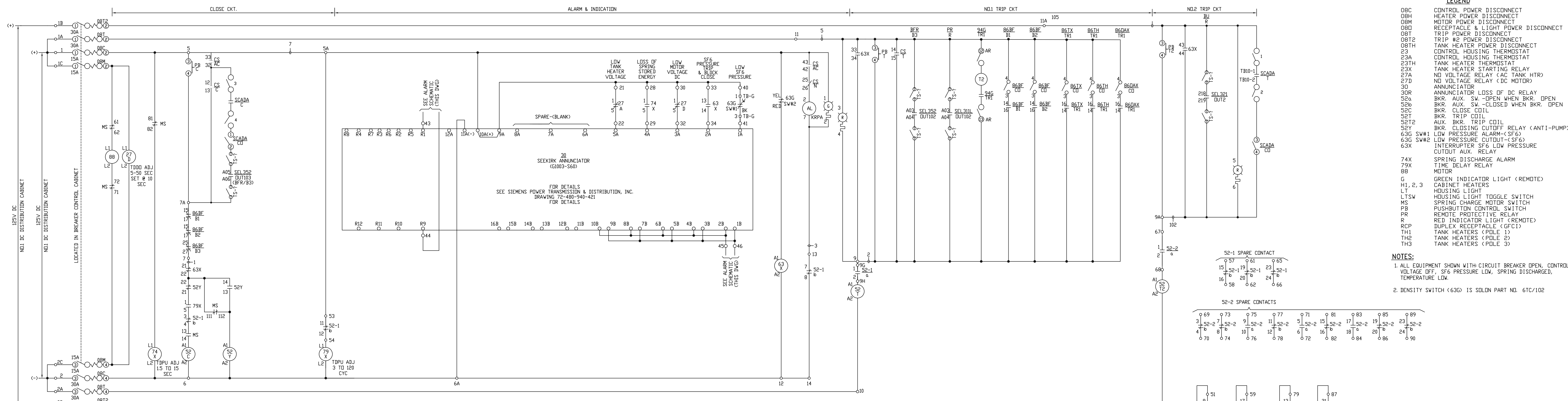
NOT FOR CONSTRUCTION

ENG: CC
 APPR: JHM
 DATE: 04/16/21
 ISSUE: For Review
 DRAWING CREATED BY IDWA STATE SENIOR DESIGN 2020.

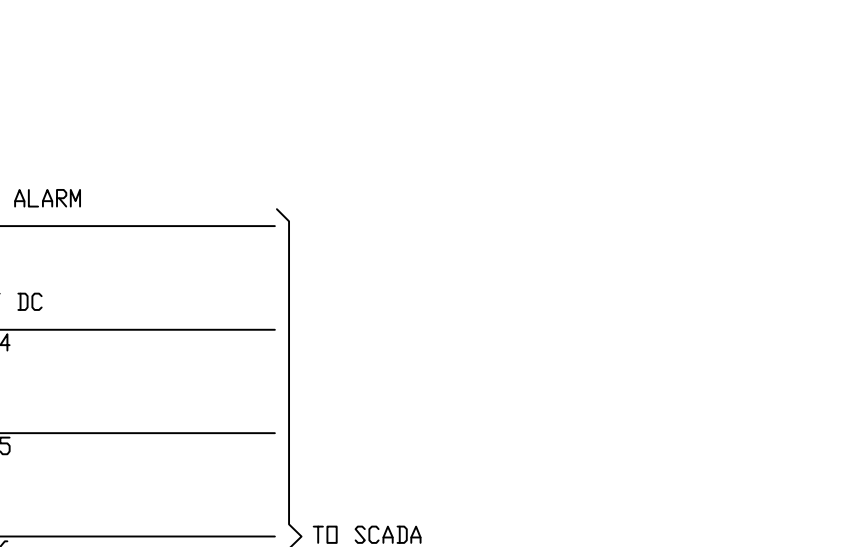
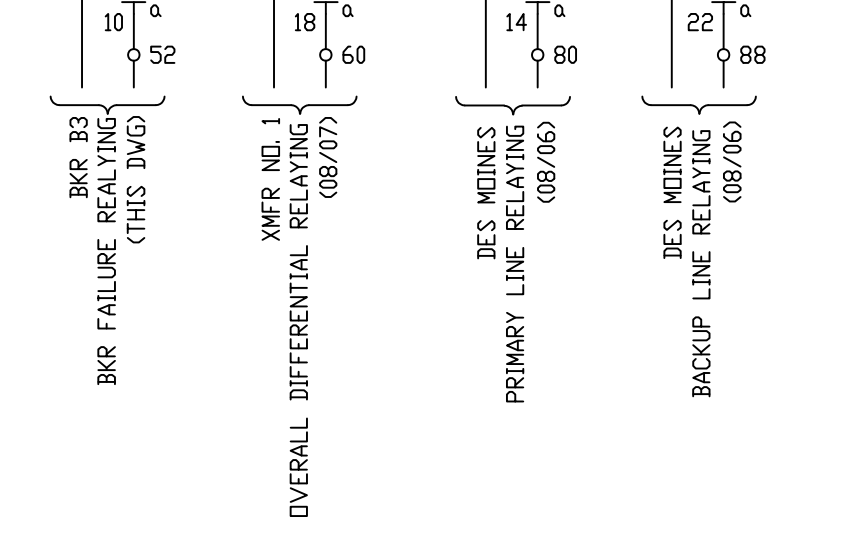
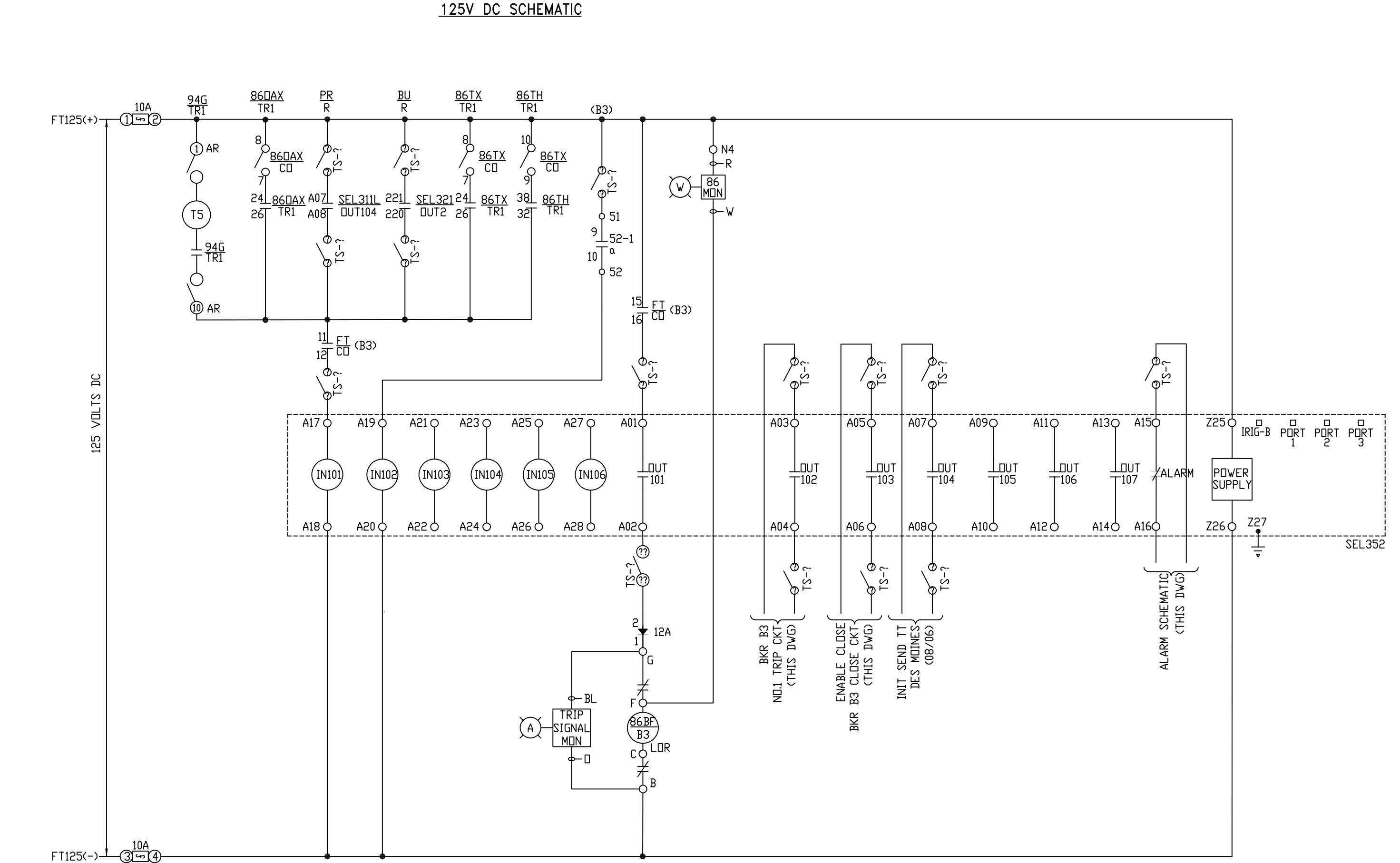
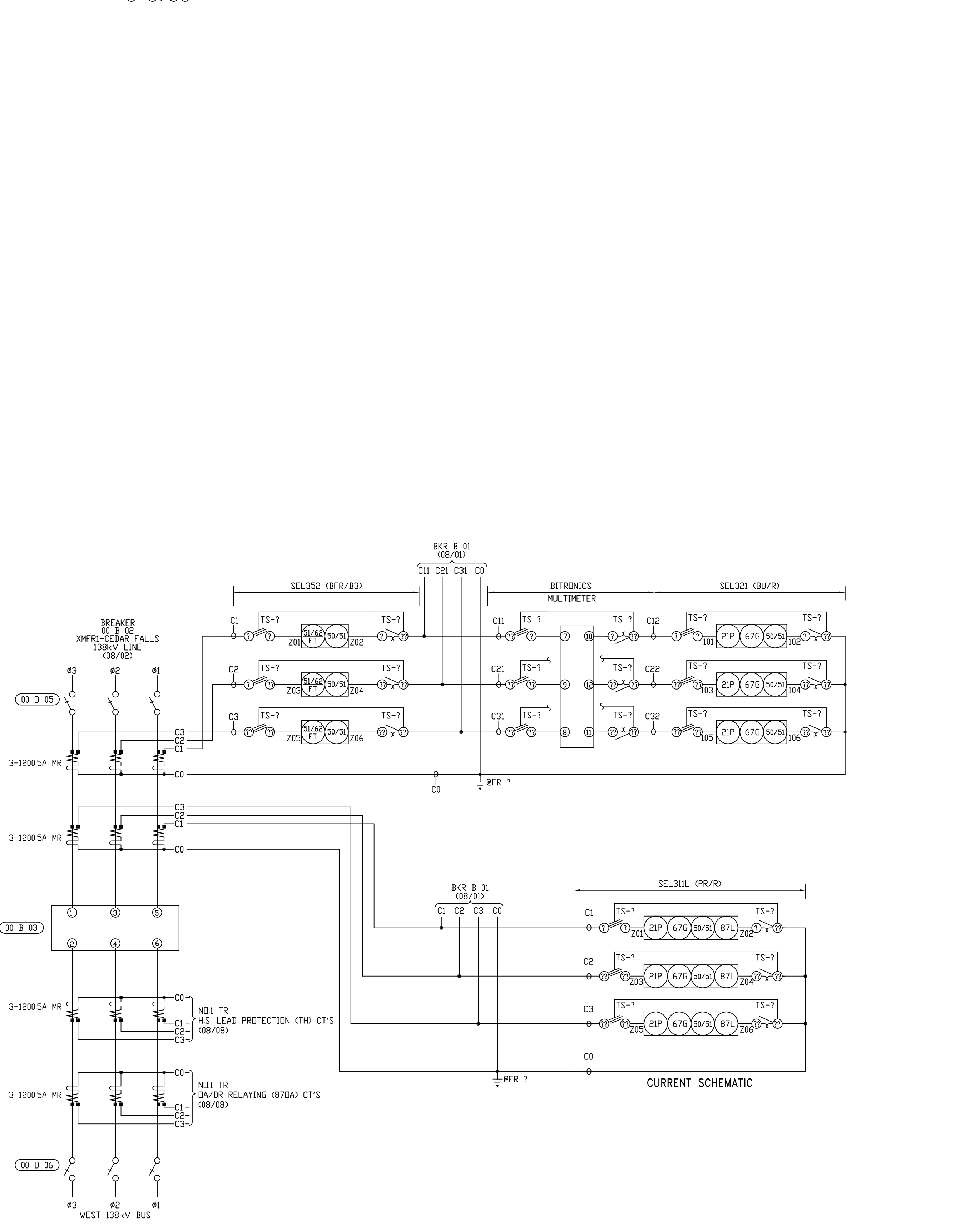
CYCLONE
 CITY: AMES STATE: IDWA ZIP: 50014

CEDAR FALLS/XMFR 1
 138 kV BREAKER 2
 AC/DC SCHEMATIC

ISU-SD-04 IA-000-08-02



- LEGEND**
- OBC CONTROL POWER DISCONNECT
 - OBH HEATER POWER DISCONNECT
 - OBM MOTOR POWER DISCONNECT
 - OBP RECEPTACLE & LIGHT POWER DISCONNECT
 - OBT TRIP POWER DISCONNECT
 - OBT2 TRIP #2 POWER DISCONNECT
 - OBTH TANK HEATER POWER DISCONNECT
 - OBTH2 TANK HEATER POWER DISCONNECT
 - OBTH3 TANK HEATER POWER DISCONNECT
 - OBTH4 TANK HEATER POWER DISCONNECT
 - OBTH5 TANK HEATER POWER DISCONNECT
 - OBTH6 TANK HEATER POWER DISCONNECT
 - OBTH7 TANK HEATER POWER DISCONNECT
 - OBTH8 TANK HEATER POWER DISCONNECT
 - OBTH9 TANK HEATER POWER DISCONNECT
 - OBTH10 TANK HEATER POWER DISCONNECT
 - OBTH11 TANK HEATER POWER DISCONNECT
 - OBTH12 TANK HEATER POWER DISCONNECT
 - OBTH13 TANK HEATER POWER DISCONNECT
 - OBTH14 TANK HEATER POWER DISCONNECT
 - OBTH15 TANK HEATER POWER DISCONNECT
 - OBTH16 TANK HEATER POWER DISCONNECT
 - OBTH17 TANK HEATER POWER DISCONNECT
 - OBTH18 TANK HEATER POWER DISCONNECT
 - OBTH19 TANK HEATER POWER DISCONNECT
 - OBTH20 TANK HEATER POWER DISCONNECT
 - OBTH21 TANK HEATER POWER DISCONNECT
 - OBTH22 TANK HEATER POWER DISCONNECT
 - OBTH23 TANK HEATER POWER DISCONNECT
 - OBTH24 TANK HEATER POWER DISCONNECT
 - OBTH25 TANK HEATER POWER DISCONNECT
 - OBTH26 TANK HEATER POWER DISCONNECT
 - OBTH27 TANK HEATER POWER DISCONNECT
 - OBTH28 TANK HEATER POWER DISCONNECT
 - OBTH29 TANK HEATER POWER DISCONNECT
 - OBTH30 TANK HEATER POWER DISCONNECT
 - OBTH31 TANK HEATER POWER DISCONNECT
 - OBTH32 TANK HEATER POWER DISCONNECT
 - OBTH33 TANK HEATER POWER DISCONNECT
 - OBTH34 TANK HEATER POWER DISCONNECT
 - OBTH35 TANK HEATER POWER DISCONNECT
 - OBTH36 TANK HEATER POWER DISCONNECT
 - OBTH37 TANK HEATER POWER DISCONNECT
 - OBTH38 TANK HEATER POWER DISCONNECT
 - OBTH39 TANK HEATER POWER DISCONNECT
 - OBTH40 TANK HEATER POWER DISCONNECT
 - OBTH41 TANK HEATER POWER DISCONNECT
 - OBTH42 TANK HEATER POWER DISCONNECT
 - OBTH43 TANK HEATER POWER DISCONNECT
 - OBTH44 TANK HEATER POWER DISCONNECT
 - OBTH45 TANK HEATER POWER DISCONNECT
 - OBTH46 TANK HEATER POWER DISCONNECT
 - OBTH47 TANK HEATER POWER DISCONNECT
 - OBTH48 TANK HEATER POWER DISCONNECT
 - OBTH49 TANK HEATER POWER DISCONNECT
 - OBTH50 TANK HEATER POWER DISCONNECT
 - OBTH51 TANK HEATER POWER DISCONNECT
 - OBTH52 TANK HEATER POWER DISCONNECT
 - OBTH53 TANK HEATER POWER DISCONNECT
 - OBTH54 TANK HEATER POWER DISCONNECT
 - OBTH55 TANK HEATER POWER DISCONNECT
 - OBTH56 TANK HEATER POWER DISCONNECT
 - OBTH57 TANK HEATER POWER DISCONNECT
 - OBTH58 TANK HEATER POWER DISCONNECT
 - OBTH59 TANK HEATER POWER DISCONNECT
 - OBTH60 TANK HEATER POWER DISCONNECT
 - OBTH61 TANK HEATER POWER DISCONNECT
 - OBTH62 TANK HEATER POWER DISCONNECT
 - OBTH63 TANK HEATER POWER DISCONNECT
 - OBTH64 TANK HEATER POWER DISCONNECT
 - OBTH65 TANK HEATER POWER DISCONNECT
 - OBTH66 TANK HEATER POWER DISCONNECT
 - OBTH67 TANK HEATER POWER DISCONNECT
 - OBTH68 TANK HEATER POWER DISCONNECT
 - OBTH69 TANK HEATER POWER DISCONNECT
 - OBTH70 TANK HEATER POWER DISCONNECT
 - OBTH71 TANK HEATER POWER DISCONNECT
 - OBTH72 TANK HEATER POWER DISCONNECT
 - OBTH73 TANK HEATER POWER DISCONNECT
 - OBTH74 TANK HEATER POWER DISCONNECT
 - OBTH75 TANK HEATER POWER DISCONNECT
 - OBTH76 TANK HEATER POWER DISCONNECT
 - OBTH77 TANK HEATER POWER DISCONNECT
 - OBTH78 TANK HEATER POWER DISCONNECT
 - OBTH79 TANK HEATER POWER DISCONNECT
 - OBTH80 TANK HEATER POWER DISCONNECT
 - OBTH81 TANK HEATER POWER DISCONNECT
 - OBTH82 TANK HEATER POWER DISCONNECT
 - OBTH83 TANK HEATER POWER DISCONNECT
 - OBTH84 TANK HEATER POWER DISCONNECT
 - OBTH85 TANK HEATER POWER DISCONNECT
 - OBTH86 TANK HEATER POWER DISCONNECT
 - OBTH87 TANK HEATER POWER DISCONNECT
 - OBTH88 TANK HEATER POWER DISCONNECT
 - OBTH89 TANK HEATER POWER DISCONNECT
 - OBTH90 TANK HEATER POWER DISCONNECT
 - OBTH91 TANK HEATER POWER DISCONNECT
 - OBTH92 TANK HEATER POWER DISCONNECT
 - OBTH93 TANK HEATER POWER DISCONNECT
 - OBTH94 TANK HEATER POWER DISCONNECT
 - OBTH95 TANK HEATER POWER DISCONNECT
 - OBTH96 TANK HEATER POWER DISCONNECT
 - OBTH97 TANK HEATER POWER DISCONNECT
 - OBTH98 TANK HEATER POWER DISCONNECT
 - OBTH99 TANK HEATER POWER DISCONNECT
 - OBTH100 TANK HEATER POWER DISCONNECT

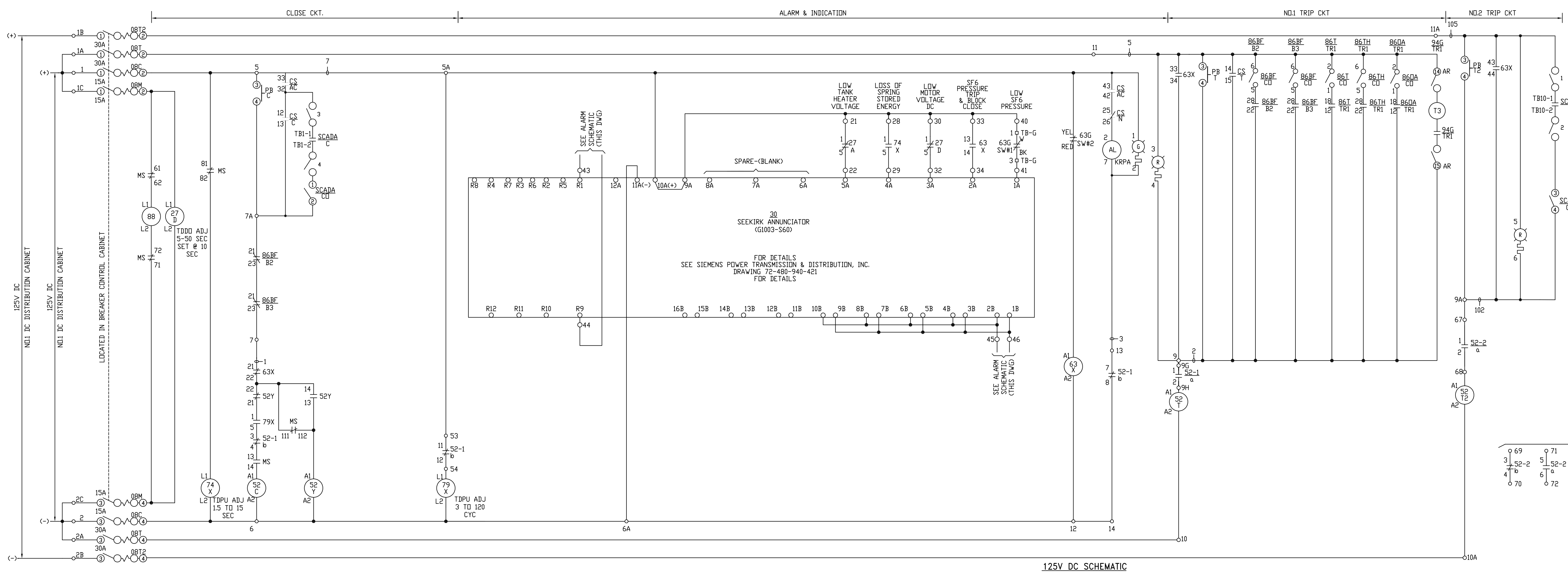


ELECTROSWITCH TYPE "LDR"

CONTROL SWITCH (CS)	POSITION	CONTACTS	POS
12-13 C	TRIP	11-12	X
14-15 T X	TRIP	14-18	X
21-22 N	TRIP	15-16	X
25-26 N	TRIP	14-14	X
32-33 AC	TRIP	21-22	X
35-36 AT	TRIP	14-28	X
42-43 AC	TRIP	25-26	X
46-47 AC	TRIP	14-24	X
		31-32	X
		14-38	X
		35-36	X
		14-34	X

FOR REVIEW

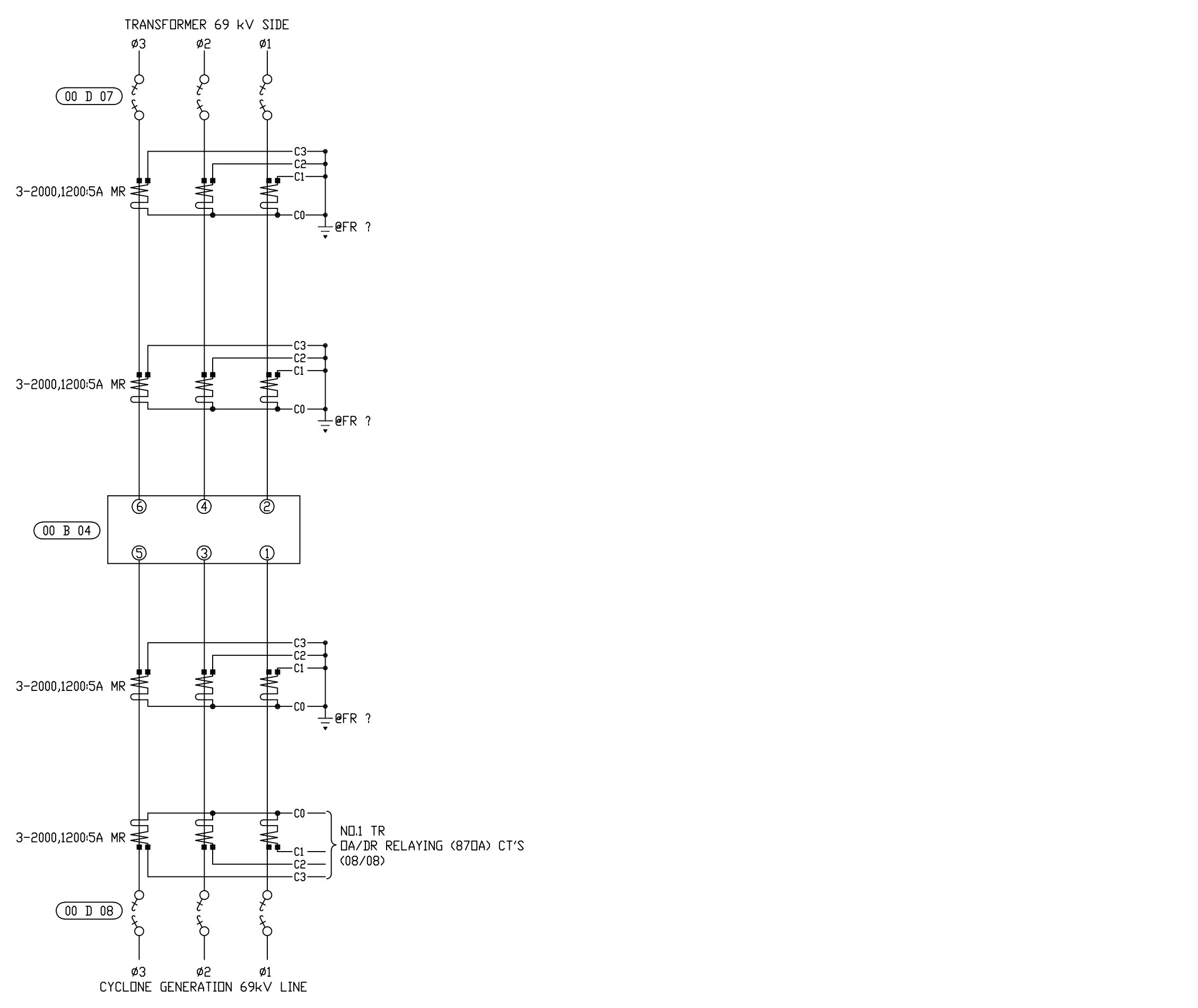
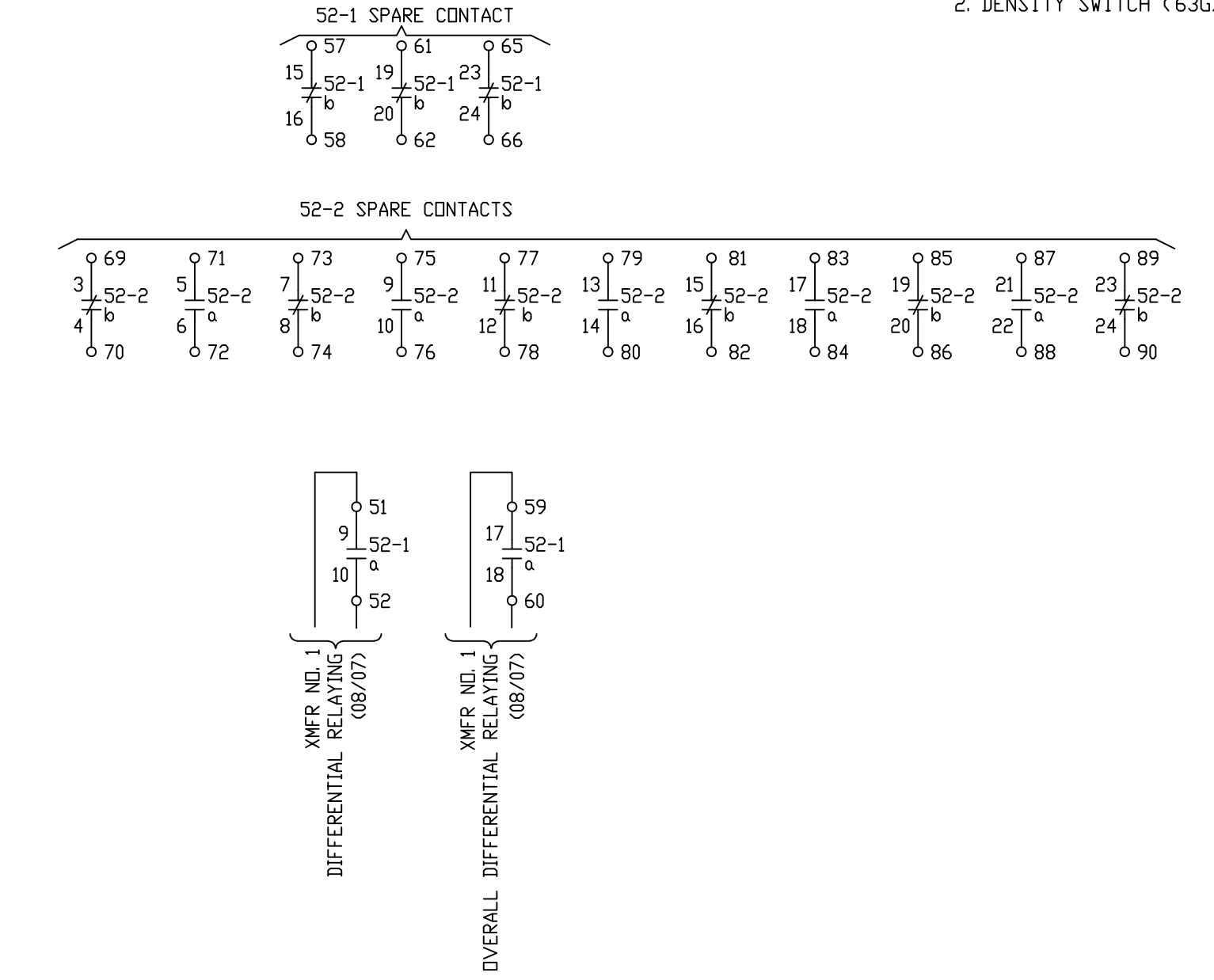
NOT FOR CONSTRUCTION



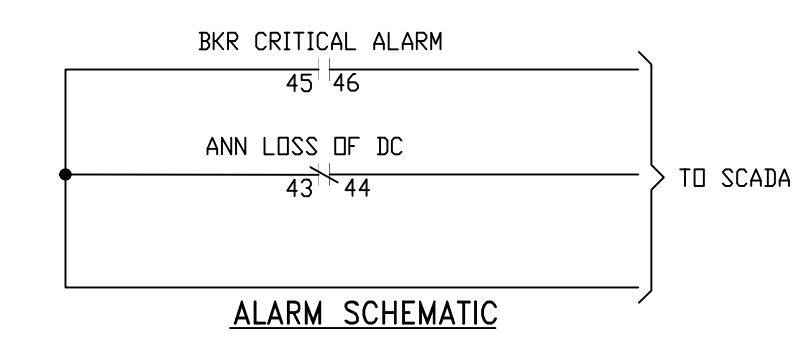
125V DC SCHEMATIC

- LEGEND**
- OBC CONTROL POWER DISCONNECT
 - OBH HEATER POWER DISCONNECT
 - OBM MOTOR POWER DISCONNECT
 - OBP RECEPTACLE & LIGHT POWER DISCONNECT
 - OBT TRIP POWER DISCONNECT
 - OB2 TRIP #2 POWER DISCONNECT
 - OBTH TANK HEATER POWER DISCONNECT
 - 23 CONTROL HOUSING THERMISTAT
 - 23A TANK HEATER THERMISTAT
 - 23TH TANK HEATER THERMISTAT
 - 27A TANK HEATER STARTING RELAY
 - 27A ND VOLTAGE RELAY (AC TANK HTR)
 - 27D ND VOLTAGE RELAY (DC MOTOR)
 - 30 ANNUNCIATOR
 - 30R ANNUNCIATOR LOSS OF DC RELAY
 - 52a BKR. AUX. SW. -OPEN WHEN BKR. OPEN
 - 52b BKR. AUX. SW. -CLOSED WHEN BKR. OPEN
 - 52C BKR. CLOSE COIL
 - 52T BKR. TRIP COIL
 - 52Y2 AUX. BKR. TRIP COIL
 - 52Y BKR. CLOSING CUTOFF RELAY (ANTI-PUMP)
 - 63G SW#1 LOW PRESSURE ALARM-(SF6)
 - 63G SW#2 LOW PRESSURE CUTOFF-(SF6)
 - 63X INTERRUPTER SF6 LOW PRESSURE CUTOFF AUX. RELAY
 - 74X SPRING DISCHARGE ALARM
 - 79X TIME DELAY RELAY
 - 88 MOTOR
 - G GREEN INDICATOR LIGHT (REMOTE)
 - H1, 2, 3 CABINET HEATERS
 - LT HOUSING LIGHT
 - MS HOUSING LIGHT TOGGLE SWITCH
 - LTSW SPRING CHARGE MOTOR SWITCH
 - PB PUSHBUTTON CONTROL SWITCH
 - PR REMOTE PROTECTIVE RELAY
 - R RED INDICATOR LIGHT (REMOTE)
 - RCP DUPLEX RECEPTACLE (GFCI)
 - TH1 TANK HEATERS (POLE 1)
 - TH2 TANK HEATERS (POLE 2)
 - TH3 TANK HEATERS (POLE 3)

- NOTES:**
1. ALL EQUIPMENT SHOWN WITH CIRCUIT BREAKER OPEN, CONTROL VOLTAGE OFF, SF6 PRESSURE LOW, SPRING DISCHARGED, TEMPERATURE LOW.
 2. DENSITY SWITCH (63G) IS SOLON PART NO. 6TC/102



240/120V AC SCHEMATIC



CONTROL SWITCH (CS)

CONTACT	SYMBOL	TRIP	POSITION	POS
12-13	C			X
14-15	T	X		X
21-22	N	X	X	X
25-26	N	X	X	X
32-33	AC		X	X
35-36	AT	X	X	X
42-43	AC		X	X
46-47	AC		X	X

FT/CD

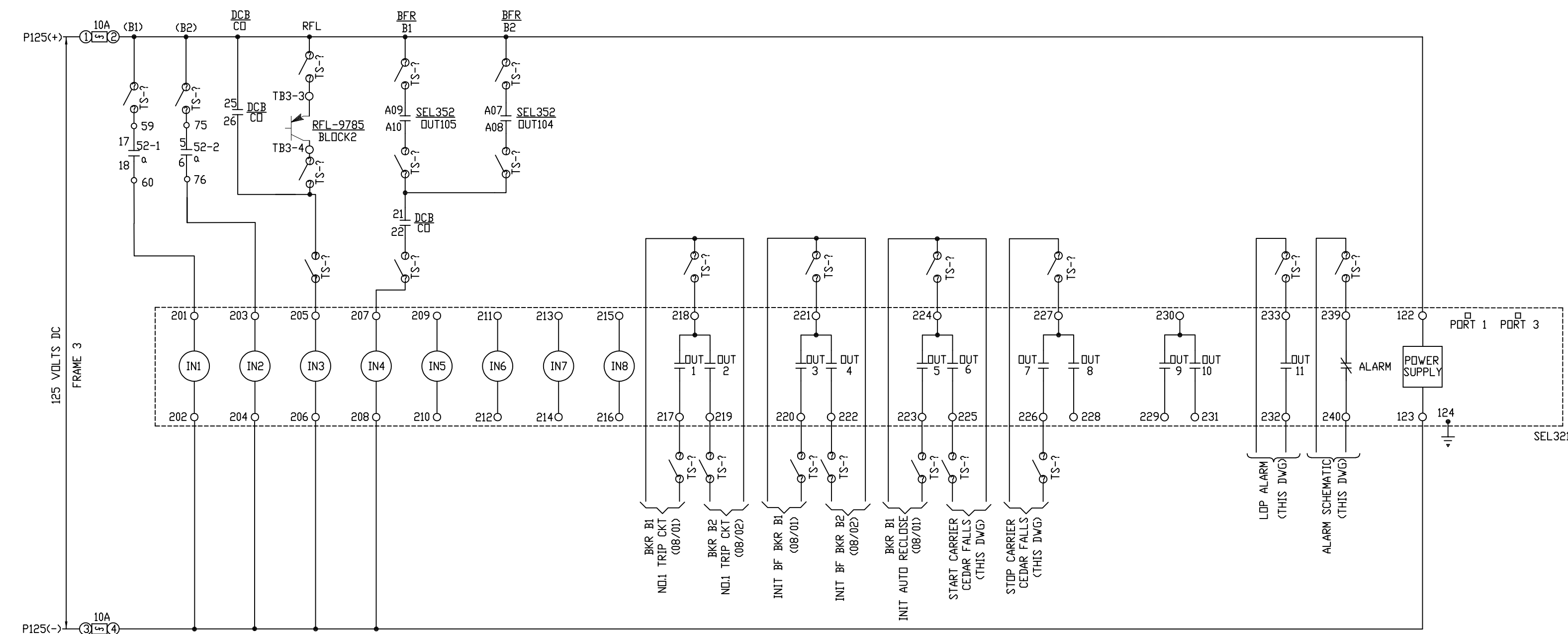
CONTACTS	POS
11-12	X
15-16	X
14-15	X
21-22	X
25-26	X
25-26	X
35-36	X
42-43	X
46-47	X
31-32	X
35-36	X
35-36	X

ESW 24

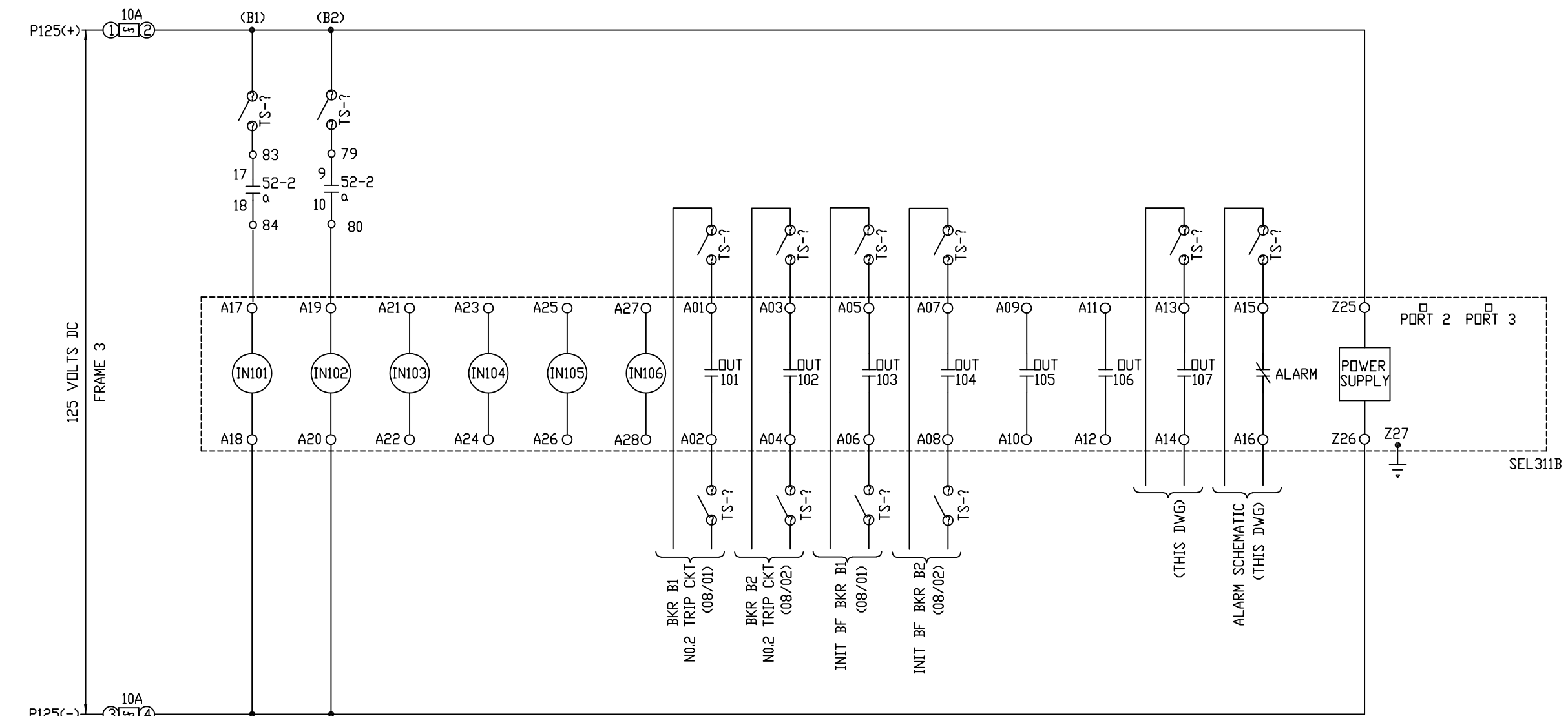
FOR REVIEW

NOT FOR CONSTRUCTION

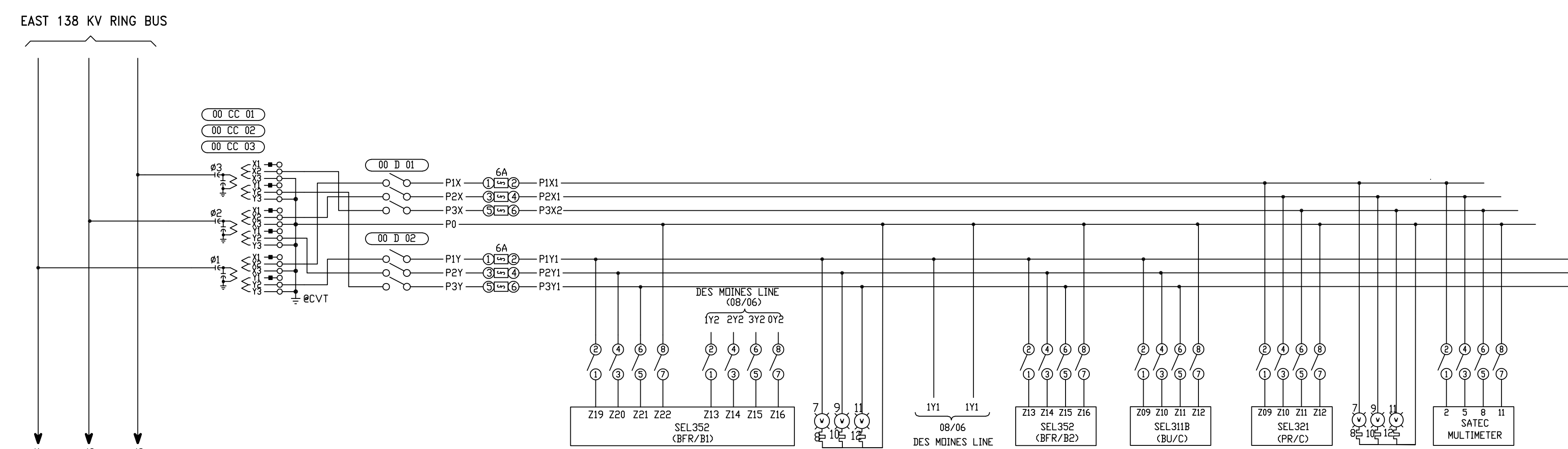
ENG: ZL APP: JHM DATE: 04/16/21 ISSUE: For Review DRAWING CREATED BY IDWA STATE SENIOR DESIGN 2020.	CYCLONE CITY: AMES STATE: IDWA ZIP: 50014 CYCLONE GENERATION 69 kV BREAKER 4 AC/DC SCHEMATIC ISU-SD-04 IA-000-08-04
---	---



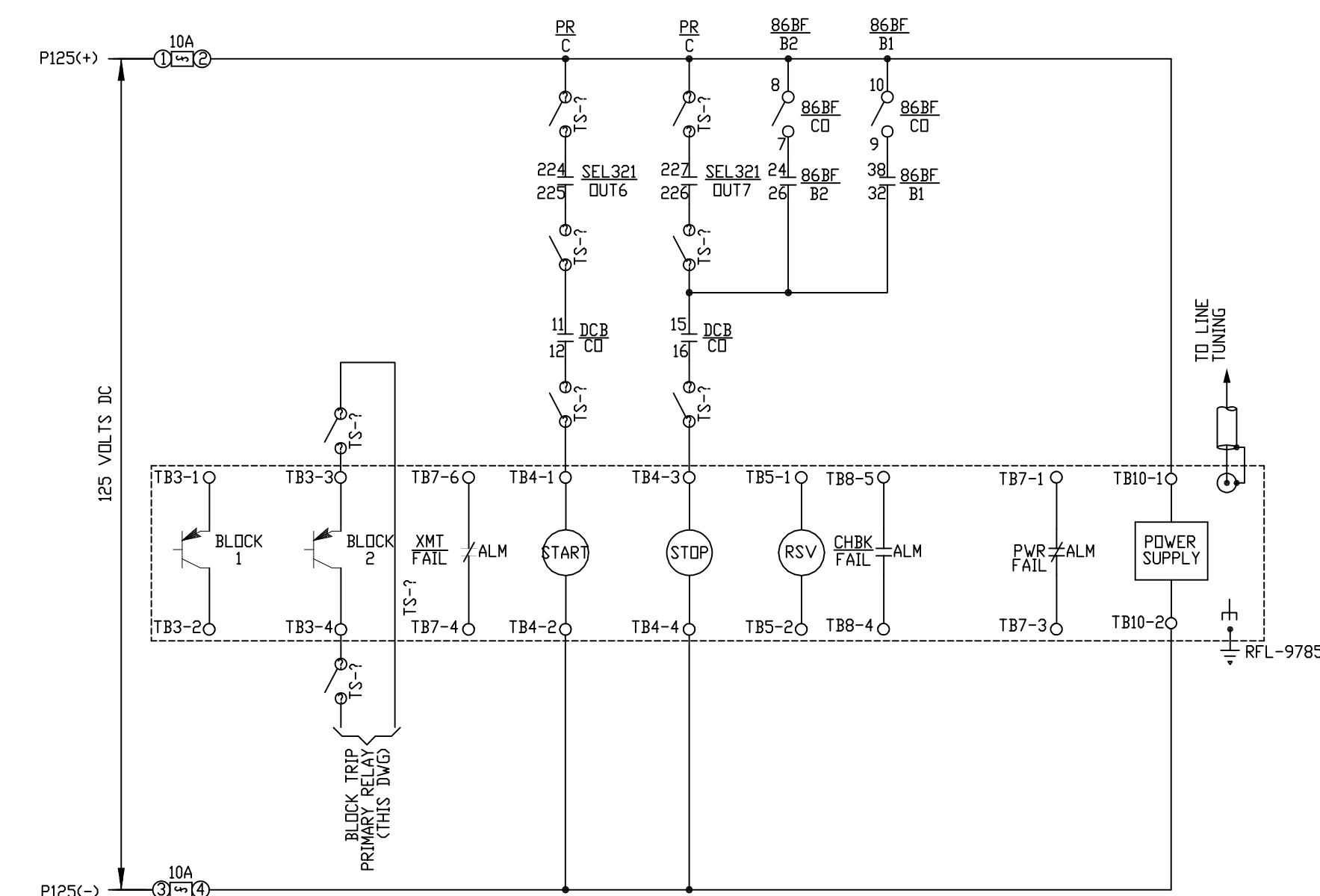
CEDAR FALLS PRIMARY LINE RELAYING (PR/C)



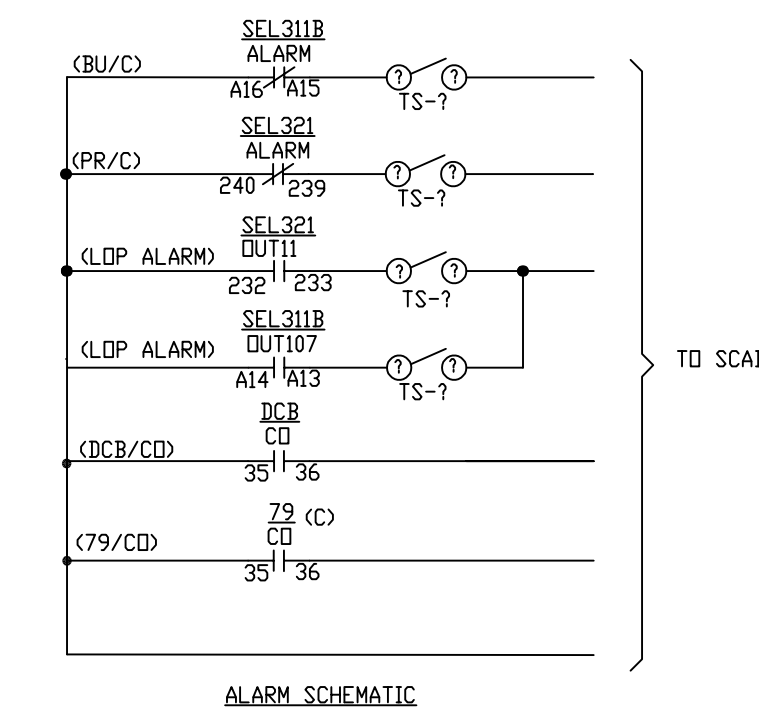
CEDAR FALLS BACKUP LINE RELAYING (BU/C)



POTENTIAL SCHEMATIC



DCB CARRIER RELAYING



ALARM SCHEMATIC

CONTACTS	PDS
11 → 12	X
15 → 16	X
21 → 22	X
25 → 26	X
31 → 32	X
35 → 36	X
38 → 39	X
41 → 42	X

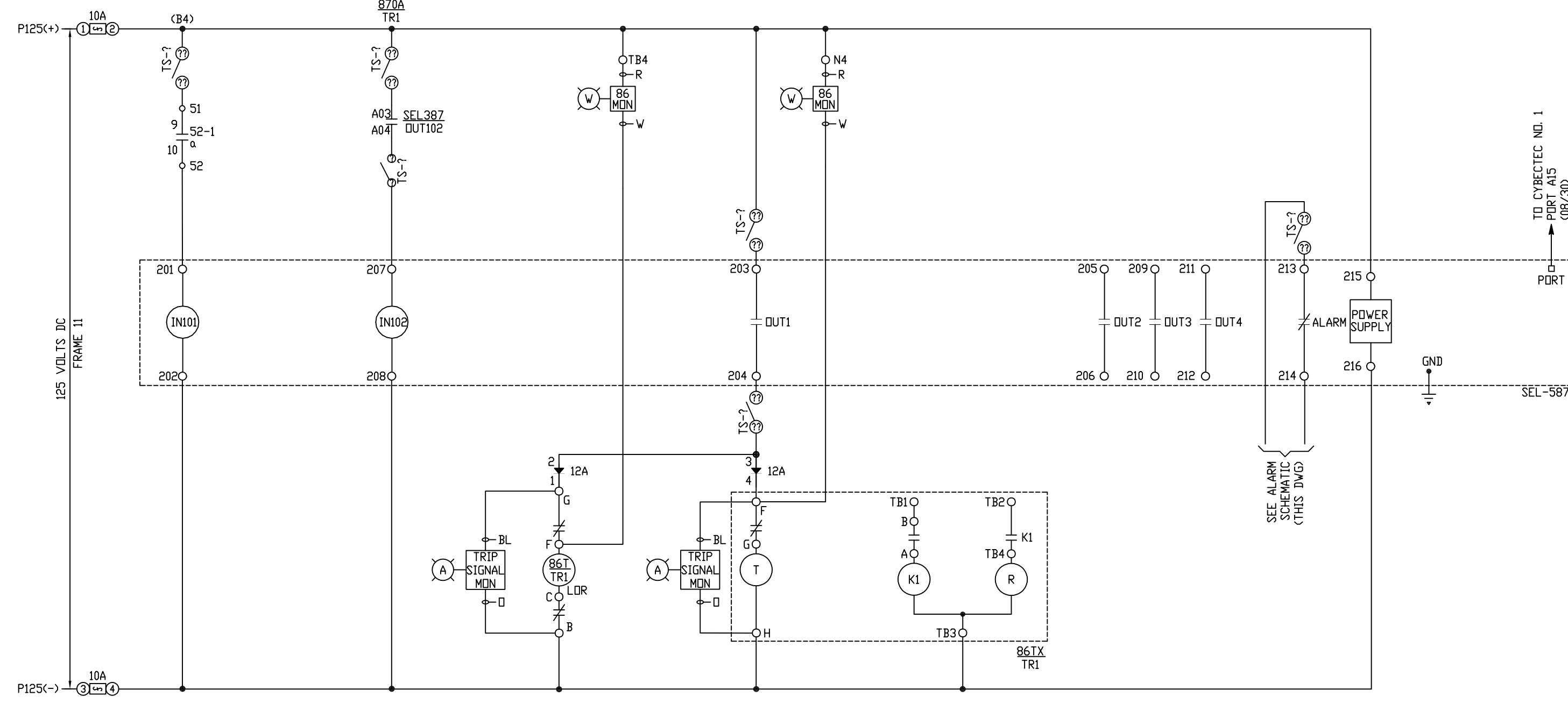
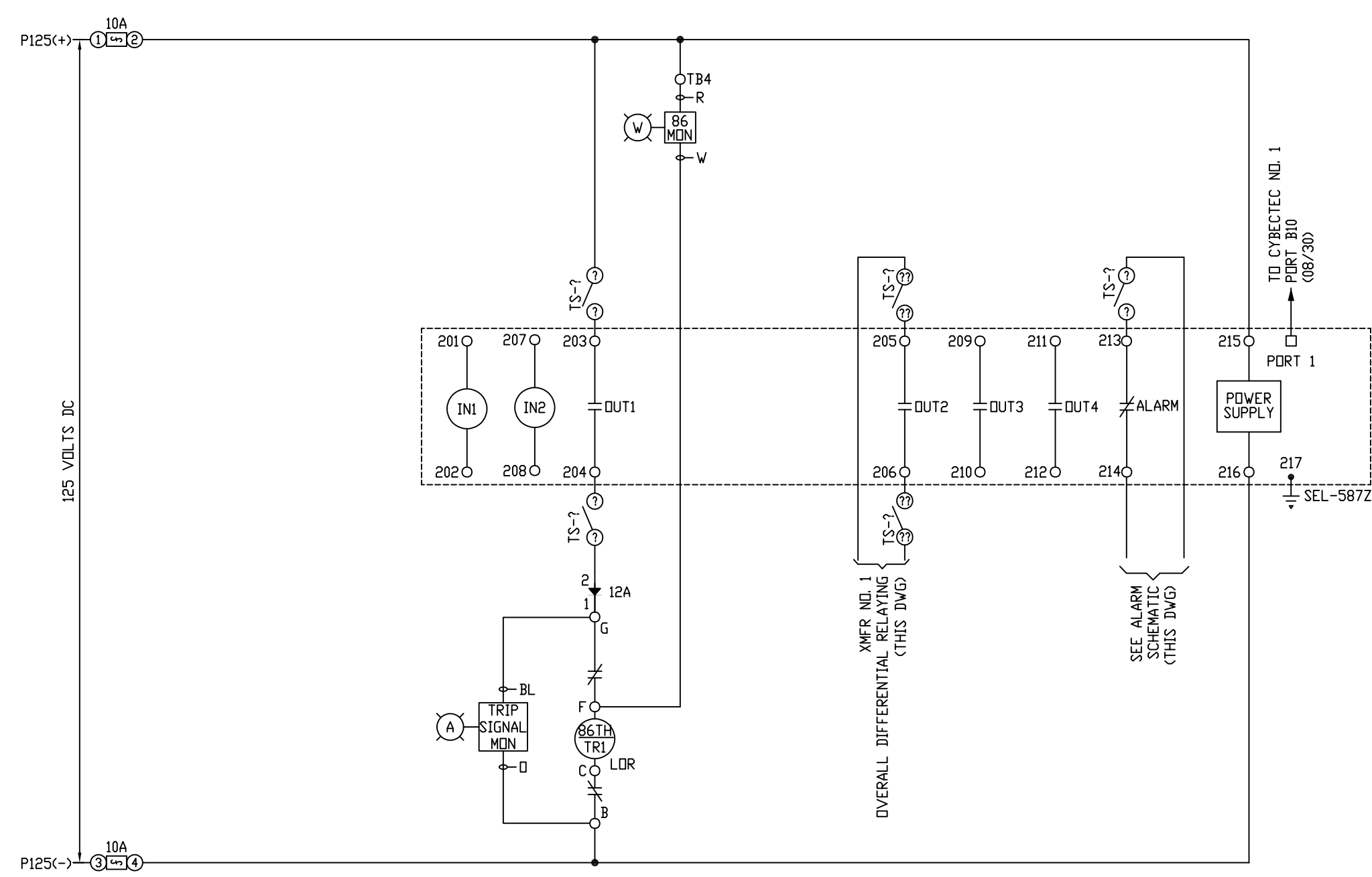
ESW 24

FOR REVIEW

NOT FOR CONSTRUCTION

ENG: MH
 APP: JRM
 DATE: 04/16/2004
 ISSUE: For Review
 DRAWING CREATED BY IDWA STATE SENIOR DESIGN 2020

CYCLONE
 CITY: AMES STATE: IOWA ZIP: 50014
 CEDAR FALLS LINE
 AC/DC
 RELAYING SCHEMATIC
 ISU-S0-04 IA-000-08-05

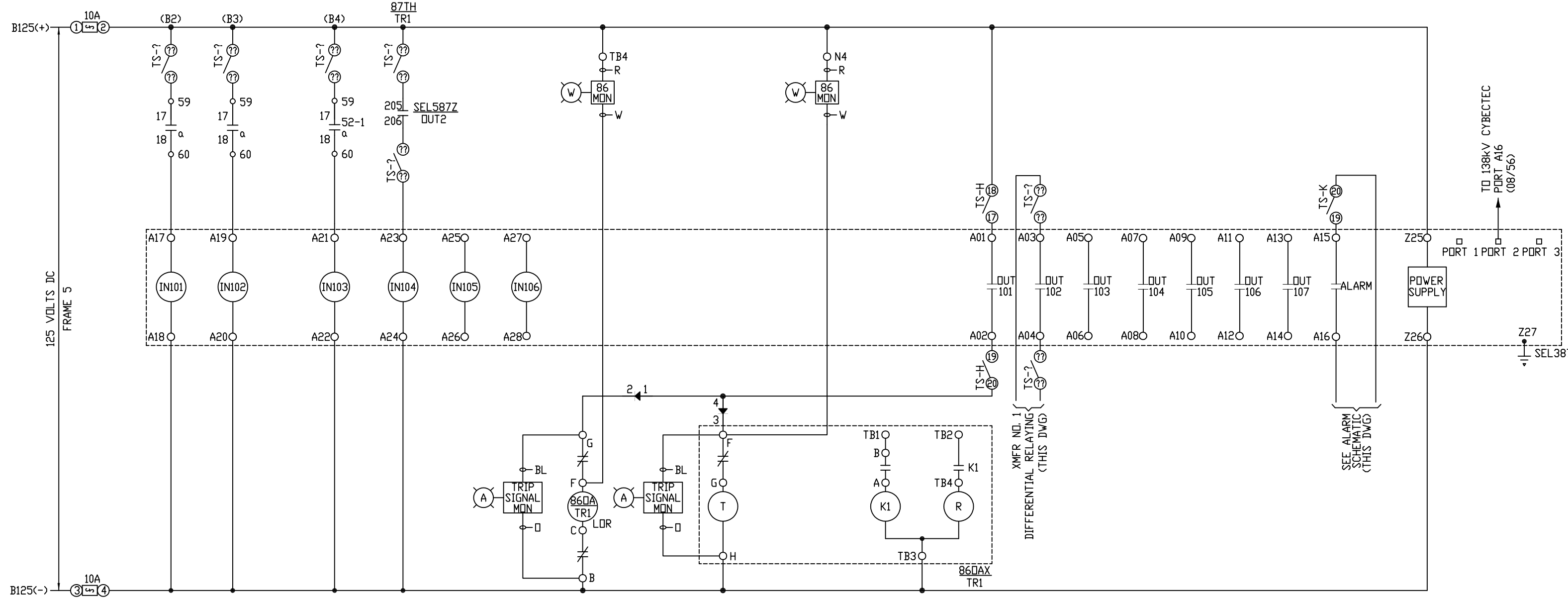


CONTACTS	FUNCTION	DWG. NO.
11-13	SPARE	
12-18-2-5	SPARE	
13-17	SPARE	
14-16-3-4	SPARE	
21-23	SPARE	
22-28-3-5	SPARE	
23-27	SPARE	
24-26-7-8	SPARE	
31-33	SPARE	
32-38-3-10	SPARE	
33-37	SPARE	
34-36-11-12	SPARE	
41-43	SPARE	
42-48-13-14	SPARE	
43-47	SPARE	
44-46-15-16	SPARE	
51-53	SPARE	
52-58-17-18	SPARE	
53-57-19-20	SPARE	
54-56	SPARE	

TYPE 'AR'

CONTACTS	FUNCTION	DWG. NO.
11-13	TRIP BKR B2	(08/02)
12-18-2-5	TRIP BKR B3	(08/03)
13-17	TRIP BKR B4	(08/04)
14-16-3-4	INITIATE BF B2	(08/02)
21-23	INITIATE BF B3	(08/03)
22-28-3-5	INITIATE BF B4	(08/04)
23-27	SPARE	
24-26-7-8	SCADA INDICATION	(THIS DWG)

TYPE 'AR'



CONTACTS	TRIP	RESET	FUNCTION	DWG. NO.
11-13	X		SPARE	
12-18-2-5	X		TRIP BKR B2	(08/02)
13-17	X		SPARE	
14-16-3-4	X		TRIP BKR B3	(08/03)
21-23	X		SPARE	
22-28-3-5	X		INITIATE BF B2	(08/02)
23-27	X		SPARE	
24-26-7-8	X		INITIATE BF B3	(08/03)
31-33	X		SPARE	
32-38-3-10	X		SPARE	
33-37	X		SPARE	
34-36-11-12	X		SPARE	
41-43	X		SPARE	
42-48-13-14	X		SPARE	
43-47	X		SPARE	
44-46-15-16	X		SPARE	
51-53	X		SPARE	
52-58-17-18	X		RELAY FAILURE ALARM	(THIS DWG)
53-57-19-20	X		SPARE	
54-56	X		SCADA INDICATION	(THIS DWG)

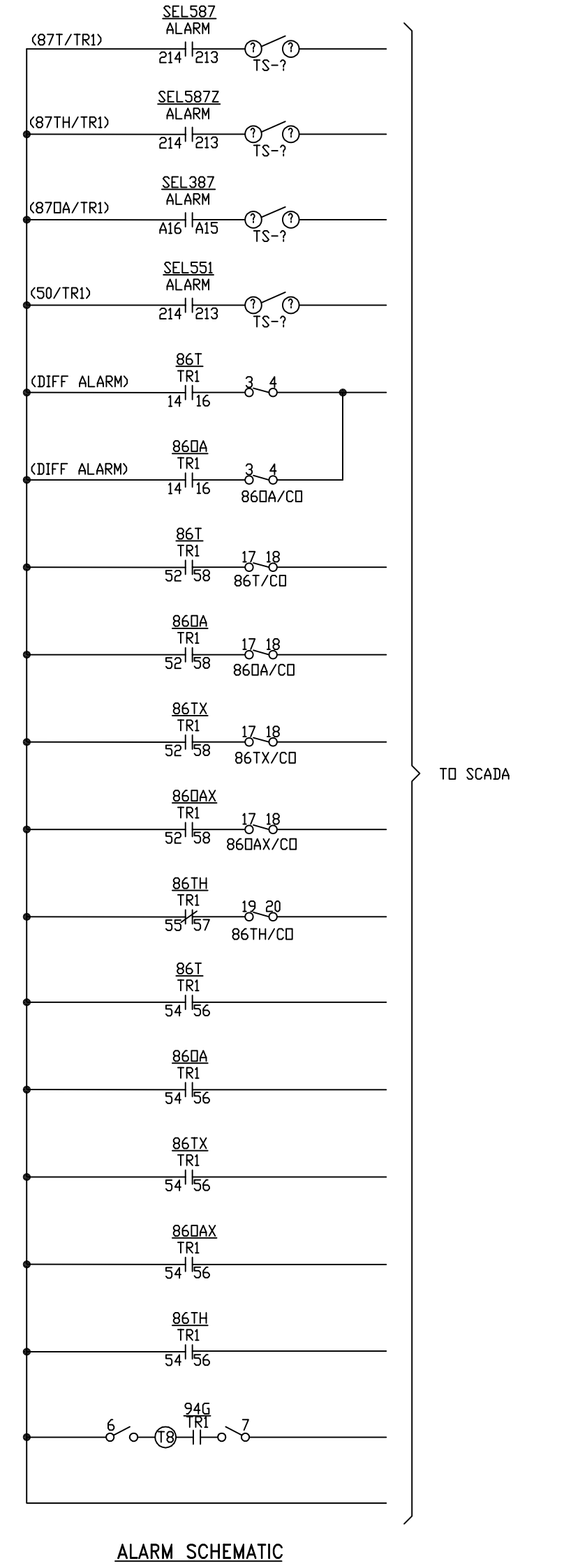
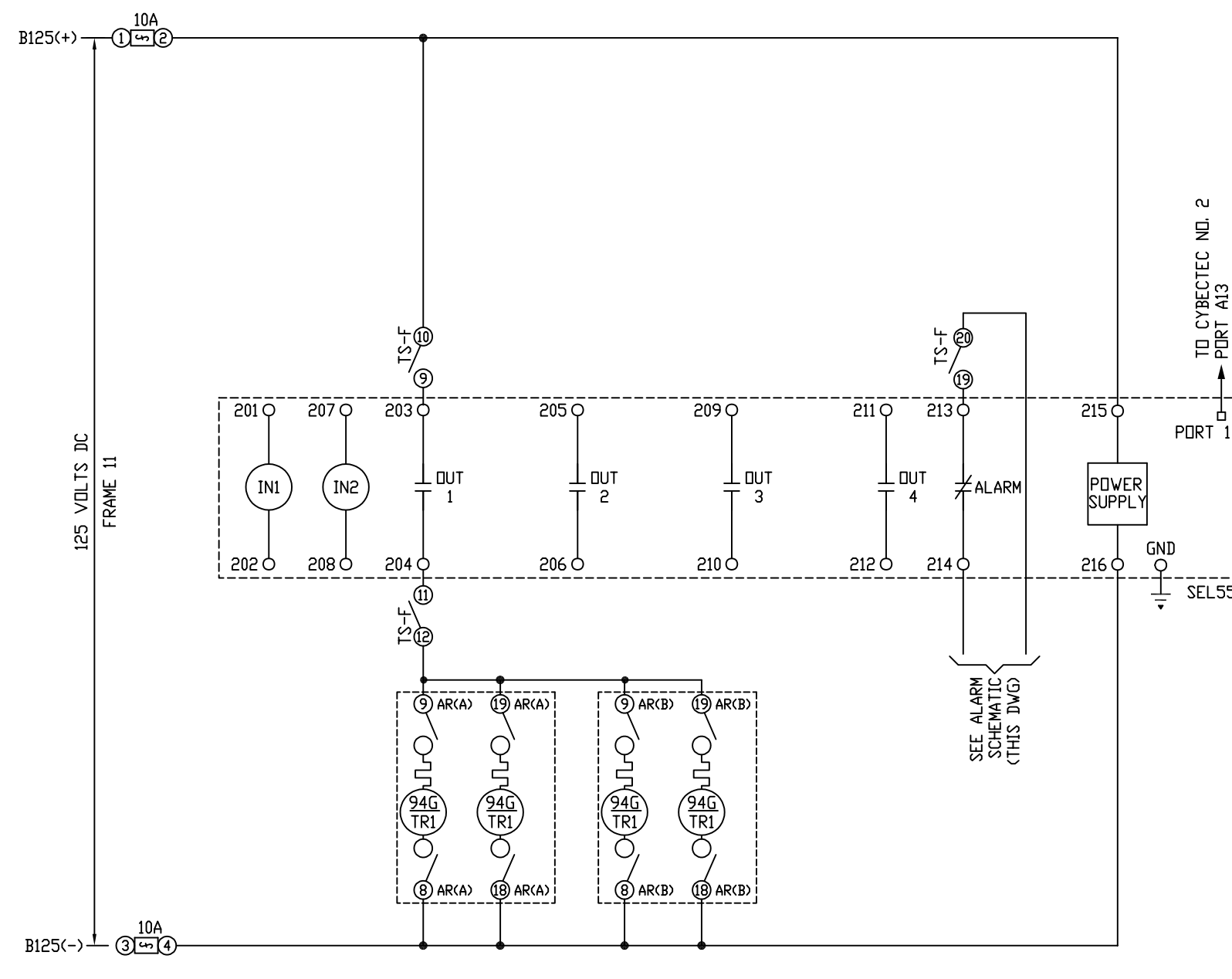
ELECTROSWITCH TYPE 'LDR-ER'

CONTACTS	TRIP	RESET	FUNCTION	DWG. NO.
11-13	X		SPARE	
12-18-2-5	X		TRIP BKR B2	(08/02)
13-17	X		SPARE	
14-16-3-4	X		TRIP BKR B3	(08/03)
21-23	X		SPARE	
22-28-3-5	X		INITIATE BF B2	(08/02)
23-27	X		SPARE	
24-26-7-8	X		INITIATE BF B3	(08/03)
31-33	X		SPARE	
32-38-3-10	X		SPARE	
33-37	X		SPARE	
34-36-11-12	X		SPARE	
41-43	X		SPARE	
42-48-13-14	X		SPARE	
43-47	X		SPARE	
44-46-15-16	X		SPARE	
51-53	X		SPARE	
52-58-17-18	X		RELAY FAILURE ALARM	(THIS DWG)
53-57-19-20	X		SPARE	
54-56	X		SCADA INDICATION	(THIS DWG)

ELECTROSWITCH TYPE 'LDR-ER'

CONTACTS	TRIP	RESET	FUNCTION	DWG. NO.
11-13	X		SPARE	
12-18-2-5	X		TRIP BKR B2	(08/02)
13-17	X		SPARE	
14-16-3-4	X		TRIP BKR B3	(08/03)
21-23	X		SPARE	
22-28-3-5	X		TRIP BKR B4	(08/04)
23-27	X		SPARE	
24-26-7-8	X		INITIATE BF B2	(08/02)
31-33	X		SPARE	
32-38-3-10	X		INITIATE BF B3	(08/03)
33-37	X		SPARE	
34-36-11-12	X		INITIATE BF B4	(08/04)
41-43	X		SPARE	
42-48-13-14	X		SHORT PHASE A CT INPUTS	(08/08)
43-47	X		SPARE	
44-46-15-16	X		SHORT PHASE B CT INPUTS	(08/08)
51-53	X		SPARE	
52-58-17-18	X		RELAY FAILURE ALARM	(THIS DWG)
53-57-19-20	X		SPARE	
54-56	X		SCADA INDICATION	(THIS DWG)

ELECTROSWITCH TYPE 'LDR'



CONTACTS	TRIP	RESET	FUNCTION	DWG. NO.
11-13	X		DE-ENERGIZE XFMR 1 FANS	(08/09)
12-18-2-5	X		TRIP BKR B4	(08/04)
13-17	X		SPARE	
14-16-3-4	X		XFMR DIFF ALARM	(THIS DWG)
21-23	X		SPARE	
22-28-3-5	X		SPARE	
23-27	X		SPARE	
24-26-7-8	X		SPARE	
31-33	X		SPARE	
32-38-3-10	X		RELAY FAILURE ALARM	(THIS DWG)
33-37	X		SPARE	
34-36-11-12	X		SPARE	
41-43	X		SPARE	
42-48-13-14	X		SPARE	
43-47	X		SPARE	
44-46-15-16	X		SPARE	
51-53	X		SPARE	
52-58-17-18	X		RELAY FAILURE ALARM	(THIS DWG)
53-57-19-20	X		SPARE	
54-56	X		SCADA INDICATION	(THIS DWG)

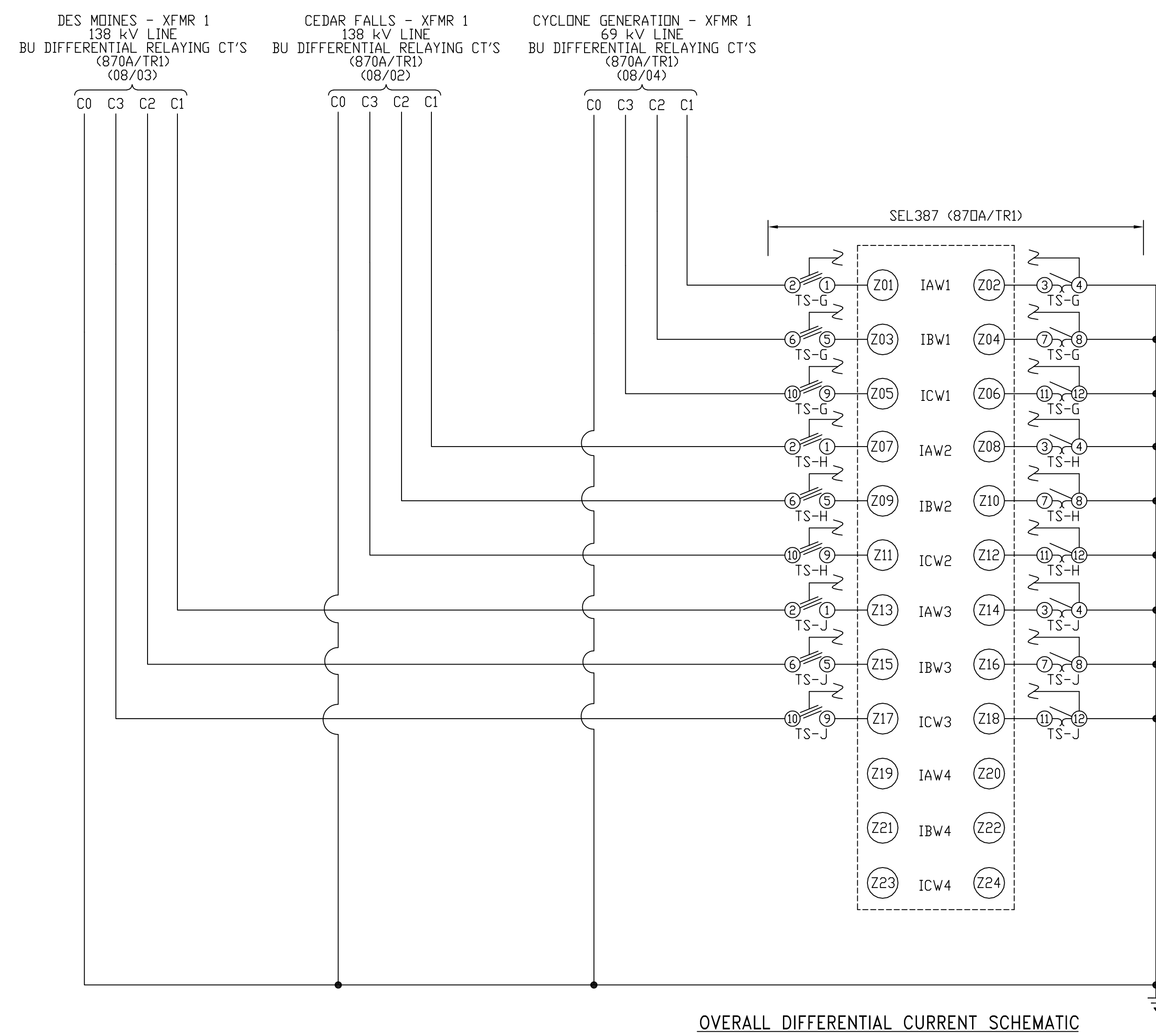
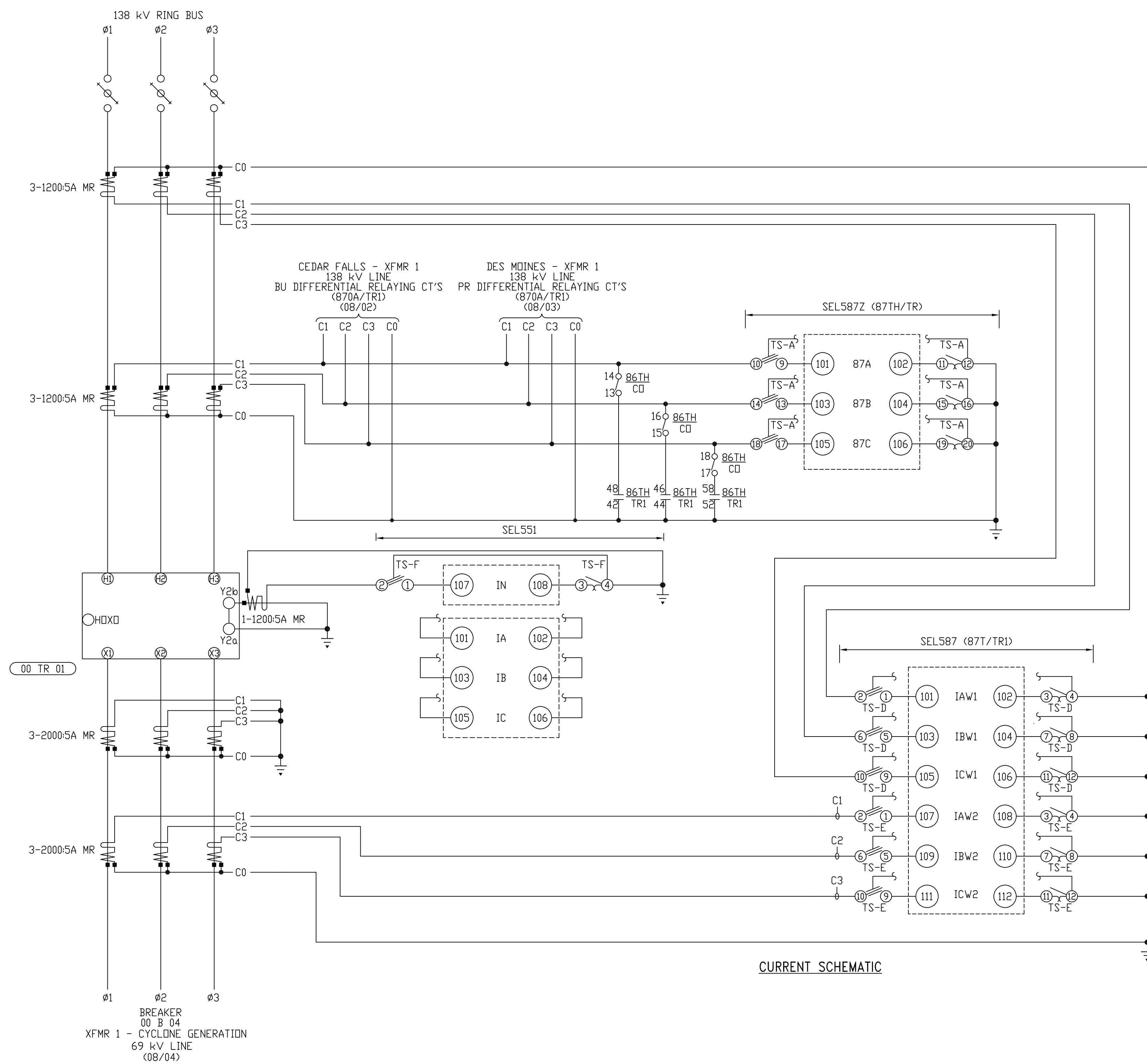
ELECTROSWITCH TYPE 'LDR'

CONTACTS	TRIP	RESET	FUNCTION	DWG. NO.
11-13	X		SPARE	
12-18-2-5	X		TRIP BKR B4	(08/04)
13-17	X		SPARE	
14-16-3-4	X		XFMR DIFF ALARM	(THIS DWG)
21-23	X		SPARE	
22-28-3-5	X		SPARE	
23-27	X		SPARE	
24-26-7-8	X		SPARE	
31-33	X		SPARE	
32-38-3-10	X		RELAY FAILURE ALARM	(THIS DWG)
33-37	X		SPARE	
34-36-11-12	X		SPARE	
41-43	X		SPARE	
42-48-13-14	X		SPARE	
43-47	X		SPARE	
44-46-15-16	X		SPARE	
51-53	X		SPARE	
52-58-17-18	X		RELAY FAILURE ALARM	(THIS DWG)
53-57-19-20	X		SPARE	
54-56	X		SCADA INDICATION	(THIS DWG)

ELECTROSWITCH TYPE 'LDR'

FOR REVIEW

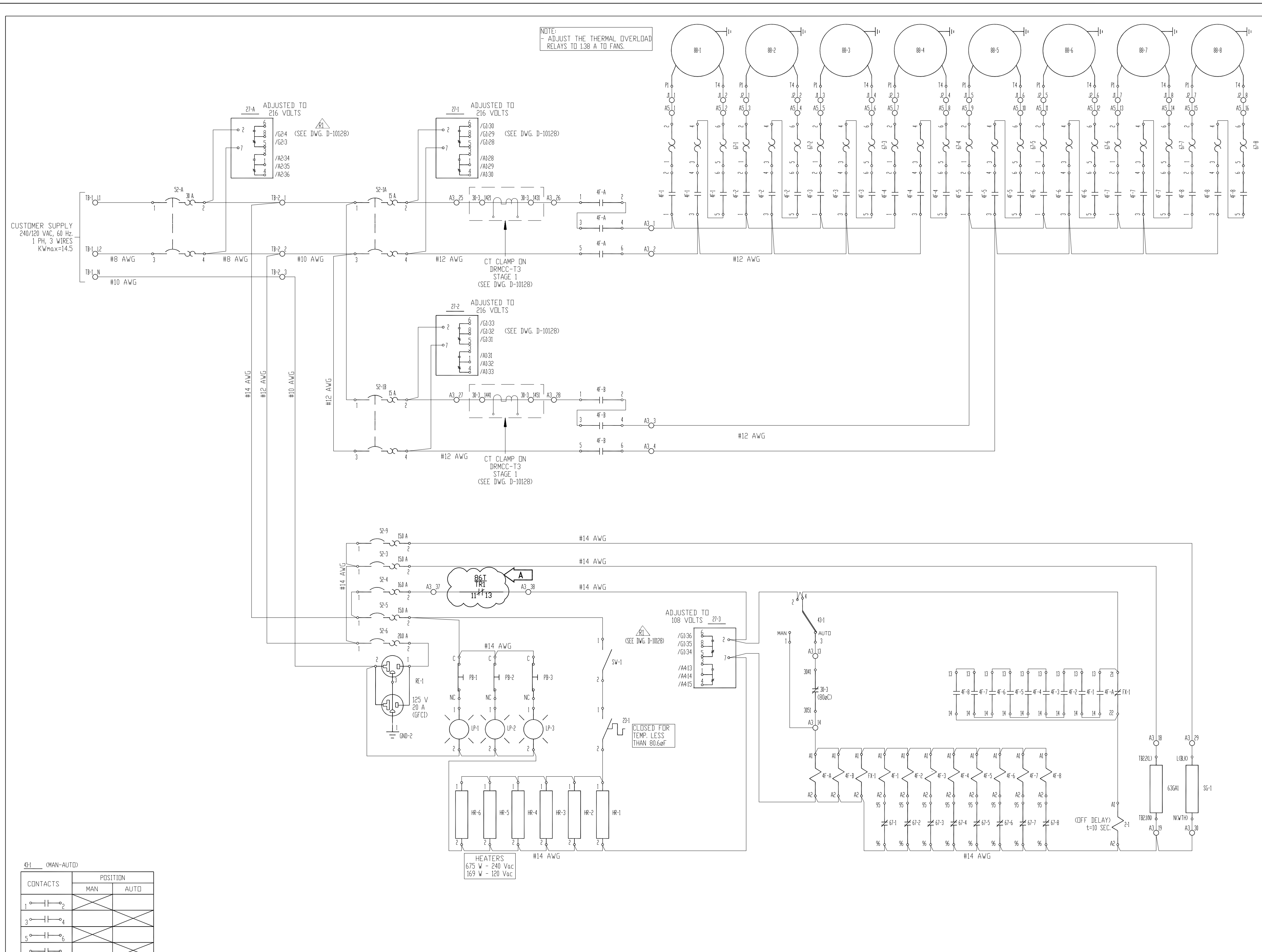
NOT FOR CONSTRUCTION



FOR REVIEW

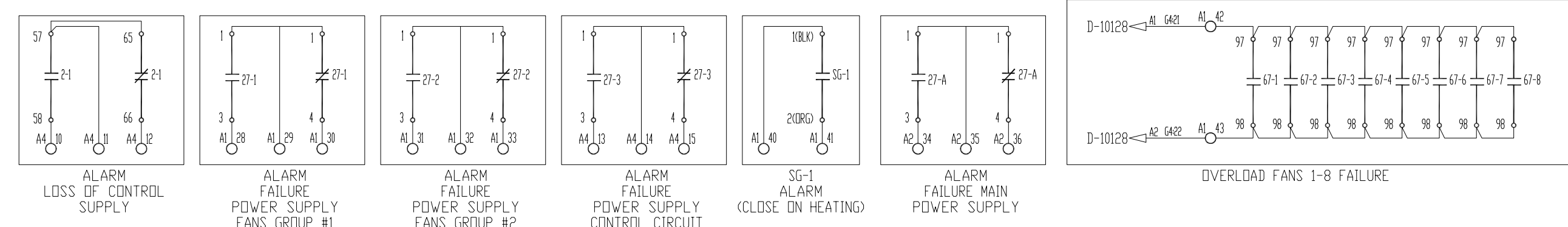
NOT FOR CONSTRUCTION

ENG: JIM	CYCLONE		
APP: JIM	CITY: AMES	STATE: IOWA	ZIP: 50014
DATE: 04/16/21			
ISSUE: For Review			
DRAWING CREATED BY IOWA STATE SENIOR DESIGN 2020.			
XFMR AC SCHEMATIC			
ISU-SD-04	IA-000-08-08		



DEVICE NUMBER	ACCESSORY	RATING	MODEL	MANUFACTURER
AL-5	TERMINAL BLOCK	600 Vac, 750 A	15125TRC	MARATHON
AL-7	TERMINAL BLOCK 12 POLE, "RIVETED CONNECTOR", 75 A, #10-16 AWG			
FX-1	AUXILIARY CONTACTOR 2 NO & 2 NC CONTACTS 120 Vac (Cab)	120 Vac @60 30 A	700-CF2200	ALLEN-BRADLEY
GN-1,2	GROUND BAR	15 Holes Compression Clamp	13-16-103	SIBTO
GR-1	GROUND BAR EXTRUDED COPPER (PLAIN & UNFINISHED), 15 HOLES			
HR-1,6	HEATER	120 VAC, 675 W	HR-6070-2676	ODGEN
	HEATER CP VIDEO, RATED @ 240 VAC, BUT CONNECTED @ 120 VAC, (168.75W)			
LP-1,3	LAMP	120 VAC	14006	GE
	(INCANDESCENT LIGHT (60 WATTS))			
ADDITION	LAMP BASE	60 W, BLACK	7000	FENOLPLASTICA
	BASE LAMP TO STANDARD INCANDESCENT LAMP			
PS-1,3	SWITCH	250 Vac, 30 A	841K7	CUTLER-HAMMER
	DIOR OPERATING SWITCH			
RE-1	OUTLET	125 Vac, 20 A	8899-W	LEVITON
	CONVENIENCE OUTLET (FCI), NEMA 5-20R			
SG-1	DEHYDRATING BREATHING 10 A, 120-240 VAC		AR182-0000	WALKER-SHA
	DEHYDRATING BREATHING 120-240 VAC, 1 A, 8000 GALLONS (R LESS 12000.3 LITERS)			
SW-1	TOGGLE SWITCH	250 Vac, 10 A	7500K4	CUTLER-HAMMER
	TOGGLE SWITCH SPST			
TB-1L1,3	TERMINAL BLOCK	600 Vac, 1750 A	1422572	MARATHON
TB-2	POWER STUD BLOCK 3- POLE (STUD-STUD)			
Z-1	AUXILIARY CONTACTOR 2 NO & 2 NC CONTACTS 120 Vac (Cab)	120 Vac @60 30 A	700-CF2200	ALLEN-BRADLEY
ADDITION	RELAY	OFF Delay Module 60 to 30 sec	100-FFT30	ALLEN-BRADLEY
	TIME DELAY CONTACT BLOCK 1 NC + 1 NO CONTACT 0.3-30 sec "OFF DELAY"			
4F-1,8	CONTACTOR	230 A (Contacts-4C3 4Way)	100-C2300	ALLEN-BRADLEY
	MOTOR CONTACTOR 3P WITH 1 N/O CONTACT, 120 Vac "COIL", 23 A			
4F-1,8	CONTACTOR	230 A (Contacts-4C3 4Way)	100-C2300	ALLEN-BRADLEY
	MOTOR CONTACTOR 3P WITH 1 N/O CONTACT, 120 Vac "COIL", 23 A			
Z-1	THERMOSTAT	110 A @ 120 Vac	A-TEMPC	HOFFMAN
	ADJUSTABLE THERMOSTAT (1-11 A 60Sec), CO TO 140W) NC SWITCH			
U-1,3	UNDER VOLTAGE RELAY (24-240 Vac (COIL))		47180R2K	ATC
RT-1	INDUSTRIAL RELAY, 24-240 VAC, 24 VAC, 10 Sec, 1 No, 10 No, "OFF DELAY"			
ADDITION	DIGITAL SOCKET		000-825-85-00	ATC
	8-PIN DIGITAL SOCKET FOR USE WITH ATC RELAYS #4178 (HELD DOWN 0407-025-13-00)			
ADDITION	DIGITAL SOCKET		0407-025-13-00	ATC
	HOLD DOWNS CLIPS			
4S-1	SWITCH	100 Vac, 30 A (Contacts)	KS11F8H2	SQUARE D
	SELECTOR SWITCH 2 POS. MAINTAINED, CLASS 3000			
5S-4	BREAKER	240 Vac, 30 A	ED22803+ADIE062	SIEMENS
	2 POLE THERMAL MAGNETIC BREAKER, 125 AMP FRAME SIZE WITH MICRO-SWITCH C FORM, 10 kA @ 240 V.			
5S-1A,8	BREAKER	240 Vac, 15 A	ED22803+ADIE062	SIEMENS
	2 POLE THERMAL MAGNETIC BREAKER, 125 AMP FRAME SIZE WITH MICRO-SWITCH C FORM, 10 kA @ 240 V.			
5S-3, 5S-5	BREAKER	240 Vac, 15 A, 10 kA rms	00U115	SQUARE D
5S-7	1 POLE THERMAL MAGNETIC BREAKER			
5S-4	BREAKER	240 Vac, 16 A	55Y4167-5ST3 010	SIEMENS
	1 POLE THERMAL MAGNETIC BREAKER, 10 kA @ 24 to 440 Vac & 24 to 60 VAC+ AUX. CONTACT FORM C			
5S-6	BREAKER	240 Vac, 20 A, 10 kA rms	00U120	SQUARE D
	1 POLE THERMAL MAGNETIC BREAKER			
6S0A1	MONITOR	100-240 Vac	CALISTO 2	MSS
	DISSOLVED HYDROGEN, CARBON MONOXIDE AND WATER MONITOR			
67-1,8	THERMAL OVL	10 - 50 A (Setting Range)	193-EECB	ALLEN-BRADLEY
	THERMAL OVERLOAD RELAYS, SOLID STATE, 1 N/O + 1 N/C CONTACTS			
8S-1,8	MOTOR FAN	240 Vac, 12 A (Thermoplate)	F26-66878-2M	KRENZ-VENT
	MOTOR FAN 1 POLE, 1/2 HP, 1140 RPM WITH STAINLESS STEEL SHAFT			

CONTACTS	POSITION	
	MAN	AUTO
1-2	NO	NC
3-4	NO	NC
5-6	NO	NC
7-8	NO	NC



REFERENCE DWGS: D-1026, D-1027, D-1028, D-1029, D-1030, D-1031, D-1032

REV.	DESCRIPTION
REV. 1	MODIFIED: LEGEND OF REFERENCE.

REVISIONS		SCHEMATIC CONTROL COOLING	
DATE:	BY:	DRAWING No:	REV:
UNIT: NONE	DR:	D-101 25	1
SCALE: NONE	APP:		

FOR REVIEW

NOT FOR CONSTRUCTION

CYCLONE	
CITY: AMES	STATE: IDWA ZIP: 50014
XMF1 CONTROL COOLING SCHEMATIC	
ISU-SD-04	IA-000-08-09 A