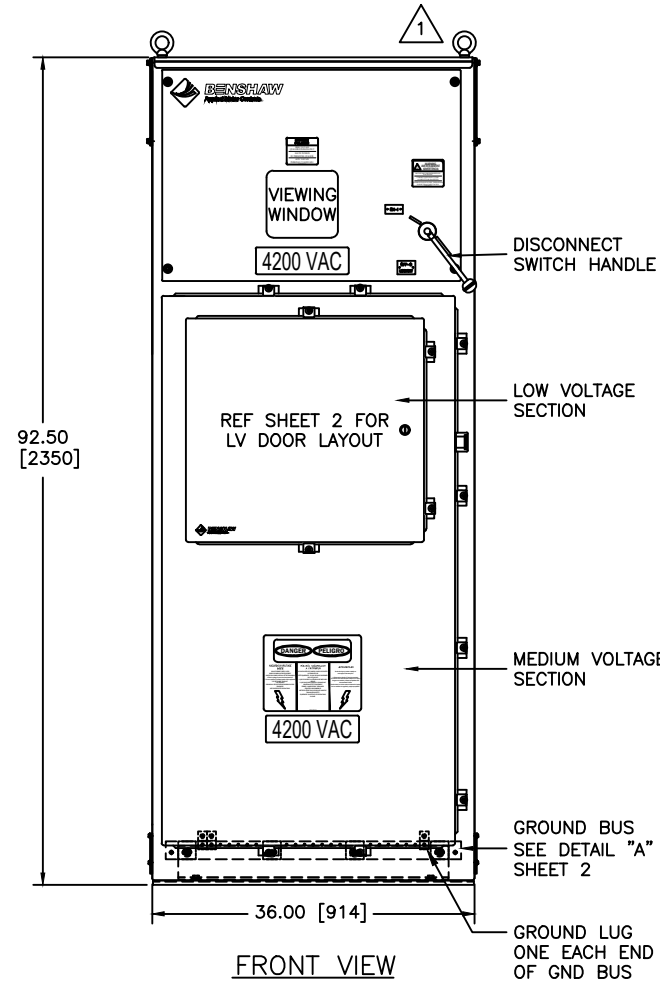
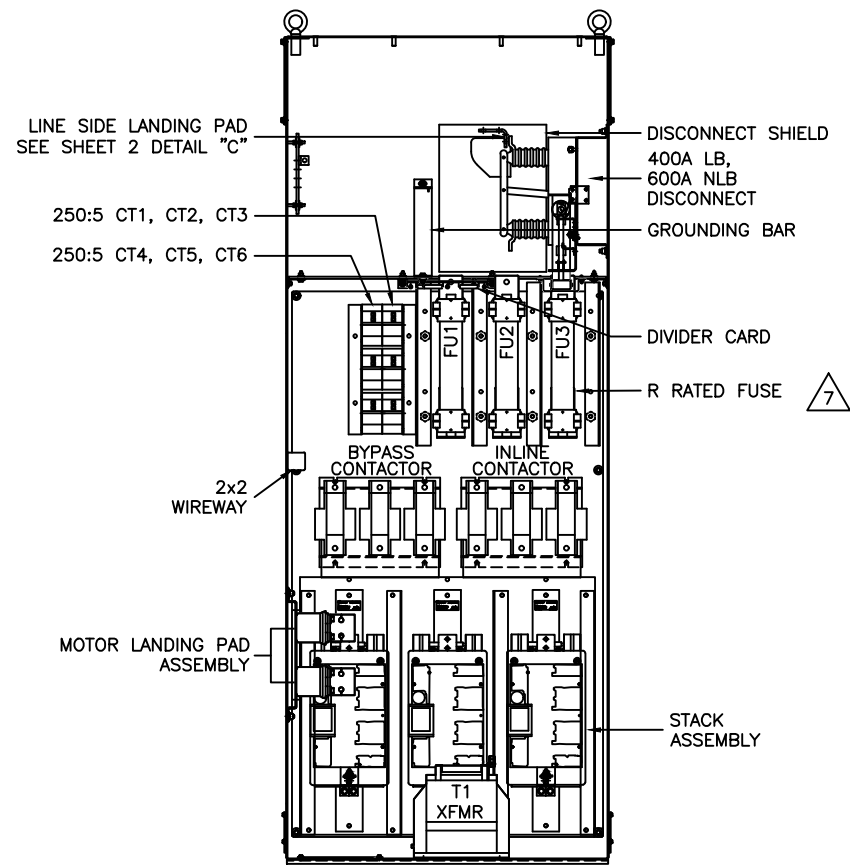


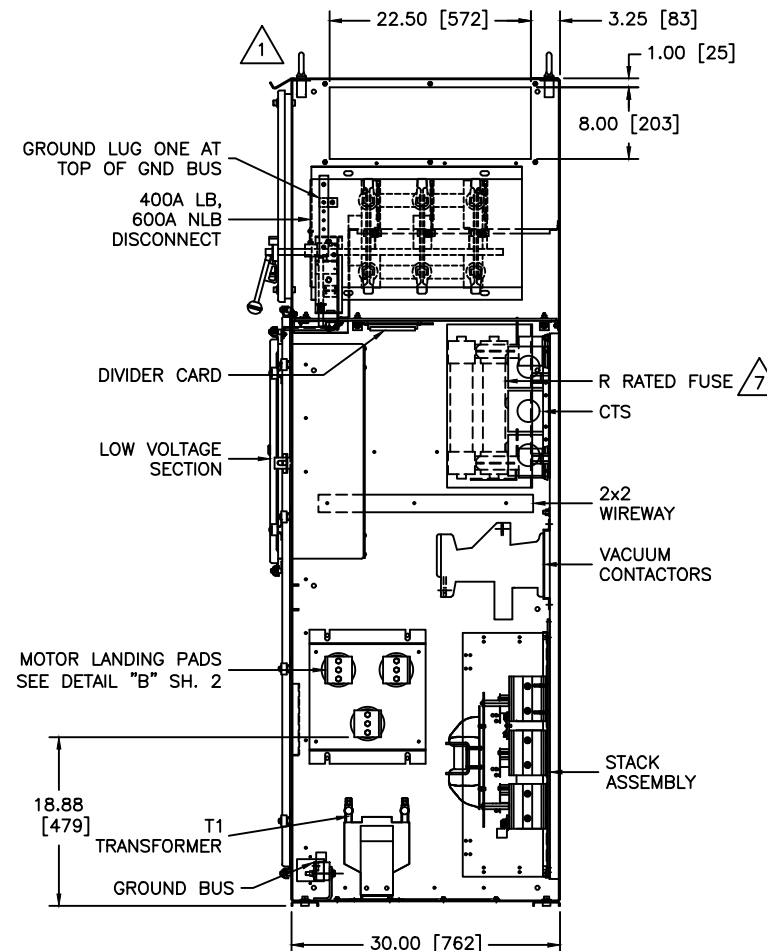
TOP VIEW



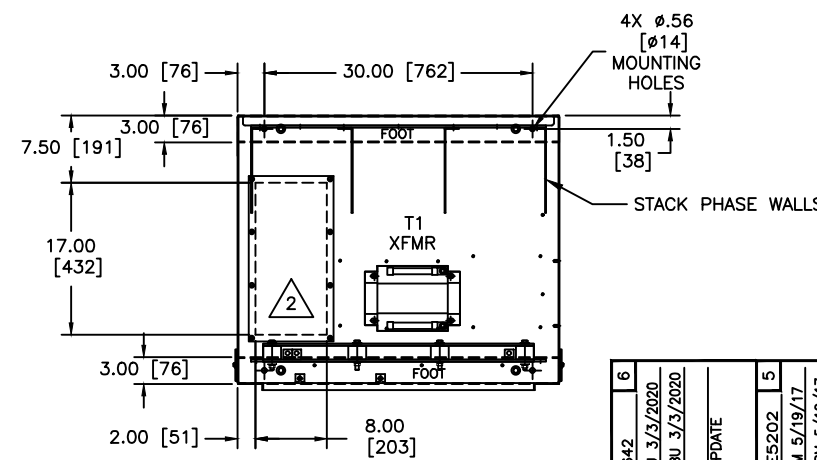
FRONT VIEW



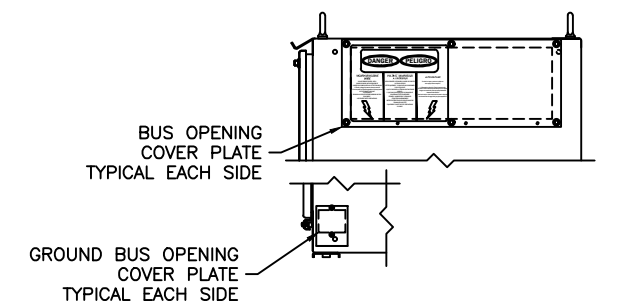
FRONT INTERIOR VIEW



RIGHT SIDE INTERIOR VIEW



FRONT OF ENCLOSURE PLAN VIEW



- NOTES:
- 1 REMOVABLE LIFTING EYEBOLTS
 - 2 CABLE ENTRY/EXIT AREA. CUTOUT W/ COVER PLATE SUPPLIED
 - 3 CABLE ENTRY/EXIT AREA. NO CUTOUT SUPPLIED. CUSTOMER TO CUT AS REQUIRED.
 - 4 ENCLOSURE COLOR: ANSI 61 GREY
 - 5 TIGHTEN BOLTS PER CHART BELOW

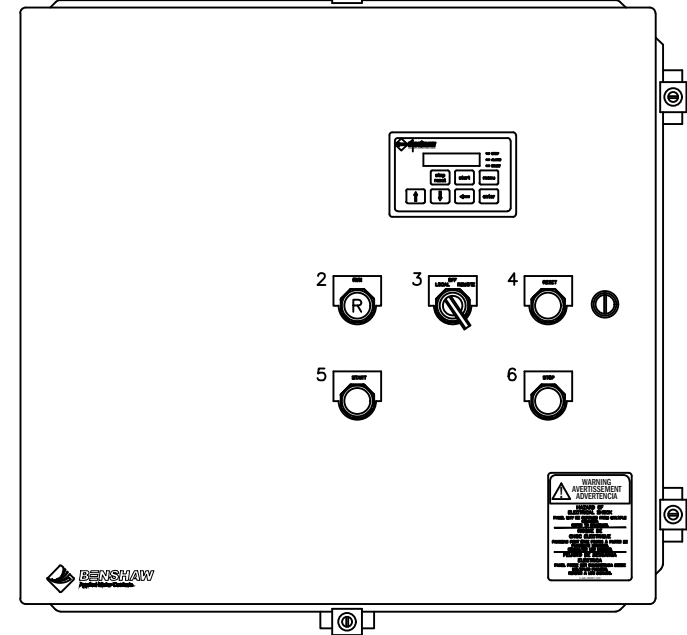
STEEL BOLT TORQUE IN POUND-FOOT [NEWTON-METER]				
1/4-20	5/16-18	3/8-16	1/2-13	5/8-11
5 [6.8]	12 [16.3]	20 [27]	50 [67.8]	95 [128.8]

- 6 APPROXIMATE WEIGHT IS 1600LBS [726KG]
- 7 R-FUSES SHOWN FOR REFERENCE. REFERENCE SALES ORDER FOR FUSE SIZE.

ECO #5642 APPRD:JBU 3/3/2020 CHG BY:JBU 3/3/2020 CHANGE: UL 347 UPDATE	ECO# ES202 APPRD:SMM 5/19/17 CHG BY:RBW 5/19/17 CHANGE: CHANGED TO MICRORUPTER DISCONNECT	APPRD:JBU 7/7/16 CHG BY:JBU 7/7/16 CHANGE: GENERAL UPDATE	REVISION DO NOT SCALE DWG	THIRD ANGLE PROJECTION	UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS IN INCHES [mm] INTERPRET DRAWING PER ASME Y14.5M-1994 TOLERANCES: .XX ± .03 .XXX ± .015 ANGLES ± 1°	SIGNATURES DRWN: SMM 7/2/14 CHKD: SMM 7/2/14 ENG: SMM 7/2/14	DATE 7/2/14	TITLE: UL LABELED CFMVRMX18-1500-4160-12 SOLID STATE STARTER ENCLOSURE LAYOUT	815 ALPHA DRIVE PITTSBURGH, PA 15238 550 BRIGHT ST. E. LISTON, ONTARIO M4W 3K2
			MATERIAL: FINISH:	SIZE DWG. NO.		SCALE: 3/32 : 1			
			THIS DRAWING AND ALL INFORMATION CONTAINED HEREIN IS THE PROPERTY OF BENSHAW INC. AND MAY NOT BE REPRODUCED, OR DWGULG TO UNAUTHORIZED PERSONS WITHOUT THE EXPRESS WRITTEN CONSENT OF BENSHAW INC. IT IS PROVIDED SOLELY FOR THE CONVENIENCE OF THE USER AND SHALL BE RETURNED UPON REQUEST.			SHEET 1 OF 7			
			D MVRXE181500416012			REV 6			

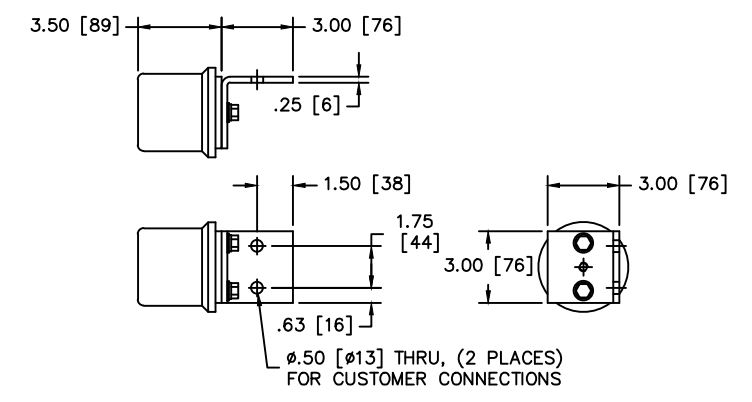
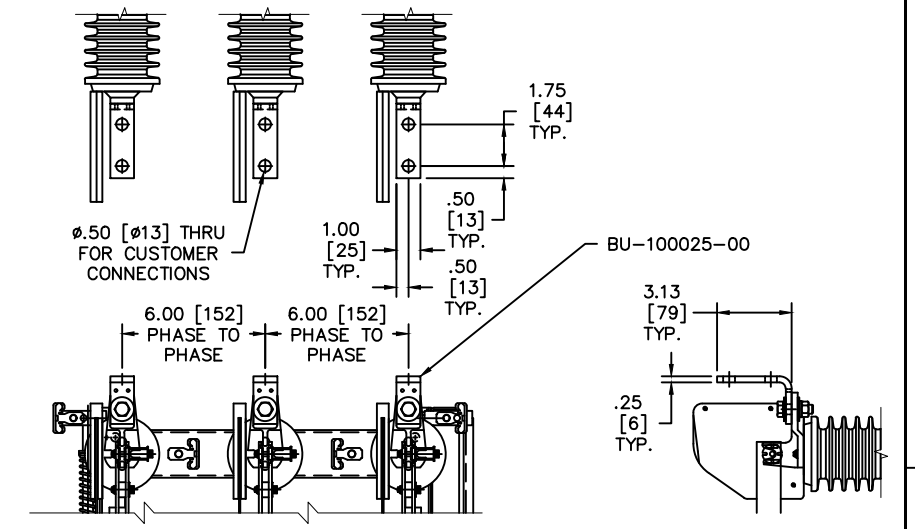
CUSTOMER TERMINAL BLOCKS

6	REMOTE E-STOP
6C	REMOTE E-STOP
6B	START/STOP COMMAND CUSTOMER SUPPLIED
65	START/STOP COMMAND CUSTOMER SUPPLIED
66	
80	FAULT INDICATION IN S.S. MODE FOR CUSTOMER USE
81	FAULT INDICATION IN S.S. MODE FOR CUSTOMER USE
82	
83	UP-TO-SPEED INDICATION IN S.S. MODE FOR CUSTOMER USE
84	UP-TO-SPEED INDICATION IN S.S. MODE FOR CUSTOMER USE
85	
86	RUN INDICATION IN ATL & S.S. MODES FOR CUSTOMER USE
87	RUN INDICATION IN ATL & S.S. MODES FOR CUSTOMER USE
88	
92	ANALOG OUTPUT FOR CUSTOMER USE
93	ANALOG OUTPUT FOR CUSTOMER USE
94	
95	O/L FAULT IND. IN ATL MODE FOR CUSTOMER USE
96	O/L FAULT IND. IN ATL MODE FOR CUSTOMER USE
97	
98	RS-485
99	RS-485
SHD	
SP	
SP	
SP	



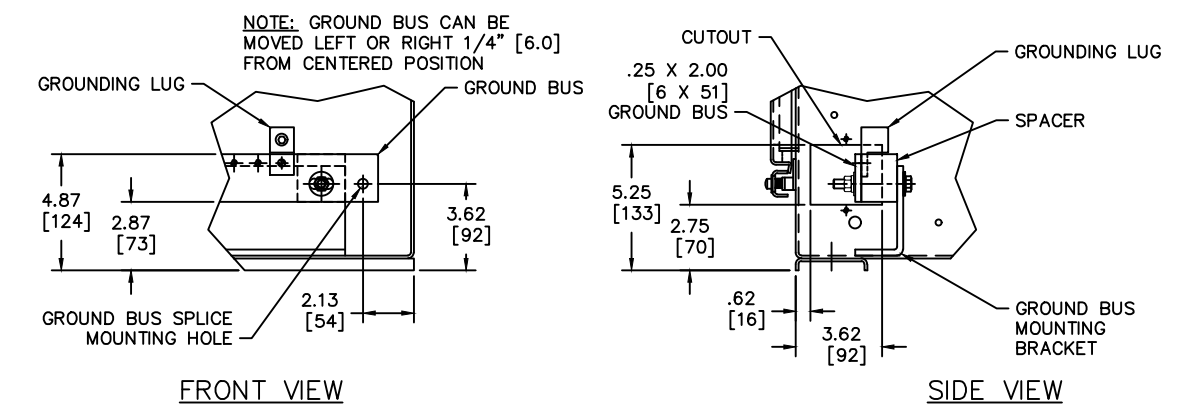
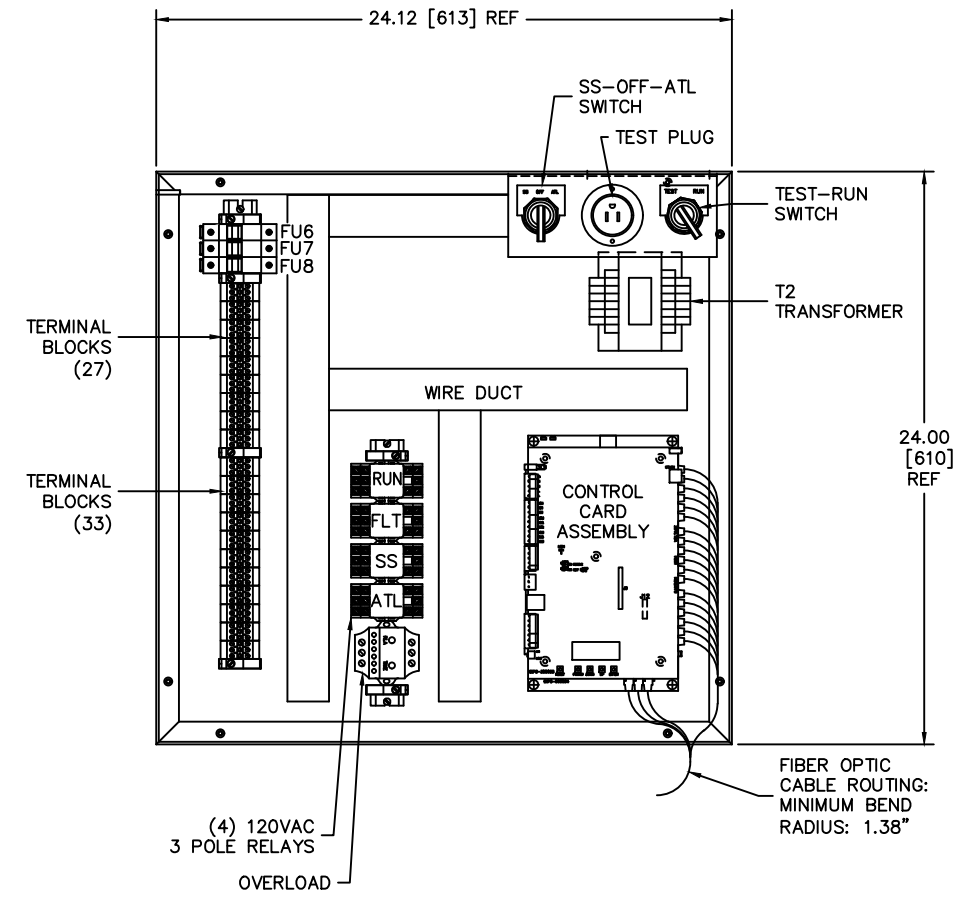
LOW VOLTAGE COMPARTMENT DOOR

- DEVICE LEGEND**
1. KEYPAD DISPLAY
 2. "RUN" (RED) PILOT LIGHT
 3. "LOCAL-OFF-REMOTE" SELECTOR SWITCH
 4. "RESET" (BLACK) PUSHBUTTON
 5. "START" (GREEN) PUSHBUTTON
 6. "STOP" (RED) RAISED PUSHBUTTON



BENSHAW TERMINAL BLOCKS

4
5A
6
6
6B
6B
6B
7
7
7
7
7
7
7
7
7
5
5
10
10
13
36
41
42
43
44
51
52
SP
SP
SP
SP



LOW VOLTAGE COMPARTMENT INTERIOR VIEW

6	ECO #5642	5	ECO# E5202	3	ECO: E5003	2	E4864A	1		THIRD ANGLE PROJECTION THIS DRAWING AND ALL INFORMATION CONTAINED HEREIN IS THE PROPERTY OF BENSCHAW INC. AND MAY NOT BE REPRODUCED, OR DIVULGED TO UNAUTHORIZED PERSONS WITHOUT THE EXPRESS WRITTEN CONSENT OF BENSCHAW INC. IT IS PROVIDED SOLELY FOR THE CONVENIENCE OF THE USER AND SHALL BE RETURNED UPON REQUEST.	UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS IN INCHES [mm] INTERPRET DRAWING PER ASME Y14.5M-1994 TOLERANCES: .XX ± .03 .XXX ± .015 ANGLES ± 1°	SIGNATURES DRWN: SMM 7/2/14 CHKD: SMM 7/2/14 ENG: SMM 7/2/14	DATE 7/2/14	TITLE: UL LABELED CFMVRM18-1500-4160-12 SOLID STATE STARTER LOW VOLTAGE COMPARTMENT AND ENCLOSURE DETAILS	SCALE: 1/4 : 1 SHEET 2 OF 7	BENSCHAW 815 ALPHA DRIVE PITTSBURGH, PA. 15238 550 BRIGHT ST. E. LISTONEL, ONTARIO N4W 3K2					
APPRD: JBU 3/3/2020	CHG BY: JBU 3/3/2020	CHANGE: UL 347 UPDATE	APPRD: SMM 5/19/17	CHG BY: REM 5/19/17	CHANGE: CHANGED TO MICRODISCONNECT	APPRD: JBU 7/8/16	CHG BY: JBU 7/8/16	CHANGE: GENERAL UPDATE	APPRD: JBU 5/17/16								CHG BY: MCF 3/14/16	CHANGE: UPDATED KEYPAD REVISED GROUND BUS DETAIL	APPRD: JBU 1/15/16	CHG BY: JBU 1/15/16	CHANGE: LABEL UPDATE

SHOP NOTES:

- S1 ALL INSTRUMENT AND CONTROL GROUND WIRES ARE #12AWG GREEN WIRE, EXCEPT WHERE NOTED, RUN SEPARATELY TO GROUND LUG POINT. DO NOT DAISY CHAIN GROUND WIRES. RUN ALL GROUND WIRES A MINIMUM OF FOUR (4) INCHES FROM POWER CABLE AND HEATSINKS.
- S2 ALL SECONDARY POWER WIRING MUST BE ROUTED SEPARATE FROM GROUND WIRES AND CONTROL WIRING.
- S3 ALL CURRENT TRANSFORMER SIGNAL WIRING TO BE COVERED WITH HIGH VOLTAGE SLEEVING. ALL CURRENT TRANSFORMERS TO BE SEPARATELY GROUNDED TO GROUND BUS.
- S4 ALL WIRING IN THE MEDIUM VOLTAGE AREA WITHIN FOUR (4) INCHES OF THE HEATSINK ASSEMBLY OR POWER CABLE MUST HAVE 5KV SLEEVING.
- S5 SEPARATE LOW VOLTAGE SUPPLY & CONTROL WIRING AS MUCH AS POSSIBLE FROM MV WIRING. MINIMUM SPACE IS 3". WIRES TO CROSS AT 90° ANGLES.
- S6 14AWG GREEN WIRE, EXCEPT WHERE OTHERWISE NOTED, RUN SEPARATELY TO GROUND LUG POINT. DO NOT DAISY CHAIN GROUND WIRES. RUN ALL GROUND WIRES A MINIMUM OF FOUR (4) INCHES FROM POWER CABLE AND HEATSINKS.
- S7 SCR GATE WIRES TO BE COVERED WITH HIGH VOLTAGE SLEEVING.
- S8 ALL CONTROL WIRING TO BE 14AWG EXCEPT WHERE NOTED.

PARAMETER SETTINGS

SEE MANUAL FOR ADDITIONAL SETTINGS

GROUP	DISPLAY	FUNCTION	AS BUILT
QST 04	LOCAL SRC	LOCAL START SOURCE	TERMINAL
QST 05	REMOTE SRC	REMOTE START SOURCE	TERMINAL
I/O/ 26	Kpd Stop	KEYPAD STOP ENABLE / DISABLE	DISABLE
I/O/ 01	DI 1 CONFIG	DIGITAL INPUT #1 CONFIGURATION	OFF
I/O/ 02	DI 2 CONFIG	DIGITAL INPUT #2 CONFIGURATION	INLINE CNFRM
I/O/ 03	DI 3 CONFIG	DIGITAL INPUT #3 CONFIGURATION	DISCONNECT
I/O/ 04	DI 4 CONFIG	DIGITAL INPUT #4 CONFIGURATION	FAULT LOW
I/O/ 05	DI 5 CONFIG	DIGITAL INPUT #5 CONFIGURATION	OFF
I/O/ 06	DI 6 CONFIG	DIGITAL INPUT #6 CONFIGURATION	FAULT RESET
I/O/ 07	DI 7 CONFIG	DIGITAL INPUT #7 CONFIGURATION	OFF
I/O/ 08	DI 8 CONFIG	DIGITAL INPUT #8 CONFIGURATION	OFF
I/O/ 10	R1 CONFIG	RELAY OUTPUT #1 CONFIGURATION	FAULT FS
I/O/ 11	R2 CONFIG	RELAY OUTPUT #2 CONFIGURATION	UTS
I/O/ 12	R3 CONFIG	RELAY OUTPUT #3 CONFIGURATION	RUNNING
I/O/ 13	R4 CONFIG	RELAY OUTPUT #4 CONFIGURATION	OFF
I/O/ 14	R5 CONFIG	RELAY OUTPUT #5 CONFIGURATION	OFF
I/O/ 15	R6 CONFIG	RELAY OUTPUT #6 CONFIGURATION	OFF
I/O/ 21	Aout Fctn	ANALOG OUTPUT FUNCTION	OFF
RTD 01	RTDMod1 Addr	RTD MODULE #1 ADDRESS	OFF
RTD 02	RTDMod2 Addr	RTD MODULE #2 ADDRESS	OFF

GROUP	DISPLAY	FUNCTION	AS BUILT
FUN 03	CT RATIO	CT RATIO	250:5
FUN 05	RATED VOLTS	RATED RMS VOLTAGE	4160
FUN 07	STARTER TYPE	STARTER TYPE	NORMAL
FUN 20	STACK OL	STACK OL ENABLE / DISABLE	ENABLE
FUN 21	STACK RATING	STACK RATING	195A

STANDARD LEGEND

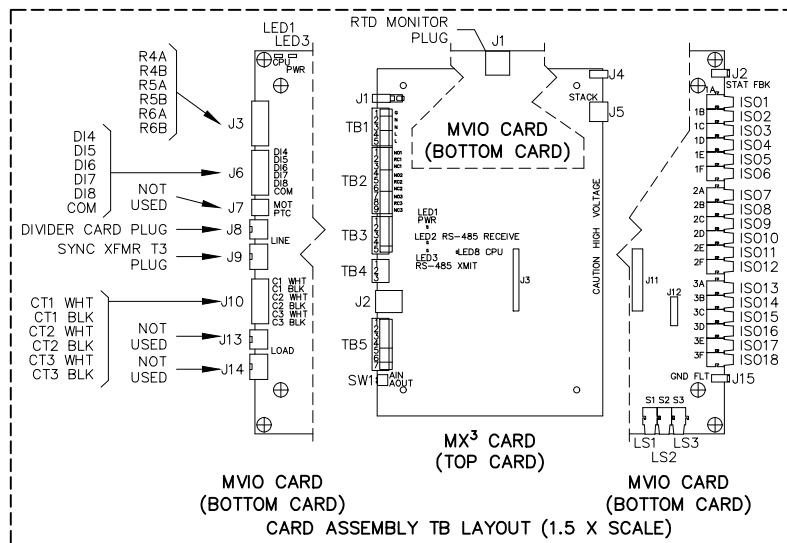
- WIRE NODE SYMBOL
- BENSRAW SUPPLIED TERMINAL BLOCK
- POWER CONNECTION
- TWISTED PAIR
- TWISTED, SHIELDED PAIR
- SHIELDED
- FIBER OPTIC CABLE
ARROW INDICATES DIRECTION OF SIGNAL
- (C-3) UNDERLINED CONTACT REFERENCES ARE NORMALLY CLOSED
- (C-3) NORMALLY OPENED CONTACT REFERENCES ARE NOT UNDERLINED

CUSTOMER NOTES:

- C1 ITEM LOCATED IN STARTER MEDIUM VOLTAGE SECTION.
- C2 ITEM LOCATED IN STARTER LOW VOLTAGE SECTION.
- C3 R1 RELAY SHOWN IN DE-ENERGIZED STATE. R1 N.O. CONTACT WILL OPEN AND R1 N.C. CONTACT WILL CLOSE ON SYSTEM FAULT. R1 RELAY INDICATES FAULT ON POWER-UP UNTIL STARTER SELF-CHECK IS COMPLETE.
- C4 LED STATUS WITH POWER APPLIED.
 "ON" "OFF"
- C5 REMOVE REMOTE RUN COMMAND PRIOR TO RESETTING A FAULT TO PREVENT IMMEDIATE RESTART OF THE MOTOR.
- C6 REFERENCE SALES ORDER FOR R-FUSE SIZE.
- C7 THE ACTUAL HP AND FLA RATINGS VARY PER MOTOR. SIZE R-FUSES PER MOTOR FLA. THE MAXIMUM SIZE R-FUSE FOR THIS MODEL MVRXE IS 12R.

	SOFTWARE VERSION	MANUAL
MX3 CARD	810023-02-xx	890034-03-xx
MVIO CARD	810024-01-xx	

xx VERSION AT TIME OF SHIPMENT

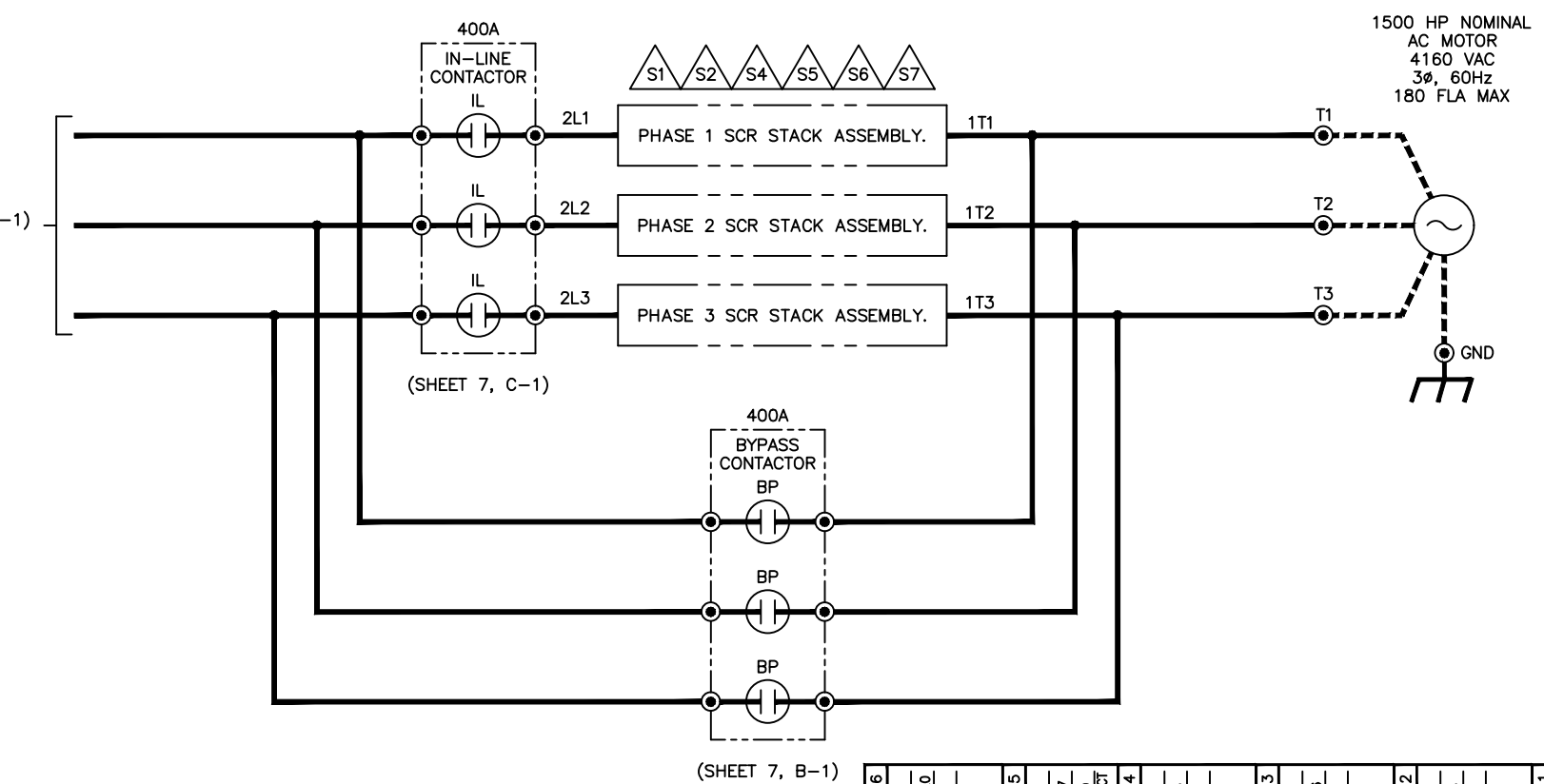
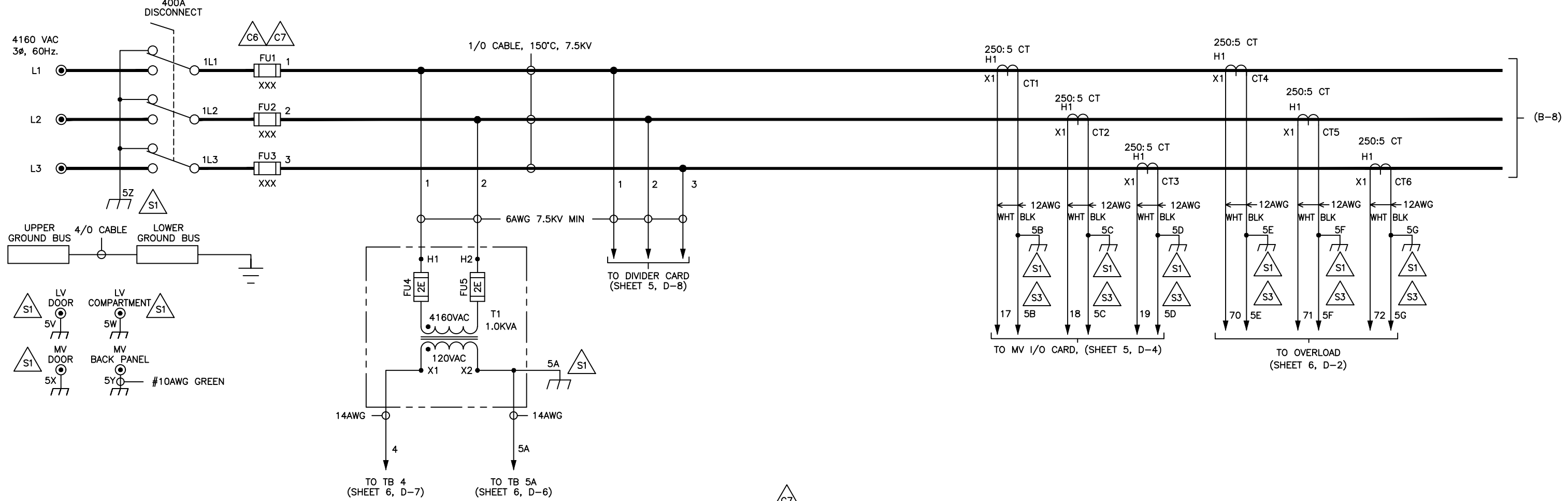


6 ECO: #5642 APPRD: JBU 3/3/2020 CHG BY: JBU 3/3/2020 CHANGE: UL 347 UPDATE	5 ECO: E5202 APPRD: SMM 5/19/17 CHG BY: RBM 5/19/17 CHANGE: CHANGED TO MICROPIPER DISCONNECT	4 ECO: E5003 APPRD: JBU 7/8/16 CHG BY: JBU 7/8/16 CHANGE: GENERAL UPDATE	3 ECO: E5003 APPRD: JBU 5/17/16 CHG BY: MCF 3/14/16 CHANGE: NO CHANGES TO THIS SHEET.	2 E4865A APPRD: JBU 1/15/16 CHG BY: JBU 1/15/16 CHANGE: SHEETS 1 & 2	1 APPRD: SMM 7/2/14 CHG BY: SMM 7/2/14 CHANGE: INITIAL RELEASE	REVISION DO NOT SCALE DWG	THIRD ANGLE PROJECTION	UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS IN INCHES [mm] INTERPRET DRAWING PER ASME Y14.5M-1994 TOLERANCES: .XX ± .03 .XXX ± .015 ANGLES ± 1°	SIGNATURES DRWN: SMM 7/2/14 CHKD: SMM 7/2/14 ENG: SMM 7/2/14	DATE 7/2/14	TITLE: UL LABELED CFMVRM18-1500-4160-12 SOLID STATE STARTER SCHEMATIC NOTES	SCALE: N/A	SHEET 3 OF 7	REV 6
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MATERIAL: FINISH:

SIZE: D DWG. NO. MVRXE181500416012

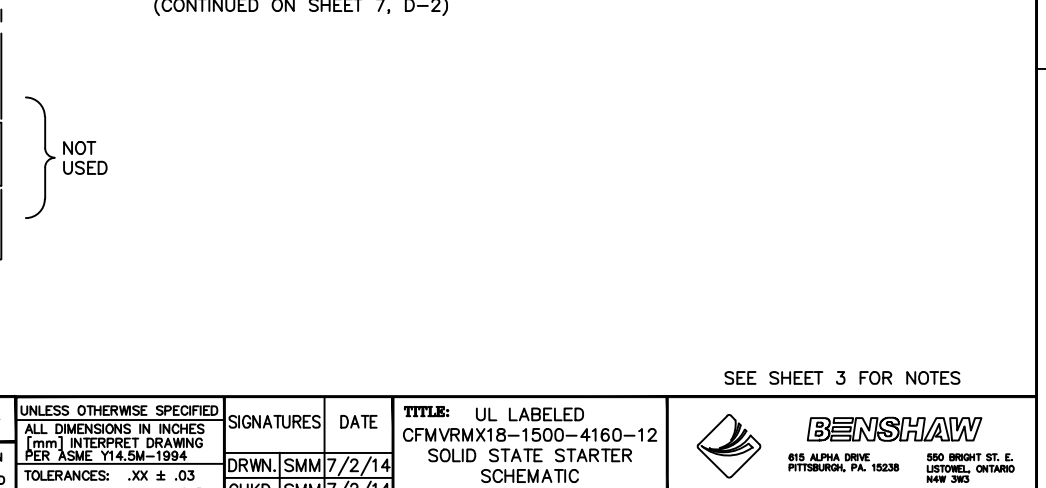
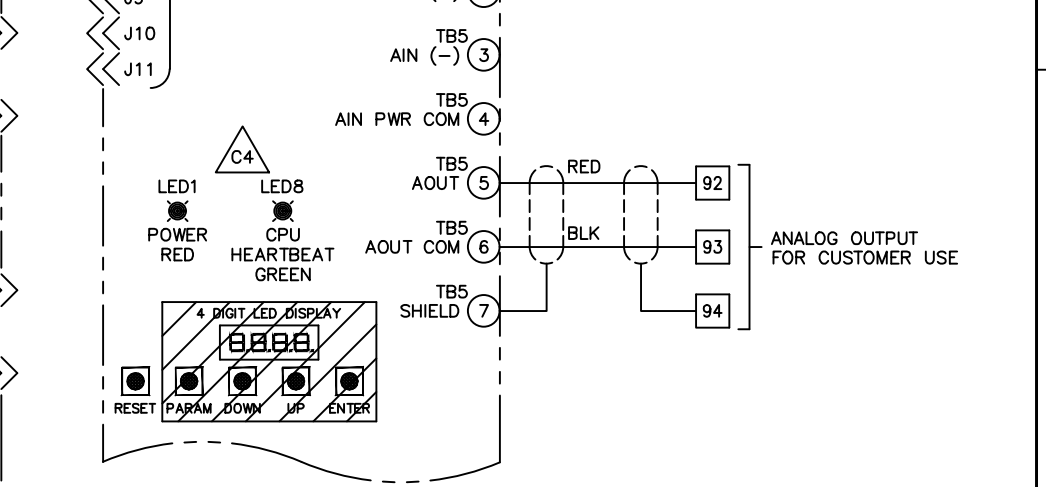
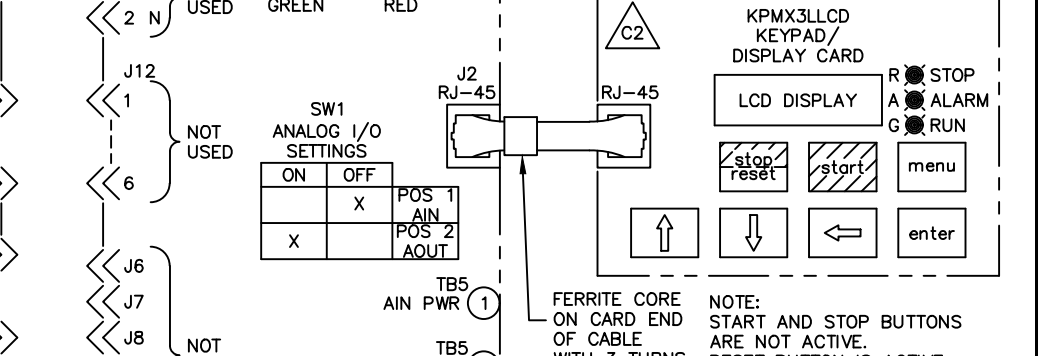
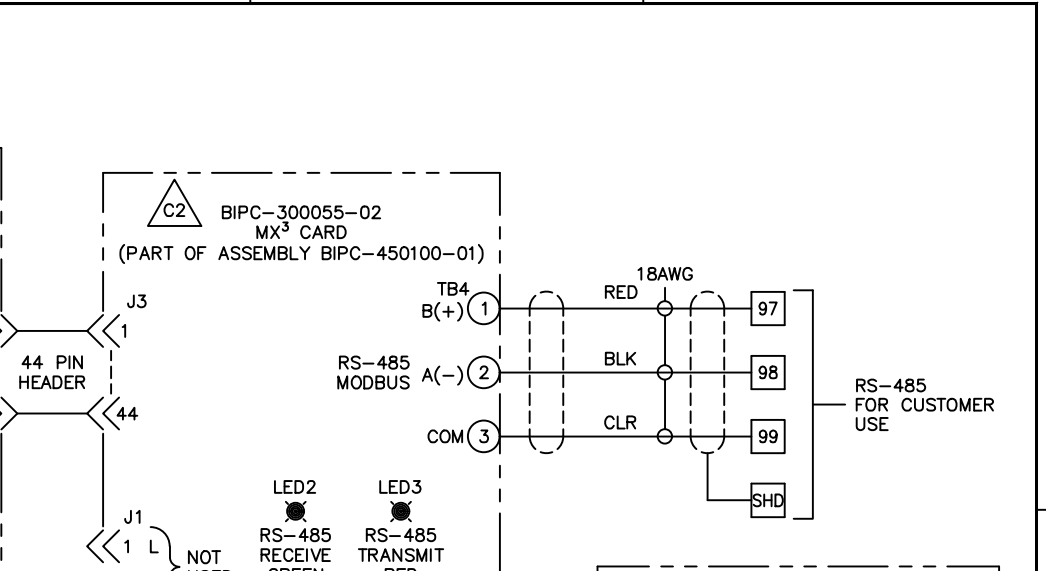
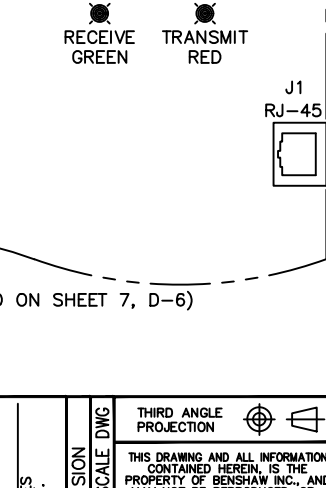
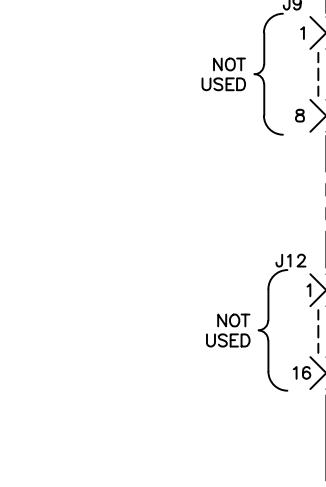
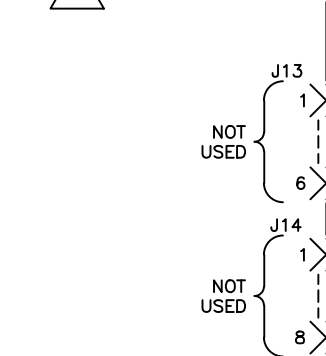
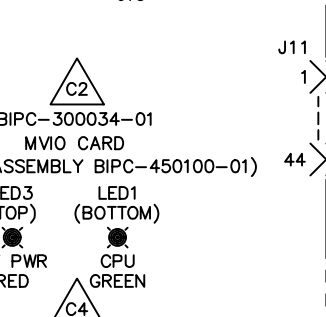
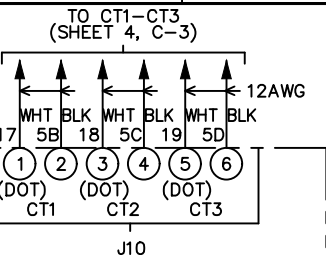
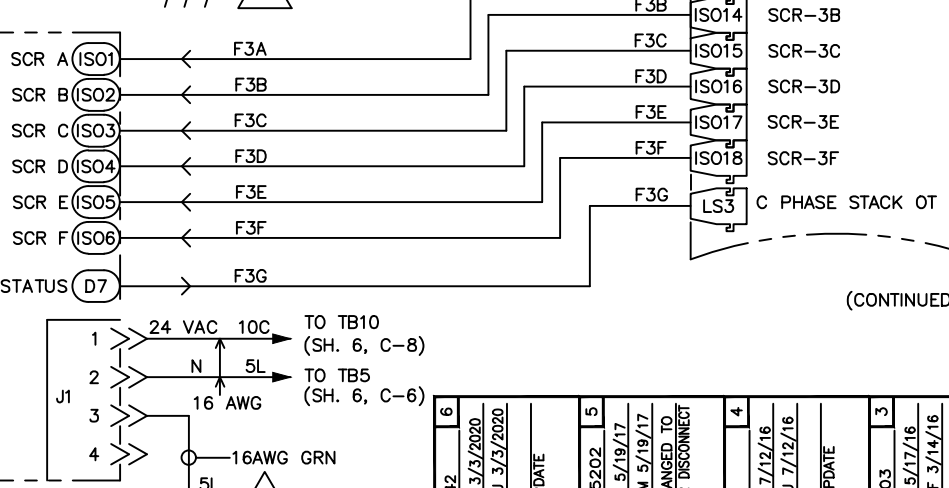
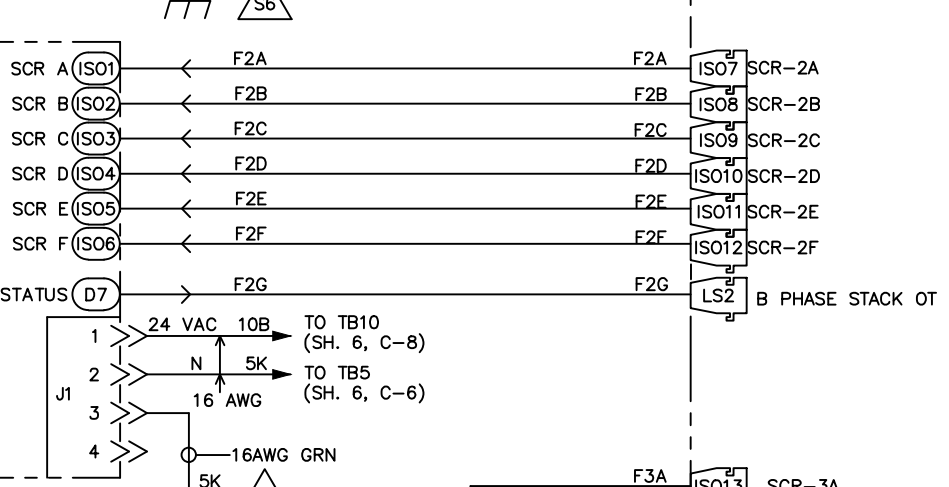
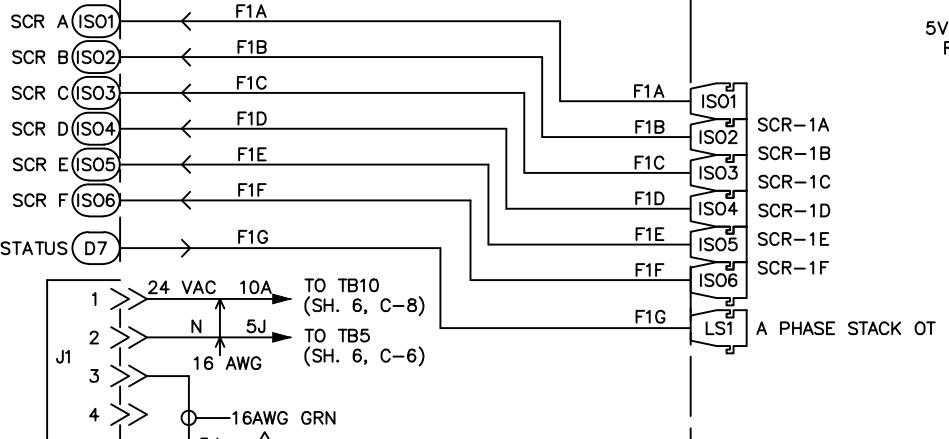
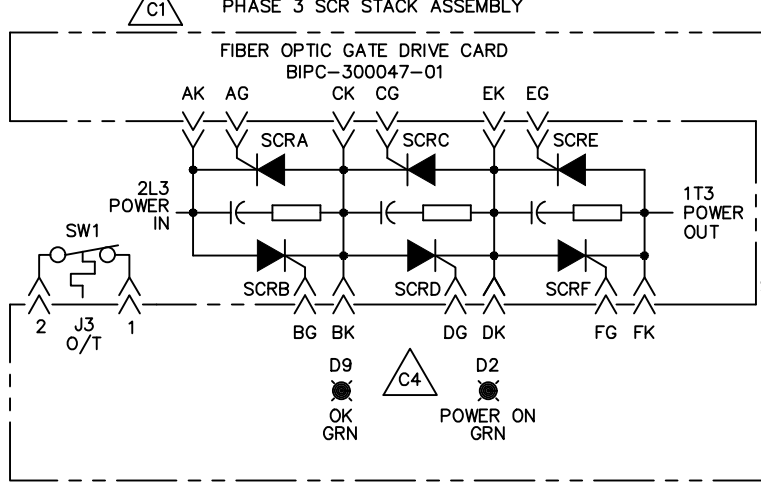
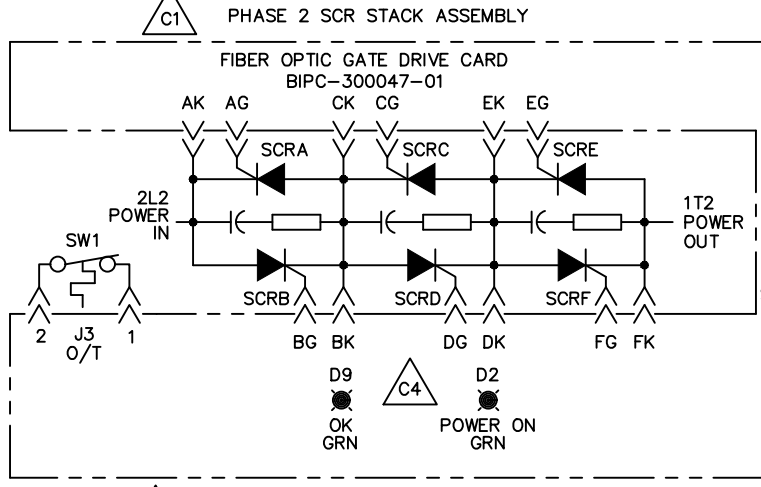
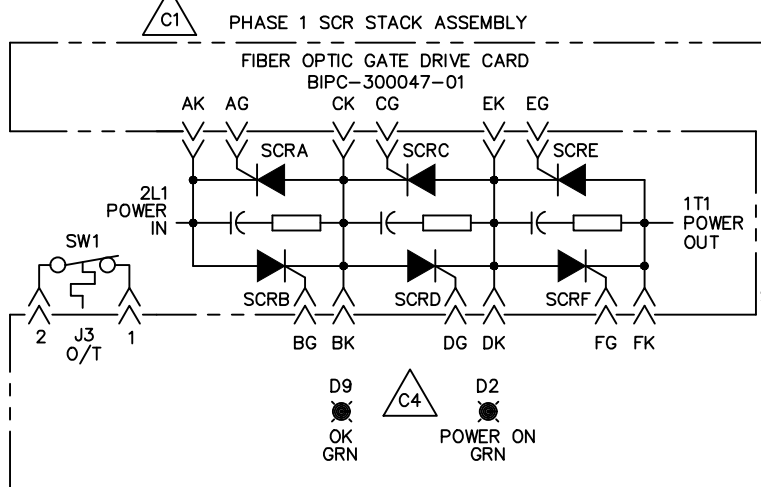
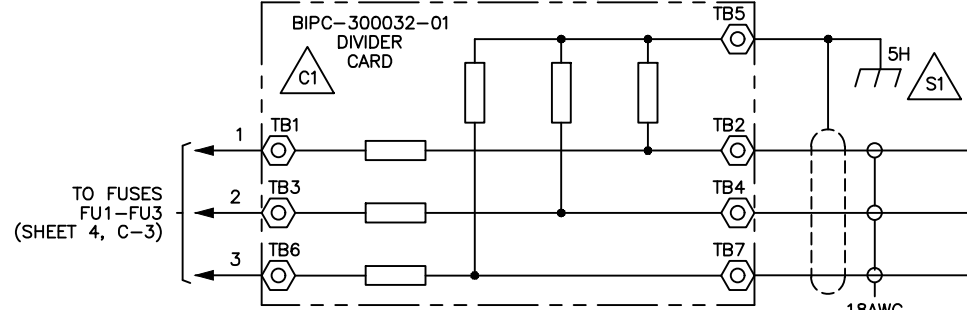
BENSHAW
815 ALPHA DRIVE PITTSBURGH, PA. 15238
550 BRIGHT ST. E. LISTONEL, ONTARIO N4W 3K2



CAUTION:
SEVERE DAMAGE MAY RESULT IF SURGE CAPACITORS, LIGHTNING ARRESTERS, OR POWER FACTOR CORRECTION CAPACITORS ARE CONNECTED TO THE LOAD SIDE OF THE SOLID STATE STARTER. CONSULT FACTORY BEFORE USING ANY OF THESE POWER QUALITY ENHANCEMENT DEVICES.

6 ECO #5642 APPRD: JBU 3/3/2020 CHG BY: JBU 3/3/2020 CHANGE: UL 347 UPDATE	5 ECO# ES202 APPRD: SMM 5/19/17 CHG BY: RBM 5/19/17 CHANGE: CHANGED TO MICROPIPER DISCONNECT	4 APPRD: JBU 7/11/16 CHG BY: JBU 7/11/16 CHANGE: GENERAL UPDATE	3 ECO: E5003 APPRD: JBU 5/17/16 CHG BY: MCF 3/14/16 CHANGE: NO CHANGES TO THIS SHEET.	2 E4865A APPRD: JBU 1/15/16 CHG BY: JBU 1/15/16 CHANGE: SHEETS 1 & 2	1 APPRD: SMM 7/2/14 CHG BY: SMM 7/2/14 CHANGE: INITIAL RELEASE	REVISION DO NOT SCALE DWG	THIRD ANGLE PROJECTION	UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS IN INCHES [mm] INTERPRET DRAWING PER ASME Y14.5M-1994 TOLERANCES: .XX \pm .03 .XXX \pm .015 ANGLES \pm 1'	SIGNATURES DATE DRWN: SMM 7/2/14 CHKD: SMM 7/2/14 ENG: SMM 7/2/14	TITLE: UL LABELED CFMVRM18-1500-4160-12 SOLID STATE STARTER SCHEMATIC	SCALE: N/A SHEET 4 OF 7	SEE SHEET 3 FOR NOTES
MATERIAL: FINISH:								SIZE: D	DWG. NO.: MVRXE181500416012	REV: 6		



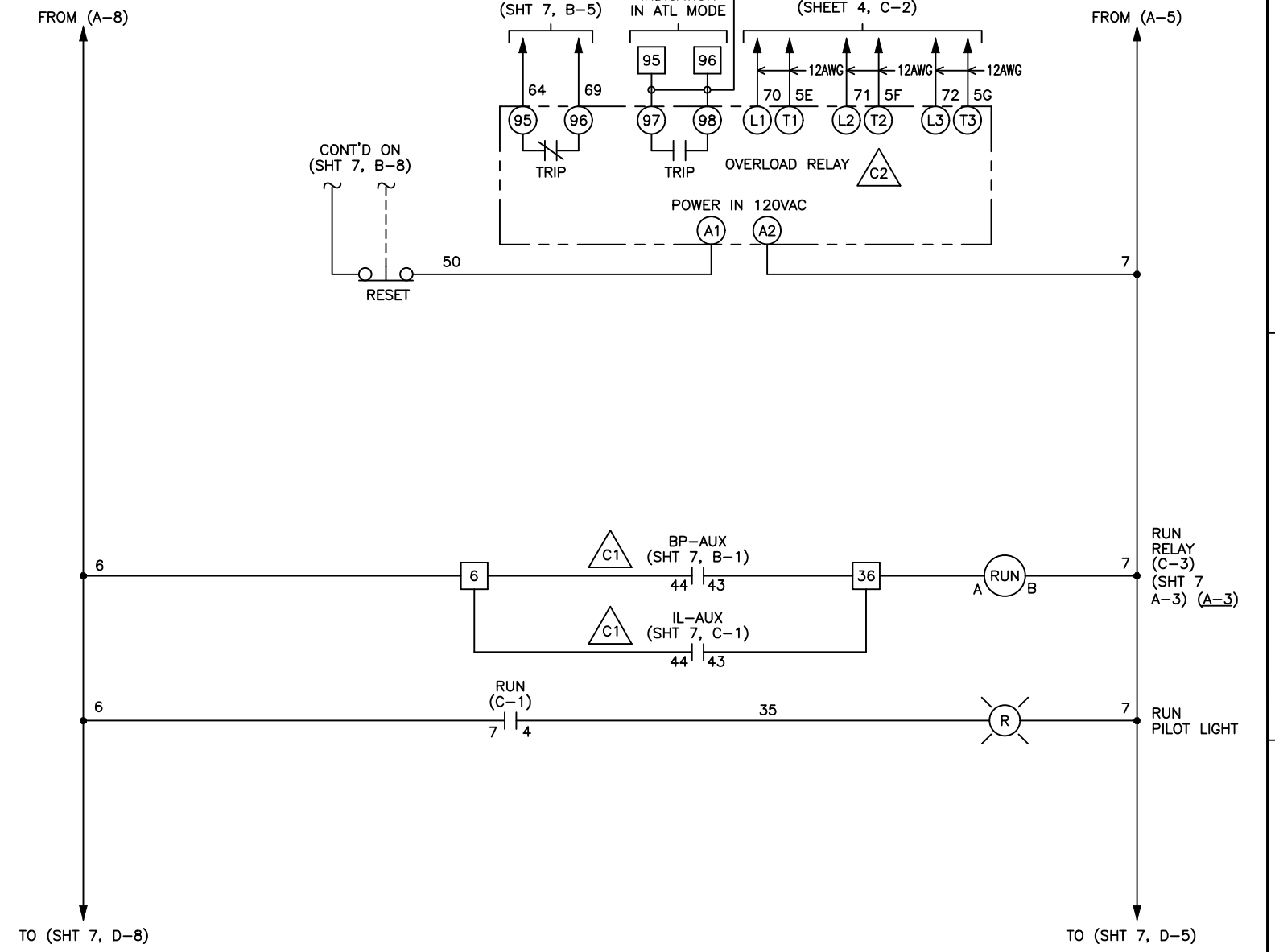
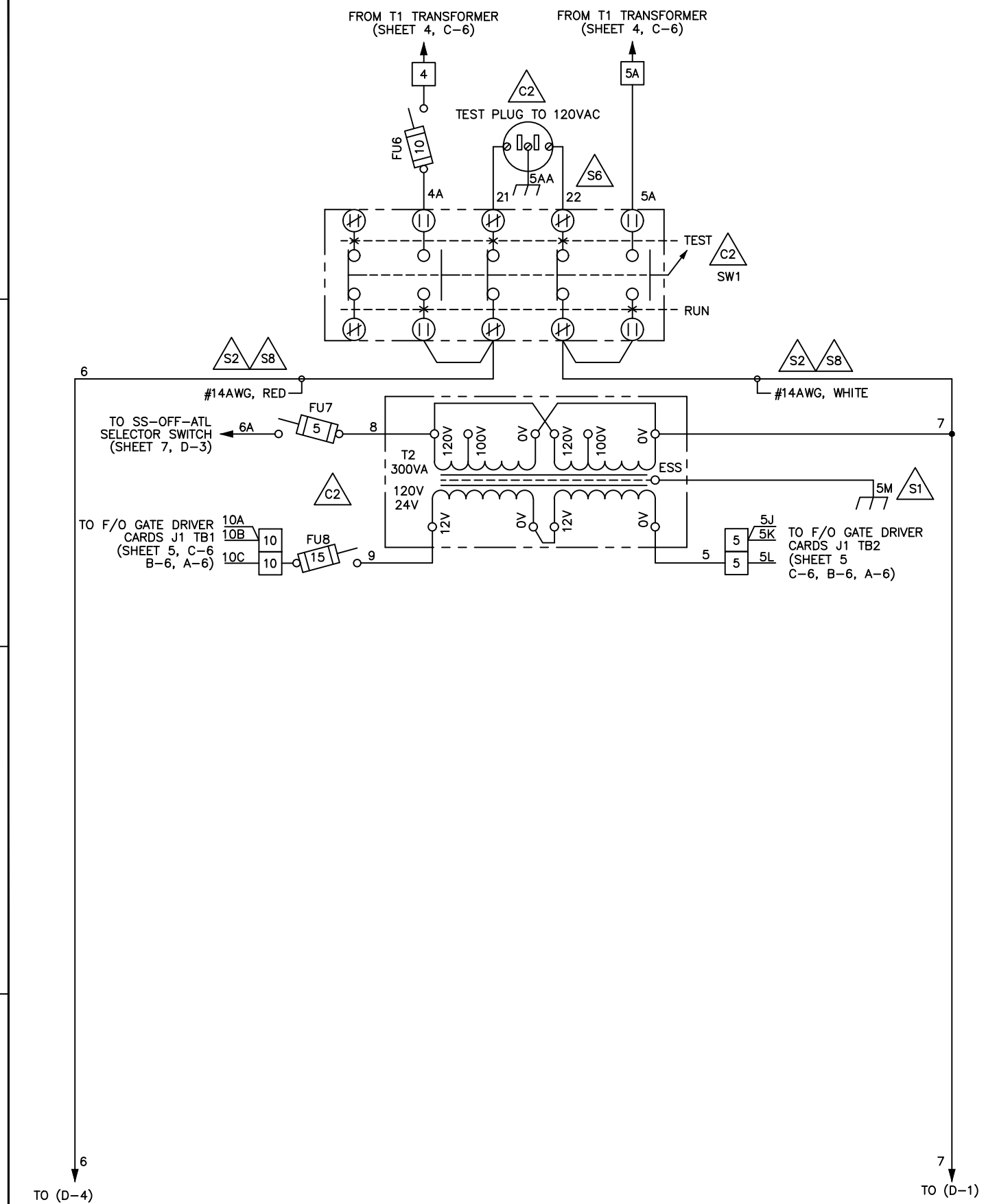


(CONTINUED ON SHEET 7, D-6)

(CONTINUED ON SHEET 7, D-2)

SEE SHEET 3 FOR NOTES

ECO #5642	APPRD: JBU 3/3/2020	CHG BY: JBU 3/3/2020	CHANGE: UL UL 347 UPDATE	ECO# E5202	APPRD: SMM 5/19/17	CHG BY: RBM 5/19/17	CHANGE: CHANGED TO MICROPLIFIER DISCONNECT	ECO# E5003	APPRD: JBU 5/17/16	CHG BY: MCF 3/14/16	CHANGE: NO CHANGES THIS SHEET.	REVISION	DO NOT SCALE DWG	THIRD ANGLE PROJECTION	UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS IN INCHES [mm] INTERPRET DRAWING PER ASME Y14.5M-1994	TOLERANCES: .XX ± .03 .XXX ± .015 ANGLES ± 1°	MATERIAL:	FINISH:	SIGNATURES	DATE	TITLE: UL LABELED CFMVRM18-1500-4160-12 SOLID STATE STARTER SCHEMATIC	SCALE: N/A	SHEET 5 OF 7	REV 6				
															D MVRXE181500416012													

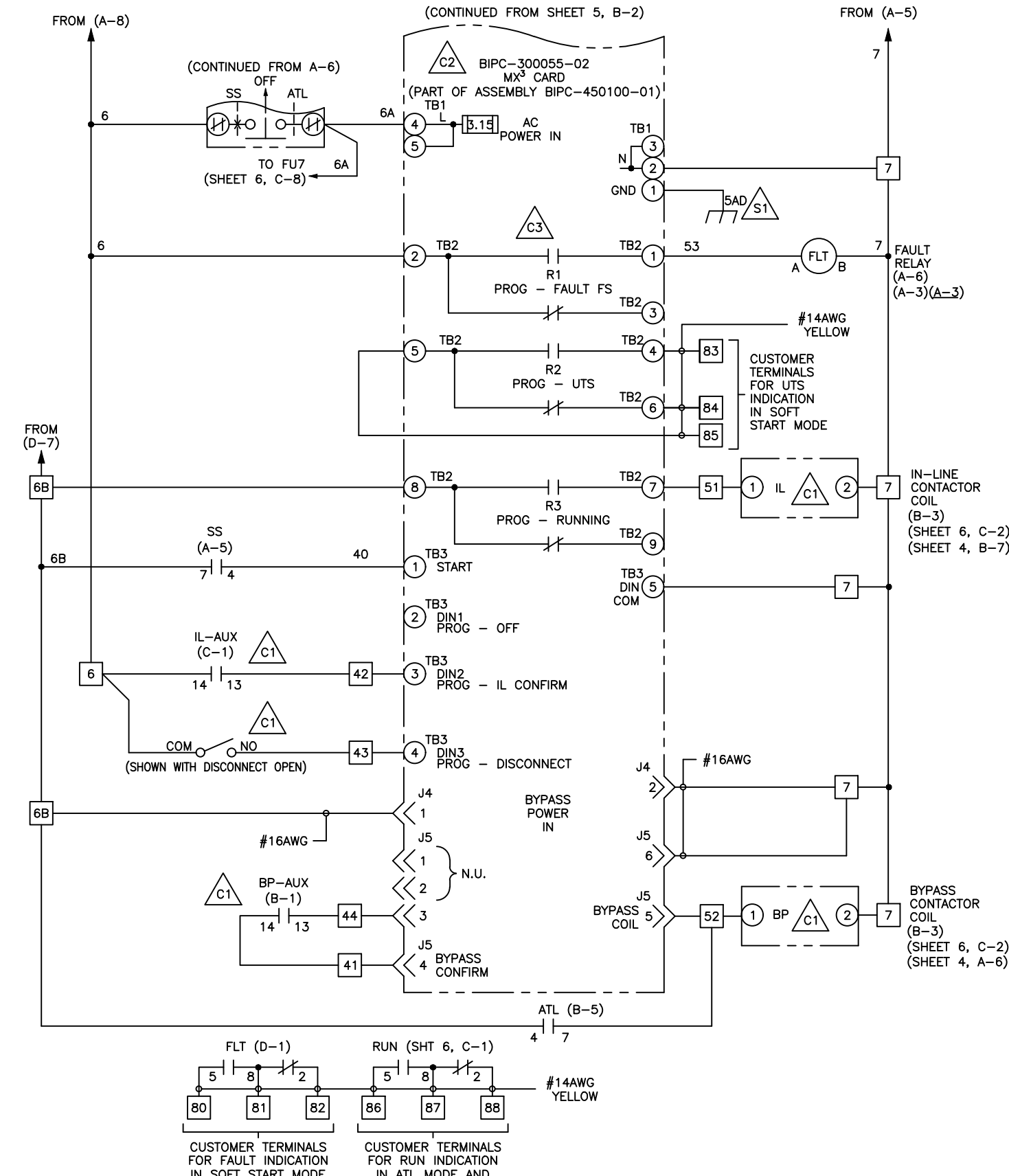
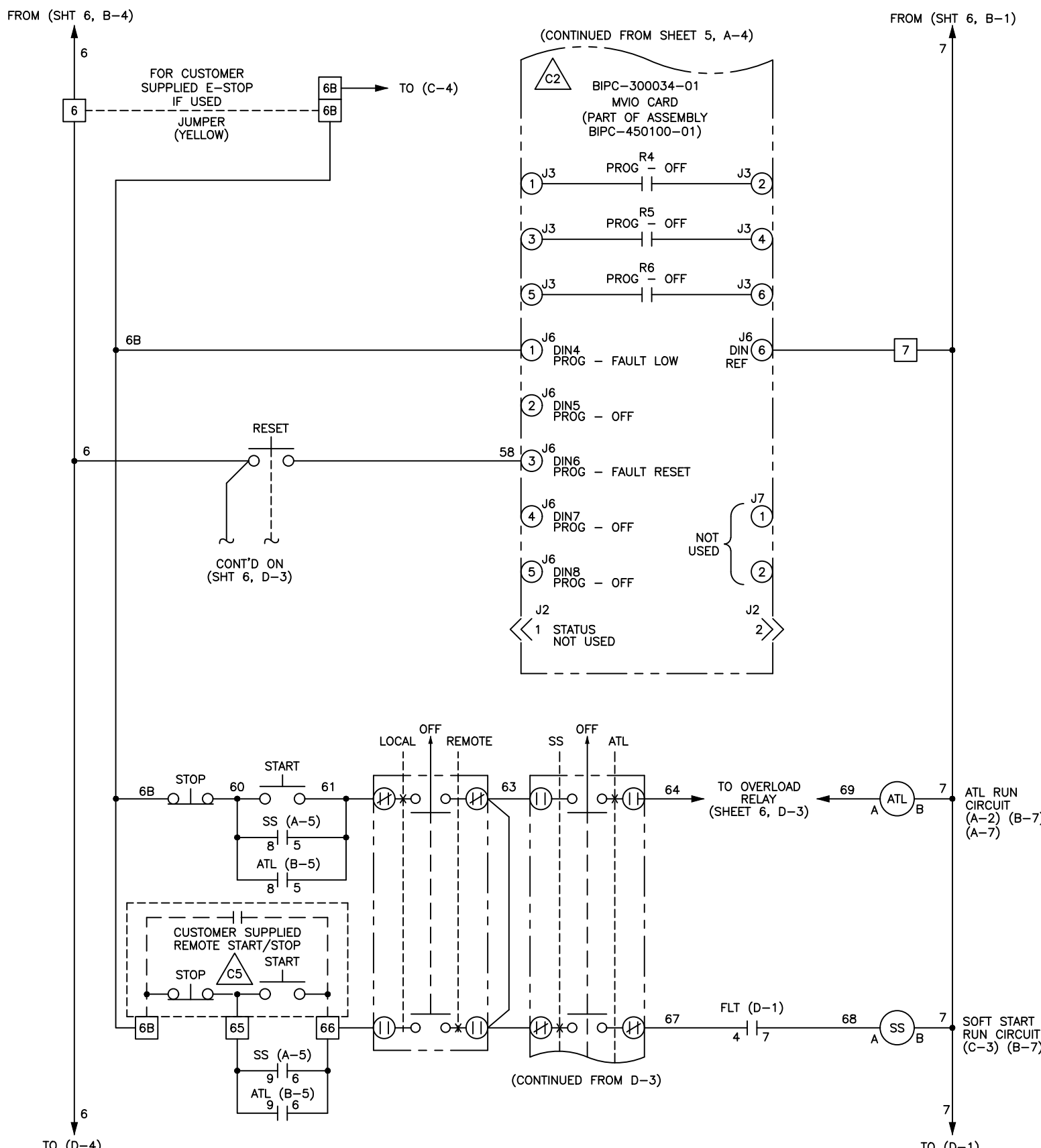


ECO #5642	APPRD: JBU 3/3/2020	CHG BY: JBU 3/3/2020	CHANGE: UL 347 UPDATE	ECO # E5202	APPRD: SMM 5/19/17	CHG BY: RBM 5/19/17	CHANGE: CHANGED TO MICROPIPER DISCONNECT	APPRD: JBU 7/13/16	CHG BY: JBU 7/13/16	CHANGE: GENERAL UPDATE	ECO: E5003	APPRD: JBU 5/17/16	CHG BY: MCF 3/14/16	CHANGE: NO CHANGES TO THIS SHEET.	E4865A	APPRD: JBU 1/15/16	CHG BY: JBU 1/15/16	CHANGE: SHEETS 1 & 2	APPRD: SMM 7/2/14	CHG BY: SMM 7/2/14	CHANGE: INITIAL RELEASE	REVISION	DO NOT SCALE DWG	THIRD ANGLE PROJECTION	UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS IN INCHES [mm] INTERPRET DRAWING PER ASME Y14.5M-1994	TOLERANCES: .XX ± .03 .XXX ± .015 ANGLES ± 1°	MATERIAL:	FINISH:	SIGNATURES	DATE	TITLE: UL LABELED CFMVRMX18-1500-416-12 SOLID STATE STARTER SCHEMATIC	SCALE: N/A	SHEET 6 OF 7	REV 6
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SEE SHEET 3 FOR NOTES



SIZE DWG. NO. D MVRXE181500416012



6	ECO #5642	5	ECO# E5202
5	APPRD:JBU 3/3/2020	4	APPRD:SMM 5/19/17
4	CHG BY:JBU 3/3/2020	3	CHG BY:RBM 5/19/17
3	CHANGE: UL 347 UPDATE	2	CHANGE: CHANGED TO MICROPIPER DISCONNECT
2	ECO# E5003	1	APPRD:JBU 7/13/16
1	APPRD:JBU 5/17/16	0	CHG BY:JBU 7/13/16
0	CHG BY:MCF 3/14/16		CHANGE: GENERAL UPDATE
	CHANGE: NOT CHANGES THIS SHEET		
	E4865A		
	APPRD:JBU 1/15/16		
	CHG BY:JBU 1/15/16		
	CHANGE: SHEETS 1 & 2		
	APPRD:SMM 7/2/14		
	CHG BY:SMM 7/2/14		
	CHANGE: INITIAL RELEASE		
	DO NOT SCALE DWG		
	THIRD ANGLE PROJECTION		
	UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS IN INCHES [mm] INTERPRET DRAWING PER ASME Y14.5M-1994		
	TOLERANCES: .XX ± .03		
	.XXX ± .015		
	ANGLES ± 1°		
	MATERIAL:		
	FINISH:		
	REVISION		
	DO NOT SCALE DWG		
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	SIGNATURES		
	DATE		
	DRWN: SMM 7/2/14		
	CHKD: SMM 7/2/14		
	ENG: SMM 7/2/14		
	TITLE: UL LABELED CFMVRMX18-1500-4160-12 SOLID STATE STARTER SCHEMATIC		
	SCALE: N/A		
	SHEET 7 OF 7		
	SEE SHEET 3 FOR NOTES		
	REV 6		