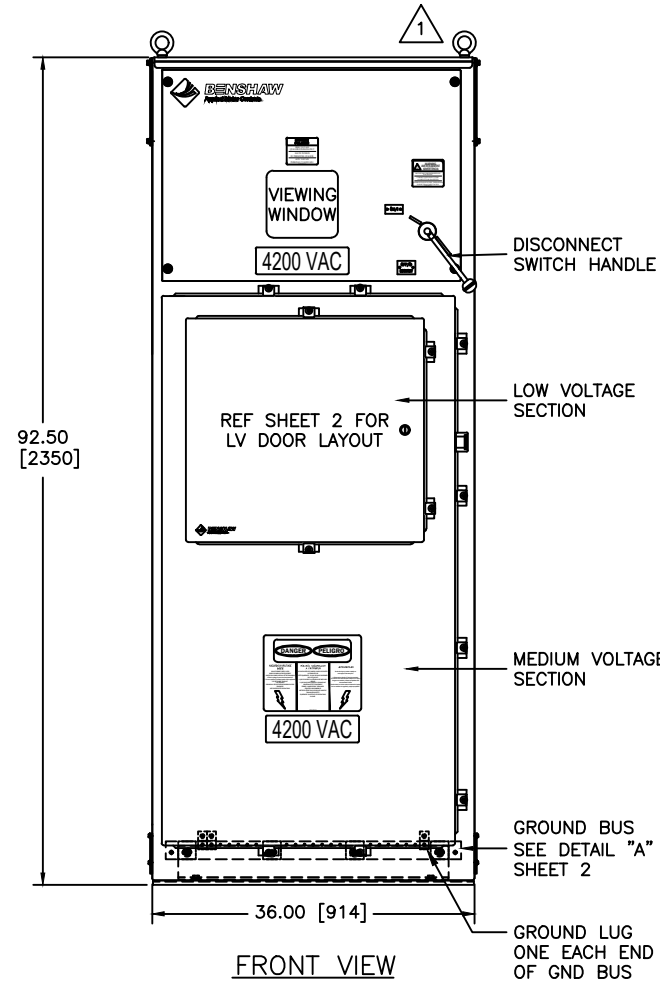
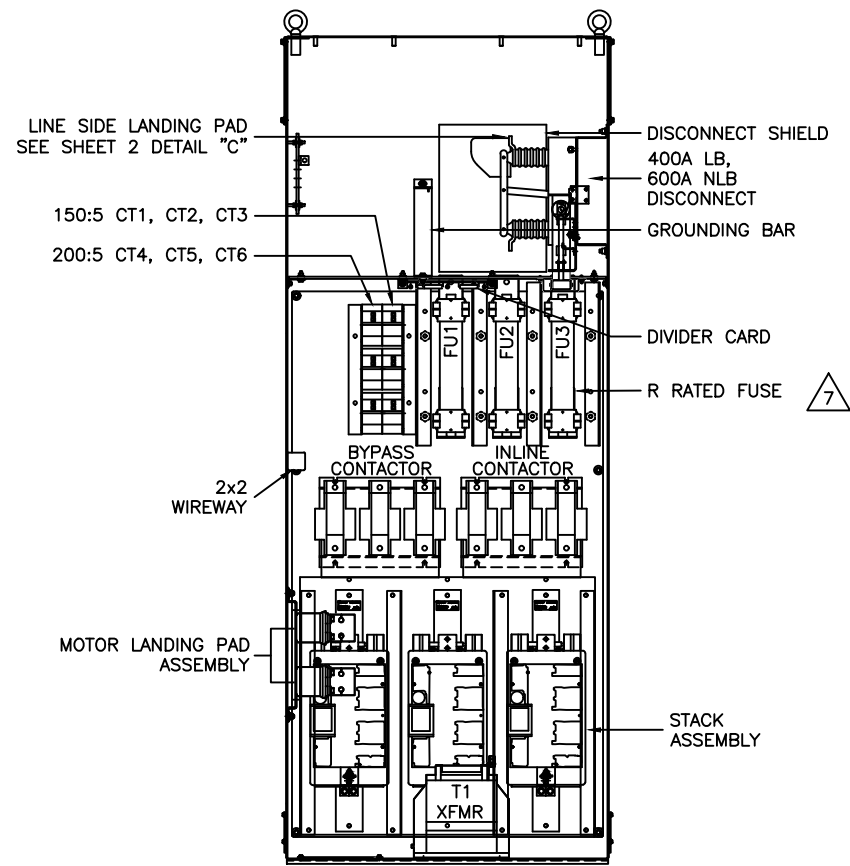


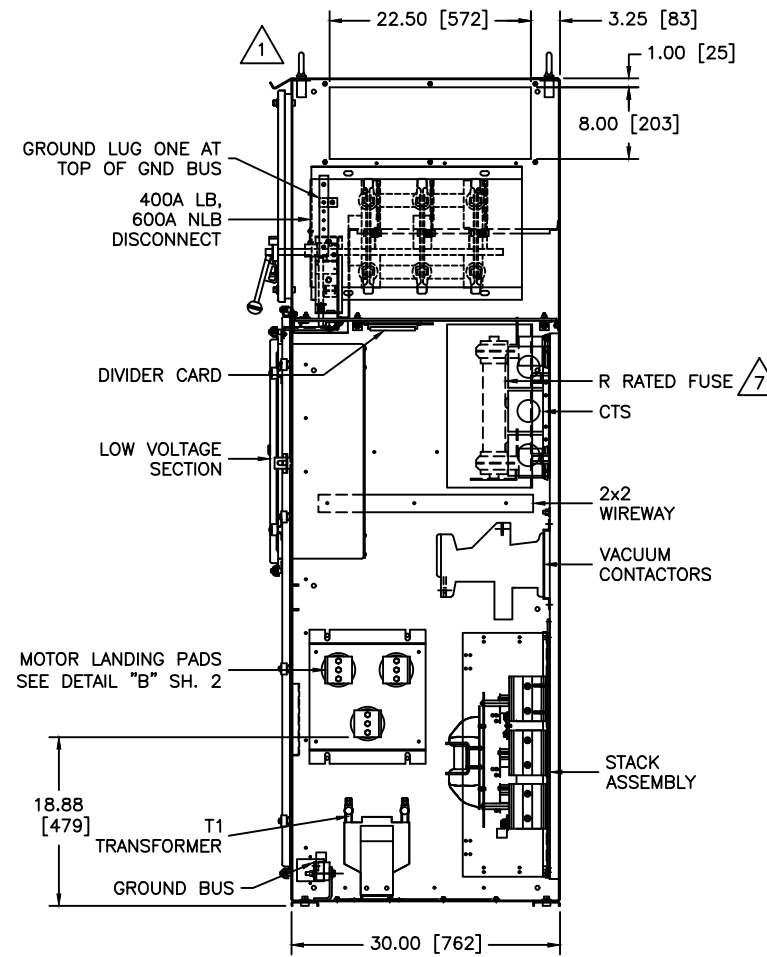
TOP VIEW



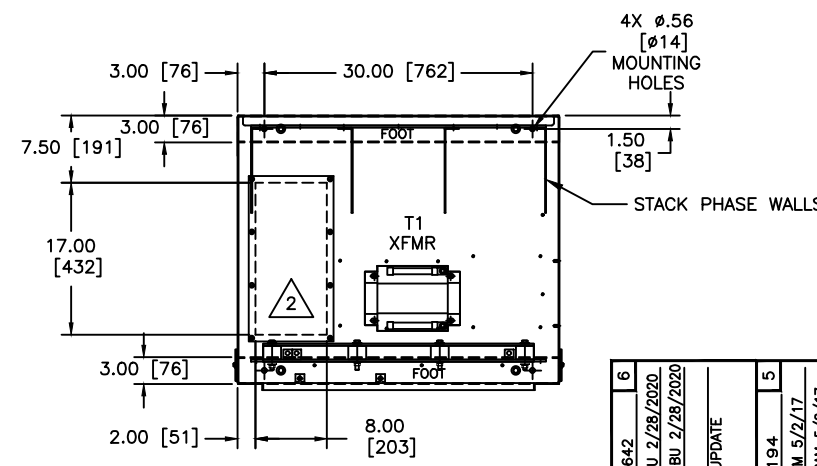
FRONT VIEW



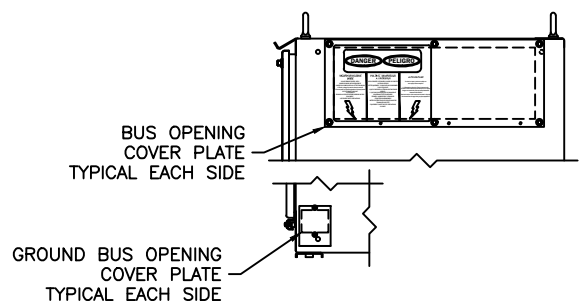
FRONT INTERIOR VIEW



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

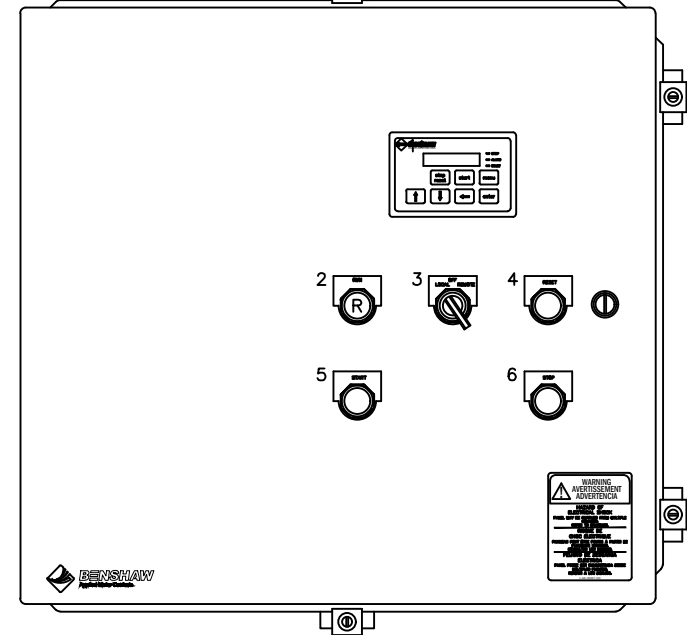
STEEL BOLT TORQUE IN POUND-FOOT [NEWTON-METER]				
1/4-20	5/16-18	3/8-16	1/2-13	5/8-11
5 [6.8]	12 [16.3]	20 [27]	50 [67.8]	95 [128.8]

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

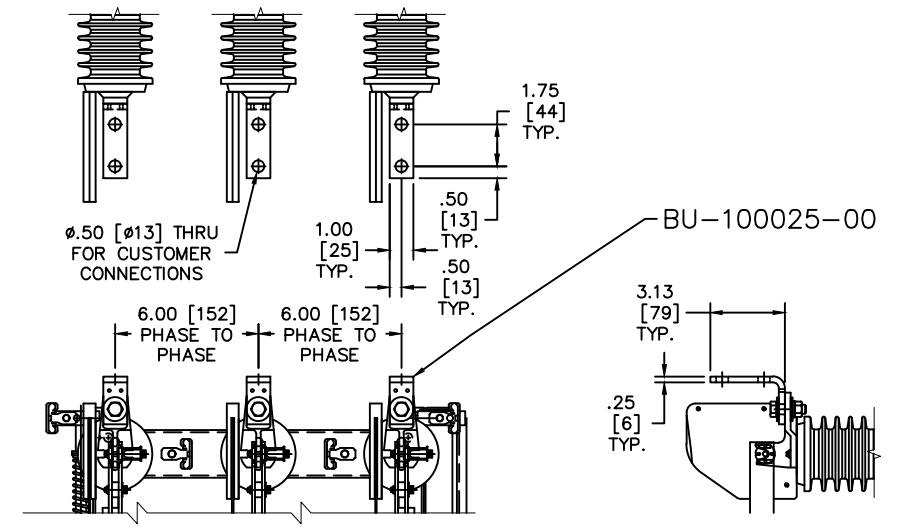
ECO: #5642 APPRD: JBU 2/28/2020 CHG BY: JBU 2/28/2020 CHANGE: UL 347 UPDATE	ECO: ES194 APPRD: SAM 5/2/17 CHG BY: SAM 5/2/17 CHANGE: MICRORUPTER, INPUT BUS	APPRD: JBU 7/7/16 CHG BY: JBU 7/7/16 CHANGE: GENERAL UPDATE	REVISION DO NOT SCALE DWG	THIRD ANGLE PROJECTION THIS DRAWING AND ALL INFORMATION CONTAINED HEREIN, IS THE PROPERTY OF BENSCHAW INC., AND MAY NOT BE REPRODUCED, OR DWLGED 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 11/13/13 CHKD. ENG. SMM 11/13/13	DATE 11/13/13	TITLE: UL LABELED MVRXE18-1000-4160-12 SOLID STATE STARTER ENCLOSURE LAYOUT	815 ALPHA DRIVE PITTSBURGH, PA 15238 550 BRIGHT ST. E. LISTON, ONTARIO M4W 3K2	SCALE: 3/32 : 1 SHEET 1 OF 7	REV 6
						MATERIAL: FINISH:					

**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	UP-TO-SPEED INDICATION IN S.S. MODE FOR CUSTOMER USE
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	UP-TO-SPEED INDICATION IN S.S. MODE FOR CUSTOMER USE
86	RUN INDICATION IN ATL & S.S. MODES FOR CUSTOMER USE
87	RUN INDICATION IN ATL & S.S. MODES FOR CUSTOMER USE
88	RUN INDICATION IN ATL & S.S. MODES FOR CUSTOMER USE
92	ANALOG OUTPUT FOR CUSTOMER USE
93	ANALOG OUTPUT FOR CUSTOMER USE
94	ANALOG OUTPUT FOR CUSTOMER USE
95	O/L FAULT IND. IN ATL MODE FOR CUSTOMER USE
96	O/L FAULT IND. IN ATL MODE FOR CUSTOMER USE
97	O/L FAULT IND. IN ATL MODE FOR CUSTOMER USE
98	RS-485
99	RS-485
SHD	
SP	
SP	
SP	

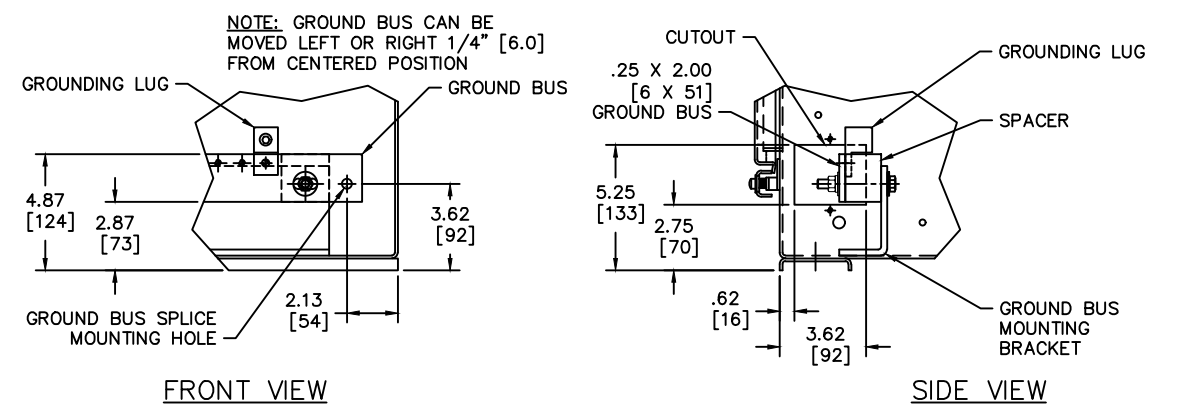
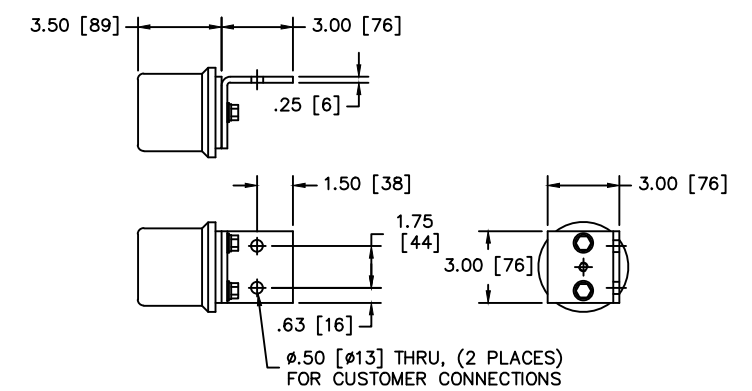
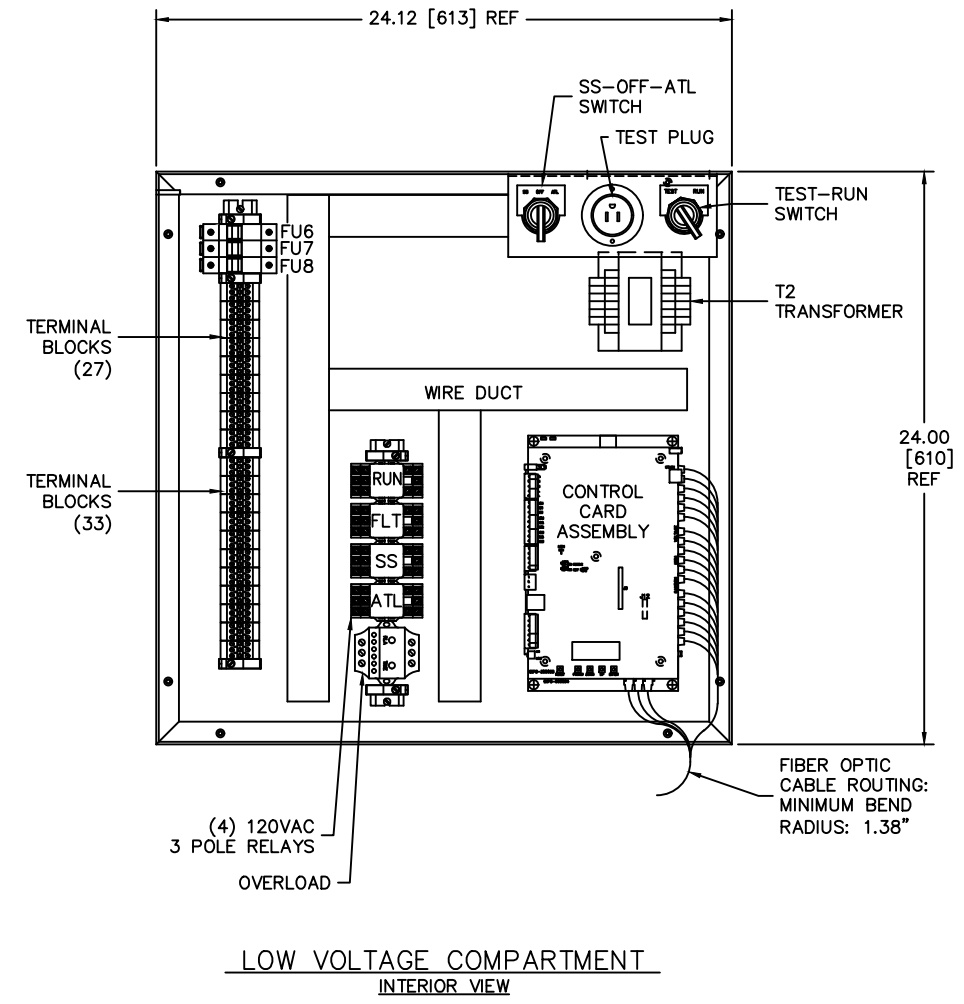


- DEVICE LEGEND**
1. KEYPAD DISPLAY
  2. "RUN" (RED) PILOT LIGHT
  3. "LOCAL-OFF-REMOTE" SELECTOR SWITCH
  4. "RESET" (BLACK) PUSHBUTTON
  5. "START" (GREEN) PUSHBUTTON
  6. "STOP" (RED) RAISED PUSHBUTTON



**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



6	ECO: #5642	5	ECO: E5194	4	APPRD: JBU 7/8/16	3	ECO: E5003	2	ECO: E4865	1	APPRD: SMM 11/13/13	THIRD ANGLE PROJECTION	UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS IN INCHES [mm] INTERPRET DRAWING PER ASME Y14.5M-1994	SIGNATURES	DATE	TITLE: UL LABELED MVRXE18-1000-4160-12 SOLID STATE STARTER LOW VOLTAGE COMPARTMENT AND ENCLOSURE DETAILS	<p>815 ALPHA DRIVE PITTSBURGH, PA. 15238 550 BRIGHT ST. E. LISTONVILLE, ONTARIO N4W 3K2</p>
	APPRD: JBU 2/28/2020		APPRD: SAM 5/2/17		CHG BY: JBU 7/8/16		APPRD: JBU 4/4/16		APPRD: SMM 8/24/15		CHG BY: SMM 11/13/13	THIS DRAWING AND ALL INFORMATION CONTAINED HEREIN IS THE PROPERTY OF BENSHAW INC. AND MAY NOT BE REPRODUCED, OR DIVULGED 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.	DRWN: SMM 11/13/13	11/13/13		SCALE: 1/4 : 1	
	CHG BY: JBU 2/28/2020		CHG BY: SAM 5/2/17		CHG BY: JBU 7/8/16		CHG BY: MCF 3/14/16		CHG BY: SMM 8/24/15		CHG BY: SMM 11/13/13		TOLERANCES: .XX ± .03 .XXX ± .015 ANGLES ± 1°	CHKD:			SHEET 2 OF 7
	CHANGE: UL 347 UPDATE		CHANGE: MICROUPTOR, INPUT BUS TABS		CHANGE: GENERAL UPDATE		CHANGE: KEYPAD REVISED GROUND BUS DETAIL		CHANGE: REV PER ECO UPDATED LABELS		CHANGE: INITIAL RELEASE		MATERIAL: FINISH:	ENG: SMM 11/13/13			REV 6

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	150:5
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

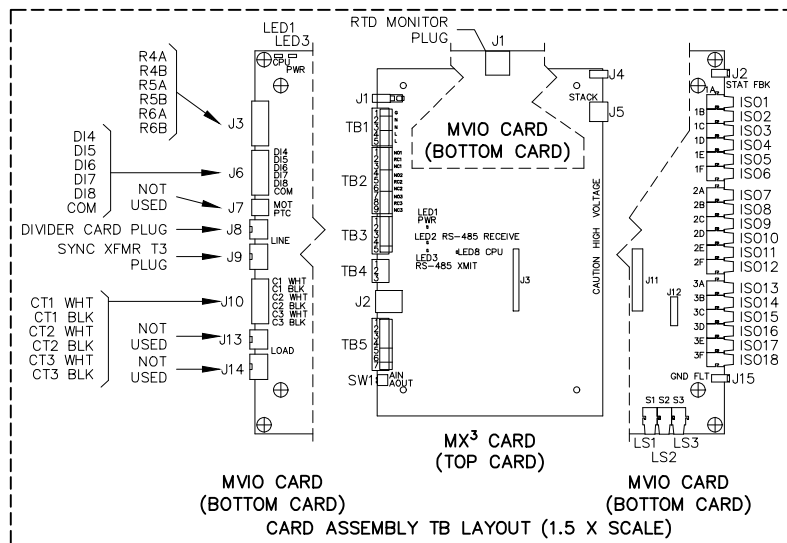
- WIRE NODE SYMBOL
- BENSRAW SUPPLIED TERMINAL BLOCK
- POWER CONNECTION
- TWISTED PAIR
- TWISTED, SHIELDED PAIR
- SHIELDED
- FIBER OPTIC CABLE  
ARROW INDICATES DIRECTION OF SIGNAL
- (C-3) UNDERLINED CONTACT REFERENCES ARE NORMALLY CLOSED
- (C-3) NORMALLY OPENED CONTACT REFERENCES ARE NOT UNDERLINED

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 9R.

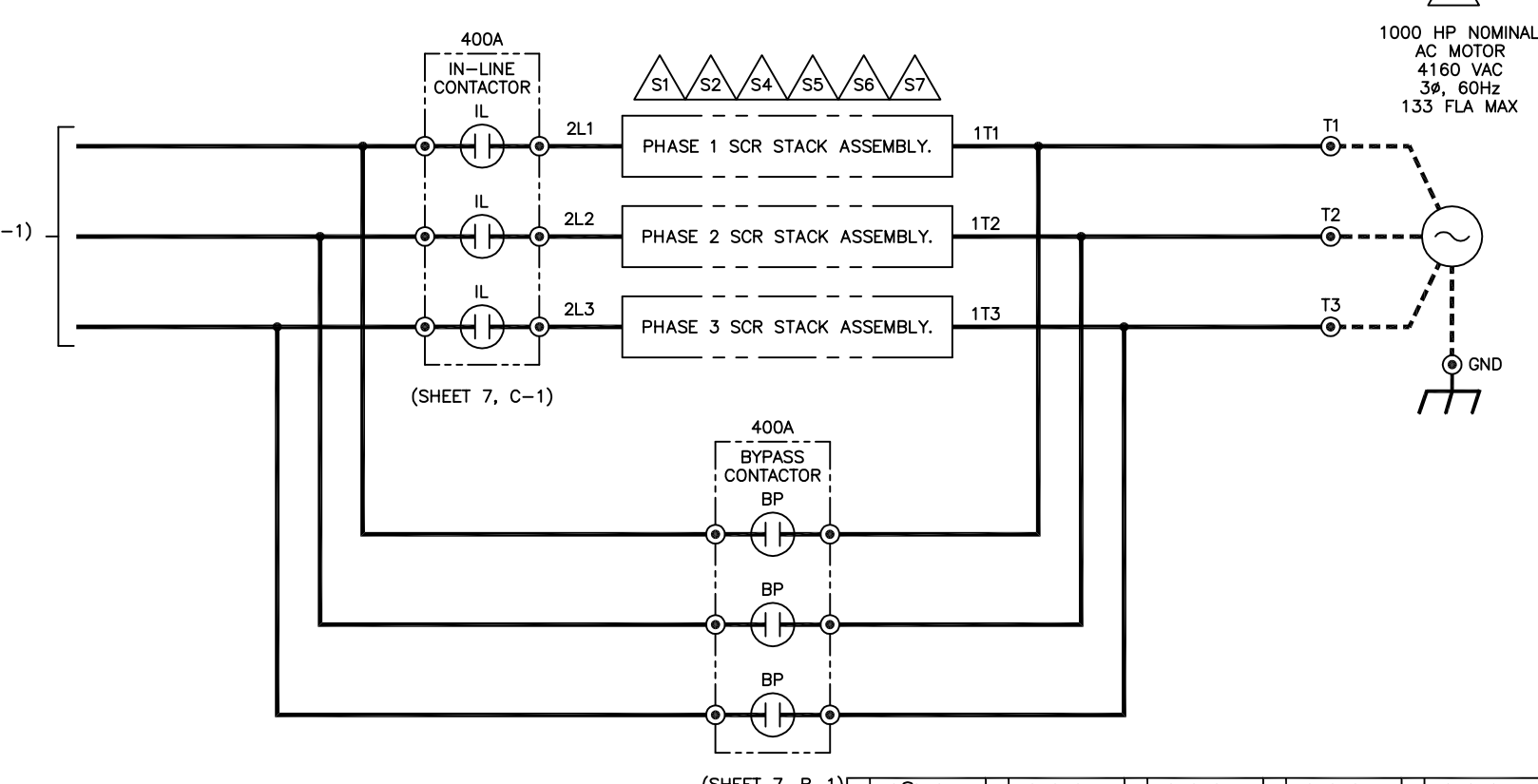
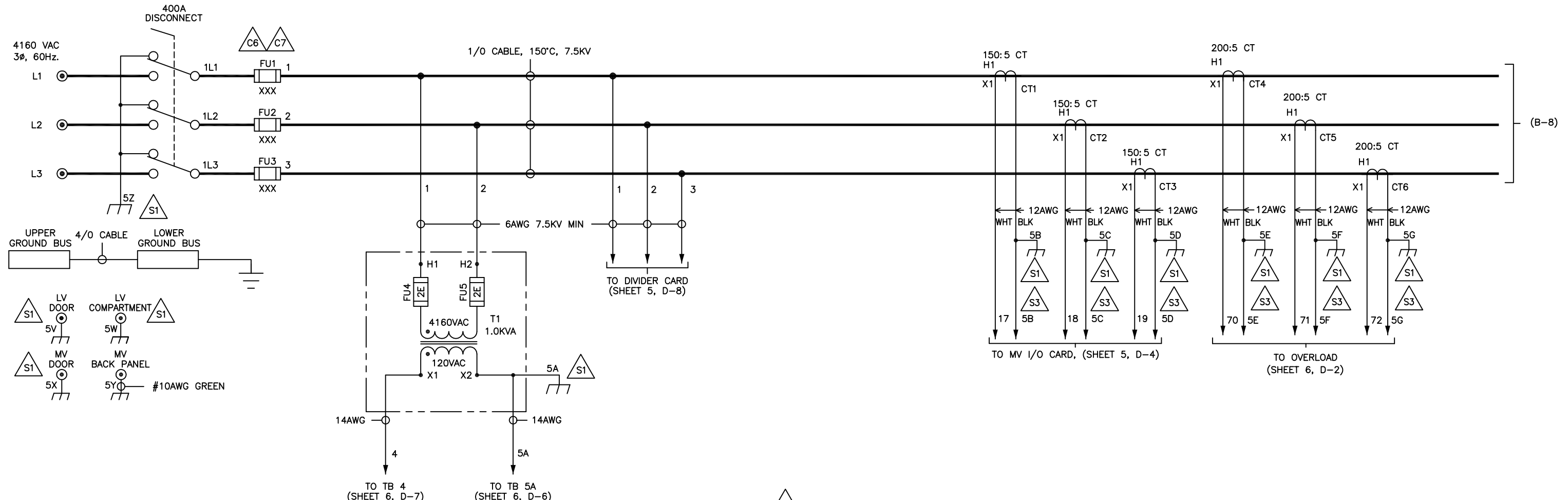
	SOFTWARE VERSION	MANUAL
MX3 CARD	810023-02-xx	890034-03-xx
MVIO CARD	810024-01-xx	

xx VERSION AT TIME OF SHIPMENT



6 ECO: #5642 APPRD: JBU 2/28/2020 CHG BY: JBU 2/28/2020 CHANGE: UL 347 UPDATE	5 ECO: E5194 APPRD: SAM 5/3/17 CHG BY: SAM 5/3/17 CHANGE: NO CHANGE THIS SHEET	4 ECO: E5003 APPRD: JBU 7/8/16 CHG BY: JBU 7/8/16 CHANGE: GENERAL UPDATE	3 ECO: E5003 APPRD: JBU 4/4/16 CHG BY: MCF 3/14/16 CHANGE: NO CHANGES THIS SHEET	2 ECO# E4865 APPRD: SMM 8/24/15 CHG BY: SMM 8/24/15 CHANGE: REV PER ECO NO CHANGE THIS SHEET	1 APPRD: SMM 11/13/13 CHG BY: SMM 11/13/13 CHANGE: INITIAL RELEASE	<p>THIRD ANGLE PROJECTION</p> <p>THIS DRAWING AND ALL INFORMATION CONTAINED HEREIN IS THE PROPERTY OF BENSRAW INC. AND MAY NOT BE REPRODUCED, OR DIVULGED TO UNAUTHORIZED PERSONS, WITHOUT THE EXPRESS WRITTEN CONSENT OF BENSRAW INC. IT IS PROVIDED SOLELY FOR THE CONVENIENCE OF THE USER AND SHALL BE RETURNED UPON REQUEST.</p> <p>UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS IN INCHES [mm] INTERPRET DRAWING PER ASME Y14.5M-1994</p> <p>TOLERANCES: .XX ± .03 .XXX ± .015 ANGLES ± 1°</p> <p>MATERIAL: FINISH:</p>	<p>SIGNATURES</p> <p>DRWN. SMM 11/13/13</p> <p>CHKD.</p> <p>ENG. SMM 11/13/13</p>	<p>DATE</p> <p>11/13/13</p>	<p>TITLE: UL LABELED MVRXE18-1000-4160-12 SOLID STATE STARTER SCHEMATIC NOTES</p>	<p>SCALE: N/A</p> <p>SHEET 3 OF 7</p>	<p>REV 6</p>
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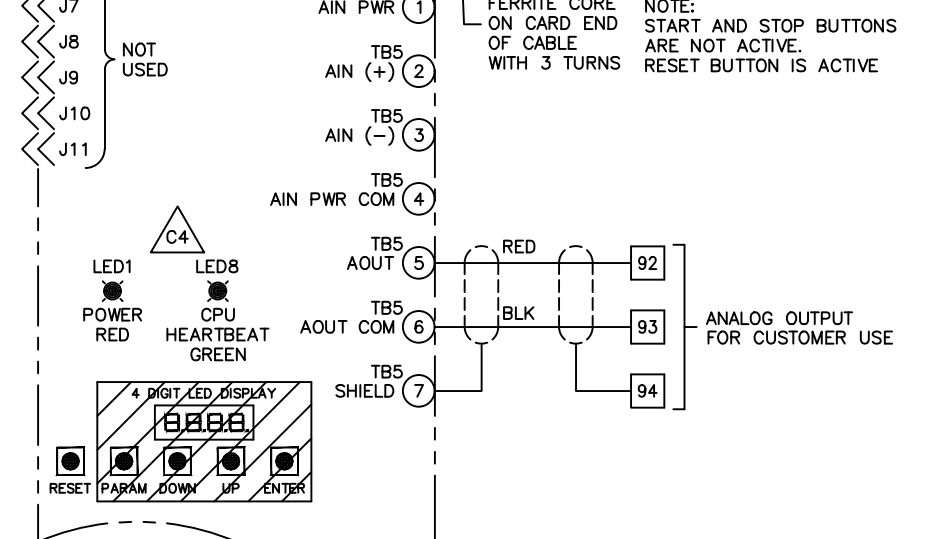
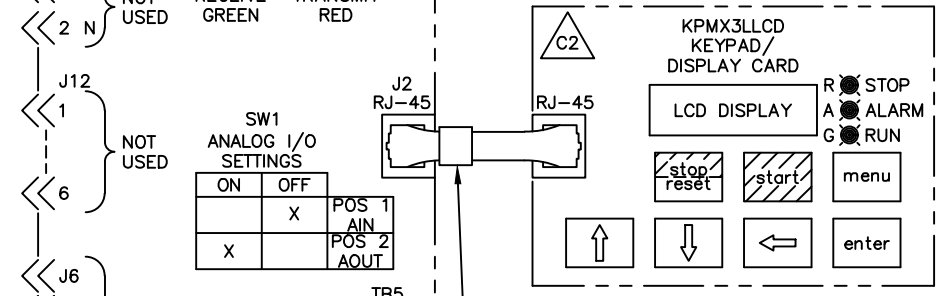
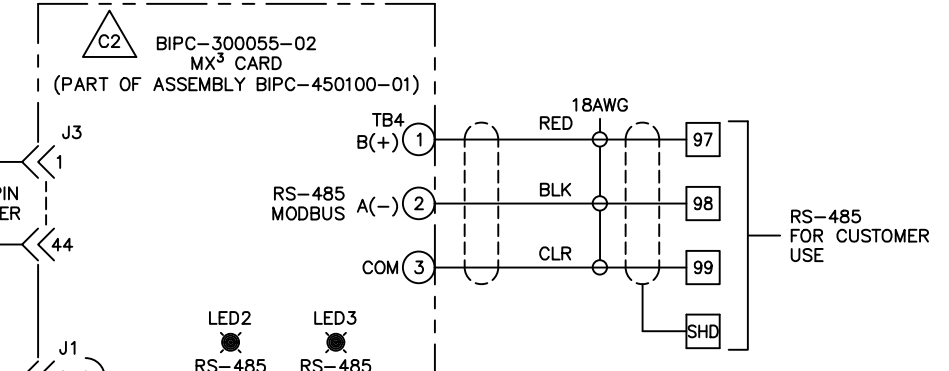
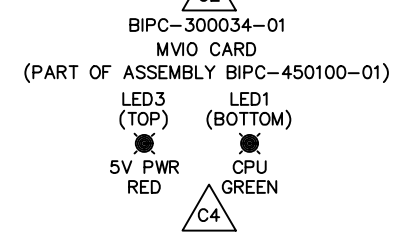
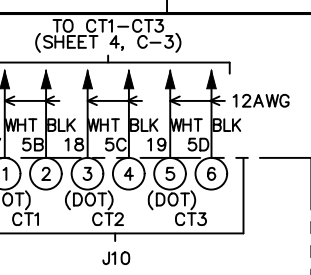
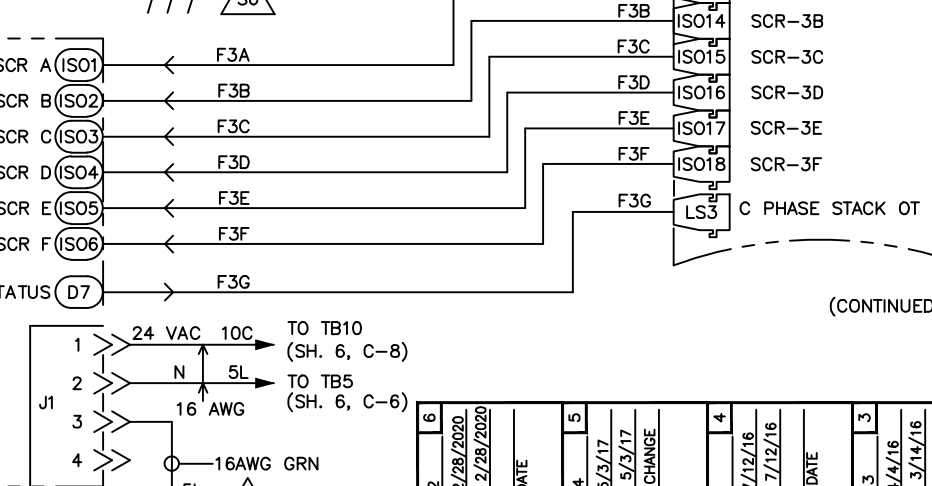
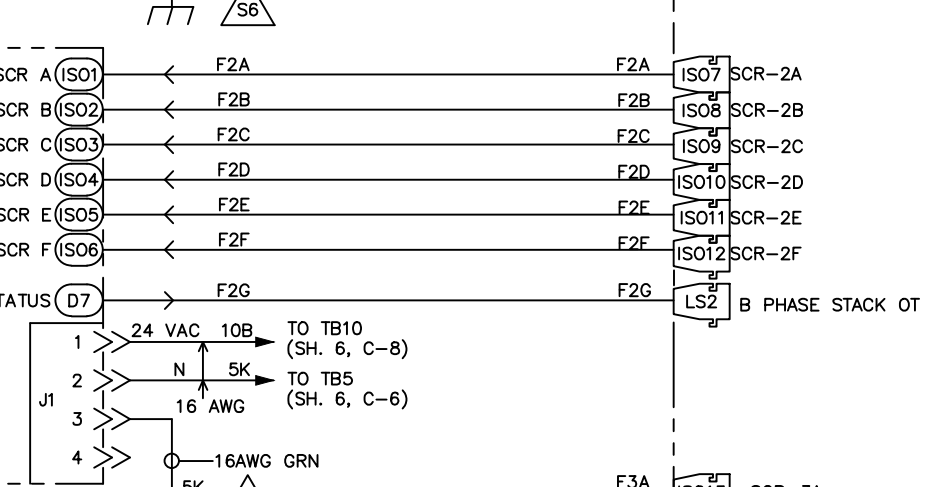
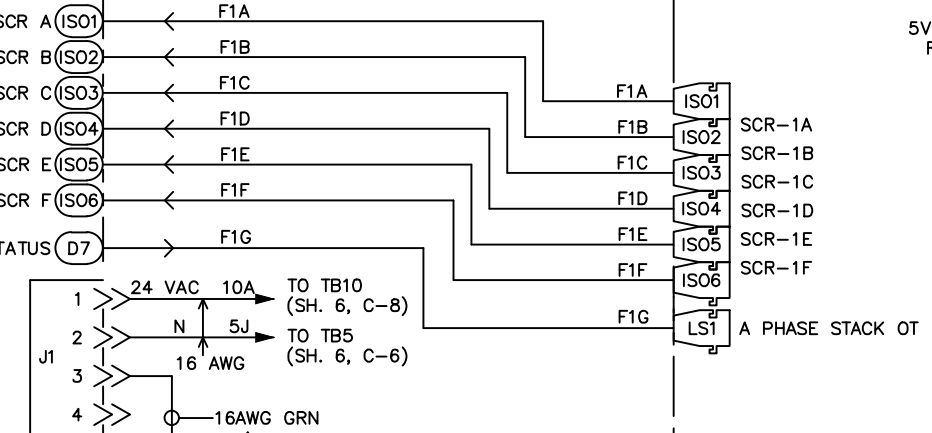
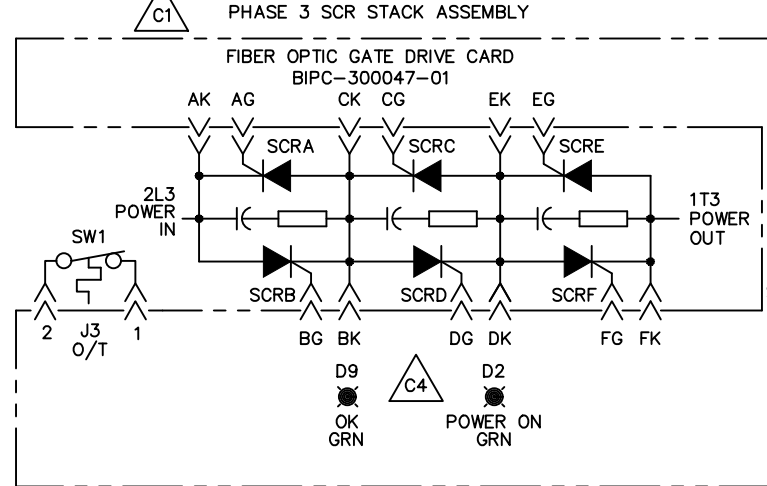
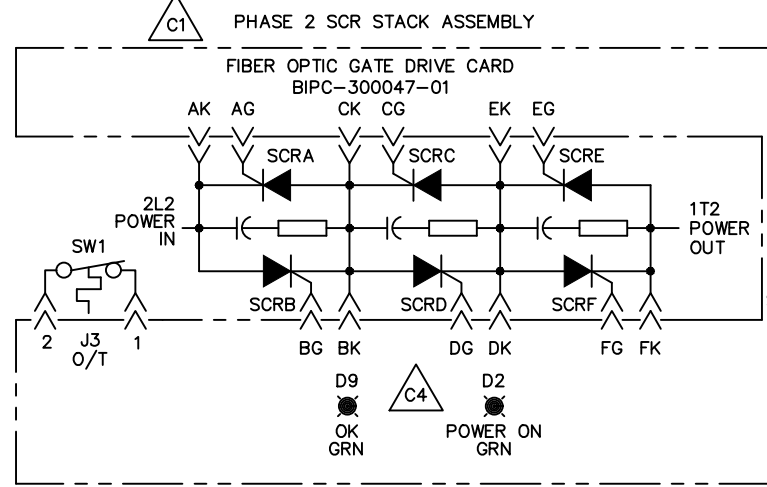
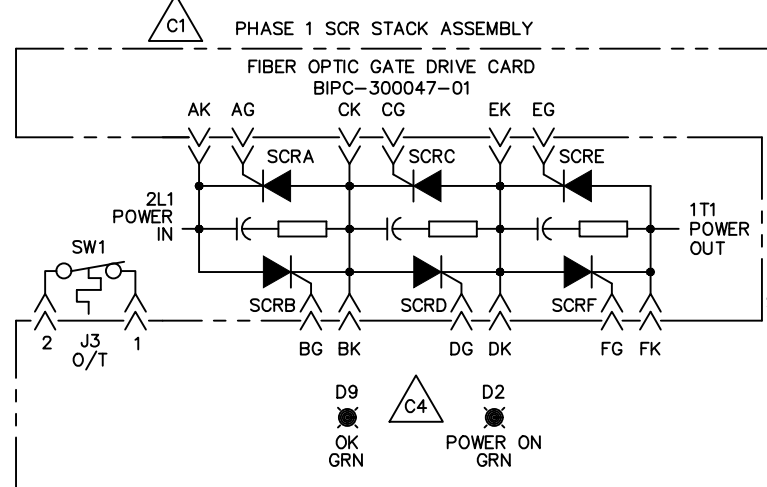
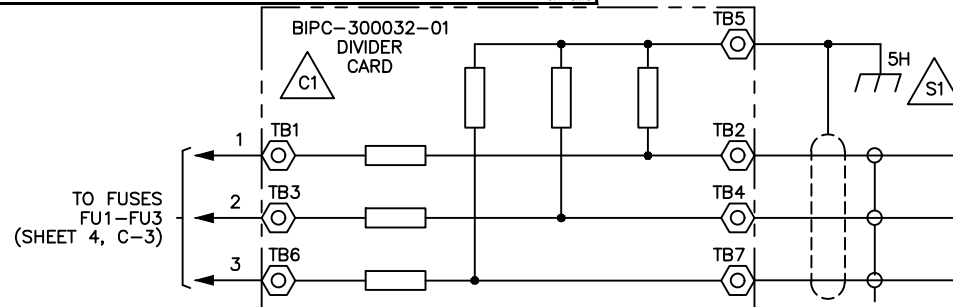




**CAUTION:**  
SEVERE DAMAGE MAY RESULT IF SURGE CAPACITORS, LIGHTNING ARRESTERS, OR POWER FACTOR CORRECTION CAPACITORS ARE CONNECTED TO THE LOAD SIDE OF THE SOLID STATE STARTER. CONSULT FACTORY BEFORE USING ANY OF THESE POWER QUALITY ENHANCEMENT DEVICES.

SEE SHEET 3 FOR NOTES

ECO #5642	ECO:ES194	ECO# E4865	APPRD:JBU 11/13/13	THIRD ANGLE PROJECTION	UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS IN INCHES [mm] INTERPRET DRAWING PER ASME Y14.5M-1994	SIGNATURES	DATE	TITLE: UL LABELED MVRXE18-1000-4160-12 SOLID STATE STARTER SCHEMATIC	<p>615 ALPHA DRIVE PITTSBURGH, PA. 15238</p> <p>550 BRIGHT ST. E. LISTONEL, ONTARIO M4W 3K3</p>
APPRD:JBU 2/28/2020	APPRD:SM 5/3/17	APPRD:SM 8/24/15	CHG BY:SM 11/13/13	THIS DRAWING AND ALL INFORMATION CONTAINED HEREIN, IS THE PROPERTY OF BENSHAW INC., AND MAY NOT BE REPRODUCED, OR DIVULGED 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.	TOLERANCES: .XX $\pm$ .03 .XXX $\pm$ .015 ANGLES $\pm$ 1'	DRWN. SMM 11/13/13	11/13/13	SCALE: N/A	
CHG BY:JBU 2/28/2020	CHG BY:SM 5/3/17	CHG BY:SM 8/24/15	CHG BY:SM 11/13/13	DO NOT SCALE DWG	MATERIAL:	CHKD.		SHEET 4 OF 7	
CHANGE: UL 347 UPDATE	CHANGE: NO CHANGE THIS SHEET	CHANGE: REV PER ECO NO CHANGE THIS SHEET	CHANGE: INITIAL RELEASE	REVISION	FINISH:	ENG. SMM 11/13/13		REV 6	
						D MVRXE181000416012			

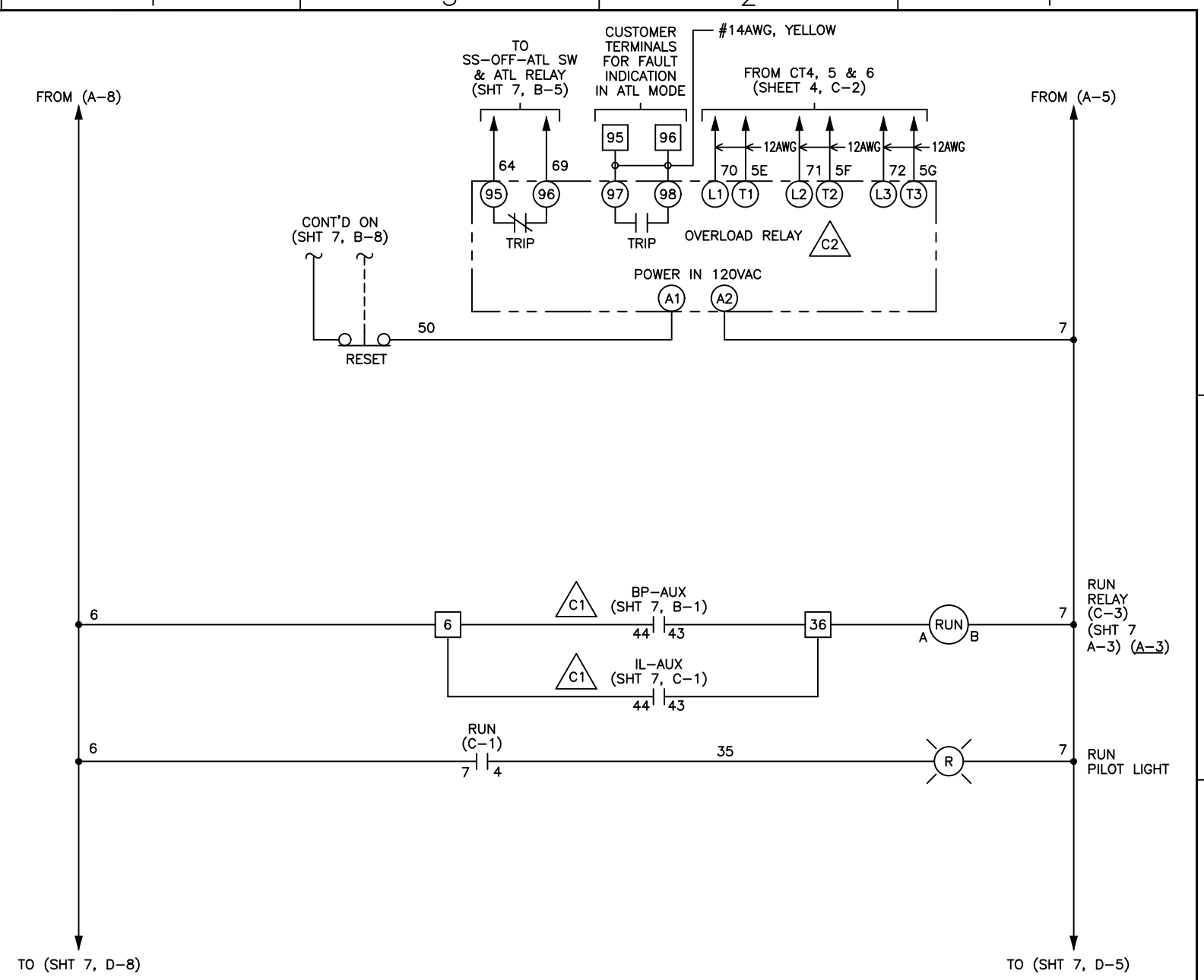
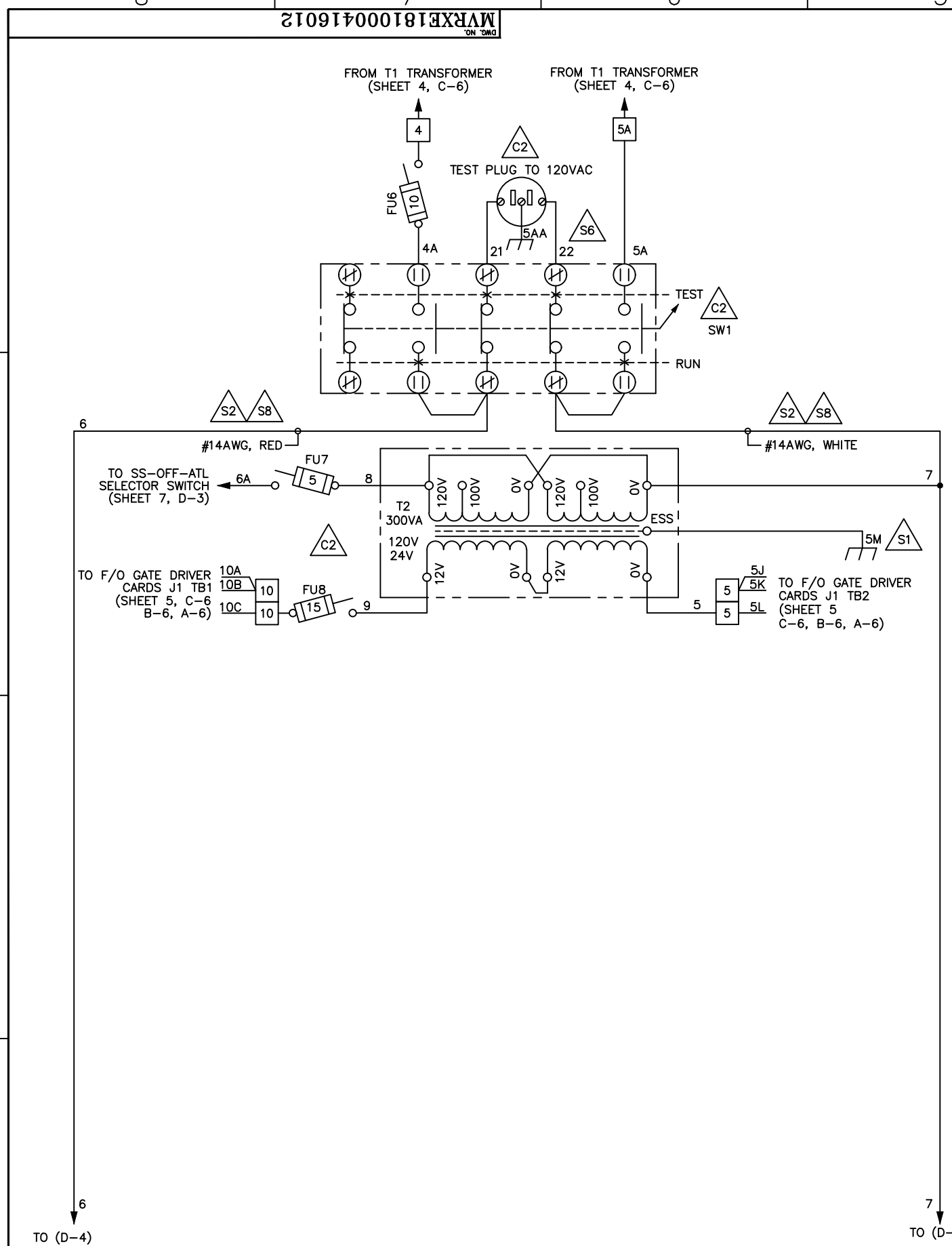


(CONTINUED ON SHEET 7, D-6)

(CONTINUED ON SHEET 7, D-2)

SEE SHEET 3 FOR NOTES

ECO: #5642	APPRD: JBU 2/28/2020	CHG BY: JBU 2/28/2020	CHANGE: UPDATE	ECO: E5194	APPRD: SAM 5/3/17	CHG BY: SAM 5/3/17	CHANGE: NO CHANGE THIS SHEET	ECO: E5003	APPRD: JBU 4/4/16	CHG BY: MCF 3/14/16	CHANGE: NO CHANGE 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 MVRXE18-1000-4160-12 SOLID STATE STARTER SCHEMATIC	SCALE: N/A	SHEET 5 OF 7	REV 6				
															D MVRXE181000416012													



6	ECO: #5642
6	APPRD: JBU 2/28/2020
6	CHG BY: JBU 2/28/2020
6	CHANGE: UL 347 UPDATE
5	ECO: E5194
5	APPRD: SAM 5/3/17
5	CHG BY: SAM 5/3/17
5	CHANGE: NO CHANGE THIS SHEET
4	APPRD: JBU 7/13/16
4	CHG BY: JBU 7/13/16
4	CHANGE: GENERAL UPDATE
3	ECO: E5003
3	APPRD: JBU 4/4/16
3	CHG BY: MCF 3/14/16
3	CHANGE: NO CHANGES THIS SHEET
2	ECO: E4865
2	APPRD: SMM 8/24/15
2	CHG BY: SMM 8/24/15
2	CHANGE: REV PER ECO NO CHANGE THIS SHEET
1	APPRD: SMM 11/13/13
1	CHG BY: SMM 11/13/13
1	CHANGE: INITIAL RELEASE

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 DATE
MATERIAL:	DRWN: SMM 11/13/13
FINISH:	CHKD:
	ENG: SMM 11/13/13
	SIZE DWG. NO.
	D MVRXE181000416012

THIRD ANGLE PROJECTION		UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS IN INCHES [mm] INTERPRET DRAWING PER ASME Y14.5M-1994		SIGNATURES DATE		TITLE: UL LABELED MVRXE18-1000-416-12 SOLID STATE STARTER SCHEMATIC	
TOLERANCES: .XX ± .03 .XXX ± .015 ANGLES ± 1°		MATERIAL:		DRWN: SMM 11/13/13		SCALE: N/A	
FINISH:		FINISH:		CHKD:		SHEET 6 OF 7	
				ENG: SMM 11/13/13		REV 6	
				SIZE DWG. NO. D MVRXE181000416012		SEE SHEET 3 FOR NOTES	



