

CUST. NAME:

PROJECT NO.:

P.O. NUMBER:

DESCRIPTION: HX7+C/HX7+D INVERTER STANDARD
18 PULSE INPUT AUTOTRANSFORMER
518~700kVA, SINEWAVE
518~700kVA, NON-SINEWAVE

FINAL

PRELIMINARY

FOR APPROVAL

Note: Final Engineering and Manufacturing will proceed upon receipt of final approval

- NOT APPROVED AS NOTED - RESUBMIT DRAWINGS FOR APPROVAL. DO NOT PROCEED WITH FINAL ENGINEERING OR MANUFACTURING.
- APPROVED AS NOTED - PROCEED WITH FINAL ENGINEERING AND MANUFACTURING.
- APPROVED AS SUBMITTED - PROCEED WITH FINAL ENGINEERING AND MANUFACTURING.

APPROVAL BY:

Initial

Date

NO	DRAWING NO	REV	DRAWING DESCRIPTION
00	I808LA00	9	DRAWING LIST
01	---	--	----
02	I808LA02	1	DRAWING LEGEND
03	---	--	----
04	---	--	----
05	I808LA05	7	EQUIPMENT RATINGS
06	I808LA06	7	EQUIPMENT RATINGS
07	I808LA07	0	EQUIPMENT RATINGS - IGBT7 OPTION
08	I808LA08	1	THREE-LINE DIAGRAM
09	I808LA09	0	MAIN CIRCUIT - AC IN/DC BUS
10	I808LA10	1	MAIN CIRCUIT - DC BUS/AC OUT
11	---	--	----
12	I808LA12	0	MAIN CIRCUIT - INVERTER DETAIL
13	---	--	----
14	---	--	----
15	---	--	----

NO	DRAWING NO	REV	DRAWING DESCRIPTION
16	---	--	----
17	---	--	----
18	I808LA18	2	LOGIC INTERFACE CIRCUIT
19	---	--	----
20	I808LA20	0	CONTROL CIRCUIT
21	I808LA21	3	CONTROL CIRCUIT - TEMPERATURE CONTROL
22	---	--	----
23	---	--	----
24	---	--	----
25	---	--	----
26	---	--	----
27	---	--	----
28	---	--	----
29	I808LA29	1	PCB INTERCONNECTIONS
30	I808LA30	0	CUSTOMER CONNECTIONS DIMENSIONS
31	I808LA31	4	ENCLOSURE OUTLINE - OUTDOOR

13					
12					
11					
10					
9	06/14/13	EC086339 REV SHEETS 00, 05, 06	NJM		
REV	DATE	DESCRIPTION	BY	CHK	APPR

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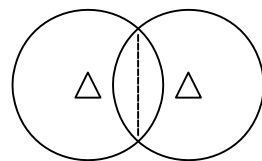
TITLE: DRAWING LIST
2 POWER MODULES HX7+ 480VAC 18P

CUSTOMER NAME: PROJECT NO.:

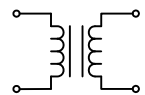
REVISION: 9 SCALE:

P.O.NO.:

DRAWING NO.: I808LA00



POWER TRANSFORMER



CONTROL POWER OR POTENTIAL TRANSFORMER



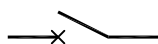
CURRENT TRANSFORMER



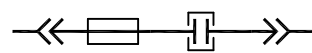
REACTOR



LIGHTNING ARRESTOR



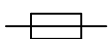
CIRCUIT BREAKER



FUSED VACUUM DRAWOUT CONTACTOR



AIR CONTACTOR



FUSE



CAPACITOR



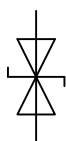
RESISTOR



DIODE



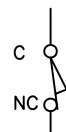
THYRISTOR



SURGE ABSORBER

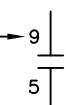


INSULATED GATE BIPOLAR TRANSISTOR (IGBT)



LIMIT SWITCH

DENOTES ACTUAL CONTACT USED



DEVICE NAME

N.O. CONTACT

DENOTES RELAY CAN BE FOUND ON PAGE 12, COLUMN F



N.C. CONTACT



OFF-TIME DELAY CONTACT N.C.



OFF-TIME DELAY CONTACT N.O.



ON-TIME DELAY CONTACT N.C.



ON-TIME DELAY CONTACT N.O.



THERMAL SWITCH N.C.



RELAY COIL

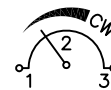
DEVICE LEGEND

NAME	
a	b 11B
a	b
a	b
a	b
a	b
a	b
a	b
MODEL #	

← DENOTES b - CONTACT, USED ON PAGE 11, COLUMN B

--- DENOTES CONTACTS UNAVAILABLE

a - DENOTES NORMALLY OPEN
b - DENOTES NORMALLY CLOSED



POTENTIOMETER



SELECTOR SWITCH



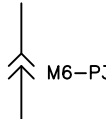
N.C. PUSH BUTTON



N.O. PUSH BUTTON



CONTROL TERMINAL BLOCK



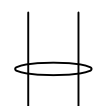
PLUG/CONNECTOR ASSEMBLY



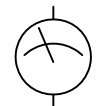
GROUND



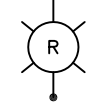
TWISTED WIRE



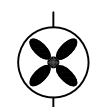
SHIELDED WIRE



METER



ILLUMINATED PUSH BUTTON OR INDICATING LIGHT (LETTER = COLOR)



COOLING FAN

LEGEND

- ACL AC LINE REACTOR
- A/C AIR CONDITIONER
- AM AMMETER
- AS AMMETER SWITCH
- AMVM AMMETER OR VOLTMETER
- CL CURRENT LIMITER
- CPT CONTROL POWER TRANSFORMER
- CT CURRENT TRANSFORMER
- DBR DYNAMIC BRAKING RESISTOR
- DCL DC REACTOR
- M AIR CONTACTOR
- MCCB MOLDED CASE CIRCUIT BREAKER
- MCP MOTOR CIRCUIT PROTECTOR
- MOT MOTOR
- OL THERMAL OVERLOAD
- RFF RADIO FREQUENCY FILTER
- VFD VARIABLE FREQUENCY DRIVE
- VM VOLTMETER
- VS VOLTMETER SWITCH
- XFMR TRANSFORMER
- ZCT GROUND FAULT CT

SYMBOL LEGEND

- (J) JUMPER
- (M) MECHANICAL INTERLOCK
- DU - CONTACTOR DRIVE UNIT
- LS1 - DRAWOUT UNIT INTERLOCK, CLOSED IN EITHER "TEST" OR "RUN" POSITION
- LS2 - RACKING HANDLE INTERLOCK, NORMALLY CLOSED, OPENS DURING RACKING OPERATION
- TOC - TRUCK OPERATED CONTACT, NORMALLY OPEN, CLOSED IN CONTACTOR RUN POSITION

REV	DATE	DESCRIPTION	BY	CHK	APPR
4					
3					
2					
1	07/01/11	ECO 80816 CORRECTED GROUND SYMBOL	JLP		
0	03/31/09	FIRST ISSUE	JT	MC	JBA

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TITLE: DRAWING LEGEND

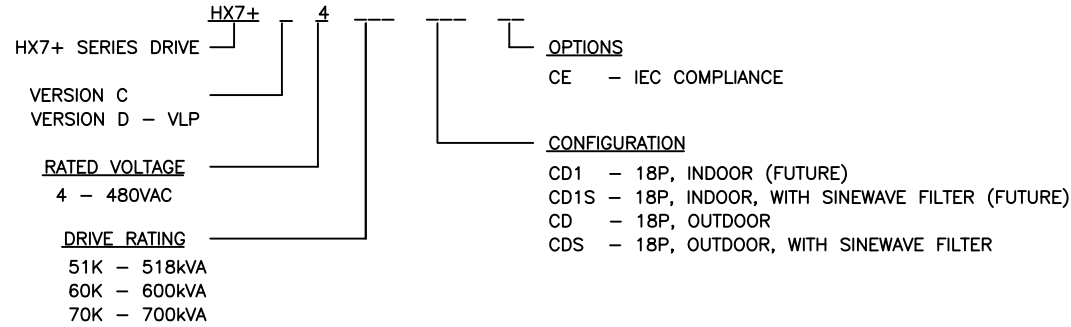
CUSTOMER NAME: _____ PROJECT NO.: _____

REVISION: 1 SCALE: _____

P.O.NO.: _____ DRAWING NO.: 1808LA02

PAGE No.	DEVICE	DESCRIPTION	518kVA, 480V, 623A			600kVA, 480V, 722A			
			TYPE FORM	RATING	PART NUMBER	TYPE FORM	RATING	PART NUMBER	
8	MCCB1	MOLDED CASE SWITCH	SQD PUL3600S80	600V, 800A, 3P, 65KAIC@480V	PC11001P029	SQD PUL3600S80	600V, 800A, 3P, 65KAIC@480V	PC11001P029	
	FRA~FTA	SEMICONDUCTOR FUSE	CRF A055URD32TT11600	550V, 1600A (X3)	PC15360P160	CRF A055URD32TT11600	550V, 1600A (X3)	PC15360P160	
	BFI	BLOWN FUSE INDICATOR	CRF MS3V1-5BS	250V, 3A	PC15360P001	CRF MS3V1-5BS	250V, 3A	PC15360P001	
	CPT1	CNTL. PWR. TRANSFORMER	GTI GT-F851	380/400/415/480:230V, 2kVA	PC33130P201	GTI GT-F851	380/400/415/480:230V, 2kVA	PC33130P201	
	MCCB3	CPT1 PRIMARY CIRCUIT BRKR	SMS ED62B020	600V, 20A, 2P, 25KAIC@480V	PC11321P020	SMS ED62B020	600V, 20A, 2P, 25KAIC@480V	PC11321P020	
	8FU3	CPT1 SECONDARY FUSE	GLD TRM 15	15A, 250V, TD, 10KAIC	PC26130P033	GLD TRM 15	15A, 250V, TD, 10KAIC	PC26130P033	
	HCTU, V, W	HALL CT	LEM HAX-500-S/SP11B	625A:4V	PC30013P061	LEM HAX-500-S/SP11C	725A:4V	PC30013P062	
	T1	AUTOTRANSFORMER	GTI GT-H366	460V, 18P, 600HP	PC32165P600	GTI GT-H367	460V, 18P, 700HP	PC32165P700	
	8FU34~36	T1 FUSE	CRF AJT 300	600V, 300A, JTD, 200KAIC	PC15265P300	CRF AJT 350	600V, 350A, JTD, 200KAIC	PC15265P350	
	FAN31, 32	FAN	EBM W2D250-HH14-09	480V, 3ø, 165W	PC50050P050	EBM W2D250-HH14-09	480V, 3ø, 165W	PC50050P050	
	8FU31~33	FAN FUSE	CRF ATQR 5	5A, 600V, CC, 200KAIC	PC26143P500	CRF ATQR 5	5A, 600V, CC, 200KAIC	PC26143P500	
	① ACL1, 2	OUTPUT LINE REACTOR	TCI KTRSWA400XA	600V, 441A, 0.120mH, 2.2kHz	PC34097P502	TCI KTRSWA400XA	600V, 441A, 0.120mH, 2.2kHz	PC34097P502	
	① CAP1~4	FILTER CAPACITOR	SHZ RG-2	200UF, 3PH, 460VAC, 50A	PC14150P031	SHZ RG-2	200UF, 3PH, 460VAC, 50A	PC14150P031	
	② ACL1, 2	OUTPUT LINE REACTOR	TCI KLR360BCB	480V, 360A, 1.5%	PC34092P360	TCI KLR360BCB	480V, 360A, 1.5%	PC34092P360	
	SA1~SA3	SURGE SUPPRESSOR	EPCOS B40K550	550V	PC47000P003	EPCOS B40K550	550V	PC47000P003	
	OL1A, 2A	OVERLOAD RELAY	SQD LRD03	690V, 0.25~0.40A	PC24201P003	SQD LRD03	690V, 0.25~0.40A	PC24201P003	
	OL1B, 2B	RELAY MOUNT	SQD LAD7B106	690V, 37A	PC24201P032	SQD LAD7B106	690V, 37A	PC24201P032	
	9	MS1	SOFT START CONTACTOR	TMQ LC1F400U7	400A, 600V, 3P	PC18701P005	TMQ LC1F400U7	400A, 600V, 3P	PC18701P005
		MS2	CAP DISCHARGE CONTACTOR	CLK 7001-5150-21	40A, 500VDC, 1P	PC18720P013	CLK 7001-5150-21	40A, 500VDC, 1P	PC18720P013
		OHAMB	T-STAT 90°C FIXED N.C.	TKN OHD3-90B	90°C	37619	TKN OHD3-90B	90°C	37619
		OH1T~2T	T-STAT 75°C FIXED N.C.	TKN OHD3-75B	75°C	45811	TKN OHD3-75B	75°C	45811
		OH1B~2B, TS1A, B	T-STAT 90°C FIXED N.C.	TKN OHD3-90B	90°C	37619	TKN OHD3-90B	90°C	37619
		THR1	HEATSINK THERMISTOR	FEN 590-32BP01-203	2KOHM @ 25 DEG C	41935	FEN 590-32BP01-203	2KOHM @ 25 DEG C	41935
R1		SOFT START RESISTOR	T&B RS105-0.67	0.67 OHM, 18.9k	PC41490P052	T&B RS105-0.67	0.67 OHM, 18.9k	PC41490P052	
R2		CAP DISCHARGE RESISTOR	T&B RS105-500	500 OHM, 300W, 3S	PC41490P052	T&B RS105-500	500 OHM, 300W, 3S	PC41490P052	
REC1A, M, B-1~6		DIODE PACK	EUP DD260N16K	1600V, 260A (X12)	PC40316P260	EUP DD260N16K	1600V, 260A (X12)	PC40316P260	
RECA, B		DIODE	SNX DD110F160	1600V, 172A (X6)	45242	SNX DD110F160	1600V, 172A (X6)	45242	
DCL1~DCL1B		DC REACTOR	GTI B502	190uH, 260A	41443	GTI B503	150uH, 350A	41444	
10, 12		HCTA	HALL CT	NNE HEC-05A(AMO)	500A:4V	PC30013P067	NNE HEC-05A(AMO)	500A:4V	PC30013P067
		CA	CAPACITOR	HIT HCGF5AS2G123YQ	12kUF, 400VDC (3P/2S)	37568	HIT HCGF5AS2G123YQ	12kUF, 400VDC (3P/2S)	37568
		FA	SEMICONDUCTOR FUSE	CRF 6,9URB000BS88	690V, 250A (X3)	52751	CRF 6,9URB000BS88	690V, 250A (X3)	52751
		RA	CAP BALANCING RESISTOR	DLR RS-10	50 KOHM, 10W (X12)	PC41470P052	DLR RS-10	50 KOHM, 10W (X12)	PC41470P052
		FUP, FUN	SEMICONDUCTOR FUSE	CRF 6,9URD32TTF0800	690V, 800A (X4)	37578	CRF 6,9URD32TTF0800	690V, 800A (X4)	37578
		BFI	BLOWN FUSE INDICATOR	CRF MS3V1-5BS	250V, 3A	PC15360P001	CRF MS3V1-5BS	250V, 3A	PC15360P001
	IGBT	IGBT	EUP FZ600R12KE3	1200V, 600A (X12)	PC40200P600	EUP FZ600R12KE3	1200V, 600A (X12)	PC40200P600	
	PCB20~20B	SNUBBER CIRCUIT PCB	PC61910P117A	---	PC61910P117A	PC61910P117A	---	PC61910P117A	
	RP, RN	RESISTOR	ITK IRH100N	25 OHM, 100W	PC41490P038	ITK IRH100N	25 OHM, 100W	PC41490P038	
	RS1, 1A	RESISTOR	EBG HPP/4-10R	10 OHM, 60W	53706	EBG HPP/4-10R	10 OHM, 60W	53706	
	TS3	T-STAT 90°C FIXED NC	TKN OHD3-90B	90°C	37619	TKN OHD3-90B	90°C	37619	
	18	DS1, 2	DOOR SWITCH	IDE TABD311N-R	10A, 600V	PC21230P162	IDE TABD311N-R	10A, 600V	PC21230P162
MST		TIMER, ON DELAY	IDE GT5Y-2SN1A200	240VAC COIL, 0.1S-10M DELAY	PC20111P180	IDE GT5Y-2SN1A200	240VAC COIL, 0.1S-10M DELAY	PC20111P180	
MSX		CONTROL RELAY	IDE RR2P-U-AC240V	240VAC COIL, 7A	PC20229P326	IDE RR2P-U-AC240V	240VAC COIL, 7A	PC20229P326	
20	FAN1, 2	HEAT SINK FAN	ZA RH31M-4EK.2F.1R	230VAC, 50/60HZ	PC50050P312	ZA RH31M-4EK.2F.1R	230VAC, 50/60HZ	PC50050P312	
	C1, 2	FAN RUN CAPACITOR	ASC CMPS/X349	350V, 4uF	PC42000P412	ASC CMPS/X349	350V, 4uF	PC42000P412	
	FAN11, 12	INTERNAL FAN	ETR 148VK0281030	240VAC, 33W, 50/60HZ	00226	ETR 148VK0281030	240VAC, 33W, 50/60HZ	00226	
	NK1, 2	SURGE SUPPRESSOR	MCN RFM25M224KD	250VAC, 0.22uF, 220 OHM	00427	MCN RFM25M224KD	250VAC, 0.22uF, 220 OHM	00427	
	NK8~11	SURGE SUPPRESSOR	MCN RFM25M224KD	250VAC, 0.22uF, 220 OHM	00427	MCN RFM25M224KD	250VAC, 0.22uF, 220 OHM	00427	
	HEX1	HEAT EXCHANGER	DAN PS060100B-P2	230VAC, 1.0A, 100W/°F	PC67808P168	DAN PS060100B-P2	230VAC, 1.0A, 100W/°F	PC67808P168	
	HEX2	HEAT EXCHANGER	DAN PS035055B-P2	230VAC, 1.86A, 55W/°F	PC67808P167	DAN PS035055B-P2	230VAC, 1.86A, 55W/°F	PC67808P167	
	FANA, B	FAN	ETR 129XR-0281	230V	00224	ETR 129XR-0281	230V	00224	
	TCC, TCD	CONTACTOR	TMQ LC1D09U7	240V COIL, 9A, 600V	PC18701P060	TMQ LC1D09U7	240V COIL, 9A, 600V	PC18701P060	
	TCCX	CONTROL RELAY	IDE RY4SUAC240V	240VAC COIL, 3A	PC20249P711	IDE RY4SUAC240V	240VAC COIL, 3A	PC20249P711	
	CDT	TIMER, OFF DELAY	TMQ RE7RL13BU	0.05S~300H, 240V COIL	PC20111P203	TMQ RE7RL13BU	0.05S~300H, 240V COIL	PC20111P203	
	29	③ PCB1	CONTROL BOARD	56000G	---	56000G	56000G	---	56000G
		④ PCB1	CONTROL BOARD	56000V	---	56000V	56000V	---	56000V
		PCB2, 2A	GATE DRIVE BOARD	42755P4EX	---	42755P4EX	42755P4EX	---	42755P4EX
PCB3		INTERFACE BOARD	PC61910P120C	---	PC61910P120C	PC61910P120C	---	PC61910P120C	
PCB4~4E		G-E PROTECT CIRCUIT BOARD	38383C	---	38383C	38383C	---	38383C	
PCB5		TERMINAL BOARD	48570A	---	48570A	48570A	---	48570A	
PCB5A		JUMPER BOARD	50611A	---	50611A	50611A	---	50611A	
PCB11		SPEED SEARCH BOARD	55594A	---	55594A	55594A	---	55594A	
⑤ EO1		OPERATOR INTERFACE	58363-X	---	58363-X	58363-X	---	58363-X	
④ EO1		OPERATOR INTERFACE	66663-V	---	66663-V	66663-V	---	66663-V	
F1, F2		FERRITE BEAD	TDK ZCAT 3035-1330	SNAP ON FERRITE, 100 OHM	48927	TDK ZCAT 3035-1330	SNAP ON FERRITE, 100 OHM	48927	

HX7+ DRIVE MODEL NUMBER DEVELOPMENT



NOTES:

- ① SINEWAVE FILTER OPTION
- ② NON-SINEWAVE FILTER
- ③ STANDARD SOFTWARE
- ④ VLP SOFTWARE

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TITLE:
EQUIPMENT RATINGS
2 POWER MODULES HX7+ 480VAC 18P

CUSTOMER NAME: PROJECT NO.:

REVISION: 7
SCALE:
P.O.NO.:
DRAWING NO.: 1808LA05

REV	DATE	DESCRIPTION	BY	CHK	APPR
9					
8					
7	06/14/13	ECO86339 MCCB1, MCCB3 CHANGED	NJM		
6	07/18/12	ECO 84715 CHANGE TS3	SGA	P So	AM
5	02/17/12	ECO 82941 CHANGE FAN1 & FAN2	P So	HP	AM

PAGE No.	DEVICE	DESCRIPTION	700kVA, 480V, 842A			
			TYPE FORM	RATING	PART NUMBER	
8	MCCB1	MOLDED CASE SWITCH	SQD PJJ36000S10	600V, 1000A, 3P, 65KAIC@480V	PC11001P030	
	FRA~FTA	SEMICONDUCTOR FUSE	CRF A055URD32TT11600	550V, 1600A (X3)	PC15360P160	
	BF1	BLOWN FUSE INDICATOR	CRF MS3V1-5BS	250V, 3A	PC15360P001	
	CPT1	CNTL. PWR. TRANSFORMER	GTI GT-F851	380/400/415/480:230V, 2kVA	PC33130P201	
	MCCB3	CPT1 PRIMARY CIRCUIT BRKR	SMS ED62B020	600V, 20A, 2P, 25KAIC@480V	PC11321P020	
	8FU3	CPT1 SECONDARY FUSE	GLD TRM 15	15A, 250V, TD, 10KAIC	PC26130P033	
	HCTU, V, W	HALL CT	LEM HAX-850-S	850A:4V	PC30013P052	
	T1	AUTOTRANSFORMER	GTI GT-H368	460V, 18P, 800HP	PC32165P800	
	8FU34~36	T1 FUSE	CRF AJT 400	600V, 400A, JTD, 200KAIC	PC15265P400	
	FAN31, 32	FAN	EBM W2D250-HH14-09	480V, 3ø, 165W	PC50050P050	
	8FU31~33	FAN FUSE	CRF ATQR 5	5A, 600V, CC, 200KAIC	PC26143P500	
	① ACL1, 2	OUTPUT LINE REACTOR	TCI KTRSWA500XA	600V, 588A, 0.077mH, 2.2kHz	PC34097P501	
	① CAP1~4	FILTER CAPACITOR	SHZ RG-2	250UF, 3PH, 460VAC, 75A	PC14150P030	
	② ACL1, 2	OUTPUT LINE REACTOR	TCI KLR480BCB	480V, 480A, 1.5%	PC34092P400	
	SA1~SA3	SURGE SUPPRESSOR	EPCOS B40K550	550V	PC47000P003	
	OL1A, 2A	OVERLOAD RELAY	SQD LRDO3	690V, 0.25~0.40A	PC24201P003	
	OL1B, 2B	RELAY MOUNT	SQD LAD7B106	690V, 37A	PC24201P032	
9	MS1	SOFT START CONTACTOR	TMQ LC1F400U7	400A, 600V, 3P	PC18701P005	
	MS2	CAP DISCHARGE CONTACTOR	CLK 7001-5150-21	40A, 500VDC, 1P	PC18720P013	
	OHAMB	T-STAT 90°C FIXED N.C.	TKN OHD3-90B	90°C	37619	
	OH1T~2T	T-STAT 75°C FIXED N.C.	TKN OHD3-75B	75°C	45811	
	OH1B~2B, TS1A, B	T-STAT 90°C FIXED N.C.	TKN OHD3-90B	90°C	37619	
	THR1	HEATSINK THERMISTOR	FEN 590-32BP01-203	2KOHM @ 25 DEG C	41935	
	R1	SOFT START RESISTOR	T&B RS105-0.67	0.67 OHM, 18.9kJ	PC41490P052	
	R2	CAP DISCHARGE RESISTOR	T&B RS105-500	500 OHM, 300W, 3S	PC41490P052	
	REC1A, M, B-1~6	DIODE PACK	EUP DD260N16K	1600V, 260A (X12)	PC40316P260	
	RECA, B	DIODE	SNX DD110F160	1600V, 172A (X6)	45242	
	DCL1~DCL1B	DC REACTOR	GTI B503	150uH, 350A	41444	
	10, 12	HCTA	HALL CT	NNE HEC-05A(AMO)	500A:4V	PC30013P067
		CA	CAPACITOR	HIT HCGF5AS2G123YQ	12kUF,400VDC (3P/2S)	37568
FA		SEMICONDUCTOR FUSE	CRF 6,9URB000BS88	690V, 250A (X3)	52751	
RA		CAP BALANCING RESISTOR	DLR RS-10	50 KOHM, 10W (X12)	PC41470P052	
FUP, FUN		SEMICONDUCTOR FUSE	CRF 6,9URD32TTF0800	690V, 800A (X4)	37578	
BF1		BLOWN FUSE INDICATOR	CRF MS3V1-5BS	250V, 3A	PC15360P001	
IGBT		IGBT	EUP FZ600R12KE3	1200V, 600A (X12)	PC40200P600	
PCB20~20B		SNUBBER CIRCUIT PCB	PC61910P117A	---	PC61910P117A	
RP, RN		RESISTOR	ITK IRH100N	25 OHM, 100W	PC41490P038	
RS1, 1A		RESISTOR	EBG HPP/4-10R	10 OHM, 60W	53706	
18		TS3	T-STAT 90°C FIXED NC	TKN OHD3-90B	90°C	37619
20		DS1, 2	DOOR SWITCH	IDE TABD311N-R	10A, 600V	PC21230P162
	MST	TIMER, ON DELAY	IDE GTSY-2SN1A200	240VAC COIL, 0.1S-10M DELAY	PC20111P180	
	MSX	CONTROL RELAY	IDE RR2P-U-AC240V	240VAC COIL, 7A	PC20229P326	
21	FAN1, 2	HEAT SINK FAN	ZA RH31M-4EK.2F.1R	230VAC, 50/60HZ	PC50050P312	
	C1, 2	FAN RUN CAPACITOR	ASC CMPS/X349	350V, 4uF	PC42000P412	
	FAN11, 12	INTERNAL FAN	ETR 148VK0281030	240VAC, 33W, 50/60HZ	00226	
	NK1, 2	SURGE SUPPRESSOR	MCN RFM25M224KD	250VAC, 0.22uF, 220 OHM	00427	
	NK8~11	SURGE SUPPRESSOR	MCN RFM25M224KD	250VAC, 0.22uF, 220 OHM	00427	
	HEX1	HEAT EXCHANGER	DAN PS060100B-P2	230VAC, 1.0A, 100W/°F	PC67808P168	
	HEX2	HEAT EXCHANGER	DAN PS035055B-P2	230VAC, 1.86A, 55W/°F	PC67808P167	
	FANA, B	FAN	ETR 129XR-02B1	230V	00224	
	TCC, TCD	CONTACTOR	TMQ LC1D09U7	240V COIL, 9A, 600V	PC18701P060	
	TCCX	CONTROL RELAY	IDE RY4SUAC240V	240VAC COIL, 3A	PC20249P711	
	CDT	TIMER, OFF DELAY	TMQ RE7RL13BU	0.05S~300H, 240V COIL	PC20111P203	
29	③ PCB1	CONTROL BOARD	56000G		56000G	
	④ PCB1	CONTROL BOARD	56000V	---	56000V	
	PCB2, 2A	GATE DRIVE BOARD	42755P4EX	---	42755P4EX	
	PCB3	INTERFACE BOARD	PC61910P120C	---	PC61910P120C	
	PCB4~4E	G-E PROTECT CIRCUIT BOARD	38383C	---	38383C	
	PCB5	TERMINAL BOARD	48570A	---	48570A	
	PCB5A	JUMPER BOARD	50611A	---	50611A	
	PCB11	SPEED SEARCH BOARD	55594A	---	55594A	
	③ EO1	OPERATOR INTERFACE	58363-X	---	58363-X	
	④ EO1	OPERATOR INTERFACE	66663-V	---	66663-V	
F1, F2	FERRITE BEAD	TDK ZCAT 3035-1330	SNAP ON FERRITE, 100 OHM	48927		

NOTES:

- ① SINEWAVE FILTER OPTION
- ② NON-SINEWAVE FILTER
- ③ STANDARD SOFTWARE
- ④ VLP SOFTWARE

REV	DATE	DESCRIPTION	BY	CHK	APPR
9					
8					
7	06/14/13	ECO86339 MCCB1, MCCB3 CHANGED	NJM		
6	07/19/12	ECO 84715 CHANGE TS3	SGA	P So	AM
5	02/17/12	ECO 82941 CHANGE FAN1 & FAN2	P So	HP	AM

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TITLE:
 EQUIPMENT RATINGS
 2 POWER MODULES HX7+ 480VAC 18P

CUSTOMER NAME: _____ PROJECT NO.: _____

REVISION: 7	SCALE:
P.O.NO.:	DRAWING NO.:
	1808LA06

PAGE No.	DEVICE	DESCRIPTION	518~700kVA, 480V		
			TYPE FORM	RATING	PART NUMBER
8	IGBT7	DYNAMIC BRAKE IGBT	EUP FZ600R12KE3	1200V, 600A (X2)	PC40200P600
	D7A, B	DYNAMIC BRAKE DIODE	SMK SKN60F15	75A, 1500V	PC40300P075
	C7	SNUBBER CAPACITOR	EC 5MP-13086K	5.0UF, 1000VDC	46326
	C7A, B	SNUBBER CAPACITOR	SGU 564R30GAD47	4700pF, 3000V	PC42200P003
	R7	SNUBBER RESISTOR	UPE RBN50/8-25R	25 OHM, 50W	PC41490P035
	PCB6	DYNAMIC BRAKE G-E PROT	44348A	---	44348A
21	FAN7	INTERNAL FAN	ETR 148VK0281030	240VAC, 33W, 50/60HZ	00226

4					
3					
2					
1					
0	03/31/09	FIRST ISSUE	JT		
REV	DATE	DESCRIPTION	BY	CHK	APPR

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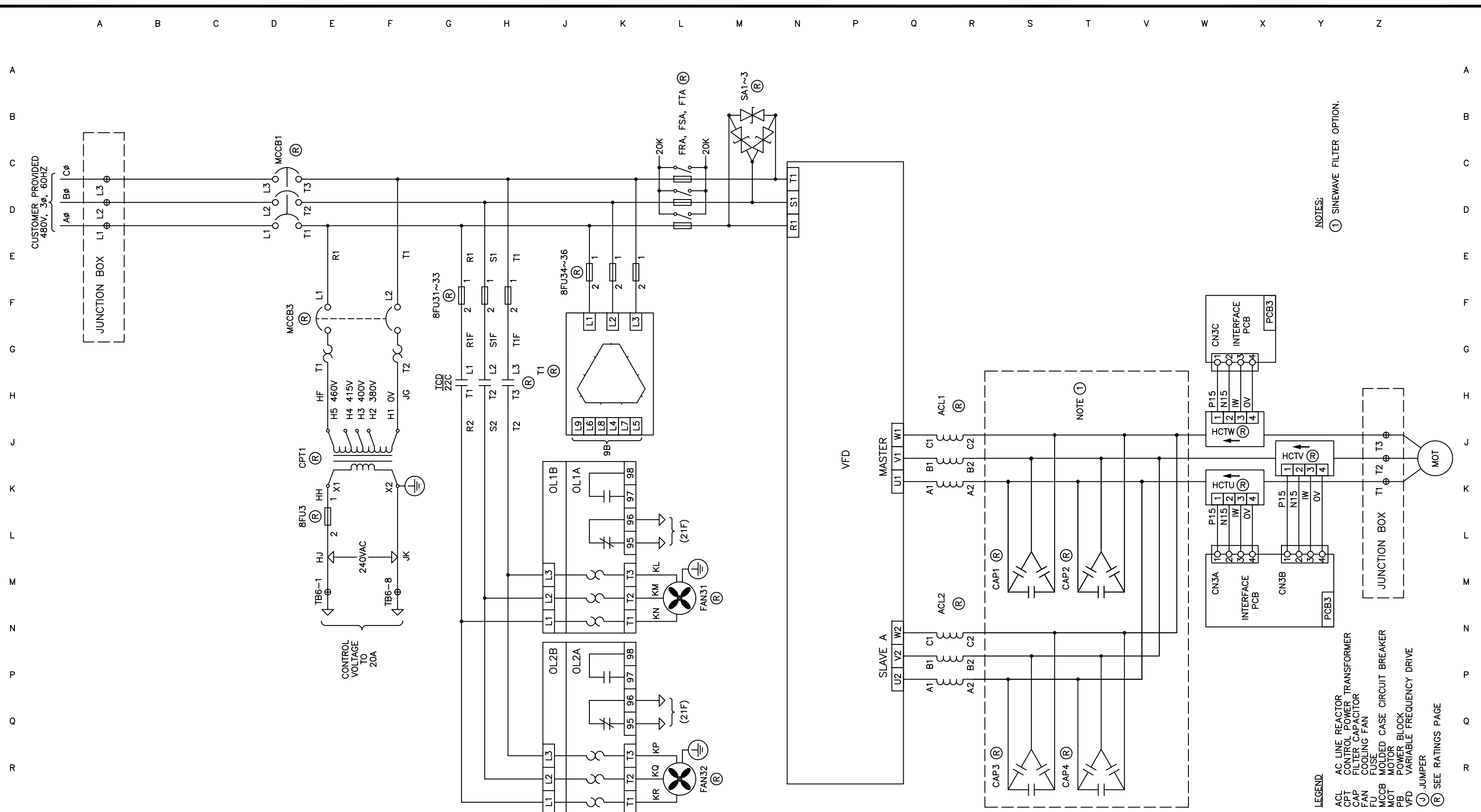
TITLE:
EQUIPMENT RATINGS – IGBT7 OPTION
2 POWER MODULES HX7+ 480VAC 18P

CUSTOMER NAME: _____ PROJECT NO.: _____

REVISION: 0 SCALE: _____

P.O.NO.: _____

DRAWING NO.: 1808LA07



NOTES:
 ① SINEWAVE FILTER OPTION.

LEGEND:
 ACL AC LINE REACTOR
 CPT CONTROL POWER TRANSFORMER
 CAP FILTER CAPACITOR
 FAN COOLING FAN
 FU FUSE
 MCCB MOLDED CASE CIRCUIT BREAKER
 MOT MOTOR
 PB POWER BLOCK
 VFD VARIABLE FREQUENCY DRIVE
 J JUMPER
 R SEE RATINGS PAGE

4					
3					
2					
1	11/30/11	ECO 82492 ADD OL RELAY TO FANS	KN		
0	03/31/09	FIRST ISSUE	JT	MC	JBA
REV	DATE	DESCRIPTION	BY	CHK	APPR

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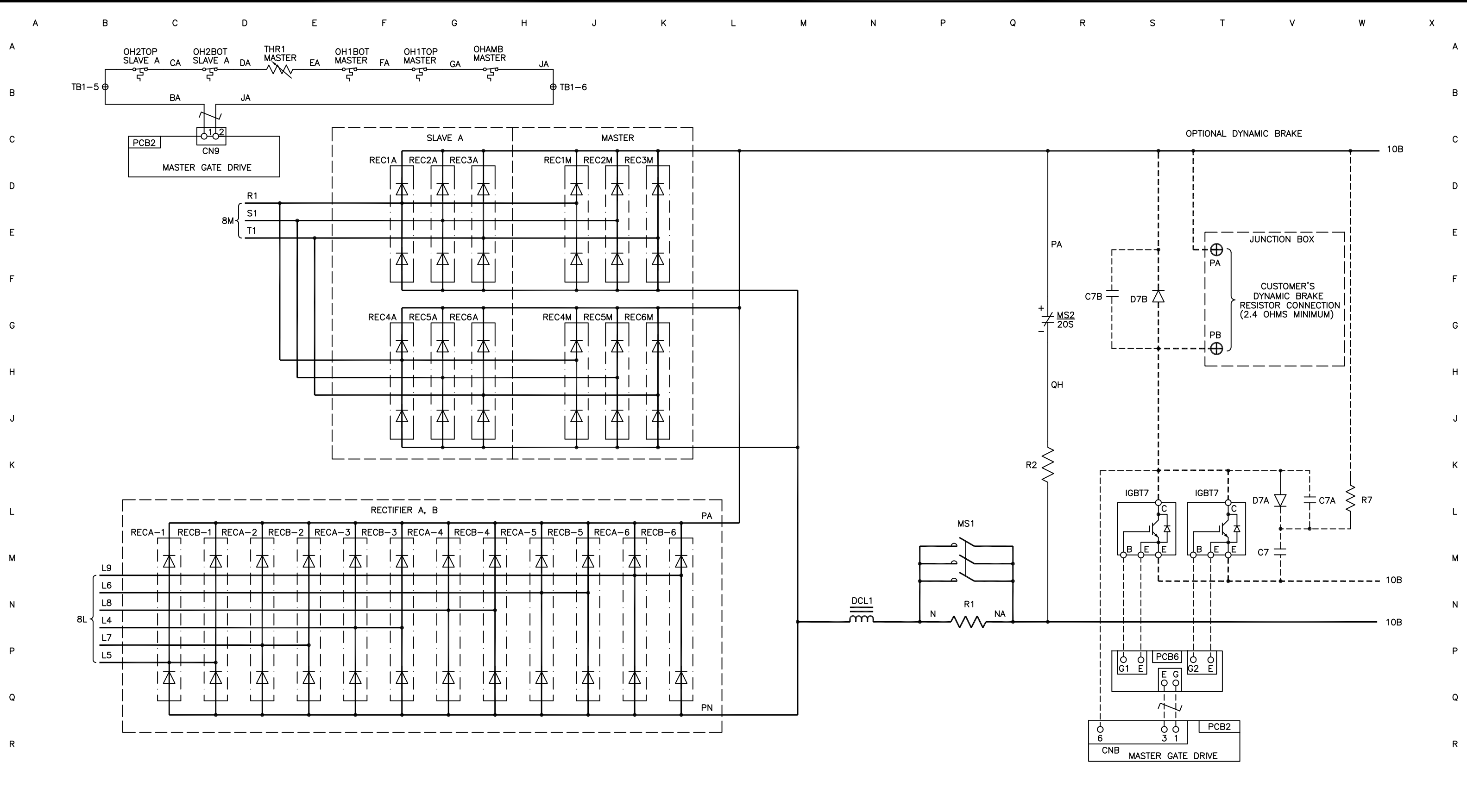
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TITLE:
 THREE-LINE DIAGRAM
 2 POWER MODULES HX7+ 480VAC 18P

CUSTOMER NAME: _____ PROJECT NO.: _____

REVISION: 1 SCALE: _____

P.O.NO.: _____ DRAWING NO.: 1808LA08



4					
3					
2					
1					
0	03/31/09	FIRST ISSUE	JT		
REV	DATE	DESCRIPTION	BY	CHK	APPR

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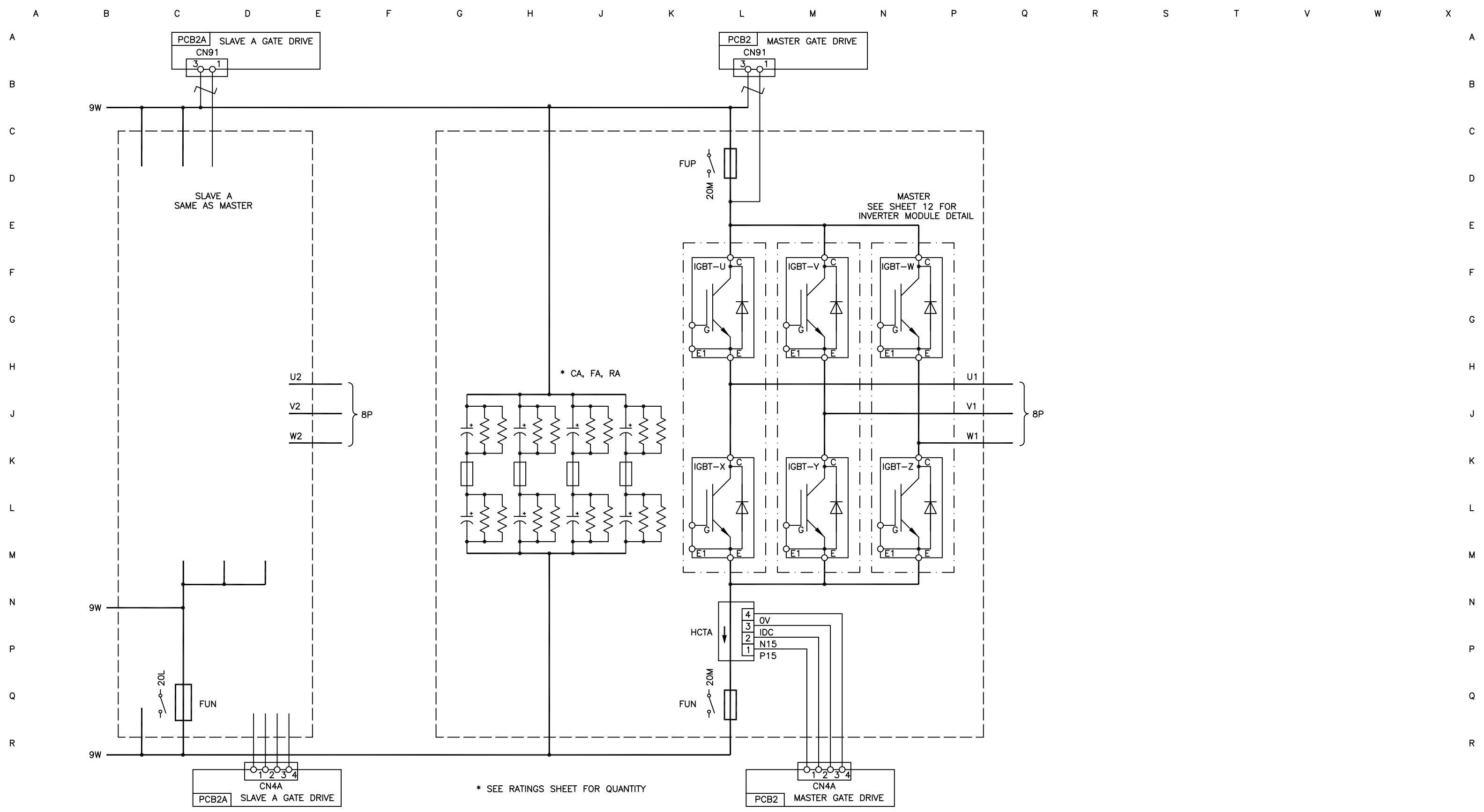
TITLE:
 MAIN CIRCUIT - AC IN/DC BUS
 2 POWER MODULES HX7+ 480VAC 18P

CUSTOMER NAME: _____ PROJECT NO.: _____

REVISION: 0 SCALE: _____

P.O.NO.: _____

DRAWING NO.: 1808LA09



* SEE RATINGS SHEET FOR QUANTITY

MASTER
SEE SHEET 12 FOR
INVERTER MODULE DETAIL

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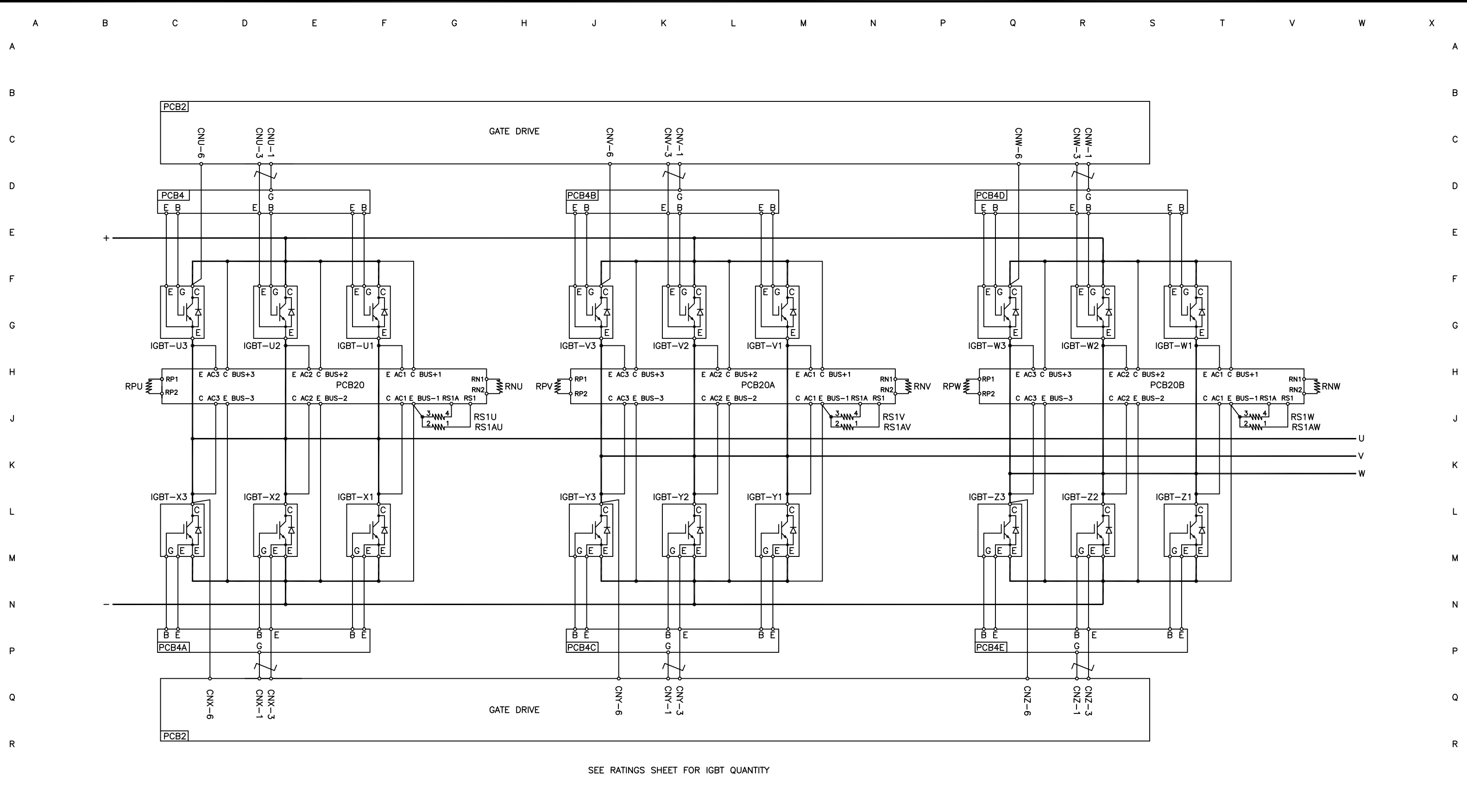
TITLE:
MAIN CIRCUIT - DC BUS/AC OUT
2 POWER MODULES HX7+ 480VAC 18P

CUSTOMER NAME:

PROJECT NO.:

REVISION:	SCALE:
1	
P.O.NO.:	
DRAWING NO.:	1808LA10

REV	DATE	DESCRIPTION	BY	CHK	APPR
4					
3					
2					
1	11/30/11	ECO 82491/82492 ADDED RA IN PARALLEL	KN		
0	03/31/09	FIRST ISSUE	JT	MC	JBA



SEE RATINGS SHEET FOR IGBT QUANTITY

4					
3					
2					
1					
0	03/31/09	FIRST ISSUE	JT		
REV	DATE	DESCRIPTION	BY	CHK	APPR

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TITLE:
 MAIN CIRCUIT – INVERTER DETAIL
 2 POWER MODULES HX7+ 480VAC 18P

CUSTOMER NAME: _____ PROJECT NO.: _____

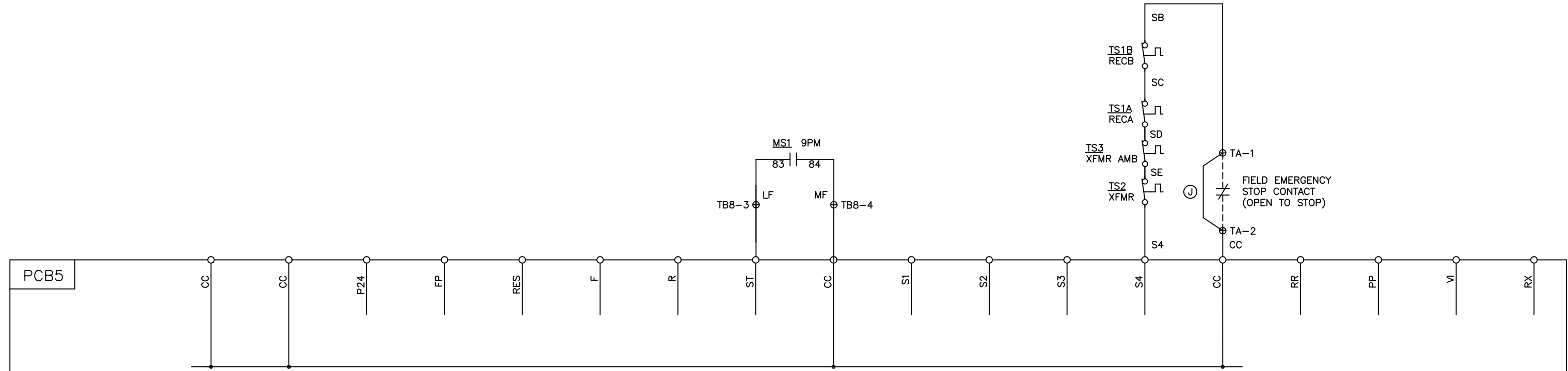
REVISION: 0 SCALE: _____

P.O.NO.: _____ DRAWING NO.: 1808LA12

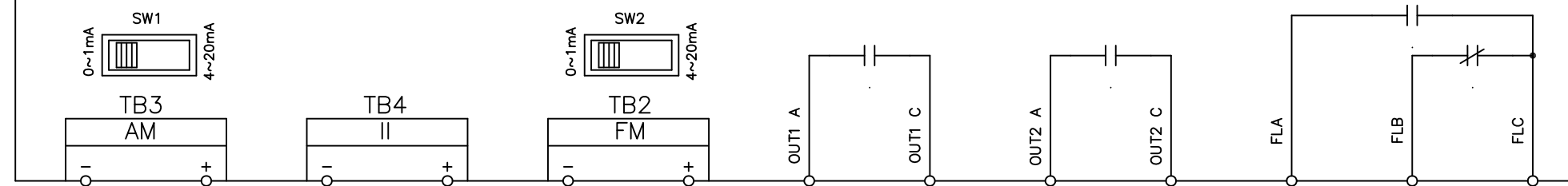
A B C D E F G H J K L M N P Q R S T V W X Y Z

A
B
C
D
E
F
G
H
J
K
L
M
N
P
Q
R

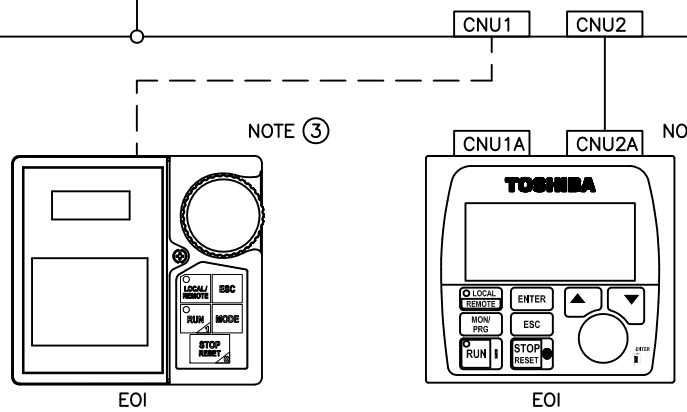
A
B
C
D
E
F
G
H
J
K
L
M
N
P
Q
R



(2A/250Vac CONTACTS)



NOTE: SEE G7 INVERTER MANUAL FOR TERMINAL FUNCTIONS.



- NOTES:
- ① 12 PULSE OPTION
 - ② STANDARD SOFTWARE
 - ③ VLP SOFTWARE
 - ⓐ JUMPER

4					
3					
2	11/30/11	ECO 82492 VLP KEYPAD	KN		
1	07/01/11	ECO 80816 ADD MS1 INTERLOCK & TS3	JLP PS ₀	HP	AM
0	03/31/09	FIRST ISSUE	JT	MC	JT
REV	DATE	DESCRIPTION	BY	CHK	APPR

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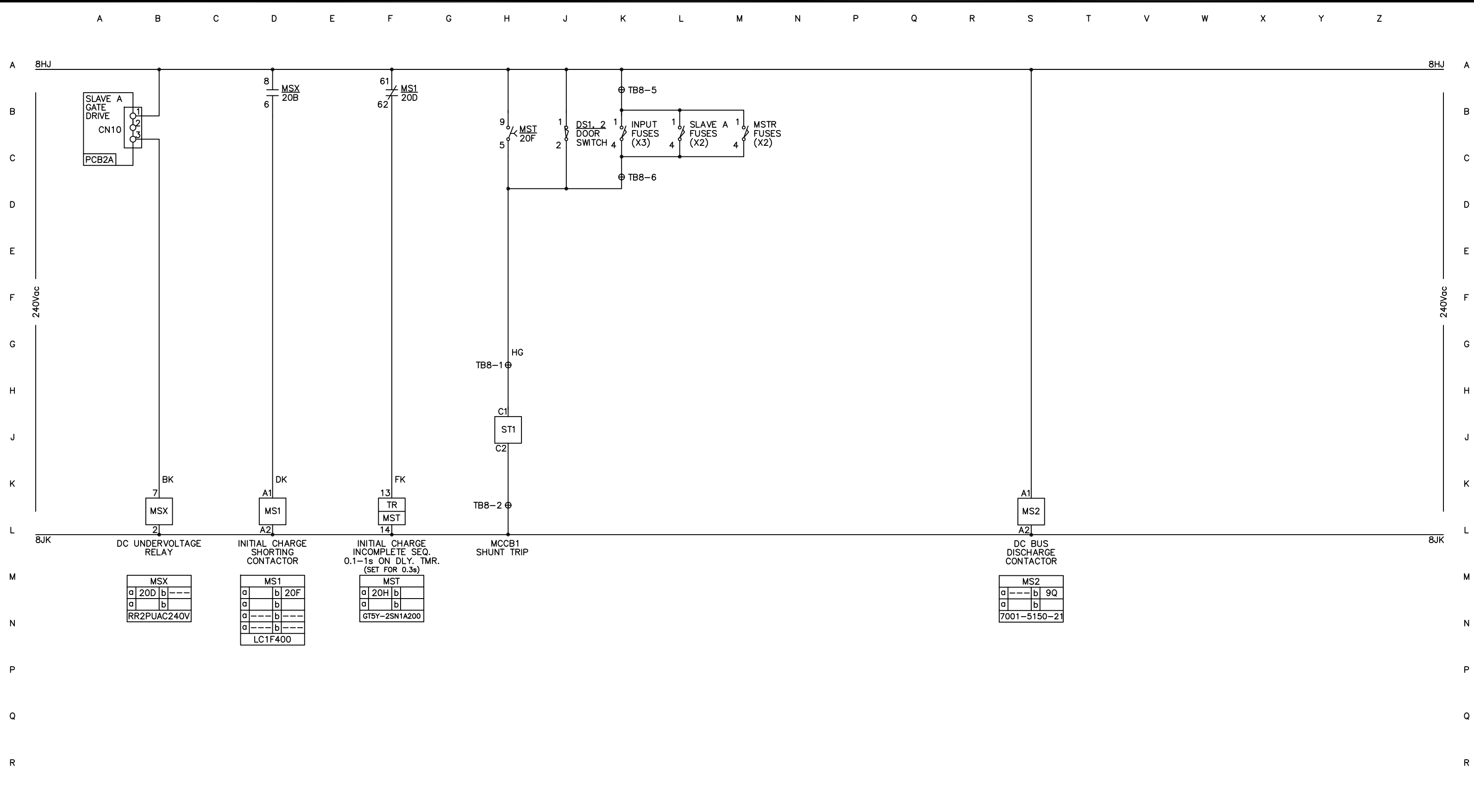
TITLE:
LOGIC INTERFACE CIRCUIT
2 POWER MODULES HX7+ 480VAC 18P

CUSTOMER NAME: _____ PROJECT NO.: _____

REVISION: 2 SCALE: _____

P.O.NO.: _____

DRAWING NO.: 1808LA18

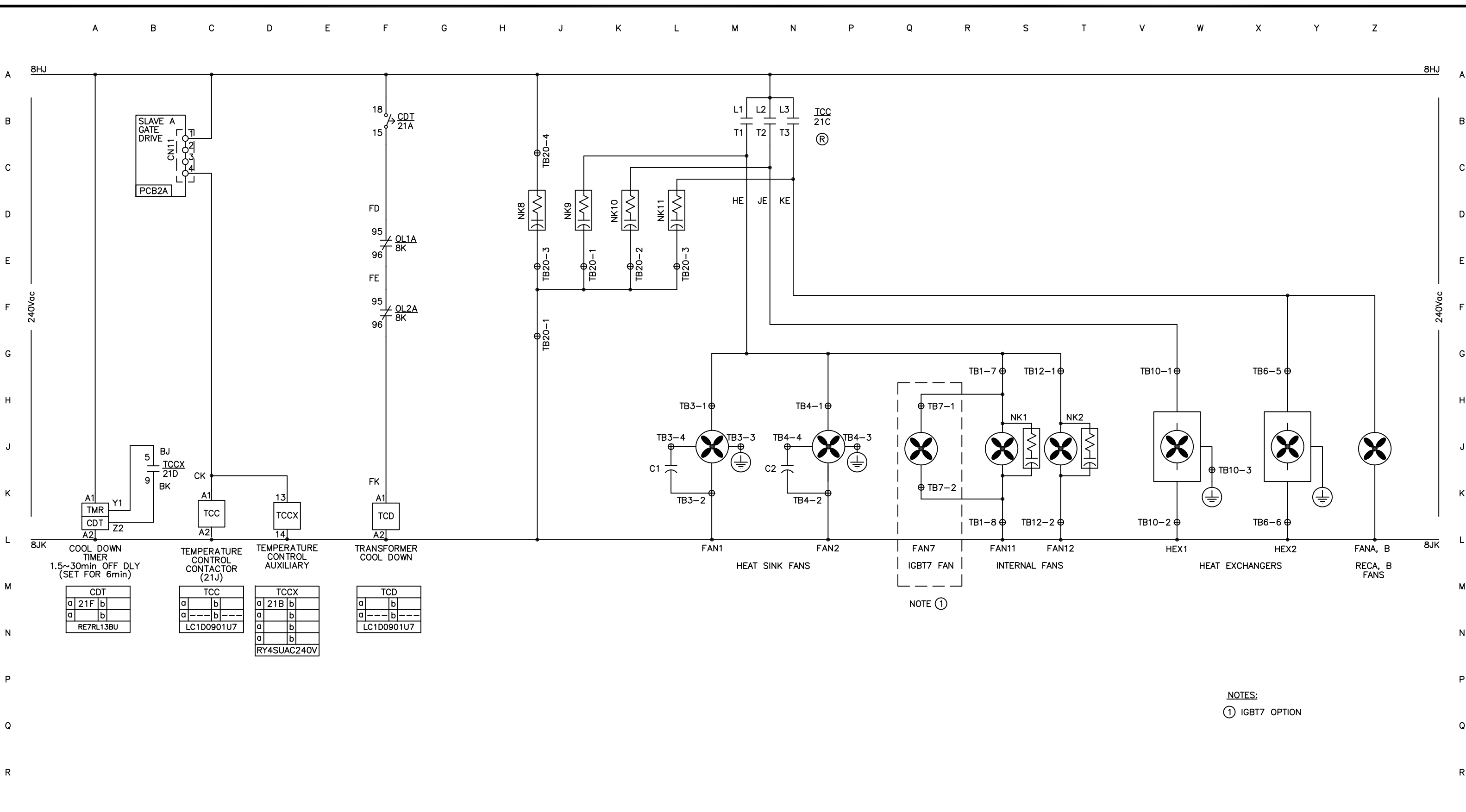


4					
3					
2					
1					
0	03/31/09	FIRST ISSUE	JT		
REV	DATE	DESCRIPTION	BY	CHK	APPR

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TITLE:
 CONTROL CIRCUIT
 2 POWER MODULES HX7+ 480VAC 18P
 CUSTOMER NAME:
 PROJECT NO.:

REVISION: 0
 SCALE:
 P.O.NO.:
 DRAWING NO.: 1808LA20



CDT	TCC	TCCX	TCD
a 21F b	a b	a 21B b	a b
a b	a b	a b	a b
RE7RL13BU	LC1D0901U7	RY4SUAC240V	LC1D0901U7

NOTES:
 ① IGBT7 OPTION

REV	DATE	DESCRIPTION	BY	CHK	APPR
4					
3	02/17/12	ECO 82941 CHANGE FAN1 & FAN2 WIRING	P	So	
2	11/30/11	ECO 82492 OL1A, OL2A, FAN TSTAT, NOTE 2	KN	P	AM
1	11/24/09	ECO 77809, ADD SUPPRESSORS NK8~11	P	So	AM TF
0	03/31/09	FIRST ISSUE	JT	MC	JBA

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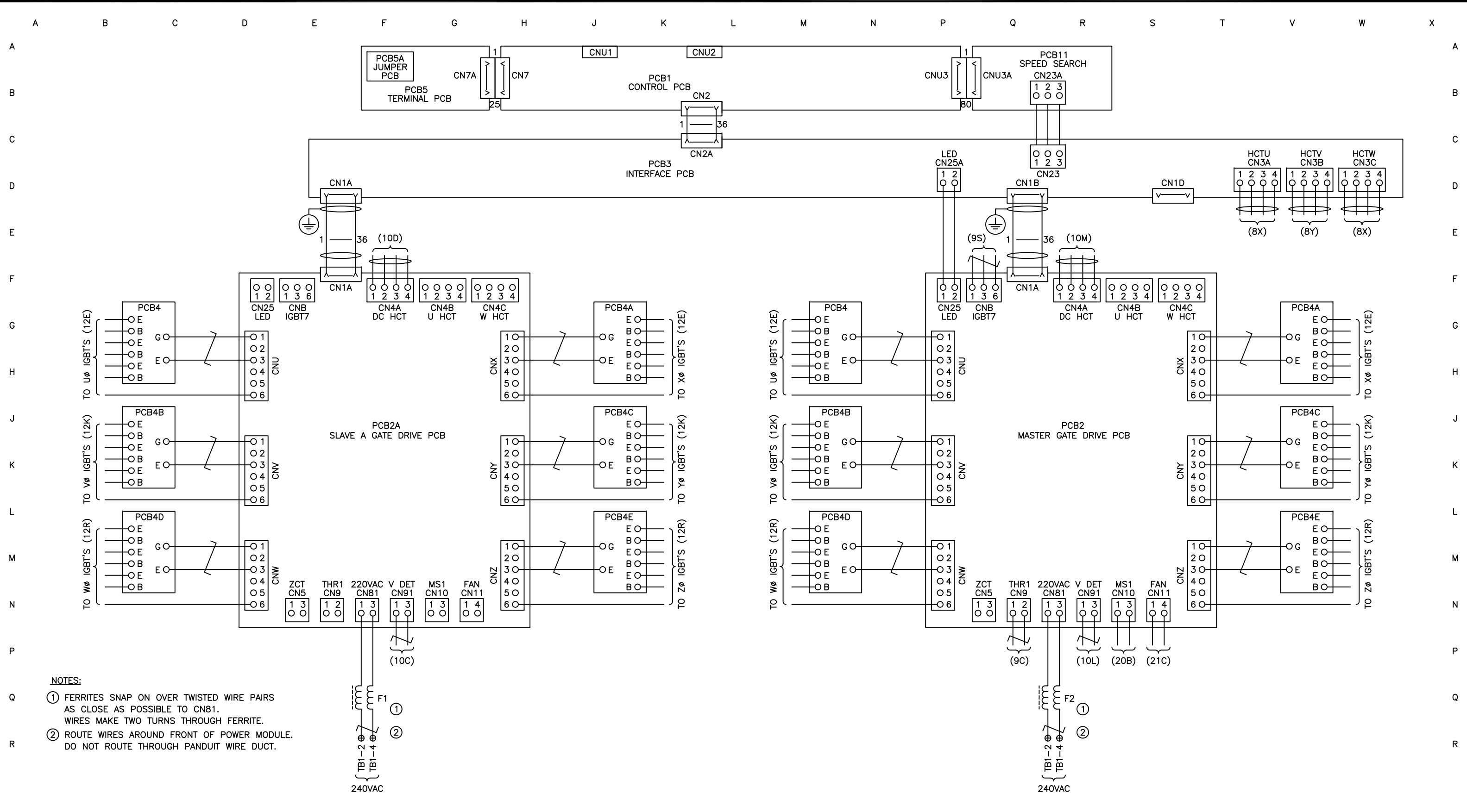
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TITLE: CONTROL CIRCUIT-TEMPERATURE CONTROL
 2 POWER MODULES HX7+ 480VAC 18P

CUSTOMER NAME: PROJECT NO.:

REVISION: 3 SCALE:

P.O.NO.: DRAWING NO.: 1808LA21



- NOTES:**
- ① FERRITES SNAP ON OVER TWISTED WIRE PAIRS AS CLOSE AS POSSIBLE TO CN81. WIRES MAKE TWO TURNS THROUGH FERRITE.
 - ② ROUTE WIRES AROUND FRONT OF POWER MODULE. DO NOT ROUTE THROUGH PANDUIT WIRE DUCT.

4					
3					
2					
1	11/24/09	ECO 77809, ADD FERRITES F1 & F2	P	So	
0	03/31/09	FIRST ISSUE	JT	MC	JBA
REV	DATE	DESCRIPTION	BY	CHK	APPR

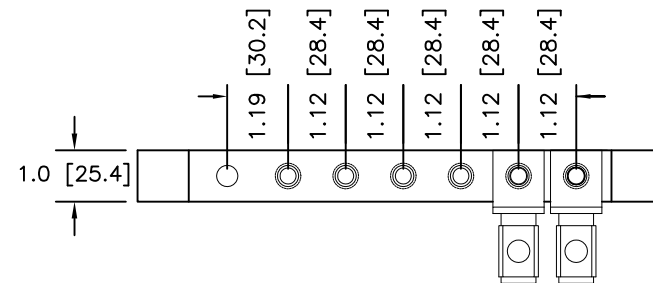
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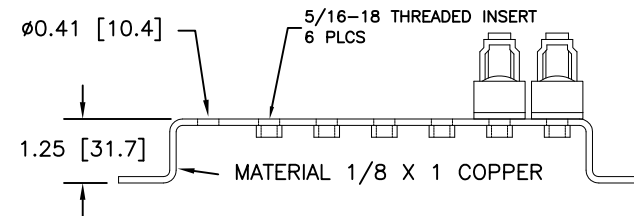
TITLE:
PCB INTERCONNECTIONS
2 POWER MODULES HX7+ 480VAC 18P

CUSTOMER NAME: _____ PROJECT NO.: _____

REVISION: 1	SCALE:
P.O.NO.:	
DRAWING NO.: 1808LA29	



GROUND BUS BAR TOP VIEW (NOT TO SCALE) ①



GROUND BUS BAR FRONT VIEW (NOT TO SCALE) ①

NOTES

- FOR NEC (NATIONAL ELECTRICAL CODE) VERSIONS, SEE DRAWING I808J106 FOR JUNCTION BOX DETAILS.
- FOR IEC (INTERNATIONAL ELECTROTECHNICAL COMMISSION) VERSIONS, SEE DRAWING I808KJ06 FOR JUNCTION BOX DETAILS.
- DIMENSIONS IN INCHES [mm].
- DIMENSIONS FOR REFERENCE ONLY.
- LUGS LISTED DO NOT NECESSARILY INDICATED PROPER CABLE SIZING. INPUT, OUTPUT, AND GROUND CABLES MUST BE SIZED ACCORDING TO NEC OR APPLICABLE LOCAL STANDARDS.

① GROUND BUS BAR LUGS
518~700kVA 2 x (2AWG~4/0) [34mm²~107mm²]

4					
3					
2					
1					
0	11/30/11	FIRST ISSUE	KN		
REV	DATE	DESCRIPTION	BY	CHK	APPR

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TITLE: CUSTOMER CONNECTIONS DIMENSIONS
2 POWER MODULES HX7+ 480VAC 18P

CUSTOMER: PROJECT NUMBER:

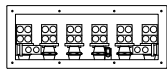
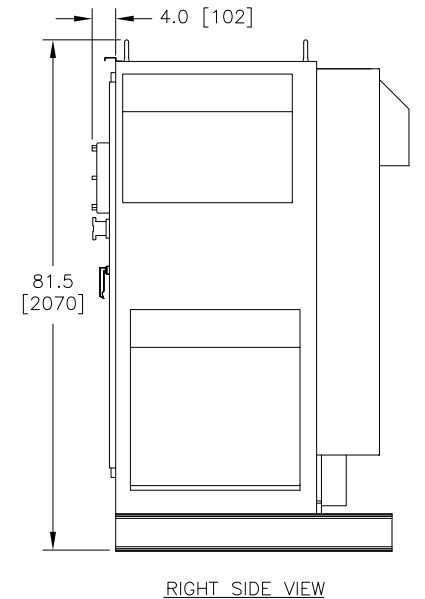
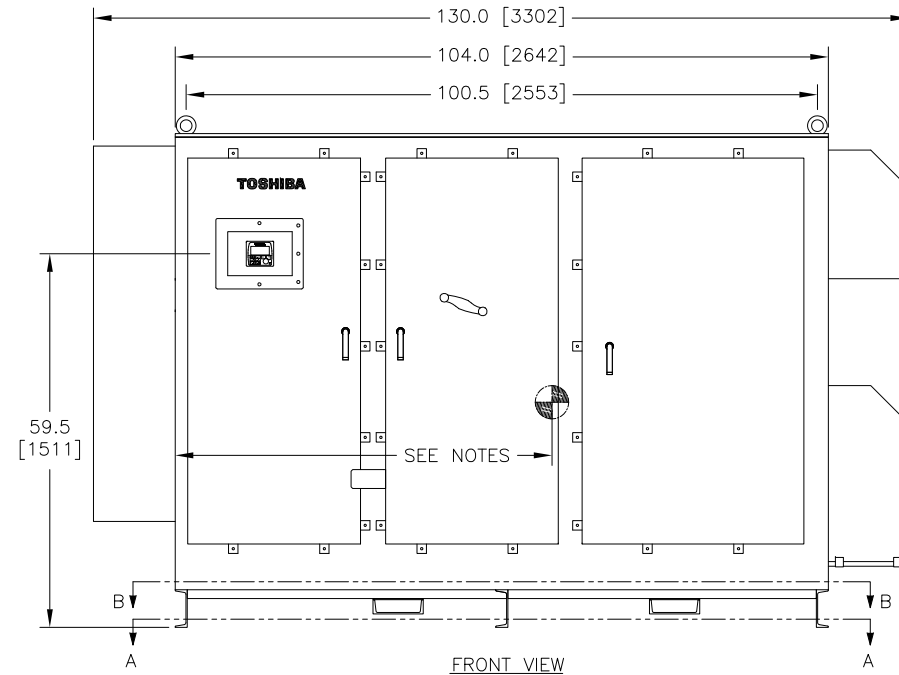
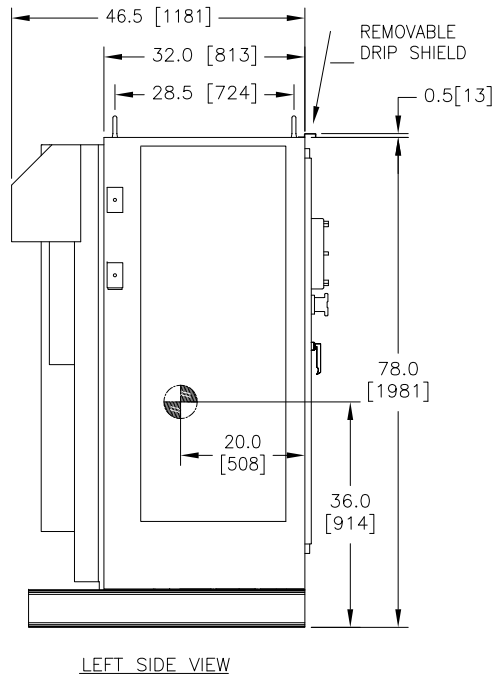
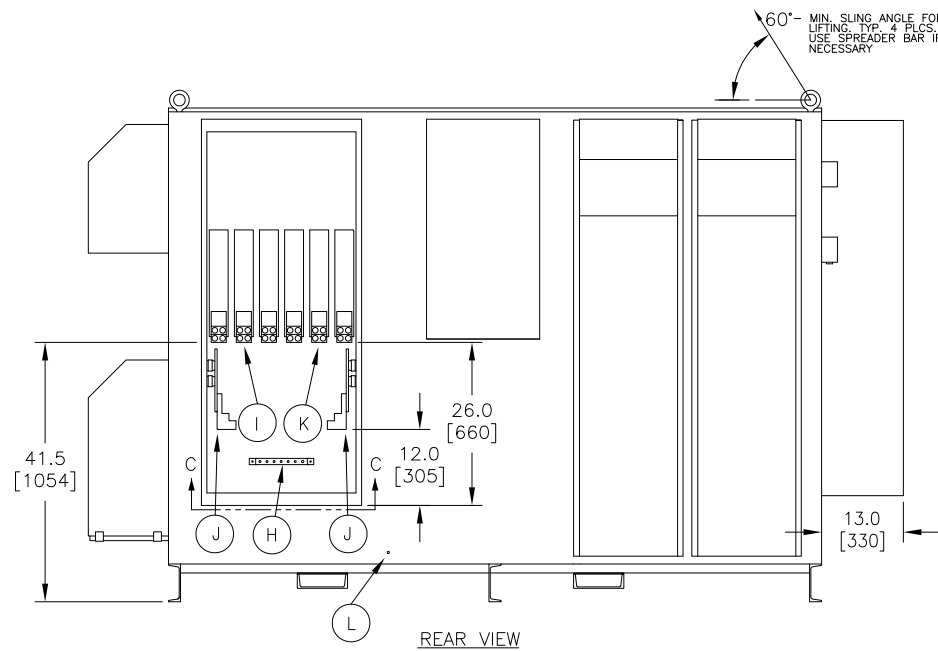
REVISION: 0 SCALE:

DRAWING NUMBER: 1808LA30

LEGEND

- H - GROUND BUS BAR ① ②
518~700kVA (SEE SHEET 30 FOR DETAILS)
- I - INPUT TERMINATION LUGS ① ②
518~700kVA 4 x (1/0~750MCM) [54mm²~380mm²]
- J - DB RESISTOR CONNECTION LUGS (WHEN INSTALLED)
2 x (2AWG~500MCM) [34mm²~253mm²]

- K - OUTPUT TERMINATION LUGS ③
518~700kVA 4 x (1/0~750MCM) [54mm²~380mm²]
- L - GROUNDING STUD (3/8-16 x 3/4)



SECTION C-C
2.5 x 7.0 [572 x 178]
OPENING WITH REMOVABLE
COVER PLATE

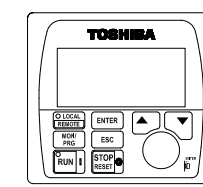
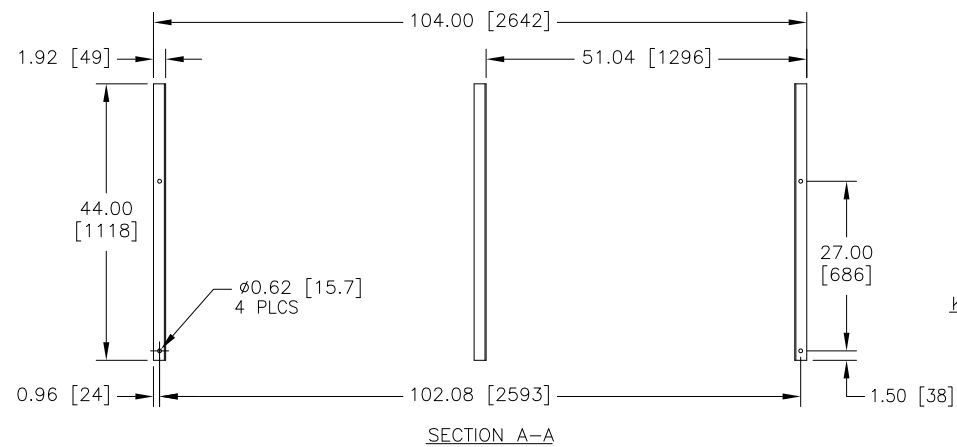
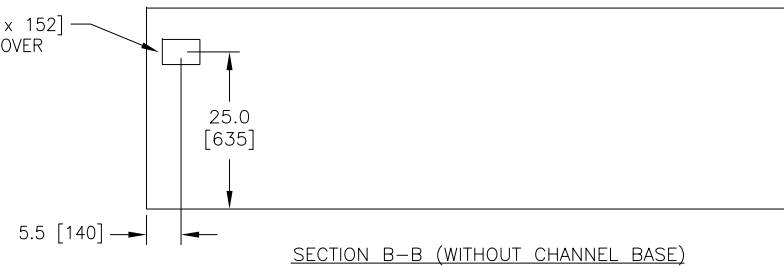
NOTES

- DIMENSIONS ARE IN INCHES [mm]
- DIMENSIONS FOR REFERENCE ONLY
- WEIGHT: (APPROX) 518kVA - 5600lbs [2540kg]
600kVA - 5700lbs [2585kg]
700kVA - 5775lbs [2619kg]
- COLOR: WHITE (NONE IF STAINLESS STEEL)
- INPUT/OUTPUT TERMINATION BENDING SPACE IN ACCORDANCE WITH NEC TABLE 312-6(b)
- FRONT VIEW CENTER OF GRAVITY;
NON-SINEWAVE: 55.0 [1397]
SINEWAVE: 60.0 [1524]
- LUGS LISTED DO NOT NECESSARILY INDICATE PROPER CABLE SIZING. INPUT, OUTPUT, AND GROUND CABLES MUST BE SIZED ACCORDING TO NEC OR APPLICABLE LOCAL STANDARDS.

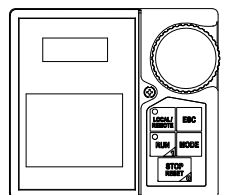
- ① FOR NEC (NATIONAL ELECTRICAL CODE) VERSIONS, SEE DRAWING I808J106 FOR JUNCTION BOX DETAILS.
- ② FOR IEC (INTERNATIONAL ELECTROTECHNICAL COMMISSION) VERSIONS, SEE DRAWING I808KJ06 FOR JUNCTION BOX DETAILS.
- ③ SEE DRAWING I808J106 FOR JUNCTION BOX DETAILS.
- ④ STANDARD KEYPAD
- ⑤ VLP SOFTWARE KEYPAD

⊕ CENTER OF GRAVITY, ±2 INCHES [51].

4.0 x 6.0 [102 x 152]
OPENING WITH COVER
PLATE



KEYPAD DETAILED VIEW ④



KEYPAD DETAILED VIEW ⑤

REV	DATE	DESCRIPTION	BY	CHK	APPR
4	11/30/11	ECO 82492 GND BAR TO SHT 30, VLP EOI	KN		
3	10/11/11	ECO 82695 CABLE/LUG SIZES, GROUND BAR	KN	P So	AM
2	07/01/11	ECO 80816 CHANGE CUSTOMER CONNECTIONS	JLP PSo	HP	AM
1	07/17/09	UPDATED JUNCTION BOX & FRONT CG	JCC	P So	MC
0	03/31/09	FIRST ISSUE	JT	MC	JBA

TOSHIBA
TOSHIBA INTERNATIONAL CORPORATION
MADE IN HOUSTON, TEXAS U.S.A.

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TITLE:
ENCLOSURE OUTLINE - OUTDOOR
518~700kVA HX7+ 480VAC 18P

CUSTOMER NAME:

PROJECT NO.:

REVISION:

4

SCALE:

1.0=32.0

P.O.NO.:

DRAWING NO.:

I808LA31