

Type of Panel	AMF Control Panel
DG Rating	100kVA
AC Voltage System	3PH., 400VAC, 50Hz
Control Voltage	12VDC
Engine Make	MHEL
Genset Controller Used	DSE 7320MKII
Project	EXPORT

L-2 DRAWING PPAP BATCH
DRAWING RELEASE DATE: 13/07/22
DESIGNER : PRITHVIRAJ KANASE
CHECKER : H B PATIL
APPROVED BY : RAJESH KALE

ER	LET	LOC	REVISION	DSNR	CKR	APPR	DATE
	A		TOGGLE SWITCH ADDED,IN GA DOOR CHANGE	PBK	HBP	RAK	14/02/22
	B		TOGGLE SWITCH REMOVED	PBK	HBP	RAK	17/02/22
	C		TIMER REMOVED FORM BOM	PBK	HBP	RAK	04/03/22
	D		HEATER TB SHIFTED TO RHS SIDE,16DIAMETER HOLE AND PGB GLAND ADDED IN RHS SIDE	PBK	HBP	RAK	07/04/22
	E		EARTHING CABLE SIZE UPDATED	PBK	HBP	RAK	13/07/22

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COVER SHEET

<SC> :SIGNIFICANT CHARACTERISTICS		▽ :CRITICAL CHARACTERISTICS	
BREAK SHARP CORNERS MAY BE EITHER A CHAMFER OR A RADIUS FROM 0.2 mm MIN. TO 1.0 mm MAX.		MAHINDRA & MAHINDRA LIMITED TRACTOR DIVISION KANDIVLI(EAST), MUMBAI 400 101, INDIA.	
UNSPECIFIED TOLERANCES AS PER ISO-2768-1:1989		E.R. / PROC.REQND : PART NO. :	
DIMENSIONS		PART NAME : 100kVA 3PH. 400V AMF PANEL WITH DSE7320MKII_COLD START_EXPORT	
LINEAR IN mm	DIVER UPTD 3 6 30 120 400 1000 2000 4000	MATERIAL : HEAT TREATMENT :	
F FINE	0.05 0.1 0.15 0.2 0.3 0.5 1 2	2021 NAME SIGN DATE FIRST USED -FRGR- MODEL	
M MEDIUM	0.1 0.15 0.2 0.3 0.5 1 2	CAD ENGG. SSS 22/10/21 SCALE N.T.S	
C COARSE	0.2 0.3 0.5 1 2 3 4	DESIGNER SSS 22/10/21 SHEET 1 OF 12	
V VERY COARSE	0.5 1 2 3 4 6 8	CHECKER RBN 22/10/21 UNIT QTY. :	
ANGULAR IN deg.	LENGTH OF SHORTER SIDE OF THE ANGLE IN mm	APPR. BY RAK 22/10/21 WEIGHT : kg.	
DIVER UPTD 10 50 120 400		PART OF THIS DRAWING / DOCUMENT SHOULD NOT BE REPRODUCED IN ANY FORM OR BY ANY MEANS WITHOUT WRITTEN PERMISSION OF M & M LTD.	
F FINE	±1° ±0°30' ±0°20' ±0°10' ±0°5'	COMPUTER GENERATED DRAWING DO NOT CHANGE MANUALLY	
M MEDIUM	±1° ±0°30' ±0°15' ±0°10'	IF IN DOUBT, ASK DO NOT SCALE DRG SIZE : ALL DIMENSIONS ARE IN mm. CHECK DRG WITH LATEST CHANGE	
C COARSE	±1° ±2° ±1° ±0°30' ±0°20'		
V VERY COARSE	±1° ±2° ±1° ±0°30' ±0°20'		

ER	LET	LOC	REVISION	DSNR	CKR	APPR	DATE
	A		TOGGLE SWITCH ADDED,IN GA DOOR CHANGE	PBK	HBP	RAK	14/02/22
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	C		TIMER REMOVED FORM BOM	PBK	HBP	RAK	04/03/22
	D		HEATER TB SHIFTED TO RHS SIDE,16DIAMETER HOLE AND PG9 GLAND ADDED IN RHS SIDE	PBK	HBP	RAK	07/04/22
	E		EARTHING CABLE SIZE UPDATED	PBK	HBP	RAK	13/07/22

TABLE (3φ SWITCHGEAR COMPONENT SELECTION CHART)

SR NO.	RATING KVA	PHASE	MCCB	CONTACTOR	CT RATIO	AL BUSBAR	POWER CABLE UNINYVIN-TYPE	CONTROL PANEL M&M PART NO.											
1	100	3	3P,160A	4P,200A	200/5A	20 x 10 mm	U-4	0	0	7	7	1	0	0	2	6	H	9	1

CURRENT RATINGS			
SR NO.	RATING KVA	FULL-LOAD CURRENT	OVERLOAD CURRENT
1	100	144A	159A

SWITCHGEAR COMPONENT SELECTION CHART

<SC> :SIGNIFICANT CHARACTERISTICS ▽ :CRITICAL CHARACTERISTICS

BREAK SHARP CORNERS MAY BE EITHER A CHAMFER OR A RADIUS FROM 0.2 mm MIN. TO 1.0 mm MAX.
UNSPECIFIED TOLERANCES AS PER ISO-2768-1:1989

MAHINDRA & MAHINDRA LIMITED
TRACTOR DIVISION
KANDIVLI(EAST), MUMBAI 400 101, INDIA.

E.R. / PROC.REQNO : PART NO. :

PART NAME : 100KVA 3PH. 400V AMF PANEL
WITH DSE7320MKII_COLD START_EXPORT

MATERIAL : HEAT TREATMENT :

DIMENSIONS		0.5	3	6	30	120	400	1000	2000
LINEAR IN mm	DIVER UPTD	3	6	30	120	400	1000	2000	4000
F FINE	OXXXX	±0.08	±0.05	±0.1	±0.15	±0.2	±0.3	±0.5	-
n MEDIUM	OXXX	±0.1	±0.1	±0.2	±0.3	±0.5	±0.8	±1.2	±2
c COARSE	OX	±0.2	±0.3	±0.5	±0.8	±1.2	±2	±3	±4
v VERY COARSE	>	-	±0.5	±1	±1.5	±2.5	±4	±6	±8

LENGTH OF SHORTER SIDE OF THE ANGLE IN mm		10	50	120	400
ANGULAR IN deg.	DIVER UPTD	10	50	120	400
F FINE	OXXXX	±1°	±0°30'	±0°20'	±0°10'
n MEDIUM	OXXX	±1°	±0°30'	±0°15'	±0°10'
c COARSE	OX	±3°	±2°	±1°	±0°30'
v VERY COARSE	>	±3°	±2°	±1°	±0°30'

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2021	NAME	SIGN	DATE	FIRST USED -FRGR- MODEL
CAD ENGG.	SSS		22/10/21	SCALE N.T.S
DESIGNER	SSS		22/10/21	SHEET 2 OF 12
CHECKER	RBN		22/10/21	UNIT QTY. :
APPR.BY	RAK		22/10/21	WEIGHT : kg.

SR NO.	DESCRIPTION OF COMPONENT	MODEL	MAKE	QTY	M&M PART NO
1	DC RELAY CARD FOR R1/R2/R3; 4 CH WITH C/O 12VDC-70A-2Nos 5A-2No RELAY	UL5302NO-C-DP-72	UL AUTOMATION OEN	1	006034573H1
2	BATTERY CHARGER-12VDC; 5A	CB1205A	SEDEMAC	1	007709451H91
3	CURRENT TRANSFORMER	(Refer Table C)	NEWTEK	3	
4	DOOR LOCK	DMCL-WL-MR2	DARSHANA	2	
5	DOOR STOPPER	-	DARSHANA/SONAX	1	
6	ENCLOSURE-MADE OF CRCA SHEET	(Refer sheet no. 6)	-	1	
7	ELECTRONIC BUZZER-BASE MOUNTING	12VDC	IOTA	1	006025640H91
8	FUSE TERMINAL BLOCK	4Sq.mm	CONNECTWELL	8	
9	GLASS FUSE	2A	PROTECTRON	1	
10	GLASS FUSE	6A	PROTECTRON	7	
11	GENERATOR CONTROL UNIT	DSE-7320MKII	DEEPSEA	1	006019284H91
12	TOGGLE SWITCH 28VDC, 15A	KT1521BY	KAYCEE	1	006029316H91
13	MCB 1 POLE-32A."C" CURVE WITH 10KA BREAKING	BB10320C	L&T	1	006024461H91
14	MCB 1 POLE-6A."C" CURVE WITH 10KA BREAKING	BB10060C	L&T	2	006029656H91
15	MCCB FOR DG INCOMING/EB INCOMING WITH SPREADER	(Refer Table B)	L&T	2	
16	POWER CONTACTOR, 4POLE WITH 220VAC COIL SUPPLY	(Refer Table A)	SCHNEIDER	2	
17	ADD ON BLOCK 1NO+1NC	LAEN11	SCHNEIDER	2	007709810H91
18	MECHANICAL INTERLOCK	LA9D11502	SCHNEIDER	1	007709808H91
19	SURGE SUPPRESSOR	LA4DA2U	SCHNEIDER	2	007709811H91
20	12VDC 5A RELAY CARD ,2CH, 2C/O	UL02-2C	UL AUTOMATION	1	006029707H91
21	CONNECTOR 8PIN,250 SERIES	250 SERIES	MSSL	1	
22	CONNECTOR 10PIN,250 SERIES	250 SERIES	MSSL	1	
23	TERMINAL BLOCK.4P-200A	TSB-28	POWERMATE	1	
24	MICROSWITCH	2A, 250V	SURDHI	1	006019613H91
25	LED LAMP	12VDC-1W(OVP)	SAM INTEGRATIONS	1	006025268H91
26	RUBBER GLAND FOR HARNESS	25 MM	-	1	
27	CONNECTOR 2PIN, 250 SERIES	250 SERIES	MSSL	1	
28	HINGES	DHMF40	DARSHANA	3	
29	ACRYLIC SHEET	THICKNESS 2MM		-	
30	ACRYLIC SHEET -A	(Refer SHEET 7)		3	
	ACRYLIC SHEET -B	(Refer SHEET 7)		2	
	ACRYLIC SHEET -C	(Refer SHEET 7)		1	
	ACRYLIC SHEET -D	(Refer SHEET 6)		1	
31	EYE BOLT	(Refer SHEET 7) M12	-	2	
32	BUSBAR SUPPORT	-	-	4	
33	AUTOMOTIVE RELAY 1NO	741-12-1A-2SA	OEN/BGLI	1	007710327H91
34	TERMINAL BLOCK	6SQ.MM	CONNECTWELL	3	
35	EARTHING CABLE	Refer Sheet 12	-	4	
36	RESISTOR R2	1000Ω±0.5%, ¼ WATT	-	1	

ER	LET	LOC	REVISION	DSNR	CKR	APPR	DATE
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	E		EARTHING CABLE SIZE UPDATED	PBK	HBP	RAK	13/07/22

TABLE A:

RATING KVA	CONTACTOR	M&M PART NO
100	200A,4P AC1 LC1D1150046M7	007709804H91

TABLE B:

RATING KVA	MCCB	M&M PART NO
100	160A,3P, 25KA DU250C	006031137H91

TABLE C:

RATING KVA	CT	M&M PART NO
100	200/5A,CL-1,2.5VA	006035519H1

CABLE SIZE TABLE		CABLE MAKE & SPECS.
BATTERY +VE BATTERY-VE	4Sq.mm	FINOLEX/POLYCAP/BONTON RR CABLES/LAPP/HAVELS PVC INSULATED SINGLE CORE MULTISTAND FR CABLE
CURRENT TRANSFORMER	1.5Sq.mm	
CONTROL SIGNAL	1Sqmm	
START,STOP SIGNAL	4Sq.mm	
B+VE & B-VE FOR BATTERY CHARGER & PANEL HEATER & TIMER CONN.	2.5Sq.mm	
EARTHING CABLE(YELLOW GREEN)		
POWER CABLE	REFER SHEET 2	MIRACLE MAKE UNINYVIN CABLE AS PER BSG177 STANDARD

BILL OF MATERIAL

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UNSPECIFIED TOLERANCES AS PER ISO-2768-11989

MAHINDRA & MAHINDRA LIMITED
TRACTOR DIVISION
KANDIVLI(EAST), MUMBAI 400 101, INDIA.

ER. / PROC.REQNO : PART NO. :

PART NAME : 100KVA 3PH. 400V AMF PANEL
WITH DSE7320MKII_COLD START_EXPORT

MATERIAL : HEAT TREATMENT :

DATE	NAME	SIGN	DATE	FIRST USED -TRGR- MODEL
2021	SSS		22/10/21	
	SSS		22/10/21	
	RBN		22/10/21	
	RAK		22/10/21	

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1	Metering facility available in the Genset controller DSE-7320	
	Voltage (Phase to Phase)	
	Current	
	Frequency	
	kW	
	kVA	
	kVAR	
	PF	
	kWh	
	kVARh	
	kVAh	
	RPM	
	Hours	
	Battery Voltage	
	Pressure - Bar/PSI/kPa	
	Temperature - °C/°F	
	Fuel - %	
	Clock Time	

2	Genset Controller Key Features	
	Dimension Details	Overall : 240 (w) x 181 (h) x 41.7 (d) Cutout : 220 (w) x 160 (h)
	Degrees of Protection	BS EN60529 IP 42
	Shock	BS EN 60068-2-27 Three Shocks in each of three major axes 15 gn in 11 mS
	Humidity	BS EN 60068-2-30 Db Damp Heat Cyclic 20 °C / 55 °C @ 95% RH 48 Hours

		BS EN 60068-2-78 Cab Damp Heat Static 40°C @ 93% RH 48 Hours
	Vibration	BS EN 60068-2-6 Ten Sweeps in each of three major axes 5 Hz to 8Hz @ +/-7.5mm 8 Hz to 500 Hz @ 2 gn
	Temperature	BS EN 60068-2-1 Ab/Ae Cold Test -30 °C BS EN 60068-2-2 Bb/Be Dry Heat +70 °C
	Electrical Safety	BS EN 60950 Safety for Information Technology Equipment, including Electrical Business Equipment.
	Electro-Magnetic Compatibility	BS EN 61000-6-2 EMC Generic immunity standard for the Industrial Environment BS EN 61000-6-4 EMC Generic Emission standard for the Industrial Environment

3	Engine Type	Conventional	
4	Analog Input Assignment	Sensor Type	Trip Setting
	Input-A	Lube Oil Pressure	MHEL 1.5 bar
	Input-B	Coolant Temperature Switch	MHEL 105°C
	Input-C	Fuel Level	Resistive LR-45 10%
5	Digital Input Assignment		
	Input-A	Oil Pressure Switch	
	Input-B	Water in Fuel Switch	
	Input-C	Emergency Stop	
	Input-D	-	
	Input-E	-	
	Input-F	-	

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	D		HEATER TB SHIFTED TO RHS SIDE, 16 DIAMETER HOLE AND PG9 GLAND ADDED IN RHS SIDE	PBK	HBP	RAK	07/04/22
	E		EARTHING CABLE SIZE UPDATED	PBK	HBP	RAK	13/07/22

DSE-7320 CONTROLLER CONFIGURATION DETAILS

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1	2	3	4
6	Digital Output Assignment		
OUTPUT-A	Fuel relay		
OUTPUT-B	Start Relay		
OUTPUT-E	De-Energize Mains Contactor (Close)		
OUTPUT-F	Energize Alternator Contactor (Close)		
OUTPUT-G	Audible Alarm		
OUTPUT-I	Pre-Heat		
7	Timer Setting made on the controller		
a)	Start Timer	Mains Transient Delay	5.0 Sec
		Start Delay	5.0 Sec
		Delay in Crank	1 Sec
		Pre-Heat	3.0 Min
		Cranking Time	30.0 Sec
		Crank Rest Time	10.0 Sec
		Smoke Limit	0 Sec
		Smoke Limit Off	0 Sec
		Safety ON Delay	10.0 Sec
		Warming Up Time	1.0 Sec
b)	Load/Stopping Timers	Load Control Timers	
		Transfer Time	2.0 Sec
		Breaker Trip Pulse	0.5 Sec
		Breaker Close Pulse	0.5 Sec
		Stopping Timers	
		Return Delay	30.0 Sec
		Cooling Time	1.0 Min
		ETS Solenoid Hold	10.0 Sec
		Fail to Stop Delay	30.0 Sec
		Generator Transient Delay	5 Sec
8	Generator Options	No. of Pole Selection	4 Pole
		AC System	3Ph., 4Wire

3	4	5	6
9	Generator Voltage	Under Voltage Shutdown	332V
		Loading Voltage	380V
		Nominal Voltage	400V
		Over Voltage Shutdown	450V
10	Generator Frequency	Under Frequency Shutdown	45 Hz
		Loading Frequency	48 Hz
		Nominal Frequency	50 Hz
		Over Frequency Shutdown	55 Hz
11	Generator Current	CT Primary	(Refer sheet no. 2)
		Full Load Rating	(Refer sheet no. 2)
		Over Current Alarm - 110%	(Refer sheet no. 2)
12	Start-up Options	Start Attempt	3
13	Crank Disconnect	Crank Disconnect on Oil Pressure	Yes
14	Crank Disconnect Freq		21Hz
15	Plat Battery (VDC)	Under Voltage Warning	8.0VDC
		Under Voltage Return	8.5VDC
		Under Voltage Delay	1.0 Min
		Over Voltage Return	15.0VDC
		Over Voltage Warning	15.5VDC
		Over Voltage Delay	1.0 Min
16	Mains Options	No. of Pole Selection	4 Pole
		AC System	3Ph., 4Wire
17	Mains Voltage	Under Voltage Shutdown	332V
		Loading Voltage	380V
		Over Voltage Shutdown	450V
18	Mains Frequency	Under Frequency Shutdown	45.0 Hz
		Loading Frequency	48.0 Hz
		Nominal Frequency	50.0 Hz
		Over Frequency Shutdown	55.0 Hz

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DSE-7320 CONTROLLER CONFIGURATION DETAILS

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MAHINDRA & MAHINDRA LIMITED
TRACTOR DIVISION
KANDIVLI(EAST), MUMBAI 400 101, INDIA.

DIMENSIONS		ER / PROC REQ NO	PART NO.
LINEAR IN mm	OVER UPTO		
F FINE	0.5 3 6 30 120 400 1000 2000		
M MEDIUM	±0.1 ±0.1 ±0.2 ±0.3 ±0.5 ±0.8 ±1.2 ±2		
C COARSE	±0.2 ±0.3 ±0.5 ±0.8 ±1.2 ±2 ±3 ±4		
V VERY COARSE	±0.5 ±1 ±1.5 ±2.5 ±4 ±6 ±8		
ANGULAR IN deg.	LENGTH OF SHORTER SIDE OF THE ANGLE IN mm		
F FINE	OVER UPTO 10 50 120 400		
M MEDIUM	±1° ±0°30' ±0°20' ±0°10' ±0°5'		
C COARSE	±1°30' ±1° ±0°30' ±0°15' ±0°10'		
V VERY COARSE	±3° ±2° ±1° ±0°30' ±0°20'		

PART NAME : 100KVA 3PH. 400V AMF PANEL
WITH DSE7320MKII_COLD START_EXPORT

MATERIAL : _____ HEAT TREATMENT : _____

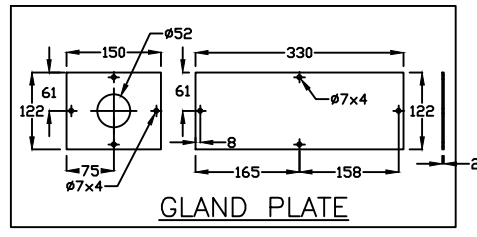
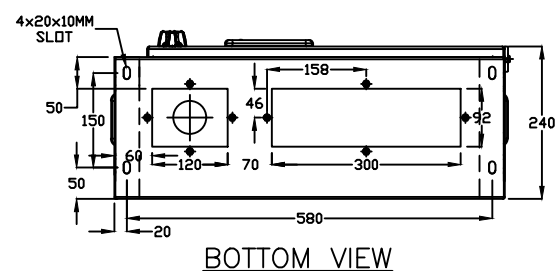
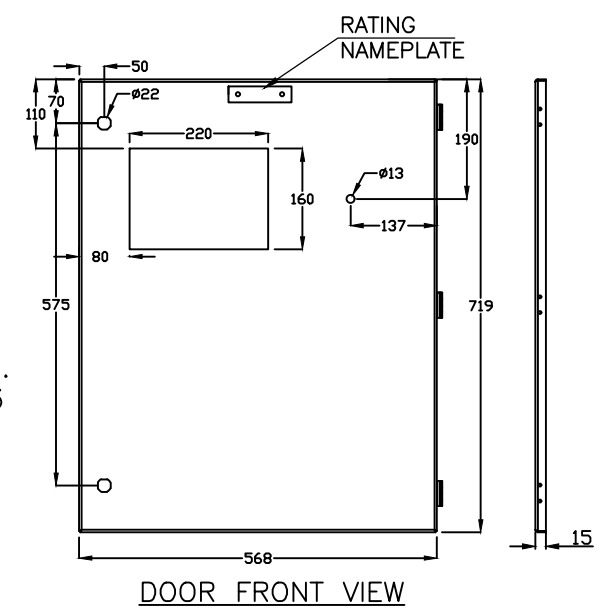
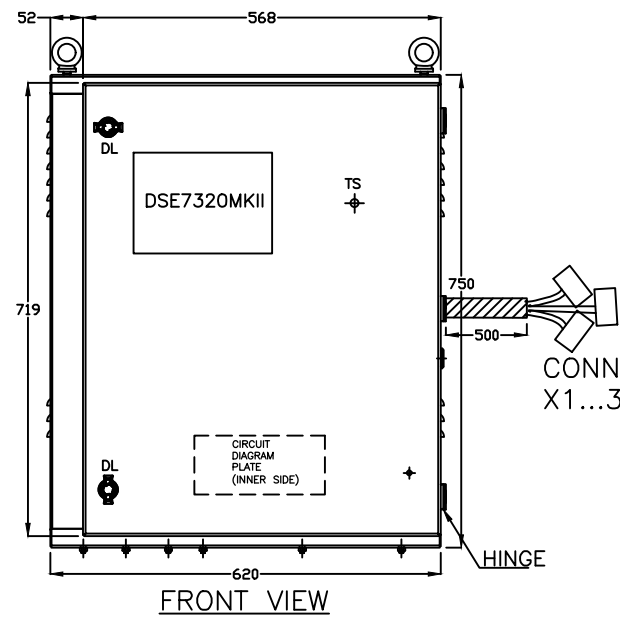
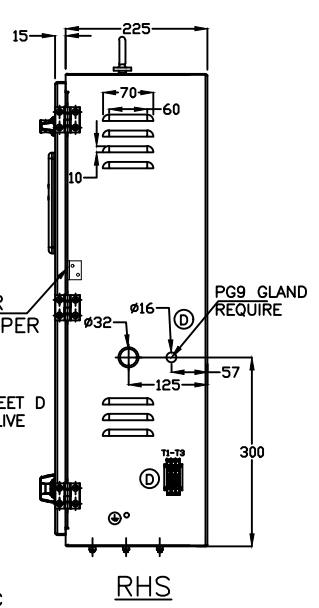
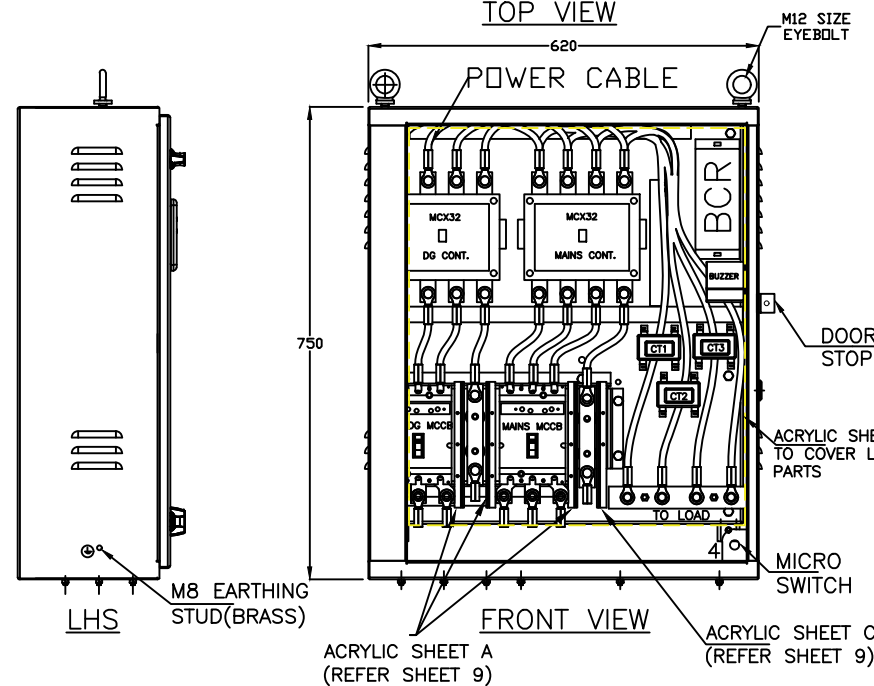
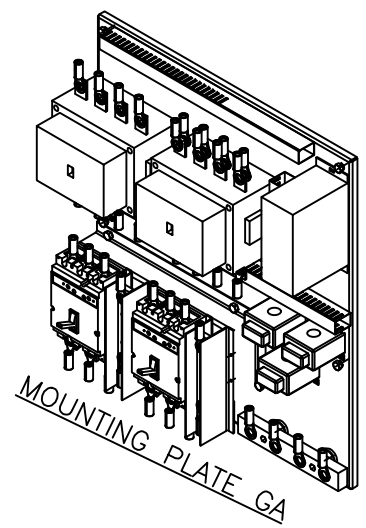
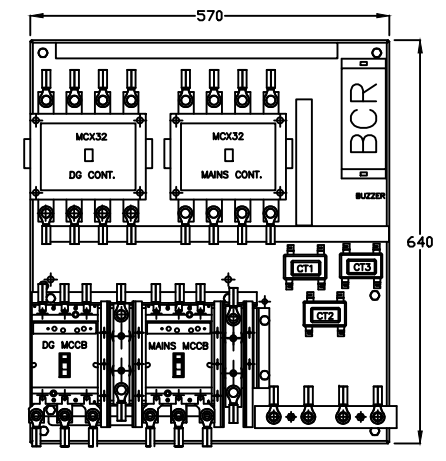
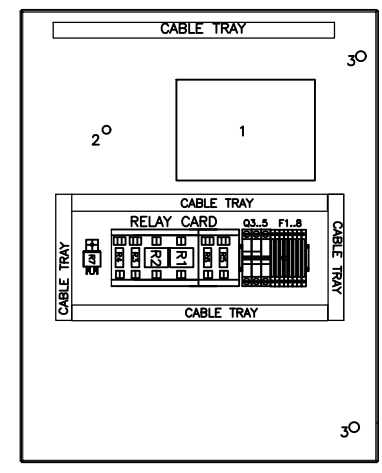
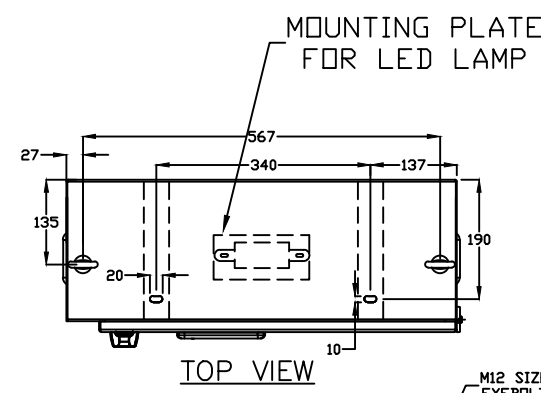
2021	NAME	SIGN	DATE	FIRST USED -TRGR- MODEL
CAD ENGG.	SSS		22/10/21	
DESIGNER	SSS		22/10/21	SCALE N.T.S
CHECKER	RBN		22/10/21	SHEET 5 OF 12
APPR BY	RAK		22/10/21	UNIT QTY. : _____
				WEIGHT : _____ kg.

PART OF THIS DRAWING / DOCUMENT SHOULD NOT BE REPRODUCED IN ANY FORM OR BY ANY MEANS WITHOUT WRITTEN PERMISSION OF M & M LTD.
COMPUTER GENERATED DRAWING DO NOT CHANGE MANUALLY

IF IN DOUBT, ASK DO NOT SCALE DRG SIZE : _____ ALL DIMENSIONS ARE IN mm. CHECK DRG WITH LATEST CHANGE

ER	LET	LOC	REVISION	DSNR	CKR	APPR	DATE
	A		TOGGLE SWITCH ADDED, IN GA DOOR CHANGE	PBK	HBP	RAK	14/02/22
	B		TOGGLE SWITCH REMOVED	PBK	HBP	RAK	17/02/22
	C		TIMER REMOVED FORM BOM	PBK	HBP	RAK	04/03/22
	D		HEATER TB SHIFTED TO RHS SIDE, 16DIAMETER HOLE AND PG9 GLAND ADDED IN RHS SIDE	PBK	HBP	RAK	07/04/22
	E		EARTHING CABLE SIZE UPDATED	PBK	HBP	RAK	13/07/22

CUBICLE DATA	
TAG	DESCRIPTION
PANEL TYPE	FREE STANDING VERTICAL
SIZE	620(W)X750(H)X240(D)
MATERIAL	CRCA SHEET
THICKNESS	1.5MM FOR ENCLOSURE 2MM FOR DOOR, MOUNTING PLATE, MCCB MOUNTING BRACKET, HINGES SUPPORTING BRACKET 2MM FOR GLAND PLATE 4MM FOR PANEL SUPPORTING PLATE AT TOP 4MM FOR PANEL SUPPORTING PLATE AT BOTTOM.
PAINT SHADE	MAT BLACK-301736 FOR ENCLOSURE WITH MAT FINISH RAL 2000 FOR MOUNTING PLATE
WEIGHT	WITH SEMI GLASSY FINISH 90KG (APPROX)
NO SHARP EDGES TO BE PRESENT	



GENERAL ARRANGEMENT DRAWING

- * Door hinge type DHFM-40 Darshana Make, door stopper to be provided.
- * Circuit Diagram must be on riveted black anodized plate, fixed on the inner side of the door.
- * No sharp edges to be present.
- * Tolerance for all dimensions should be considered as +/- 1mm.
- * Mounting plate arrangement is tentative this may or may not changes.

SR. NO.	LEGEND	DESCRIPTION	CUTOUT/DIMENSION
1	DSE7320	DSE7320 CONTROLLER	220X160
2	TS	TOGGLE SWITCH	Ø13
3	DL	DOOR LOCK	Ø27.5
4	DLS	MICROSWITCH	Ø15

<S> :SIGNIFICANT CHARACTERISTICS ▽ :CRITICAL CHARACTERISTICS

BREAK SHARP CORNERS MAY BE EITHER A CHAMFER OR A RADIUS FROM 0.2 mm MIN. TO 1.0 mm MAX.
UNSPECIFIED TOLERANCES AS PER ISO-2768-11989

MAHINDRA & MAHINDRA LIMITED
TRACTOR DIVISION
KANDIVLI(EAST), MUMBAI 400 101, INDIA.

ER. / PROC. REQ. NO. : PART NO. :
PART NAME : 100KVA 3PH. 400V AMF PANEL
WITH DSE7320MKII_COLD START_EXPORT

MATERIAL : HEAT TREATMENT :

LINEAR IN mm	OVER	UNDER	0.5	3	6	30	120	400	1000	2000
F FINE	0.0XXX	+0.08	+0.05	+0.1	+0.15	+0.2	+0.3	+0.5	+0.8	+1.2
n MEDIUM	0.0XX	+0.1	+0.1	+0.2	+0.3	+0.5	+0.8	+1.2	+2	+3
c COARSE	0.0X	+0.2	+0.3	+0.5	+0.8	+1.2	+2	+3	+4	+6
v VERY COARSE	>	+0.5	+1	+1.5	+2.5	+4	+6	+8		

ANGULAR IN deg. LENGTH OF SHORTER SIDE OF THE ANGLE IN mm

OVER	UNDER	10	50	120	400
F FINE	0.0XXX	+1*	+0*30'	+0*20'	+0*10'
n MEDIUM	0.0XX	+1*	+0*30'	+0*15'	+0*10'
c COARSE	0.0X	+3*	+2*	+1*	+0*30'
v VERY COARSE	>	+3*	+2*	+1*	+0*30'

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2021	NAME	SIGN	DATE	FIRST USED -TRGR- MODEL
CAD ENGG.	SSS		22/10/21	SCALE N.T.S
DESIGNER	SSS		22/10/21	SHEET 6 OF 12
CHECKER	RBN		22/10/21	UNIT QTY. :
APPR. BY	RAK		22/10/21	WEIGHT : kg.

ER	LET	LOC	REVISION	DSNR	CKR	APPR	DATE
	A		TOGGLE SWITCH ADDED, IN GA DOOR CHANGE	PBK	HBP	RAK	14/02/22
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	D		HEATER TB SHIFTED TO RHS SIDE, 16 DIAMETER HOLE AND PGB GLAND ADDED IN RHS SIDE	PBK	HBP	RAK	07/04/22
	E		EARTHING CABLE SIZE UPDATED	PBK	HBP	RAK	13/07/22

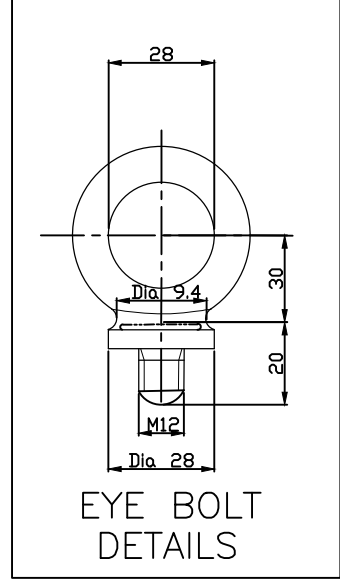
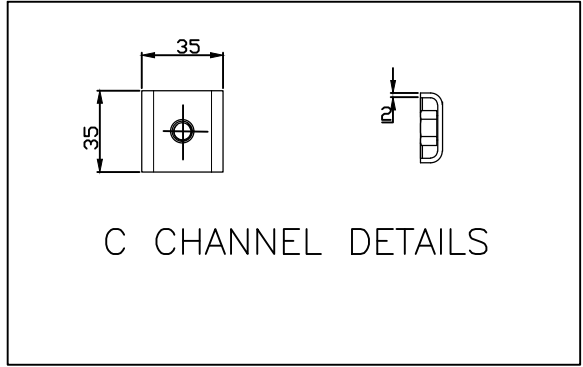
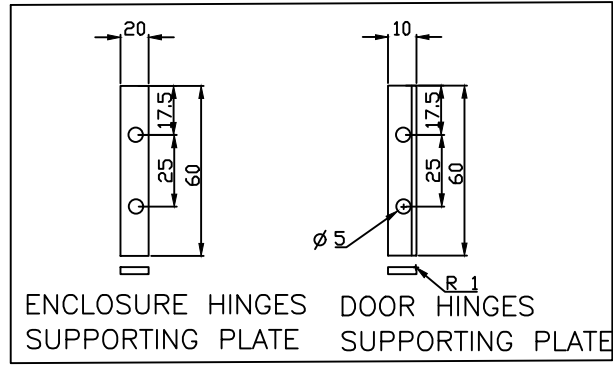
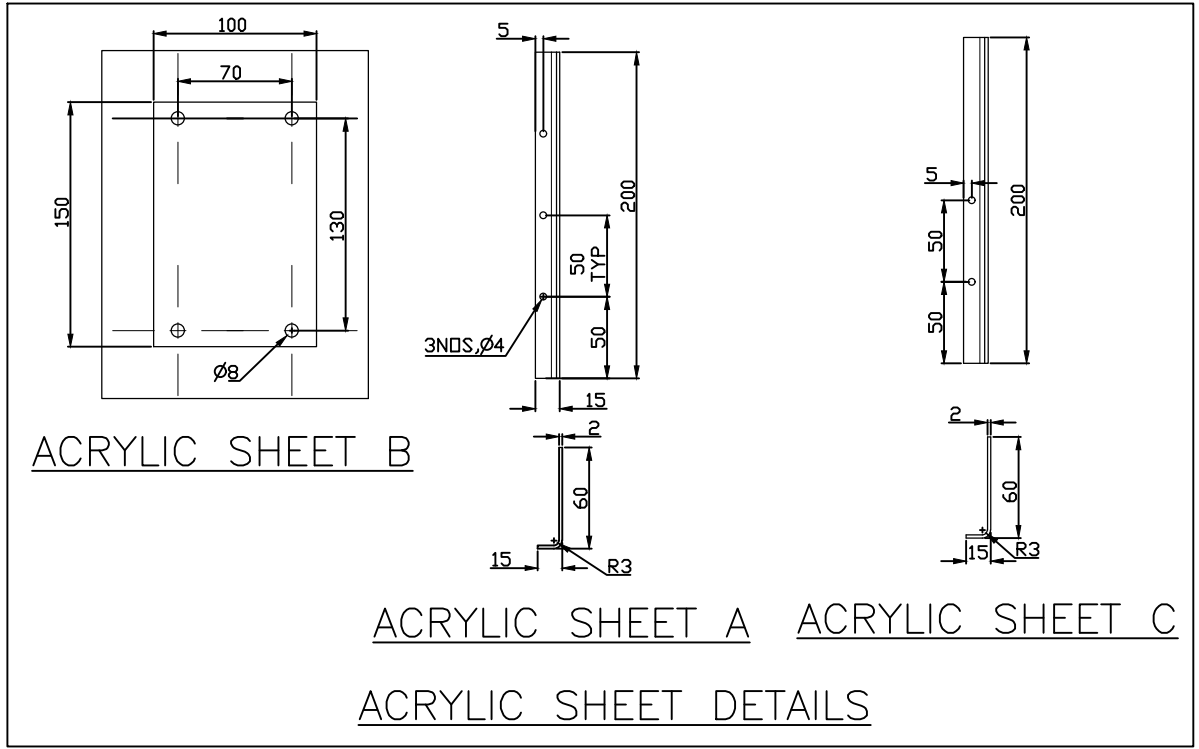
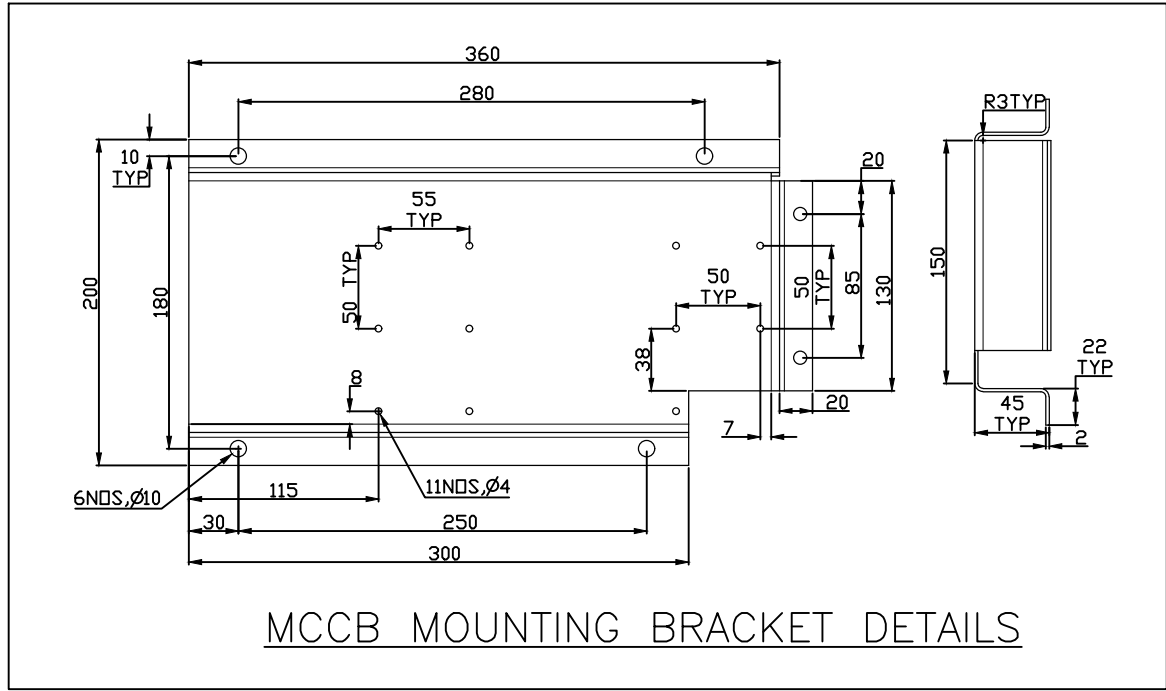
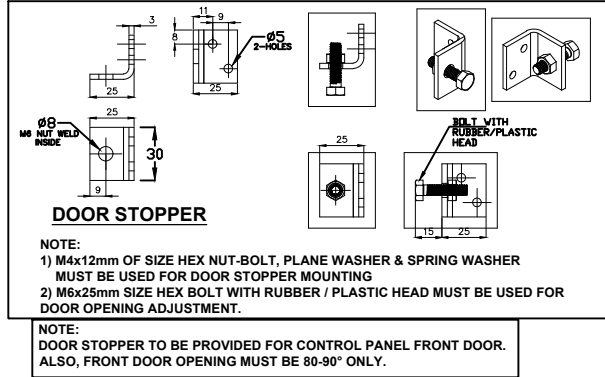


TABLE 1

BOLT SIZE	M3	M4	M5	M6	M8	M10	M12
GRADE OF BOLT	8.8	8.8	8.8	8.8	8.8	8.8	8.8
GRADE OF NUT	8	8	8	8	8	8	8
TORQUE	1.4+/-0.2	3.1+/-0.6	6.2+/-1.2	10.4+/-0.2	25+/-5	72+/-13	126+/-24

INDIVIDUAL PART DRAWING



MAHINDRA & MAHINDRA LIMITED
TRACTOR DIVISION
KANDIVLI(EAST), MUMBAI 400 101, INDIA.

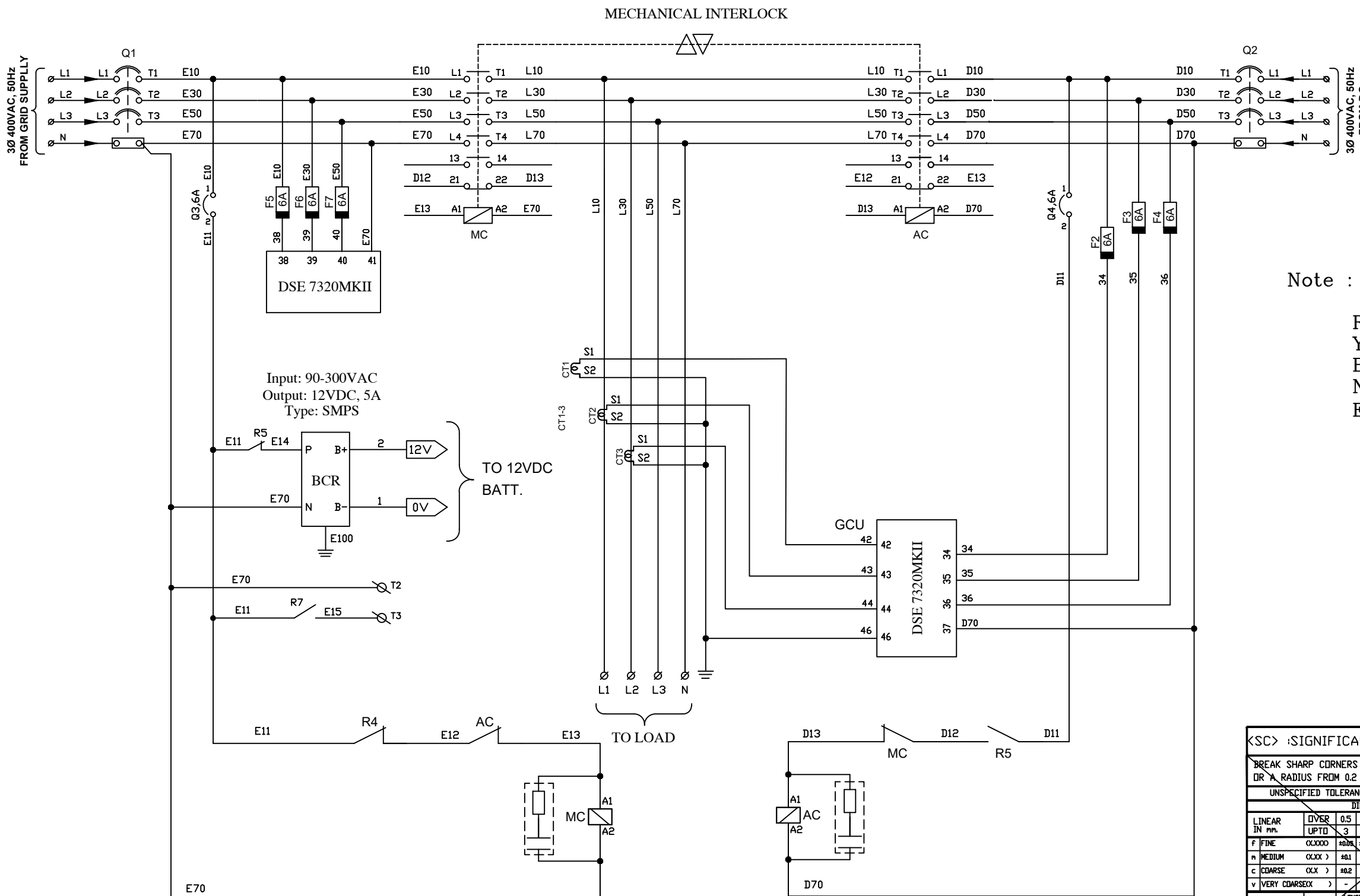
ER. / PROC. REQ. NO. : PART NO. :
PART NAME : 100KVA 3PH. 400V AMF PANEL WITH DSE7320MKII_COLD START_EXPORT

MATERIAL : HEAT TREATMENT :

2021	NAME	SIGN	DATE	FIRST USED - PRGR. MODEL
CAD ENGG.	SSS		22/10/21	
DESIGNER	SSS		22/10/21	SCALE N.T.S.
CHECKER	RBN		22/10/21	SHEET 7 OF 12
APPR. BY	RAK		22/10/21	UNIT QTY. : WEIGHT : kg.

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	E		EARTHING CABLE SIZE UPDATED	PBK	HBP	RAK	13/07/22



Note : Use Heat Shrink Sleeve on Power Cable as per below colour coding:
R Phase: Brown
Y Phase: Black
B Phase: Gray
Neutral: Blue
Earthing: Yellow/Green

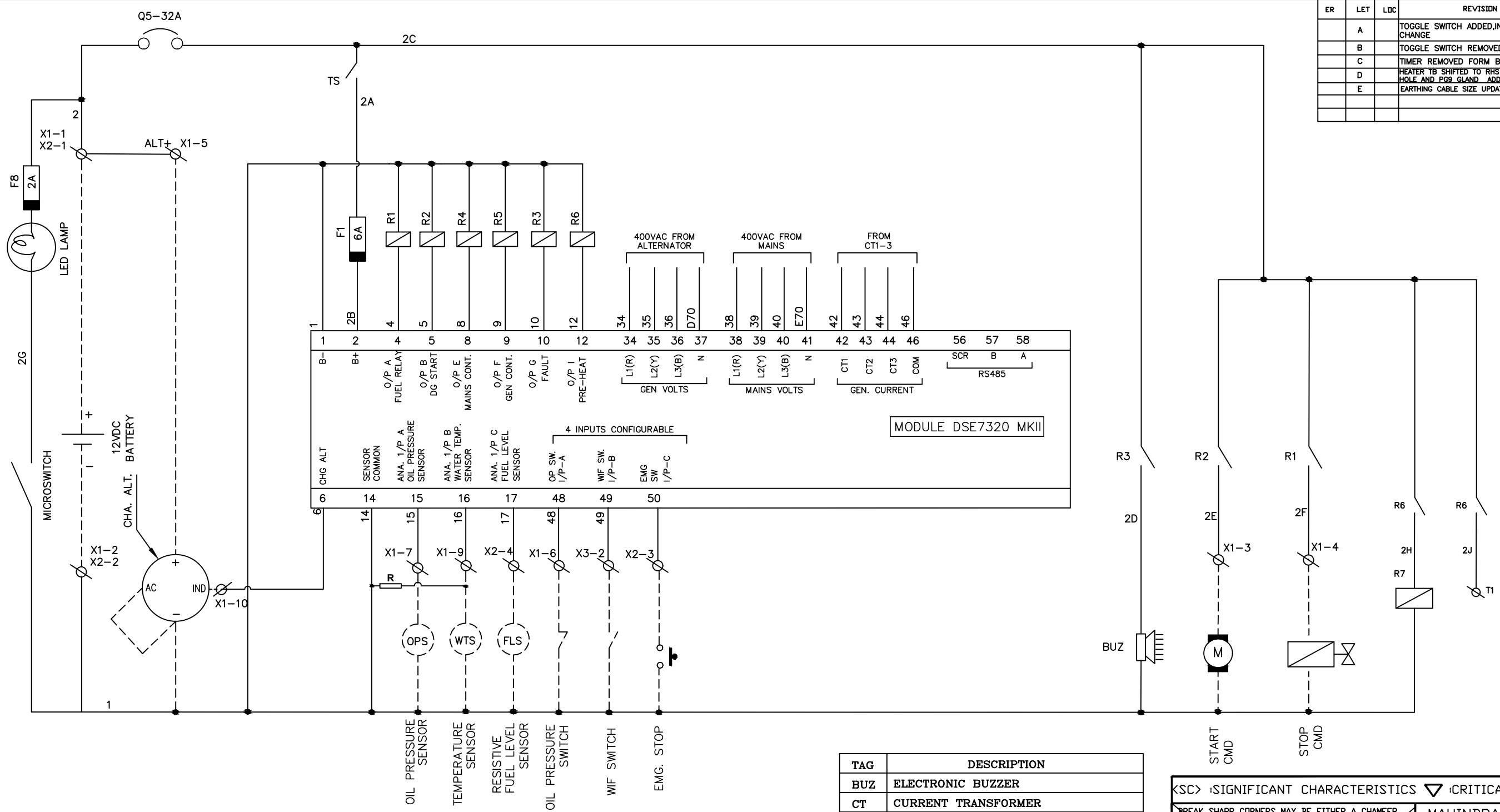
POWER CIRCUIT DRAWING

<S> : SIGNIFICANT CHARACTERISTICS <V> : CRITICAL CHARACTERISTICS BREAK SHARP CORNERS MAY BE EITHER A CHAMFER OR A RADIUS FROM 0.2 mm MIN. TO 1.0 mm MAX. UNSPECIFIED TOLERANCES AS PER ISO-2768-1:1989		MAHINDRA & MAHINDRA LIMITED TRACTOR DIVISION KANDIVLI(EAST), MUMBAI 400 101, INDIA.																																																																				
DIMENSIONS <table border="1"> <tr> <th>LINEAR IN mm</th> <th>DIVER</th> <th>0.5</th> <th>3</th> <th>6</th> <th>30</th> <th>120</th> <th>400</th> <th>1000</th> <th>2000</th> </tr> <tr> <td>UPTD</td> <td></td> <td>3</td> <td>6</td> <td>30</td> <td>120</td> <td>400</td> <td>1000</td> <td>2000</td> <td>4000</td> </tr> <tr> <td>F FINE</td> <td><CXXX></td> <td>+0.05</td> <td>+0.05</td> <td>+0.1</td> <td>+0.15</td> <td>+0.2</td> <td>+0.3</td> <td>+0.5</td> <td>-</td> </tr> <tr> <td>n MEDIUM</td> <td><CXX></td> <td>+0.1</td> <td>+0.1</td> <td>+0.2</td> <td>+0.3</td> <td>+0.5</td> <td>+0.8</td> <td>+1.2</td> <td>+2</td> </tr> <tr> <td>c COARSE</td> <td><CX></td> <td>+0.2</td> <td>+0.3</td> <td>+0.5</td> <td>+0.8</td> <td>+1.2</td> <td>+2</td> <td>+3</td> <td>+4</td> </tr> <tr> <td>v VERY COARSE</td> <td><X></td> <td>-</td> <td>+0.5</td> <td>+1</td> <td>+1.5</td> <td>+2.5</td> <td>+4</td> <td>+6</td> <td>+8</td> </tr> </table>		LINEAR IN mm	DIVER	0.5	3	6	30	120	400	1000	2000	UPTD		3	6	30	120	400	1000	2000	4000	F FINE	<CXXX>	+0.05	+0.05	+0.1	+0.15	+0.2	+0.3	+0.5	-	n MEDIUM	<CXX>	+0.1	+0.1	+0.2	+0.3	+0.5	+0.8	+1.2	+2	c COARSE	<CX>	+0.2	+0.3	+0.5	+0.8	+1.2	+2	+3	+4	v VERY COARSE	<X>	-	+0.5	+1	+1.5	+2.5	+4	+6	+8	E.R. / PROC. REQ. NO. : _____ PART NO. : _____ PART NAME : 100KVA 3PH. 400V AMF PANEL WITH DSE7320MKII_COLD START_EXPORT MATERIAL : _____ HEAT TREATMENT : _____								
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Note: POWER CABLE LUGS SHOULD BE DOWELLS MAKE

*** Note: USE PVC WHITE PRINTED FERRULE OF SIZE 3.5 MM

ER	LET	LOC	REVISION	DSNR	CKR	APPR	DATE
	A		TOGGLE SWITCH ADDED, IN GA DOOR CHANGE	PBK	HBP	RAK	14/02/22
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	E		EARTHING CABLE SIZE UPDATED	PBK	HBP	RAK	13/07/22



TAG	DESCRIPTION
BUZ	ELECTRONIC BUZZER
CT	CURRENT TRANSFORMER
GCU	GENERATOR CONTROL UNIT (DSE-7320MKII)
TS	TOGGLE SWITCH
Q1, Q2	MINIATURE CIRCUIT BREAKER
R1/R2	RELAY - FOR START OUT/SOLENOID
CONN.	CONNECTORS FOR ENGINE HARNESS
F	FUSE (CONTROL)
R3	FAILURE RELAY FOR BUZZER
R4/R5	MAINS/DG CONTACTOR RELAYS
MC	MAINS CONTACTOR
AC	ALTERNATOR CONTACTOR
BCR	BATTERY CHARGER
F1-8	FUSE TERMINAL BLOCK
RM	RELAY MODULE

MAHINDRA & MAHINDRA LIMITED
TRACTOR DIVISION
KANDIVLI (EAST), MUMBAI 400 101, INDIA.

ER. / PROC. REQ. NO. : PART NO. :
PART NAME : 100KVA 3PH. 400V AMF PANEL
WITH DSE7320MKII_COLD START_EXPORT

MATERIAL : HEAT TREATMENT :
2021 NAME SIGN DATE FIRST USED -FRGR- MODEL
CAD ENGG. SSS 22/10/21 SCALE N.T.S
DESIGNER SSS 22/10/21 SHEET 9 OF 12
CHECKER RBN 22/10/21 UNIT QTY. :
APPR. BY RAK 22/10/21 WEIGHT : kg.

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*** Note: USE PVC WHITE PRINTED FERRULE OF SIZE 3.5 MM

CONTROL CIRCUIT

R-1000Ω RESISTOR

CONNECTOR DETAILS

ER	LET	LOC	REVISION	DSNR	CKR	APPR	DATE
	A		TOGGLE SWITCH ADDED, IN GA DOOR CHANGE	PBK	HBP	RAK	14/02/22
	B		TOGGLE SWITCH REMOVED	PBK	HBP	RAK	17/02/22
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	E		EARTHING CABLE SIZE UPDATED	PBK	HBP	RAK	13/07/22

PANEL SIDE
10-PIN (MALE) CONNECTOR
250 SERIES MSSL
FROM BACK VIEW
(CABLE INSERTION VIEW)

CONNECTOR SEQUENCE	
PINS No	FERRULE No
1	B +VE
2	B -VE
3	START CMD
4	STOP CMD
5	ALT +VE
6	LOP SW
7	LOP SEN
8	SPARE
9	TEMP SEN
10	IND

X1

PANEL SIDE
8-PIN (MALE) CONNECTOR
250 SERIES MSSL
FROM BACK VIEW
(CABLE INSERTION VIEW)

CONNECTOR SEQUENCE	
PINS No	FERRULE No
1	BATT. +VE
2	BATT. -VE
3	EMG. STOP
4	FLS
5	SPARE
6	SPARE
7	SPARE
8	SPARE

X2

X3 DETAILS

TERMINAL INSERTION
DETAIL FOR 2 PIN(M) CONN.
WITH MALE PINS
MSSL 250 SERIES
PART NO: 6070-2471

*** Note: USE PVC WHITE PRINTED FERRULE OF SIZE 3.5 MM

CONNECTOR DETAILS

<SC> :SIGNIFICANT CHARACTERISTICS ▽ :CRITICAL CHARACTERISTICS

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UNSPECIFIED TOLERANCES AS PER ISO-2768-1:1989

MAHINDRA & MAHINDRA LIMITED
TRACTOR DIVISION
KANDIVLI(EAST), MUMBAI 400 101, INDIA.

E.R. / PROC. REQ. NO : PART NO. :

PART NAME : 100KVA 3PH. 400V AMF PANEL
WITH DSE7320MKII_COLD START_EXPORT

MATERIAL : HEAT TREATMENT :

LINEAR IN mm	DIVER	UPTD	0.5	3	6	30	120	400	1000	2000	4000
F FINE	0.0000	±0.05	±0.05	±0.1	±0.15	±0.2	±0.3	±0.5	±1	±2	±4
n MEDIUM	0.0000	±0.1	±0.1	±0.2	±0.3	±0.5	±0.8	±1.2	±2	±3	±4
c COARSE	0.0000	±0.2	±0.3	±0.5	±0.8	±1.2	±2	±3	±4	±6	±8
v VERY COARSE	>	±0.5	±1	±1.5	±2.5	±4	±6	±8	±12	±16	±20

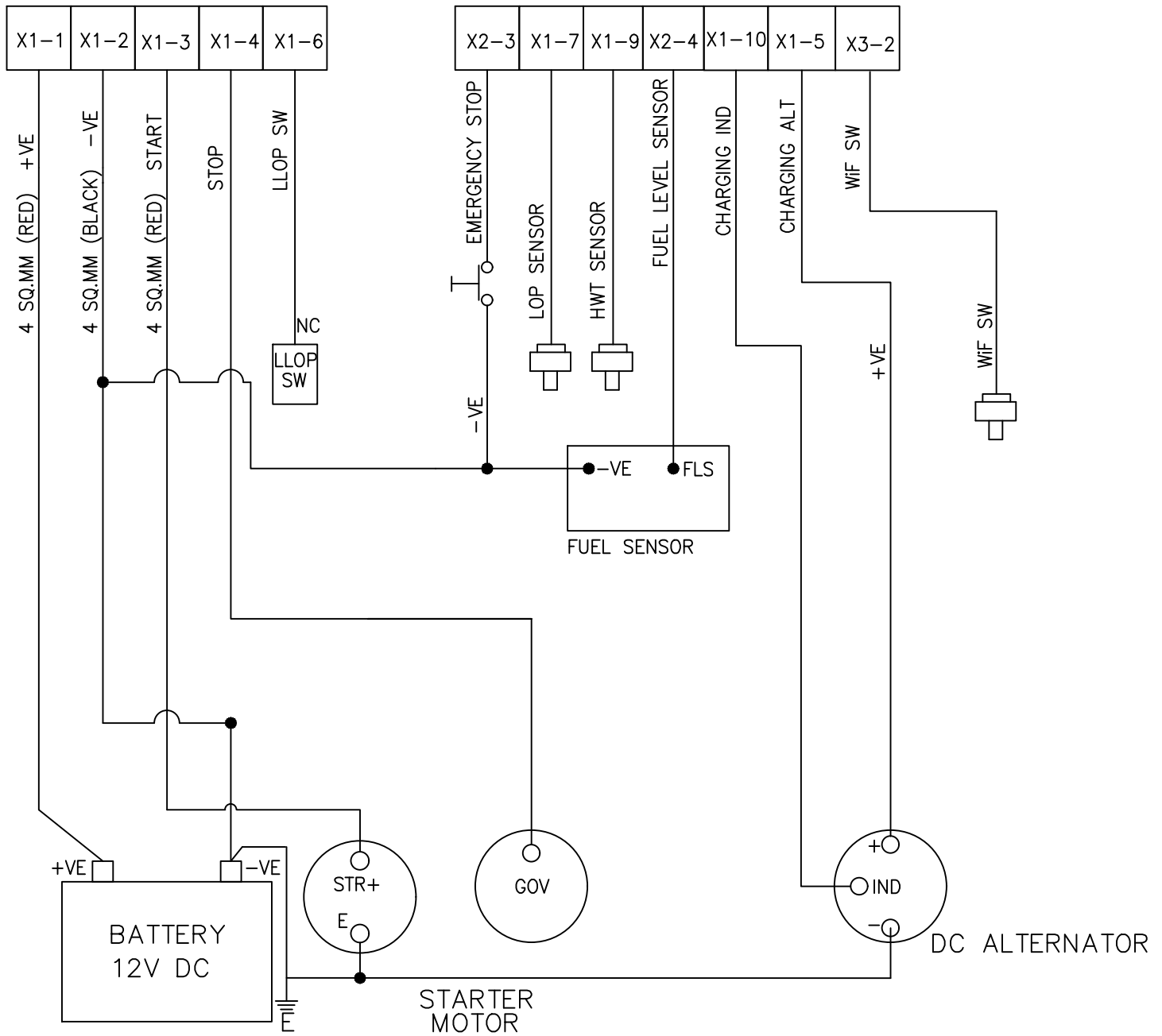
ANGULAR IN deg.	DIVER	UPTD	10	50	120	400
F FINE	0.0000	±1°	±0°30'	±0°20'	±0°10'	±0°5'
n MEDIUM	0.0000	±1°30'	±1°	±0°30'	±0°15'	±0°10'
c COARSE	0.0000	±3°	±2°	±1°	±0°30'	±0°20'
v VERY COARSE	>	±3°	±2°	±1°	±0°30'	±0°20'

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COMPUTER GENERATED DRAWING DO NOT CHANGE MANUALLY

IF IN DOUBT, ASK DO NOT SCALE DRG SIZE : ALL DIMENSIONS ARE IN mm. CHECK DRG WITH LATEST CHANGE

2021	NAME	SIGN	DATE	FIRST USED -FRGR- MODEL
CAD ENGG.	SSS		22/10/21	SCALE N.T.S
DESIGNER	SSS		22/10/21	SHEET 10 OF 12
CHECKER	RBN		22/10/21	UNIT QTY. :
APPR. BY	RAK		22/10/21	WEIGHT : kg.

ER	LET	LOC	REVISION	DSNR	CKR	APPR	DATE
	A		TOGGLE SWITCH ADDED, IN GA DOOR CHANGE	PBK	HBP	RAK	14/02/22
	B		TOGGLE SWITCH REMOVED	PBK	HBP	RAK	17/02/22
	C		TIMER REMOVED FORM BOM	PBK	HBP	RAK	04/03/22
	D		HEATER TB SHIFTED TO RHS SIDE, 16 DIAMETER HOLE AND PG9 GLAND ADDED IN RHS SIDE	PBK	HBP	RAK	07/04/22
	E		EARTHING CABLE SIZE UPDATED	PBK	HBP	RAK	13/07/22



ENGINE WIRING DIAGRAM

*** Note: USE PVC WHITE PRINTED FERRULE OF SIZE 3.5 MM

DIMENSIONS		E.R. / PROC REQD		PART NO.	
LINEAR IN mm	UP TO	3	6	30	120
F FINE	0.000	±0.05	±0.05	±0.1	±0.1
m MEDIUM	0.000	±0.1	±0.1	±0.2	±0.3
c COARSE	0.000	±0.2	±0.3	±0.5	±0.8
v VERY COARSE	>	±0.5	±1	±1.5	±2.5
ANGULAR IN deg.	UP TO	10	50	120	400
F FINE	0.000	±1°	±0°30'	±0°20'	±0°10'
m MEDIUM	0.000	±1°	±0°30'	±0°15'	±0°10'
c COARSE	0.000	±3°	±2°	±1°	±0°30'
v VERY COARSE	>	±3°	±2°	±1°	±0°30'

<SC> : SIGNIFICANT CHARACTERISTICS ▽ : CRITICAL CHARACTERISTICS
 BREAK SHARP CORNERS MAY BE EITHER A CHAMFER OR A RADIUS FROM 0.2 mm MIN. TO 1.0 mm MAX.
 UNSPECIFIED TOLERANCES AS PER ISO-2768-1:1989

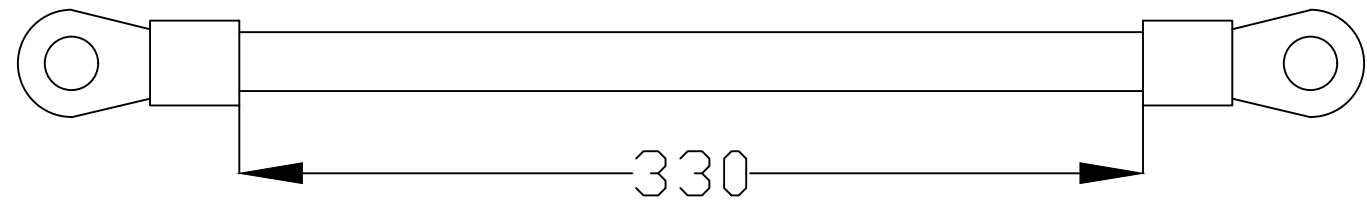
MAHINDRA & MAHINDRA LIMITED
 TRACTOR DIVISION
 KANDIVLI(EAST), MUMBAI 400 101, INDIA.

PART NAME : 100KVA 3PH. 400V AMF PANEL WITH DSE7320MKII_COLD START_EXPORT
 MATERIAL : _____ HEAT TREATMENT : _____

2021	NAME	SIGN	DATE	FIRST USED - PRGR. MODEL
CAD ENGG.	SSS		22/10/21	SCALE N.T.S
DESIGNER	SSS		22/10/21	SHEET 11 OF 12
CHECKER	RBN		22/10/21	UNIT QTY. :
APPR. BY	RAK		22/10/21	WEIGHT : _____ kg.

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 COMPUTER GENERATED DRAWING / DO NOT CHANGE MANUALLY
 IF IN DOUBT, ASK DO NOT SCALE DRG SIZE : _____ ALL DIMENSIONS ARE IN mm. CHECK DRG WITH LATEST CHANGE

ER	LET	LOC	REVISION	DSNR	CKR	APPR	DATE
	A		TOGGLE SWITCH ADDED,IN GA DOOR CHANGE	PBK	HBP	RAK	14/02/22
	B		TOGGLE SWITCH REMOVED	PBK	HBP	RAK	17/02/22
	C		TIMER REMOVED FORM BOM	PBK	HBP	RAK	04/03/22
	D		HEATER TB SHIFTED TO RHS SIDE,16DIAMETER HOLE AND PG9 GLAND ADDED IN RHS SIDE	PBK	HBP	RAK	07/04/22
	E		EARTHING CABLE SIZE UPDATED	PBK	HBP	RAK	13/07/22



NOTE:

- 1) SIZE OF CABLE 10SQ.MM.
- 2) ALL CABLES SHOULD BE FINOLEX/POLYCAB/BONTON/LAPP/HAVELLS MAKE HRFR TYPE
- 3) ALL LUGS SHOULD BE DOWELLS MAKE.
- 4) ALL LUGS SHOULD BE CRIMPED PROPERLY.
- 5) SHRINKING SLEEVE YELLOW/GREEN
- 6) CABLE TO BE IN YELLOW/GREEN COLOR
- 7) LUG ID SHOULD OF 10MM

EARTHING CABLE

<SC> :SIGNIFICANT CHARACTERISTICS		▽ :CRITICAL CHARACTERISTICS	
BREAK SHARP CORNERS MAY BE EITHER A CHAMFER OR A RADIUS FROM 0.2 mm MIN. TO 1.0 mm MAX.		MAHINDRA & MAHINDRA LIMITED TRACTOR DIVISION KANDIVLI(EAST), MUMBAI 400 101, INDIA.	
UNSPECIFIED TOLERANCES AS PER ISO-2768-1:1989		E.R. / PROC.REQNO : PART NO. :	
DIMENSIONS		PART NAME : 100KVA 3PH. 400V AMF PANEL WITH DSE7320MKII_COLD START_EXPORT	
LINEAR IN mm	OVER UPTD 3 6 30 120 400 1000 2000 4000	MATERIAL : HEAT TREATMENT :	
F FINE	±0.05 ±0.05 ±0.1 ±0.15 ±0.2 ±0.3 ±0.5 -	2021 NAME SIGN DATE FIRST USED -TRGR- MODEL	
n MEDIUM	±0.1 ±0.1 ±0.2 ±0.3 ±0.5 ±0.8 ±1.2 ±2	CAD ENGG. SSS 22/10/21 SCALE N.T.S	
c COARSE	±0.2 ±0.3 ±0.5 ±0.8 ±1.2 ±2 ±3 ±4	DESIGNER SSS 22/10/21 SHEET 12 OF 12	
v VERY COARSE	- ±0.5 ±1 ±1.5 ±2.5 ±4 ±6 ±8	CHECKER RBN 22/10/21 UNIT QTY. :	
ANGULAR IN deg.	OVER UPTD 10 50 120 400	APPR. BY RAK 22/10/21 WEIGHT : kg.	
F FINE	±1° ±0°30' ±0°20' ±0°10' ±0°5'	IF IN DOUBT, ASK DO NOT SCALE DRG SIZE : ALL DIMENSIONS ARE IN mm. CHECK DRG WITH LATEST CHANGE	
n MEDIUM	±1°30' ±1° ±0°30' ±0°15' ±0°10'		
c COARSE	±3° ±2° ±1° ±0°30' ±0°20'		
v VERY COARSE	-		