

Type of Panel	AMF CONTROL PANEL
DG Rating	7.5-35kVA
AC Voltage System	3PH.,400VAC,50Hz
Control Voltage	12VDC
Engine Make	Mahindra & Mahindra
Genset Controller Used	DSE-4520-R1
Project	EXPORT

(A)

TABLE OF CONTENTS	
PAGE	TITLE
1 OF 11	COVER SHEET
2 OF 11	SWITCHGEAR COMPONENT SELECTION CHART
3 OF 11	BILL OF MATERIAL
4 OF 11	DSE-4520-R1 CONTROLLER CONFIGURATION DETAILS
5 OF 11	DSE-4520-R1 CONTROLLER CONFIGURATION DETAILS
6 OF 11	GENERAL ARRANGEMENT DRAWING
7 OF 11	POWER CIRCUIT DRAWING
8 OF 11	CONTROL CIRCUIT DRAWING
9 OF 11	CONNECTOR DETAIL, SYMBOLS & NOMENCLATURE
10 OF 11	ENGINE WIRING DIAGRAM
11 OF 11	EARTHING CABLE

LET	LOC	REVISION	DSNR	CKR	APPR	DATE
A		RATING CHANGED,3S CONNECTOR CONNECTION ADDED IN CIRCUIT	PBK	RBN	RAK	29/10/21
B		TIMER T1 SETTING UPDATED AS 3 MIN.	SSS	RBN	RAK	24/11/21

L1-PROTO DEVELOPMENT
DRAWING DATE: 24/11/2021
DESIGNER: SHITAL SURWASE
CHECKER : RAJI BABU NAIDU
APPROVED BY: RAJESH KALE

COVER SHEET

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TABLE A (3Ø SWITCHGEAR COMPONENT SELECTION CHART)																		
SR.NO.	RATING KVA	PHASE	MCB	CONTACTOR	CT RATIO	POWER CABLE (UNINYVIN)	CONTROL PANEL M&M PART NO.											
							0	0	7	7	1	0	0	8	3	H	9	1
1	7.5	3	3P,16A	4P,20A	30/5A	U-18	0	0	7	7	1	0	0	8	3	H	9	1
2	10.0	3	3P,16A	4P,20A	30/5A	U-18	0	0	7	7	1	0	0	1	9	H	9	1
3	12.5	3	3P,25A	4P,20A	30/5A	U-16	0	0	7	7	1	0	0	8	4	H	9	1
4	15.0	3	3P,25A	4P,25A	30/5A	U-14	0	0	7	7	1	0	0	2	0	H	9	1
5	20	3	3P,32A	4P,32A	50/5A	U-12	0	0	7	7	1	0	0	2	1	H	9	1
6	25	3	3P,40A	4P,40A	50/5A	U-12	0	0	7	7	1	0	0	8	5	H	9	1
7	30	3	3P,50A	4P,50A	75/5A	U-10	0	0	7	7	1	0	0	2	2	H	9	1
8	35	3	3P,63A	4P,60A	75/5A	U-10	0	0	7	7	1	0	0	8	6	H	9	1

KVA RATING	PHASE	MCB	M&M PART NO	CONTACTOR	M&M PART NO	MECHANICAL INTERLOCK	M&M PART NO	SURGE SUPPRESSOR	M&M PART NO	ADD ON BLOCK 1NO+1NC	M&M PART NO
7.5	3	3P,16A (BB30160C)	006025272H91	4P,20A (LC1E06004M5WB)	007709402H91	LAEM1	007709400H91	LAERCU	007709398H91	LAEN11	007709397H91
10	3		006025212H91		007709403H91						
12.5	3	3P,25A (BB30250C)	006025212H91	4P,25A (LC1E09004M5WB)	007709403H91						
15	3	3P,32A (BB30320C)	006025213H91	4P,32A (LC1E12004M5WB)	007709407H91						
20	3	3P,40A (BB30400C)	006025214H91	4P,40A (LC1E18004M5WB)	007709408H91						
25	3	3P,50A (BB30500C)	006025215H91	4P,50A (LC1E25004M5WB)	007709404H91						
30	3	3P,63A (BB30630C)	006025273H91	4P,60A (LC1E38004M5WB)	007709405H91						
35	3										

RATING KVA	CT RATIO	M&M PART NO.
7.5	30/5A, CL-1, 2.5VA	006032827H91
10		
12.5		
15	50/5A, CL-1, 2.5VA	006031740H91
20		
25	75/5A, CL-1, 2.5VA	006032995H91
30		
35		

SWITCHGEAR COMPONENT SELECTION CHART

LET	LOC	REVISION	DSNR	CKR	APPR	DATE
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B		TIMER T1 SETTING UPDATED AS 3 MIN.	SSS	RBN	RAK	24/11/21

CURRENT RATINGS			
SR NO.	RATING KVA	FULL-LOAD CURRENT	OVERLOAD CURRENT
1	7.5	11A	12A
2	10	14A	16A
3	12.5	18A	20A
4	15	22A	24A
5	20	29A	32A
6	25	36A	40A
7	30	43A	48A
8	35	50A	56A

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DIMENSIONS LINEAR IN mm. OVER UPTO 0.5 3 6 30 120 400 1000 2000 3 6 30 120 400 1000 2000 4000 T FINE (X.XXX) 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100 M MEDIUM (X.XX) 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100 C COARSE (X.X) 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100 V VERY COARSE () 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100		E.R / PROC.REQ.NO: HGF PART NO.: REFER SHEET NO.2 PART NAME: 7.5-35kVA, 3PH., AMF PANEL COLD START WITH DSE-4520-R1 MATERIAL: _____ HEAT TREATMENT: _____	
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SR NO.	DESCRIPTION OF COMPONENT	MODEL	MAKE	QTY	M&M PART NO
1	DC RELAY CARD FOR R1/R2/R3/R4, 4-CH. WITH C/O 12VDC-70A-2 NOS, 5A-2 NO. RELAY	UL5302NO-C-DP-72	UL AUTOMATION OEN	1	006034573H1
2	BATTERY CHARGER 12VDC; 5A	CB1205A	SEDEMAC	1	007709451H91
3	CURRENT TRANSFORMER	(Refer Sheet 2 Table C)	NEWTEK	3	-
4	DOOR LOCK	-	DARSHANA	1	-
5	DOOR HINGES	-	DARSHANA	2	-
6	DOOR STOPPER	-	SONAX	1	-
7	ENCLOSURE-MADE OF CRCA SHEET	(Refer sheet no. 6)	-	1	-
8	ELECTRONIC BUZZER-BASE MOUNTING	12VDC	IOTA	1	006025640H91
9	FUSE TERMINAL BLOCK	4Sq.mm	CONNECTWELL	8	-
10	GLASS FUSE	2A	PROTECTRON	1	-
11	GLASS FUSE	6A	PROTECTRON	7	-
12	GENERATOR CONTROL UNIT	DSE-4520-R1	DEEPSEA	1	006040370H91
13	TOGGLE SWITCH 15A 28V DC	KT 1521BY	KAYCEE	1	-
14	MCB 1 POLE-32A."C" CURVE WITH 10KA BREAKING	BB10320C	L&T	1	006024461H91
15	MCB 1 POLE-6A."C" CURVE WITH 10KA BREAKING	BB10060C	L&T	2	006029656H91
16	MCB FOR DG INCOMING/EB INCOMING; 'C' Curve, 10KA	Refer Sheet 2 (Table B)	L&T	2	-
17	POWER CONTACTOR, 4POLE WITH 220VAC COIL SUPPLY	Refer Sheet 2 (Table B)	SCHNEIDER	2	-
18	12V DC, 5A RELAY CARD, 2 CH, 2C/O	UL02-2C	UL AUTOMATION	1	006029707H91
19	CONNECTOR 6PIN 250 SERIES	250 SERIES	MSSL	1	-
20	CONNECTOR 8PIN,250 SERIES	250 SERIES	MSSL	1	-
21	CONNECTOR 10PIN,250 SERIES	250 SERIES	MSSL	1	-
22	TERMINAL BLOCK.4P,63A	-	POWERMATE	2	-
23	MICROSWITCH	2A, 250V	SURDHI	1	006019613H91
24	LED LAMP 61.2(L)x46.5(W)	12VDC-1W(OVP)	SAM INTEGRATIONS	1	006025268H91
25	PVC GLAND FOR HARNESS CONN.	25 MM	-	1	-
26	PVC POWER CABLE GLAND WITH CAP FOR MAINS & LOAD	PG29	JIGO	2	-
27	ADD ON BLOCK (1NO+1NC)	Refer Sheet 2 (Table B)	SCHNEIDER	2	Refer Table 2
28	MECHANICAL INTERLOCK	Refer Sheet 2 (Table B)	SCHNEIDER	1	Refer Table 2
29	SURGE SUPPRESSOR	Refer Sheet 2 (Table B)	SCHNEIDER	2	Refer Table 2
30	RESISTOR	240Ω±0.5%	-	1	-
31	AUTOMOTIVE RELAY 1NO	741-12-1A-2SA	OEN	1	007710327H91
32	TERMINAL BLOCK	6 SQ.MM	CONNECTWELL	1	-
33	ELECTRONIC TIMER	150DT4(R8)	GIC	1	-
34	EARTHING CABLE	Refer Sheet 11	-	3	-

LET	LOC	REVISION	DSNR	CKR	APPR	DATE
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TAG	DESCRIPTION
BUZ	ELECTRONIC BUZZER
CT	CURRENT TRANSFORMER
GCU	GENERATOR CONTROL UNIT (DSE-4520-R1)
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	AMF RELAYS
MC	MAINS CONTACTOR
AC	ALTERNATOR CONTACTOR
BCR	BATTERY CHARGER
F1-8	FUSED TERMINAL BLOCK
RM	RELAY MODULE

CABLE SIZE TABLE	CABLE SIZE & Specification
BATTERY +VE BATTERY-VE	4 Sq.mm
CURRENT TRANSFORMER	1.5 Sq.mm
CONTROL SIGNAL	0.75 Sq.mm
START,STOP SIGNAL	4 Sq.mm
BATT. +VE BATT.-VE FOR BATT. CHARGER & PANEL HEATER & TIMER CONN.	2.5 Sq.mm
POWER CABLE	Refer Sheet 2 (Table A)

FINOLEX/POLYCAB/BONTON /RR CABLE/LAPP/HAVELS PVC INSULATED SINGLE CORE MULTISTAND FR CABLE
MIRACLE MAKE UNINYVIN CABLE AS PER BSG177 STD.

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

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

REFER SHEET NO.2

PART NAME: **7.5-35kVA, 3PH., AMF PANEL**
COLD START WITH DSE-4520-R1

MATERIAL: _____ HEAT TREATMENT: _____

T	DATE	NAME	SIGN	DATE	FIRST USED TRCR. MODEL
CAD ENGG	SSS			20/10/21	
DESIGNER	SSS			20/10/21	SCALE N.T.S
CHECKER	RBN			20/10/21	SHEET 3OF 11
APPR. BY	RAK			20/10/21	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

BILL OF MATERIAL

1	METERING FACILITY AVAILABLE IN THE GENSET CONTROLLER DSE-4520-R1	
	Voltage (Phase to Neutral)	
	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 : 140 (w) x 113 (h) x 43 (d) Cutout : 118 (w) x 92 (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: 20/55 °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	M&M	1.5 bar
	Input-B	Coolant temp. sensor	M&M	108 °C
	Input-C	Fuel Level Sensor	Resistive LR45	10%
5	Digital Input Assignment			
	Input-A	Not used		
	Input-B	COOLANT TEMP. SWITCH		
	Input-C	Not used		
	Input-D	Emergency Stop		

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DSE-4520-R1 CONTROLLER CONFIGURATION DETAILS

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6	Digital Output Assignment		
	OUTPUT-A	Fuel Relay	
	OUTPUT-B	Start Relay	
	OUTPUT-C	Energize to Stop	
	OUTPUT-D	De-Energize Mains Contactor (Close)	
	OUTPUT-E	Energize Alternator Contactor (Close)	
	OUTPUT-F	AUDIBLE ALARM RELAY	
7	Timer Setting made on the controller		
a)	Start Timer	Mains Transient Delay	5.0 Sec
		Start Delay	5.0 sec
		Delay in Crank	2.0 Min
		Pre-Heat	0 Sec
		Cranking Time	45.0 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
8	Generator Options	No. of Pole Selection	4 Pole
		AC System	3Ph.,4Wire

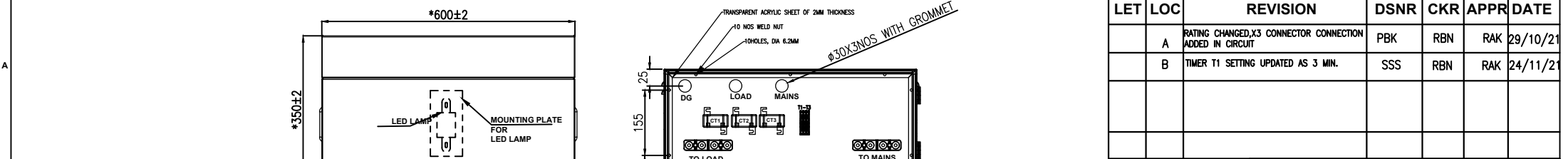
9	Generator Voltage	Under Voltage Shutdown	320V
		Loading Voltage	380V
		Nominal Voltage	400V
		Over Voltage Shutdown	440V
10	Generator Frequency	Under Frequency Shutdown	45 Hz
		Loading Frequency	48 Hz
		Nominal Frequency	50 Hz
		Over Frequency Shutdown	55 Hz
11	Generator Current	CT Primary	(Refer Sheet 2)
		Full Load Rating	(Refer Sheet 2)
		Over Current Alarm - 110%	(Refer Sheet 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	8.5VDC
		Under Voltage Return	9.0VDC
		Under Voltage Delay	5.0 Sec
		Over Voltage Return	15.0VDC
		Over Voltage Warning	15.5VDC
		Over Voltage Delay	5.0 Sec
16	Mains Options	AC System	3Ph.,4Wire
17	Mains Voltage	Under Voltage Shutdown	320V
		Loading Voltage	380V
		Over Voltage Shutdown	440V
		Over Frequency Shutdown	55 Hz
18	Mains Frequency	Under Frequency Shutdown	45 Hz
		Loading Frequency	48 Hz
		Nominal Frequency	50 Hz
		Over Frequency Shutdown	55 Hz

LET	LOC	REVISION	DSNR	CKR	APPR	DATE
A		RATING CHANGED,3S CONNECTOR CONNECTION ADDED IN CIRCUIT	PBK	RBN	RAK	29/10/21
B		TIMER T1 SETTING UPDATED AS 3 MIN.	SSS	RBN	RAK	24/11/21

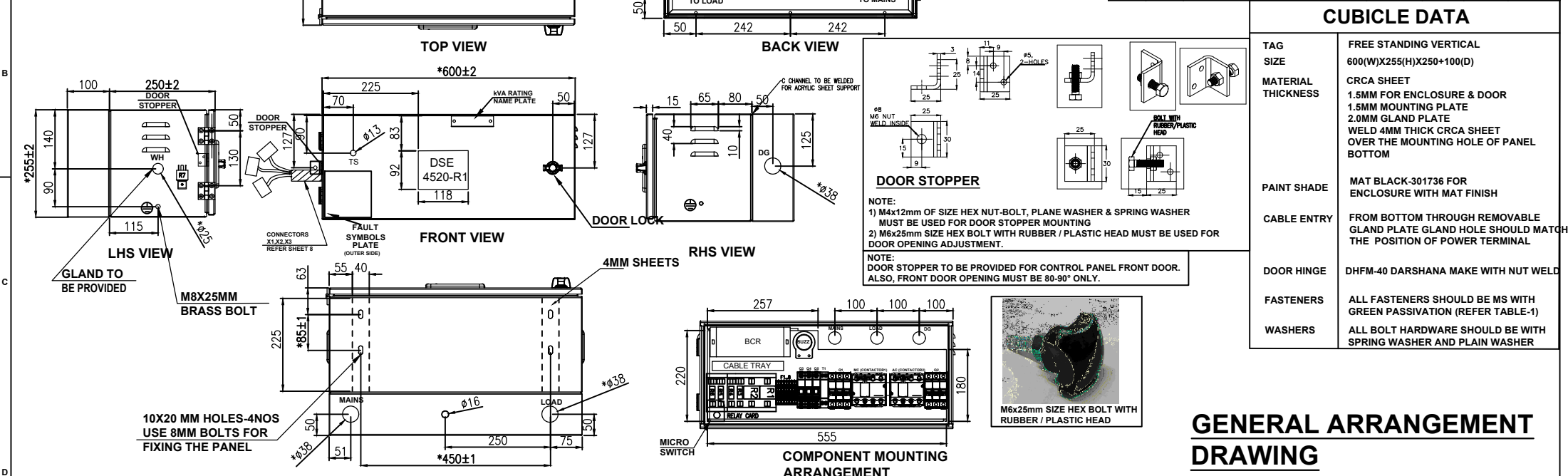
DSE-4520-R1 CONTROLLER CONFIGURATION DETAILS

<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			
DIMENSIONS		E.R / PROC.REQ.NO. : HGF	
LINEAR IN mm.	OVER UPTO	0.5 3 6 30 120 400 1000 2000	PART NO. : REFER SHEET NO.2
T FINE (X.XXX)	HFN	25.1 25.1 25.1 25.1 25.1 25.1 25.1 25.1	PART NAME : 7.5-35kVA, 3PH., AMF PANEL COLD START WITH DSE-4520-R1
M MEDIUM (X.XX)	HFN	25.1 25.1 25.1 25.1 25.1 25.1 25.1 25.1	MATERIAL : HEAT TREATMENT :
C COARSE (X.X)	HFN	25.1 25.1 25.1 25.1 25.1 25.1 25.1 25.1	E.R / PROC.REQ.NO. : 2021
V VERY COARSE ()	HFN	25.1 25.1 25.1 25.1 25.1 25.1 25.1 25.1	NAME SSS
ANGULAR IN deg.	OVER UPTO	- 10 50 120 400	SIGN SSS
T FINE (X.XXX)	HFN	25.1 25.1 25.1 25.1 25.1 25.1 25.1 25.1	DATE 20/10/21
M MEDIUM (X.XX)	HFN	25.1 25.1 25.1 25.1 25.1 25.1 25.1 25.1	FIRST USED TRCR. MODEL N.T.S
C COARSE (X.X)	HFN	25.1 25.1 25.1 25.1 25.1 25.1 25.1 25.1	SCALE 1:1
V VERY COARSE ()	HFN	25.1 25.1 25.1 25.1 25.1 25.1 25.1 25.1	SHEET 5 OF 11
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	APPR.BY RAK	UNIT QTY. : —
IF IN DOUBT, ASK	DO NOT SCALE	DRG SIZE :	WEIGHT : kg.
ALL DIMENSIONS ARE IN mm.		CHECK DRG WITH LATEST CHANGE	

0 1 2 3 4 5 6 7 8 9

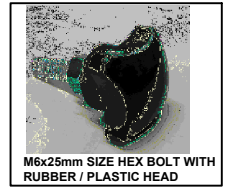
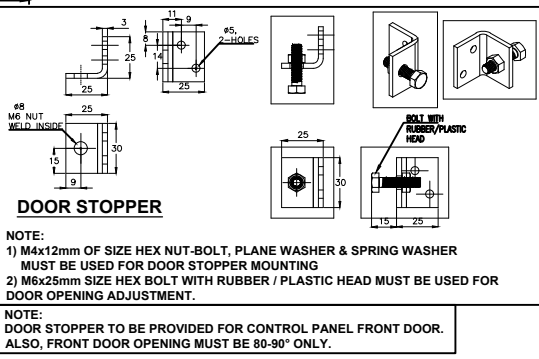


LET	LOC	REVISION	DSNR	CKR	APPR	DATE
	A	RATING CHANGED, X3 CONNECTOR CONNECTION ADDED IN CIRCUIT	PBK	RBN	RAK	29/10/21
	B	TIMER T1 SETTING UPDATED AS 3 MIN.	SSS	RBN	RAK	24/11/21



CUBICLE DATA

TAG SIZE	FREE STANDING VERTICAL 600(W)X255(H)X250+100(D)
MATERIAL THICKNESS	CRCA SHEET 1.5MM FOR ENCLOSURE & DOOR 1.5MM MOUNTING PLATE 2.0MM GLAND PLATE WELD 4MM THICK CRCA SHEET OVER THE MOUNTING HOLE OF PANEL BOTTOM
PAINT SHADE	MAT BLACK-301736 FOR ENCLOSURE WITH MAT FINISH
CABLE ENTRY	FROM BOTTOM THROUGH REMOVABLE GLAND PLATE GLAND HOLE SHOULD MATCH THE POSITION OF POWER TERMINAL
DOOR HINGE	DHFM-40 DARSHANA MAKE WITH NUT WELD
FASTENERS	ALL FASTENERS SHOULD BE MS WITH GREEN PASSIVATION (REFER TABLE-1)
WASHERS	ALL BOLT HARDWARE SHOULD BE WITH SPRING WASHER AND PLAIN WASHER



GENERAL ARRANGEMENT DRAWING

- NOTE:**
1. LENGTH OF THE GLAND WIRE, OUT OF PANEL SHOULD BE 400+50mm
 2. NO SHARP EDGES TO BE PRESENT
 3. TOLERANCE FOR ALL DIMENSION SHOULD BE CONSIDERED AS ±1mm.
 4. DOOR LOCK OPENING AND CLOSING IS TO BE ENSURED AT VENDOR END BEFORE DISPATCH.
 5. PANEL ENCLOSURE IS PROVIDED WITH VERTICAL 'C' BEND [TOP, BACK & BOTTOM] & SIDE PLANES ARE WELDED TO IT.
 6. ALL FASTENER USED SHOULD BE GREEN PASSIVATED
 7. FAULT SYMBOL MUST BE ON REVITED BLACK ANODIZED PLATE, FIXED ON THE OUTER SIDE OF DOOR.
 8. GLAND HOLES SHOULD MATCH THE POSITION OF POWER TERMINALS
 9. DOOR HINGE TYPE DHFM40 DARSHANA MAKE. NUT WELD PANEL INSIDE FOR HINGE.
 10. ADD DOOR STOPPER ON SIDE VIEW-1NO.
 11. THE DIMENSIONS MARKED WITH (*) ARE CRITICAL TO QUALITY.
 12. ONLY YELLOW-GREEN WIRES MUST BE USED FOR BODY EARTHING .
 13. AT ONE NODE/JUNCTION POINT CONNECT TWO EARTHING CABLES ONLY.
 14. MOUNTING PLATE ARRANGEMENT IS TENTATIVE THIS MAY OR MAY NOT CHANGES.

CABLE ENTRY DETAILS FOR LOAD & MAINS (LS ALT)

Sr.No	kVA	Gland Hole Details	Gland Details
1	7.5-35	Ø38	PG29 (2Nos.)

ENGINE & CANOPY WIRING HARNESS: Ø25 PG16(1No.)

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

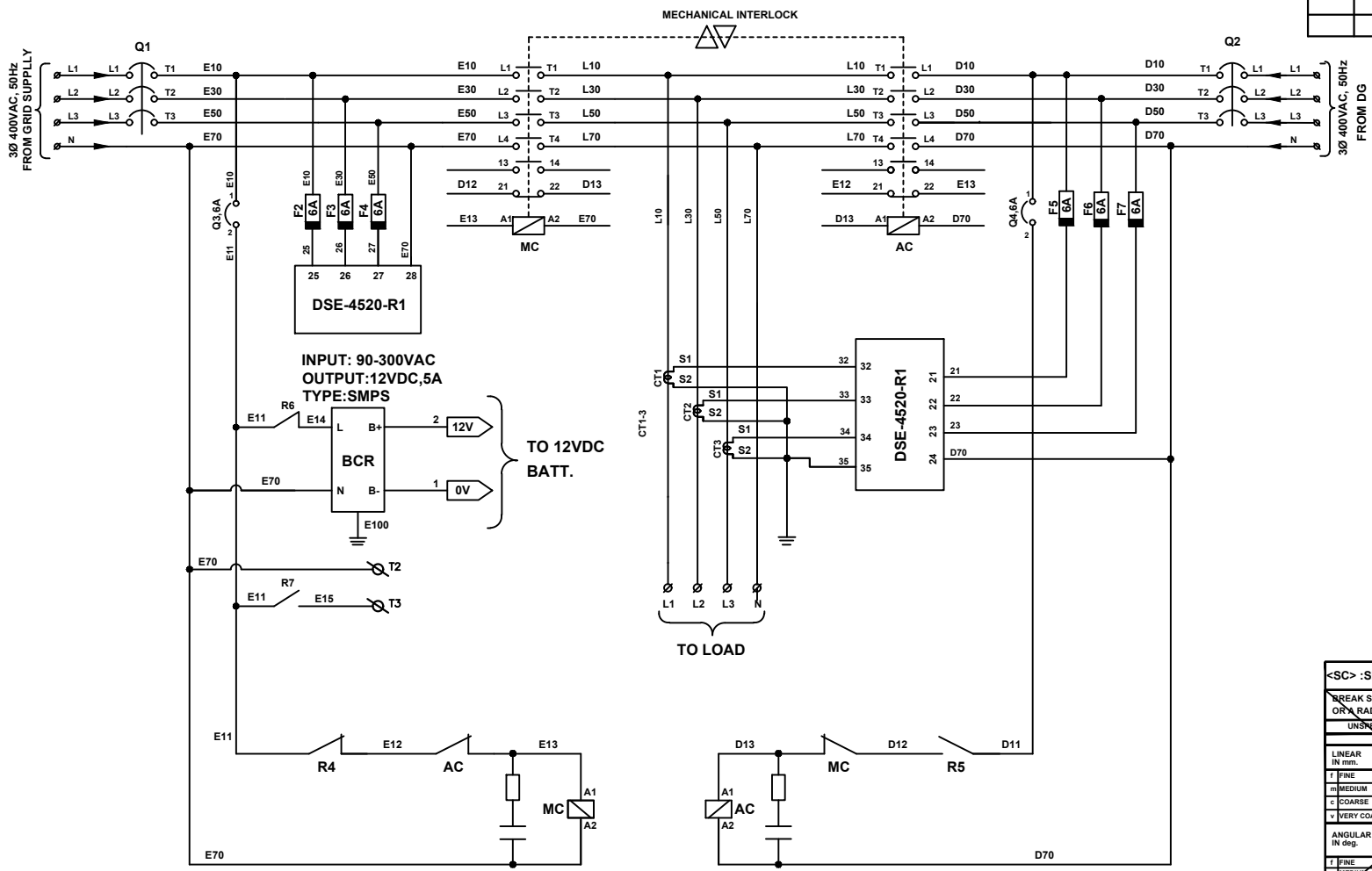
MAHINDRA & MAHINDRA LIMITED
TRACTOR DIVISION
KANDIVLI(EAST), MUMBAI-400 101, INDIA.

10-35kVA, 3PH., AMF PANEL WITH DSE-4520-R1

2021 NAME SIGN DATE FIRST USED TRCR. MODEL
CAD ENGG SSS 24/09/21
DESIGNER SSS 24/09/21 SCALE
CHECKER HBP 24/09/21 SHEET 6 OF 10
APPR BY RAK 24/09/21 UNIT QTY.:
WEIGHT: kg.

ALL DIMENSIONS ARE IN mm. CHECK DRG WITH LATEST CHANGE

LET	LOC	REVISION	DSNR	CKR	APPR	DATE
A		RATING CHANGED, 3X CONNECTOR CONNECTION ADDED IN CIRCUIT	PBK	RBN	RAK	29/10/21
B		TIMER T1 SETTING UPDATED AS 3 MIN.	SSS	RBN	RAK	24/11/21



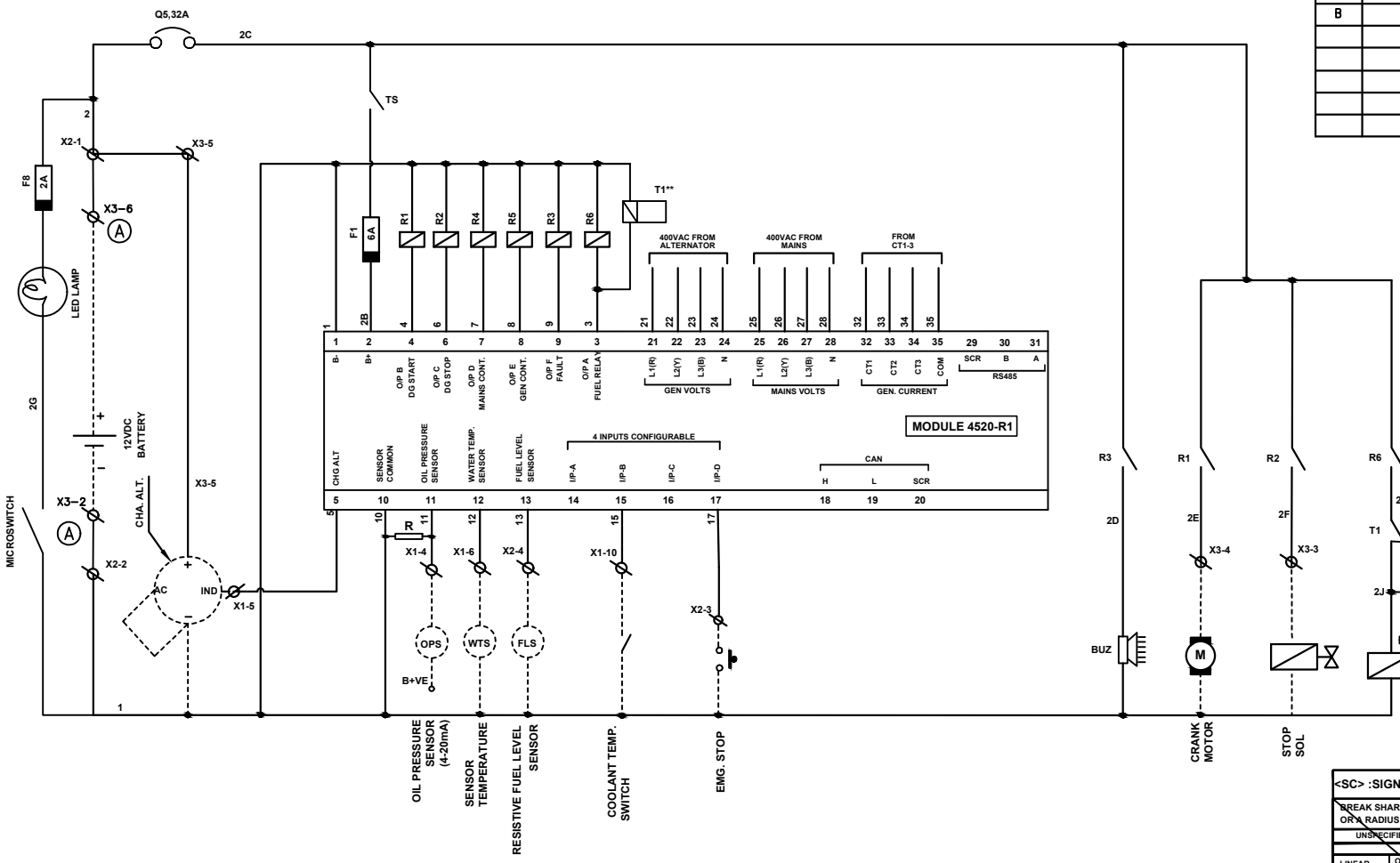
Note: Use Heat Shrink Sleeve on Power Cable as per below colour coding:
 R Phase: Brown
 Y Phase: Black
 B Phase: Gray
 Neutral: Blue
 Earthing: Yellow/Green

POWER CIRCUIT DRAWING

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

DIMENSIONS		E.R. / PROC. REQ. NO.		PART NO. :	
LINEAR	OVER	3	6	30	120
IN mm.	UPTO	3	6	30	120
UNSPECIFIED TOLERANCES AS PER ISO-2768-1:1989		H/F		REFER SHEET NO.2	
T FINE	(X.XXX)	20.0	25.0	30.0	40.0
MEDIUM	(X.XX)	16.0	20.0	25.0	32.0
COARSE	(X.X)	12.0	16.0	20.0	25.0
VERY COARSE	(X)	8.0	12.0	16.0	20.0
ANGULAR		MATERIAL :		HEAT TREATMENT :	
IN deg.	OVER	10	30	120	400
	UPTO	10	30	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.		2021		FIRST USED TRCR. MODEL	
COMPUTER GENERATED DRAWING DO NOT CHANGE MANUALLY		CAD ENGG	SSS	DATE	20/10/21
IF IN DOUBT, ASK		CHECKER	RBN	SCALE	N.T.S
DO NOT SCALE		APPR. BY	RAK	UNIT QTY. :	
DRG SIZE :		ALL DIMENSIONS ARE IN mm.		CHECK DRG WITH LATEST CHANGE	

LET	LOC	REVISION	DSNR	CKR	APPR	DATE
A		RATING CHANGED,X3 CONNECTOR CONNECTION ADDED IN CIRCUIT	PBK	RBN	RAK	29/10/21
B		TIMER T1 SETTING UPDATED AS 3 MIN.	SSS	RBN	RAK	24/11/21



Note: T1 TIMER SET AS 3 MIN.

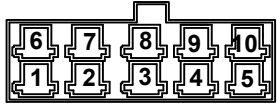
***** Note: USE PVC WHITE PRINTED FERRULE OF SIZE 3.5 MM**

CONTROL CIRCUIT DRAWING

<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			
DIMENSIONS		E.R / PROC.REQ.NO. : _____	
LINEAR	OVER	PART NO. : REFER SHEET NO.2	
IN mm.	UPTO	MAHINDRA & MAHINDRA LIMITED	
		TRACTOR DIVISION	
		KANDIVLI(EAST), MUMBAI-400 101, INDIA.	
T FINE	(X.XXX)	PART NAME : 7.5-35kVA, 3PH., AMF PANEL	
m MEDIUM	(X.XX)	COLD START WITH DSE-4520-R1	
c COARSE	(X.X)	MATERIAL : _____	
v VERY COARSE	(X)	HEAT TREATMENT : _____	
ANGULAR		DATE : 2021	
IN deg.	UPTO	NAME : _____	
		SIGN : _____	
		DATE : 20/10/21	
		FIRST USED TRCR. MODEL : _____	
PART OF THIS DRAWING / DOCUMENT SHOULD NOT BE REPRODUCED IN ANY FORM OR BY ANY MEANS WITHOUT WRITTEN PERMISSION OF M & M LTD.		SCALE : N.T.S	
COMPUTER GENERATED DRAWING DO NOT CHANGE MANUALLY		SHEET 8 OF 11	
IF IN DOUBT, ASK DO NOT SCALE DRG SIZE : _____		UNIT QTY. : _____	
		WEIGHT : kg.	
		ALL DIMENSIONS ARE IN mm. CHECK DRG WITH LATEST CHANGE	

CONNECTOR DETAILS

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

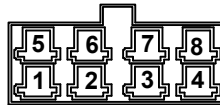


CONNECTOR SEQUENCE

PINS No	FERRULE No
1	SPARE
2	SPARE
3	SPARE
4	LOP SEN.
5	IND
6	WT SEN
7	SPARE
8	SPARE
9	SPARE
10	WT SW.

X1

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

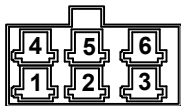


CONNECTOR SEQUENCE

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

X2

**PANEL SIDE 6-PIN (MALE)
CONNECTOR 250 SERIES MSSL
FROM BACK VIEW (CABLE
INSERTION VIEW)**



CONNECTOR SEQUENCE

PINS No	FERRULE No
1	SPARE
2	BATT. -VE
3	SOLENOID
4	START OUT
5	ALT. +VE
6	BATT. +VE

X3

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

SYMBOLS & NOMENCLATURE

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	SHUTDOWN ALARMS		Under Frequency Shutdown		Gen. Low Volt. Warning
	CAN ECU Data Fail		Under Speed Shutdown		High Coolant Temp. Warning
	CAN ECU Shutdown		Temp. Sensor Open Circuit		Low Oil Pressure Warning
	Digital Input A-D		Oil Pressure Sensor Open Circuit		Low Fuel Level
	Analogue Input A-C		Flexible Sensor		Over Frequency Warning
	Emergency Stop/RWL		Magnetic Pickup Open Circuit		Over Speed Warning
	Fail To Start		WARNING		Under Frequency Warning
	Gen. High Volt. Shutdown		Battery High Voltage		Under Speed Warning
	Gen. Low Volt. Shutdown		Battery Low Voltage		Flexible Sensor
	High Coolant Temp Shutdown		CAN ECU Warning	USER CONFIGURED SHUT DOWN	
	Loss of Mag. Pickup Signal		Charge Alternator Failure		
	Low Oil Pressure Shutdown		Digital Input A-D		Fuel Level Sensor
	Low Fuel Level		Analogue Input A-C		Analogue Input A-C
	Over Frequency Shutdown		Fail To Stop		Low Fuel Level Shut Down Switch
	Over Speed Shutdown		Gen. High Volt. Warning		RWL /EmergencyPB

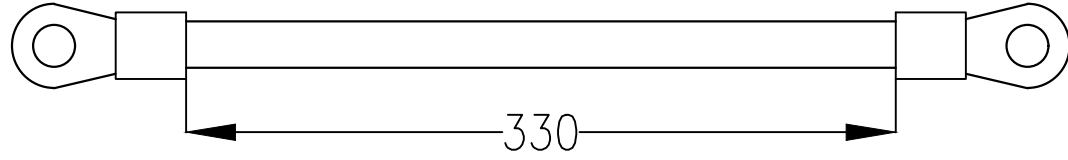
LET	LOC	REVISION	DSNR	CKR	APPR	DATE
A		RATING CHANGED, X3 CONNECTOR CONNECTION ADDED IN CIRCUIT	PBK	RBN	RAK	29/10/21
B		TIMER T1 SETTING UPDATED AS 3 MIN.	SSS	RBN	RAK	24/11/21

CONNECTOR DETAIL, SYMBOLS & NOMENCLATURE

<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			
DIMENSIONS		E.R / PROC.REQ.NO. : HGF	
LINEAR IN mm.	OVER UPTO	0.5 3 6 30 120 400 1000 2000	PART NO. : REFER SHEET NO.2
T FINE (X.XXX)	3 6 30 120 400 1000 2000	PART NAME : 7.5-35kVA, 3PH., AMF PANEL COLD START WITH DSE-4520-R1	
m MEDIUM (X.XX)	3 6 30 120 400 1000 2000	MATERIAL : _____ HEAT TREATMENT : _____	
C COARSE (X.X)	3 6 30 120 400 1000 2000	DATE : 2021 NAME : _____ SIGN : _____ DATE : 20/10/21 FIRST USED TRCR. MODEL : _____	
V VERY COARSE ()	3 6 30 120 400 1000 2000	DESIGNER : SSS CAD ENGG : SSS UNIT QTY. : _____	
ANGULAR IN deg.	OVER UPTO	10 30 90 120 400	CHECKER : RBN SHEET'S OF 11
T FINE (X.XXX)	10 30 90 120 400	APPR. BY : RAK DATE : 20/10/21 WEIGHT : _____ kg.	
m MEDIUM (X.XX)	10 30 90 120 400	COMPUTER GENERATED DRAWING DO NOT CHANGE MANUALLY	
C COARSE (X.X)	10 30 90 120 400	IF IN DOUBT, ASK DO NOT SCALE DRG SIZE : _____ ALL DIMENSIONS ARE IN mm. CHECK DRG WITH LATEST CHANGE	
V VERY COARSE ()	10 30 90 120 400		

0 1 2 3 4 5 6 7 8 9

LET	LOC	REVISION	DSNR	CKR	APPR	DATE
A		RATING CHANGED, 3X CONNECTOR CONNECTION ADDED IN CIRCUIT	PBK	RBN	RAK	29/10/21
B		TIMER T1 SETTING UPDATED AS 3 MIN.	SSS	RBN	RAK	24/11/21



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.
- 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.			
UNSPECIFIED TOLERANCES AS PER ISO-2768-1:1989			
DIMENSIONS		E.R / PROC.REQ.NO. : HGF	
LINEAR IN mm.	OVER UPTO	0.5 3 6 30 120 400 1000 2000	PART NO. : REFER SHEET NO.2
T FINE (X.XXX)	±	0.05 0.1 0.15 0.2 0.3 0.5	PART NAME : 7.5-35kVA, 3PH., AMF PANEL COLD START WITH DSE-4520-R1
m MEDIUM (X.XX)	±	0.1 0.15 0.2 0.3 0.5 0.8 1.2 1.6	MATERIAL : _____ HEAT TREATMENT : _____
C COARSE (X.X)	±	0.15 0.2 0.3 0.5 0.8 1.2 1.6 2.0	2021 NAME SIGN DATE FIRST USED TRCR. MODEL
V VERY COARSE ()	±	0.2 0.3 0.5 0.8 1.2 1.6 2.0 2.5	CAD ENGG SSS 20/10/21
ANGULAR IN deg.	OVER UPTO	10 30 60 120 400	DESIGNER SSS 20/10/21 SCALE N.T.S
T FINE (X.XXX)	±	1° 10' 20' 30' 45' 60'	CHECKER RBN 20/10/21 SHEET 1 OF 11
m MEDIUM (X.XX)	±	1° 30' 1° 1° 30' 2° 2° 30'	APPR. BY RAK 20/10/21 UNIT QTY. : _____
C COARSE (X.X)	±	2° 2° 30' 3° 3° 30' 4° 4° 30'	COMPUTER GENERATED DRAWING DO NOT CHANGE MANUALLY
V VERY COARSE ()	±	3° 3° 30' 4° 4° 30' 5° 5° 30'	IF IN DOUBT, ASK DO NOT SCALE DRG SIZE : ALL DIMENSIONS ARE IN mm. CHECK DRG WITH LATEST CHANGE