

LET	LOC	REVISION	DSNR	CKR	APPR	DATE
A		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

Type of Panel	AMF CONTROL PANEL
DG Rating	50-62.5kVA
AC Voltage System	3PH., 400VAC, 50Hz
Control Voltage	12VDC
Engine Make	Mahindra & Mahindra
Genset Controller Used	DSE-4520-R1
Project	EXPORT

L1 PROTO DEVELOPMENT
DRAWING RELEASE DATE: 24.11.2021
DESIGNER: SHITAL SURWASE
CHECKER: RAJIBABU NAIDU
APPROVED BY: RAJESH KALE

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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 KANDML(EAST), MUMBAI 400 101, INDIA.	
UNSPECIFIED TOLERANCES AS PER ISO-2768-1:1998		E.R. / PROC.REQ.NO : PART NO. : DSW REFER SHEET NO. 2	
DIMENSIONS		PART NAME : 50-62.5KVA,3PH. AMF PANEL 400V WITH DSE-4520-R1_COLD START	
LINEAR IN mm.	OVER 0.5 3 6 30 120 400 1000 2000 UPTO 3 6 30 120 400 1000 2000 4000	MATERIAL : HEAT TREATMENT :	
T/FINE (LXXX)	±0.05 ±0.08 ±0.1 ±0.15 ±0.2 ±0.3 ±0.5	2021 NAME SIGN DATE FIRST USED TRCR. MODEL	
m/MEDIUM (LXX)	±0.1 ±0.15 ±0.2 ±0.3 ±0.5 ±0.8 ±1.2	CAD ENGR. SSS 20/10/21	
c/COURSE (CX)	±0.2 ±0.3 ±0.5 ±0.8 ±1.2 ±2 ±3 ±5	DESIGNER SSS 20/10/21 SCALE N.T.S	
V/VERY COARSE (X)	±0.5 ±1 ±1.5 ±2 ±3 ±5 ±8	CHECKER RBN 20/10/21 SHEET 1 OF 11	
ANGULAR IN deg.	OVER - 10 30 120 400 UPTO 10 30 120 400	APPR. BY RAK 20/10/21 UNIT QTY. : WEIGHT : kg.	
T/FINE (LXXX)	±1' ±0'30' ±0'20' ±0'10' ±0'5'	COMPUTER GENERATED DRAWING DO NOT CHANGE MANUALLY	
m/MEDIUM (LXX)	±1'30' ±1' ±0'30' ±0'15' ±0'10'	IF IN DOUBT, ASK DO NOT SCALE DRG SIZE: A4 ALL DIMENSIONS ARE IN mm. CHECK DRG WITH LATEST CHANGE	
c/COURSE (CX)	±2' ±2' ±1' ±0'30' ±0'20'		
V/VERY COARSE (X)	±3' ±2' ±1' ±0'30' ±0'20'		

LET	LOC	REVISION	DSNR	CKR	APPR	DATE
A		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

SR NO.	RATING KVA	PHASE	MCCB	CONTACTOR	CT RATIO	POWER CABLE (UNINYVIN)	M&M PART NO.											
							0	0	7	7	1	0	0	2	4	H	9	1
1	50	3	3P,80A	4P,80A	100/5A	U-8	0	0	7	7	1	0	0	2	4	H	9	1
2	62.5	3	3P,100A	4P,100A	100/5A	U-6	0	0	7	7	1	0	0	2	5	H	9	1

TABLE A : SCHNEIDER MAKE CONTACTOR & SURGE SUPPRESSOR LIST

KVA RATING	PHASE	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
50	3	4P,80A (LC1E65004)	007709395H91	LAEM1	007709400H91	LAERCU	007709398H91	LAEN11	007709397H91
62.5	3	4P,100A (LC1E80004)	007709396H91	LAEM4	007709399H91	LAERCU			

TABLE B: L&T MAKE MCCB

RATING KVA	MCCB	M&M PART NO.	SUPPLIER P/N
50	3P,80A,10kA	006029687H91	DY125U
62.5	3P,100A,10kA	006025271H91	DY125U

TABLE C: CT SELECTION CHART

RATING KVA	CT RATIO	M&M PART NO.
50	100/5A, CL-1, 2.5VA	006025216H91
62.5	100/5A, CL-1, 2.5VA	006025216H91

SR NO.	RATING KVA	FULL-LOAD CURRENT	OVERLOAD CURRENT
1	50	72A	79A
2	62.5	90A	99A

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.										MAHINDRA & MAHINDRA LIMITED TRACTOR DIVISION KANDML(EAST), MUMBAI 400 101, INDIA.									
UNSPECIFIED TOLERANCES AS PER ISO-2768-1:1998										E.R. / PROC.REQ.NO : DSW									
DIMENSIONS										PART NAME : 50-62.5KVA,3PH. AMF PANEL 400V WITH DSE-4520-R1_COLD START									
LINEAR IN mm.										PART NO. : REFER SHEET NO. 2									
T/FINE (0.000)										MATERIAL : HEAT TREATMENT :									
MEDIUM (0.005)										2021 NAME SIGN DATE FIRST USED TRCR. MODEL									
COARSE (0.010)										CAD ENGG. SSS 20/10/21									
VERY COARSE (0.020)										DESIGNER SSS 20/10/21 SCALE N.T.S									
ANGULAR IN deg.										CHECKER RBN 20/10/21 SHEET 2 OF 11									
T/FINE (0.000)										APPR. BY RAK 20/10/21 UNIT QTY. : WEIGHT : kg.									
MEDIUM (0.005)										COMPUTER GENERATED DRAWING DO NOT CHANGE MANUALLY									
COARSE (0.010)										IF IN DOUBT, ASK DO NOT SCALE DRG SIZE: A4									
VERY COARSE (0.020)										ALL DIMENSIONS ARE IN mm. CHECK DRG WITH LATEST CHANGE									

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 NOS. RELAY	UL5302N0-C-DP-72	UL AUTOMATION OEN	1	006034573H1
2	BATTERY CHARGER 12VDC; 5A	CB1205A	SEDEMACE	1	007709451H91
3	CURRENT TRANSFORMER	(Refer Table A)	NEWTEK	3	
4	DOOR LOCK	-	DARSHANA	2	
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	DEEPESEA	1	006040370H91
13	TOGGLE SWITCH 15A 28VDC	KT 1521BY	KAYCEE	1	006029316H91
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	MCCB FOR DG INCOMING/EB INCOMING WITH SPREADER	Refer Sheet 2	L&T	2	
17	POWER CONTACTOR, 4POLE WITH 220VAC COIL SUPPLY	Refer Sheet 2	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, 100A	-	POWERMATE	1	
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 GLAND FOR SPARE	PG16	JIGO	1	
27	PVC POWER CABLE GLAND WITH CAP	PG36	JIGO	2	
28	ADD ON BLOCK (1NO+1NC)	Refer Sheet 2	SCHNEIDER	2	Refer Sheet 2
29	MECHANICAL INTERLOCK	Refer Sheet 2	SCHNEIDER	1	Refer Sheet 2
30	SURGE SUPPRESSOR	Refer Sheet 2	SCHNEIDER	2	Refer Sheet 2
31	RESISTOR	240Ω±0.5%	-	1	-
32	ACRYLIC SHEET	230mmX450mmX5mm	-	1	-
33	BUS BAR FOR NEUTRAL	20X5mm	ALUMINIUM	AS REQD	-
34	INSULATOR FOR BUSBAR	-	-	4	-
35	AUTOMOTIVE RELAY 1NO	741-12-1A-2SA	OEN	1	007710327H91
36	TERMINAL BLOCK	6 SQ.MM	CONNECTWELL	3	
37	ELECTRONIC TIMER	150DT4(RB)	GIC	1	
38	EARTHING CABLE	Refer Sheet 11	-	4	

TAG	DESCRIPTION
BUZ	ELECTRONIC BUZZER
CT	CURRENT TRANSFORMER
CCU	GENERATOR CONTROL UNIT (DSE-4520-R1)
TS	TOGGLE SWITCH
Q1,Q2	MINIATURE CIRCUIT BREAKER
R1/R2	RELAY FOR START OUT/SOLENOID
X1....	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-B	FUSED TERMINAL BLOCK
RM	RELAY MODULE

LET	LOC	REVISION	DSNR	CKR	APPR	DATE
A		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

CABLE SIZE TABLE		CABLE MAKE & SPECIFICATION
BATTERY +VE BATTERY-VE	4 Sq.mm	FINOLEX/POLYCAB/BONTON/RR CABEL/LAPP/HAVELS
CURRENT TRANSFORMER	1.5 Sq.mm	
CONTROL SIGNAL	0.75 Sq.mm	PVC INSULATED SINGLE CORE MULTISTAND FR CABLE
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	MIRACLE MAKE UNINYVIN CABLE AS PER BSG177 STANDARD

BILL OF MATERIAL

<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	
UNSPECIFIED TOLERANCES AS PER ISO-2768-1:1998		TRACTOR DIVISION	
		KANDML(EAST), MUMBAI 400 101, INDIA.	
DIMENSIONS		E.R. / PROC.REQD : PART NO. : DSW REFER SHEET NO. 2	
LINEAR IN mm.	OVER 0.5 3 6 30 120 400 1000 2000 UPTO 3 6 30 120 400 1000 2000 4000	PART NAME : 50-62.5KVA.3PH. AMF PANEL 400V WITH DSE-4520-R1_COLD START	
T/FINE (0.000)	±0.05 ±0.10 ±0.15 ±0.20 ±0.25 ±0.30 ±0.40 ±0.50	MATERIAL : HEAT TREATMENT :	
m/MEDIUM (0.010)	±0.10 ±0.15 ±0.20 ±0.25 ±0.30 ±0.40 ±0.50 ±0.60	2021 NAME SIGN DATE FIRST USED TRCR. MODEL	
c/COURSE (0.050)	±0.20 ±0.30 ±0.40 ±0.50 ±0.60 ±0.70 ±0.80 ±1.00	DESIGNER SSS	20/10/21
v/VERY COARSE (0.100)	±0.30 ±0.40 ±0.50 ±0.60 ±0.70 ±0.80 ±1.00 ±1.20	CAD ENGR. SSS	20/10/21
LENGTH OF NUMBER SIZE OF THE HOLE IN mm.		CHECKER RBN	20/10/21
ANGULAR IN deg.	OVER 10 30 45 60 90 120 150 180 UPTO 10 30 45 60 90 120 150 180	APPR. BY RAK	20/10/21
T/FINE (0.000)	±1' ±0'30' ±0'20' ±0'15' ±0'10'	SCALE N.T.S	
m/MEDIUM (0.010)	±1'30' ±1' ±0'30' ±0'15' ±0'10'	SHEET 3 OF 11	
c/COURSE (0.050)	±2' ±2' ±1' ±0'30' ±0'20'	LIMIT QTY. : _____	
v/VERY COARSE (0.100)	±3' ±2' ±1' ±0'30' ±0'20'	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: A4		ALL DIMENSIONS ARE IN mm. CHECK DRG WITH LATEST CHANGE	

*** NOTE: ALL PANELS MUST BE SUPPLIED WITH TEST CERTIFICATE AND HARD COPY OF DRAWING

LET	LOC	REVISION	DSNR	CKR	APPR	DATE
A		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

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 SENSOR	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		

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.		MAHINDRA & MAHINDRA LIMITED TRACTOR DIVISION KANDML(EAST), MUMBAI 400 101, INDIA.	
UNSPECIFIED TOLERANCES AS PER ISO-2768-1:1998		PART NAME : 50-62.5KVA.3PH. AMF PANEL 400V WITH DSE-4520-R1_COLD START	
DIMENSIONS		E.R. / PROC.REQNO : PART NO. : DSW REFER SHEET NO. 2	
LINEAR IN mm.	OVER 0.5 3 6 30 120 400 1000 2000 UPTO 3 6 30 120 400 1000 2000 4000		
T/FINE (LXXX)	±0.05 ±0.08 ±0.1 ±0.15 ±0.2 ±0.3 ±0.5 -		
M/MEDIUM (LXX)	±0.1 ±0.15 ±0.2 ±0.3 ±0.5 ±0.8 ±1.2		
C/COURSE (CX)	±0.2 ±0.3 ±0.5 ±0.8 ±1.2 ±1.5 ±2		
V/VERY COARSE (X)	±0.5 ±1 ±1.5 ±2 ±3 ±4 ±6 ±8		
ANGULAR IN deg.	OVER - 10 50 120 400 UPTO 10 50 120 400		
T/FINE (LXXX)	±1' ±0'30" ±0'20" ±0'15" ±0'10" ±0'5'	2021	NAME SIGN DATE FIRST USED TRCR. MODEL
M/MEDIUM (LXX)	±1'30" ±1' ±0'30" ±0'15" ±0'10"	CAD ENGR.	SSS 20/10/21
V/VERY COARSE (X)	±2' ±2' ±1' ±0'30" ±0'20"	DESIGNER	SSS 20/10/21
PART OF THIS DRAWING / DOCUMENT SHOULD NOT BE REPRODUCED IN ANY FORM OR BY ANY MEANS WITHOUT WRITTEN PERMISSION OF M & M LTD.		CHECKER	RBN 20/10/21
COMPUTER GENERATED DRAWING DO NOT CHANGE MANUALLY		APPR.BY	RAK 20/10/21
IF IN DOUBT, ASK DO NOT SCALE DRG SIZE: A4		SCALE N.T.S. SHEET 4 OF 11 UNIT QTY. : WEIGHT : kg.	
ALL DIMENSIONS ARE IN mm. CHECK DRG WITH LATEST CHANGE			

6	Digital Output Assignment		
	OUTPUT-A	Fuel Relay	
	OUTPUT-B	Start Relay	
	OUTPUT-C	Energise to Stop	
	OUTPUT-D	De-Energize Mains Contactor (Close)	
	OUTPUT-E	Energize Alternator Contactor (Close)	
	OUTPUT-F	Audible Alarm (Fault 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

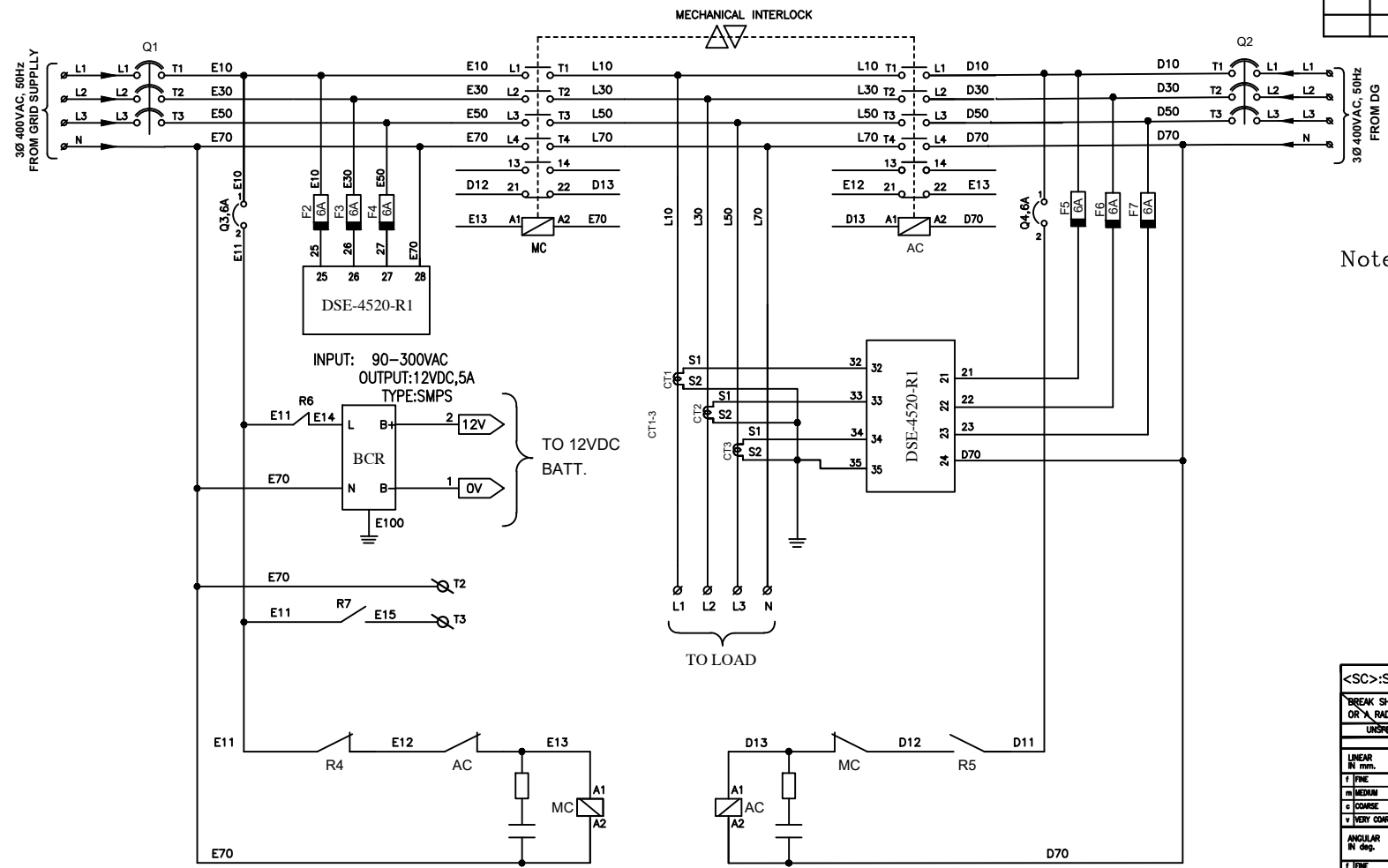
9	Generator Voltage	Under Voltage Shutdown	332V
		Loading Voltage	380V
		Nominal Voltage	400V
		Over Voltage Shutdown	455V
10	Generator Frequency	Under Frequency Shutdown	45 Hz
		Loading Frequency	48 Hz
		Nominal Frequency	50 Hz
		Over Frequency Shutdown	55 Hz
11	Generator Current	CT Primary	(Refer Sheet 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
16	Mains Options	AC System	3Ph.,4Wire
17	Mains Voltage	Under Voltage Shutdown	332V
		Loading Voltage	380V
		Over Voltage Shutdown	455V
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		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

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.		MAHINDRA & MAHINDRA LIMITED TRACTOR DIVISION KANDLI(EAST), MUMBAI 400 101, INDIA.	
UNSPECIFIED TOLERANCES AS PER ISO-2768-1:1998		E.R. / PROC.REQ.NO : DSW	
DIMENSIONS		PART NO. : REFER SHEET NO. 2	
LINEAR IN mm.	OVER 0.5 3 6 30 120 400 1000 2000 UPTO 3 6 30 120 400 1000 2000 4000	PART NAME : 50-62.5KVA,3PH. AMF PANEL 400V WITH DSE-4520-R1_COLD START	
T/FINE (0.000)	±0.000 ±0.000 ±0.1 ±0.15 ±0.2 ±0.3 ±0.5 -	MATERIAL : _____ HEAT TREATMENT : _____	
MEDIUM (0.005)	±0.005 ±0.005 ±0.1 ±0.15 ±0.2 ±0.3 ±0.5 -	2021 NAME SIGN DATE FIRST USED TRCR. MODEL	
COURSE (0.01)	±0.01 ±0.01 ±0.1 ±0.15 ±0.2 ±0.3 ±0.5 -	CAD ENGG. SSS 20/10/21	
VERY COARSE (0.05)	±0.05 ±0.05 ±0.1 ±0.15 ±0.2 ±0.3 ±0.5 -	DESIGNER SSS 20/10/21 SCALE N.T.S	
ANGULAR IN deg.	OVER - 10 50 120 400 UPTO 10 50 120 400 -	CHECKER RBN 20/10/21 SHEET 5 OF 11	
T/FINE (0.000)	±1' ±0'30' ±0'20' ±0'10' ±0'5'	APPR. BY RAK 20/10/21 UNIT QTY. : _____	
MEDIUM (0.005)	±1'30' ±1' ±0'30' ±0'15' ±0'10'	COMPUTER GENERATED DRAWING DO NOT CHANGE MANUALLY	
COURSE (0.01)	±3' ±2' ±1' ±0'30' ±0'20'	IF IN DOUBT, ASK DO NOT SCALE DRG SIZE: A4 ALL DIMENSIONS ARE IN mm. CHECK DRG WITH LATEST CHANGE	
VERY COARSE (0.05)	±3' ±2' ±1' ±0'30' ±0'20'		

LET	LOC	REVISION	DSNR	CKR	APPR	DATE
A		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 : 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

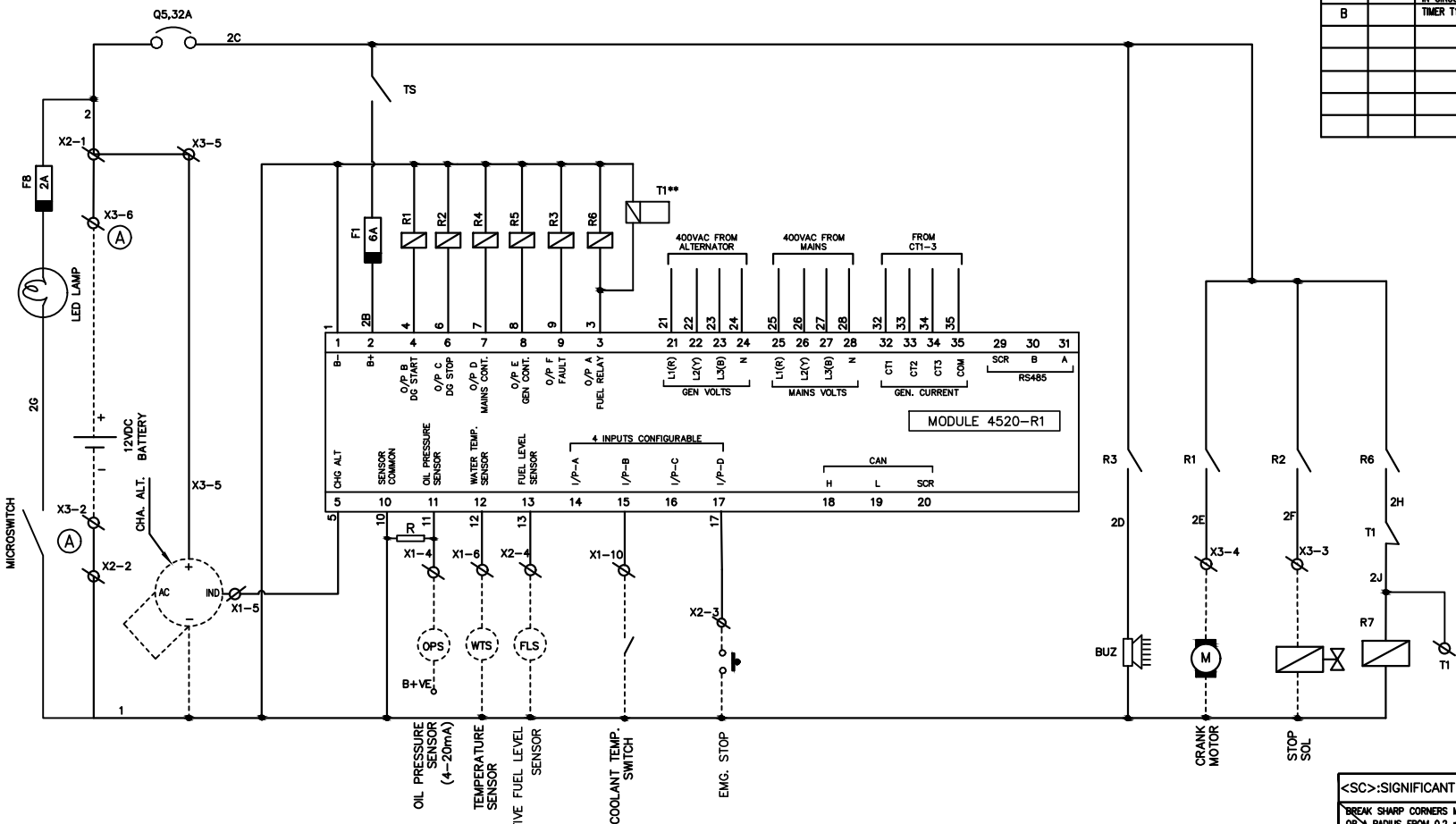
POWER CIRCUIT DRAWING

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

DIMENSIONS		MATERIAL :		HEAT TREATMENT :	
LINEAR	OVER	3	6	10	15
UPTO	3	6	10	15	20
T FINE	(0.000)	±0.05	±0.10	±0.15	±0.20
m	(0.000)	±0.05	±0.10	±0.15	±0.20
±	(0.000)	±0.05	±0.10	±0.15	±0.20
VERY COARSE	(0.000)	±0.10	±0.20	±0.30	±0.40
ANGULAR	OVER	10	30	60	90
IN deg.	UPTO	10	30	60	90
T FINE	(0.000)	±1'	±0'30"	±0'20"	±0'10"
m	(0.000)	±1'	±0'30"	±0'20"	±0'10"
±	(0.000)	±1'	±0'30"	±0'20"	±0'10"
VERY COARSE	(0.000)	±3'	±2'	±1'	±0'30"

PART NAME : 50-62.5KVA.3PH. AMF PANEL 400V WITH DSE-4520-R1_COLD START		SCALE N.T.S	
DESIGNER	SSS	20/10/21	SHEET 7 OF 11
CHECKER	RBN	20/10/21	UNIT QTY. :
APPR. BY	RAK	20/10/21	WEIGHT : kg.

LET	LOC	REVISION	DSNR	CKR	APPR	DATE
A		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



B

**** Note: T1 TIMER SET AS 3 MIN.**

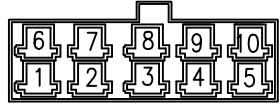
***** Note: USE PVC WHITE PRINTED FERRULE OF SIZE 3.5 MM**

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.		MAHINDRA & MAHINDRA LIMITED TRACTOR DIVISION KANDML(EAST), MUMBAI 400 101, INDIA.	
UNSPECIFIED TOLERANCES AS PER ISO-2768-1:1989		PART NAME : 50-62.5KVA.3PH. AMF PANEL 400V WITH DSE-4520-R1_COLD START	
DIMENSIONS		E.R. / PROC.REQ.NO. : PART NO. : DSW REFER SHEET NO. 2	
LINEAR IN mm.	OVER 0.5 3 6 30 120 400 1000 2000		
UPTO	3 6 30 120 400 1000 2000 4000		
T/FINE (0.000)	±0.02 ±0.03 ±0.04 ±0.05 ±0.07 ±0.10 ±0.15 ±0.20		
M/MEDIUM (0.005)	±0.03 ±0.04 ±0.05 ±0.07 ±0.10 ±0.15 ±0.20 ±0.25		
C/COURSE (0.01)	±0.04 ±0.05 ±0.07 ±0.10 ±0.15 ±0.20 ±0.25 ±0.30		
V/VERY COARSE (0.02)	±0.05 ±0.07 ±0.10 ±0.15 ±0.20 ±0.25 ±0.30 ±0.35		
ANGULAR IN deg.	OVER 10 30 60 120 400		
UPTO	10 30 60 120 400		
T/FINE (0.000)	±1' ±0'30' ±0'20' ±0'10' ±0'5'		
M/MEDIUM (0.005)	±1'30' ±1' ±0'30' ±0'15' ±0'10'		
C/COURSE (0.01)	±2' ±2' ±1' ±0'30' ±0'20'		
V/VERY COARSE (0.02)	±2' ±2' ±1' ±0'30' ±0'20'		
PART OF THIS DRAWING / DOCUMENT SHOULD NOT BE REPRODUCED IN ANY FORM OR BY ANY MEANS WITHOUT WRITTEN PERMISSION OF M & M LTD.		DESIGNER SSS 20/10/21 SCALE N.T.S.	
COMPUTER GENERATED DRAWING DO NOT CHANGE MANUALLY		CHECKER RBN 20/10/21 SHEET 8 OF 11	
IF IN DOUBT, ASK DO NOT SCALE DRG SIZE: A4		APPR. BY RAK 20/10/21 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)

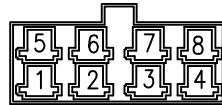


CONNECTOR SEQUENCE

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)

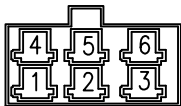


CONNECTOR SEQUENCE

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

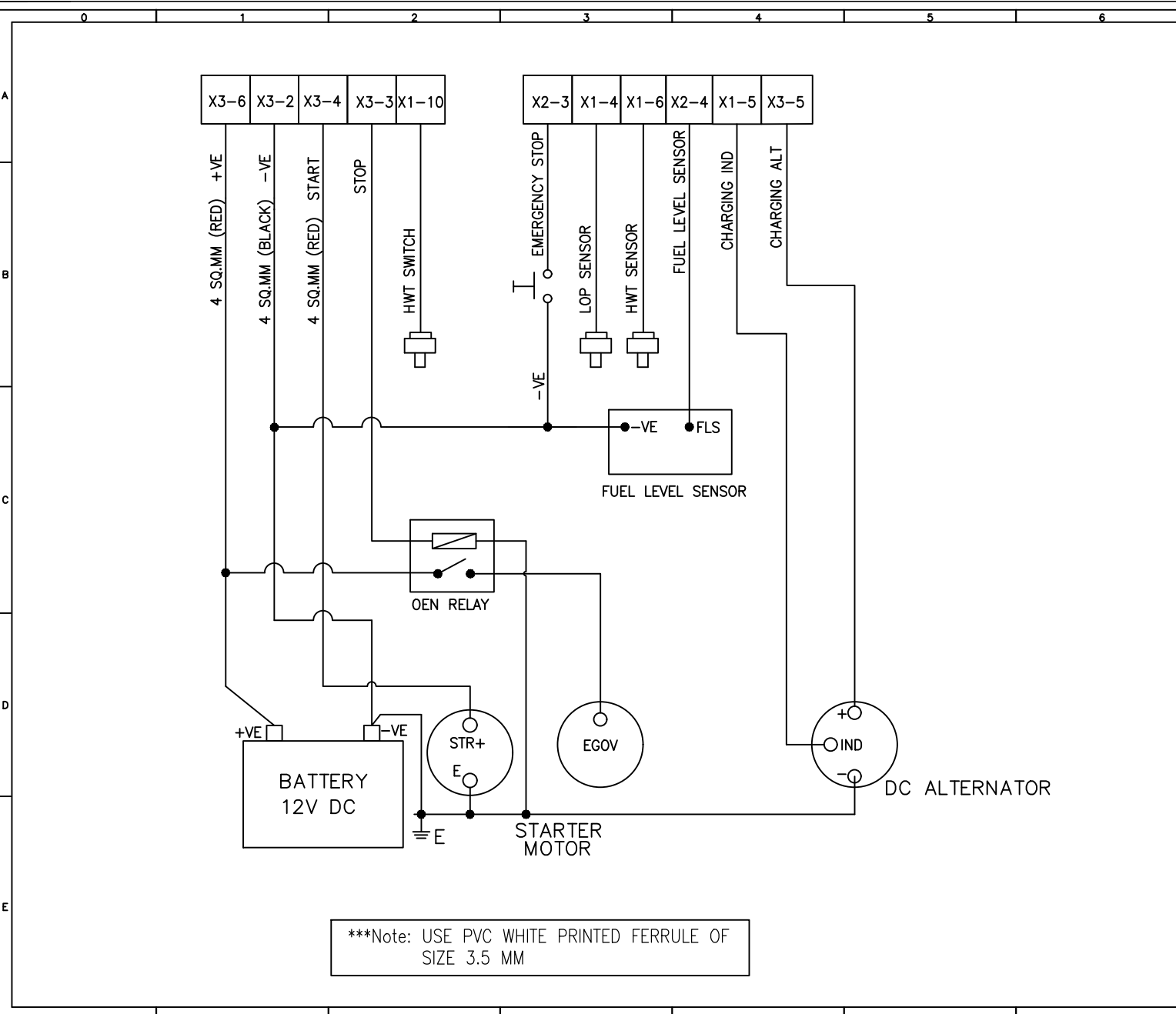
SYMBOLS & NOMENCLATURE

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		Digital Input A-D
	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 /Emergency PB

LET	LOC	REVISION	DSNR	CKR	APPR	DATE
A		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-2768-1:1998		MAHINDRA & MAHINDRA LIMITED TRACTOR DIVISION KANDLUL(EAST), MUMBAI 400 101, INDIA.																																									
DIMENSIONS		E.R. / PROC.REQ.NO :	PART NO. :																																								
<table border="1"> <tr> <th>LINEAR IN mm.</th> <th>OVER</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>LIPTO</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> </table>		LINEAR IN mm.	OVER	0.5	3	6	30	120	400	1000	2000	LIPTO		3	6	30	120	400	1000	2000	4000	DSW	REFER SHEET NO. 2																				
LINEAR IN mm.	OVER	0.5	3	6	30	120	400	1000	2000																																		
LIPTO		3	6	30	120	400	1000	2000	4000																																		
<table border="1"> <tr> <th>T/FINE (0.000)</th> <th>0.000</th> <th>0.000</th> <th>0.000</th> <th>0.000</th> <th>0.000</th> <th>0.000</th> <th>0.000</th> <th>0.000</th> <th>0.000</th> </tr> <tr> <td>m/MEDIUM (0.000)</td> <td>0.000</td> <td>0.000</td> <td>0.000</td> <td>0.000</td> <td>0.000</td> <td>0.000</td> <td>0.000</td> <td>0.000</td> <td>0.000</td> </tr> <tr> <td>c/COURSE (0.000)</td> <td>0.000</td> <td>0.000</td> <td>0.000</td> <td>0.000</td> <td>0.000</td> <td>0.000</td> <td>0.000</td> <td>0.000</td> <td>0.000</td> </tr> <tr> <td>V/VERY COURSE (0.000)</td> <td>0.000</td> <td>0.000</td> <td>0.000</td> <td>0.000</td> <td>0.000</td> <td>0.000</td> <td>0.000</td> <td>0.000</td> <td>0.000</td> </tr> </table>		T/FINE (0.000)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	m/MEDIUM (0.000)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	c/COURSE (0.000)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	V/VERY COURSE (0.000)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	PART NAME : 50-62.5KVA.3PH. AMF PANEL 400V WITH DSE-4520-R1_COLD START	
T/FINE (0.000)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000																																		
m/MEDIUM (0.000)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000																																		
c/COURSE (0.000)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000																																		
V/VERY COURSE (0.000)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000																																		
ANGULAR IN deg.		MATERIAL :																																									
<table border="1"> <tr> <th>OVER</th> <th>10</th> <th>50</th> <th>120</th> <th>400</th> </tr> <tr> <td>LIPTO</td> <td></td> <td></td> <td></td> <td></td> </tr> </table>		OVER	10	50	120	400	LIPTO					HEAT TREATMENT :																															
OVER	10	50	120	400																																							
LIPTO																																											
<table border="1"> <tr> <th>T/FINE (0.000)</th> <th>±1'</th> <th>±0'30"</th> <th>±0'20"</th> <th>±0'10"</th> <th>±0'5'</th> </tr> <tr> <td>m/MEDIUM (0.000)</td> <td>±1'30"</td> <td>±1'</td> <td>±0'30"</td> <td>±0'15"</td> <td>±0'10"</td> </tr> <tr> <td>c/COURSE (0.000)</td> <td>±3'</td> <td>±2'</td> <td>±1'</td> <td>±0'30"</td> <td>±0'20"</td> </tr> </table>		T/FINE (0.000)	±1'	±0'30"	±0'20"	±0'10"	±0'5'	m/MEDIUM (0.000)	±1'30"	±1'	±0'30"	±0'15"	±0'10"	c/COURSE (0.000)	±3'	±2'	±1'	±0'30"	±0'20"	2021	NAME	SIGN	DATE	FIRST USED TRCR. MODEL																			
T/FINE (0.000)	±1'	±0'30"	±0'20"	±0'10"	±0'5'																																						
m/MEDIUM (0.000)	±1'30"	±1'	±0'30"	±0'15"	±0'10"																																						
c/COURSE (0.000)	±3'	±2'	±1'	±0'30"	±0'20"																																						
PART OF THIS DRAWING / DOCUMENT SHOULD NOT BE REPRODUCED IN ANY FORM OR BY ANY MEANS WITHOUT WRITTEN PERMISSION OF M & M LTD.		DESIGNER	SSS		20/10/21	SCALE N.T.S																																					
COMPUTER GENERATED DRAWING DO NOT CHANGE MANUALLY		CHECKER	RBN		20/10/21	SHEET 9 OF 11																																					
IF IN DOUBT, ASK DO NOT SCALE DRG SIZE: A4		APPR. BY	RAK		20/10/21	UNIT QTY. : WEIGHT : kg.																																					
		ALL DIMENSIONS ARE IN mm.		CHECK DRG WITH LATEST CHANGE																																							



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

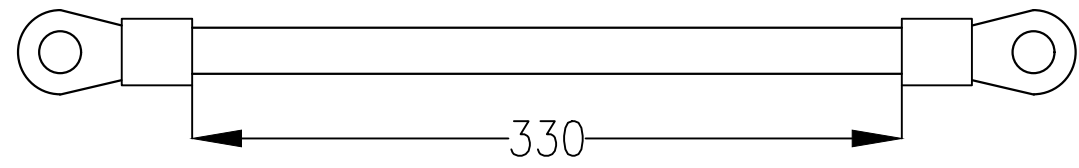
LET	LOC	REVISION	DSNR	CKR	APPR	DATE
A		X3 CONNECTOR CONNECTION ADDED IN CIRCUIT	PBK	RBN	RAK	29/10/21
B		TIMER T1 SETTING UPDATED AS 3 MIN.	SSS	RBN	RAK	24/11/21

ENGINE WIRING DIAGRAM

<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	
UNSPECIFIED TOLERANCES AS PER ISO-2768-1:1998		TRACTOR DIVISION	
DIMENSIONS		KANDIVLI(EAST), MUMBAI 400 101, INDIA.	
LINEAR	OVER 0.5 3 6 30 120 400 1000 2000	E.R. / PROC.REQ.NO :	PART NO. :
UP TO	3 6 30 120 400 1000 2000 4000	DSW	REFER SHEET NO. 2
T FINE (0.000)	±0.005 ±0.008 ±0.010 ±0.015 ±0.020 ±0.025 ±0.030	PART NAME : 50-62.5KVA.3PH. AMF PANEL 400V WITH DSE-4520-R1_COLD START	
m (MEDIUM) (0.005)	±0.010 ±0.015 ±0.020 ±0.025 ±0.030 ±0.035 ±0.040	MATERIAL :	
± COARSE (0.010)	±0.020 ±0.030 ±0.040 ±0.050 ±0.060 ±0.070 ±0.080	HEAT TREATMENT :	
± VERY COARSE (0.020)	±0.040 ±0.050 ±0.060 ±0.070 ±0.080 ±0.090 ±0.100		
ANGULAR	OVER - 10 30 120 400		
IN deg.	UP TO 10 30 120 400		
T FINE (0.000)	±1' ±0'30' ±0'20' ±0'10' ±0'5'	2021	NAME SIGN DATE FIRST USED TROR. MODEL
m (MEDIUM) (0.005)	±1'30' ±1' ±0'30' ±0'15' ±0'10'	CAD ENGR.	SSS 20/10/21
± COARSE (0.010)	±2' ±2' ±1' ±0'30' ±0'20'	DESIGNER	SSS 20/10/21
± VERY COARSE (0.020)	±3' ±2' ±1' ±0'30' ±0'20'	CHECKER	RBN 20/10/21
PART OF THIS DRAWING / DOCUMENT SHOULD NOT BE REPRODUCED IN ANY FORM OR BY ANY MEANS WITHOUT WRITTEN PERMISSION OF M & M LTD.		APPR. BY	RAK 20/10/21
COMPUTER GENERATED DRAWING DO NOT CHANGE MANUALLY		SHEET NO OF 11	
IF IN DOUBT, ASK DO NOT SCALE DRG SIZE: A4		UNIT QTY. : _____	
ALL DIMENSIONS ARE IN mm.		WEIGHT : _____ kg.	
CHECK DRG WITH LATEST CHANGE			

0 1 2 3 4 5 6 7 8 9

LET	LOC	REVISION	DSNR	CKR	APPR	DATE
A		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:

- 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 KANDLI(EAST), MUMBAI 400 101, INDIA.	
UNSPECIFIED TOLERANCES AS PER ISO-2768-1:1998		E.R. / PROC.REQ.NO : DSW	
DIMENSIONS		PART NO. : REFER SHEET NO. 2	
LINEAR IN mm.	OVER 0.5 3 6 30 120 400 1000 2000 UPTO 3 6 30 120 400 1000 2000 4000	PART NAME : 50-62.5KVA,3PH. AMF PANEL 400V WITH DSE-4520-R1_COLD START	
T/FINE (0.000)	±0.000 ±0.000 ±0.1 ±0.15 ±0.2 ±0.3 ±0.5 -	MATERIAL : _____ HEAT TREATMENT : _____	
m/MEDIUM (0.001)	±0.1 ±0.15 ±0.2 ±0.3 ±0.5 ±0.8 ±1.2	2021 NAME SIGN DATE FIRST USED TRCR. MODEL	
c/COURSE (0.01)	±0.2 ±0.3 ±0.5 ±0.8 ±1.2 ±2 ±3 ±5	DESIGNER SSS	20/10/21
v/VERY COARSE (0.1)	±0.5 ±1 ±1.5 ±2 ±3 ±5 ±8	CAD ENGG. SSS	20/10/21
ANGULAR IN deg.	OVER - 10 50 120 400 UPTO 10 50 120 400	CHECKER RBN	20/10/21
T/FINE (0.000)	±1' ±0'30' ±0'20' ±0'10' ±0'5'	APPR. BY RAK	20/10/21
m/MEDIUM (0.001)	±1'30' ±1' ±0'30' ±0'15' ±0'10'	SCALE N.T.S	
c/COURSE (0.01)	±2' ±2' ±1' ±0'30' ±0'20'	SHEET 11 OF 11	
v/VERY COARSE (0.1)	±3' ±2' ±1' ±0'30' ±0'20'	LIMIT QTY. : _____	
PART OF THIS DRAWING / DOCUMENT SHOULD NOT BE REPRODUCED IN ANY FORM OR BY ANY MEANS WITHOUT WRITTEN PERMISSION OF M & M LTD.		WEIGHT : _____ kg.	
COMPUTER GENERATED DRAWING DO NOT CHANGE MANUALLY		ALL DIMENSIONS ARE IN mm.	
IF IN DOUBT, ASK DO NOT SCALE DRG SIZE: A4		CHECK DRG WITH LATEST CHANGE	