

**ELECTROSOFT AUTOMATION PVT. LTD.**

**QUALITY ASSURANCE PLAN / FAT PLAN  
FOR ELECTRICAL CONTROL PANELS**

<b>PROJECT:</b>	<b>P.O. NO.:</b>	<b>APPROVAL ABBREVIATIONS:</b>
	<b>END CLIENT:</b>	<b>R: REVIEWED</b>
<b>ITEM NAME:</b>	<b>ITEM SERIAL NO.:</b>	<b>P: PERFORMED</b>
<b>AGENCY (A): M/S ELECTROSOFT AUTOMATION PVT LTD.</b>	<b>AGENCY (B):</b>	<b>V: VERIFIED</b>
<b>AGENCY (C):</b>	<b>AGENCY (D):</b>	<b>W : WITNESSED</b>

Sr. No.	Component / Operation	Characteristics checked	Class	Method / Type of Check	Acceptance norm	Approval by Agency				Remarks
						A	B	C	D	
1	2	3	4	5	6	7				8

1 INPUT / RAW MATERIAL INSPECTION										
1A	MS Sheet Steel (Fabrication)	A) Surface Finish	Major	Visual	Manufacturer certificate shall be provided					
		B) Sheet Metal Thickness	Major	Measurement	Approved Drawings					
	Enclosure	C) Dimensions	Major	Measurement	Approved Drawings					
1B	Busbar Support DMC	A) Type of Support	Major	Visual	As per Approved Drawings					
1C	Busbar	A) Size & Cross Section	Major	Measurement	Approved. Drawings & Specifications					
	Main Busbar (Ver. & Hor.) Al / Cu	B) Resistivity / Conductivity	Major	Certification	Manufacturer certificate shall be provided					
1D	Hardware									
1	Bolt / Nuts / Plain Washer / Spring Washer	A) Dimensional Conformity	Major	Sample Measurement	Internal Standards					
		B) MOC	Major	Certification	Internal Standards					
1E	Paint	A) Finish (Shade) Viscosity	Major	Visual	Manufacturer certificate shall be provided					
		B) Routine Test	Major	Visual	Manufacturer certificate shall be provided					
		C) Thickness	Major	Certification	Manufacturer certificate shall be provided					
1F	Neoprene Rubber Gasket	A) Dimensional Conformity	Major	Sample Measurement	Internal Standard					
1G	Conductor / Wire	A) Verification of Cross Section make, Colour Code etc.	Major	Physical Verification	Internal Standard					
		B) Grade	Major	Physical Verification	Manufacturer certificate shall be provided					
1H	Air Circuit Breaker (ACB)	A) Verification of Current rating	Major	Physical Verification	Approved Drawing					
		B) Verification of Voltage Grade	Major	Physical Verification	Approved Drawing					
		C) Mounting Arrangement & Dimensions	Major	Measurement	Approved Drawing					
		D) Setting of Releases	Major	Physical Verification	Approved Drawing					
		E) Voltage Rating of Closing Coil / Shunt / Trip / Under Voltage	Major	Physical Verification	Approved Drawing					

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		H) Routine / Type Test	Major	Certification	Manufacturer certificate shall be provided					
1I	Terminal for Power & Control	A) Size / Current rating	Major	Physical Verification	As per approved Drawing.					
		B) Connecting Arrangement	Major	Visual	As per approved Drawing.					
1J	HRC Fuses	A) Verification of Make, current rating, rupturing current	Major	Physical Verification	As per approved Drawing.					
1K	Protective Relays	A) Mounting Detail Setting range Aux. Contact Pos.	Major	Physical Verification	As per approved Drawing					
		B) Operation	Critical	Test	As per approved Drawing					
1 L	MCCBs / Contactors / Timers / Time switches	A) Mounting Detail & Mechanical operation	Major	Physical Verification	As per approved Drawing					
		B) Current Rating / Make	Major	Physical Verification	As per approved Drawing					
		C) No. Of Contacts	Major	Physical Verification	As per approved Drawing					
1M	Current Transformer	A) Mounting Detail & Dimensions	Minor	Measurement	As per approved Drawing					
		B) CT Ratio, Class of Accuracy	Critical	Physical Verification	Manufacturer certificate shall be provided					
1 N	Indicating Instruments (Voltmeter, Ammeter, Frequency, KW, KWH, Meter	A) Mounting Detail & Dimensions	Minor	Measurement	As per approved Drawing					
		B) Accuracy Class	Major	Physical Verification	As per approved Drawing					
		C) Routine / Type Test	Major	Certification	Manufacturer certificate shall be provided					
1O	Control Switch	A) Visual	Minor	Physical Verification	As per approved Drawing					
		B) Contact Rating AC / DC	Major	Physical Verification	As per approved Drawing					
		C) Operational Test	Major	Functional test	As per approved Drawing					
1P	Space Heater	A) Mounting Detail	Minor	Visual / Physical inspection	As per approved Drawing					
		B) Verification of Volt / Watt Rating	Major	Visual / Physical inspection	As per approved Drawing					
1Q	LED Indicating Light	A) Verification Of Voltage Grade	Major	Verification	As per approved Drawing					
		B) Operational Test	Major	Functional test	As per approved Drawing					
1R	Voltage Transformer	A) Mounting Detail & Dimensions	Major	Measurement	As per approved Drawing					
		B) PT Ratio, Class of Accuracy	Major	Physical Verification	As per approved Drawing					
		C) Verification of polarity	Major	Electrical	As per approved Drawing					
		D) Routine / Type test	Major	Certification	Manufacturer certificate shall be provided					
1S	MPCB	A) Verification of Rating & Contact Arrangement	Major	Visual / Physical inspection	As per approved Drawing					
		B) Current Setting	Major	Visual / Physical inspection	As per approved Drawing					
		C) Mounting Arrangement	Major	Visual / Physical inspection	As per approved Drawing					
		D) Re Setting arrangement	Major	Visual / Physical inspection	As per approved Drawing					
1T	MCB / MCCB	A) Verification of rating & Make	Major	Physical Verification	As per approved Drawing					
1U	Push Button	A) Verification of Rating & Contact Arrangement	Major	Physical Verification	As per approved Drawing					
		B) Mounting Arrangement	Major	Measurement	As per approved Drawing					
		C) Operational / Functional	Major	Functional test	As per approved Drawing					
<b>2</b>	<b>IN-PROCESS INSPECTION</b>									

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2A	PANEL FABRICATION	A) Visual check for weld, dressing, de-burring, straightness & dimensional control	Minor	Visual Inspection	Internal Standard					
		B) Checking of Frame.	Minor	Visual Inspection / Measurement	Internal Standard					
		C) Checking of Trollies with standard fixtures	Minor	Physical	Internal Standard					
		D) Dimensions	Minor	Process (Measurement before assembly)	As per fabrication Drawing					
		E) Lifting Facilities	Minor	Process (Physical check before assembly)	As per fabrication Drawing					
		F) Cable Entry	Minor	Process (Physical check before assembly)	As per fabrication Drawing					
		G) Waviness	Minor	Process (Physical check before assembly)	As per fabrication Drawing					
		H) Gasket Arrangement	Minor	Process (Physical check before assembly)	As per fabrication Drawing					
2B	Pre-treatment / Painting	A) Pre- Treatment of sheet steel	Minor	Physical / Visual	Internal Standard/ IS / IEC Standards					
		B) Final Painting	Minor	Physical / Visual	Internal Standard/ IS / IEC Standards					
		- Paint Thickness	Minor	Certification / Measurement	As per approved Drawing					
		- Finish	Minor	Visual	As per approved Drawing					
2C	Assembly	A) Alignment of Panel & Busbar	Major	Physical Verification	Internal Standard					
		b) Check for Busbar Mounting	Major	Physical Verification	Internal Standard					
		1) Tightness of Busbar Joints	Major	Physical test by Torque Wrench	Internal Standard					
		2) Busbar Mounting on Insulators	Major	Physical Verification	Internal Standard					
		3) Busbar jointing Arrangement & Overlapping	Major	Physical Verification	Internal Standard					
		4) Busbar bending & Drilling	Major	Physical Verification	Internal Standard					
		5) Phase Identification &	Critical	Visual / Measurement	Internal Standard					
		6) Busbar Sleeving & Colour.	Minor	Visual Check	Internal Standard					
		C) Check for CT Mounting	Minor	Visual Check	Internal Standard					
		1) Mounting & Adequate Supports of CT	Major	Physical Verification	Internal Standard					
		2) Provision for Shorting link on CT terminal	Major	Physical Verification	Internal Standard					
		D) Arrangement of Components & Terminations	Major	Physical Verification	Internal Standard					
2D	Wiring	A) Proper Wire Clamping	Minor	Visual	Internal Standard					
		B) Continuity & Ferruling as per wiring diagram	Minor	Visual / test	Internal Standard					

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		C) Proper crimping of lugs / connections tightening at terminals & components	Minor	Visual	Internal Standard					
<b>3</b>	<b>FINAL INSPECTION / FACTORY ACCEPTANCE TEST</b>									
3A	BOQ	Verification of :- 1. Component, 2. Rating, 3. Quantities 4. Make	Major	Physical Verification	As per approved BOQ					
3B	Mounting Arrangement	Proper Mounting Arrangement of :- 1. Components, 2. Mounting plates, 3. Gland plates 4. Name plates 5. Doors & covers	Major	Physical Verification	As per approved Drawing					
3C	Wiring	1. Completeness 2. Finishing 3. Ferruling & Lugging 4. Harnessing	Major	Physical Verification	As per approved Drawing					
3D	Continuity test	Wire Continuity test	Major	Routine test	As per approved Drawing					
3E	Insulation Resistance test	IR test using 500V megger	Critical	Phase-Phase; Phase-Earth; Phase-Neutral	Shall not be less than 10Mohms					
3F	HV test	HV test using 3KV, 30 mA HV tester	Critical	2KV Phase-Phase; 1.5KV Phase-Earth 1.5KV Phase-Neutral	Shall withstand for 1 minute					
3G	Busbars	1. Clearance 2. Tightness 3. Sleeving	Critical	Visual / Physical Verification	Manufacturer certificate shall be provided					
3H	Ingressive protection	Degree of protection by insertion of thin paper	Critical	Test	Manufacturer certificate shall be provided					
3I	Powder Coating	1) Shade	Minor	Visual	Manufacturer certificate shall be provided					
		2) Surface Finish	Minor	Visual	Manufacturer certificate shall be provided					
		3) Thickness	Major	Certification	Manufacturer certificate shall be provided					

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3J	Functional Test	1. R,Y,B lamps 2. On, off trip and other lamps 3. No load starting and stopping 4. Current injection tripping 5. 100W Lamp test at output terminals of all feeders 6. Contactor on off 7. Auxiliary relays on off 8. VFD power on and display settings. 9. Reading at all voltmeters 10. Control transformer 11. Space heaters & thermistors 12. Illumination lights 13. Ventilation fans 14. Testing of utility sockets etc. 15. Control test in manual mode keeping its C.B off for all capacitor contactors 16. On indication status lamp functionality test 17. Load testing of equal or less than 5KVAR capacitors.	Major	Visual and Measurement of voltage wherever applicable	Manufacturer certificate shall be provided					

**SIGNATURES:**

AGENCY:	A	B	C	D
ROLE:	MANUFACTURER	CONTRACTOR	CONSULTANT	END CLIENT
AGENCY NAME:	ELECTROSOFT AUTOMATION PVT. LTD.	AGENCY B	AGENCY C	AGENCY D
SIGNATURE:				
NAME OF PERSONNEL:				
DATE:				
PLACE:				