



BHARAT HEAVY ELECTRICALS LIMITED
TIRUCHIRAPALLI - 14

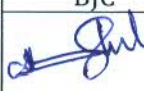
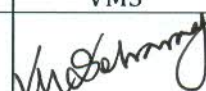
CONTROLS & INSTRUMENTATION/FB

SHEET 01 OF 07

Technical Specification for
FIBRE GLASS REINFORCED POLYESTER (FRP) JUNCTION BOX

Specification Number - TCI:252, Rev. 03

Revision History

REV. NO.	DATE	DESCRIPTION	PREPARED	REVIEWED		APPROVED
				ENGINEERING	QAC	ENGINEERING
00	23-09-2008	Initial Release	-Sd-	-Sd-	-Sd-	-Sd-
01	12-02-2014	Revisit	-Sd-	-Sd-	-Sd-	-Sd-
02	30-03-2016	Revisit	-Sd-	-Sd-	-Sd-	-Sd-
03	10-07-2017	Revised to include TT mountable JB	BJC	VMS	RMV	VM
						



SPECIFICATION REQUIREMENT

1. Site Conditions :- Atmosphere	Dusty, Salty, corrosive & Heavily polluted.
2. Applicable Standard	IS/IEC-60529.
3. Application	For field marshalling.
4. Enclosure protection	Water and dust proof – IP 65 protection as per IS/IEC-60529. Enclosure protection Type test certificate from any of the National Test House shall be submitted during the time of Inspection (Typical Certificates produced shall not be earlier than 5 years from the date of Purchase Enquiry).
5. Material of the Junction box	Fibre glass Reinforced Polyester (FRP) Wall thickness – 4 mm (Minimum).
6. Finish - Colour	As per Purchase Enquiry
7. Number of Ways (Variant)	Item No. 01 : Standard Junction Box - 24, 48 & 72 way – as per purchase enquiry. Item No. 02 : MTM Junction Box - 24, 48 & 72 way – as per purchase enquiry. Item No. 03 : Junction box with DIN Rail provision to mount 4 or 6 Nos. of Temperature Transmitters (TT) – as per purchase enquiry.
8. Terminal Blocks	<u>Standard Junction Box :</u> Side Entry, Cage clamp type, suitable for 4 sq.mm. cables. Wago Model No. 281-101. Colour: Grey. <u>MTM Junction Box (for Thermocouple) :</u> Side Entry, Screw clamp type, Thermocouple Terminal blocks suitable for 'K' type Thermocouple, suitable for 2.5 Sq.mm size. Connectwell Model No. CTT2.5U. Colour: Grey.



SPECIFICATION REQUIREMENT

Junction box (JB) with DIN Rail provision to mount 4 or 6 Nos. of Temperature Transmitters (TT):

Side Entry, Cage clamp type, suitable for 4 sq.mm. cables. Wago Model No. 281-101. Colour: Grey.

Minimum number of Terminal block (TB) to be provided is as below :-

JB Variety	No. of input TB	No. of output TB
4TT	40	16
6TT	60	24

All terminal blocks shall be properly numbered as per the respective method.

Terminal blocks shall be mounted by using suitable Zinc plated DIN RAIL and other mounting accessories.

Terminal blocks shall be mounted in vertical orientation for all the varieties of junction boxes.

Vendor can also offer equivalent models for the above items from the approved makes indicated in QA:CI:STD:QP:34, Rev. 04.

9. Canopy

Requirement as per purchase Enquiry.

Material shall be FRP, with a minimum thickness of 5 mm. Colour shall be same as junction box, as per Purchase enquiry

Canopy shall have 30 mm over-hanging on both sides and 50 mm projection at front (with door closed).

Canopy mounting shall not hinder Door opening and IP rating of the junction box.

Canopy shall be supplied as loose with fixing accessories. Fixing accessories shall be SS-304.



SPECIFICATION REQUIREMENT

10. Component Mounting Plate	2 mm thick, Mild steel / Aluminium sheet, Powder coated/Painted/Zinc passivated. Requirement as per purchase enquiry.
11. Cable duct	Salzer make, flame retardant type PVC cable duct of suitable size and length shall be provided between rows of terminal blocks and at the bottom.
12. External earthing/ Grounding Terminals	1 No. SS-304, M6, earth bolt with 2 Nos. SS Nuts & washers, shall be provided at both sides of the junction box. Earth Symbol sticker (Black lines on Yellow background) shall be provided near earth terminal.
13. Shield Bus	Shield bus-10 mm x 3 mm, 150 mm long, Connectwell Model, NEB-10. 10 numbers of Sliding type Earth Links, Connectwell Model, CENC-4. Shield bus shall be mounted using Bus-bar mounting support, Connectwell Model, NES.
14. Door Arrangement	Door Gasket shall be of Neoprene Rubber or PUF material to meet with Enclosure protection requirements. Door shall be provided with Industrial type metal Lock arrangement with common key suitable for the enclosure protection of IP-65. Door Handle shall be provided as per Vendor's standard practice. Doors shall be removable or hinged - as per purchase enquiry. <u>Removable Door :</u> Doors shall be fixed by using SS-304 Bolts, at four sides. Door shall be provided with Retention chain.



SPECIFICATION REQUIREMENT

Hinged Door :-

Door shall be fixed with Stainless Steel Hinge. Stainless Steel bolt & nut shall be used for fixing the hinge. Number of Hinges shall be as per Clause No. 15. Hinge shall be 2" in size, minimum.

15. Dimensions :-

As per vendor's standard. However, the minimum dimensions shall be maintained as indicated below.

No. of Ways/Dimensions	24 Way	48 Way	72 way	4TT	6TT
	Standard & MTM junction boxes				
Minimum Height (mm)	390	420	450	400	500
Minimum Width (mm)	310	420	450	460	460
Minimum Depth (mm) (without Door)	130	130	130	220	220
No. of SS Hinges	3	3	4	3	4

16. Mounting

Suitable for mounting on walls, columns, structures etc.

17. Junction box mounting Accessories

SS-304 Mounting Brackets, Bolts, Nuts, Plate & Spring washers shall be supplied.

18. Name Plate

2 Nos. of SS-304 Name Plate of size 75 mm X 25 mm and thickness 0.5mm shall be provided for each Junction box. Mounting hole of 4 mm dia. shall be provided at both ends of the name plate.

2 Sets of SS-304, M3 x 10 size bolt, nuts & washers shall be supplied with each name plate.

Name plate Engraving details will be furnished during the time of purchase order. Colour of Engraving shall be Black.



SPECIFICATION REQUIREMENT

19. Cable Entries :-

Plain holes as per the details below shall be provided in each variety of the junction box.

Junction box	Cable Entry
24 way – Standard JB	1" dia. Hole – 2 Nos. $\frac{3}{4}$ " dia. Hole – 8 Nos.
48 way – Standard JB	1" dia. Hole – 3 Nos. $\frac{3}{4}$ " dia. Hole – 10 Nos.
72 way – Standard JB	1" dia. Hole – 4 Nos. $\frac{3}{4}$ " dia. Hole – 15 Nos.
24 way – MTM JB	1" dia. Hole – 2 Nos. $\frac{1}{2}$ " dia. Hole – 6 Nos.
48 way – MTM JB	1" dia. Hole – 3 Nos. $\frac{1}{2}$ " dia. Hole – 12 Nos.
72 way – MTM JB	1" dia. Hole – 4 Nos. $\frac{1}{2}$ " dia. Hole – 16 Nos.
JB suitable for 4 TT	1" dia. Hole – 2 Nos. $\frac{1}{2}$ " dia. Hole – 6 Nos.
JB suitable for 6 TT	1" dia. Hole – 2 Nos. $\frac{1}{2}$ " dia. Hole – 8 Nos.

However, exact size and number of cable entries will be indicated during Dimensional Drawing Approval.

20. Dummy Plugs	All Cable entries shall be plugged with suitable Dummy Plugs. Material: Neoprene or Equivalent material.
21. Inspection & Testing	Quality plan No. QA:CI:STD:QP:74. Revision as per Purchase enquiry.
22. Packing	Packing procedure No. QA:CI:STD:PR:02. Revision as per Purchase enquiry.
23. Guarantee	A Guarantee certificate for 18 months from the date of shipment or 12 months from the date of commissioning whichever is earlier shall be furnished.



SPECIFICATION REQUIREMENT

24. Documents to be submitted by the vendor

Along with Offer :-

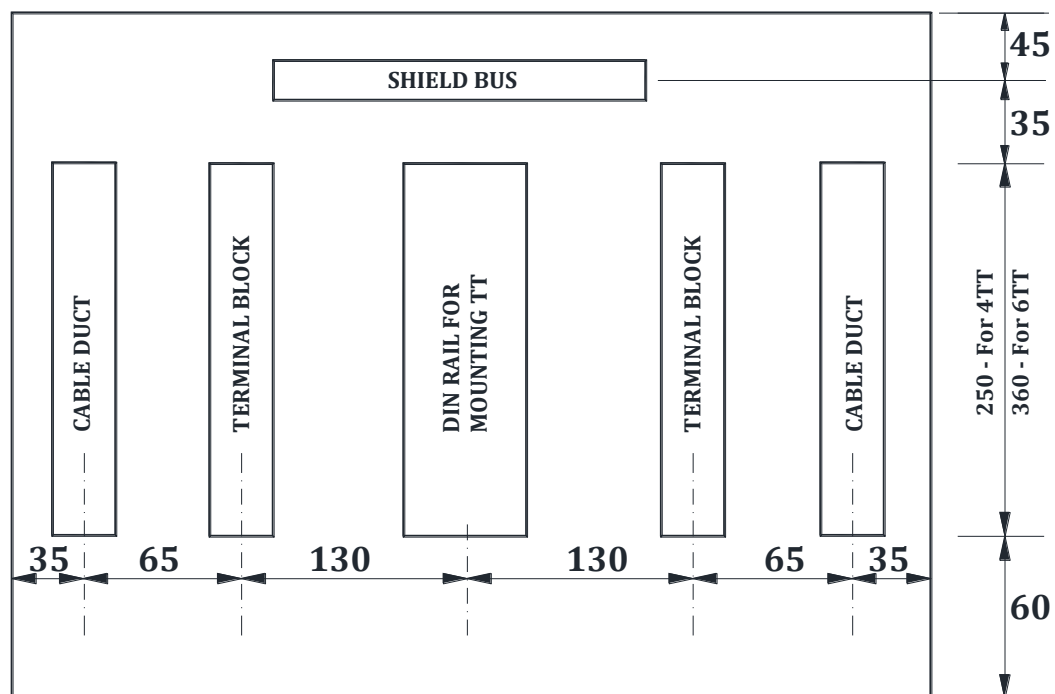
Sub-Delivery Enquiry Deviation format indicating "No Deviation" with the references of Technical Specification and Quality Plan and Packing Procedure.

In the absence of No Deviation format, the vendor's offer will not be evaluated.

After Placement of Purchase order :-

Vendor to forward the Dimensional Drawings for all the varieties of Junction boxes, indicating the references of Purchase Order, Quality Plan, complete BOM (Materials for various components) and get the same approved by BHEL(T), before start of manufacture.

TERMINAL BLOCK & SHIELD BUS ARRANGEMENT FOR TEMPERATURE TRANSMITTER MOUNTABLE JUNCTION BOX

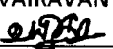
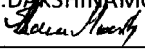


	BHARAT HEAVY ELECTRICALS LIMITED TIRUCHIRAPPALLI - 620014		QA:CI:STD:QP:74 Rev: 00 Page: 1 of 3
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CONTROLS AND INSTRUMENTATION/QA/FB

STANDARD QUALITY PLAN FOR

FRP JUNCTION BOX

REV	DATE	PREPARED	REVIEWED	APPROVED	REVISION HISTORY
00	19/01/2015	V.AVINASH 	RM.VAIRAVAN 	S.DAKSHINAMOORTHY 	Initial Release

	BHARAT HEAVY ELECTRICALS LIMITED TIRUCHIRAPPALLI - 620014	QUALITY PLAN FOR FRP JUNCTION BOX	QA:CI:STD:QP:74 Rev: 00 Page: 2 of 3
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Sl. No.	Components & Operation	Characteristics	Class	Type Of Check	Quantum Of Check		Ref Doc. & Acceptance STD	Format Of Record	Agency			Remarks
					M	B/ C			M	B	C	
A	RAW MATERIALS											
1.	Polyester Resin, C. S. Mat, Accelerator, Pigment, Catalyst	Review Of Manufacture T.C Check for Proper Labels. Identification Check For Batch Number and Date To Ensure Shelf Life	Major	VISU	100%	-	Manufacturer Spec.	LGB / TC	P	-	-	
2	Pre Treatment Of Moulds	Rectification Of Moulds For Any Undulations Scratches Etc.	Major	VISU	100%	-	Manufacture Procedure	LGB	P	-	-	
3.	Mechanical Operation Preparation	A) Weighment Of Resin Pigments Accelerator In Correct Proportions	Major	MEAS	100%	-	Manufacture Procedure	LGB	P	-	-	
		B) Templates For Cutting Glass Fibre	Major	VISU MEAS	One Lot	-	-Do-, Drawing	LGB	V	-	-	
		C) Curing	Major	PHYS	100%	-		LGB	V	-	-	
4.	Post Moulding	Check For Thickness, Dimension & Finish	Major	VISU, MEAS	100%	-	Manufacture Drawing	LGB	V	-	-	
B	INPROCESS INSPECTION	Component Fitment To Chassis	Major	VISU, FUNC	100%	-	-Do-	LGB	P	-	-	
C	FINAL INSPECTION & TESTING	1. MECHANICAL a. BOM Check	Critical	VISU	100%	10%	Approved BOM / Manufacture Drawing	IR	P	W	-	
		b. Physical & Dimensional Verification	Critical	MEAS	100%	10%	Manufacture Drawing	IR	P	W	-	
		c. Lock and Door Arrangement	Major	MECH	100%	10%	Manufacture Drawing	IR	P	W	-	
		d. Paint thickness	Critical	MEAS	100%	1 place	Approved Drawing	IR	P	W	-	on each side
		e. Surface Finish	Critical	VISU	100%	Random	Manufacture Drawing	IR	P	W	-	
		f. Earth point and Marking	Critical	VISU	100%	100%		IR	P	W	-	
		g. Interchangeability of cover	Critical	MECH	100%	10%	Manufacture Drawing	IR	P	W	-	
		2. ELECTRICAL a. Insulation Resistance Test with 500 V DC Megger	Critical	ELEC	100%	10%	IS60947-1	IR	P	W	-	Before and after HV test.

M- MANUFACTURER/ SUB-VENDOR; B - BHEL / TPI; C - CUSTOMER / TPI
P - PERFORM; W - WITNESS V – VERIFICATION.

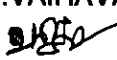
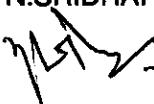
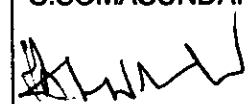
Sl. No.	Components & Operation	Characteristics	Class	Type Of Check	Quantum Of Check		Ref Doc. & Acceptance STD	Format Of Record	Agency			Remarks
					M	B/ C			M	B	C	
		b. High Voltage Test At 2.0 KV For 1 Min.	Critical	ELEC	100%	10%	IS60947-1	IR	P	W	-	
D	TYPE TEST	Enclosure Protection Test	Major	ENVI	One of Design	One of Design	IS60529	TC	V	V	-	
E	PACKING & DESPATCH	A) Check For Completeness Of Equipment & Accessories	Major	VISU	100%	100%	BHEL Spec.	LGB	P	-	-	

F. NOTES: 1. LEGEND : <table style="width: 100%;"> <tr> <td>VISU : Visual</td> <td>ELEC : Electrical</td> </tr> <tr> <td>MEAS : Measurement</td> <td>FUNC : Functional</td> </tr> <tr> <td>PHYS : Physical</td> <td>BOM : Bill Of Material</td> </tr> <tr> <td>FRP : Fiber Reinforced Polymer</td> <td>LGB : Log Book</td> </tr> <tr> <td>IR : Inspection Report</td> <td>TC : Test certificate</td> </tr> <tr> <td>ENVI : Environmental</td> <td>MECH : Mechanical</td> </tr> </table> 2. Vendor shall arrange all test facilities at their works. Tests for which facilities are not available are to be carried out at recognized national test houses like ETDC/CIL/ NPL/ ERTL/ NABL accredited lab at vendor's cost. 3. Through logbooks/ any other documents available at the vendor's works, it shall be possible to correlate the finished product with raw material and in process stage checks / inspection carried out. 4. All measuring and testing instruments shall be periodically calibrated from recognized test houses and certificates made available during Inspection.	VISU : Visual	ELEC : Electrical	MEAS : Measurement	FUNC : Functional	PHYS : Physical	BOM : Bill Of Material	FRP : Fiber Reinforced Polymer	LGB : Log Book	IR : Inspection Report	TC : Test certificate	ENVI : Environmental	MECH : Mechanical	5. Test certificates for type test to be furnished by the vendor. Type test certificates shall not be earlier than 5 years from the date of Enquiry. Otherwise type test have to be conducted and T.C shall be submitted 6. Vendor to give tentative inspection program in advance and confirm exact date, two weeks in advance for arranging BHEL inspection. 7. Packing shall be as per the 'PACKING PROCEDURE' as indicated in the Specification. G. REFERENCE STANDARDS: (For Indicated Standards Refer the Latest Version) <table style="width: 100%;"> <tr> <td>IS60947-1</td> <td>: General rules for low voltage switch gear</td> </tr> <tr> <td>IS60529</td> <td>: Specification for Enclosure Protection Test.</td> </tr> </table>	IS60947-1	: General rules for low voltage switch gear	IS60529	: Specification for Enclosure Protection Test.
VISU : Visual	ELEC : Electrical																
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SQP74R0.DOC

**BHARAT HEAVY ELECTRICALS LIMITED / TIRUCHIRAPPALLI
CONTROLS AND INSTRUMENTATION/QA/FB**

**STANDARD QUALITY PLAN
FOR
ELECTRICAL PANEL ACCESSORIES**

REV	DATE	PREPARED	REVIEWED	APPROVED		REVISION HISTORY
				ENGG.	QUALITY	
00	16.06.97	-Sd-	-Sd-	-Sd-	-Sd-	Initial release
01	22.02.99	-Sd-	-Sd-	-Sd-	-Sd-	New Vendors Added
02	21.03.02	-Sd-	-Sd-	-Sd-	-Sd-	Dept. name changed & General revision-Based on Engg. discussion.
03	08.01.04	-Sd-	-Sd-	-Sd-	-Sd-	Revised to include the comments /Feedback of internal discussion
04	07.12.07	RM.VAIRAVAN 	N.SRIDHAR 	L.A.E.Fernandez 	S.SOMASUNDARAM 	Vendor list updated. Inputs considered are: • TCE approved List for Jojobera • NTPC approved list for BAP(Sipat). • NTPC approved list for Korba-III. • NTPC approved list for Barh STPP. • Feedbacks obtained during discussion

SL.NO	PRODUCT	APPROVED VENDORS
01	Air Circuit Breaker.	L&T / GEPC / SIEMENS / CONTROLS & SWITCHGEAR Co.LTD / SCHNEIDER-MERLIN GERIN ENERPACT
02	Miniature circuit breaker (MCB).	MDS / CROMPTON GREAVES / INDO - ASIAN / IM / LUPUS / SCHNEIDER ELECTRIC / SIEMENS / L&T – HAGER /INDOKOPP/COOPER BUSMANN /STANDARD
03	Moulded case circuit breaker (MCCB).	L&T / GEPC/ CROMPTON GREAVES / BCH / ABB / SIEMENS / CONTROLS & SWITCHGEAR Co.LTD/ SCHNEIDER ELECTRIC / ANDREW YULE /AREVA
04	Power contactors – AC.	L&T / SIEMENS / CONTROLS & SWITCHGEAR CONTACTORS LTD (TC) / SPRECHER & SCHUH / ANDREW YULE / BCH / GEPC / CROMPTON GREAVES / SCHNEIDER ELECTRIC
05	Power & Auxiliary Contactors – DC.	GEPC / BCH / CONTROLS & SWITCHGEAR CONTACTORS LTD(TC) / SIEMENS / SPRECHER & SCHUH / L&T / SCHNEIDER ELECTRIC/ANDREW YULE.
06	Auxiliary Contactors – AC.	L&T / SIEMENS / ABB / BCH / CONTROLS & SWITCHGEAR CONTACTORS LTD(TC) / CROMPTON GREAVES / GEPC/ SPRECHUR & SCHUH / SCHNEIDER ELECTRIC / ANDREW YULE.
07	Indicating lamp.	SIEMENS / VAISHNAO / GEPC / BCH / L&T - ESBEE / CANDS / TEKNIC / CONCORD / ESSEN / CONTROLS & SWITCHGEAR CONTACTORS LTD(TC)-RASS Series
08	Push Button.	SIEMENS / BCH / TEKNIC / CANDS / L&T - ESBEE / VAISHNAO / GEPC / CONTROLS & SWITCHGEAR CONTACTORS LTD(TC)-RASS Series / SCHNEIDER ELECTRIC/CONCORD.
09	Illuminated Push button	PARAMOUNT / BCH
10	Indicating Instruments.	AE / IMP / MECO / L&T-RISHAB / SIETEX / MASSIBUS/ALSTOM.
11	Switches (Power / Control).	KAYCEE / SIEMENS / L&T / SALZAR/ GEPC / CONTROLS & SWITCHGEAR Co. LTD / SCHNEIDER ELECTRIC / SWITRON (For Control switch only)

SL.NO	PRODUCT	APPROVED VENDORS
12	Thermal Overload Relays.	L&T / SIEMENS / CONTROLS & SWITCHGEAR CONTACTORS LTD (TC) / BCH / GEPC / SPRECHER & SCHUH / CROMPTON GREAVES / SCHNEIDER ELECTRIC/ ANDREW YULE.
13	Protective Relays(Electromechanical).	AREVA / EASUN REYROLLE / ABB / SEG & CONTROLS / SIEMENS.
14	Protective Relays(Microprocessor).	AREVA / ABB / L&T
14	Timers - Electronic.	SIEMENS / ABB / CONTROLS & SWITCHGEAR CONTACTORS LTD((TC) / GEPC / OMRON / SPRECHER & SCHUH / SELECTRON. / BCH
15	Timers - Electro – Pneumatic.	BCH / CONTROLS & SWITCHGEAR CONTACTORS LTD(TC)/ SPRECHER & SCHUH
16	Timers - Synchronous.	L&T - G I C.
17	Annunciators.	IIC / L&T / PROCON / ADVANI OERLIKON / OMRON / PIRI / PECON / SIEMENS/MINILEC
18	Current & Potential transformers.	AE / KAPPA / INDCOIL / PRAYOG / CONTROLS & SWITCHGEAR CONTACTORS LTD(TC) / SIEMENS / APPOLO / PRAGATI / PRECISE / JYOTI / SILKAANS/G&M(For PT only) .
19	Control supply transformers.	AE / KAPPA / INDCOIL / SOUTHERN ELECTRIC / SIEMENS / APPOLO / CONTROLS & SWITCHGEAR / PRECISE / LOGICSTAT/PRAGATI/PRAYOG
20	Terminal block - screw type (terminals & fasteners shall be brass with nickel cadmium plated).	ESSEN / ELMEX (THERMO –PLASTIC TYPE) / TOSHA / ASIA ELECTRIC (IEC MAKE) / CONNECT WELL / TECHNOPLAST / VEECON / PHOENIX/WAGO
21	Terminal Block – Cage Clamp type.	WAGO / PHOENIX / ELMEX
22	Fuse Carriers.	SIEMENS / L&T / S&S / CROMPTON GREAVES / CONTROLS & SWITCHGEAR Co. LTD / GEPC / COOPER BUSSMAN.
23	Fuse Links/Neutral Links.	SIEMENS / L&T / CROMPTON GREAVES / CONTROLS & SWITCHGEAR Co.LTD/ GEPC / CANDS / COOPER BUSSMAN.

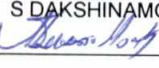
SL.NO	PRODUCT	APPROVED VENDORS
24	Panel Wires	BIS APPROVED
25	Cable Glands – (weather proof).	COMET / POWER ENGG / SUNIL & CO / SMI / BRACCO / ARUP ENGG. WORKS / QPIE / GLANDMECH / CONTROLS & SWITCHGEAR Co. LTD / QUALITY PRECISION
26	Ferrules	MICROSIGN/MAY FAIR/OESER
27	Lugs.	DOWELL / 3D / DIVYA JYOTHI / CHETNA / JAINSONS
28	Space Heater.	SOPHIA / CANDS / CROMPTON GREAVES / PYRO SYSTEM / VELCO / CONTROLS & SWITCHGEAR Co.LTD.
29	15/5 A Power Supply Switch With Plug & Socket (Metal Clad Type With Spring Loaded Cap).	CROMPTON GREAVES/ AJMERA / BCH / BEST & CROMPTON./GEWIS INDIA
30	Cubicle Illumination Lamp.	PHILIPS / BAJAJ / CROMPTON GREAVES / MYSORE LAMPS / HMT.
31	Door Switch.	ESSEN / IEC.
32	Cooling Fan.	RALLI-WOLF / KHAITAN / USHA.
33	Interposing Relay (Low Burden).	JYOTHI / OMRON / ABIL / ABB / SIEMENS / GEPC / OEN / L&T/OWN MAKES OF APPROVED PLC VENDORS.
34	Cable Glands - Flame Proof.	BALIGA / SUDHIR / CEAG / PROMPT / COMET
35	Indicating Lamp – LED.	SRISHYLA / TEKNIC / PARAMOUNT / BINAY / KWALITY / HEWLETT PACKARD
36	Motor Protection Circuit Breaker	L&T / GEPC / SIEMENS / SCHNEIDER ELELCTRIC / SPRECHER & SCHUH .
37	Cable Dressing Material.	MICROSIGN.
38	Wire Duct.	SALZAR.

SL.NO	PRODUCT	APPROVED VENDORS
39	Electrical Transducer	ABB / AE / SOUTHERN TRANSDUCER/ELSTER/RISHAB.
40	Thermostat	APT / TEMPTROL / VIKAS ELECTRIC / AI / RENUTROL / ANCO
41`	Trivector Meter	ALSTOM / BHEL/AREVA/IMP

**BHARAT HEAVY ELECTRICALS LIMITED
TIRUCHIRAPPALLI**

**CONTROLS AND INSTRUMENTATION / FB
QUALITY ASSURANCE**

**STANDARD PACKING PROCEDURE
FOR
ELECTRICAL AND ELECTRONIC PANELS
(INCLUDING BOXES, CABINETS, CUBICLES, SYSTEMS AND CHASSIS)**

Rev	Date	Prepared	Checked	Approved	Revision History
00	01.01.96	Sd/-	Sd/-	Sd/-	Initial History
01	28.03.02	A.J.OMPRAKASH Sd/-	R.VARADARAJAN Sd/-	G.MATHIYALAGAN Sd/-	Department name changed
02	26.02.07	RM.VAIRAVAN	N.SRIDHAR	S.SOMASUNDARAM	Revised after discussion with Shipping Dept.
03	07.02.2017	AVINASH V 	RM VAIRAVAN 	S DAKSHINAMOORTHY 	Type of wood for packing changed

1.0 SCOPE

- 1.1 This procedure gives minimum guidelines to be complied with for packing of Electrical, Electronics and Instrumentation panels. This packing shall be suitable for different handling operations and for the adverse conditions during transportation and during indoor / outdoor storage for periods more than one year.

2.0 WOOD SPECIFICATION FOR PACKING

- 2.1 Any seasoned wood or plywood as per relevant international standard
2.2 Sea worthy packing is envisaged for international shipments.

3.0 PACKING

- 3.1 Any seasoned wood or plywood shall be used .It shall be free from knots, etc. and any kind of decay caused by insects and fungus.
- 3.2 The required wood case for the equipment to be packed shall be made out of individual planks of single length and no joint is permissible. Using such planks, the required wood case for the panel shall be made,
- 3.3 Sufficient number horizontal, vertical and diagonal planks (dimension depending upon case size) shall be used for binding and strengthening. Runners have to be provided with metallic sling plates for handling.
- 3.4 Support planks are to be provided such that, no force is acting on the parts of equipment or its parts.
- 3.5 Panels above 1.5 metre shall be bolted at the bottom.
- 3.6 The equipments covered with a polythene sheet shall be kept inside the box, followed by coir, wooden bottoms, thermo coal, etc to prevent vibration effect during loading, transportation, etc.
- 3.7 On all sides of the inner case, black polythene sheet shall be nailed.
- 3.8 Loose items of the equipment, if any, shall be packed separately.
- 3.9 Delicate components likely to be damaged, example PCB – Electronic modules, instrument, etc are to be covered individually in anti-static bags and packed in cartons and filled with fillers like thermo coal, paper cuttings, etc.
- 3.10 Such cartons shall be packed with overall polythene rapping and packed in wooden cases. Mark prominently as "ELECTRONIC COMPONENTS".

4.0 **MARKING**

- 4.1 After completing the packing, Stencil marking, as per dispatch instructions and symbol marking as per Annexure – I shall be made. Please ensure the box is stenciled with "FRAGILE ITEM", "HANDLE WITH CARE"

5.0 **PACKING SLIP**

- 5.1 A copy of the packing slip, kept in a polythene cover shall be kept inside the box. Another copy of the packing slip, kept in a polythene cover shall be kept out side the box and covered with a metallic plate to the case.

6.0 **CAUTION**

Do not pack any other Mechanical items with this case.

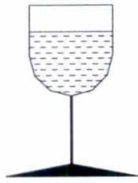
7.0 **GENERAL**

- 7.1 These packing procedures are the minimum requirements in addition to the standard instructions mentioned in the Purchase Order and Specification.

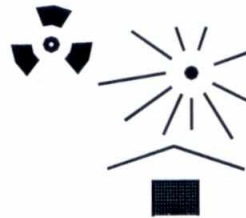
ANNEXURE - 1

TO

PROCEDURE NO:CI:QAC:PR:02/00 ; PR:03/00 ; PR:04/00



FRAGILE, HANDLE WITH CARE



PROTECT FROM HEAT AND RADIOACTIVE SOURCES



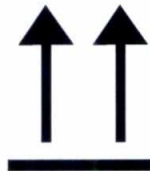
USE NO HOOKS

NOTE: The design of heavy goods packages cannot always resist top lifting by grabhooks.



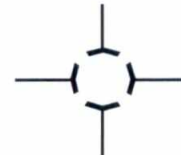
KEEP DRY

NOTE: Not all cases have waterproof internal liners: plywood used in the construction may not have a waterproof glueline.



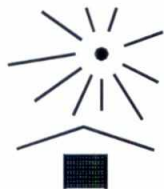
THIS WAY UP

NOTE: Certain designs of small cases make it difficult to distinguish top from bottom.



CENTRE OF GRAVITY

NOTE: This should be stencilled as a minimum on the two longest case sides (this information will normally be supplied by the manufacturer of the item(s) packed).

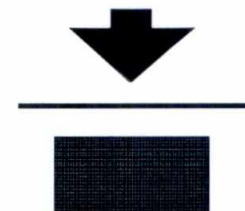


KEEP AWAY FROM HEAT



INTERNATIONAL "SLING HERE" SYMBOL

... kg max



STACKING LIMITATION

NOTE: The maximum load in kilograms should be marked above the arrow.