



**PRODUCT STANDARD**  
**PROJECT ENGINEERING & SYSTEMS DIVISION**  
**HYDERABAD**

Std. / Doc. Number

**PY 56295**

Rev. No.

**01**

Sheet 1 of 10

**SPECIFICATION for WEATHER PROOF & EXPLOSION PROOF JUNCTION BOXES**

**1. SCOPE**

The scope of supply covers Weather proof and Explosion proof Junction Boxes as per the technical requirements specified in Specification, complete with cable glands, plugs, terminal strips and telephone shoe etc.

**2. Proven Track Record**

The items being offered as per specification should be operating satisfactorily in captive power plant applications / hydrocarbon industries like Refinery, Petrochemical and gas processing plants under similar process conditions for at least 4000 Hours. The above criteria shall be applicable to main equipment, sub- components as well as bought out items if any.

Vendor shall submit necessary supporting documents / past users confirmation supporting to above PTR requirements along with technical offer.

If offered instruments / equipment's are supplied to BHEL PE&SD within last 5 years, above PTR clause is not applicable.

**3. INSTRUCTIONS TO BIDDERS**

3.1 Bidders **are advised to contact BHEL for essential technical queries in writing within one week of issue of Enquiry**. In the event of any conflict between these specifications, data sheets, related standards, codes etc. the vendor shall refer the matter to the purchaser for clarifications before bid submission and the decision of Purchaser shall be final & binding on Bidder, without any cost & delivery implications. In the event of conflict, most stringent requirements shall be followed in general.

3.2 Offers with incomplete information will not be considered for evaluation, and are likely to be rejected outright without any further interaction with the Bidder.

3.3 Any technical features [over & above BHEL enquiry specification requirements] proposed by Bidder will not be given preference for the purpose of evaluation.

3.4 Bidder shall submit the "Duly filled & Signed copy of Check list" compulsorily along with technical offer without which offer is liable for rejection without any further interaction with the Bidder

**4. Ambient Conditions :**

Max. Temperature : 60°C  
Min. Temperature : 0°C  
Relative Air Humidity : 100%

**5. DESIGN VARIABLES to be provided after P.O. Placement / during drawing approval:**

Following variables to be finalized during drawing approval and vendor shall comply the same without any commercial implication:

a) Tag Numbers of JB's & <u>Exact ODS of cables</u>	:	Shall be intimated after P.O. placement
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<b>Revisions:</b> Refer to record of revisions	<b>Prepared By:</b> (Sd/-)	<b>Checked By :</b> (Sd/-)	<b>Approved :</b> (Sd/-)	<b>Date :</b>
	Vineet	Sujatha	K. Anand	01.08.18



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**PY 56295**Rev. No. **01**Sheet 2 of **10****6. CHECK LIST** (To be filled by BIDDER and submitted along with Technical offer is compulsorily)

Vendor shall submit the following documents mandatorily as part of COMPLTE technical offer.

Enquiry No. / Date :

Name of the Bidder :

Project Name :

Item Description :

S. No	Document	Bidder confirmation (Yes/No)	Remarks
1	Technical offer complies with the specifications and its associated annexures, pre-bid clarifications in Toto and there are no technical deviations. Signed and stamped copy of this specification along with annexures enclosed along with technical offer.		
2	In case of deviation, vendor to confirm that these are technically not feasible deviations and same are submitted in <b>BHEL format</b> . In case technically feasible deviations are proposed by the bidder and subsequently withdrawn, <u>no commercial implications can be claimed by the bidder</u>		
3	All items are manufactured conforming to latest version of material grade standard and manufacturing standard mentioned in this specifications		
4	<b>Bidder to quote as per BHEL price format only. No other format is acceptable.</b> Bidder to attach un-priced price bid format by indicating "QUOTED" against each item and submit with technical offer duly signed & stamped.		
5	For addition/reduction of quantity, unit rate quoted in the present offer shall be considered during ordering and shall be valid up to execution of the contract to the extent of + 10% and -30% of order Value.		
6	Bidder to agree that Bill of materials / list of equipment furnished in the offer is only for information; Vendor shall supply all the material to meet the performance, sizing & technical requirement as per specification & its Annexures, scope matrix etc.		
7	All the equipments / items / etc., supplied by bidder are having valid statutory approval certificates and same will be produced at any stage of contract execution to BHEL. The same were eligible to take local statutory regulatory body approval during commissioning of the system		

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 \_\_\_\_\_  
 (Bidder's Signature and stamp with date)



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**DEVIATION FORMAT**

**Enquiry No.:****Item:****Name of Bidder:****Offer Ref. No.:**

Sl. No.	Clause no. & Spec. no.	Description as per Specification	Deviation taken	Nature of Deviation	Remarks

**NOTES:**

1. Technical offer of the bidder will be evaluated only on the basis of Deviation Schedule. Deviation Schedule constitutes this sheet (with these Notes) duly signed and stamped.
2. Deviations, if any, shall be clearly brought out only in this format. Deviations mentioned / taken elsewhere or in any other format will be ignored.
3. Additional sheets in the same format can be attached by the vendor, if necessary.
4. Nature of Deviations shall only be of Design / Manufacturing constraints and non-availability of items / components / makes in market.
5. No price implications shall be entertained for deviations withdrawn during the technical scrutiny. If any deviations are accepted by BHEL during technical scrutiny then also there will be no price implication. Hence, in no case there will be consideration of Price implications.
6. Reasons for the deviations shall be specified in the Remarks column.
7. If there are no deviations from the specifications, bidder still has to submit the signed copy of this format by writing "NO Deviations" on this format.
8. If the "Deviation Schedule" is not submitted along with the offer, the bidder's offer is likely to be rejected without any further interaction with the bidder. Only the accepted deviations in conjunction with the original tender shall constitute the contract document for the award of job to the bidder

SIGNATURE OF THE BIDDER \_\_\_\_\_

NAME \_\_\_\_\_

DESIGNATION \_\_\_\_\_

DATE \_\_\_\_\_

COMPANY SEAL

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S. No	Technical Requirements	Specification
1	Application	Connection of Instruments in power plants, petrochemical industries
2	Construction of Enclosure	<b>MOC of enclosure shall be as per material code / enquiry</b> With smooth internal and external surface finish, completely free from dents, defect. Allen screws (made of SS304) type fasteners shall be used for fixing covers and shall be self-locking type to ensure that they do not fall off when cover is opened.
3	Wall Thickness of Enclosure	Adequate thickness shall be provided to withstand at least 80 Kg weight (weight of one man standing upon the box and to withstand the stress at the cable gland entries due to armoured cable)
4	Cable Glands	<b>MOC of glands shall be as per Material code / enquiry</b> , glands shall be Double compression type <b>with Slipper type PVC hoods</b> - for all types of JB's for all entries.
5	Dummy Plugs	<b>SS 304</b> dummy plugs shall be provided for 50% entries.
6	Ferruling JB	Heat shrinkable printed sleeve type
7	Name plate	Junction box shall have tag number engraved on the front cover. Type: S.S. name plate fixed firmly on the front cover by S.S. screws with following details (letter size min 3 mm) : <ul style="list-style-type: none"> <li>BHEL material Code No.</li> <li>Manufacturer's Model No.</li> <li>Size &amp; No. of terminals.</li> <li>Enclosure classification (Certificate No (If any))</li> <li>Manufacture's Name.</li> </ul>
8	Tag Plate	Each junction box shall be supplied with an additional loose S.S. Plate <ul style="list-style-type: none"> <li>Size - 25 mm X 100mm X 1mm thick with holes for fixing screws</li> <li>Fixing arrangement on JB body.</li> <li>Fixing screws – to be provided of suitable size.</li> </ul>
9	Terminals	<ul style="list-style-type: none"> <li>Type - DIN rail mounted, Screw less Cage clamp terminals</li> <li>Suitable for 0.5 - 4 Sq.mm wires</li> <li>Colour – Material codes in Table A - Light blue (Subjected to change during drawing approval) Material codes in Table B, C, - Grey. (Subjected to change during drawing approval)</li> <li>No of rows – 2 No's</li> <li>Numbering System – Sequentially 1 to last no.</li> <li>Make – Elmax / Connectwell / Phoenix / Wago – <b>subject to change during drg. approval</b> <b>Double decker terminals should not be used.</b></li> </ul>
10	Cable Entries	<ul style="list-style-type: none"> <li>Inlet Entries – From bottom, right &amp; left side of JB - <b>As per enquiry material code</b></li> <li>Outlet entries – From Bottom</li> </ul>
11	Earthing Screws	Internal and External 1 no. each with washers shall be provided. All Junction box shall be provided with separate insulated terminal strip for connecting shield wire.
12	Grounding	Two terminals for body and shield ground bus bar
13	Size	<b>Vendor to decide based on this specification</b>
14	Doors	<ul style="list-style-type: none"> <li>Hinged at left hand side and bolted at 4 corners, lockable type for Table A &amp; B.</li> <li>Screwed / Bolted as per manufacture's design for Table C.</li> </ul>
15	Gaskets	High quality Neoprene O-Ring gaskets shall be provided.
16	Paint shade	<ul style="list-style-type: none"> <li><b>For Table – A:</b> Exterior - Light blue (shade 101 of IS-5) paint.</li> <li><b>For Table – B &amp; C:</b> Exterior - Anticorrosive epoxy light Grey (shade 631 of IS-5) paint.</li> <li><b>For Table –A, B &amp; C:</b> Interior - Pale cream (shade 352 of IS-5).</li> </ul> <b>Subject to change during drg. approval</b>
17	Environmental Protection	JBs, Cable Glands & Dummy plugs shall be <ul style="list-style-type: none"> <li><b>For Table – A &amp; B:</b> Weather proof to IP65 to IS/IEC 60529 (latest edition).</li> <li><b>For Table – C:</b> Proof to IS2148/latest edition, zone 1 and 2, Gas Group IIA, IIB and IIC and weather proof to IP65 to IS2147, (latest edition).</li> </ul>
18	Other requirements	For junction boxes, sizing shall be done with due consideration for accessibility and maintenance in accordance with the following guidelines: <ul style="list-style-type: none"> <li>50 to 60 mm gap between terminals and sides of box parallel to terminal strip for up to 50 terminals and additional 25 mm for each additional 25 terminals.</li> <li>100 to 120 mm between two terminal strips for upto 50 terminals and additional 25mm for each additional 25 terminals.</li> <li>Bottom/top of terminal shall not be less than 100 mm from bottom / top of the junction box.</li> </ul>



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**8. Inspection & Testing:**

Junction Boxes and accessories shall be subjected to inspection and testing at vendor works by BHEL/Third party Inspector (TPI) and /or BHEL's customer. Test procedure shall include but not be limited to the following. All the tests being conducted shall clearly bring out in the Quality Assurance Plan (QAP) by Vendor.

S.No	Test	:	Category	Reference documents
a)	Dimensional check	:	10% witness (random)	Approved drawing
b)	Material test	:	100%, Certificate review	Approved drawing
c)	BOM Verification [For JB, glands & plugs]	:	100% witness	JB quantity – As per P.O. Glands & plugs quantity – As per this specification
d)	Size of inlet & outlet entries	:	10% witness (random)	Approved drawing
e)	Tag plate markings	:	10% witness (random)	As per this specification
f)	Ingress protection	:	100% Type test Certificate review	As per this specification
g)	Explosion proof certificate [For JBs, glands & plugs] (For Table C )	:	100% Type test Certificate review	As per enquiry material code

**9. MANDATORY SPARES** - Spares requirement shall be as per enquiry.**10. DOCUMENTATION**

## 10.1 Information to be included with offer

Vendor shall make the offer in detail, with respect to every item of the Purchaser's specifications. Any offer not conforming to this shall be summarily rejected.

- Duly filled & Signed copy of Check list
- Deviation list, if any (as per "No deviation format" given in this specification). If there are no deviations, bidders shall submit "Deviation format" by mentioning deviations "Nil".
- Unpriced price schedule (To be submitted compulsorily without fail)
- Proven Track record and reference list (if applicable)
- Bill of materials (only for information)

## 10.2 Documentation submission within 2 weeks of placement of LOI (for approval by BHEL and / or BHEL's customer in 4 sets)

- Consolidated BOM sheet along with accessories of instruments for approval.
- Detail GA drawings
- Type tests, statutory certificates
- Comprehensive Quality Assurance plan (QAP).

**NOTES::**

- BHEL Shall provide the following inputs to vendor immediately (within 7 days) after placement P.O. / LOI:
  - JB tag list with tag no's, cable entry sizes, site identification no's, etc
  - Typical Cover page for Junction Box
- Following points to be noted while submitting drgs & data sheets for approval:
  - Data sheet / drgs to be submitted along with cover page & tag list.
  - All extra quantities to be marked as "E.spares".
  - All data sheets & drgs to be submitted in soft copy first and once it is cleared for manufacturing, then same shall be submitted in spiral hard copies for formal approval. Do not submit drgs/data sheets in loose papers as well as in bits & pieces for approval.
- All vendor documents and its sub-items shall be submitted to Customer / Consultant for approval during order execution (if applicable). Any comment furnished by Customer / Consultant / BHEL shall be taken care by vendor during ordering execution.
- Further BHEL will provide comments on vendor submitted document within 07 working days for revision & resubmission. Vendor shall follow up with BHEL for non-receipt of comments/approvals.



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- e) Revised drawings / Documents shall be submitted by Bidder in 07 days of receipt of comments / observations from BHEL. BHEL shall revert within 7 days on receipt of these revised documents / drawings from vendor for approvals.
- f) All the approvals required for manufacturing shall be completed within 2 months from P.O to meet the P.O delivery schedule. Accordingly vendor shall ensure the submission of approval category documents (which are required for manufacturing) and obtain their approvals.
- g) Vendor shall obtain final approvals on all technical + quality aspect documents before inspection dates.
- h) It is vendor's responsibility to obtain approvals from BHEL as earliest as possible to meet PO delivery schedules. Accordingly vendor to plan and execute the supplies in time.
- 10.3 Documents to be submitted during final shop testing and before equipment dispatch. **(Note: submission of these documents are commercially linked)** - all in 16 sets (2 sets to be included with item dispatch and balance to BHEL purchase department).
- a) Complete O& M manual.
- b) Approved Engg documents
- c) As-Shipped documents
- d) As-Built documents
- e) Guarantee and all test certificates for review and acceptance by BHEL and / or BHEL's Customer
- 3 sets of CD-ROM – containing **O&M manual and Engineering documents** (1 set to be included with item dispatch and balance to BHEL purchase department).

### 11. MARKING, PACKING AND DESPATCH

- 11.1 All items shall be marked (stamped/etched) in accordance with the applicable code/standard/specification. In addition, the item code, if available, shall also be marked.
- 11.2 For ease of identification, the color of painted strip (wherever required) shall be as per the applicable standard.
- 11.3 Part number/Dispatch link-up of all the equipment's/items supplied and also their co-relation with system/drawing/approved BOQ.
- 11.4 Paint or ink for marking shall not contain any harmful metal or metal salts which can cause corrosive attack either ordinarily or in service. Special items/smaller items shall have attached corrosion resistant tag providing salient features.
- 11.5 The equipment shall be transported to site by the vendor in fully assembled condition. However, in case some components are liable to be damaged during transit, the same shall be dismantled and supplied separately, to be reassembled at site the vendor. Assembly of the item supplied loose at site and repairing of any item damaged during transport shall be in the vendor's scope. The vendor shall send each consignment to site with a detailed packing list.
- 11.6 All the equipment shall be divided into several sections for protection and ease of handling during transportation. The equipment shall be properly packed for transportation by ship/rail or trailer. The equipment shall be wrapped in polythene sheets before being placed in crates/cases to prevent damage to the finish. Crates/cases shall have skid bottom for handling.
- 11.7 Special notations such as 'Fragile', 'This side up', 'Center of gravity', 'Weight', 'Owner's particulars', 'PO Nos.' etc. shall be clearly marked on the package together with other details as per purchaser order.
- 11.8 The equipment/items may be stored outdoors for long periods before installation. The packing shall be completely suitable for outdoor storage in areas with heavy rains/high ambient temperature, unless otherwise agreed.
- 11.9 The following minimum packing procedures shall be followed:-
- a) All items shall be dry, clean and free from moisture, dirt and loose foreign material of all kinds.
- b) All items shall be protected from rust, corrosion, and mechanical damage during transportation and handling.
- c) Each variety and size of item shall be supplied in separate packaging marked with the purchase order no., item code (if available), and the salient specifications.
- d) All electrical, instrumentation etc., shall be properly packed to prevent damage during transport, storage, handling at site.



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- e) All the items which the Bidders considered liable to be damaged during shipment or storage, shall be packaged for separate shipment. If instruments are removed from the panel, they and their connection shall be suitably tagged to ensure simple re installation at the job site. Each instrument shall be sealed in plastic bags containing moisture absorbing desiccants.
- f) It shall be bidder's sole responsibility to protect all the material during period of dispatch, storage and erection against corrosion, incidental damage due to vermin, sunlight, rain, high temperature, humid atmosphere, rough handling in transit and including delays in transit.
- g) Mandatory Spare parts shall be packaged separately and clearly marked as 'Mandatory Spares' .
- h) Commissioning spares, Tools & tackles to be packed separately & suitably tagged.
- 11.10 *If mandatory spare items are ordered, same shall be sent in pre-decided lots in containers /secure boxes distinctly marked in Red color with boldly written "S" mark on each face of the containers /secure boxes*
- 11.11 *Loose vendor items sent by vendor to sites shall be quantified/numbered/tagged and not merely mentioned as ONE lot of loose items.*
- 11.12 *A packing list covering items having shelf life are to be intimated to site. Also, shelf life items shall be packed separately in black color painted box for easy identification at site.*



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**TABLE – A (WEATHER PROOF JUNCTION BOXES – INTRINSIC SAFE TYPE)**

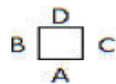
Var No	Material Code	Entries (Note-4)			Entry Size (NPT) & Cable OD		No. of terminals	Material of Junction Box Enclosure	Cable Gland Material
		A (Outlet)	B (inlet)	C (inlet)	Inlet	Outlet			
00	PY9756295007	14	0	0	½" NPT (12 No's)	1½" NPT (2 No's)	48	Dia cast Aluminium (LM6) with protective coating	SS
01	PY9756295015	2	6	6	½" NPT (12 No's)	1½" NPT (2 No's)	48	Dia cast Aluminium (LM6) with protective coating	Nickel plated Brass

**TABLE – B (WEATHER PROOF JUNCTION BOXES)**

Var No	Material Code	Entries (Note-4)			Entry Size (NPT) & Cable OD		No. of terminals	Material of Junction Box Enclosure	Cable Gland Material
		A (Outlet)	B (inlet)	C (inlet)	Inlet	Outlet			
02	PY9756295023	2	6	6	½" NPT (12 No's)	1½" NPT (2 No's)	48	SS316	Nickel plated Brass
03	PY9756295031	2	6	6	½" NPT (12 No's)	1½" NPT (2 No's)	48	Die cast Aluminium (LM6) with protective coating	Nickel plated Brass
07	PY9756295074	2	6	6	½" NPT (12 No's)	1½" NPT (2 No's)	48	SS304	Nickel plated Brass
11	PY9756295112	2	3	3	½" NPT (6 No's)	1" NPT (2 No's)	24	Die cast Aluminium (LM6) with protective coating	Nickel plated Brass
12	PY9756295120	3	0	0	½" NPT (1 No's)	½" NPT (2 No's)	12	Die cast Aluminium (LM6) with protective coating	Nickel plated Brass

Notes:

- The dimensions in brackets for inlets and outlets indicate cable OD diameter. The cable glands shall be suitable for the cable size indicated.
- \*Vendor to furnish this information along with offer.
- External /Internal dimensions' variation shall be +/- 10 mm maximum.



4.



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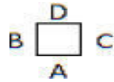
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**TABLE – C (EXPLOSION PROOF JUNCTION BOXES- GR IIA, IIB & IIC OF IS2148)**

Var No	Material Code	Entries (Note-4)			Entry Size (NPT) & Cable OD		No. of terminals	Material of Junction Box Enclosure	Cable Gland Material
		A (Outlet)	B (inlet)	C (inlet)	Inlet	Outlet			
04	PY9756295040	14	0	0	½" NPT (12 No's)	1½" NPT (2 No's)	48	Dia cast Aluminium (LM6) with protective coating	Flameproof, SS
05	PY9756295058	2	6	6	½" NPT (12 No's)	1½" NPT (2 No's)	48	Dia cast Aluminium (LM6) with protective coating	Flameproof, Nickel plated Brass
06	PY9756295066	2	6	6	½" NPT (12 No's)	1½" NPT (2 No's)	48	SS316	Flameproof, Nickel plated Brass
08	PY9756295082	2	3	3	½" NPT (6 No's)	1" NPT (2 No's)	24	Die cast Aluminium (LM6) with protective coating	Flameproof, Nickel plated Brass
09	PY9756295090	3	0	0	½" NPT (1 No's)	½" NPT (2 No's)	12	Die cast Aluminium (LM6) with protective coating	Flameproof, Nickel plated Brass

Notes:

5. The dimensions in brackets for inlets and outlets indicate cable OD diameter. The cable glands shall be suitable for the cable size indicated.
6. \*Vendor to furnish this information along with offer.
7. External /Internal dimensions' variation shall be +/- 10 mm maximum.





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	<u>Price Bid format</u> <u>[for Main Supply ]</u>	Annexure -[1] of PY 56295
	<u>Junction Box</u>	Rev 00
	Project: Nalco Damanjodi 18.5 MW STG + 300 TPG Boiler Project	
<b>BHEL ENQUIRY NO :</b> Ref. date:		<b>Vendor Offer ref no:</b> Ref. date:
<b>NOTES ::</b>		
1	This document details the price schedule format for the enquiry. <b>No other format will be entertained.</b> Applicable taxes and duties shall be indicated separately in commercial offer.	
2	Duly signed & stamped un-priced price schedule format shall be submitted by vendor in the technical offer as a token of concurrence that price schedule would be submitted in this format. Any tampering / modification / additions, etc. are NOT allowed and not considered binding and is liable for rejection of the offer.	
3	<b>Bidders shall be evaluated on overall L1 basis.</b>	
4	For addition/reduction of quantity, unit rate quoted in the present offer shall be considered during ordering and shall be valid up to execution of the contract to the extent of +10% and -30% of order Value. These would include the cost up to engineering, installation of the item, wiring up in the panel and seamless integration with main system at works/site without any cost implications. All accessories required for this purpose shall be included in the price quoted.	
5	Billing will be as per BOM of actual supplied main equipment (including accessories & services) & spares.	
6	Unit Rates of the individual package items shall be derived by multiplying the "Unit Price Fixing Factor" with the Lumpsum Price quoted. Unit Rates of the Individual items thus arrived, shall be binding on the bidder, in case of any repeat order/Ammendment of order as per BHEL policies. Observations / Objections, if any, of the Bidder, to the "Unit Price Fixing Factor" shall be brought to the notice of BHEL, during Pre-Bid Stage. No Observations / Objections shall be entertained after the Techno-Commercial Bid is opened.	

		<u>Price Bid format</u> <u>[for Main Supply]</u>				Annexure -[1] of PY 56295		
		<u>Junction Box</u>				Rev 00		
		Project: Nalco Damanjodi 18.5 MW STG + 300 TPG Boiler Project						
S. No	Material Code	Item Description	Quantity [1]	UNITS	Unit Rate (Rs. ) [1]	TOTAL PRICE (Rs.) [1*1]	Weightage (%) for Calculation of Line Item Prices by BHEL Weightage of each item /unit price fixing factor (Refer Note-6) (%)	Remarks
<b>[A] Junction Box</b>								
1	PY9756295031	JB-WP-48, 12 1/2" x 2 O/L 1.5"	150	No's		63.88		
2	PY9756295058	JB-EP-48, 12 1/2" X 2 O/L 1.5"	28	No's		16.13		
3	PY9756295112	JB-WP-24, 6 1/2" X 2 O/L 1"	32	No's		8.02		
4	PY9756295082	JB-EP-24, 6 1/2" X 2 O/L 1"	17	No's		5.96		
5	PY9756295120	Miniature JB-WP-12, 1 1/2" X 2 O/L 1/2"	20	No's		2.51		
6	PY9756295090	Miniature JB-EP-12, 1 1/2" X 2 O/L 1/2"	20	No's		3.51		
								----- [ 1 ]
<b>Total prices for overall L1 evaluation ( [1] (Rs.) ::</b>								

**INSPECTION PROCEDURE (IP) FOR ELECTRICAL EQUIPMENT AT MANUFACTURERS' WORKS**

**Project** : NALCO CGPP  
**Contractor's Name** :  
**Package Description** : BOILER & TURBOGENERATOR

**Contract/P.O. No.** :  
**Contract Specification Reference** : NALCO CGPP-3CA01-PWR-01(R1)  
**IP No. & Rev.** : IP-28812-E-XX Rev. 0

List-A		List-A		List-B	
Code	Test & Test Certificates	Code	Test & Test Certificates	Code	Documents
1	Visual & Workmanship	16	Dynamic Balancing	31	GA Drawing duly approved
2	Dimensional	17	Oil BDV Test	32	Data Sheet duly approved
3	Ultrasonic Test	18	Measurement of tan delta & capacitance	33	BOM duly approved
4	Routine test as per relevant standard	19	FRLS Tests	34	SLD/Schematic duly approved
5	Acceptance Test as per relevant standard	20	Contact resistance measurement	35	Terminal Plan duly approved
6	Type test as per relevant standard	21	Environmental tests	36	Cable Schedule/Earthing Schedule
7	Pressure/Vacuum test	22	Operational & Fuctional Tests	37	Manufacturer's Catalogue
8	High Voltage Test	23	Burn-in tests	38	Control Philosphy
9	Measurement of Insulation Resistance	24	Measurement of shaft voltage	39	Painting Certificate
10	Enclosure Protection	25	Measurement of ripples	40	Calibration Certificates from NABL accredited Laboratory
11	Painting Shade & Thickness Check	26	Measurement of harmonics		B11 Functional Description
12	Temperature Rise Test	27	LPT Tests		B12 Test Certificates from statutory bodies like CMRI/ NEPA/UL/FM/ BASEFA
13	Impulse Test	28	Physical & Chemical Properties		
14	Oil leakage test	29	Over speed test		
15	PI Value measurement	30	Short Circuit Test		

**General Note :-**

- 1) Three sets of test certificates (2 sets hard & 1 set soft) duly verified and signed by the main Contractor shall be furnished.
- 2) IP number and revision status to be indicated by M.N.Dastur & Co. (P) Ltd.
- 3) Drawing approval authority shall be as per contract.
- 4) If quantity is in lot/set, substantial quantity shall be offered for economy of inspection & lot/set break-up details should be certified by the competent authority.
- 5) Attempt shall be exercised to furnish IP for all the items if the package in single lot.
- 6) Calibration Certificate of all measuring Instruments and Gauges used in inspection & testing shall be from NABL Lab.

Sl. No.	Contract/ Billing Schedule/ Item No.	Equipment/Item Description	Qty.	In-Process Inspection (Select from List-A)			Final Inspection (Select from List-A)			Acceptance Norm (Indicate applicable Standards, Methods, Procedures] & Documents from List B	Test Certificates & Documents to be submitted by Contractor (Select from List A&B)	Remarks/Sampling Plan, if any
				M	C	D	M	C	D			

**Abbreviation:-**

M : Manufacturer                      C : Contractor                      D : M.N.Dastur & Company (P) Ltd.                      R : Document Review

Signature of Contractor & Seal  
Name:

Signature of Client  
Name:

Signature of Inspection Agency & Seal  
Name: M.N. Dastur & Company (P) Ltd.



**STANDARD MANUFACTURING QUALITY PLAN**

MQP. NO.: PESD/QA/EP/0002

PROJECT ENGINEERING & SYSTEMS DIVISION  
BHEL, RC PURAM, HYD-502032

PRODUCT: FLWP JB

REV NO: 00

DATE: 19-AUG-2016

PAGE 2 OF 4

SL NO	COMPONENTS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT & ACCEPTANCE NORMS	FORMAT OF RECORD	*	AGENCY			REMARKS
									P	W	V	


**1.0 RAW MATERIALS & BOUGHT OUT ITEMS/**

	CASTING	VERIFICATION OF MATERIAL OF CONSTRUCTION	MAJOR	CHEMICAL	100%	AS PER BHEL SPEC. /APPD. DRG. /APPD. DATA SHEET	MTC/IR/TC	√	2		1	
	READYMADE COMPONENTS LIKE PB ELEMENT, SELECTOR SWITCH, METER & TERMINAL CONNECTORS etc.	RATING, FUNCTIONAL, HIGH VOLTAGE, INSULATION RESISTANCE TEST	MAJOR	ELECTRICAL	100%	AS PER BHEL SPEC. /APPD. DRG. /APPD. DATA SHEET	MTC/IR/TC	√	2		1	
	GASKET & HARDWARE	DIMENSIONS	MAJOR	VISUAL	100%	AS PER BHEL SPEC. /APPD. DRG. /APPD. DATA SHEET	MTC/IR/TC	√	2		1	
	Spares If any	BOM, Make and rating	Mino	VISUAL	100%	AS PER APPD DRG/APPD DATASHEET/BHEL SPEC.	IR/TC	√	2		1	

**2.0 INPROCESS INSPECTION**

	MACHINING	DIMENSIONS	MAJOR	MEASUREMENT	100%	AS PER BHEL SPEC. /APPD. DRG. /APPD. DATA SHEET	IR/TC		2		1	
		CABLE ENTRY	MAJOR	MEASUREMENT	100%	AS PER BHEL SPEC. /APPD. DRG. /APPD. DATA SHEET	IR/TC		2		1	
	PAINTING	SHADE	MAJOR	VISUAL	100%	AS PER BHEL SPEC. /APPD. DRG. /APPD. DATA SHEET	IR/TC		2		1	

<p>LEGEND: P: PERFORM, W: WITNESS, V: VERIFICATION. INDICATE 1 FOR BHEL/BHEL NOMINATED INSPECTION AGENCY 2 FOR VENDOR/SUB VENDOR AS APPROPRIATE AGAINST EACH COMPONENT /CHARACTERISTIC UNDER P, W &amp; V COLUMNS. * FOR ITEMS MARKED ✓ (TICK) IN COLUMN 'D', TEST CERTIFICATES SHALL BE SUBMITTED TO BHEL FOR RECORDS.</p>	CHECKED BY	APPROVED BY	APPROVED BY
	BHEL QA SIGNATURE & STAMP	BHEL QA SIGNATURE & STAMP	CUSTOMER'/CONSULTANT'S SIGNATURE & STAMP

		<b>STANDARD MANUFACTURING QUALITY PLAN</b>					MQP. NO.: PESD/QA/EP/0002					
		PROJECT ENGINEERING & SYSTEMS DIVISION BHEL, RC PURAM, HYD-502032			PRODUCT: FLWP JB		REV NO: 00		DATE: 19-AUG-2016			
		PAGE 3 OF 4										
SL NO	COMPONENTS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT & ACCEPTANCE NORMS	FORMAT OF RECORD	*	AGENCY			REMARKS
									P	W	V	


3.0 FINAL INSPECTION & TESTING												
ACCEPTANCE TEST	OVERAL DIMENSION	MAJOR	MEASUREMENT	100%	AS PER BHEL SPEC. /APPD. DRG. /APPD. DATA SHEET	IR/TC	√	2	1			
	CABLE ENTRY	MAJOR	VISUAL	100%	AS PER BHEL SPEC. /APPD. DRG. /APPD. DATA SHEET	IR/TC	√	2	1			
	CHECK FOR JOINTS,SURFACE & GAP/CLEARANCE	MAJOR	VISUAL	100%	AS PER BHEL SPEC. /APPD. DRG. /APPD. DATA SHEET	IR/TC	√	2	1			
	TERMINAL ARRANGEMENT	MAJOR	VISUAL	100%	AS PER BHEL SPEC. /APPD. DRG. /APPD. DATA SHEET	IR/TC	√	2	1			
	LOCATION OF COMPONENTS(ASS EMBLY)	MAJOR	VISUAL	100%	AS PER BHEL SPEC. /APPD. DRG. /APPD. DATA SHEET	IR/TC	√	2	1			10% by BHEL
	PAINT SHADE,PAINT THICKNESS & FINISHING	MAJOR	VISUAL	100%	AS PER BHEL SPEC. /APPD. DRG. /APPD. DATA SHEET	IR/TC	√	2	1			
	DIELECTRIC TEST	MAJOR	ELECTRICAL	100%	AS PER BHEL SPEC. /APPD. DRG. /APPD. DATA SHEET	IR/TC	√	2	1			
	INSULATION RESISTANCE TEST	MAJOR	ELECTRICAL	100%	AS PER BHEL SPEC. /APPD. DRG. /APPD. DATA SHEET	IR/TC	√	2	1			
	BOM CHECK	MAJOR	VISUAL	100%	AS PER BHEL SPEC. /APPD. DRG. /APPD. DATA SHEET	IR/TC	√	2	1			10% by BHEL

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	BHEL QA SIGNATURE & STAMP	BHEL QA SIGNATURE & STAMP	CUSTOMER'/CONSULTANT'S SIGNATURE & STAMP

SL NO		COMPONENTS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT & ACCEPTANCE NORMS	FORMAT OF RECORD	*	AGENCY			REMARKS	
									D	P	W	V		
		DEGREE OF PROTECTION TEST OF ENCLOSURE			MAJOR	ELECTRICAL	---	AS PER BHEL SPEC. /APPD. DRG. /APPD. DATA SHEET	IR/TC	√	2		1	
		FLAME PROOFNESS OF ENCLOSURE			MAJOR	ELECTRICAL	---	AS PER BHEL SPEC. /APPD. DRG. /APPD. DATA SHEET	IR/TC	√	2		1	If applicable
		CCOE/PESO APPROVALS			MAJOR	ELECTRICAL	---	AS PER BHEL SPEC. /APPD. DRG. /APPD. DATA SHEET	IR/TC	√	2		1	If applicable
		BIS LICENCE FOR FLAMEPROOF EQUIP.			MAJOR	ELECTRICAL	---	AS PER BHEL SPEC. /APPD. DRG. /APPD. DATA SHEET	IR/TC	√	2		1	If applicable
<b>4.0</b>		<b>PRESERVATION &amp; PACKING</b>												
		PACKING			MAJOR	VISUAL	100%	AS PER BHEL SPEC. /APPD. DRG. /APPD. DATA SHEET	IR/TC	√	2		1	
		PACKING LIST			MAJOR	VISUAL	100%	AS PER BHEL SPEC. /APPD. DRG. /APPD. DATA SHEET	IR/TC	√	2		1	

**Notes:-**

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	BHEL QA SIGNATURE & STAMP	BHEL QA SIGNATURE & STAMP	CUSTOMER'/CONSULTANT'S SIGNATURE & STAMP

		<b>STANDARD MANUFACTURING QUALITY PLAN</b>					MQP. NO.: PESD/QA/EP/0002					
		PROJECT ENGINEERING & SYSTEMS DIVISION BHEL, RC PURAM, HYD-502032			PRODUCT: FLWP JB		REV NO: 00	DATE: 19-AUG-2016				
		PAGE 5 OF 4										
SL NO	COMPONENTS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT & ACCEPTANCE NORMS	FORMAT OF RECORD	*	AGENCY			REMARKS
								D	P	W	V	

1. This Standard MQP should be read along with specification (Latest revision as per PO), approved drawings & approved datasheet (as applicable).
2. Drawing/datasheet shall prevail over quality plan for contradiction if any.
3. Any project/customer specific requirements which shall be notified have to be fulfilled by the vendor at the time of execution of order.

**Abbreviations:-**

MTC - Material Test certificate	TC - Test Certificate	RT - Radiography Test
IR - Inspection Report	ITR - Internal Test Report	UT - Ultrasonic Test
NDE - Non Destructive Examination	LPT - Liquid Penetrant Test	
IBR - Indian Boiler Regulations	DFT - Dry Film Thickness	
COC - Certificate of Compliance		

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	BHEL QA SIGNATURE & STAMP	BHEL QA SIGNATURE & STAMP	CUSTOMER'/CONSULTANT'S SIGNATURE & STAMP



PROJECT ENGINEERING & SYSTEMS DIVISION

RC PURAM, HYDERABAD.

QUALITY & BUSINESS EXCELLENCE

INSPECTION / TC REVIEW FORMAT

1	Vendor's Name:		5	Applicable BHEL Spec No:	
2	Project:		6	Approved Drawing No:	
3	PO No:		7	Approved Data Sheet No:	
4	Item Description:		8	Approved QAP No:	

OFFER LIST

S.No	BBU/ PO Sr. No.	Item Description	Total Qty as per PO/BBU	Qty. already accepted	Qty offered for TC review	Cumulative Qty	Balance Qty
A							
B							
C							
D							

TC REVIEW REQUISITION

BBU / PO Sr. No.	QAP Clause No.	Format of Record	Certificate No. & Date	Page No.	REMARKS
<b>A. Item Description:</b>					
<b>B. Item Description:</b>					
<b>C. Item Description:</b>					
<b>D. Item Description:</b>					
<b>E. Item Description:</b>					

<p>SUPPLIER / VENDOR SIGNATURE WITH SEAL</p>   <p>Dt:</p>	<p>BHEL/ BHEL's TPIA SIGNATURE WITH SEAL</p>   <p>Dt:</p>
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**BHARAT HEAVY ELECTRICALS LIMITED**  
**RAMACHANDRAPURAM:: HYDERABAD – 502032**  
**PROJECT ENGINEERING & SYSTEMS DIVISION**  
**QUALITY & BUSINESS EXCELLANCE DEPARTMENT**  
**Format for inspection call**

Ref: BHEL/PESD/QS/CQIR-Inspection Call/01

Dt: 20.07.2020

Due to unavailability of all BHEL/Customer approved documents TPIAs visits are wasting .To avoid this it is mandatory to vendor to arrange all the approved reference documents and then only raise the inspection call in portal. Vendor has to fill the below details and upload this documents in portal while raising the inspection call.

Sr.No	Approved Documents	Approved Documents date
	Approved QAP No with revision	
	Approved Drawing No with revision	
	Approved Data Sheet No with revision	
	Purchase specification	
	Purchase Order/BBU	

**Note:** While raising inspection call vendor has to take care of below points.

1. **Purchasing Unit:** Purchasing Unit should be PE & SD.
2. **Joint Inspection:** Joint inspection means where BHEL and BHEL client both are jointly attending the inspection.
3. **CQ Center:** CQ center is a TPIA (We are having two TPIA, TUV and BVI) operating region, suppose inspection is in Mumbai than CQ center will be either of TUV Mumbai/BVI Mumbai.

Vendor Signature

**Notes:**

1. During inspection, the Vendor/Supplier/manufacturers shall furnish valid calibration certificate for measuring and testing instruments, to be used during inspection, with clear identification of instrument number from NABL accredited laboratory.
2. Material Test certificates for physical & chemical properties shall be submitted as per agreed ITP . Test Certificates submitted shall be from approved laboratories accredited by NABL. Materials used for manufacturing shall not be more than five years old.
3. Type test certificate for electrical, electronics and instrumentation items shall be furnished which in general shall not be more than 5 years old from the effective date of contract. In case Type test certificates are not available, Vendor/Supplier shall organize Type test for such items at their cost.
4. If testing from outside laboratory is required, Vendor/Supplier shall get the samples/equipment tested from NABL accredited laboratory. In case of any dispute about test results and test methods or for other reasons Consultant can opt for getting sample/equipment tested from NABL accredited laboratory. Cost of the such test(s) shall be borne by Vendor/Supplier.