

कदम कदम मिलाना है ग्राहक सफल बनाना है

Marching Towards Business Excellence



ENQUIRY

TWO PART BID

BP_200101

E-TENDER

भारत हेवी इलेक्ट्रिकल्स लिमिटेड, पिपलानी, भोपाल- ४६२०२२ (भारत)

सामग्री प्रबंधन विभाग

BHARAT HEAVY ELECTRICALS LIMITED, PIPLANI, BHOPAL-462022 (INDIA)

MATERIALS MANAGEMENT DIVISION

TIN NO- 23573000001

ECC NO- AAACB4146PXM009

MPCT NO- HEL/05/01/0001/S15/11/79

PHONE NO : 91-755-2500100

FAX : 91-755-2500023

www.bhel.com

ENQUIRY NO

E5963020

ENQUIRY DATE

04/09/26

ENQUIRY DUE DATE

14/09/26

SUPP NAME AND ADDRESS	SUPP CODE	REV CD	REV NO	REV DATE	NO OF CATY2	NO OF CATY3	ENQ NO OF ITEMS	INDENT NO
	0	1	0	NA	2	2	2	121364537
	GUARANTEE CERTIFICATE		Y	SUPPLY CONDITION SUPPLIER'S IDENTIFICATION MARK SHOULD BE ON EACH JOB.				
	TEST CERTIFICATE		Y					
	INSTRUCTION BOOKLET		N	TECHNICAL CONDITION AS PER DRG.				
	SAMPLE		N					
	GATE PASS		Y	INSPECTION CONDITION AT BHEL BHOPAL				

NOTE: QUOTE PRICE BOTH IN FIGURES & WORDS.IN CASE OF MISMATCH PRICE IN WORDS WILL BE VALID,QUOTATIONS NOT BEARING ENQUIRY NO AND DUE DATE LIABLE TO BE REJECTED.

SL NO	MATERIAL CODE	DESC	UNIT	ITEM QTY	QTY VR%	LOT NO	LOT QTY	DEST	DELIVERY DATE
1	BP9044825615	TA7009BZ,TA6301BX FLEXIBLE SHUNT ASSY TO DRG.NO. 37164532006 V-00 REV-08 TO BE SUPPLIED IN PROPER PACKING.	NO	30.000	30	1	30.000	213	02/11/26
2	BP9094824310	TA6301BX,TA7009BZ FLEXIBLE SHUNT ASSY TO DRG.NO. 37164532006 V-02 REV-08.TO BE SUPPLIED IN PROPER PACKING.	NO	60.000	30	1	60.000	213	02/11/26

REMARK AS PER NIC E TENDER

DRAWING	Y	PURCH SPEC	Y	CATALOUGE	N	Quality Surveillance Plan	N	TWO PART BID	Y
---------	---	------------	---	-----------	---	---------------------------	---	--------------	---

NOTE:BHEL,BHOPAL'S Standard Terms & Conditions BP200102C/BP205316 for imports and BP200102C/ BP205316 for indigenous procurements form a part of this Enquiry. Bidders may obtain from us copies of these terms and conditions if not already available.

Note: During Bid Evaluation, No loading of price with regard to preferential payment of within 45 days will be made on vendore falling under MSMED ACT - OCT 06

Please submit your lowest quotation in sealed envelop essentially superscribed with ENQUIRY NO, DUE DATE AND PARTY'S NAME so as to reach at TENDER ROOM, GROUND FLOOR, ADM BUILDING, BHEL, PIPLANI BHOPAL-462022 by 11.00 am of due date.

1.This is only a request for Quotation & not an order.

2.Small Scale industries should indicate SSI Regn. No. in Quotation/invoice.

3.In case you are not making an offer against this Enquiry, we request you to post a regret letter.

4.Indian vendors to please indicate GSTIN on their quotation.

SPECIAL REMARK: Bid to be submitted through e-procurement. Refer eproc link on BHEL Bhopal B2B site.

Documents Enclosed

1.Drawing. 3.Purchase specification.

2.Catalogue. 4.Quality Surveillance Plan.

NAME : SHRI MANENDRA SINGH

DESG : MANAGER

0755-2505880

manendra1@bhel.in

SIGN & SEAL

E
N
Q
U
I
R
Y



MATERIAL MANAGEMENT - TRACTION MACHINES

HEAVY ELECTRICAL PLANT, BHOPAL

BHARAT HEAVY ELECTRICALS LIMITED

BHEL ENQUIRY NO. E5963020

NIT TERMS & CONDITIONS:

SL. NO.	DESCRIPTION	DETAILS
1.	RATE CONTRACT TERMS	We intend to enter into a Rate Contract (RC) for ordering up to 12 (Twelve) months from RC freeze date, i.e. RC is to be kept valid for ordering up to 12 months from RC freeze date. Purchase Ordering shall be done as per BHEL requirement against the finalised rate contract & within its validity. Dispatches to be made against our purchase order (computerized) only, which will be issued against this Rate Contract.
2.	ITEM DESCRIPTION	Item#01: - TA7009BZ, TA6301BX FLEXIBLE SHUNT ASSY TO DRG. NO. 37164532006 V-00 REV-08 TO BE SUPPLIED IN PROPER PACKING. Item#02: - TA6301BX, TA7009BZ FLEXIBLE SHUNT ASSY TO DRG. NO. 37164532006 V-02 REV-08. TO BE SUPPLIED IN PROPER PACKING.
3.	TECHNICAL CONDITION	As per attached T-PQR and SPEC.
4.	QUANTITY	Item#01: - 30 ± 30% Nos Item#02: - 60 ± 30% Nos
5.	QUANTITY VARIATION/ Option Clause	+/-30%
6.	SPLITTING OF ORDER	Not Applicable.
7.	DELIVERY SCHEDULE REQUIREMENT	Delivery in single lot of 30 Nos of item#01 & 60 Nos of item#02 shall be within 60 days from date of placement of the PO.
8.	DELIVERY TERMS	FOR Destination. DESTINATION FOR SUPPLY OF ITEM SHALL BE BHEL BHOPAL.
9.	DELIVERY INSTRUCTION	SUPPLIER'S IDENTIFICATION MARK SHOULD BE ON EACH JOB.
10.	QAP	Not Applicable
11.	INSPECTION CONDITION	AT BHEL BHOPAL
12.	SAMPLE	As specified in the Spec
13.	TEST CERTIFICATE	All Material TC to be supplied along with material as per Spec.
14.	GUARANTEE / WARRANTY	As per BHEL GTC of ENQUIRY (BP200102C, Cl. No. 18)
15.	GUARANTEE/ WARRANTY CERTIFICATE	GC to be supplied along with the material and GC should incorporate /Spec. as mentioned in item description.



MATERIAL MANAGEMENT - TRACTION MACHINES

HEAVY ELECTRICAL PLANT, BHOPAL

BHARAT HEAVY ELECTRICALS LIMITED

BHEL ENQUIRY NO. E5963020

16.	PAYMENT TERMS	100% payment in 90 days of receipt (45 days for Micro & Small and 60 days for Medium enterprises as registered in Udyam Certificate as per relevant MSME act in force) and subject to acceptance of material and relevant documents at BHEL. Any deviation from the above payment terms, if accepted (by BHEL), shall be loaded @ "Repo Rate + 4%" for the purpose of bid evaluation. Other terms as per attached BHEL GTC of ENQUIRY (BP200102C, Cl. No. 16).
17.	TECHNICAL PQR (T-PQR)	Technical Pre-Qualification Requirements (T-PQR) for procurement of the items is attached with the NIT. Compliance of all the points in T-PQR is mandatory. In absence of compliance of above and non-submission of documents required against the T-PQR, the Vendor's offer is liable to be rejected. Duly filled T-PQR with desired documents shall be submitted by the Vendor along with the offer. <i>Information/ compliance/ documents submitted by vendor shall be authentic in all aspects. In case any deviation/ false information/ forged documents are observed / revealed later on, BHEL is free to initiate appropriate punitive proceeding against the Vendor as per Prevalent Processes and Guidelines of Company.</i>
18.	FINANCIAL PQR (F-PQR)	Not Applicable.
19.	BID PARTS	Offer shall be submitted by the bidders in Two Parts, i.e. Part-I Technical cum Commercial bid & Part-II Price bid.
20.	PENALTY / LD	As per attached BHEL GTC of ENQUIRY (BP200102C, Cl. No. 9) i.e. 0.5% of the undelivered portion per week of delay or part thereof, subject to a maximum of 10% of the undelivered order value owing to delayed delivery. Any loading on penalty clause shall be to the extent to which it is not agreed to by the bidder (at offered value).
21.	PRICE BASIS	Firm Price basis
22.	PRICING TERMS	As per attached BHEL GTC of ENQUIRY (BP200102C, Cl. No. 12)
23.	PRICE VALIDITY	Offer shall be valid for a period of 90 days from the date of Techno- commercial (Part-I) bid opening date.
24.	TAXES & DUTIES	As per attached BHEL GTC of ENQUIRY (BP200102C, Cl. No. 14)
25.	EVALUATION CRITERIA	Overall L1 basis.
26.	EVALUATION IN CASE OF MORE THAN ONE L-1 BIDDER	In the course of evaluation, if more than one bidder happens to occupy L-1 status, effective L-1 will be decided by soliciting discounts from the respective L-1 bidders. In case more than one bidder happens to occupy the L-1 status even after soliciting discounts, the L-1 bidder shall be decided by a toss/draw of lots, in the presence of the respective L-1 bidder(s) or their representative(s). Ranking will be done accordingly. Decision of BHEL in such situations shall be final and binding.



MATERIAL MANAGEMENT - TRACTION MACHINES

HEAVY ELECTRICAL PLANT, BHOPAL

BHARAT HEAVY ELECTRICALS LIMITED

BHEL ENQUIRY NO. E5963020

27.	BID SECURITY/ Earnest Money Deposit (EMD)	Not Applicable
28.	PERFORMANCE SECURITY (PBG)	Not Applicable.
29.	REVERSE AUCTION	Not Applicable
30.	MSE PREFERENCE	Applicable as per attached BHEL GTC of ENQUIRY (BP200102C, Cl. No. 29). Item is divisible on package basis.
31.	PUBLIC PROCUREMENT (PREFERENCE TO MAKE IN INDIA), ORDER 2017 (As per BHEL GTC BP200102C, Cl. No. 33)	Not Applicable.
32.	INTEGRITY PACT (IP)	Not Applicable.
33.	RESTRICTION UNDER RULE 144 (xi) GFR	As per attached BHEL GTC of ENQUIRY (BP200102C, Cl. No. 34)
34.	CONFLICT OF INTEREST AMONG BIDDERS/ AGENTS AND THEIR DECLARATION	A bidder shall not have conflict of interest with other bidders. Such conflict of interest can lead to anti-competitive practices to the detriment of Procuring Entity's interests. Bidders having a conflict of interest shall not be eligible to participate in the tender process. Treatment of cases regarding conflict of interest: - The bidder notes that a conflict of interest would said to have occurred in the tender process and execution of the resultant contract, in case of any of the following situations: i) If its personnel have a close personal, financial, or business relationship with any personnel of BHEL who are directly or indirectly related to the procurement or execution process of the contract, which can affect the decision of BHEL directly or indirectly; ii) The bidder (or his allied firm) provided services for the need assessment/ procurement planning of the Tender process in which it is participating; iii) Procurement of goods directly from the manufacturers /suppliers shall be preferred. However, if the OEM/ Principal insists on engaging the services of an agent, such agent shall not be allowed to represent more than one manufacturer/ supplier in the same tender. Moreover, either the agent could bid on behalf of the manufacturer/ supplier or the manufacturer/ supplier could bid directly but not both. In case bids are received from both the manufacturer/ supplier and the agent, bid received from the agent shall be ignored. However, this shall not debar more than one Authorised distributor (with/ or without the OEM) from quoting



MATERIAL MANAGEMENT - TRACTION MACHINES

HEAVY ELECTRICAL PLANT, BHOPAL

BHARAT HEAVY ELECTRICALS LIMITED

BHEL ENQUIRY NO. E5963020

		equipment manufactured by an Original Equipment Manufacturer (OEM) in procurements under a Proprietary Article Certificate. iv) A bidder participates in more than one bid in this tender process. Participation in any capacity by a Bidder (including the participation of a Bidder as a partner/ JV member or sub-contractor in another bid or vice-versa) in more than one bid shall result in the disqualification of all bids in which he is a party. However, this does not limit the participation of an entity as a sub-contractor in more than one bid if he is not bidding independently in his own name or as a member of a JV. The Bidder declares that they have read and understood the above aspects, and the bidder confirms that such conflict of interest does not exist and undertakes that they will not enter into any illegal or undisclosed agreement or understanding, whether formal or informal with other Bidder(s), in this regard. This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to introduce cartelization in the bidding process. In case, the Bidder is found having indulged in above activities, the same will be considered as a violation of the tender conditions, and suitable action shall be taken by BHEL as per extant policies/ guidelines.
35.	ANNEXURE-IX	The Bidder/Supplier/Contractor will, when presenting his bid, declare whether other Family Firms or Sister Concern Affiliates/Subsidiary firms are participating in the same tender, so as to eliminate the possibility of cartel formation. Format for declaration is available in the NIT documents for this enquiry (Annexure-IX). Same is to be submitted with the offer.
36.	SPECIAL CONDITIONS	Bidders who fall under MSE (Micro & Small Enterprises only) and fail to upload 'UDYAM Registration Certificate (URC)' shall automatically be considered as Non-MSE supplier for this tender. Further, it is to be noted that MSE benefits are not being extended to Agent/ Dealer/ Trader/ Distributor (i.e. Other than manufacturer). Supplier has to also provide supporting document(s) such as Agreement Between OEM & Bidder(s) etc. Identification must. Soon after rejection of material, it is to be ensured by supplier that material should be taken back maximum within two weeks after communication for rectification/ replacement & supply back the rectified/ fresh material to BHEL Bhopal within 30 days from rejection. In the event of non-lifting of rejected material by supplier, BHEL will not be responsible for loss of such items to the supplier in any case. Offers of suppliers who are in 'HOLD/BANNED' status in BHEL Bhopal PMD shall not be considered. Unregistered vendors to submit documents required for registration to BHEL Portal Online (https://bhel.com/supplier-registration).
37.	OTHER TERMS & CONDITIONS	Other Terms & Conditions as per attached BHEL GTC of ENQUIRY (BP200102C). Any deviation of NIT, BHEL GTC of ENQUIRY (BP200102C) and BHEL PO Terms, where vendor response is not affirmative to be clearly indicated, else BHEL will consider that all above Terms & Conditions are acceptable to vendors.



MATERIAL MANAGEMENT - TRACTION MACHINES

HEAVY ELECTRICAL PLANT, BHOPAL

BHARAT HEAVY ELECTRICALS LIMITED

BHEL ENQUIRY NO. E5963020

38.	GEM REGISTRATION	As you are kindly aware that Government e-Marketplace (GeM) is a one stop portal to facilitate Online Procurement of Goods & Services required by various Government Departments/ Organizations/ PSUs. BHEL being a PSU, would like that its suppliers/ contractors also have visibility on this portal so that GeM can be used for procurement by BHEL. Hence, you are requested to get yourselves registered on GeM.
39.	TENDER FEE	Not applicable
40.	BID SUBMISSION WITHIN DUE DATE & TIME	No request for extension of tender due date will be entertained at the time of tender opening and after due date under any circumstances. Hence, all bidders are requested to submit their bid well within due date and time only. <i>BHEL reserves the right for extension of tender based on the situation without assigning any reason whatsoever it may be.</i>
41.	DOCUMENTS TO BE FURNISHED ALONG WITH YOUR QUOTATION	Signed and Sealed copy of: - NIT - BHEL GTC of ENQUIRY (BP200102C) - BHEL ENQ & PO Terms Duly Filled, Signed and Sealed copy of: - Techno-Commercial Annexure - Compliance of T-PQR with applicable documents - Annexure-IX in Company Letterhead - Annexure-A - OEM & MSE Declaration Others: UDYAM Registration Certificate (<i>as applicable for MSME bidders only</i>)
42.	INVOICING THROUGH SUVIDHA PORTAL	For supply orders placed on Indian Suppliers, irrespective of the value of the invoice amount, the bidder / vendor should necessarily upload the despatch & invoice details on BHEL SUVIDHA portal at https://suvidha.bhel.in/suvidha/ , prior to despatch. All documents as per PO checklist, along with additional documents (if any), must be uploaded on the portal. It is mandatory that tax invoices with a net amount (including taxes) exceeding Rs five lakhs uploaded on the portal are digitally signed using a Class 3 Digital Signature Certificate (DSC) issued by a licensed Certifying Authority. Submission of invoice document in hard copy is allowed for invoices with a net amount (including taxes) equal to and upto Rs five lakhs, in case they were not digitally signed and uploaded on the portal. The material will not be accepted inside BHEL in absence of the above.

IT IS HEREBY MENTIONED THAT THIS IS E-TENDER SO OFFER SUBMITTED THROUGH E-PROCUREMENT PORTAL (www.eprocurebhel.co.in) SHALL ONLY BE CONSIDERED.

Techno-Commercial Annexure

(To be filled by supplier inline with NIT requirement and submit with offer)

Tender No.		E5963020		
Description :		Description: RATE CONTRACT FOR Item#01: - TA7009BZ,TA6301BX FLEXIBLE SHUNT ASSY TO DRG.NO. 37164532006 V-00 REV-08 TO BE SUPPLIED IN PROPER PACKING- Qty: 30 ± 30% Nos Item#02: - TA6301BX,TA7009BZ FLEXIBLE SHUNT ASSY TO DRG. NO. 37164532006 V-02 REV-08.TO BE SUPPLIED IN PROPER PACKING- Qty: 60 ± 30% Nos Delivery required as per NIT.		
Sr. No.	ELEMENTS	Standards	To be offered/confirmed by supplier	Remarks, if any
1	Quotation reference no. & date	As per supplier		
2	HSN / SAC code	As per supplier		
3	Quotation currency	In INR		
4	Contact person	As per supplier		
5	Phone / Mobile	As per supplier		
6	E-Mail	As per supplier		
7	Order to be placed on, Supplier Name Supplier code, If registered at BHEL Bhopal PAN No., if not registered in BHEL.	As per supplier		
8	Address	As per supplier		
9	Brand name, if any.	As per supplier		
10	Supply from	As per supplier		
11	Are you manufacturer of quoted item (s).	Yes / No		
12	Are you registered under MSMED ACT 2006 as small or micro. NOTE: - Firms registered under medium scale shall not be considered eligible for MSE benefits.	Yes / No (If select Yes, please enclosed valid UDYAM certificate)		
13	CGST RATE (IN %)	As per supplier		
14	SGST RATE (IN %)	As per supplier		
15	IGST RATE (IN %)	As per supplier		
16	UGST RATE (IN %)	As per supplier		
17	Please specify delivery in weeks/ days (Specify item wise, lot wise as per NIT)	As per NIT/ Accepted with deviation (If select Accepted with deviation, please mention the deviation)		
18	Terms of delivery ("FOR DESTINATION ") as per NIT .	Accepted/ Accepted with deviation (If select Accepted with deviation, please mention the deviation)		
19	Terms of Payment as per NIT.	Accepted as per NIT/ Accepted with deviation (If select Accepted with deviation, please mention the deviation)		
20	Acceptance to Performance Security as per NIT.	Yes / No	Not Applicable	
21	Acceptance to "REVERSE AUCTION" as per NIT.	Yes / No	Not Applicable	
22	Declaration of conflict of interest by bidder as per NIT.	Yes / No		
23	Rate quoted on "Firm" price basis	Yes / No		
24	Quoted for all the items and full quantity of tender enquiry	Yes / No. (If "No" please mention item number with Qty of regreted items)		
25	Technical specifications	Accepted as per NIT / Accepted with deviation (If select Accepted with deviation, please mention the deviation)		

Techno-Commercial Annexure

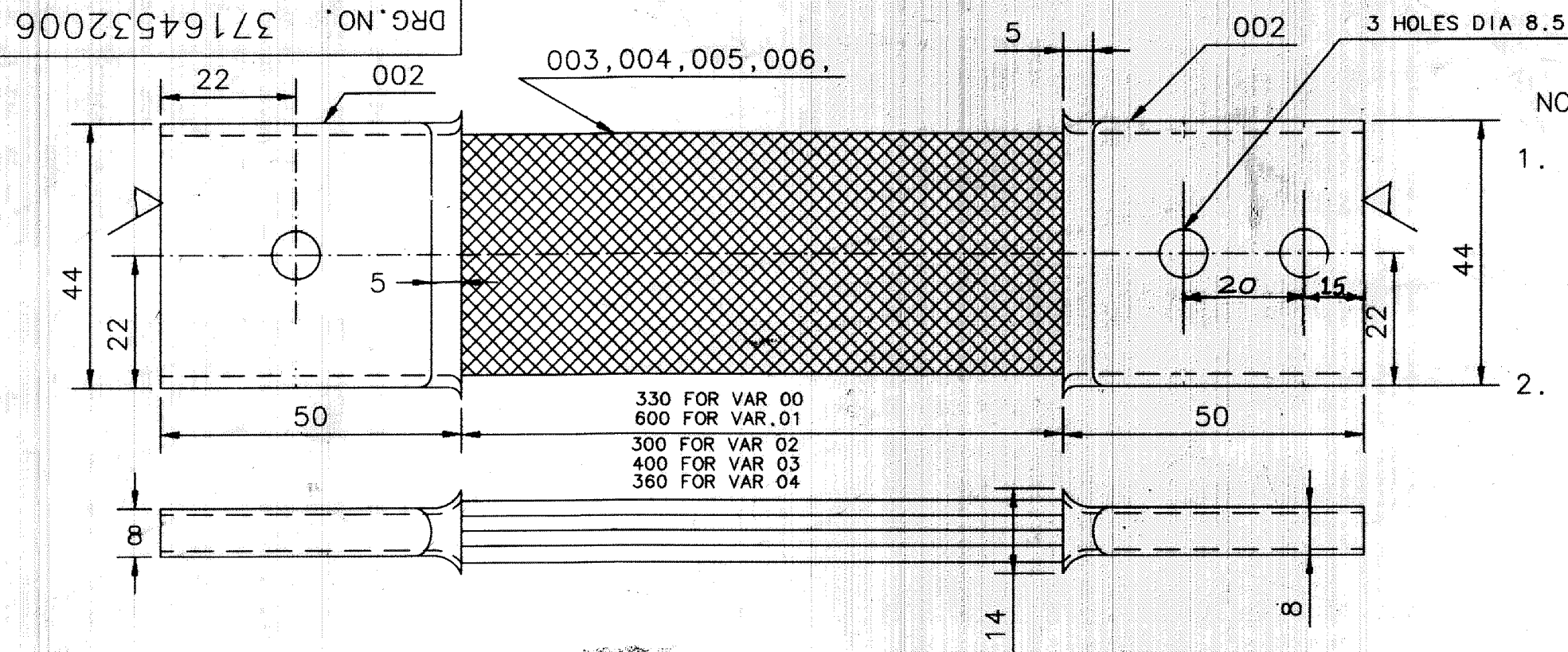
(To be filled by supplier inline with NIT requirement and submit with offer)

Tender No.		E5963020		
Description :		Description: RATE CONTRACT FOR Item#01: - TA7009BZ,TA6301BX FLEXIBLE SHUNT ASSY TO DRG.NO. 37164532006 V-00 REV-08 TO BE SUPPLIED IN PROPER PACKING- Qty: 30 ± 30% Nos Item#02: - TA6301BX,TA7009BZ FLEXIBLE SHUNT ASSY TO DRG. NO. 37164532006 V-02 REV-08.TO BE SUPPLIED IN PROPER PACKING- Qty: 60 ± 30% Nos Delivery required as per NIT.		
Sr. No.	ELEMENTS	Standards	To be offered/confirmed by supplier	Remarks, if any
26	Inspection	As per NIT/ Accepted with deviation (If select Accepted with deviation, please mention the deviation)		
27	Test certificate & Gurantee certificate as per NIT and specification will be submitted along with each consignment	Yes (In case of "No" your offer may be rejected).		
28	SELF CERTIFICATION OF MINIMUM LOCAL CONTENT, IF MORE THAN 50% VALUE ADDITION IS IN INDIA. (Note- In case of tenders worth more than Rs. 10 crores, Suppliers shall necessarily submit certificate from statutory auditor or cost auditor or cost accountant or CA) Please also specify the amount of local content in India. EXAMPLE :if 100% INDIGENOUS (MADE IN INDIA) MARK "Y"/100%	As per supplier	Not Applicable	
29	Details of location of value addition / manufacturing	As per supplier		
30	Submission of MII Certificate with duly sealed & signed (Under Public Procurement Policy)	Yes / No	Not Applicable	
31	Other Charges (If any)	Applicable / Not Applicable. (If applicable please mention percentage (%) / Value (along with type of charges).		
32	Penalty for delayed performance as per BP200102C & NIT	Yes / No (In case of "No", your offer will be loaded suitably)		
33	Confirmation that documents pertaining to PQR has been submitted.	Yes / No		
34	Submission of Declaration format with duly sealed & signed (Annexure IX, refer attached) regarding whether other family firms or sister concern affiliates / subsidiary firms are participating in the same tender.	(Yes / No) If No please specify the reason.		
35	Submission of Declaration format with duly sealed & signed (Annexure-A - OEM & MSE Declaration)	Yes / No		
36	Acceptance to General terms and conditions of enquiry BP200102C.	Yes (In case of "No" your offer may be rejected).		
37	Quotation Validity will be 90 days from the date of techno-commercial bid opening.	Yes / No		

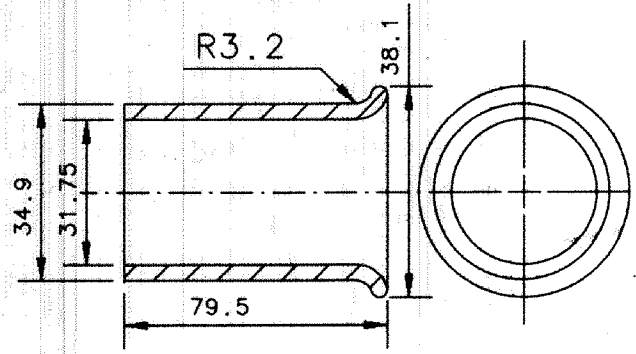
FIRST ANGLE PROJECTION

ALL DIMENSIONS ARE IN MM.

THE INFORMATION ON THIS DOCUMENT IS THE PROPERTY OF BHARAT HEAVY ELECTRICALS LIMITED. IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETERIMENTAL TO THE INTEREST OF THE COMPANY.



- NOTE
1. FLEXIBLE SHUNT ASSY. ITEM 001 & 003 TO 006 ARE MADE OF 2.8TK X44.45 OF WIDE DIA 0.122 (SWG40)STRANDING 48/82,WEIGHT 0.5 KG/MTR. NO OF PLAITS/10 CM-10 TO 14.
 2. ITEM 002TO BE ANNEALED BEFORE FORMING TO SILVER PLATED TO 0.013 MM, TK



ITEM 002

004	-	-	-	-	ST 9044825607		006	FLEXIBLE CU.BRAID FOR 360LG				AA12010	KG	2.20	
-	-	-	-	004	ST 9044825615		005	FLEXIBLE CU.BRAID FOR 330LG				AA12010	KG	0.200	
-	-	004	-	-	ST 9044825631		004	FLEXIBLE CU.BRAID FOR 300LG				AA12010	KG	0.180	
-	-	-	004	-	ST 9044825623		003	FLEXIBLE CU.BRAID FOR 600LG				AA12010	KG	0.360	
002	002	002	002	002	ST 9044825641		002	FERRULE				AA12017	KG	0.125	
-	004	-	-	-	ST 9044825658		001	FLEXIBLE CU.BRAID FOR 400LG			001	AA12010	KG	0.24	
VAR 04	VAR 03	VAR 02	VAR 01	VAR. 00	REMARKS	VAR NO.	ITEM NO.	DESCRIPTION	STD	DRAWING NO.	IT.NO.	MATL.CODE	A C	UNIT WT.	3
										VAR	MATL.SPCN.		QTY.		

28-CARD TYPE-3				28-CARD TYPE-1				28-CARD TYPE-2			
ADDITIONAL INFORMATION				TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT				TRACTION ALTERNATORS TA7003AZ & TA6301AZ			
STATUS OF DRAWING				DISTRIBUTION OF PRINTS				BHARAT HEAVY ELECTRICALS LTD. BHOPAL			
TNX (TAM) 1				DEPT TME				DRN. D.S.SHARMA			
				CODE 405				CKD. A.P.M			
								APPD.			
REV DATE ALT				REV DATE ALT				REV DATE ALT			
08 04-08-12 CKD APPD				07 29-3-07 CHECKED APPROVED				04 30-10-03 CKD APPD			
DIMN. 20 & 15 WERE NOT ON.				DRG REDRAWN & REVISED				REF. TO ASSY. DRG. 04301065003 04301073001			
				TITLE FLEXIBLE SHUNT ASSY				DRAWING NO. 37164532006			
								SHEET NO. 01 NO.OF SHEET 01			

A3 SIZE



CORPORATE PURCHASING SPECIFICATION

AA 120 10

Rev. No. 03

PAGE 1 OF 4

FLEXIBLE COPPER BRAID – ANNEALED, FLAT

1.0 GENERAL:

This specification governs the quality requirements of flat flexible copper braid in annealed condition, manufactured from high conductivity copper wire, plaited in a tubular form.

2.0 APPLICATION:

Used in the manufacture of flexible connections of electrical apparatus.

3.0 CONDITION OF DELIVERY:

Copper braid shall be supplied in flat flexible annealed condition. The braid shall be of ordinary flexible quality or stretch wires refer Cl.6.3.

4.0 COMPLIANCE WITH NATIONAL STANDARDS:

There is no Indian Standard covering this material.

5.0 DIMENSIONS AND TOLERANCES:

5.1 Sizes:

The Copper braid shall be supplied with the width and thickness as specified in BHEL order. The stranding of the preferred sizes are given below:

Thickness mm	Width mm	No of strands	Wire dia mm	No of braids	Effective area, cm ²
1.60	19.05	648	0.122	1	0.1174
3.20	25.40	1908	0.152	3	0.4355

The stranding of other sizes shall be as described in BHEL order

5.2 Tolerances:

5.2.1 Width & Thickness:

The tolerance on width and thickness shall be ± 0.381 mm measured on the braid under no compression or tension.

Revisions :

Clause:20.10.9 of MOM of MRC-NFCW+HE

APPROVED :

INTERPLANT MATERIAL RATIONALISATION
COMMITTEE-MRC (NFCW+HE)

Rev. No. 03

Amd.No.

Reaffirmed

Prepared

Issued

Dt. of 1st Issue

Dt :15.02.2006

Dt :

Year :2012

BHOPAL

Corp. R&D

November, 1978

AA 120 10	CORPORATE PURCHASING SPECIFICATION	
Rev. No. 03		
PAGE 2 OF 4		

5.2.2 Wire:

The tolerance on wire diameter shall be as follows:

Nominal Over	Diameter mm upto & incld.	Tolerance (±)
--	0.127	0.0025
0.127	0.190	0.0051

6.0 MANUFACTURE:

6.1 The wires for the braid shall be manufactured from copper of ETP grade conforming to IS:191.

6.2 **Braiding:** The stands shall be divided into groups of equal number and braided in tubular form. The braid shall then be flattened. The lay of the braid side shall, at the supplier's discretion, meet the flexibility and dimensional details specified.

For large number of strands the braids may be manufactured in two or more concentric tubular forms.

6.3 **Stretch wires:** Whenever specified in BHEL order, the braid shall be supplied with two parallel stretch wires of large diameter than the wire used in the braid running the whole length of the braid, to assist in controlling the width during manufacture and excessive stretching.

7.0 FREEDOM FROM DEFECTS:

The braid shall be clean, and free from harmful harmful defects.

8.0 CHEMICAL ANALYSIS:

The analysis of copper when analyzed in accordance with IS:440, shall as follows.

Element	Percent	
	Min.	Max
Copper and Silver	99.90	-----
Bismuth*	-----	0.001
Lead*	-----	0.005
Total of all impurities excl. silver and oxygen	-----	0.030
Silver present will be counted as copper.		



CORPORATE PURCHASING SPECIFICATION

AA 120 10

Rev. No. 03

PAGE 3 OF 4

*These elements need not be determined when the material supplied conforms with mechanical and electrical properties specified in this specification. However, the supplier shall ensure that the composition of the material lies within the limits specified above.

9.0 TEST SAMPLES

One sample per size per melt per consignment of 3 tonnes or part thereof shall be taken for chemical and electrical tests.

The sample shall be cut off cold and shall receive no further treatment before being tested.

10.0 ELECTRICAL RESISTIVITY (AS RECEIVED)

When measured in accordance with IS: 3635, the electrical resistivity at 20⁰.C shall not be greater than 0.01739 ohm-mm²/metre, which is equivalent to an electrical conductivity of 99.14%, minimum of IACS standard. (Refer Appendix B of IS: 613 for temperature correction factor).

11.0 INSPECTION AT SUPPLIER ' WORKS:

When ever specified tests and inspection are to be conducted in the presence of BHEL's representative.

The supplier shall offer BHEL's representative all reasonable facilities, without charge to Satisfy the latter that the material is being furnished in accordance with this specification. The supplier shall prepare and provide necessary test specimens for testing to be carried out at his premises. If facilities are not available at his works, the supplier shall make Necessary arrangements for carrying out the prescribed test elsewhere. The supplier shall Notify BHEL in advance about the readiness of the material for inspection and testing.

BHEL reserves the right to test the material at BHEL's works and the final acceptance of the material shall be based on these test results.

12.0 TEST CERTIFICATES:

Unless other wise stated, three copies of certificates shall be supplied along with each consignment.

In addition, the supplier shall ensure to send one copy of test certificates along with the dispatch documents to facilitate quick clearance of the material.

AA 120 10	CORPORATE PURCHASING SPECIFICATION	
Rev. No. 03		
PAGE 4 OF 4		

The test certificate shall bear the following information:

AA 12010 (Rev.03) : Flexible Copper Braid - Annealed, Flat
 BHEL Order No.
 Manufacturer 's/Supplier's Name:
 Lot/Identification/Batch/Melt No.
 Sizes and Quantity Supplied

The effective cross sectional area of the braid in square cm calculated from $W/o.887$ where W is the weight of finished braid in kg per metre length.

Results of dimensional inspection, chemical analysis, mechanical and electrical tests as per this specification.

13.0 PACKING AND MARKING:

The material shall be suitably packed to prevent damage during transit.
 Each package shall be legibly marked or labeled with the following information:

AA 12010 : Flexible Copper braid – Annealed, Flat
 BHEL Order No.
 Manufacturer's/Supplier's Name :
 Lot/Identification/Batch/Melt No.
 Sizes and Quantity Supplied

14.0 REFERRED STADARDS (Latest Publications Including Amendments):

1. IS: 191	2. IS:440	3. IS: 613
4. IS: 3635		



5.2.2 Length:

Tolerance on length of the tubes ordered in specified length shall be as follows:

Length, metre		:	Tolerance, ± mm
over	upto & incl.	:	
--	3.0		1.5
3.0	6.0		3.0

For sizes not included in this specification, tolerance shall be as stated in BHEL order.

5.2.3 Circular Tubes Diameters:

The mean diameter of the tube shall not vary from the specified diameter by more than the amount of tolerance given below. The mean diameter is half the sum of two diameters measured at right angles at any section of the tube.

Nominal Diameter mm		Tolerance mm	
over	up to & incl.	plus	minus
	15	0.0	0.13
15	50	0.0	0.20
50	100	0.0	0.25

5.2.4 Square & Rectangular Tubes:

The tolerances on square and Rectangular tubes shall be as agreed between BHEL and the suppliers.

6.0 MANUFACTURE:

The tubes shall be manufactured from copper of ETP grade conform to IS:191, except that oxygen content shall not exceed 0.001% .

7.0 FREEDOM FROM DEFECTS:

The material shall be clean, bright, smooth and free from spills, sealing, blisters, cracks, lappings, shaving, splinters, metal dust, oxidation and other harmful defects. However, such surface marks caused during drawing or rolling that are barely noticeable to the naked eye are allowed

Ends shall be cut clean and square with the axis of the tube.

8.0 CHEMICAL COMPOSITION:

The analysis of copper when analysed in accordance with IS: 440, shall be as follows.

PAGE 3 OF 5

AA 120 17	CORPORATE PURCHASING SPECIFICATION	
Rev. No. 02		
PAGE 4 OF 5		

12.0 OPTIONAL TESTS:

Whenever specified in BHEL order the following tests shall be conducted on the norms of acceptance shall be as specified there in.

12.1 Hydrogen Embrittlement Test:

The test pieces cut from the tube(either full section or strips from the tubes) is exposed to hydrogen atmosphere at 825°C - 875°C for 30 minutes. After cooling down to room temperature the pieces are tested. In case of full section sample, the tube shall be flattened to close. In case of a strip cut from the tube, it shall be bent 180°. In no case the copper shall exhibit any crack.

12.2 Metallographic Examination:

After subjecting the material to the hydrogen embrittlement test, the test pieces shall be examined under an optical microscope at a magnification of at least 200. Test pieces shall show no fissures or cracks and inclusions, particularly cuprous oxide shall be absent.

12.3 Hydrogen Resistance-Round Tubes:

Tube specimens of 10 to 20 mm length are annealed for 30 minutes at 800 to 850° C in a reduced atmosphere (hydrogen or fuel gas) cooled and then compressed between two parallel platens until the specimen shall not show any incipient cracks or fracture at the bend. In case of thick-walled tubes or tubes of larger cross-section, a strip of about 10 mm wide can be taken as test specimen.

13.0 INSPECTION AT SUPPLIER'S WORKS:

Whenever specified, tests and inspection are to be conducted in the presence of BHEL's representative.

The supplier shall offer BHEL's representative all reasonable facilities, without charge to satisfy the latter that the material is being furnished in accordance with this specification. The supplier shall prepare and provide necessary test specimens' for testing to be carried out at his premises. If facilities are not available at his works, the supplier shall make necessary arrangements for carrying out the prescribed tests elsewhere. The supplier shall notify BHEL in advance about the readiness of the material for inspection and testing. BHEL reserves the right to test the material at BHEL's works and the final acceptance of the material shall be based on these test results.

14.0 TEST CERTIFICATES:

Unless otherwise stated, three copies of certificates shall be supplied along with each consignment.

	CORPORATE PURCHASING SPECIFICATION	AA 120 17
		Rev. No. 02
		PAGE 5 OF 5
In addition, the supplier shall ensure to send one copy of test certificates along with the despatch documents to facilitate quick clearance of the material. The test certificate shall bear the following information: AA 12017 (Rev.No.02) : Oxygen Free High Conductivity Copper Tube - Medium Hard. BHEL Order No Manufacturer's/Suppliers's Name Lot/Identification/Batch/Melt No. Sizes and Quantity supplied Results of dimensional inspection, chemical analysis, mechanical and electrical tests as per this specification. 15.0 PACKING AND MARKING: The material supplied shall be suitable packed to avoid damage during transit. Each package shall be legibly marked or labelled with the following information. AA 12017 : Oxygen Free High Conductivity Copper Tube - Medium Hard. BHEL Order No Manufacturer's/Supplier's Name Lot/Idetification/Batch/Melt No. Size and Quantity supplied 16.0 REFERRED STANDARDS (Latest Publications Including Amendments) 1) IS: 191 2) IS:440 3) IS: 613 4) IS: 1501 (Part 1) 5) IS: 1608 6) IS: 3635 7) BS: 1977 8) ASTM E 1004.		



BHARAT HEAVY ELECTRICALS LIMITED, BHOPAL
TRACTION MACHINES ENGINEERING DIVISION

Dated: 13.03.25

Technical requirement of Flexible Shunt Item is as under:

Sl. No.	Description	Vendor to comment	
		Complied / Not complied	Supporting relevant document to be submitted
1	Flexible shunt assembly to be as per BHEL drawing.	Yes/No	Deviation not accepted
2.	Manufacturing / supply experience in preceding 5 years (from tender opening date) for same or similar item* is required.	Yes/No	Unpriced PO copies, corresponding Challan/Invoice required.

Note:

- *Copper Connectors made up of flexible copper braiding shall be considered as similar item.
- Compliance of all the points in above PQR is mandatory. In absence of compliance of above, vendor's offer is liable to be rejected.

Prepared by