


# REQUEST FOR QUOTATION

	<b>BHARAT HEAVY ELECTRICALS LIMITED</b> Electronics Division PB No. 2606, Mysore Road Bangalore - 560026 INDIA	<b>RFQ NUMBER:</b> AKSPROP032  <b>RFQ DATE :</b> 07.09.2022	<b>Due Date/Day:</b> 19.09.2022 MON <b>Time</b> : 13:00 HRS <div style="background-color: black; height: 20px; width: 100%; margin-top: 5px;"></div> <div style="background-color: black; height: 20px; width: 100%; margin-top: 5px;"></div>
MMI:PU:RF:003			
(address for communication) :		(for all correspondence) Purchase Executive : ABHISHEK Phone : 26998102 Fax : 00918026989215 E-mail: singh.abhishek@bhel.in	

1) This RFQ is for entering into Rate contract (RC) with BHEL for the tendered item. Validity of the RC will be 1 year from the award of rate contract. Firm orders will be placed during the tenure of rate contract. Prices will remain firm till the validity of RC or till the completion of supplies against the Purchase Orders placed against this rate contract whichever is later. Please note that these quantities are projections based on the current business scenario and expected orders from customers. In the eventuality of business not coming through, BHEL is not obligated to exhaust the ordering of RC quantities.

2) Reverse Auction Clause: BHEL shall be resorting to Reverse Auction (RA) (Guidelines as available on [www.bhel.com](http://www.bhel.com)) for this tender. RA shall be conducted among all the techno-commercially qualified bidders. Price bids of all techno-commercially qualified bidders shall be opened and same shall be considered as initial bids of bidders in RA. In case any bidder(s) do(es) not participate in online Reverse Auction, their sealed envelope price bid along with applicable loading, if any, shall be considered for ranking.

SI No.	Description	Qty	Unit	Delivery qty	Delivery Date
1	TI0668103531 HIGH VOLTAGE INDICATOR 48-4300VAC/DC * HSN/SAC : 3921  HIGH VOLTAGE INDICATOR 48-4300VAC/DC, CABLE 2.35 MT as per Specification No: PS4452541 rev <span style="background-color: black; color: black;">XXXXXXXXXX</span> <span style="background-color: black; color: black;">XXXXXXXXXX</span>	750	NO	750	<span style="background-color: black; color: black;">XXXXXXXXXX</span>

Total Number of Items - 1

- 1.
- 2.

## NOTES:

1. This RFQ is governed by:
  - a) INSTRUCTIONS TO BIDDERS/SELLERS and GENERAL CONDITIONS OF CONTRACT FOR PURCHASE available at <http://edn.bhel.com> (RFQ-PO Terms & Conditions)
  - b) Any other specific Terms and Conditions mentioned.

\* The HSN/SAC no mentioned against the line items in the RFQ are indicative only.

For and On behalf of BHEL.

ABHISHEK  
Control Equipment

1 OF 1



PREQUALIFICATION CRITERIA (PQC)  
FOR HIGH VOLTAGE INDICATOR  
GROUP: TRACTION ENGINEERING

Ref: 445/PQC\_HVI/22

Rev. No.: 01

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1.0 PRE QUALIFICATION CRITERIA (PQC)

1. The Bidder should be Supplier of High Voltage indicators for rolling stock applications.
2. BHEL shall approach and submit credentials/details furnished by vendor with their offers to customer and await customer's decision for a maximum of one month from the date of tender opening. If approval is not received within the above period, BHEL shall treat the offer as "Not meeting" Pre-qualification criteria and offer shall be rejected.
3. It is preferred that the bidder is the manufacturer of this item. If the bidder is importing some portion of the components, then minimum value addition shall be 20%. Bidder to confirm this in the offer. Value addition less than 20% is not acceptable.

2.0 DOCUMENTS SUBMISSION

1. Bidder to submit clause by clause compliance to complete technical specification (Technical specification no. PS4452541 Rev. No.00, dated 21.12.2015) along with copy of type test report.
2. Should possess a valid type test report, not older than five years, conducted at a NABL accredited laboratory or equivalent as per relevant standards mentioned in the specification with respect to time during the bid submission.
3. Proof of supply of High voltage indicators or higher rating indicators used in traction applications directly or through any agency to Indian Railways during the last 5 years to be submitted.
4. For the vendors already qualified and added in the source list, the above points (point no. 2 & 3) are not applicable.

3.0 REFERENCE DOCUMENTS

- a) Purchase Specification No PS4452541, Rev. No. 00 for High Voltage Indicator.

REVISION 01

APPROVED

AGOSH CHANDRAN R S

PREPARED

L SUNITHA

  
01/09

ISSUED

TRACTION ENGG

DATE

01.09.2022



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**PURCHASE SPECIFICATION**  
**GROUP: TRACTION ENGINEERING**

P.S NO. : PS4452541

REV. NO: 00

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**SPECIFICATION FOR HIGH VOLTAGE INDICATOR**

Code No. TI0668103531

**REVISION HISTORY SHEET**

REV. NO.	DATE	NATURE OF CHANGE	REASONS	PREPARED BY	APPROVED BY
00	21.12.2015	FIRST ISSUE	—	B. Haribhushan	Shekar R.

REVISIONS

00

APPROVED BY

PREPARED BY

ISSUED BY

DATE

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21.12.2015

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**PURCHASE SPECIFICATION**  
**GROUP: TRACTION ENGINEERING**

P.S NO. : PS4452541

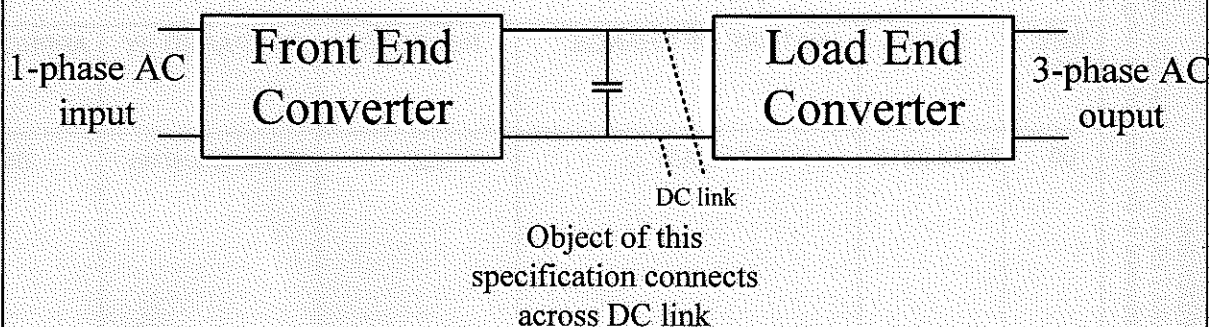
REV. NO: 00

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**SPECIFICATION FOR HIGH VOLTAGE INDICATOR**

**1.0 Functional requirements:**

This document covers specification of a High voltage indicator, to be used at the DC link of an IGBT based converter. The indicator will be mounted in a cabinet/enclosure and will be used in traction applications for on board mounting. The block diagram is shown below.



**2.0 APPLICATION :** Indicating the DC voltage presence in traction equipment

**3.0 TYPE :** Dry Type, Air natural cooling

**4.0 REFERENCE STANDARDS:**

IEC 60571	Railway applications – Electronic equipment used on rolling stock
IEC 62498-1	Railway applications – Environmental conditions for equipment – Part 1: Equipment on board rolling stock

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**PURCHASE SPECIFICATION**  
**GROUP: TRACTION ENGINEERING**

P.S NO. : PS4452541

REV. NO: 00

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**SPECIFICATION FOR HIGH VOLTAGE INDICATOR****5.0 ENVIRONMENTAL CONDITIONS:**

- 5.1 Ambient Temperature : 55°C  
5.2 Maximum Temperature : 70°C (when locomotive standing dead under sun)  
55°C (when locomotive working)  
47°C Nominal  
5.3 Relative Humidity : Up to 95% relative humidity, any moisture condensation during operation shall not lead any damage or failure  
Yearly average  $\leq$  75% Relative Humidity  
5.4 Altitude : Up to 1200 m above mean sea level  
5.5 Atmosphere during hot weather: Extremely dusty and desert terrain in certain areas. The dust concentration in air may reach a high value of 1.6mg/cub meter.  
5.6 Air Pollution : The equipment shall be designed to work in coastal area in humidity and salt laden corrosive atmosphere. The maximum values will be as follows  
(a) Maximum pH Value : 8.5  
(b) Sulphate : 7mg/litre  
(c) Maximum concentrate of chlorine: 6mg/liter  
(d) Maximum conductivity: 230  $\mu$ Siemens/m  
5.7 Climate : Tropical, Hot and humid Climate

**6.0 ELECTRICAL REQUIREMENTS**

- 6.1 Input voltage range : 40 V to 4000 V DC or 40 V<sub>rms</sub> to 4000 V<sub>rms</sub>  
6.2 Flashing frequency at 1 - 4 kV : 2Hz +/- 10%  
6.3 Input current : < 5mA  
6.4 Operating temperature : -50°C to +70°C

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**PURCHASE SPECIFICATION**  
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P.S NO. : PS4452541

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**SPECIFICATION FOR HIGH VOLTAGE INDICATOR**

**7.0 CONSTRUCTION**

**7.1 Housing:**

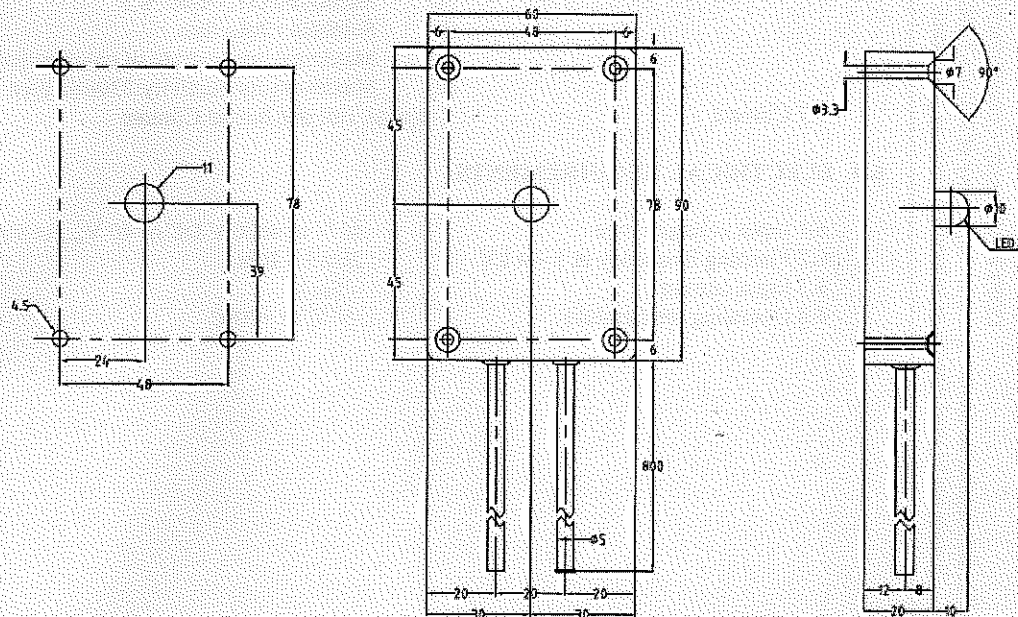
The PCB should be encapsulated in an housing made of Polyamide 6 with Glass reinforced material confirming to flame class V-0, as per the mechanical dimensions specified

**7.2 Termination:**

Termination should be done with electron beam irradiated cable of 3.6 kV class with 2.35 meter cable length (ex. Huber+Suhner AG Radox 9 GKW-AX)

**8.0 MECHANICAL DIMENSION LIMITATION**

The High voltage indicator dimensions (overall & mounting) shall not exceed the dimensions indicated in the below sketch. This sketch is given for guidance only for limiting dimensions



Supplier to prepare detailed drawing & submit to BHEL for approval before commencing manufacturing process

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**SPECIFICATION FOR HIGH VOLTAGE INDICATOR**

**9.0 TESTS TO BE CONDUCTED AT SUPPLIER'S WORKSPACE**

High Voltage Indicator		
Name of the test	Type test	Routine test
Visual Inspection	Yes	Yes
Performance test	Yes	Yes
Hot operation test	Yes	No
Dielectric test	Yes	Yes
Electrical endurance test	Yes	No

**9.1 Visual Inspection**

Check of dimensions as per drawing.

**9.2 Performance test**

The Visual LED Indicator shall be checked at the minimum and maximum rated voltages (AC & DC) and the frequency of flashes noted to be within the specified limits.

**9.3 Hot operation test**

The test 9.2 shall be repeated at the maximum ambient temperature.

**9.4 Dielectric test**

A test voltage of 2 kV rms at power frequency for 1 minute shall be applied between the input terminals shorted and earth.

**9.5 Electrical endurance test**

The Visual LED Indicator shall be subject to the maximum rated voltage and kept on for 168 hours and test 9.2 shall be repeated at the end

**10.0 TEST PROTOCOL**

Supplier shall submit test protocol for Routine & Type tests along with techno-commercial offer. List of tests are as per clause 5.0 of this specification.

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**PURCHASE SPECIFICATION**  
**GROUP: TRACTION ENGINEERING**

P.S NO. : PS4452541

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**SPECIFICATION FOR HIGH VOLTAGE INDICATOR****11.0 DOCUMENTATION**

- 11.1 Information required along with techno commercial offer without which offer is liable for rejection.
- 11.2 Supplier shall furnish clause wise confirmation/comments to the technical specification in the typical format given below. Deviation, if any, shall be clearly brought out indicating the clause number, original specification, deviation sought with proper technical backup (catalogue, technical brochure, international standards, calculations etc. If no deviations required, then supplier shall furnish certificate indicating "NO DEVIATION REQUESTED" and we comply fully with all the technical requirements of this specification no.
- 11.3 Supplier shall take a copy of this specification and sign on each page and submit the signed copy along with offer.
- 11.4 Supplier shall furnish winding material, winding resistance, winding cross section.
- 11.5 Supplier shall furnish the type of core used along with technical details of core.
- 11.6 Information required after the placement of order
- 11.7 Detailed dimensional drawing for BHEL approval
- 11.8 Test protocol for BHEL approval.
- 11.9 Information required along with material supply.
- 11.10 Two sets of Test certificates.
- 11.11 BHEL engineer witnessed Pre inspection report.

**12.0 ACCEPTANCE**

- 12.1 Dimensions as per approved drawing
- 12.2 Routine test certificate
- 12.3 Type test certificate

**13.0 PRE-SHIPMENT INSPECTION**

Pre-shipment inspection will be carried out by BHEL engineer as per the approved test protocol. BHEL engineers will witness Routine & Type tests before dispatch.

**14.0 RATING PLATE DETAILS**

- 14.1 BHEL Specification No.
- 14.2 Input voltage range
- 14.3 Serial number
- 14.4 Month & Year of Manufacture
- 14.5 Manufacturer Name

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