

PRE-QUALIFICATION CRITERIA (PQC) for Current Sensor (500A) for Hotel Load Converter GROUP: TRACTION ENGINEERING

Ref.: HLC/PQC/CS500

Rev. No.: 01

Page 01 of 01

1. Pre-qualification Criteria

- 1.1 The bidder should be manufacturer/supplier of current sensors for use in rolling stock application (locomotive/EMU/Metro) in India or abroad.
- 1.2 The bidder should be an "Regular" approved vendor of RDSO/CLW/Indian Railways for offered item. If not, if offer of bidder meets technical requirement, BHEL will approach and submit credentials/details furnished by bidder with their offer to customer i.e., CLW and await its decision for a maximum of one month from the date of document submission. The approval requested shall be for usage of offered transformer in "Hotel Load Converter" project. If approval is not received within this period, BHEL shall treat the offer as "Not meeting Pre-qualification criteria" and offer shall be rejected.

Extension beyond one month will not be given for whatsoever reason.

- 1.3 It is preferred that the bidder is the manufacturer of this item. If the bidder is importing the item, then minimum value addition in India shall be 20%. Bidder to confirm this in the offer. Value addition less than 20% is not acceptable.
- 1.4 Bidder should possess valid type test report for the item, conducted at an accredited laboratory as per standards mentioned in the specification at the time of bid submission.

2. Documents to be submitted:

- 2.1 Proof of supply of the item for rolling stock application (locomotive/EMU/Metro) in India or abroad directly or through any agency.
- 2.2 Copy of type test report.
- Clause by clause compliance to technical specification as mentioned in clause no.3.1.

3. Reference documents:

Purchase-cum-Technical Specification No.: PS/445/2759, Rev. 00 for Current Sensor (500A) for Hotel Load Converter

Rev.	00	Approved by:	200111		
		Venkateshalu K	Mekalshalu		
		Prepared by:		Department:	Date:
		Girish Chand	Junh	Traction Engg.	22.02.2021

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REVISION: 00

19.02.2022

Approved

Approved

VENKATESHALU K

Checked

LAKSHMI

NARAYANA KATHARI

Prepared

SACHIN R M

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BHEL ELECTRONICS DIVISION PES-TRACTION ENGG CURRENT SENSORS FOR HLC

PS4452759

REV. No. 00 PAGE 2 OF 4

1. INTRODUCTION

The Current sensor proposed to be procured against this specification are intended to be used in the Hotel Load Converters (HLC). The HLCs are used in IR (Indian Railways) locomotives.

2. FUNCTION

Current sensor (500A rms):

Three current sensors are used to measure the three phase output current of the Hotel Load Converter

3. POWER SUPPLY

Power supply of +/-15V DC, to activate the sensors shall be provided from the interface card present in the HLC.

4. TECHNICAL DETAILS

Primary Current (Nominal) I_{PN} : 500 A rms
Measuring range @ ±15V (±5%) : ±880 A peak
Secondary current (at I_{PN}) : 100 mA rms

Supply voltage : $\pm 15V$ (tolerance $\pm 5\%$)

Conversion ratio : 1:5000

Error (as % of I_{PN}) : $\leq \pm 0.5$ at 25° C

≤ ±1 at range of -40°C to 85° C

Dielectric strength (at 50Hz for 1 minute) : ≥ 12kV (Primary/secondary)

 $\begin{array}{ll} \text{Measuring resistance (Minimum)} & : 0\Omega \\ \text{Measuring resistance used in circuit} & : 50\Omega \\ \text{Maximum operating temperature} & : 85 ^{\circ} \text{ C} \\ \end{array}$

5. DIMENSIONAL REQUIREMENT:



BHEL ELECTRONICS DIVISION PES-TRACTION ENGG CURRENT SENSORS FOR HLC

PS4452759

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NOTE: Mounting dimensions have to be strictly within the general tolerance limit (±1 mm)

3 Faston 6.35 x 0.8

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BHEL ELECTRONICS DIVISION PES-TRACTION ENGG CURRENT SENSORS FOR HLC

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6. DOCUMENTATION

The supplier has to provide the following documents:

- 1. Datasheet of the sensor
- 2. 3D model in .stp /.igs format

7. APPLICABLE STANDARDS

EN 50155: Electronic equipment used in railway applications

EN 50121-3-2: Electromagnetic compatibility of equipment installed on board of railway vehicles

EN 50124-1: Insulation coordination

IEC 61373: Railway applications - Rolling stock equipment- Shock and vibration tests

-(Category 1- Class B equipment)

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PRE-QUALIFICATION CRITERIA (PQC) for Current Sensor (1000A) for Hotel Load Converter GROUP: TRACTION ENGINEERING

Ref.: HLC/PQC/CS1000 Rev. No.: 01

Page 01 of 01

1. Pre-qualification Criteria

- 1.1 The bidder should be manufacturer/supplier of current sensors for use in rolling stock application (locomotive/EMU/Metro) in India or abroad.
- 1.2 The bidder should be an "Approved" vendor of RDSO/CLW/Indian Railways. If not, the bidder shall approach and submit its credentials to RDSO/CLW/Indian railways and obtain approval within a period of one month from the date of tender opening. The approval shall be for usage of offered item in Hotel Load Converter project. If approval is not received within this period, BHEL shall treat the offer as "Not meeting Pre-qualification criteria" and offer shall be rejected.

Extension beyond one month will not be given for whatsoever reason.

- 1.3 It is preferred that the bidder is the manufacturer of this item. If the bidder is importing the item, then minimum value addition in India shall be 20%. Bidder to confirm this in the offer. Value addition less than 20% is not acceptable.
- 1.4 Bidder should possess valid type test report for the item not older than five years, conducted at an accredited laboratory as per standards mentioned in the specification at the time of bid submission.

2. Documents to be submitted:

- 2.1 Proof of supply of the item for rolling stock application (locomotive/EMU/Metro) in India or abroad directly or through any agency.
- 2.2 Copy of type test report.
- Clause by clause compliance to technical specification as mentioned in clause no.3.1.

3. Reference documents:

Purchase-cum-Technical Specification No.: PS/445/2758, Rev. 00 for Current Sensor (1000A) for Hotel Load Converter

Rev.	00	Approved by:	dani		
		Venkateshalu K	Mekashali		
		Prepared by:		Department:	Date:
		Girish Chand	innh	Traction Engg.	22.02.2022

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Purchase Specification for Current Sensors (1000A) for Hotel Load Converter

REVISION HISTORY SHEET

Rev. No.	DATE	Nature of Change	Reason	Prepared	Checked	Approved
00	19.02.2022	FIRST ISSUE	-	SRM	KLN	VK

	Prepared	Checked	Approved
	62.10.26A	t. LNoye	Kleikalshalu
REVISION: 00 19.02.2022	SACHIN R M	LAKSHMI NARAYANA KATHARI	VENKATESHALU K



BHEL ELECTRONICS DIVISION PES-TRACTION ENGG CURRENT SENSORS FOR HLC

PS4452758

REV. No. 00

PAGE 2 OF 4

1. INTRODUCTION

The Current sensors proposed to be procured against this specification are intended to be used in the Hotel Load Converters (HLC). The HLCs are used in IR (Indian Railways) locomotives.

The sensors shall be of traction grade and shall have proper insulation between primary, secondary and control supplies.

1. INTRODUCTION

The sensor shall be of traction grade and shall have proper insulation between primary, secondary and control supplies.

2. FUNCTION

Input current sensor (1000A rms):

One number of current sensor is used to measure the single phase input current of the Hotel Load Converter.

3. POWER SUPPLY

Power supply of +/-15V DC, to activate the sensors shall be provided from the interface card present in the HLC.

4. TECHNICAL DETAILS

PART 1: INPUT CURRENT SENSOR (1000A rms)

 $\begin{array}{lll} \mbox{Primary Current (Nominal) } \mbox{I_{PN}} & : 1000 \mbox{ A rms} \\ \mbox{Measuring range } \textcircled{0} \ \pm 15 \mbox{V} \ (\pm 5\%) & : \pm 1200 \mbox{ A peak} \\ \mbox{Secondary current (at } \mbox{I_{PN}}) & : 200 \mbox{ mA rms} \\ \end{array}$

Supply voltage : $\pm 15V$ (tolerance $\pm 5\%$)

Conversion ratio : 1:5000

Error (as % of I_{PN}) : $\leq \pm 0.5$ at 25°C

≤ ±1 at range of -40°C to 85°C

Dielectric strength (at 50Hz for 1 minute) : ≥ 12kV (Primary/secondary)

 $\begin{array}{ll} \text{Measuring resistance (Minimum)} & : 0\Omega \\ \text{Measuring resistance used in circuit} & : 11\Omega \\ \text{Maximum operating temperature} & : 85 ^{\circ} \text{ C} \end{array}$



BHEL ELECTRONICS DIVISION PES-TRACTION ENGG CURRENT SENSORS FOR HLC

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5. DIMENSIONAL REQUIREMENT:

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General tolerance: ±1 mm

NOTE: Mounting dimensions have to be strictly within the general tolerance limit (±1 mm)

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BHEL ELECTRONICS DIVISION PES-TRACTION ENGG CURRENT SENSORS FOR HLC

PS4452758

REV. No. 00

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6. DOCUMENTATION

The supplier has to provide the following documents:

- 1. Datasheet of the sensor
- 2. 3D model in .stp /.igs format

7. APPLICABLE STANDARDS

EN 50155: Electronic equipment used in railway applications

EN 50121-3-2: Electromagnetic compatibility of equipment installed on board of railway vehicles

EN 50124-1: Insulation coordination

IEC 61373: Railway applications – Rolling stock equipment- Shock and vibration tests

-(Category 1- Class B equipment)

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PRE-QUALIFICATION CRITERIA (PQC) for Voltage Sensor (2000VDC) for Hotel Load Converter GROUP: TRACTION ENGINEERING

Ref.: 445/PQC/VS2000

Rev. No.: 01

Page 01 of 01

1. Pre-qualification Criteria

- 1.1 The bidder should be manufacturer/supplier of current sensors for use in rolling stock application (locomotive/EMU/Metro) in India or abroad.
- 1.2 The bidder should be an "Regular" approved vendor of RDSO/CLW/Indian Railways for offered item. If not, if offer of bidder meets technical requirement, BHEL will approach and submit credentials/details furnished by bidder with their offer to customer i.e., CLW and await its decision for a maximum of one month from the date of document submission. The approval requested shall be for usage of offered transformer in "Hotel Load Converter" project. If approval is not received within this period, BHEL shall treat the offer as "Not meeting Pre-qualification criteria" and offer shall be rejected.

Extension beyond one month will not be given for whatsoever reason.

- 1.3 It is preferred that the bidder is the manufacturer of this item. If the bidder is importing the item, then minimum value addition in India shall be 20%. Bidder to confirm this in the offer. Value addition less than 20% is not acceptable.
- 1.4 Bidder should possess valid type test report for the item, conducted at an accredited laboratory as per standards mentioned in the specification at the time of bid submission.

2. Documents to be submitted:

- 2.1 Proof of supply of the item for rolling stock application (locomotive/EMU/Metro) in India or abroad directly or through any agency.
- 2.2 Copy of type test report.
- 2.3 Clause by clause compliance to technical specification as mentioned in clause no. 3.1.

3. Reference documents:

Purchase-cum-Technical Specification No.: PS/445/2761, Rev. 00 for Voltage Sensor 2000VDC for Hotel Load Converter.

	Rev.	00	Approved by:	20. hal balo		
			Venkateshalu K	Mekalshali		
			Prepared by:		Department:	Date:
			Girish Chand	Junh	Traction Engg.	03.03.2022

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BHEL ELECTRONICS DIVISION PES-TRACTION ENGG VOLTAGE SENSOR 2000VDC FOR HLC

PS/445/2761

REV. No. 00

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Purchase Specification for Voltage sensor 2000VDC for Hotel Load Converter

REVISION HISTORY SHEET

Rev	. DATE	Nature of	Reason	Prepared	Checked	Approved
No.		Change				
00	03.03.2022	FIRST ISSUE	-	SRM	KLN	VK

	Prepared	Checked	Approved
	Eng. 07. 20	t. Way	Kleikalshalu
REVISION: 00 03.03.2022	SACHIN R M	LAKSHMI NARAYANA KATHARI	VENKATESHALU K

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BHEL ELECTRONICS DIVISION PES-TRACTION ENGG VOLTAGE SENSOR 2000VDC FOR HLC

PS/445/2761 REV. No. 00 PAGE 2 OF 3

1. INTRODUCTION

The AC Voltage sensor proposed to be procured against this specification is intended to be used in the Hotel Load Converters (HLC). The HLCs are used in IR (Indian Railways) and mounted inside WAP7 locomotives.

The sensor shall be of traction grade and shall have high immunity against ambient electric and magnetic fields with proper insulation between primary, secondary and control supplies.

2. FUNCTION

The voltage sensor proposed in this specification is used to measure DC link voltage of Hotel Load Converter.

3. POWER SUPPLY

Power supply of +/-15V DC, for powering the sensor shall be provided from the interface card present in the HLC.

4. TECHNICAL DETAILS

 $\begin{array}{ll} \text{Max Voltage (V_{PN})} & : 2000 \text{ V rms} \\ \text{Secondary current (at V}_{PN}) & : 50 \text{ mA rms} \end{array}$

Supply voltage : $\pm 15V$ (tolerance $\pm 5\%$)

Error (as % of V_{PN}) : $\leq \pm 1$ at 25°C

≤ ±1.7 at range of -40°C to 85° C

Measuring resistance (Minimum): 0ΩMeasuring resistance (Maximum): ≥ 100ΩMaximum operating temperature: 85° C



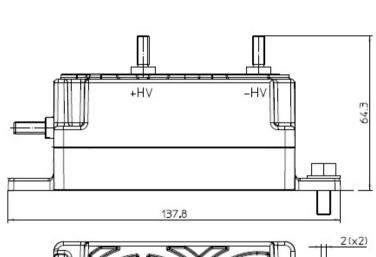
BHEL ELECTRONICS DIVISION PES-TRACTION ENGG VOLTAGE SENSOR 2000VDC FOR HLC

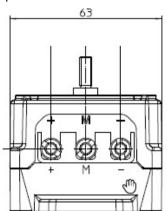
PS/445/2761 REV. No. 00

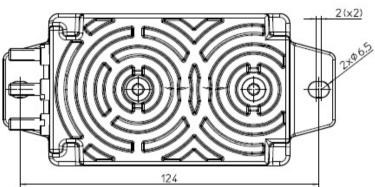
PAGE 3 OF 3

5. DIMENSIONAL REQUIREMENT:

Mounting footprint and limiting dimensions shall be strictly as shown below. If mounting footprint differs, suitable adaptor plate/arrangement should be provided along with the equipment.







6. DOCUMENTATION

The supplier has to provide the following documents:

- 1. Datasheet of the sensor
- 2. Type test reports
- 3. 3D model in .stp /.igs format

7. APPLICABLE STANDARDS

EN 50155: Electronic equipment used in railway applications

EN 50121-3-2: Electromagnetic compatibility of equipment installed on board of railway vehicles

EN 50124-1: Insulation coordination

IEC 61373: Railway applications – Rolling stock equipment- Shock and vibration tests

-(Category 1- Class B equipment)



PRE-QUALIFICATION CRITERIA (PQC)

for Voltage Sensor (1500A) for Hotel Load Converter GROUP: TRACTION ENGINEERING

Ref.: 445/PQC/VS1500 Rev. No.: 01

Page 01 of 01

1. Pre-qualification Criteria

- 1.1 The bidder should be manufacturer/supplier of current sensors for use in rolling stock application (locomotive/EMU/Metro) in India or abroad.
- 1.2 The bidder should be an "Regular" approved vendor of RDSO/CLW/Indian Railways for offered item. If not, if offer of bidder meets technical requirement, BHEL will approach and submit credentials/details furnished by bidder with their offer to customer i.e., CLW and await its decision for a maximum of one month from the date of document submission. The approval requested shall be for usage of offered transformer in "Hotel Load Converter" project. If approval is not received within this period, BHEL shall treat the offer as "Not meeting Pre-qualification criteria" and offer shall be rejected.

Extension beyond one month will not be given for whatsoever reason.

- 1.3 It is preferred that the bidder is the manufacturer of this item. If the bidder is importing the item, then minimum value addition in India shall be 20%. Bidder to confirm this in the offer. Value addition less than 20% is not acceptable.
- 1.4 Bidder should possess valid type test report for the item, conducted at an accredited laboratory as per standards mentioned in the specification at the time of bid submission.

2. Documents to be submitted:

- 2.1 Proof of supply of the item for rolling stock application (locomotive/EMU/Metro) in India or abroad directly or through any agency.
- 2.2 Copy of type test report.
- 2.3 Clause by clause compliance to technical specification as mentioned in clause no. 3.1.

3. Reference documents:

Purchase-cum-Technical Specification No.: PS/445/2760, Rev. 00 for Voltage Sensor (1500VAC) for Hotel Load Converter.

Rev.	00	Approved by:	2001111		
		Venkateshalu K	Mekalshali		
		Prepared by:		Department:	Date:
		Girish Chand	Junh	Traction Engg.	22.02.2022

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BHEL ELECTRONICS DIVISION PES-TRACTION ENGG AC VOLTAGE SENSORS FOR HLC

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Purchase Specification for oltage sensor (1500VAC) for Hotel Load Converter

REVISION HISTORY SHEET

Rev. No.	DATE	Nature of Change	Reason	Prepared	Checked	Approved
00	21.02.2022	FIRST ISSUE	-	SRM	KLN	VK

	Prepared	Checked	Approved
	62.10 2pm	t. Waye	Kleikalshalu
REVISION: 00 21.02.2022	SACHIN R M	LAKSHMI NARAYANA KATHARI	VENKATESHALU K

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BHEL ELECTRONICS DIVISION PES-TRACTION ENGG AC VOLTAGE SENSORS FOR HLC

PS/445/2760 REV. No. 00 PAGE 2 OF 4

1. INTRODUCTION

The AC Voltage sensor proposed to be procured against this specification is intended to be used in the Hotel Load Converters (HLC). The HLCs are used in IR (Indian Railways) locomotives.

The sensor shall be of traction grade and shall have high immunity against ambient electric and magnetic fields with proper insulation between primary, secondary and control supplies.

2. FUNCTION

One Number of voltage sensor is used as the input voltage sensor to measure the single phase voltage provided as the input supply to HLC by the hotel load winding of the traction transformer.

Three Numbers of voltage sensors are used to measure the three phase voltage output of the Hotel Load Converter.

3. POWER SUPPLY

Power supply of \pm -15V DC, to activate the sensors shall be provided from the interface card present in the HLC.

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BHEL ELECTRONICS DIVISION PES-TRACTION ENGG AC VOLTAGE SENSORS FOR HLC

PS/445/2760

REV. No. 00

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4. TECHNICAL DETAILS

Primary Voltage (Nominal) V_{PN} : 1500 V rms Measuring range : ± 2250 V peak Secondary current (at V_{PN}) : 50 mA rms

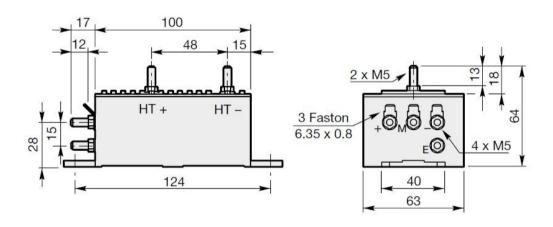
Supply voltage : $\pm 15V$ (tolerance $\pm 5\%$)

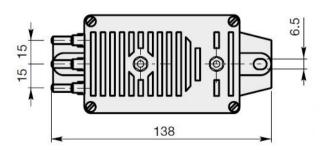
Error (as % of V_{PN}) : $\leq \pm 1$ at 25°C

≤ ±1.7 at range of -40°C to 85° C

Dielectric strength (at 50Hz for 1 minute) : $\geq 8kV$ Measuring resistance (Minimum) : 0Ω Measuring resistance (Maximum) : $\geq 100\Omega$ Maximum operating temperature : 85° C

DIMENSIONAL REQUIREMENT:





General tolerance: ±1 mm

NOTE: Mounting dimensions have to be strictly within the general tolerance limit (±1 mm)

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BHEL ELECTRONICS DIVISION PES-TRACTION ENGG AC VOLTAGE SENSORS FOR HLC

PS/445/2760 REV. No. 00

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5. DOCUMENTATION

The supplier has to provide the following documents:

- 1. Datasheet of the sensor
- 2. 3D model in .stp /.igs format

6. APPLICABLE STANDARDS

EN 50155: Electronic equipment used in railway applications

EN 50121-3-2: Electromagnetic compatibility of equipment installed on board of railway vehicles

EN 50124-1: Insulation coordination

IEC 61373: Railway applications – Rolling stock equipment- Shock and vibration tests

-(Category 1- Class B equipment)

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