



A4 - 12

PURCHASE SPECIFICATION
GROUP: TRACTION ENGINEERING

P.S NO. : PS/445/2691

REV. NO: 00

PAGE 00 OF 04

REVISION HISTORY SHEET

REV. NO.	DATE	NATURE OF CHANGE	REASONS	PREPARED BY	APPROVED BY
00	27.11.20	FIRST ISSUE	--	--	--

THIS DOCUMENT IS A SPECIFICATION CUM DATA SHEET. VENDOR TO FILL UP ALL CONFIRMATIONS AND DATA AS REQUIRED AND SUBMIT THE SAME TO BHEL / EDN, BANGALORE. ANY DEVIATIONS TO THIS DOCUMENT TO BE BROUGHT OUT CLEARLY BY VENDOR.

REVISIONS 00 DT: 27.11.2020

APPROVED BY:

PREPARED BY:

Agosh Chandran R S
Manager/Traction Engg

ISSUED BY

TE

DATE

27.11.2020



A4 – 10

PURCHASE SPECIFICATION
GROUP: TRACTION ENGINEERING

P.S NO. : PS/445/2691

REV. NO: 00

PAGE 01 OF 04

COPYRIGHT AND CONFIDENTIAL
The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED.
It must not be used directly or indirectly in anyway detrimental to the interest of the company.

SPECIFICATION FOR
VOLTAGE TRANSDUCER



A4 – 11

PURCHASE SPECIFICATION

GROUP: TRACTION ENGINEERING

P.S NO. : PS/445/2691

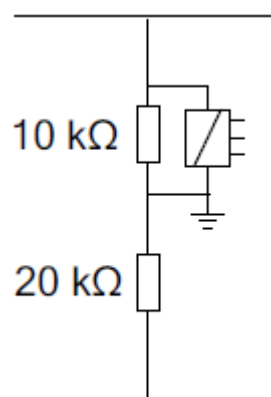
REV. NO: 00

PAGE 02 OF 04

1.0 INTRODUCTION:

The traction converter employs an earth fault detection circuit for detecting earth faults in DC and AC. It consists of a resistor divider network and a **Voltage Transducer**. The **Voltage Transducer** is an Electronic Sensor of DC voltage with a galvanic isolation between the primary and secondary circuits. A positive differential voltage at the primary should result in a positive output current from the Measurement terminal.

2.0 FUNCTION:



The asymmetrical voltage divider network is used for detecting earth faults. The measurement of **Voltage Transducer** is continuously compared with the DC link voltage to detect any earth fault in the DC link or in the Motor/Transformer connections.

3.0 PROTECTIONS

The electronic circuits should be properly coated and should be housed in a self-extinguishing plastic case conforming to UL94-V0. The Earth Fault Transducer should be protected against polarity reversal of Power Supply, Short Circuits in the measuring circuit and sudden opening of the measuring circuit. The Earth Fault Transducer should have high immunity to external interferences and low temperature drift considering the very harsh operating environment in an Electric locomotive.



A4 – 11

PURCHASE SPECIFICATION
GROUP: TRACTION ENGINEERING

P.S NO. : PS/445/2691

REV. NO: 00

PAGE 03 OF 04

4.0 CHARACTERISTICS

SI No	Characteristic	Value	Unit
1	Nominal Primary Voltage, U_{PN}	2800	V
2	Measuring Range, $U_{P \max}$	± 4200	V
3	Max Measuring Resistance	133	Ω , @ $U_{P \max} / \pm 24 (\pm 5\%)$
4	Min Measuring Resistance	0	Ω , @ $U_{PN} / \pm 24 (\pm 5\%)$
5	Secondary current at U_{PN}	50	mA
6	Accuracy at U_{PN}	± 1.5	%, -25 to +70°C
7	Accuracy at U_{PN}	± 1.7	%, -40 to +85°C
8	Offset Current	± 50	μA
9	Linearity Error	± 0.1	%, over ± 4200 range
10	Bandwidth	0...12 (-3 db)	kHz
11	Supply Voltage	$\pm 24 (\pm 5\%)$	V d.c
12	Operating Temperature	-40 to +85	°C
13	Storage & Staring Temperature	-50 to +90	°C

COPYRIGHT AND CONFIDENTIAL
The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED.
It must not be used directly or indirectly in anyway detrimental to the interest of the company.



A4 – 11

PURCHASE SPECIFICATION
GROUP: TRACTION ENGINEERING

P.S NO. : PS/445/2691

REV. NO: 00

PAGE 04 OF 04

5.0 INSPECTION

The type test reports from a NABL accredited laboratory to be provided along with the technical offer. For series supplies, Routine test reports are to be provided.

6.0 APPLICABLE NORMATIVE STANDARD

The offered system shall generally conform to the following normative standards

- IEC 60529 for IP68 protection
- EN 50155 Railway applications electronics equipment used on rolling stock
- EN 50121-2 EMC: Emissions to external environments
- IEC60077 Rules for equipment for onboard rail vehicles
- IEC 60571 Rules for electronic equipment onboard rail vehicles
- IEC-61373 Electric Railway Equipment-Rolling Stock-Shock & Vibrations Requirements