

SECTION - C

TECHNICAL SPECIFICATIONS OF STORES AND DRAWINGS.

Technical Specifications for
Factory Acceptance Tests, Supply and Site Acceptance
Tests at IPR of 750 kV RC Compensated Voltage
Divider



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1. SCOPE OF SUPPLY

Scope of supply includes 750 kV RC Compensated High Voltage Divider along with accessories as per the technical specification at Institute for Plasma Research (IPR), Bhat, Gandhinagar, India.

2. APPLICATION

The High Voltage Divider will be used for the measurement of output voltage of High Voltage DC Power Supplies at IPR.

3. TECHNICAL SPECIFICATIONS

The High Voltage RC Compensated Divider shall be designed, manufactured, tested and supplied as per the technical specifications defined in Table-1.

TABLE-1: Technical Specifications

Sr.	Parameters	Requirement
1.	Type of Divider	Wideband Compensated High Voltage Divider
2.	Max. DC Voltage	750 kV
3.	Maximum AC Voltage at 50/60 Hz	750kV peak
4.	Duty	Continuous without external cooling
5.	DC Accuracy	0.5% or better
6.	AC Accuracy at 50/60 Hz	1% or better
7.	Frequency Range	DC to 100 kHz
8.	Compensation	Duly compensated for the offered frequency range
9.	Temperature Coefficient	≤ 50 ppm / °C
10.	Long-time stability of the divider accuracy	0.5 % / Year or better
11.	Rated current at rated Voltage	≤ 1 mA
12.	Impedance Matching	a) 1 M Ohm For Oscilloscope and b) Optional:10M Ohm for DVM, in addition to the above .
13.	Output Cable Connector	BNC type
14.	Cable length	30 ft. minimum
15.	Divider ratio	10,000:1
16.	Mounting	Base Mounted Divider on a movable trolley
17.	Environment/Installation	Indoor
18.	Applicable Calibration Standard	Standard Calibration to NIST ANSI Z540-1-1994 OR Accredited Calibration to ISO/IEC17025

4. ACCEPTANCE TEST

4.1 FACTORY ACCEPTANCE TESTS (FAT):

Following tests shall be performed at manufacturer's Factory / Works OR at independent approved laboratory by the bidder. Test will performed as per the applicable standards. Test reports to be sent to IPR for approval and dispatch clearance

- a) Measurement of the resistance and capacitance of HV and LV arms at DC and any three frequencies up to and including 100 kHz.
- b) DC voltage withstand test for 1 minutes and 10 minutes minimum:

- i. For modular construction: Each module to be tested for full rated voltage.
 - ii. For single stack construction: The test to be performed at 750 kV i.e. at rated voltage. During the voltage withstand test, temperature rise and leakage current shall be measured.
- c) AC voltage withstand test (50/60Hz) for 1 minutes:
- i. For modular construction: Each module to be tested for full rated voltage.
 - ii. For single stack construction: The test to be performed at 750 kV peak i.e. at rated voltage.
- During the voltage withstand test, temperature rise and leakage current shall be measured.
- d) Step response measurement corresponding to Bandwidth of 100 kHz.
- e) Accuracy measurement at DC 0.5%, at 50/60Hz 1%. The plot of measurement accuracy vs. frequency (DC to 100 kHz) shall be provided.
- f) Measurement of the DC and AC voltage ratio
- g) Tightness test: Hydro or pneumatic test as applicable depending upon the type of insulation medium i.e. oil or gas.
- h) Calibration Test with reference to standards mentioned in the technical specification.

Tests which are not considered above but required for characterization & Testing of the High Voltage Divider should be mentioned in the Technical Offer.

4.2 SITE ACCEPTANCE TESTS (SAT)

Following site acceptance tests shall be performed by IPR representatives on receipt of HV Voltage Divider at IPR site.

- a) Visual and Dimensional Inspection
- b) Ratio Test by voltage measurement as per site conditions.
- c) Resistance Measurement

5. DOCUMENT:

Following documents (3 sets of hard copies and one set soft copy) shall be provided along with the supply of HV divider

- a) Instruction Manual
- b) Manufacturing Test Certificates and Reports.
- c) Operating manual and measurement procedure using digital multi-meter, CRO etc. should be included

6. DELIVERY PERIOD:

The required delivery period of High Voltage Divider is **on or before 8 months** from the date of issue of Purchase Order.

Annexure I
TECHNICAL BID COMPLIANCE

Bidder must submit along with the bid the following documents –

- a) The detail catalog/specification, data sheet and all included accessories etc.
- b) The detailed testing plan and procedure.
- c) Sample test report of similar voltage divider of previous supplies.
- d) Technical Compliance Sheet (Table-2) duly filled in data against each parameter. Just filling “complied” shall not be accepted, the actual value have to be indicated.

TABLE-2: TECHNICAL COMPLIANCE SHEET

Sr. No.	Technical Specification	Bidders Data
1.	Type of Divider	
2.	Max. DC Voltage	kV _{DC}
3.	Maximum AC Voltage at 50/60 Hz	kV _{AC} Peak
4.	Duty	Continuous / _____
5.	DC Accuracy	%
6.	AC Accuracy at 50/60 Hz	%
7.	Frequency Range	DC to _____ kHz
8.	Compensation	
9.	Temperature Coefficient	ppm / °C
10.	Long-time stability of the divider accuracy	/ Year
11.	Rated current at rated Voltage	mA
12.	Impedance Matching	
13.	Divider ratio	:
14.	Output Cable Connector	
15.	Mounting	
16.	Environment/Installation	Indoor/_____
17.	Cable length	Feet
18.	Applicable Calibration Standard	
19.	List of Test to be performed by vendor	
ADDITIONAL INFORMATION TO BE PROVIDED BY THE BIDDER		
1.	Manufacturer's name & address	
2.	Model No.	
3.	Overall Dimensions	____ x ____ x ____ mm
4.	General Arrangement (GA) Drawing	Attached / No/ _____
5.	Weight	_____ kg
6.	Type of Insulation	Oil / Gas
	a) If oil Grade of Oil	
	b) If gas Gas & gas Pressure	_____ ; _____ Bar
7.	Type of resistor used in divider	Metal Film / Carbon film / _____
8.	Nominal input capacitance of divider	_____ pF
9.	Nominal Input Resistance	_____ MΩ
10.	Accuracy at 100kHz	_____ %
11.	Flexural and Compression strength.	
12.	Recommended Calibration periodicity	
13.	Recommended Spares / Accessories	List recommended spares / accessories

Authorised Signatory

Official Seal & Date