

Annexure 1: Specification for Temperature Monitor along with Temperature Sensors for Cryogenic Application

Temperature Monitor along with sensors is required to measure and monitor temperature in vacuum environment. Temperature monitor shall have its own power supply for excitation of sensors and shall support silicon diodes and Positive and Negative temperature coefficient RTDs. Temperature monitor shall have provision to select sensor type while connecting sensor. Measurement range of temperature monitor shall be Better than 2K to 400 K. This monitor will be used for continuous operation in laboratory requirements.

Detailed specification of temperature monitor along with temperature sensors are given below. Bidder has to explicitly provide response against each specification point given in the “Bidder response” column. In case response against any specification clause is not provided either in the form of compliance or non-compliance, offer submitted by the bidder will be summarily rejected. Wherever bidder has been asked to submit documents in the “Bidder Response” column, Bidder shall submit the details as an attachment. In case Bidder has not submitted required documents as per specification clause, offer submitted by the bidder will be summarily rejected.

If bidder wants to provide any other relevant information in addition to the asked details, separate documents can be enclosed along with the offer. During technical evaluation of bids, if Purchaser ask for any clarification against submitted response from bidder or for any of the specification clause of the enquiry, Bidder shall submit complete details against the clarification in single response within the prescribed time. Failing which, offer will not be considered for further evaluation and will be summarily rejected declaring the bid technically Non-compliant.

Note: Available power supply line voltage for operation of temperature monitor is either 230V, single phase AC, 50Hz or 415V three phase AC, 50Hz.

Sl. No.	Technical Specification of Temperature Monitor		Bidder Response (Compliance/ Non-Compliance)
1.	Item Description	Temperature Monitor for temperature measurement using 4 wire sensor configuration	
2.	Quantity	1 No.	
3.	Supported Measurement Range for Temperature	Better than 2 K to 400 K	
4.	No. of Channel for Temperature Measurement	1 No.	
5.	Type of Sensors (of any make) to be supported by Monitor	<ul style="list-style-type: none"> a. Silicon Diodes. b. Platinum RTDs. c. Negative Coefficient RTDs such as Cernox or Ruthenium Oxide 	
6.	Display Units	<ul style="list-style-type: none"> a. K and °C for Temperature b. V/mV for Voltage c. Ω for Resistance. 	
7.	Temperature Display Resolution	2 digits after decimal for full temperature range i.e. 1.99K, 10.99 K or 100.99 K	
8.	Communication Interface	<ul style="list-style-type: none"> a. Using a software to communicate with monitor through either USB, Ethernet or RS-232 Serial Port b. Using front panel keys on monitor for setting input parameters <p>Note: Bidder shall provide required software for communication with monitor along with the product.</p>	

Sl. No.	Technical Specification of Temperature Monitor		Bidder Response (Compliance/ Non-Compliance)
9.	Analog to Digital Converter Resolution	24 bits	
10.	Type of Display	LCD or LED	
11.	Calibration Charts and Data	Provision to feed calibration data either using keypad or through PC using software	
12.	Ambient Temperature for Temperature Monitor	15°C to 35°C	
13.	Preferred Overall Volume	200 x 200 x 200 mm	
14.	Maximum Mass	1 kg	
Sl. No.	Technical Specification of Temperature Sensor		Bidder Response (Compliance/ Non-Compliance)
15.	Type	Silicon Diode	
16.	Quantity	4 Nos.	
17.	Measurement Range	2 to 300 K	
18.	Sensor Lead Wire Configuration	4 Wire in twisted pairs	
19.	Lead Wire Material Details	36 AWG Phosphorus Bronze wires with vacuum compatible shielding material such as polyimide/Formvar	
20.	Length of lead wire	2 m	
21.	Shape and Size of Sensor	Disc shape having Maximum Dia. of 10 mm & Maximum height of 4 mm	
22.	Sensor Mounting	Thermal contact with measuring surface using flat face of disc and fixing using screw	
23.	Accuracy	± 1 K in measurement range	
24.	All Temperature Sensors shall be compatible for Vacuum Environment.		

Sl. No.	Specification for Temperature Monitor and Sensors	Bidder Response (Compliance/ Non-Compliance)
25.	Guarantee/Warranty: Temperature Monitor along with sensors shall be guaranteed/warranted against any manufacturing defects for a period of 12 months from the date of receipt of items at SAC, Ahmedabad.	
26.	Delivery Period: Within 16 weeks from date of P.O.	
27.	System Installation Support: Supplier has to depute their representative for installation and operation of temperature monitor after receipt of items at SAC. In case Supplier does not have any technical support staff/infrastructure in India, Supplier shall provide online support for installation and operation of Temperature Monitor	
28.	Testing: Supplier has to carry out functional testing of Temperature Monitor before dispatch to ensure proper functioning & operation. In addition to functional test, document for all standard tests carried out on Temperature Monitor and Temperature Sensors for its acceptance as per Supplier's quality protocol shall also be supplied.	

Sl. No.	Pre-Qualification Criteria	Bidder Response (Compliance/ Non-Compliance)
29.	Bidder shall be either a manufacturer of Temperature Monitor or an authorized representative of the Temperature Monitor manufacturer.	
30.	If bidder is a manufacturer, bidder shall submit a self-declaration stating that they are manufacturer of Temperature Monitor along with their company profile.	Bidder shall enclose self-declaration along with company profile in the technical bid.
31.	If bidder is an authorized representative/distributor of the manufacturer, bidder shall submit an authorization letter from Temperature Monitor Manufacturer along with manufacturer's company profile. Authorization letter submitted by the Bidder shall be valid until warranty period/obligations of the offered products is over.	Bidder shall enclose authorization letter and manufacturer's company profile in the technical bid.
32.	If bidder has not submitted documentary evidence as mentioned from Sl. No. 29 to 31, their offer will be summarily rejected.	
Sl. No.	Bid Documentation	Bidder Response (Compliance / Non-Compliance)
The following documents (in English) shall be provided by the vendor along with the quotation for offered products		
33.	Data sheet of all the offered Temperature Monitor along with detailed technical specification.	Bidder shall enclose details of the offered products in the technical bid.
34.	Data sheet of offered temperature sensor along with detailed technical specification.	
35.	Details of accessories which will be provided with temperature monitor	
36.	Details of EMI/EMC Test carried out on the Temperature Monitor along with the standard followed for EMI/EMC Testing.	

Sl. No.	Bid Documentation	Bidder Response (Compliance / Non-Compliance)
The following documents (in English) shall be provided by the vendor along with the consignment at the time of Delivery:		
37.	Guarantee/Warranty certificate	
38.	Performance/Acceptance Test Certificate for Temperature Monitor	
39.	Test Certificate/CoC for Temperature Sensors	
40.	Operation and Instruction manual for Temperature Monitor	
41.	Safety precautions to be followed during operation of temperature Monitor, if applicable.	
42.	Declaration that offered Temperature Monitor will support sensors of all make and operation of temperature monitor is not dependent on make of temperature sensor.	
43.	Recommendations for grounding and isolation of temperature monitor during usage, if applicable.	
Packing and Marking		
44.	Temperature Monitor and temperature sensors are to be packed separately. Temperature Monitor and Temperature Sensors shall be supplied in suitable packing to avoid any damage during handling and transportation.	
Material Receipt Inspection		
45.	Material receipt inspection of Temperature Monitor along with sensors will be carried out, for their acceptance, after receipt at SAC; Ahmedabad.	