INDIAN INSTITUTE OF TECHNOLOGY BOMBAY
MATERIALS MANAGEMENT DIVISION
Powai, Mumbai 400076.

Ref. PR No. 1000052288 RFx. No. 6100002688

Cryogenic Temperature Controller

Sr. No	Item Description	Detailed Technical Specification	Technical Compliance (Yes / No)	Additional Information (if any)
A.		**Cryogenic Temperature Controller: AC resistance bridge for cryogenic ultra-low temperature Application, Lake shore 372S or substantially Equivalent** **Quantity:1 Number**		
1.		**Input type**: AC, 4-lead differential, resistance		
2.		**Number of inputs** :1		
3.		**Maximum channels:** 16 with scanner card		
4.		**Resistance ranges:** 22 ranges from 2 mΩ to 63.2 MΩ (excitation dependent) or more.		
5.		**Maximum update rate:** 10 rdg/s (single range and input) or better.		
6.		**Range change settling:** 3 s + filter settling		
7.		**Temperature coefficient:** ±0.0015%/°C of rdg		
8.		**Maximum lead resistance:** 100 Ω + 10% of resistance range per lead for current ≤3.16 mA		
9.		**Isolation:** should be isolated from chassis and heater ground.		
10.		**Lead connections:** V+, V-, I+, I-, V shield, I shield, individual guards		
11.		**Excitation:** Sinusoidal AC current source		
12.		**Excitation accuracy:** ±2% of nominal		
13.		**Range selection modes:** Manual, voltage excitation, current excitation, auto range		
14.		**Scanner modes:** Manual or auto scan		
15.		**Supported sensors:** NTC resistive sensors including germanium, Cernox®, Rox™, PTC resistive sensors including rhodium-iron		

16.		**Connectors:** 6-pin DIN (current out), 6-pin DIN (voltage in), and D6-pin DIN (current out), 6-pin DIN (voltage in), and DA-15 (scanner control)		
17.		**User curves:** 25 Cal Curves™ or user curves		
18.		**Control modes:** Closed-loop PID, PID zones, open-loop		
19.		**Setpoint units:** Ω, K (with temperature curve)		
20.		**D/A resolution:** 16 bit		
21.		**Output compliance voltage (min):** +/- 10V		
22.		**Maximum power:** 10W		
23.		**Number of control loops:** 2		
24.		**Display:** 8-line by 40-character (256 × 64 pixel) graphic VF display module		
25.		**Number of reading displays:** 1-8		
26.		**Interface:** IEEE, USB, Ethernet		
27.		**Alarms:** high and low		
28.		**Relays:** 2		
29.		**Ambient temperature:** 15 °C to 35 °C at rated accuracy; 5 °C to 40 °C at reduced accuracy		
30.		**Power requirement:** 220 V Single phase 50Hz		
31.		**Size:** 450 mm W × 100 mm H × 400 mm D or less		
B.		**Rox™ ruthenium oxide 102B RTD in RS package, or substantially Equivalent, calibrated 10 mK to 40 K,** **Quantity :2 Numbers**		
1.		Resistance range: 10 kΩ to 20 kΩ		
2.		Recommended excitation voltage: • 20 mV for temperatures between 0.05 K and 0.1 K • 63 mV for temperatures between 0.1 K and 1 K 10 mV or less for temperatures above 1 K		
3.		Short-term stability: ±15 mK at 4.2 K		
4.		Long-term stability: ±30 mK per year at 4.2 K		
5.		Thermal response time: 0.5 s at 4.2 K		
6.		Maximum power before damage: 10^{-5} W, or 0.1 mA, or 1 V (whichever is lower)		
7.		Typical dissipation at rated excitation: 7.5–8 μW at 4.2 K		
C.		**Cryogenic thermal paste: Apiezon® N grease, 25 g tube, or substantially equivalent,** **Quantity: 1 Number**		
		Warranty- 1 year		