

## Annexure A

Hardware for monitoring system that interfaces the software and equipments:

S.No.	Name of the hardware/sensor	Specification/requirement	Quantity
	<b>Hardware for software</b>		
1	Time controller	Must be capable of sustaining high temperature upto 70 C Input voltage range 5 V – 40 V In-built memory (system minimum 128 MB; non-volatile storage 2 GB or more) USB ports: available for data capture/transfer Ethernet port: 100 base, 10 base T Serial port: RS232 Real time operating system Software support: Yes	1
2	Re-configurable chassis	Slots: minimum 8 Wide operating range: -40 to 70 V	1
3	Thermocouple input module	Channels: 16 ADC: 24 bit Cold junction compensation: Yes Earth isolation: 250 V RMS Measurement sensitivity: 0.02 C Speed: 75 samples/channel/second	1
4	Analog input module	Input channels: 8 Range: +/- 20 mA, 0-20 mA (programmable) Resolution: 16 bit Sampling rate: 200 KS/s Operating range: upto 70 C Earth isolation: yes	1
5	Digital input module	Inputs: 500 ns Voltage range: +/- 5 V up to 24 V, single or differential digital input Operation type: hot swap Operating range: up to 70 C	1
	<b>Sensors</b>		
6	Voltage Input Module	Maximum Voltage: 300 V Sampling Rate : 50000 samples per sec Resolution: 24 bits 600 V RMS channel to channel isolation Built in anti-alias filters No. of Channels : 4	2
7	Channel Current Input Module	Number of channels: 4 Upto 5 A RMS measurement 50 Ks/S/CH simultaneous inputs	2

		250 V RMS channel to channel isolation Resolution: 24 bits	
8	Flowmeter for Inlet gas	Turbine Gas flowmeter Line Size : DN 40 / DN 50 (optional) Flow Range: 0-95 scm <sup>3</sup> /hr Pressure: 3 Bar Max Output: Pulsed or 4-20 mA	1
10	Flowmeter for jacket water	Line Size : DN 80 Flow Range: 33 m <sup>3</sup> /hr max Pressure: 0-10.6 kg/cm <sup>3</sup> Output: Pulsed or 4-20 mA	1
11	Flowmeter for VAM chilled water	Line Size : DN 125 Flow Range: 63.5 m <sup>3</sup> /hr max Pressure: 0-10.6 kg/cm <sup>3</sup> Output: Pulsed or 4-20 mA	1
12	Flowmeter for VAM-CT	Line Size : DN 150 Flow Range: 110 m <sup>3</sup> /hr max Pressure: 0-6 kg/cm <sup>3</sup> Output: Pulsed or 4-20 mA	1
13	Flowmeter for chiller circuit	Line Size : DN 200 Flow Range: 152 m <sup>3</sup> /hr max Pressure: 0-10.6 kg/cm <sup>3</sup> Output: Pulsed or 4-20 mA	1
14	Flowmeter for chiller-CT	Line Size : DN 200 Flow Range: 230 m <sup>3</sup> /hr max Pressure: 0-6 kg/cm <sup>3</sup> Output: Pulsed or 4-20 mA	1
15	Flowmeter for exhaust gas	Ventury type flowmeter Line Size : 10 inch Temperature: 450 C ma Pressure: 50-100 mBar Output: Pulsed or 4-20 mA Maximum flow: 1866 kg/hr	1
16	Thermocouples	K-type Compatible to data acquisition temperature module	10 (below 50 C) 2 (between 50 C – 90 C) 1 (between 250 C – 500 C)