



# PRODUCT STANDARD

## SWITCHGEAR

### HYDERABAD

Product  
STD NO.

SG 80067

Rev No 00

Page 1 of 6

## TURBO AIR COMPRESSOR FOR 25 kW Fuel Cell system

### Material code: SG9780067019

1. **DESCRIPTION:** Turbo Air compressor for high power fuel cell system
2. **TECHNICAL DETAILS:**

SL.NO.	DESCRIPTION	SPECIFICATIONS
1	Application	For supply of oil-free pressurized air to PEM Fuel Cell stacks in stationary/ mobile applications.
2	Air flow rate at Pressure Ratio of 1.8bar or higher referring to suction side.	60 g/s or higher
3	Medium	Filtered air (ISO ePM2.5 95%)
4	Design	Single stage
5	Bearings	High-speed gas bearings with Oil free technology shall be used to avoid contamination in the supplied air.
6	Motor	AC synchronous motor
7	Compressor Speed	Minimum : 20000 rpm Rated Capacity (60g/s @ PR 1.8) : 140000 rpm Maximum speed : 150000 rpm The speed at rated capacity shall not be more than 95% of maximum speed.
8	Maximum Pressure Ratio	2.05
9	Total Power consumption in kW	Vendor has to specify the peak power and rated power of the compressor. The maximum power demand by turbo compressor shall not exceed 7.5 kW.
10	Ambient temperature	-20°C to 50°C
11	Inlet pressure of compressor	Atmospheric
12	Enclosure Protection Class	IP67 or better
13	Efficiency of compressor	> 70 %
14	Acceleration time from zero to maximum speed	Vendor has to specify
15	Mass flow rate maximum	Vendor has to specify
16	Weight of compressor	Weight of the compressor has to be specified in Kg and weight of the compressor preferably be less than 10 Kg.

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Revisions:

Refer to record of revisions:

Prepared:  
LVRKApproved:  
KDGDate:  
11.03.2024



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17	Volume & size of compressor	Vendor has to specify the compressor volume and size (LXWXH in mm) excluding the cables and power converter. Volume of the compressor shall be less than 10 Liters (water volume)
18	Make and Part no of Compressor	Vendor has to specify
19	Cooling System	Vendor has to specify the details of the following 1.Coolant medium 2.Maximum and minimum allowed coolant flow rate 3.type and size of connection 4. Maximum coolant inlet temperature 5. Cooling water pressure 6. Cooling water pressure losses.
20	Motor	Vendor has to specify the details of the following 1.Minimum voltage and maximum voltage 2. Requirement of motor winding temperature monitoring. 3. Motor temperature sensor warning 4. Motor temperature sensor limit.
21	Inlet Air Filter	Vendor has to provide the details of compatible air filter to be used with compressor
22	Inlet and Outlet Connection Type	Vendor has to specify the size & type of compressor Inlet and outlet connection
23	Vibration Standards	The compressor shall be qualified for Shock and Vibration test standards of DIN EN 60068-2.
24	Power converter, power cables and control cable	Vendor has to supply a compatible power converter for driving the compressor, power cables and control cables along with each compressor as a set. Cost of power converter, power cables and control cables may be included in the main compressor cost.
25	Input Voltage	Fuel Cell Stack will power the compressor through power converter in normal working condition after startup. Range of Input voltage (DC or AC) to the power converter has to be specified

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25	Input Voltage	Fuel Cell Stack will power the compressor through power converter in normal working condition after startup. Range of Input voltage (DC or AC) to the power converter has to be specified
26	Input Current	Vendor has to specify the maximum current drawn for a given voltage
27	Startup Battery	Vendor has to specify the Voltage & AH capacity of Start-up battery (Preferably 12 V or 24 V) for initial start-up of compressor.
28	Speed Control of Compressor to control Air Flow Rate	Vendor shall provide the methodology for speed control of Compressor. Also indicate the requirement of any auxiliary supply for speed control.
29	Communication Interface	Provision for communication over CAN/ Modbus RS485 may be available. Vendor has to specify the details, if any other communication interface is used.
30	Submission of flow characteristic curves	Vendor shall submit compressor map showing the Flow Rate vs Pressure Ratio curves corresponding to compressor speed and power along with the offer.
31	Manufacturer Test Certificate	Vendor shall submit technical documents such as data sheets / catalogues/GA drawing/interface connection details of the offered Make and model for technical scrutiny by BHEL.

### 3. TEST CERTIFICATES:

The following certificates shall be submitted by supplier

- a) Duly signed manufacturers test certificates
- b) Country of origin on supplier's letter head in case of foreign vendor
- c) Guarantee Certificate

### 4. GUARANTEE CERTIFICATE:

A guarantee certificate for 18 months of trouble free performance from the date of shipment or 12 months from the date of commissioning whichever is earlier shall be furnished.

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**5. PACKING:**

- a) Turbo Air compressor shall be packed individually in a box. Such boxes shall be packed in a cardboard case with adequate cushioning material to withstand normal transit risks.
- b) The item shall be stored in a covered shed for long periods before installation. The packing shall be suitable for such storage.

**6. MARKING:**

The following details shall be marked on the packing case.

- a) Manufacturer's name or trade mark
- b) BHEL purchase order no.

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