

STATEMENT OF TECHNICAL REQUIREMENT FOR DIESEL DRIVEN COMPRESSOR

1. **Diesel Driven Air Compressor.** The Diesel Driven Air Compressor shall be a self-sustaining package, accessories, controls, alarms, instrumentation etc. The Compressor shall be a robust & modern compact design. The diesel engine, compressor and control panel (including pressure gauges etc.) shall be installed on a common base frame on SV mounts. The base frame, shock mounts (with all associated fasteners) and jacking bolts are part of firm's scope of supply. The provision for local & remote control is to be provided. The main function of Diesel Driven Air Compressor is to provide compressed air to the ship's High Pressure Air System at an absolute output of 1.33 LPM at a pressure of 200 Bar.

2. **Technical Data.** The compressor output during its life time shall be as follows: -

- (a) Absolute output pressure : 200 bar
- (b) Flow rate : 1.33 lts/min
- (c) Discharge Air Temperature : 40 to 45 °C

3. **Design Requirement.**

- (a) **Free Air Delivery.** The conditions associated with free air to be taken as 35 °C and 1.013 bar absolute.
- (b) The air inlet silencer is to be capable of adequately silencing the intake suction noise. Intake Air, Filter-cum-Silencer is in the supplier's scope of supply.
- (c) The Compressor should have a provision for unloading during starting in order to avoid excessive load on the prime mover.
- (d) The compressor must be directly driven by the diesel engine through a flexible coupling to accommodate small misalignments.
- (e) Flexible hoses at air discharge connection on the compressor are to be provided.
- (f) Filtration and purification arrangements complying with the requirements of NES-316 are to be provided at the compressor inlet and discharge.
- (g) For oil-flooded compressors, the maximum temperature at delivery flange of the compressor before the oil separator is not to exceed 110°C with 30°C ambient temperatures.
- (h) Starting.
 - (i) Engine Starting. From Two independent source: -
 - (aa) 1st stage – Air.
 - (ab) 2nd stage –Battery.
 - (ac) Battery & battery.
 - (ii) The battery /Air stored shall be sufficient to provide six starts.
 - (iii) In addition to above, provision for Hand starting should be made.
- (j) **Cooling.**
 - (i) Intercoolers, after coolers and cylinders are to be Sea water cooled or Air Cooled.
 - (ii) If sea water cooling is used, the SW cooling and pump should be part of the compressor system.
- (g) **Lubrication.**
 - (i) To be maintained under all environmental conditions.

(ii) Oil coolers are to remain full of oil when compressor is not running. In case of forced lubrication oil system, a pump driven directly by the compressor unit is to be used. No hand priming should be required.

(h) Drainage System. Water / Moisture separators are to be provided at the discharge of each stage and at the outlet of after-cooler. These separators are to be automatically operated at periodic intervals and remain open for sufficient duration to ensure removal of collected water/moisture without unduly reducing the compressor output. Discharge from drains needs to be silenced. Time interval for drain operation is to be selected to suit appropriate normal and high humidity settings. The local control panel should have provision to vary the frequency of operation (based on normal / high humidity condition) and the duration of opening of the drain. This arrangement is to be provided inside the local control panel. Data on percentage loss in the output of the compressor due to draining arrangement is to be given by the supplier in the offer. All condensate/moisture drain lines are to be connected to common condensate manifold, which is to be supplied by the supplier.

(k) Control and Monitoring. The system shall be designed for controlling the operation of the Diesel Engine of the Compressor and electromagnetic valve actuating the blowing valve, compressor protection in emergency state of operating parameters as well as signalling about switching – on, operation and stopping during compressor in emergency. Control and monitoring panel is to be provided with auxiliary relays and timers for smooth operation of the compressor. Necessary indicators, start / stop push buttons, Hooter, Lamp test, accept, reset, manual blow off, emergency stop push buttons are also to be provided.

(l) Engine. The engine is to be equipped with the following: -

- (i) ON / OFF toggle switch.
- (ii) Starter push button.
- (iii) Solenoid relay.
- (iv) Hooter.
- (v) Engine low oil pressure switch.
- (vi) Engine low oil pressure indication lamp.
- (vii) Warning lamp.
- (viii) Any other necessary sensors/signals.

(m) Compressor. The following instrumentation is to be provided locally: -

- (i) Compressor discharge pressure.
- (ii) Compressor inter stage pressure.
- (iii) Air discharge temperature.
- (iv) Interstage air temperature.
- (v) Lubricating oil temperature.
- (vi) Hours run/ Running Hrs meter.
- (vii) Any other instrumentation considered necessary by the supplier.
- (viii) L. O. In / Out pressure.

4. Type Test. The first of each type of equipment is to be type tested and each successive unit is to be production tested at the manufacturer's works.

(a) Type tests shall be carried out on electrical equipment as details below: -

<u>SN</u> <u>o</u>	<u>Test</u>	<u>Specification</u>	<u>Test Condition /Severity</u>
1.	Vibration	JSS 55555 - Test 28	5 – 33 Hz

2.	High Temperature	JSS 55555 - Test 17	55 deg C for 16 Hrs. Procedure 5, Test Condition 'G'
3.	Damp heat	JSS 55555 - Test 10	40 deg C, 95 RH for 16 Hrs
4.	Drip proof	JSS 55555 - Test 11	Vertical Water drip 1 m height for 15 min
5.	Mould growth	JSS 55555 - Test 21	29 ° C, 90 % RH mould growth chamber for 28 days
6.	Bump	JSS 55555 - Test 5	1000 bumps – 40 G, 6 m/sec
7.	Shock / Impact	JSS 55555 - Test 24	As per laid down Specifications
8.	Inclination/ Tilt	CL 0563 Sec 19	
9.	Ship Motion		
10.	EMI/EMC	MIL-STD 461 E	

(b) Shock Test. The equipment shall be designed and guaranteed to withstand IN shock grade A.

(c) Noise & Vibration Requirements:

(i) The Noise measurement & acceptance criteria should be as per type 2 of the "MIL-STD-740-2". The graph of 1/3rd octave band frequency range is to be followed

(ii) The maximum acceptable vibration levels measured as acceleration dB ref 1e-5m/s², as per MIL-STD-740-2.