

**SPECIFICATION FOR ROTARY SCREW TYPE ELECTIC DRIVEN
AIR COMPRESSOR
SPECIFICATION NO. MECH/M&P/3100/GM/09**

**1.0 IMPORTANT INSTRUCTIONS TO TENDERERS FOR FILLING TECHNICAL
BID**

- 1.1 Bidders are required to give clause wise comments on the technical specifications, confirming compliance/non-compliance with details of deviations if any along with their effect on the performance. Back references to be avoided, offers are likely to be ignored in case of non-compliance of these instructions for furnishing the information.
- 1.2 Unless otherwise stated, latest alterations/ revisions of specifications/ standards/ drawings shall be applicable. In respect of safety standards and environmental standards relevant to the machine, the machine manufacturers shall ensure compliance with international (CE/ISO/DIN/JIS)/National standards (IS) (where applicable).
- 1.3 Tenderers should offer and quote for all the specified concomitant accessories, as these are considered essential for commissioning and utilization of the machine. Even if bidder does not recommend the purchase any of these accessories, the price must be quoted for comparison purposes and their recommendation/suggestion indicated in the offer. Tenderers should also quote for optional accessories, spares and consumable spares as asked in the specifications.
- 1.4 In case, any item is required in sets, please specify nos./pieces per set. This is essential for proper technical evaluation of the offer. Offers received without this may be considered as incomplete and liable to be rejected.
- 1.5 The bidder should quote only for the specified make of sub-assemblies and equipment wherever specified. Makes of sub-systems other than the specified ones will normally not be acceptable. In case, some other make is quoted, specific reasons for the same including its features/advantages over specified makes must be brought out in the offer.
- 1.6 In case there is a contradiction in any information provided (some parametric values given in the specification and those given in the brochure or some other document enclosed by the tenderer), unless specifically mentioned in the deviation cum confirmation statement the values as given in the specification shall be taken as confirmed by the tenderer and offer evaluated accordingly.
- 1.7 The Purchaser may accept internationally accepted alternative specifications which ensure equal or higher quality than the specifications mentioned in the Technical Specification. However, the decision of the Purchaser in this regard shall be final.
- 1.8 Purchaser reserves the right to verify the details submitted by the bidder by actual site visits.

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2.0 DESCRIPTION AND SCOPE OF SUPPLY:

The specification covers design, manufacture, supply and commissioning of Electric driven oil free, tank mounted silenced screw air compressor as per parameter in schedule –I.

3.0 PURPOSES AND CAPABILITY:

The Compressor is required for testing of BMBC cylinders in M&C lab and operation of other testing equipments.

The air compressor shall be capable of supplying compressed air at full rated capacity.

The compressor shall be capable of working continuously in three shifts at full rated capacity.

Bidders must offer a design in which the compressor is mounted on a deck such that it is possible to install the compressor on plain concrete floor, thus, eliminating the need for foundations.

The compressor shall be capable of working in normal Indian Railways workshop environment with maximum ambient temperature up to 48°C and maximum relative humidity up to 98%.

4.0 CONCOMITANT ACCESSORIES:

4.1 The following concomitant accessories should accompany the machine:

- a First fill of oils and lubricates (quality and acceptable) – Cost per liter. Brands of each item to be indicated in the bid)
- b Air intake filter.
- c Oil filter
- d Oil – air separator
- e Light maintenance tool kit (List of tools to be furnished in the bid) – 01 set

The cost of each listed concomitant accessory should be quoted separately. Wherever for any reason the cost of any concomitant accessories is included in the basic price of the machine, it should be specifically mentioned.

4.2 Any other attachment / accessory, which in the opinion of the tenderer shall enhance the capability of the air compressor, shall be quoted separately bringing out the advantage thereof.

4.3 List of standard accessories which will be supplied free of cost with Compressor should be furnished.

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4.4 List of any optional accessories which may be useful to improve the working /efficiency of Compressor duly indicating price of each should be furnished.

5 BASIC DESIGN FEATURES:

5.1 Compressor Unit:

5.1.1 The compressor shall comprise of a compressor coupled to an electric motor, controls, safety devices, oil reservoir-cum separator, oil cooler and after cooler mounted on a rigid structural steel base. i.e. sub frame/ deck on a set of anti vibration mounting pads.

5.1.2 One single stage , rotary screw element complete with:

- a. Dry paper type suction air filter with silencer conveniently located for easy replacement of filter element.
- b. Unloader with integrated regulating valve for load/unload control system. Simple design with only one moving part that needs no regular adjustments.
- c. Three way solenoid valve required for load/unload regulation of the compressor.
- d. Air/Oil Temperature switch to shut down the compressor in case of too high outlet air temperature.
- e. Material specifications and hardness of rotor screws shall be indicated in the bid.
- f. The rotor shall be statically any dynamically balanced.

5.2 Motor:

Motor should be 7.5 HP or 5.5 kw, 2 pole, squirrel cage induction type with TEFC IP 55 enclosure, class F insulation, suitable for 45°C ambient temperature and 415+/- 10% volts, 3 phase, 50+/- 3% Hz supply.

5.3 Power and Control Panel:

Power panel shall incorporate:

- a. Suitable DOL starter with contactors, relays etc.
- b. Emergency stop button
- c. Power cable suitable for 3 phase 4 wire connection of 3 m length approx., factory connected.
- d. Dial indicators shall be mounted on control panel for “Discharge Air Pressure”.
- e. Hour meter shall be mounted on control panel for indicating “Total running hours”
- f. Electropneumatic energy saving control with pressure switch, solenoid valve, timer etc for load & unload regulation, and to shutdown compressor when no air is needed.
- g. Safety device to shut down compressor in case of high element outlet temperature.

5.4 Air Oil Receiver Tank:

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The air oil receiver tank should be consisting of:

- a Sight glass for oil level indication and oil filling arrangement.
- b Minimum pressure valve to close off the compressor when the unit is stopped or running unloaded and to maintain required air pressure in the system for proper oil lubrication.
- c Safety valve.
- d Oil draining arrangement.
- e Three stage air oil separation system.

5.5 Oil Cooler Assembly:

- a Compact cooler of aluminum for optimum heat transfer, lower pressure drop and lower weight.
- b Oil filter (spin on) mounted on air oil receiver for filtration of lubricating oil.
- c Thermostatic valve to regulate oil temperature within the system.

5.6 Moisture Separator:

5.6.1 A Suitable moisture separator with condensate trap shall be provided at delivery end.

5.6.2 A moisture separator shall have an automatic drainage system.

5.7 Interlocking safety features:

The compressor shall ensure ensure complete safety during operation and maintenance. Details of the safety features provided shall be listed in the bid. The features shall necessarily include the following:

5.7.1 Automatic shut down for compressor when reservoir air temperature exceeds 105°C there should also be an indicator alarm to show the status.

5.7.2 Air pressure relief valves shall be mounted on air oil separator and air receiver, and shall operate at 115% and 110% of the normal operating air pressure.

5.7.3 The safety valve shall be designed to allow air to escape without increasing the pressure beyond 10% of the normal working pressure when compressor is working at full rated capacity.

5.7.4 Automatic blow off valve shall be mounted to discharge air pressure in the air oil separator and air reservoir after the compressor is being shut down.

5.7.5 Motor Overload (Thermal) Protection shall also be provided.

5.8 Air piping (s):

5.8.1 Interconnecting air piping shall be provided.

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5.8.2 Drain piping shall be provided from all drain points leading to a common drain header.

5.9 Oil & Lubricants:

5.9.1 The bidder shall clearly indicate the quality, periodicity of replacement and equivalent brands for compressor oil and lubricants.

5.9.2 The bidder shall furnish the information for compressor oil and lubricants.

6.0 DEVIATION:

Any deviation from the above stipulations shall be brought out clearly giving advantages of the proposed deviation and approval shall be taken from Dy. Chief Mechanical Engineer(Proj.)/RCF before supply of material to RCF.

7.0 PAINTING

All surfaces to be painted, should be thoroughly cleaned of loose mill scales, rust, foreign matter by wire brush etc. All surfaces to be painted should be suitably subjected to anti-corrosive treatment before applying two coats of primer like red oxide/zinc chromate and two coats of synthetic enamel paint.

8.0 MAINTAINABILITY

The design of equipment will ensure that all important equipments like motor, compressor and air receiver are so positioned as to ensure easy accessibility for normal maintenance and removal for repairs etc. Grease nipples/oil cups should be provided to ensure positive lubrication at required locations.

9.0 SPARES:

The tenderer should quote separately item-wise for spare parts (with rates) recommended for two years of normal maintenance.

10.0 TECHNICAL LITERATURE:

10.1 One copy of the printed illustrative catalogue showing features of the machine and its elements must be enclosed with each copy of the bid.

10.2 The successful bidder shall furnish for each compressor 4 copies of spare parts catalogue giving the part list number of each component with exploded views and assemble drawings, maintenance manual troubleshooting guide.

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11.0 SPECIAL FEATURES:

Special features incorporated in the machine, if any, should be indicated separately in the bid clearly indication the advantages.

12.0 INSPECTION AND TESTING:

12.1 A load test must be carried out at the manufacturer's work. Rigidity of the machine must be demonstrated to the satisfaction of the appointed Inspector or Inspecting Agency.

12.2 Manufactures must have suitable facilities at their works for carrying out various performance tests on the machine. The tenderer should clearly confirm that all facilities exist and shall be made available to the inspecting authority.

13.0 INSTALLATION AND COMMISSIONING:

13.1 The contractor or his authorized agent shall be required to carry out a joint check at the consignee's end along with the consignee before unpacking is done to avoid subsequent complaints regarding short shipment or transit damages. It is necessary that consignee to avoid commissioning delays due to shortages/ transit damages do this joint inspection immediately on receipt of the machine.

13.2 The contractor or his authorized agent shall commission the machine within 60 days from the date of intimation by the consignee in respect of readiness of site and installation of the machine.

13.3 The contractor or his authorized agent shall demonstrate the machine performance after successful commissioning at the consignee's works for a period of two 8 hours shifts. Thereafter the consignee shall watch the machine performance for a period of one month (each working day having one shift of 8 hours) before final proving test certificate is issued.

14.0 WARRANTY:

As per IRS terms and conditions of the contract

SCHEDULE –I

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MAJOR PARAMETERS:

1	Free air delivers	21 CFM at normal working pressure
2	Maximum Working Air pressure	10 bar
3	Sound level in dB(A) (maximum)	65
4	Dimensions in mm (maximum)	1420 x 550 x 1280
5	Volume (Air Reservoir)	200 ltrs
6	Motor	7.5 HP or 5.5 kw, 2 pole, squirrel cage induction type with TEFC IP 55 enclosure, class F insulation, suitable for 45°C ambient temperature and 415+/- 10% volts, 3 phase, 50+/- 3% Hz supply

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