


INTER PLANT STANDARD - STEEL INDUSTRY		
	SPECIFICATION FOR AC CABIN FAN FOR EOT CRANES (First Revision)	IPSS:1-03-011-92
	Corresponding IS does not exist	Formerly IPSS:1-03-011-87

0. FOREWORD

0.1 This Interplant Standard (First Revision) prepared by the Standards Committee on Rotating Electrical Machinery, IPSS 1:3 with the active participation of representatives of the steel plants and other associated organizations, was adopted by the Approval Committee on Consumable Stores and General Equipment, IPSS 1 on 13 February 1992.

0.2 Interplant Standards for steel industry primarily aim at achieving rationalization and unification of parts and assemblies used in steel plant equipment and accessories, and provide guidance in Indenting stores or equipment (or while placing orders for additional requirements) by individual steel plants. For exercising effective control on inventories, it is advisable to select a fewer number of sizes (or types) from among those mentioned in this standard, for the purpose of company standards of individual steel plants. It is not desirable to make deviations in technical requirements.

0.3 This Interplant Standard was first published in 1987. This revision has been carried out to update the standard based on the requirements of the steel plants.

0.4 In this standard, frequent references have been made to the following Indian Standards:

IS 555:1979 Specification for electric table type fans and regulators (third revision)

IS 4691:1985 Degrees of protection provided by enclosures for rotating electrical machinery (first revision)

IS 6362:1971 Designation of methods of cooling of rotating electrical machines

IS 6680:1972 Specification for railway carriage fans

IS 8354:1977 Code of practice for packaging of electric fans

1. SCOPE

1.1 This Interplant Standard specifies the requirements of ac cabin fans suitable for operation on 240 V single phase ac 50 Hz square or sine wave form, or 250 V dc in conjunction with an inverter for use in operator's cabin in EOT cranes.

2. SITE CONDITIONS

2.1 The following shall constitute normal site conditions for the purpose of this standard:

- a) **Ambient Temperature** - The ambient temperature or the cooling medium temperature not exceeding 50 deg C.
- b) **Relative Humidity** - The relative humidity can be up to the maximum of 100 percent. Maximum ambient temperature and 100 percent relative humidity may not occur simultaneously.
- c) **Ambient air** - This may contain fair amount of conductive dust.
- d) **Altitude** - Not exceeding 1000 m.

3. RATING

3.1 Air Delivery - 30 m³/min.

3.2 Speed - 900 rpm.

4. GENERAL REQUIREMENTS

4.1 The cabin fan shall have a sweep of 400 mm and shall be of tilting type, but non-oscillating. Provision shall be made for locking it in any desired position.

4.2 The fan shall be suitable for operation on 240 V (+ 6/- 10 %) single phase, 50 Hz, ac supply.

4.3 The fan shall conform to IS 555:1979 with regard to general and safety requirements, air delivery, service value, test requirements etc, unless otherwise specified in this standard.

4.4 There shall be minimum of 3 numbers of holes on the base, to accommodate bolts of at least 9 mm diameter for mounting.

4.5 It shall be possible to mount the fan on a vertical plane or in an inverted position and the fan shall be capable of working efficiently in any position of mounting.

4.6 Foundation details as specified by the user.

5. TECHNICAL REQUIREMENTS

5.1 Design and General Construction

5.1.1 Motor - The motor shall be of 100 percent duty cycle and so designed that it may readily be dismantled without disturbing the fan base. The fan shall be of robust construction to ensure satisfactory operation under conditions of vibration, rough usage etc, as encountered in the EOT cranes. The fan motor shall be ac capacitor or shaded pole type. It shall have an enclosure conforming to IP 54 degree of protection according to IS 4691:1985. Motor cooling shall correspond to the cooling designation IC 0141 according to IS 6362:1971. The motor shall be so designed that the performance of fans working in dusty atmosphere is not impaired.

5.1.2 The motor winding shall be of Copper conductor and its insulation shall not be inferior to class 'B'.

5.1.3 The motor shaft shall be mounted on sealed antifriction bearings of size 10 x 30 x 9 packed with lithium base grease.

5.2 Stampings - Stampings of fan motors shall conform to IS 555:1979.

5.3 Blades - The fan shall be fitted with four well balanced blades made from mild steel sheet of thickness not less than 0.9 mm. It shall conform to clause 7.3 of IS 6680:1972 and shall be securely fixed so that they do not get loose in operation and vibration normally encountered in an EOT crane. The blade carrier shall have a provision to lock it on the motor shaft extension. The minimum gap between the blades and the guard shall not be less than 25 mm.

5.4 Guard - The fan shall have a hinged guard conforming to clause 7.7 and 7.7.1 of IS 6680:1972.

5.4.1 A knob shall be provided at the centre of the guard for the purpose of tilting the fan.

5.5 Base - The base shall be even and large enough so that the fan does not topple in any position of the tilt and with the fan running.

5.6 Resilient Pad - For damping the vibration normally encountered on EOT cranes, a resilient pad of at least 12 mm thickness shall be secured firmly to the bottom of the base by a suitable adhesive with holes drilled to accommodate bolts of the required size.

5.7 Noise Level - When measured at a distance of one metre from the plane of the blades along the axis, the noise level of the sound coming from the fan shall not exceed 50 dB at a reference of 20 micro-pascal.

6. MARKING

6.1 Each fan shall be provided with a name plate indelibly marked with the following information:

- a) Manufacturer's name, trade-mark (if any),
- b) Type designation or serial number,
- c) Rated Voltage,
- d) Input in Watts,
- e) Size of fan in mm,
- f) Class of insulation, and
- g) Details of bearing.

6.2 Earthing terminal or contact shall be indelibly marked with the symbol

7. PACKING

7.1 The assembled fan shall be packed in strong wooden case in accordance with IS 8354:1977. Paste board fillers shall be provided to prevent damage during transit.

8. SPARES

8.1 The manufacturer shall supply full information of the recommended spares.

9. TESTS

9.1 Type Tests - The following type tests shall be conducted:

- a) Air delivery tests (clause 18.2 of IS 6680:1972), and
- b) Temperature rise test (clause 15.3 of IS 555:1979 except that the temperature rise test for insulated winding of the motor shall be suitable for class B insulation, the other values remaining the same).

9.2 Routine Tests - The following routine tests shall be conducted

- a) Flash test (clause 15.13 of IS 555:1979),
- b) Insulation resistance test (clause 15.14 of IS 555:1979), and

c) Running test to determine that the fan is in working order.

10. INVERTER

10.1 If the fan is to be fitted on a dc EOT crane operating at 250 V dc, an inverter with the following specification shall be used for operating the fan:

Static inverter : Suitable for 400 mm sweep cabin fan for EOT crane

Input voltage : From 190 V dc to 270 V dc depending on position of EOT crane with respect to feeding point of power rails

Output voltage : 220 V ac to 240 V ac at 60 VA load

Output frequency : 50 Hz normal with variation up to maximum 53 Hz at 270 V dc input supply

Output wave-form : Square wave

Overload capacity : 200 percent continuous

Ambient temperature : 50 deg C average

10.2 Polarity reversal on dc side shall have no effect on the

operation of the inverter. In other words, it shall be possible to connect the dc supply to the inverter terminals without having to ensure correct polarity.

NOTE: It may also be noted that the inverter is to be fitted on EOT cranes subjected to vibrations, dust and heat.