

CENTRAL RAILWAY

TECHNICAL SPECIFICATION FOR BLDC CEILING FAN, INPUT VOLTAGE SINGLE PHASE 230 VOLT AC 50 HZ FOR GENERAL SERVICES APPLICATIONS.

SPECIFICATION NUMBER: PCEE/CR/BLDC CEILING FAN REV. 0

**ISSUED BY
OFFICE OF THE PRINCIPAL CHIEF ELECTRICAL ENGINEER
PARCEL BUILDING , CSMT, MUMBAI**

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TECHNICAL SPECIFICATION FOR BLDC CEILING FAN, INPUT VOLTAGE SINGLE PHASE 230 VOLT AC 50 HZ FOR GENERAL SERVICES APPLICATIONS.

1.0 SCOPE:

This Specification defines the requirement of Design, Manufacture, Supply, Testing & inspection of Ceiling Fan & Electronic fan Regulator for various applications at Platforms, Service buildings & Railway Quarters for General services over Central Railway. This specification supersedes earlier CR specification no. PCEE / CR / 2019 / 1400 MM BLDC FAN dtd 10.01.2019 & Rev 1 dtd 05.02.19.

2.0 Reference Standards:

The following documents given below are for reference to the manufacturer for design, manufacture, performance, safety, environmental & other type test requirements. In the event of conflict between the documents referenced herein and the contents of this specification, the contents of this specification shall prevail.

IS/IEC:

SN	Specification no.	Description
1	IS:374- 2019 Fourth revision with latest amendment	Electric Ceiling Fan
2	IS: 302.2.80-2017	Safety Requirements
3	IS: 12360-1988, Reaffirmed 2020	Rated Voltage
4	IS: 648-2006 IS: 649-1997 IS: 3024-2006	Stampings
5	IS: 1271- 1985	Insulating Materials
6	IS: 1248- 2003	Routine & Acceptance Tests
7	IS: 4905- 1968	Scale of Sampling
8	IS: 11037-2019	Electronic Fan Regulator
9	IS:737 - 2008	Fan Blade
10	IS: 13730 -1993	Copper winding wire
11	IS:13778 - 2011	Test Method of Copper winding wire

3.0 SCOPE FOR SUPPLY OF ITEMS:

- Supply of 1400 mm Sweep Ceiling Fan BEE 05 star with ISI Marked confirming to IS: 374/2019 Fourth revision with latest amendment.
- Supply of 1200 mm Sweep Ceiling Fan BEE 05 star with ISI Marked confirming to IS: 374/2019 Fourth revision with latest amendment.
- Fan regulator: ISI marked electronic fan regulator in four/five steps or stepless upto 100 watt.

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4.0 GENERAL TECHNICAL REQUIREMENTS:-

- 4.1 The fan regulator shall be electronic type and should be able to with stand long periods of overload without getting damaged.
- 4.2 The ceiling fans 1200mm & 1400mm sweep shall be BEE 05 star with ISI Marked.
- 4.3 The tolerance limit in technical parameters if not given shall be as per reference of Indian Standard.
- 4.4 The Public Procurement (Preference to make in India), 'Order-2017' shall be applicable for procurement.
- 5.0 Supply ceiling Fan 'ISI' marked and latest highest BEE star ratings confirming to IS: 374/2019 Fourth revision with latest amendment

5.1 1400 mm Sweep ceiling fan:

SN	Item	Description
1	Type of motor	Brushless DC
2	Sweep size in mm	1400 mm
3	BEE star rating	5 star
4	Minimum air delivery (Cubic m/min)	250
5	Service value (air delivery cu. Meter/min/watt)	Not less than 7.5
6	Power factor	Not less than 0.90
7	Power consumption	Not more than 35 watts.
8	Safety wire set	1.6 mm strand wire, 2 U clamp, 1 L clamp.
9	Rated voltage & frequency	230 V Single phase AC , 50 Hz
7	Working Voltage	140-285 V
8	Standard color	Ivory/ white or based on site requirement
9	Regulator	Fixed speed.
10	No. of blades	03
11	Blade thickness	Minimum 1.1 mm
12	Blade material	Aluminum
13	Winding material	Enameled copper
14	Bearing	Double ball bearing
15	Length of down rod without shackle	300 mm or greater
16	Shank	Thickness : 1.6 mm (Minimum) Material: CRC (cold Rolled Coiled) sheet
17	Shackle	Thickness : 2.0 mm (Minimum) Material: CRC (cold Rolled Coiled) sheet

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18	Total harmonic distortion (THD)	Less than 15%
19	Canopy	02 nos.
20	ISI mark	IS:374 :2019 Fourth revision with latest amendment
21	Noise level	Less than or equal 55 dB at 1 meter below fan.
22	Surge protection capacity	2 KV
23	Warranty	The fan shall be with warranty Of 05 years.


5.2 1200 mm Sweep ceiling fan:

SN	Item	Description
1	Type of motor	Brushless DC
2	Sweep size in mm	1200 mm
3	BEE star rating	5 star
4	Minimum air delivery (Cubic m/min)	230
5	Service value (air delivery cu. Meter/min/watt)	Not less than 7.5
6	Power factor	Not less than 0.90
7	Power consumption	Not more than 35 watts.
8	Safety wire set	1.6 mm strand wire, 2 U clamp, 1 L clamp.
9	Rated voltage & frequency	230 V Single phase AC , 50 Hz
7	Working Voltage	140-285 V
8	Standard color	Ivory/ white or based on site requirement
9	Regulator	With Regulator/Remote (speed level 5 (6 speed is possible with boost mode))
10	No. of blades	03
11	Blade thickness	Minimum 1.1 mm
12	Blade material	Aluminum
13	Winding material	Enameled copper
14	Bearing	Double ball bearing
15	Length of down rod without shackle	300 mm or greater
16	Shank	Thickness : 1.6 mm (Minimum) Material: CRC (cold Rolled Coiled) sheet
17	Shackle	Thickness : 2.0 mm (Minimum) Material: CRC (cold Rolled Coiled) sheet
18	Total harmonic distortion (THD)	Less than 15%
19	Canopy	02 nos
20	ISI mark	IS:374 :2019 Fourth revision with latest amendment.
21	Noise level	Less than or equal 55 dB at 1 meter below fan.

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22	Surge protection capacity	2 KV
23	Warranty	The fan shall be with warranty Of 05 years.

Note: Sr.DEE/G will decide the requirement of "Remote BLDC fans". Preferably BLDC fans with regulator will be procured

5.3 'ISI' marked Electronic Fan Regulator in Four/Five steps or stepless upto 100 watt.

SN	Item	Description
5.3.1	Fan regulator upto 100 watt	ISI marked Electronic Fan Regulator as per IS: 11037-2019.
5.3.2	Types & make of Fan Regulator	Make: Anchor, SSK, Philips, CONA, Havells, Legrand, Crabtree, & Schneider or similar. The Fan Regulator shall be Switch/Socket Type low inductive cell of metalized polyester film coated with flame retardant grade epoxy powder. The regulator shall be suitable for surface/concealed mounting complete with Knob & screws.
5.3.3	Input Voltage	Single Phase 230 volt AC, 50Hz
5.3.4	Material Grade	Poly Carbonate
5.3.5	Life Test Conditions	a) Endurance Test: Loaded at 1.1 times of rated voltage at 70 deg. C for 500 hours b) Switching Test; >20,000 cycles of 4 step/5step switch type fan regulator c) Lot to Lot testing: loaded at 450 volt AC at ambient temperature for 2 hours
5.3.6	Noise level	No appreciable noise/disturbance on radio/television when operated outside a radius of 2 mtr. From the regulator

6.0 Warranty: The fan shall be with warranty of **05** years.

7.0 Identification: Each fan shall be indelibly marked firm name, month & year of manufacture, warranty period, serial number, rated voltage, wattage, size of fan & type of fan on ceiling fan.

8.0 Inspection:

The Inspection by M/s. RITES or TPI at manufacturers works, facility for carrying out acceptance tests as per IS/IEC specification shall be made available by the manufacturer to inspecting authority at manufactures cost.

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9.0 TESTS:

The ceiling fan shall be tested with the applicable IS/IEC reference standards given In Para 2.0 of this specification.

TYPES OF TESTS:**9.1.1 Types Tests:**

Inspecting Agency M/s RITES or third party will verify the documents available with the firm for type tests mentioned in Para 9.1.4 carried out from Govt. Laboratory/National/International Accredited Laboratory to ensure the confirmation with the requirement of specification. However, only BIS-approved laboratories are permitted.

9.1.2 Acceptance tests:

These tests shall be carried out by an Inspecting Agency at the manufacturer works on sample taken from a lot for the purpose of acceptance of material.

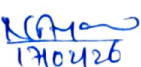
9.1.3 Routine Tests:

These tests shall be performed by the manufacturer on each item and the records shall be shown to the Inspecting Agency during the inspection of lot offered for acceptance tests.

9.1.4 TESTS SCHEME**9.1.4 (a) For Fan**


SN	Description of test	Reference Para of the specification	Type test	Acceptance test	Routine test
1	Safety requirements	Clause 9 (IS: 374:2019)	Y	-	-
2	Performance requirements	Clause 15 (IS: 374:2019)	Y	-	-
3	Speed and power factor	Clause 14.4 & 14.5 (IS: 374:2019)	Y	Y	-
4	Speed regulators	Clause 10 (IS: 374:2019)	Y	Y	-
5	Starting	Clause 11 (IS: 374:2019)	Y	Y	-
6	Interchangeability	Clause 12 (IS: 374:2019)	Y	-	-
7	Silent operation	Clause 13 (IS: 374:2019)	Y	-	-

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8	Power input	10 of IS: 302 (part 2/sec 80) (IS: 374:2019)	Y	Y	-
9	Test for harmonic distortion	Clause 17 (IS: 374:2019)	Y	-	-
10	Endurance test	Clause 16 (IS: 374:2019)	Y	-	-
11	Leakage current at operating temperature	13 of IS 302 (part 2/sec 80)	-	Y	-
12	Earthing connection	27 of IS 302 (part 2/sec 80)	-	Y	-
13	Earth continuity test	A-1 of IS 302-1	-	-	Y
14	Electric strength test	A-2 of IS 302-1	-	-	Y
15	Functional test	A-3 of IS 302-1	-	-	Y
16	Simple running test (checking fan is operating or not)	-	-	-	Y

9.1.4 (b) . For Regulator

SN	Description of test	Reference Para of the specification IS	Type test	Acceptance test	Routine test
1	Temperature-rise	Clause 9.5.1 (IS: 11037-2019)	Y	-	-
2	Leakage current	Clause 9.5.2 (IS: 11037-2019)	Y	Y	-
3	High voltage	Clause 9.5.3 (IS: 11037-2019)	Y	Y	-
4	Insulation resistance	Clause 9.5.4 (IS: 11037-2019)	Y	Y	-
5	Earthing connection	Clause 9.5.5 (IS: 11037-2019)	Y	Y	Y
6	Protection against electric shock	Clause 9.5.6 (IS: 11037-2019)	Y	Y	
7	Voltage drop	Clause 7.7 (IS: 11037-2019)	Y	-	-
8	Performance	Clause 8 (IS: 11037-2019)	Y	Y	-
9	Moisture resistance	Clause 9.5.7 (IS: 11037-2019)	Y	Y	-
10	Mechanical strength	Clause 9.5.8 (IS: 11037-2019)	Y	-	-

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11	Creepage distances and clearances	Clause 9.5.9 (IS: 11037-2019)	Y	-	-
12	Electrical endurance test	Clause 9.5.10 (IS: 11037-2019)	Y	Y	-
13	Environmental tests	Clause 9.5.11 (IS: 11037-2019)	Y	-	-
14	Resistance to abnormal heat and to fire	Clause 9.5.12 (IS: 11037-2019)	Y	-	-
15	Resistance to rusting	Clause 9.5.13 (IS: 11037-2019)	Y	-	-
16	Checking of dimensions	Clause 9.5.14 (IS: 11037-2019)	Y	-	-
17	Flash rate	Clause 9.5.3.4 (IS: 11037-2019)	-	-	Y
18	Insulation resistance	Clause 9.5.4.2 (IS: 11037-2019)	-	-	Y

This is issued with the approval of PCEE/CR.

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