	<b>PRODUCT ENGINEERING / V &amp; SB</b> <b>TECHNICAL DELIVERY CONDITIONS FOR</b> <b>SUBDELIVERY COMPONENTS OF SOOT BLOWERS</b>	TSB : 019	Rev. 12
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<div>MOTORS</div> <div>1.0 Component : Motors</div> <div>1.1 Material Code : #</div> <div>1.1.1 0.45 KW Motors (0.6 HP Motors): 96 272 005 0000 – Std. / 96 272 005 0100 - CL.F / 96 272 005 0200 – 440V / 962720050400 – 380V,Cl ‘F’ 96 272 005 0300 – TEFC, Cl ‘F’- Temp raise limited to Cl. B, S1 Duty, Continuous / 962720050301-KEC 96 272 005 0500 – 400 V Cl. F. / 96 272 005 0501 - 400V,50HZ,Spl START 85% RUN 80% / 96 272 005 0502 - 400V 60HZ / 96 272 005 06 00 – 460 V CL.F.,60HZ. / 96 272 005 0201 - 440V, 60HZ,CGL. / 96 272 005 0202 - 440V, 60HZ / 96 272 005 01 01 - 415V, Cl. F., CGL.</div> <div>1.1.2 0.37 KW Motors (0.5 HP Motors): 96 272 004 0000 – Std. / 96 272 004 0100 – Cl. F. / 96 272 004 0200 – 440 V 96 272 004 0300 – 400 V / 96 272 004 0400 – 380 V</div> <div>1.1.3 0.56 KW Motors (0.75 HP Motors): 96 272 002 0000 – STD / 96 272 002 0100 – Cl. F.</div> <div>1.1.4 0.05 KW Motors (0.066 HP Motors): 96 272 003 0000 – STD. / 96 272 003 0100 Cl. F.</div> <div>1.1.5 0.09 KW Motors (0.125 HP Motors): 96 272 071 0000 – STD / 96 272 071 0100 – BBL / 96 272 071 0200 – KEC / 96 272 072 0300 – CGL / 96 272 071 0400 – 400V / 96 272 071 0500 – 460V, 60Hz. / 96 272 071 0600 – 380V / 96 272 071 0700– 440V, 60HZ, CGL. / 96 272 071 0800 – 400V, 60Hz. 96 272 071 0001– 415V/50HZ/3Ø/TEFC</div> <div>2.0 Application</div> <div>2.0.1 Item 1.1.1 : To impart rotation to long retractable soot blower lance.</div> <div>2.0.2 Item 1.1.2 : To impart traverse motion to long retractable soot blower lance and temp. probe lance tube.</div> <div>2.0.3 Item 1.1.3 : To impart traverse motion to wall deslagger swivel tube.</div> <div>2.0.4 Item 1.1.4 : To impart rotary motion to wall deslagger swivel tube.</div> <div>2.0.5. Item 1.1.5 : To impart rotary motion to rotary blowing element and wall deslagger swivel tube..</div> <div><div>SPECIFICATION FOR LT MOTORS (SOOT BLOWER MOTORS)</div><div>2.1 General :</div><div>2.1.1 This standard specification applies to all LT Motors below 5 KW. The deviation if any to this specification should be specifically brought out for our approval prior to manufacture.</div><div>2.1.2 Standard The construction, performance, materials and other matters of motor, if not specified in this specification shall conform to the requirement in the latest edition of IS-325 specification for 3 phase induction motor. Dimensions should be as per approved IEC frame size. Wherever not specified.</div><div># Other than the specific requirements mentioned against the material codes, are as per the TSB requirements.</div></div>			
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Prepared (J.SANKAR)	Checked (SHIVAM KUMAR GUPTA)	Approved (HIRENDRA RAUT)	



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- 2.1.3 Priority :  
In cases where there are any differences between the IS specification and this motor specification the later has priority.
- 2.2 Design conditions
- 2.2.1 Normally, motors shall be suitable for operation for 415 volts, 50 cycles, 3 phase, 3 wire ungrounded supply system. However, frequency and Voltage changes for some codes mentioned in part number itself shall be followed.
- 2.2.2 All LT motors except servomotors shall be designed to operate continuously at full load. But all motors shall operate without any trouble under each of the following conditions.
- If the terminal voltage varies within 10% above and below the rated value at the rated frequency.
  - If the frequency of the source varies within five per cent above and below.
  - If the voltage and frequency of the source vary simultaneously and the sum of absolute percentage values in variation does not exceed 10%.
- 2.2.3 Motors shall have class F insulation with tropicalisation suitable for polluted dust and corrosive atmosphere with a relative humidity of 100%. The motors are to be designed for an ambient temperature of 65°C.
- 2.2.4 Motors shall be suitable for continuous winding heating with 24 Volts AC when the motors are not operating.
- 2.3 Construction :
- 2.3.1 All motors shall be IP 55 weather proof enclosure TENV motors. All motors shall be provided with weather proof enclosures. This should be proved through testing.
- 2.3.2 All motors are to be provided with two earthing terminals of suitable size, one on either side of the machine for connecting the earth conductors. 3 terminals are to be brought out from the motor.
- 2.3.3 The terminal box cable entry shall be capable of being turned through 360° in steps of 180°. Terminal boxes shall be weather-proof. Spacing between the terminals and volume available inside the terminals box should be adequately designed so that no difficulty during the connecting of 3 core 2.5 sq. mm. PVC insulated Aluminium conductor cable or 3 core 2.5 sq. mm silicone rubber insulated copper/Aluminium conductor cable. The terminal box shall be provided with removal gland plates. The terminal box dimensional drawing should be sent for our approval. Detailed arrangement for the cable box weather-proofing should be indicated.
- 2.3.4 All motors shall be painted with corrosion proof Epoxy paint.

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(J.SANKAR)

Checked  
(SHIVAM KUMAR GUPTA)

Approved  
(HIRENDRA RAUT)



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**2.3.5 Mechanical Construction:**

- i. The frames and all external parts of the motors shall be as per specification attached. Name plates shall be of stainless steel with letters embossed on them.
- ii. The motors shall be painted with one coat of rust preventing paint and two coats of suitable corrosion resisting and abrasion resisting paint. The type of paint shall be as per specification attached.
- iii. Drain plugs or drain webs shall be provided in the motor frames to permit drainage of any condensed water from the enclosure. Drain holes should be provided as per the enclosed drawing and should be plugged.
- iv. All motors shall be provided with pre lubricated ball bearings of suitable size. The bearings must be guaranteed to ensure a smooth operation and a life not shorter than 30,000 hours.
- v. The motors shall be dynamically balanced and shall rotate perfectly with no preferential stop points. The rotor shall be manufactured in such a way as to allow the removal or addition of material for balancing.
- vi. These motors are open to atmosphere. Special emphasis should be guaranteed for weather proofness. To achieve weather proofness the points Under 2.9 should be followed. The temperature rise calculation should be taken into account this point also.

**2.3.6 Starting:**

1. The motor shall be capable of being started direct online across full line voltage or reduced voltage starting.
2. Starting current will be limited 7 times full load current (Unless specified otherwise).
3. Medium voltage motors may be connected to electrical net-work where transient disturbance occur in the supply line. During transient voltage disturbances, voltage on the system may disappear completely and return back in a few cycles with the motors still running. Under the above conditions, the returning voltage may occur at such an instant that the induced emf in the motor is in phase with the applied voltage giving rise to currents surges which may reach a value equal to twice the starting current. The motor shall be suitably designed and the coils and end turns strongly brazed to provide adequate thermal and mechanical strength for with standing conditions stated above.

**2.4 Accessories:**

The following accessories are to be provided for all induction motors.  
Two earth terminals outside of the enclosure on the main motor frame.  
Name plate should be made of stainless steel.

**2.5 Torque characteristics;**

The motors should be capable of producing the torque as listed in the annexure.


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(J.SANKAR)

Checked  
(SHIVAM KUMAR GUPTA)

Approved  
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<div>2.6 Special Notes:<div>1. The weight of the motors offered should not be more than the weight indicated against each blower.</div><div>2. All motors should also be provided with an oil seal in the shaft outlet end.</div></div> <div>2.7 Technical Data:<div>The supplier should furnish the details in the form enclosed.</div></div> <div>2.7 Certificate and Drawings:<div>Detailed constructional drawings and Test Certificates as per relevant IS shall be supplied.</div></div> <div>2.8 The following precautions are to be taken care of for achieving weather proofness.<div><div>1. The terminal box seating should be ground flat and smooth.</div><div>2. A gasket should be introduced between the terminal box cover and box as well between body and the box.</div><div>3. Copper gasket should be used if bolts are used in the Construction.</div><div>4. The windings should have extra dip and backing.</div><div>5. Drain holes should be provided as indicated in the Drg.</div><div>6. The dimensions should be as per the Drg. 4-20-201-00303 for all frame sizes. Motor to be supplied with key and oil seals.</div></div></div> <div>3.0 Testing and Documents:<div><div>3.1 BHEL will witness the type and routine tests as per the test procedures laid out in IS-325 on a prototype motor at supplier’s works. On satisfaction of the prototype BHEL will give clearance for manufacture. All routine tests as per IS-325 are to be carried out in all motors by the supplier. Guide lines for testing to be taken from IS-4029.</div><div>3.2 <b>Test Certificate and Drawings:</b> 6 sets of detailed constructional drawings, test certificates and technical data shall be supplied.</div><div>3.3 <b>Guarantee Certificate:</b> To be given by the supplier for a period of 12/18 months.</div></div></div> <div>4.0 Quantity<div><div>Item 1.1.1 One No. per Long Retract</div><div>Item 1.1.2 One No. per Long Retract and One No. per Temp. probe.</div><div>Item 1.1.3 One No. per Wall Deslagger.</div><div>Item 1.1.4 One No. per Wall Deslagger</div><div>Item 1.1.5 One No. per Rotary Blower.</div></div></div> <div>5.0 Packing : Motors to be packed and despatched in weather proof boxes.</div>			
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**DATA SHEET FOR SOOT BLOWER MOTORS**

Sl. No.	Description					
1	Application	WB IE - Rotary	WBIE - Rot. Motor RB IE Motor	LR & FTP - Traverse	LR - Rotary	WB IE - Traverse
2	Frame size	71	71	80	80	90
3	Flange Type	IS2223TypeC	IS2223TypeC	IS2223TypeC	IS2223TypeC	IS2223TypeC
4	Dimensions	4-20-201-00303	4-20-201-00303	4-20-201-00303	4-20-201-00303	4-20-201-00303
5	Power in KW	0.05	0.09	0.37	0.45	0.56
6	Rated Voltage	415 V	415 V	415 V	415 V	415 V
7	No. of phases & frequency	3 Phase & 50 Hz.	3 Phase & 50 Hz.	3 Phase & 50 Hz.	3 Phase & 50 Hz.	3 Phase & 50 Hz.
8	RPM (Approx.)	As applicable to 4 Pole motor				
9	Duty	S1- Continuous	S1- Continuous	S2-15 Min.	S2-30 Min.	S2-30 Min.
10	Ambient Temp. in °C	65	65	65	65	65
11	Enclosure & Protection	TENV- IP55 protection	TENV/TEFC* - IP55 protection	TENV - IP55 protection		
12	Class of insulation	F (Temp. Raise limited to Cl. B)				
13	Voltage variation %	± 10%				
14	Frequency variation %	± 5%				
15	Combined Voltage & Frequency Variation %	± 10%				
16	Starting Torque in Kgm. (Min.)	0.245	0.29	0.32	1.1	1.14
17	No. of Leads.	6	6	6	6	6
18	Name plate	Stainless steel	Stainless steel	Stainless steel	Stainless steel	Stainless steel
19	Paint	Epoxy Grey	Epoxy Grey	Epoxy Grey	Epoxy Grey	Epoxy Grey
20	Conduit size in the terminal box.	M20 x 1.5	M20 x 1.5	M20 x 1.5	M20 x 1.5	M20 x 1.5
21	Max. stalling time (Approx.)- sec.	Hot 35 / Cold 65	Hot 35 / Cold 65	Hot 40 / Cold 75	Hot 20 / Cold 35	Hot 30 / Cold 55
22	Direction of rotation	Reversible	Reversible	Reversible	Reversible	Reversible
23	Other Constructional features.	Shaft end with oil seal				
24	Weight of Motor kg. (Approx.)	8	8	13.5	13.5	17
25	Gd <sup>2</sup> of Motor kgm <sup>2</sup> (Max)	0.0027	0.0027	0.0073	0.0073	0.0112
26	No. of Poles	4				

TEFC - TOTALLY ENCLOSED FAN COOLED ; TENV- TOTALLY ENCLOSED NON-VENTILATED; \*- MOTOR PART CODE TO BE CHECKED.