

Technical Data of Cement Mill Electromotor

Pos	Item	Spec.	Unit	Remark
1	General			
1.1	Type of machine	Asynchronous motor		
1.2	Quantity	1	piece	
1.3	Kind of machine	Three phase wound rotor induction motor		With slip ring rotor
2	Mechanical Data			
2.1	Design Standards and Specifications	IEC 60034		
2.2	Duty	S1		
2.3	Mounting form	IM 1002 (B3)		
2.4	Shaft height	1000	mm	
2.5	Number of poles	6		
2.6	Direction of rotation	Clockwise		Facing DE
2.7	Ambient temperature min/max	+5/+52	°C	
2.8	Maximum Humidity	100	% RH	
2.9	Site elevation	50	m	above sea level
2.10	Insulation class	F		
2.11	Temperature rise	B		
2.12	Degree of protection	IP 55		Totally enclosed
2.13	Type of ex-protection	None		
2.14	Installation	outdoor		
2.15	Mass of machine, appr.	15300	kg	
2.16	Mass of rotor appr.	4350	kg	
2.17	moment of inertia (J)	334	kg m2	
2.18	Air gap			Shall be specified
2.19	Sound pressure level no-load LP(A)	85	dB (A)	at 1 meter distance
2.20	Sound pressure level no-load tolerance	3	dB(A)	
2.21	Corrosion protection class	C3 acc. to DIN EN ISO 12944		Protection against humid and chemically aggressive industrial atmosphere
2.22	Final painting			RAL
2.23	Coating layer thickness	220	µm	
2.24	Balancing quality	acc. vibration level G2,5 acc. DIN ISO21940-11. Balanced acc. EN 60034-14 with half key		
2.25	Smoothness of running	Grade A acc. to EN 60034 - 14 at rigid mounting		
2.26	Type of slot wedge	Not magnetic		Shall be specified
2.27	Sound pressure level	85dBA at 1 meter distance no load		
3	Electrical Data			
3.1	Rated output	2300	kW	
3.2	Service factor	SF 1.0		

3.3	Connection stator	Star		
3.4	Rotor current (I2)	798	A	
3.5	Rotor voltage (U20)	1760	V	
3.6	Rated voltage (UN)	6300	V AC	
3.7	Rated voltage tolerances	+/-10	%	
3.8	Rated frequency	50	Hz	
3.9	Rated frequency tolerances	+/- 2	%	
3.10	Rated speed	992	rpm	
3.11	Over speed	1200	rpm	
3.12	Over speed for the duration	max. 2 minutes	minute	
3.13	Slip		%	Shall be specified
3.14	Rated torque (FLT)	22142	Nm	
3.15	Full load current (FLC)	249	A	
3.16	No load current		A	Shall be specified
3.17	Efficiency at 4/4 - load	Acc. to IE2 (High efficiency)	%	
3.18	Power factor (cos phi) at 4/4 - load	0.88		
3.19	Method of starting	by means of a rotor starter (liquid rheostat starter)		not included in price and scope of supply
3.20	Starting torque (MA)			Shall be specified
3.21	Run time at rated voltage		seconds	Shall be specified
3.22	Break down torque (MK)	2.1 x FLT @ 100% Vr		
3.23	Starting frequency	1000	times/year	
4	Shaft/Coupling/Slipring			
4.1	Shaft			
4.1.1	Shaft material			Shall be specified
4.1.2	Shaft end (quantity)	2		
4.1.3	Shape of shaft end DE and NDE	Normal cylindrical with key (The coupling half has to rest at least on the total length of the feather key.)		
4.1.4	Requirements for load cycles	Each shaft end for 100% rated torque and 200% rated torque over 5 minutes.		
4.1.5	Nominal shaft torque	17042	Nm	depends on the hydraulic pressure set for the roller
4.1.6	Torsional analysis	Torsional analysis of the complete shaft line is in the responsibility of manufacturer of driven machine		
4.2	Coupling			
4.2.1	Coupling	direct, flexible		not included in price and scope of supply
4.2.2	Feather key	The coupling half has to rest at least on the total length of the feather key.		
4.2.3	Additional load	None		
4.2.4	Coupling weight	Max. 100	kg	
4.3	Slipring/Brushes/Brush holder			

4.3.1	Degree of protection	IP55 with filter		Fully enclosed
4.3.2	Short circuit brush lifting device	No		continuous contact brushes
4.3.3	Carbon brush		(piece/phase)	Shall be specified
	Brush pressure			Shall be specified
4.3.4	Slip ring chamber	With space heater, lamp, DP switch		The slip rings should be enclosed in a separate housing from the motor. Arrangement of slip rings should be provides easy access and maintenance, and keeps carbon dust out of the motor.
5	Load Data			
5.1	Driven load	Cement vertical Roller Mill drive		
5.2	Dreive method	direct coupling		
5.3	Load moment of inertia (J)	296	kg m2	
5.4	Overload during start up	200% of nominal motor torque duration up to 10s		
5.5	Load	Periodic load variation(up to +/- 35%) depend on hydraulic pressure. Frequency < 5 Hz		
5.6	Load toque curve	in accordance to Roll- or Verticall Mill, Code word: IRSAB, Order No. 23071694, Machine: Cement mill, Mill-Type: RMC 51/26, dated 18.05.2005		
5.7	Dynamic foundation load in distance "A"	at rated torque : +/- 13,1 kN, at max. torque : +/- 131 kN		
6	Cooling			
6.1	Method of cooling	IC511		
7	Bearing Data			
7.1	Type of bearing	regreasable antifriction bearing		
7.2	Type of lubrication	SHELL ALVANIA GREASE RL3		With re-greasing pipe and lubrication nipples for manual regreasing. Position greasing nipples: radial on DE and NDE
7.3	Minimum bearing lifetime	40000	oh(operating hour)	on duty
7.4	Insulated DE bearing	none		
7.5	Insulated NDE bearing	yes		
8	Terminal Boxes (Terminal boxes have to be one frame larger than standard)			
8.1	Main terminal box			
8.1.1	Line side terminal box			
8.1.1.1	Degree of protection	IP 55		
8.1.1.2	Location	right	facing DE	
8.1.1.3	Number of connections (bus bar)	3		
8.1.1.4	Location cable entry	top		
8.1.1.5	Gland plate	with nonmagnetic, removable and drilled gland plate		
8.1.1.6	Number of cables	1		not included in price and scope of supply
8.1.1.7	Cable cross section	3x185	mm2	

8.1.1.8	Cable diameter	67	mm	
8.1.1.9	Number of glands	1		
8.1.1.10	Type of glands	M88x1,5		
8.1.2	Star point terminal box			
8.1.2.1	Degree of protection	IP 55		
8.1.2.2	Location	opposite main terminal box	facing DE	
8.1.2.3	Number of connections (bus bar)	3		
8.1.2.4	Contains	3 mounted current transformers and 3 loose supplied current transformers		
8.1.3	Rotor terminal box			
8.1.3.1	Degree of protection	IP55		
8.1.3.2	Location	right	facing DE	
8.1.3.3	Number of connections (bus bar)	3		
8.1.3.4	Location cable entry	top		
8.1.3.5	Gland plate	with nonmagnetic, removable and drilled gland plate		not included in price and scope of supply
8.1.3.6	Number of cables	6		
8.1.3.7	Cable cross section	1x500	mm ²	
8.1.3.8	Cable diameter	45	mm	
8.1.3.9	Number of glands	3		
8.1.3.10	Type of glands	M63x1,5		Pg63
8.2	Auxiliary terminal boxes			
8.2.1	Monitoring terminal box			
8.2.1.1	Location	right	facing DE	IP55
8.2.2	Space heater terminal box			
8.2.2.1	Location	right	facing DE	IP55
8.2.3	CT's Secondary Terminal box			
8.2.3.1	Location	left	facing DE	IP55
9	Control and Monitoring Equipment			
9.1	Stator winding temperature			
9.1.1	Type of monitoring	Resistance temperature measurement		without monitoring equipment
9.1.2	Type of element	Single PT100		
9.1.3	Number of elements	6		
9.1.4	Connection from Terminal box	4-wire		
9.2	Bearing metal temperature			
9.2.1	Type of monitoring	Resistance temperature measurement		without monitoring equipment
9.2.2	Type of element	Single PT100		
9.2.3	Number of elements	1	piece /bearing	
9.2.4	Connection from Terminal box	4-wire		
9.3	Shaft vibration			

9.3.1	Type of sensor	TRV-18		
9.3.2	Number of sensors	2	piece(s)/bearing	
9.3.3	Monitoring device	Machine Guard MG4-1		on DE / coaxial cable connected to the transducer
9.5	Space heater			
9.5.1	Rated voltage	230	V AC	
9.5.2	Number of heaters		piece	for stator and slip ring chamber
10	Labelling			
10.1	Data on the metal name plate	Rated output	KW	
		Rated voltage and tolerances	V/%	
		Rated current	A	
		Rated speed	rpm	
		Ambient temperature min/max	°C	
		Rated frequency and tolerances	Hz/%	
		Stator and rotor connections		
		Rotor voltage and rotor current	A	
		Service factor		
		cosφ		
		Efficiency		
		Direction of rotation		
		Degree of protection		
		Insulation class/Temperature rise		
11	Test (according to the latest standards)	Site elevation	m	
		Mass	Kg	
11.1	Routine test			EN60034
11.2	Type test	Over speed test		EN60034-1
		Vibration level test		EN60034-14
		Shaft voltage		IEEE112
		No load characteristic		EN60034-2-1
		No load test		EN60034-2-1
		Lock rotor test		IEEE112
		Retardation test		EN60034-2-2
		Heat run		EN60034-1 and EN60034-29
		Performance characteristics after heat run		EN60034-2-1
		No load characteristic after heat run		EN60034-2-1
11.3	supplement for witnessed test	1 visit		
12	Documentation			
12.1	Documentation	Outline drawing, operation and maintenance instruction, test reports in English		

12.2	Shaft material inspection certificate			Shall be provided
12.3	Shaft dimensional drawing			Shall be provided
13	Transportation			
13.1	Packing	Seaworthy packing for longer storage up to 6 months		
14	Spare parts			
14.1	Bearing	1 set (DE & NDE) antifriction bearings		