ELECTRIC MOTORS

ENGLISH



SACEMI GAMAR

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CUSTOMIZATION DURING ALL PHASES OF THE PRODUCTION PROCESS

HISTORY

SACEMI, historical leading company in the market of the electric pumps was founded in the sixties, GAMAR was born in 1996 to offer a large production of electric motors. In 2009 they merged into SACEMI-GAMAR srl.

Product quality and customer satisfaction are the key goals of our company mission and, thanks to the remarkable experience, we can propose a wide range of customized solutions in addition to those already present in the catalogue.

VISION & MISSION

In close cooperation with the main manufacturers to fulfill the requirements of the new machine tools and to design electric pumps, electric motors and their component parts, according to the needs and with the same criteria as the machines to which they belong.

PRODUCTION

The production site of Sacemi-Gamar s.r.l., in Noventa di Piave (Ve) extends over an area of 12,000 square meters, 6,000 of which are covered.

The company focuses on technology to improve speed and operational flexibility and on design to satisfy the market demands in real time.

Technology, design and manufacturing of machine tools and everything that rotates around it, such as robotics and other automation systems, are strongly linked to the components, and the electric pump and the electric motor are part of them.

The company is in contact with various realities that constantly require new technologies and therefore offers itself as a complement for the manufacturers of machines for mechanics, glass, air-conditioning, building, and liquids treatment, creating an integration among components, equipment and machines.

PROJECT DEPT.



PRODUCTION



TESTING DEPT.



LOGISTIC



New international efficiency classes - Codes IE

The International Standard **IEC 60034-30-1; 2014** sets new efficiency classes (IE code) for the electric motors, providing a common basis for the design and the international classification of the same.
The method of measuring the efficiency of the engines has been revised with the **IEC 60034-2-1; 2014,** which provides test conditions and methods of measurement much more precise and accurate than previous 2007.
The efficiency classes under the new standard relates only to the three-phase motors, 50 o 60 Hz, at a single-speed, power range from 0,12 kW to 1000 kW, 2, 4, 6 or 8 pole, for continuous duty S1 or intermittent periodic S3 ≥ 80% are identified as:

IE1 = Standard Efficiency
IE2 = High Efficiency
IE3 = Premium Efficiency
IE4 = Super Premium Efficiency

The IEC 60034-30-1 Norma though only defines the requirements for efficiency classes, creating shared measures at international level; It does not establish what are the engines to be supplied and their minimum levels of efficiency MEPS (Minimum Energy Performance Standards) that depend on individual local laws in real countries as shown by the table overleaf.

Note: For simplicity reasons we have limited the lists here below to the power of 22 kW as this is our produc-tion limit.

Efficiency values for 50 Hz according to IEC 60034-30-1; 2014

Rated output kW	Standard Efficiency IE1				High Efficiency IE2				Premium Efficiency IE3				Premium Efficiency IE4			
	2 pole	4 pole	6 pole	8 pole	2 pole	4 pole	6 pole	8 pole	2 pole	4 pole	6 pole	8 pole	2 pole	4 pole	6 pole	8 pole
0.12	45.0	50.0	38.3	31.0	53.6	59.1	50.6	39.8	60.8	64.8	57.7	50.7	66.5	69.8	64.9	62.3
0.18	52.8	57.0	45.5	38.0	60.4	64.7	56.6	45.9	65.9	69.9	63.9	58.7	70.8	74.7	70.1	67.2
0.20	54.6	58.5	47.6	39.7	61.9	65.9	58.2	47.4	67.2	71.1	65.4	60.6	71.9	75.8	71.4	68.4
0.25	58.2	61.5	52.1	43.4	64.8	68.5	61.6	50.6	69.7	73.5	68.6	64.1	74.3	77.9	74.1	70.8
0.37	63.9	66.0	59.7	49.7	69.5	72.7	67.6	56.1	73.8	77.3	73.5	69.3	78.1	81.1	78.0	74.3
0.40	64.9	66.8	61.1	50.9	70.4	73.5	68.8	57.2	74.6	78.0	74.4	70.1	78.9	81.7	78.7	74.9
0.55	69.0	70.0	65.8	56.1	74.1	77.1	73.1	61.7	77.8	80.8	77.2	73.0	81.5	83.9	80.9	77.0
0.75	72.1	72.1	70.0	61.2	77.4	79.6	75.9	66.2	80.7	82.5	78.9	75.0	83.5	85.7	82.7	78.4
1.1	75.0	75.0	72.9	66.5	79.6	81.4	78.1	70.8	82.7	84.1	81.0	77.7	85.2	87.2	84.5	80.8
1.5	77.2	77.2	75.2	70.2	81.3	82.8	79.8	74.1	84.2	85.3	82.5	79.7	86.5	88.2	85.9	82.6
2.2	79.7	79.7	77.7	74.2	83.2	84.3	81.8	77.6	85.9	86.7	84.3	81.9	88.0	89.5	87.4	84.5
3	81.5	81.5	79.7	77.0	84.6	85.5	83.3	80.0	87.1	87.7	85.6	83.5	89.1	90.4	88.6	85.9
4	83.1	83.1	81.4	79.2	85.8	86.6	84.6	81.9	88.1	88.6	86.8	84.8	90.0	91.1	89.5	87.1
5.5	84.7	84.7	83.1	81.4	87.0	87.7	86.0	83.8	89.2	89.6	88.0	86.2	90.9	91.9	90.5	88.3
7.5	86.0	86.0	84.7	83.1	88.1	88.7	87.2	85.3	90.1	90.4	89.1	87.3	91.7	92.6	91.3	89.3
11	87.6	87.6	86.4	85.0	89.4	89.8	88.7	86.9	91.2	91.4	90.3	88.6	92.6	93.3	92.3	90.4
15	88.7	88.7	87.7	86.2	90.3	90.6	89.7	88.0	91.9	92.1	91.2	89.6	93.3	93.9	92.9	91.2
18.5	89.3	89.3	88.6	86.9	90.9	91.2	90.4	88.6	92.4	92.6	91.7	90.1	93.7	94.2	93.4	91.7
22	89.9	89.9	89.2	87.4	91.3	91.6	90.9	89.1	92.7	93.0	92.2	90.6	94.0	94.5	93.7	92.1

Efficiency values for 50 Hz according to IEC 60034-30-1; 2014

Rated output kW	Standard Efficiency IE1				High Efficiency IE2				Premium Efficiency IE3				Premium Efficiency IE4			
	2 pole	4 pole	6 pole	8 pole	2 pole	4 pole	6 pole	8 pole	2 pole	4 pole	6 pole	8 pole	2 pole	4 pole	6 pole	8 pole
0.12	57.5	62.0	48.0	36.0	59.5	64.0	50.5	40.0	62.0	66.0	64.0	59.5	66.0	70.0	68.0	64.0
0.18	62.0	66.0	52.5	40.0	64.0	68.0	55.0	46.0	65.6	69.5	67.5	64.0	70.0	74.0	72.0	68.0
0.25	64.0	68.0	57.5	50.5	68.0	70.0	59.5	52.0	69.5	73.4	71.4	68.0	74.0	77.0	75.5	72.0
0.37	70.0	70.0	62.0	57.5	72.0	72.0	64.0	58.0	73.4	78.2	75.3	72.0	77.0	81.5	78.5	75.5
0.55	72.0	74.0	66.0	59.5	74.0	75.5	68.0	62.0	76.8	81.1	81.7	74.0	80.0	84.0	82.5	77.0
0.75	74.0	77.0	72.0	64.0	75.5	78.0	73.0	66.0	77.0	83.5	82.5	75.5	82.5	85.5	84.0	78.5
1.1	78.5	79.0	75.0	73.5	82.5	84.0	85.5	75.5	84.0	86.5	87.5	78.5	85.5	87.5	88.5	81.5
1.5	81.0	81.5	77.0	77.0	84.0	84.0	86.5	82.5	85.5	86.5	88.5	84.0	86.5	88.5	89.5	85.5
2.2	81.5	83.0	78.5	78.0	85.5	87.5	87.5	84.0	86.5	89.5	89.5	85.5	88.5	91.0	90.2	87.5
3.7	84.5	85.0	83.5	80.0	87.5	87.5	87.5	85.5	88.5	89.5	89.5	86.5	89.5	91.0	90.2	88.5
5.5	86.0	87.0	85.0	84.0	88.5	89.5	89.5	85.5	89.5	91.7	91.0	86.5	90.2	92.4	91.7	88.5
7.5	87.5	87.5	86.0	85.0	89.5	89.5	89.5	88.5	90.2	91.7	91.0	89.5	91.7	92.4	92.4	91.0
11	87.5	88.5	89.0	87.5	90.2	91.0	90.2	88.5	91.0	92.4	91.7	89.5	92.4	93.6	93.0	91.0
15	88.5	89.5	89.5	88.5	90.2	91.0	90.2	89.5	91.0	93.0	91.7	90.2	92.4	94.1	93.0	91.7
18.5	89.5	90.5	90.2	88.5	91.0	92.4	91.7	89.5	91.7	93.6	93.0	90.2	93.0	94.5	94.1	91.7
22	89.5	91.0	91.0	90.2	91.0	92.4	91.7	91.0	91.7	93.6	93.0	91.7	93.0	94.5	94.1	93.0

Mechanical tolerances

On the table below mechanical tolerances of the coupling components have been reported according to the regulation IEC 60072-1.

Detail	Designation	Dimension in mm	Tolerance
Shaft end***	D – DA	from 11 to 28 from 38 to 48	j6 k6
Key width	F	-	h9
Flange centring	N	up to 230 over 230	j6 h6
Shaft height	H	up to 250	- 0.5

***Note:** the shaft end of all motors is equipped with a threaded hole for the fitting of pulleys and couplings, according to DIN 332 part 2.

Electrical tolerances

The following table specifies the tolerances of the quantity requested, according to IEC 60034-1

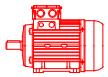
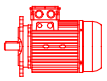
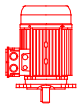
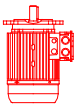
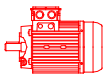
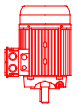
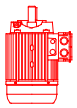
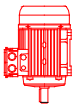
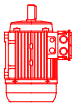
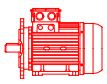
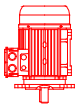
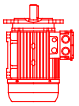
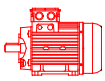
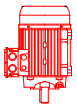
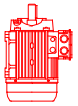
Quantity	Tolerance
Power factor (cos φ)	- 1/6 of (1 - cos φ), minimum 0.02, maximum 0.07
Efficiency (η)	- 15% (1 - η)
Slip (s)	for Pn < 1kW, ± 30% for Pn ≥1kW, ± 20%
Locked rotor current (Is)	+ 20% of the guaranteed value
Locked rotor torque (Ms)	- 15%, + 25% of the guaranteed value
Maximum torque (Mm)	- 10% of the guaranteed value (for Mm ≥ 1.5÷1.6 Mn)
Sag down torque (Mi)	- 15% of the guaranteed value
Moment of inertia (J)	± 10% of the guaranteed value
Sound level	+ 3 dB (A)
Vibration	+ 10% of the guaranteed class

General features

The motors of this catalogue have a high shaft range from 56 mm up to 160 mm.
The terminal box is usually located on the upper side of the motor; it may be requested to be supplied on the right or the left side. On motor with shaft of 56-63-71 mm the terminal box can be rotated of 180°, on all others with a release of 90°.
Concerning standard motors, **the cables glands** are not normally supplied.
The frame, made of aluminium casing for all sizes, on sizes 112-132-160 has a fitting eye and is designed for the mass inside the terminal box on the ground with connectivity outside.
The end shields and the flanges are aluminium casing made or, on specific request, cast iron made.
The shaft is usually made of steel C40E (UNI EN 10083-1 e EN 10277-5); on request it can be built with special types of steel.
The squirrel cage of the rotor is made of aluminium pressure die-cast casing.
The rotor is dynamically balanced with a **half feather key** in order to be conformed to grade N (standard) of the regulation DIN-ISO 8821.
More accurate balancing processes, grade R (reduced) or S (special) may be obtained on specific request.
The noise level, dB(A) scale expressed, is taken through a measurement of acoustic pressure level according to A curve of the sound level meter, conformed to the regulation EN 60651.

The acoustic pressure level values L_{pA} and the sound waves pressure value L_{WA} are much below the maximum values indicated by the regulation EN 60034-9.
The stator winding is made with copper wire class H grade 2 insulated and insulation materials used belong to class F according to the regulation IEC 60034-1; it is protected by a deep impregnation obtained through immersion and fallowing oven-drying. Stator windings insulated in upper classes (H) may be made on specific request.
Temperature rise, even if the motor is class F (105 K) insulated, is normally kept within class B (80 K) limit, on condition that motor alimentation is conformed to regulation IEC 60038.
Cooling, for standard motors, is IC 411 obtained with a radial flow fan allowing fully reversible rotation.
The nameplate, stainless steel made, is located on the frame.
Personalized nameplate may be supplied on request.
Screw and sheet-steel fan cover are always treated for corrosion prevention.
Standard painting is RAL 7011. Special painting may be supplied on request.

Mounting arrangements

FOOT-MOUNTED MOTORS			FLANGE-MOUNTED MOTORS LARGE FLANGE CLEARANCE FIXIN HOLES			FLANGE-MOUNTED MOTORS SMALL FLANGE TAPPED FIXING HOLES		
IM B3 IM 1001	IM B6 IM 1051	IM B7 IM 1061	IM B5 IM 3001	IM V1 IM 3011	IM V3 IM 3031	IM B14 IM 3601	IM V18 IM 3611	IM V19 IM 3631
								
IM B8 IM 1071	IM V5 IM 1011	IM V6 IM 1031	IM B35 IM 2001	IM V15 IM 2011	IM V36 IM 2031	IM B34 IM 2101	IM 2111	IM 2131
								

Standard operating conditions

Motor are designed to operate at a voltage of 230/400 V ± 10% and a frequency of 50 Hz, at an altitude not exceeding 1000 m above sea level (4000 for motors in IE2 e IE3) and a maximum ambient temperature of 40°C (60°C for motors in IE2 and IE3) with a relative humidity below 90%.
This design allows you to use 220/380 V ± 5% and 240/415 V ± 5% at 50 Hz frequency extension to 60 Hz and performances that vary according to the parameters of the table below.
If the operating conditions are more severe (e.g.: altitude and/or ambient temperature higher than those described above), there is a reduction of power output and it is recommended to call our Technical Department.
Note: The above said means regardless of the values of efficiency IE1 or IE2 or IE3 listed in the catalog tables or in the motor plates.

Transformation multiplier for 60 Hz operations

Wound motor at Hz 50	**Connected at 60 Hz**	**Catalogue characteristics' variation coefficients**						
V ±10%	**V**	Rated speed	Rated output	Full load torque	Rated load current	Locked rotor torque	Maximum torque	Locked rotor current
230	220 ± 5%	1.2	1.0	0.83	1.0	0.83	0.83	0.83
230	230 ±10%	1.2	1.0	0.83	1.0	0.83	0.83	0.83
230	240 ±10%	1.2	1.05	0.87	1.0	0.87	0.87	0.87
230	254 ±10%	1.2	1.1	0.92	1.0	0.92	0.92	0.92
230	265 ±10%	1.2	1.15	0.96	1.0	0.96	0.96	0.96
230	277 ± 5%	1.2	1.2	1.0	1.0	1.0	1.0	1.0
400	380 ± 5%	1.2	1.0	0.83	1.0	0.83	0.83	0.83
400	400 ±10%	1.2	1.0	0.83	1.0	0.83	0.83	0.83
400	415 ±10%	1.2	1.05	0.87	1.0	0.87	0.87	0.87
400	440 ±10%	1.2	1.1	0.92	1.0	0.92	0.92	0.92
400	460 ±10%	1.2	1.15	0.96	1.0	0.96	0.96	0.96
400	480 ± 5%	1.2	1.2	1.0	1.0	1.0	1.0	1.0

Bearings

Bearings are 2Z-C3 bal-kind (they hare lubricated for life with deep grove).
The spring ring is located on the non drive end of the standard motors; on the self-braking motors the ring is fitted at drive end and the non drive end bearing is fitted in its place by a retaining ring.
More over, the bearing is protected by a sealing ring from water and dust penetration.
For specific uses, bigger or special bearing can be requested.
The cart below illustrates types of bearing assembled for each size of standard motor.

Motor size	**56**	**63**	**71**	**80**	**90**	**100**	**112**	**132**	**160**
Bearing Type	6201 2Z C3	6202 2Z C3	6203 2Z C3	6204 2Z C3	6205 2Z C3	6206 2Z C3	6206 2Z C3	6208 2Z C3	6309 2Z C3
Dimensions dxDxB	12x32x10	15x35x11	17x40x12	20x47x14	25x52x15	30x62x16	30x62x16	40x80x18	45x100x25

Radial and axial thrusts for ball bearings

In the table below the value of maximum radial load were calculated equal to a life of bearing 20000 hours for motor 2 pole 40000 hours and for those with a 4,6,8 pole frequency 50 Hz.
For the use of motors at 60 Hz these value are reduced by about 6%.
For multi-speed motors to consider the values corresponding to the higher speed.

Note: if the radial load applied to the shaft is less than the maximum table more you can apply axial loads (values on request).

Motor		Maximum radial load			Maximum additional axial load with maximum radial load applied in position 2 *					
		Horizontal and vertical mounting			Horizontal shaft		Shaft down		Shaft upwards	
Motor size	Polarity	* Position 0 N	* Position 1 N	* Position 2 N	Push N	Pull N	Push N	Pull N	Push N	Pull N
56	2	391	362	337	189	138	195	132	183	144
	4	390	362	337	189	138	192	131	182	145
	6	451	418	389	209	158	216	151	202	165
	8	505	468	436	221	170	228	163	214	177
63	2	444	410	383	233	156	243	146	223	166
	4	443	409	382	233	156	245	144	221	168
	6	512	473	441	255	178	267	166	243	190
	8	575	530	495	269	192	281	180	257	204
71	2	549	502	462	315	195	330	180	300	210
	4	545	498	459	316	196	338	174	294	218
	6	631	576	531	343	223	365	201	321	245
	8	708	647	596	361	241	383	219	339	263
80	2	725	652	591	442	262	460	244	424	280
	4	716	643	582	445	265	481	229	409	301
	6	829	744	675	481	301	517	265	445	337
	8	931	836	758	505	325	541	289	469	361
90S	2	810	715	641	496	286	516	266	476	306
	4	800	706	631	500	290	539	251	461	329
	6	923	814	727	541	331	588	284	494	378
	8	1036	914	817	567	357	614	310	520	404
90L	2	817	731	661	497	287	524	260	470	314
	4	804	719	649	502	292	554	240	450	344
	6	929	830	750	542	332	600	274	484	390
	8	1044	933	843	568	358	626	300	510	416
100L	2	1125	999	898	689	399	721	367	657	431
	4	1104	977	876	697	407	772	332	622	482
	6	1275	1130	1013	753	463	836	380	670	546
	8	1428	1265	1134	792	502	886	408	698	596
112M	2	1133	1012	914	690	400	730	360	650	440
	4	1103	982	884	701	411	801	311	601	511
	6	1276	1136	1022	758	468	868	358	648	578
	8	1430	1273	1146	796	506	916	386	676	626
132S	2	1695	1486	1323	1070	600	1140	530	1000	670
	4	1655	1446	1283	1085	615	1235	465	935	765
	6	1921	1680	1491	1167	697	1317	547	1017	847
	8	2145	1876	1664	1227	757	1407	577	1047	937
132M	2	1703	1514	1362	1073	603	1163	513	983	693
	4	1648	1459	1307	1093	623	1293	423	893	823
	6	1922	1704	1529	1172	702	1362	512	982	892
	8	2149	1905	1708	1233	763	1453	543	1013	983
160M	2	3084	2696	2392	1789	1099	1949	939	1629	1259
	4	3024	2636	2332	1811	1121	2091	841	1531	1401
	6	3481	3033	2683	1971	1281	2311	941	1631	1621
	8	3919	3417	3025	2070	1380	2410	1040	1730	1720
160L	2	3093	2736	2451	1795	1105	1995	905	1595	1301
	4	3018	2661	2376	1822	1132	2172	782	1472	1482
	6	3470	3057	2728	1985	1295	2415	865	1555	1725
	8	3911	3450	3081	2084	1394	2514	964	1654	1824

* **Position 0** = In line with the flange surface (bar shaft-end) **Position 1** = Center shaft **Position 2** = Shaft end

Noise levels

The tables below show the sound power levels (Lw) of the motors of construction IM B3, for no-load and fed to the frequency of 50 Hz.
These values are determined according to EN 60651 and shown in dB (A).
According to EN 60034-9 are those set table with a maximum tolerance of +3 dB (A).
Note: These levels are also indicated in the acoustic pressure (Lp).

Motor	2 pole - 3000 min^{-1}			4 pole - 1500 min^{-1}		
	EN 60034-9	GAMAR ≤	GAMAR ≤	EN 60034-9	GAMAR ≤	GAMAR ≤
Size	LwA		LpA	LwA		LpA
56	**-**	57	48	**-**	52	43
63	**-**	60	51	**-**	52	43
71	**-**	65	56	**-**	53	44
80	**81**	70	61	**-**	58	49
90S	**81**	73	64	**71**	59	50
90L	**86**	74	65	**71**	60	51
100L	**86**	76	67	**76**	62	52
112M	**86**	77	68	**76**	65	56
132S	**91**	81	71	**81**	71	61
132M	**91**	81	71	**81**	71	61
160M	**91**	82	72	**88**	73	63
160L	**94**	82	72	**88**	73	63

Motor	6 pole - 1000 min^{-1}			8 pole - 750 min^{-1}		
	EN 60034-9	GAMAR ≤	GAMAR ≤	EN 60034-9	GAMAR ≤	GAMAR ≤
Size	LwA		LpA	LwA		LpA
56	**-**	-	-	**-**	-	-
63	**-**	52	43	**-**	-	-
71	**-**	53	44	**-**	48	39
80	**-**	53	44	**-**	50	41
90S	**-**	55	46	**-**	53	44
90L	**71**	56	47	**-**	53	44
100L	**71**	61	52	**71**	55	46
112M	**76**	64	55	**71**	60	51
132S	**76**	69	59	**71**	64	54
132M	**80**	69	59	**76**	64	54
160M	**80**	71	61	**76**	72	62
160L	**84**	71	61	**80**	72	62

Note: To add about 60 Hz →	6 dB - (2 pole)	4 dB - (4 pole)	3 dB - (6 pole)	2 dB - (8 pole)
Note: At load, for higher powers >1kW add about →	2 dB - (2 pole)	5 dB - (4 pole)	7 dB - (6 pole)	8 dB - (8 pole)

Vibrations

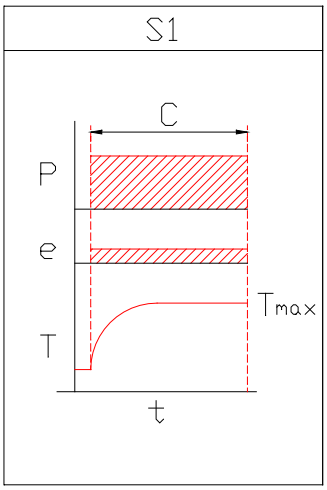
Vibrations levels permitted by EN 60034-14

Capable of balancing	Speed min^{-1}	Maximum value of vibration velocity mm/s	
		Motor size 56÷132	**Motor size 160**
N (normal)	from 600 to 3600	1.8	2.8
R (reduced)	from 600 to 1800 from 1800 to 3600	0.71 1.12	1.12 1.8
S (special)	from 600 to 1800 from 1800 to 3600	0.45 0.71	0.71 1.12

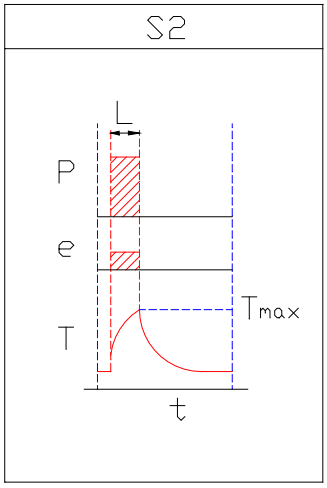
Duty types

Symbols:

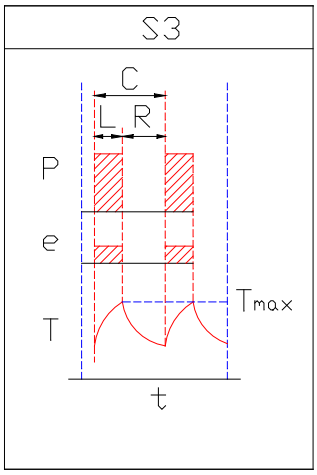
P = Power **e** = Losses **T** = Temperature **Tmax** = Maximum temperature **t** = Time
n = Speed **C** = Cycle of load **A** = Starting **L** = Operation under load **R** = Resting
V = Operation on no load **F** = Electric braking **X** = Cyclic %



Duty-type S1: continuous operation.
Operation at constant load of sufficient duration to reach thermal equilibrium.

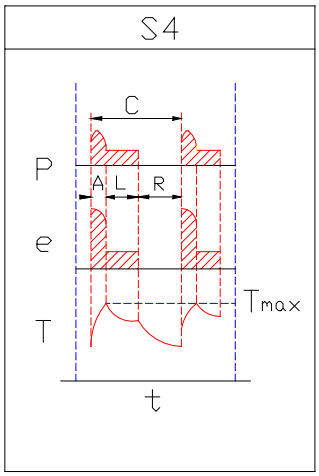


Duty-type S2: short-time duty.
Operation at constant load for a time not sufficient to reach thermal equilibrium, fallowed by a rest period sufficient to restore equality between the motor and the thermal cooling fluid.



Duty-type S3: intermittent periodic duty.
A sequence of identical duty cycles, each cycle consisting of a constant load (without reaching thermal equilibrium) and a rest period. The start-up phase does not influence the temperature significantly.

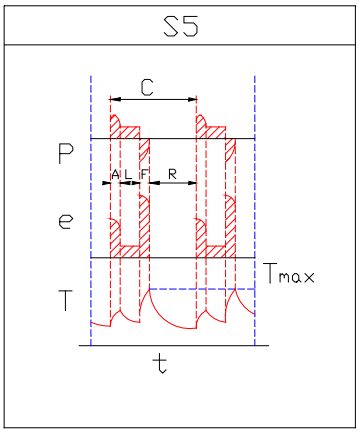
$$X = \frac{L}{L+R} \cdot 100$$



Duty-type S4: intermittent periodic duty with starting.
A sequence of identical duty cycles, each with a significant start-up, operation at constant load (without reaching thermal equilibrium) and a rest period.

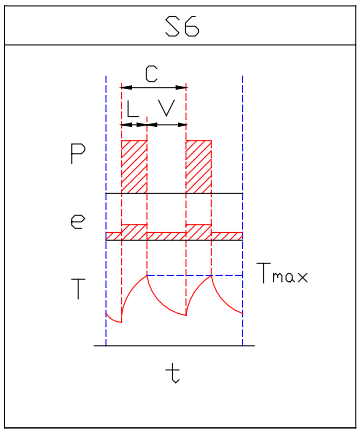
$$X = \frac{A+L}{A+L+R} \cdot 100$$

Duty types



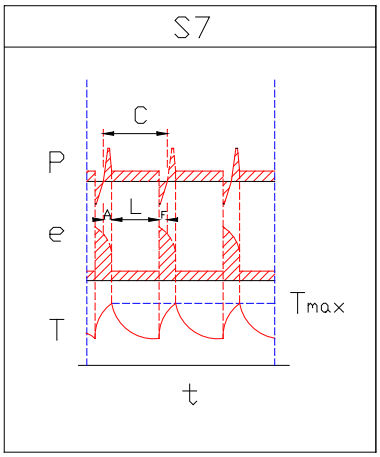
Duty-type S5: intermittent periodic duty with electric braking.
A sequence of identical duty cycles, each with a stat-up, operation at constant load (without reaching thermal equilibrium), a rapid electric braking and a rest period.

$$X = \frac{A + L + F}{A + L + F + R} \cdot 100$$



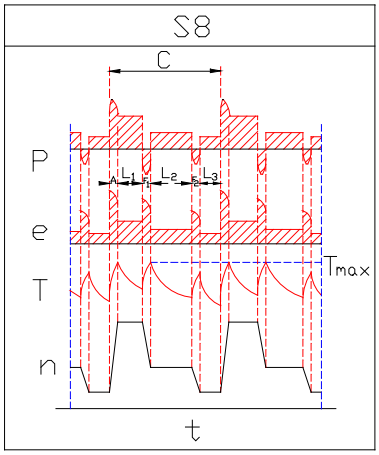
Duty-type S6: continuous operation with intermittent load.
A sequence of identical duty cycles, each including a period of load operation (without reaching thermal equilibrium) and a period of no load, without rest period.

$$X = \frac{L}{L + V} \cdot 100$$



Duty-type S7: continuous operation duty with starting and braking.
A sequence of identical duty cycles, each with a start-up, a period of constant load (without reaching thermal equilibrium) and an electric braking.

$$X = 100$$



Duty-type S8: continuous operation duty with related load/speed changes.
A sequence of identical duty cycles, each including a period of operation at constant load at a predetermined speed, fallowed by one or more periods of operation at other constant load at different speed.

$$X = \frac{A + L_1}{A + L_1 + F_1 + L_2 + F_2 + L_3} \cdot 100$$

Engineering formulae for motor drives

Power (three-phase motor)

Power input

$$P_1 = \sqrt{3} \cdot U \cdot I \cdot \cos\varphi \cdot 10^{-3} \text{ [kW]}$$

Potenza resa

$$P = P_1 \cdot \eta \text{ [kW]}$$

where: U = rated voltage (V)
I = rated load current (A)
cosφ = power factor
η = efficiency

Power requirements of some applications

Lifting.

$$P = \frac{m \cdot v}{\eta} \cdot 9{,}81 \cdot 10^{-3} \text{ [kW]}$$

Rotation:

$$P = \frac{M \cdot n}{9550 \cdot \eta} \text{ [kW]}$$

Fan and pump drives:

$$P = \frac{H \cdot Q}{\eta} \cdot 10^{-3} \text{ [kW]}$$

where: P = power (kW)
m = mass (kg)
v = speed (m/s)
n = rotational speed (min^{-1})
η = efficiency
M = torque (Nm)
Q = output (m^3/s)
H = head (N/m^2)

Torque for motor power

$$M = 9550 \cdot \frac{P}{n} \text{ [Nm]}$$

where: P = power (kW)
n = speed (min^{-1})

Conversion of torque for step-up and step-down speed ratio:

$$M_1 = \frac{M \cdot n}{n_1} \text{ [Nm]}$$

where: n = motor speed (min^{-1})
M = motor torque (Nm)
n_1 = speed of load (min^{-1})
M_1 = torque of load at n_1 (Nm)

Moment of inertia

Moment of inertia a cylindrical flywheel:

$$J = \frac{m \cdot d^2}{8} \text{ [kg.m}^2\text{]}$$

where: m = mass (kg)
d = flywheel diameter (m)

Effective moment of inertia on the motor of a linearly moved load:

$$J = 91{,}2 \cdot m \cdot \left(\frac{v}{n}\right)^2 \text{ [kg.m}^2\text{]}$$

where: m = mass (kg)
v = velocity (m/s)
n = motor speed (min^{-1})

Conversion of moment of inertia for step-up or step-down speed ratio:

$$J_1 = J \cdot \left(\frac{n}{n_1}\right)^2 \text{ [kg.m}^2\text{]}$$

where: n = motor speed (min^{-1})
J = moment of inertia of motor ($kg.m^2$)
n_1 = speed of load (min^{-1})
J_1 = moment of inertia of load ($kg.m^2$)

Factor of inertia

$$F_j = \frac{J + J_1}{J}$$

where: J = moment of inertia of motor
J_1 = moment of inertia of load

Starting time

$$t_a = \frac{F_j \cdot J \cdot n}{9{,}55 \cdot (M - M_1)} \text{ [s]}$$

dove: F_j = fattore di inerzia
J = momento d'inerzia del motore ($kg.m^2$)
n = velocità del motore (min^{-1})
M = coppia motrice media all'avviamento (Nm)
M_1 = coppia resistente media all'avviamento (Nm)

Speed

The no load speed is virtually the same as the synchronous speed is calculated as fallow:

$$n_s = 120 \cdot \frac{f}{p} \text{ [min}^{-1}\text{]}$$

where: f = frequency (Hz) p = number of poles

The synchronous speed (n) is reduced by the slip (S) to the rated speed (n) according to the formulae:

$$n = n_s \cdot (1 - S) \text{ [min}^{-1}\text{]}$$

Driver motors by inverter

The optimization of production processes and energy saving invite us increasingly to use variable speed induction motors driven by inverters.
In general the drive using inverter, which converts the constants of the electrical network (V, Hz) in the variable values, involves not purely sinusoidal supply of engines and introduces harmonic components of voltage and current and requires a power margin of about on 15%.
It' must also take into account the following factors:
- Increase in losses as a function of frequency
- Mechanical resistance and balancing of the rotor
- Bearing life (lubrication, durability, heat)
- Ventilation, noise, vibration
- Performance of the motor (starting current, starting torque and speed)

The extent of decrease of motor efficiency varies depending on the type of inverter used.

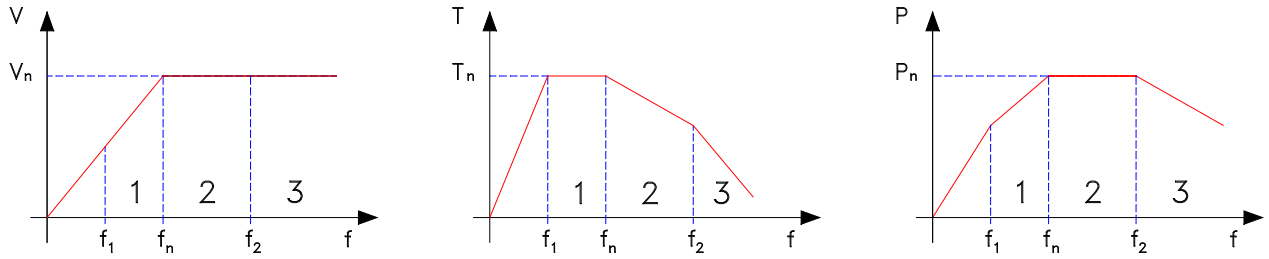
The standard manufacturing motors can be powered by inverter variable speed and used subject to the general requirements set out in IEC 60034-1.
In compliance with this regulation does not produce stresses which cause the electrical insulation of the motor causing it.
In the case of particularly demanding applications, with the motor connected to a considerable distance from the inverter and/or multiple motors connected in parallel to it, it is recommended to control the waveform of the voltage across the motor and possibly use filters to attenuate the harmonic content.
If this is not possible to make a request through our. Technical Office of the extra insulation windings act to support high voltage spikes in accordance with IEC 60034-17.
Applications to speed very low or very high may require the use of servo-ventilation, in order to improve in the first case the insufficient cooling and in the second case the noise of ventilation of the motor.

In driving the motors with inverters there are three areas of operation:

1) Area in voltage/frequency ratio constant.
For motors 230/400 V - 50 Hz is usually identified by the ratio 400 V/50 Hz, star connected motor and powered by three-phase inverter, or with a delta connected motor and powered by inverters.
This area identifies the operation of the constant-torque motor with the lower limit frequency (**f**1) of approximately 25 Hz for standard motors and 18÷20 Hz for the servo-ventilated motors.
Lower frequency applications are possible but the rated torque of the motor is no longer guaranteed.
If the current required by the motor is that it does not overstress the drive, you can set the voltage/frequency ratio equal to 400/87, in these conditions, with a delta connected motor, the magnetic flux remains almost unchanged up to 87 Hz, so you can extend the zone up to the constant torque value of frequency without causing saturation phenomena and abnormally without stressing the insulation of the motor.

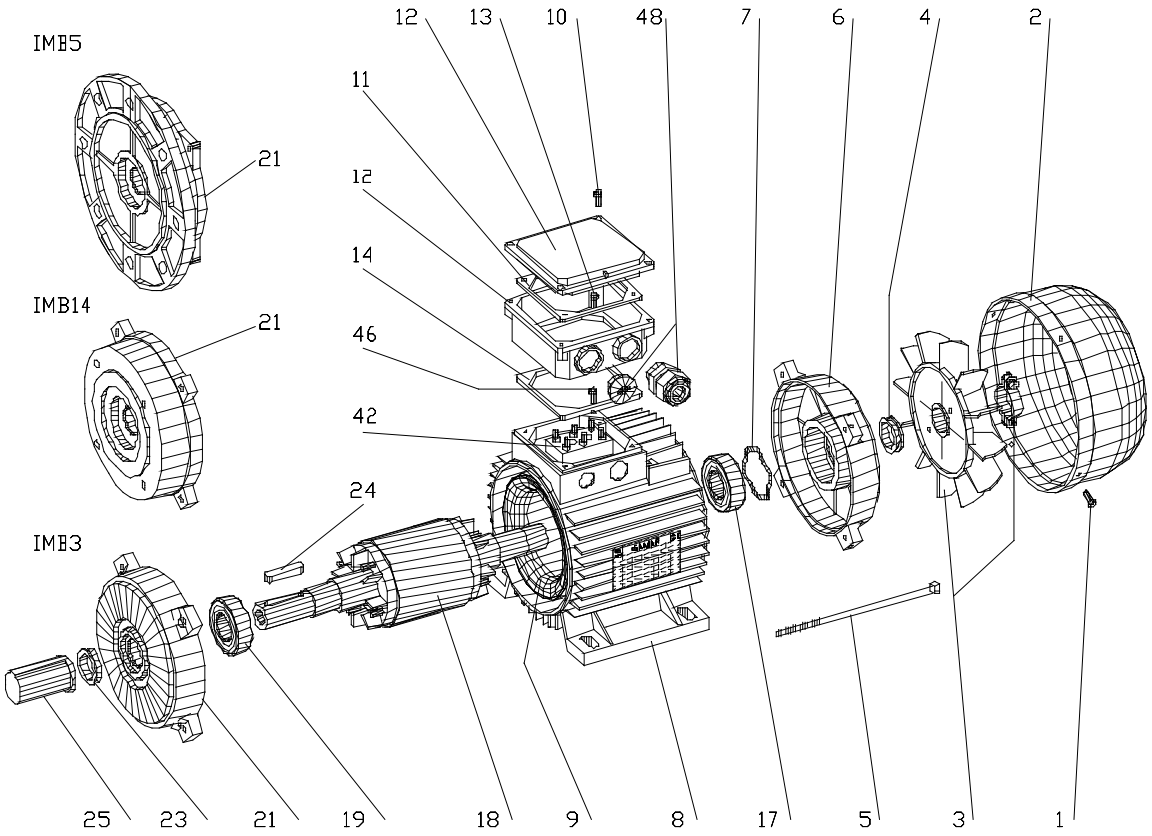
2) Zone at constant voltage (nominal value of the plate).
In this area remains constant motor power when you outflow with increasing frequency.
And 'to keep in mind that there is a physical limit in reducing the flow of the motor performance by keeping constant, this limit corresponds to a frequency (**f**2) of 90÷100 Hz

3) Zone at constant voltage with decreasing torque and power.



Asynchronous three-phase motors

Three-phase motor - X Type



Spare parts nomenclature

1. Screw for fan cover
2. Fan cover
3. Fan
4. Sealing ring
5. Rod
6. N-end shield
7. Spring ring
8. Frame
9. Stator package
10. Screw for terminal box cover
11. Gasket for terminal box cover
12. Terminal box
13. Screw for terminal box
14. Gasket for terminal box
17. Rear bearing
18. Rotor
19. Front bearing
21. D-end shield/flange
23. Sealing ring
24. Key
25. Shaft cap
42. Terminal board
46. Grounding screw
48. Cable gland

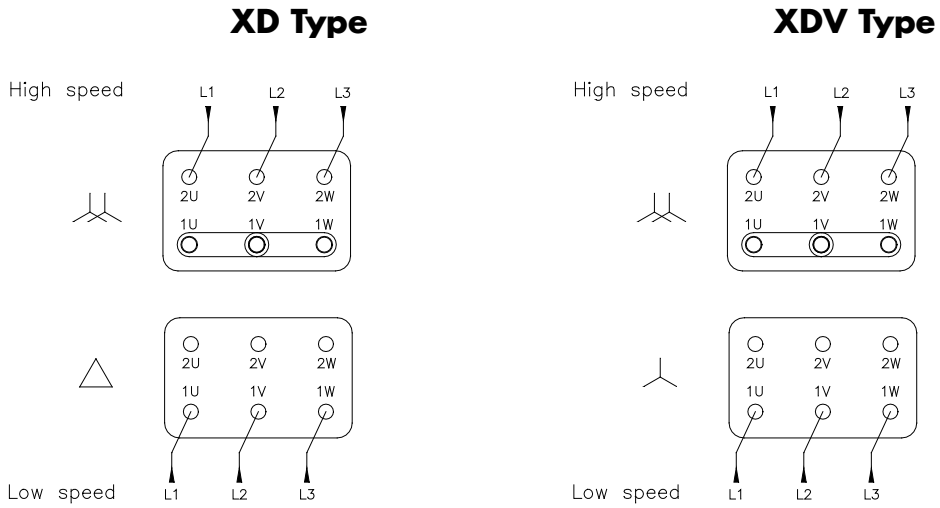
Connection for motors XS Type

Three-phase **one-speed** motors



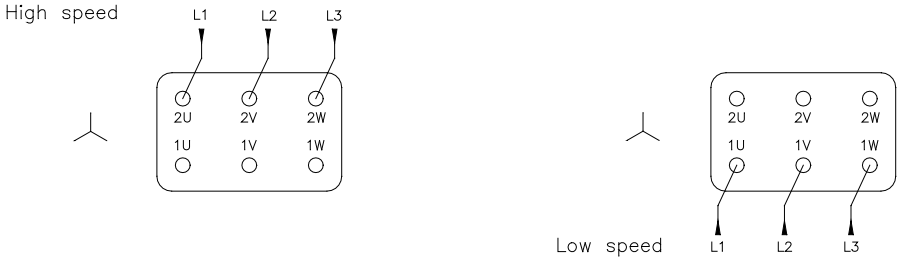
Connection for motors XD and XDV Type

Three-phase **two-speed** motors, **single winding**



Connection for motors XDD and XDDV Type

Three-phase **two-speed** motors, **double winding**



One-speed three-phase motors - Super Premium Efficiency (IE4)

TEFC construction – Squirrel cage rotor – Continuous duty S1 - Insulation class F - IP 55 protection

Supply V 400 - Hz 50

Method of determining the efficiency: IEC 60034-2-1; 2014

Motor size		Rated output Pn kW	Technical data at rated output V 400 - Hz 50 n min-1	In A	IE3 η 50 %	75 %	100 %	cos φ	Mn Nm	Direct insertion characteristics Ms/Mn	Is/In	Mm/Mn	Moment of inertia J 10-3 kg.m2	Mass (IM B3) kg
XSS Type 2 pole - 3000 min-1														
56	**b**	**0.12**	2780	0.38	55.3	61.1	66.5*	0.74	0.41	2.4	3.8	2.3	0.087	3.0
63	**a**	**0.18**	2815	0.49	64.2	69.5	70.8*	0.76	0.62	2.9	4.7	2.9	0.129	3.7
63	**b**	**0.25**	2800	0.64	68.1	71.6	74.3*	0.81	0.89	2.9	5.0	3.1	0.162	4.3
63	**c**	**0.37**	2835	0.93	69.3	75.1	78.1*	0.75	1.24	3.7	5.9	3.8	0.206	5.2
71	**b**	**0.55**	2825	1.23	77.6	79.7	81.5*	0.82	1.85	2.8	5.7	3.2	0.505	6.9
80	**a**	**0.75**	2845	1.64	81.9	83.2	83.5*	0.80	2.52	3.3	6.6	3.4	0.850	9.1
80	**b**	**1.1**	2865	2.36	83.9	85.3	85.2*	0.80	3.68	3.7	7.4	3.6	1.129	11.1
90S	**a**	**1.5**	2900	3.2	82.9	85.2	86.5*	0.80	4.94	3.2	7.6	3.7	1.469	13.7
90L	**a**	**2.2**	2900	4.5	84.2	86.0	88.0*	0.82	7.24	3.4	8.0	3.7	1.888	16.8
100L	**b**	**3**	2915	5.8	88.4	89.3	89.1*	0.84	9.82	3.1	8.8	3.8	3.542	23.3
XSS Type 4 pole - 1500 min-1														
63	**c**	**0.12**	1375	0.39	59.6	65.2	69.8*	0.67	0.84	2.3	3.3	2.4	0.326	5.0
71	**b**	**0.18**	1400	0.52	66.3	71.2	74.7*	0.71	1.21	2.6	4.3	2.7	0.800	6.5
71	**c**	**0.25**	1420	0.69	70.3	74.5	77.9*	0.69	1.68	2.9	5.2	3.3	1.175	8.2
80	**a**	**0.37**	1430	0.90	74.9	78.7	81.1*	0.76	2.45	2.7	5.9	3.2	2.157	9.6
80	**b**	**0.55**	1430	1.29	78.4	81.0	83.9*	0.76	3.64	3.3	6.5	3.7	2.789	11.6
90S	**a**	**0.75**	1440	1.82	82.0	84.5	85.7*	0.71	4.98	2.9	5.8	3.4	2.566	13.3
100L	**a**	**1.1**	1455	2.5	83.3	86.2	87.2*	0.73	7.20	3.4	7.4	4.3	5.036	20.9
100L	**b**	**1.5**	1455	3.4	84.3	87.1	88.2*	0.73	9.89	3.7	7.8	4.6	6.446	24.8
112M	**a**	**2.2**	1460	4.6	87.1	89.3	89.5*	0.77	14.3	3.3	8.0	4.1	11.08	31.4
132S	**b**	**4**	1465	8.2	89.1	90.2	91.1*	0.78	26.1	2.9	7.1	3.4	24.79	46.7
XSS Type 6 pole - 1000 min-1														
71	**c**	**0.12**	900	0.44	54.3	60.2	64.9*	0.65	1.27	1.9	2.9	2.4	1.175	8.0
80	**a**	**0.18**	935	0.56	59.7	66.1	70.1*	0.69	1.83	2.2	3.7	2.5	1.499	7.7
90S	**a**	**0.37**	955	1.09	70.0	75.7	78.0*	0.64	3.72	3.1	5.2	3.6	4.148	13.0
100L	**a**	**0.75**	950	1.84	79.9	82.1	82.7*	0.73	7.47	2.5	5.6	3.4	10.59	22.8
112M	**a**	**1.1**	970	2.64	80.9	83.9	84.5	0.71	10.8	1.9	6.1	3.3	16.51	30.0
132S	**a**	**1.5**	970	3.55	83.6	86.1	86.5	0.71	14.7	2.2	6.2	3.6	27.20	40.3
132M	**a**	**2.2**	975	5.1	85.5	87.6	87.9	0.71	21.5	2.2	6.5	3.7	34.77	48.3
132M	**b**	**3**	975	6.8	85.9	88.1	88.6*	0.72	29.4	2.0	7.0	3.8	45.65	58.7

Mn = Full load torque **Ms** = Locked rotor torque **Mm** = Maximum torque **In** = Rated load current **Is** = Locked rotor current

One-speed three-phase motors - Super Premium Efficiency (IE4)

TEFC construction – Squirrel cage rotor – Continuous duty S1 - Insulation class F - IP 55 protection

Supply V 460 - Hz 60

Method of determining the efficiency: IEC 60034-2-1; 2014

XSS Type 2 pole - 3600 min^{-1}

Motor size		Rated output Pn kW	Technical data at rated output V 400 - Hz 50 n min^{-1}	In A	IE3 η 50 %	75 %	100 %	cos φ	Mn Nm	Direct insertion characteristics Ms/Mn	Is/In	Mm/Mn	Moment of inertia J 10^{-3} kg.m^2	Mass (IM B3) kg
56	**b**	**0.12**	3395	0.36	56.4	61.9	66.0*	0.71	0.36	3.3	4.4	3.4	0.087	3.0
63	**a**	**0.18**	3390	0.47	62.3	68.2	70.0	0.71	0.52	4.0	4.8	4.2	0.129	3.7
63	**b**	**0.25**	3435	0.55	65.9	71.0	74.0*	0.76	0.69	3.8	5.9	3.6	0.162	4.3
63	**c**	**0.37**	3460	0.83	68.8	75.5	77.7	0.72	1.02	5.2	7.3	4.7	0.206	5.2
71	**b**	**0.55**	3450	1.08	76.0	79.5	80.6	0.80	1.52	3.9	7.0	3.7	0.505	6.9
80	**a**	**0.75**	3470	1.46	81.3	83.6	83.9	0.78	2.09	3.6	7.6	3.9	0.850	9.1
80	**b**	**1.1**	3480	2.08	82.9	85.6	86.0	0.77	3.02	4.5	8.9	4.7	1.129	11.1
90S	**a**	**1.5**	3515	2.8	82.6	85.7	86.6	0.79	4.08	3.5	9.0	4.3	1.469	13.7
90L	**a**	**2.2**	3510	3.9	84.7	87.0	88.5*	0.82	5.96	3.6	9.4	4.3	1.888	16.8
100L	**b**	**3**	3525	5.0	87.7	89.5	89.8	0.83	8.14	3.3	10.2	4.4	3.542	23.3
112M	**a**	**4**	3525	6.5	86.6	89.1	89.8	0.86	10.8	4.8	12.3	5.5	5.191	28.5
112M	**b**	**4.7**	3535	7.9	86.2	88.9	90.2*	0.83	12.7	6.0	14.2	6.6	6.336	31.8
132S	**a**	**5.5**	3555	9.1	85.1	88.2	90.2*	0.85	14.7	5.5	12.3	5.2	14.41	47.2
132M	**a**	**9.2**	3555	14.7	88.9	90.9	91.7*	0.86	24.8	5.4	12.0	5.4	19.58	60.1

XSS Type 4 pole - 1800 min^{-1}

63	**c**	**0.12**	1695	0.36	59.9	66.2	70.0*	0.62	0.68	2.8	3.8	3.3	0.326	5.0
71	**b**	**0.18**	1720	0.46	65.0	71.4	74.0*	0.66	0.98	3.1	5.1	3.5	0.800	6.5
71	**c**	**0.25**	1730	0.63	70.7	75.4	77.3	0.65	1.39	3.4	6.1	4.2	1.175	8.2
80	**a**	**0.37**	1740	0.81	74.6	79.3	81.5*	0.73	2.02	3.2	7.0	4.1	2.157	9.6
80	**b**	**0.55**	1740	1.16	77.3	81.1	84.0*	0.73	3.00	3.8	7.8	4.5	2.789	11.6
90S	**a**	**0.75**	1750	1.63	81.5	84.6	86.0	0.68	4.09	3.0	6.5	3.9	2.566	13.3
90L*	**a**	**1.1**	1750	2.3	82.7	85.9	87.5*	0.68	6.00	3.9	7.5	4.6	3.327	16.2
100L	**a**	**1.1**	1760	2.3	82.9	86.2	87.5*	0.71	5.98	3.7	8.3	4.9	5.036	20.9
100L	**b**	**1.5**	1760	3.1	83.9	87.1	88.5*	0.70	8.15	3.9	8.7	5.3	6.446	24.8
112M	**a**	**2.2**	1765	4.1	86.8	89.2	91.0*	0.75	11.9	3.5	9.1	4.7	11.08	31.4
112M	**b**	**3**	1760	5.6	87.8	90.1	91.0*	0.74	16.3	3.4	8.7	4.7	12.29	34.5
132S	**b**	**4**	1770	7.3	87.1	89.9	91.0*	0.76	21.6	3.3	8.0	3.9	24.79	46.7
132M	**c**	**5.5**	1770	9.7	89.4	91.1	92.4*	0.78	29.7	3.7	8.5	3.8	36.04	62.4

XSS Type 6 pole - 1200 min^{-1}

71	**c**	**0.12**	1115	0.41	56.5	62.7	68.0*	0.61	1.03	2.6	3.3	2.7	1.175	8.0
80	**a**	**0.18**	1145	0.51	60.5	67.5	72.0*	0.64	1.52	2.5	4.4	3.0	1.499	7.7
80	**b**	**0.25**	1145	0.71	64.2	69.9	75.5*	0.62	2.10	3.0	4.7	3.4	2.043	9.0
90S	**a**	**0.37**	1160	0.99	69.2	75.8	78.5*	0.59	3.04	3.4	5.8	4.2	4.148	13.0
90L	**a**	**0.55**	1155	1.31	74.2	78.6	82.5*	0.65	4.53	2.9	5.9	3.9	5.421	15.9
100L	**a**	**0.75**	1160	1.64	79.1	82.4	84.0*	0.69	6.14	2.8	6.5	3.9	10.59	22.8

Mn = Full load torque **Ms** = Locked rotor torque **Mm** = Maximum torque **In** = Rated load current **Is** = Locked rotor current

One-speed three-phase motors - Premium Efficiency (IE3)

TEFC construction – Squirrel cage rotor – Continuous duty S1 – Insulation class F – IP 55 protection

Method of determining the efficiency: IEC 60034-2-1; 2014

XSP Type		2 pole - 3000 min-1												
Motor size		Rated output Pn kW	Technical data at rated output V 400 - Hz 50 n min-1	In A	IE3 η 50 %	75 %	100 %	cos φ	Mn Nm	Direct insertion characteristics Ms/Mn	Is/In	Mm/Mn	Moment of inertia J 10-3 kg.m2	Mass (IM B3) kg
56	a	0.09	2720	0.32	48.6	55.9	56.7*	0.77	0.33	2.3	3.2	2.2	0.073	2.7
56	b	0.12	2780	0.38	55.3	61.1	62.7	0.74	0.41	2.4	3.8	2.3	0.087	3.0
63	a	0.18	2815	0.49	64.2	69.5	70.5	0.76	0.62	2.9	4.7	2.9	0.129	3.7
63	b	0.25	2800	0.64	68.1	71.6	71.7	0.81	0.89	2.9	5.0	3.1	0.162	4.3
63	c	0.37	2825	0.91	69.7	73.9	74.2	0.80	1.26	3.4	5.6	3.2	0.206	5.0
71	a	0.37	2805	0.97	70.7	74.6	74.8	0.76	1.30	3.4	5.2	3.4	0.342	5.8
71	c	0.55	2830	1.32	74.4	77.6	78.0	0.78	1.87	3.8	6.1	3.6	0.505	7.7
71	d	0.75	2820	1.84	74.9	78.1	80.7*	0.75	2.53	4.0	6.1	3.9	0.505	7.8
80	a	0.75	2845	1.64	81.9	83.2	82.5	0.80	2.52	3.3	6.6	3.4	0.850	9.1
80	b	1.1	2865	2.36	83.9	85.3	84.8	0.80	3.68	3.7	7.4	3.6	1.129	11.1
80	c	1.5	2830	3.4	81.7	82.9	84.2*	0.79	5.07	3.3	6.4	3.4	1.129	11.1
90S	a	1.5	2900	3.1	82.3	84.7	84.8	0.82	5.01	3.3	7.9	3.6	1.469	13.7
90S	b	1.8	2870	3.7	83.7	84.6	85.0*	0.85	5.99	2.6	6.6	2.8	1.469	13.8
90L	a	2.2	2890	4.5	85.7	86.8	86.2	0.84	7.38	3.1	8.1	3.6	1.888	16.8
90L	b	2.6	2850	5.2	86.4	86.4	86.5*	0.87	8.80	2.8	6.6	3.0	1.888	16.8
100L	a	3	2900	5.7	88.7	89.2	88.3	0.87	9.93	2.8	7.7	3.4	3.542	23.3
100L	b	4	2875	7.9	88.1	88.1	88.1*	0.85	13.4	2.6	7.2	3.2	3.542	23.3
112M	a	4	2920	7.3	86.6	88.4	88.6	0.88	12.9	3.9	9.9	5.5	5.191	28.5
112M	b	4.7	2925	9.3	86.7	88.9	89.4	0.81	15.2	5.1	11.7	5.8	6.336	31.8
112M	c	5.5	2910	10.5	87.6	88.9	89.2*	0.84	18.1	4.3	9.9	6.3	6.336	31.8
132S	a	5.5	2950	10.3	86.5	88.9	89.6	0.86	17.7	4.0	10.8	4.7	14.41	47.2
132S	b	7.5	2945	14.1	88.6	90.3	90.5	0.85	24.3	3.6	10.2	4.6	17.06	52.7
132M	a	9.2	2945	16.9	89.8	91.1	91.1	0.86	29.8	3.6	10.4	4.5	19.58	60.1
132M	b	11	2940	21.1	89.0	90.6	91.2*	0.83	35.7	4.2	10.1	4.6	19.58	60.6
160M	a	11	2960	20.0	90.0	91.6	91.8	0.87	35.4	4.7	10.9	3.9	41.45	85.1
160M	b	15	2960	27.2	90.4	91.8	92.1	0.87	48.4	4.7	11.5	4.0	53.42	104
160L	a	18.5	2965	33.2	91.3	92.5	92.7	0.87	59.8	4.3	11.3	3.7	61.66	118
160L	b	22	2950	38.9	91.9	92.5	92.7*	0.89	71.4	4.1	9.9	3.0	61.66	118
XSP	**Type**	**4 pole - 1500 min-1**												
56	a	0.06	1320	0.26	39.8	44.6	53.6*	0.69	0.45	1.9	2.3	2.0	0.117	2.7
56	b	0.09	1355	0.39	41.4	52.1	60.6*	0.62	0.65	2.6	2.6	2.6	0.151	3.1
63	b	0.12	1370	0.41	55.6	61.8	64.8*	0.67	0.85	2.1	3.0	2.3	0.263	4.3
63	c	0.18	1380	0.61	58.8	64.9	69.9*	0.65	1.25	2.4	3.3	2.6	0.326	5.0
71	b	0.18	1400	0.52	66.3	71.2	72.0	0.71	1.21	2.7	4.3	2.7	0.800	6.4
71	c	0.25	1420	0.69	70.3	74.5	75.6	0.69	1.68	2.9	5.2	3.3	1.175	8.2
80	a	0.37	1430	0.88	74.5	78.2	78.5	0.77	2.47	2.8	5.9	3.3	2.157	9.6
80	b	0.55	1435	1.30	76.9	80.0	80.8	0.76	3.68	3.3	6.5	3.7	2.789	11.6
80	c	0.75	1425	1.70	78.6	81.2	82.5*	0.79	5.02	3.0	6.4	3.5	2.789	11.6
90S	r	0.75	1440	1.77	81.0	83.5	83.8	0.73	4.96	3.0	6.2	3.5	2.566	13.3
90S	a	1.1	1425	2.6	80.8	82.8	84.1*	0.75	7.37	2.4	5.2	2.9	2.566	13.3
90L	r	1.1	1440	2.5	82.8	85.1	85.3	0.73	7.26	3.1	6.6	3.7	3.327	16.2
90L	a	1.5	1425	3.4	82.8	84.4	85.3*	0.76	10.1	2.7	5.8	3.2	3.327	16.2
100L	r	1.5	1445	3.3	83.9	86.1	86.1	0.75	9.90	2.8	6.1	3.6	5.036	20.9
100L	s	1.8	1455	4.1	83.1	85.9	86.5	0.70	11.6	3.3	7.4	4.3	6.446	24.9
100L	c	2.2	1440	4.9	85.0	86.8	86.7	0.76	14.5	3.0	6.6	3.6	6.446	24.9
112M	s	2.6	1460	5.6	85.6	88.0	88.5	0.75	16.9	3.2	8.0	4.1	11.08	31.6
112M	a	3.7	1450	7.8	87.4	88.8	88.5	0.77	24.2	2.9	7.4	3.8	12.29	34.4
112M	b	4	1440	8.0	87.3	88.1	88.6*	0.82	26.3	2.4	6.5	3.1	11.08	31.4
132M	r	5.5	1460	11.1	89.3	90.4	90.2	0.79	35.8	2.9	7.1	3.3	32.74	58.2
132M	b	7.5	1450	14.8	90.0	90.1	90.4*	0.82	49.4	2.4	6.1	2.7	32.74	58.1
160M	r	7.5	1480	15.4	89.7	91.2	91.5	0.77	48.3	3.4	7.6	3.1	65.67	85.0
160M	s	9.2	1470	18.1	90.6	91.5	91.2	0.80	59.6	2.9	6.2	2.5	65.67	85.0
160M	b	11	1475	20.8	92.1	92.8	92.5	0.82	71.3	2.7	7.2	2.9	85.19	102
160L	a	15	1475	29.6	91.8	92.6	92.4	0.79	97.1	3.1	7.3	2.9	98.50	113

Mn = Full load torque **Ms** = Locked rotor torque **Mm** = Maximum torque **In** = Rated load current **Is** = Locked rotor current

One-speed three-phase motors - Premium Efficiency (IE3)

TEFC construction – Squirrel cage rotor – Continuous duty S1 – Insulation class F – IP 55 protection

Method of determining the efficiency: IEC 60034-2-1; 2014

XSP Type 6 pole - 1000 min-1

Motor size		Rated output Pn kW	Technical data at rated output V 400 - Hz 50 n min-1	In A	IE3 η 50 %	75 %	100 %	cos φ	Mn Nm	Direct insertion characteristics Ms/Mn	Is/In	Mm/Mn	Moment of inertia J 10-3 kg.m2	Mass (IM B3) kg
71	c	0.12	900	0.44	54.3	60.2	61.4	0.65	1.27	1.9	2.9	2.4	1.175	8.1
80	a	0.18	935	0.56	59.7	66.1	67.5	0.69	1.83	2.2	3.7	2.5	1.499	7.7
80	b	0.25	935	0.77	64.0	68.9	70.4	0.66	2.54	2.6	4.1	2.8	2.043	9.2
80	c	0.37	940	1.10	64.1	70.0	73.5*	0.68	3.78	2.8	4.4	3.0	2.517	10.5
90S	a	0.37	955	1.09	70.0	75.7	77.5	0.64	3.72	3.1	5.2	3.6	4.148	13.0
90L	a	0.55	950	1.45	74.1	77.7	78.6	0.69	5.53	2.5	5.1	3.3	5.421	15.9
90L	b	0.75	935	2.0	75.4	78.2	78.9*	0.72	7.83	2.3	4.7	2.9	5.421	15.9
100L	r	0.75	950	2.0	75.0	78.5	79.2	0.67	7.54	2.9	5.3	3.5	8.032	18.9
100L	a	1.1	950	2.8	78.8	82.0	82.0	0.70	11.1	2.7	5.7	3.5	10.59	22.8
100L	b	1.5	940	3.7	78.5	80.6	82.5*	0.74	15.3	2.3	5.1	3.0	10.59	22.8
112M	a	1.5	965	3.6	80.9	83.3	83.5	0.73	14.9	1.7	5.7	3.0	16.51	30.1
112M	b	1.8	965	4.2	81.4	83.5	83.4	0.73	17.8	1.7	5.5	2.9	16.51	30.1
112M	c	2.2	960	5.3	80.2	82.5	84.3*	0.73	21.8	1.6	5.4	2.8	16.51	30.1
132S	a	2.2	965	5.2	83.1	85.1	85.2	0.72	21.7	1.9	5.7	3.1	27.20	40.2
132M	a	3	965	6.7	85.2	86.8	86.7	0.74	29.7	1.7	5.9	3.2	34.77	48.4
132M	b	4	970	8.9	86.1	87.9	87.9	0.74	39.3	1.8	6.6	3.5	45.65	61.4
132M	c	5.5	960	11.7	86.8	87.8	88.0*	0.78	54.2	1.7	5.9	3.0	45.65	61.6
160M	b	5.5	970	11.3	87.9	89.0	88.6	0.80	54.2	2.4	6.5	3.1	89.20	80.4
160M	c	7.5	965	15.3	87.7	88.4	89.1*	0.80	74.4	2.2	5.9	2.8	89.20	80.4
160L	b	11	970	22.4	88.7	89.6	90.3*	0.79	108.3	2.4	6.8	2.3	126.4	104

Mn = Full load torque **Ms** = Locked rotor torque **Mm** = Maximum torque **In** = Rated load current **Is** = Locked rotor current

One-speed three-phase motors - Premium Efficiency (IE3)

TEFC construction – Squirrel cage rotor – Continuous duty S1 – Insulation class F – IP 55 protection

Supply V 460 – 60 Hz

Method of determining the efficiency: IEC 60034-2-1; 2014

XSP Type		2 pole - 3600 min-1												
Motor size		Rated output	Technical data at rated output V 460 - Hz 60							Direct insertion characteristics			Moment of inertia	Mass (IM B3)
		Pn	n	In	IE3 η			cos φ	Mn	Ms/Mn	Is/In	Mm/Mn	J	
		kW	min-1	A	50 %	75 %	100 %		Nm				10-3 kg.m2	kg
56	b	0.12	3395	0.36	56.4	61.9	64.1	0.71	0.36	3.3	4.4	3.4	0.087	3.0
63	a	0.18	3390	0.47	62.3	68.2	70.0	0.71	0.52	4.0	4.8	4.2	0.129	3.7
63	b	0.25	3435	0.55	65.9	71.0	73.1	0.76	0.69	3.8	5.9	3.6	0.162	4.3
63	c	0.37	3455	0.84	67.1	73.2	75.0	0.74	1.03	3.8	6.6	4.1	0.206	5.0
71	a	0.37	3435	0.87	70.4	75.3	76.7	0.72	1.07	3.9	6.3	4.0	0.342	5.8
71	c	0.55	3450	1.18	73.4	77.5	79.0	0.75	1.52	4.6	7.3	4.4	0.505	7.7
71	d	0.75	3445	1.66	75.0	78.8	80.1	0.73	2.08	5.0	7.7	4.8	0.505	7.8
80	a	0.75	3470	1.46	81.3	83.6	83.9	0.78	2.09	3.6	7.6	3.9	0.850	9.1
80	b	1.1	3480	2.08	82.9	85.6	86.0	0.77	3.02	4.5	8.9	4.7	1.129	11.1
80	c	1.5	3465	2.9	84.0	86.0	85.5*	0.76	4.17	4.2	7.9	4.2	1.129	11.1
90S	a	1.5	3515	2.7	82.9	85.6	86.3	0.81	4.07	3.5	9.0	4.0	1.469	13.7
90S	b	1.8	3490	3.1	84.7	86.2	85.5*	0.85	4.95	3.1	8.1	3.5	1.469	13.8
90L	a	2.2	3505	3.8	86.1	88.1	88.2	0.83	5.98	3.2	8.9	3.9	1.888	16.8
90L	b	2.6	3485	4.4	87.2	88.1	86.5*	0.85	7.12	3.3	7.7	3.8	1.888	16.8
100L	a	3	3515	4.9	88.0	89.4	89.3	0.86	8.14	3.0	9.3	3.9	3.542	23.3
100L	b	4	3495	6.7	88.5	89.3	88.5*	0.84	11.1	2.8	8.3	3.5	3.542	23.3
112M	a	4	3525	6.4	85.9	88.3	89.1	0.87	10.8	5.4	11.5	5.2	5.191	28.5
112M	b	4.7	3535	8.1	86.1	88.9	89.9	0.81	12.7	6.2	13.8	6.7	6.336	31.8
112M	c	5.5	3520	9.1	87.3	89.4	89.5*	0.84	14.9	4.7	12.0	5.5	6.336	31.8
132S	a	5.5	3555	9.1	85.1	88.2	89.5	0.85	14.7	5.5	12.3	5.2	14.41	47.2
132S	b	7.5	3550	12.4	87.3	89.7	90.6	0.85	20.4	5.4	11.7	5.3	17.06	52.7
132M	a	9.2	3555	14.7	88.9	90.9	91.5	0.86	24.8	5.4	12.0	5.4	19.58	60.1
132M	b	11	3550	18.2	87.9	90.3	91.0*	0.83	29.5	5.7	11.3	4.9	19.58	60.1
160M	a	11	3565	17.5	88.4	90.6	91.4	0.87	29.4	5.3	12.4	4.2	41.45	85.1
160M	b	15	3565	23.6	88.8	91.0	91.8	0.87	40.0	5.8	12.8	4.1	53.42	104
160L	a	18.5	3565	28.8	90.2	92.0	92.5	0.87	49.6	6.1	13.2	4.0	61.66	118
160L	b	22	3560	33.6	91.6	92.7	91.8	0.89	59.1	5.6	11.7	3.2	61.66	118
XSP Type		**4 pole - 1800 min-1**												
63	b	0.12	1690	0.37	57.2	63.9	66.0*	0.62	0.69	2.8	3.5	2.8	0.263	4.3
63	c	0.18	1700	0.56	60.4	66.9	69.5*	0.59	1.04	3.0	3.9	3.2	0.326	5.0
71	b	0.18	1720	0.46	65.0	71.4	73.5	0.66	0.98	3.1	5.1	3.6	0.800	6.4
71	c	0.25	1730	0.63	70.7	75.4	77.3	0.65	1.39	3.4	6.1	4.2	1.175	8.2
80	a	0.37	1740	0.78	74.1	79.2	80.6	0.73	2.02	3.5	7.1	4.0	2.157	9.6
80	b	0.55	1740	1.18	77.2	80.9	82.3	0.72	3.04	3.8	7.7	4.5	2.789	11.6
80	c	0.75	1735	1.5	79.6	82.7	83.5*	0.76	4.13	3.2	7.7	4.3	2.789	11.6
90S	r	0.75	1750	1.6	81.0	84.2	85.4	0.69	4.08	3.3	7.0	4.1	2.566	13.3
90S	a	1.1	1735	2.3	81.7	84.3	86.5*	0.72	6.06	2.6	6.1	3.4	2.566	13.3
90L	r	1.1	1750	2.3	82.6	85.7	86.6	0.70	5.99	3.4	7.4	4.3	3.327	16.2
90L	a	1.5	1725	3.0	83.1	85.4	86.5*	0.73	8.37	3.2	6.8	3.8	3.327	16.2
100L	r	1.5	1750	3.0	83.5	86.4	87.2	0.72	8.15	3.2	7.0	4.1	5.036	20.9
100L	s	1.8	1755	3.8	83.4	86.2	87.2	0.68	9.77	3.7	8.0	4.9	6.446	24.9
100L	c	2.2	1750	4.3	85.0	87.7	89.5*	0.72	12.0	3.3	7.6	4.2	6.446	24.9
112M	s	2.6	1765	5.0	85.8	88.5	89.5	0.73	14.0	3.8	9.2	4.8	11.08	31.4
112M	a	3.7	1760	6.9	87.7	89.6	89.9	0.74	20.1	3.4	8.4	4.5	12.29	34.4
112M	b	4	1750	7.0	87.3	89.0	89.5*	0.79	21.6	2.8	7.3	3.6	11.08	31.4
132M	r	5.5	1770	9.8	89.4	91.0	91.7	0.77	29.8	3.4	8.0	3.8	32.74	58.2
132M	b	7.5	1760	12.9	90.3	91.2	91.7*	0.80	40.9	3.0	7.0	3.1	32.74	58.1
160M	r	7.5	1780	13.7	88.9	91.0	91.7	0.75	40.2	4.3	8.8	3.4	65.67	85.0
160M	s	9.2	1775	15.9	90.2	91.7	91.9	0.79	49.7	3.5	7.2	2.8	65.67	85.0
160M	b	11	1775	18.2	91.6	92.9	93.0	0.81	59.1	3.3	8.3	3.0	85.19	102
160L	a	15	1775	26.0	91.6	92.9	93.1	0.78	80.7	3.9	8.2	3.0	98.50	113

Mn = Full load torque **Ms** = Locked rotor torque **Mm** = Maximum torque **In** = Rated load current **Is** = Locked rotor current

One-speed three-phase motors - Premium Efficiency (IE3)

TEFC construction – Squirrel cage rotor – Continuous duty S1 – Insulation class F – IP 55 protection

Supply V 460 – 60 Hz

Method of determining the efficiency: IEC 60034-2-1; 2014

XSP Type 6 pole - 1200 min-1														
Motor size		Rated output Pn kW	Technical data at rated output V 460 - Hz 60							Direct insertion characteristics			Moment of inertia J 10^{-3} kg.m²	Mass (IM B3) kg
			n min-1	In A	IE3 η 50 %	IE3 η 75 %	IE3 η 100 %	cos φ	Mn Nm	Ms/Mn	Is/In	Mm/Mn		
71	**c**	**0.12**	1116	0.41	56.5	62.7	65.0	0.61	1.03	2.6	3.3	2.7	1.175	8.1
80	**a**	**0.18**	1145	0.51	60.5	67.5	69.9	0.64	1.52	2.5	4.4	3.0	2.157	7.7
80	**b**	**0.25**	1145	0.71	64.2	69.9	72.4	0.62	2.10	3.0	4.7	3.4	2.043	9.2
80	**c**	**0.37**	1145	1.00	64.2	71.1	75.3*	0.64	3.09	3.3	5.1	3.6	2.517	10.5
90S	**a**	**0.37**	1160	0.99	69.2	75.8	78.3	0.59	3.04	3.4	5.8	4.2	4.148	13.0
90L	**a**	**0.55**	1155	1.31	74.2	78.6	81.7*	0.65	4.53	2.9	5.9	3.9	5.421	15.9
90L	**b**	**0.75**	1150	1.75	75.9	79.5	82.5*	0.67	6.28	2.7	5.5	3.6	5.421	15.9

Mn = Full load torque **Ms** = Locked rotor torque **Mm** = Maximum torque **In** = Rated load current **Is** = Locked rotor current

One-speed three-phase motors - High Efficiency (IE2)

TEFC construction – Squirrel cage rotor – Continuous duty S1 – Insulation class F – IP 55 protection

Method of determining the efficiency: IEC 60034-2-1; 2014

XSH Type		2 pole - 3000 min¹												
Motor size		Rated output	Technical data at rated output V 400 - Hz 50							Direct insertion characteristics			Moment of inertia	Mass (IM B3)
		Pn	n	In	IE2 η			cos φ	Mn	Ms/Mn	Is/In	Mm/Mn	J	
		kW	min-1	A	50 %	75 %	100 %		Nm				10-3 kg.m2	kg
56	a	0.09	2720	0.32	48.6	55.9	56.5	0.77	0.33	2.3	3.2	2.2	0.073	2.7
56	b	0.12	2780	0.38	55.3	61.1	62.7	0.74	0.41	2.4	3.8	2.3	0.087	3.0
63	a	0.18	2815	0.49	64.2	69.5	70.5	0.76	0.62	2.9	4.7	2.9	0.129	3.7
63	b	0.25	2800	0.64	68.1	71.6	71.7	0.81	0.89	2.9	5.0	3.1	0.162	4.3
63	c	0.37	2825	0.91	69.7	73.9	74.2	0.80	1.26	3.4	5.6	3.2	0.206	5.0
71	a	0.37	2820	0.95	68.6	73.6	74.4	0.75	1.24	3.3	5.5	3.4	0.342	5.8
71	b	0.55	2815	1.38	71.6	74.9	75.3	0.77	1.87	3.5	5.7	3.4	0.424	6.7
XSH Type		**4 pole - 1500 min¹**												
56	a	0.06	1320	0.26	39.8	44.6	49.0	0.69	0.45	1.9	2.3	2.0	0.117	2.7
56	b	0.09	1355	0.39	41.4	52.1	54.9	0.62	0.65	2.6	2.6	2.6	0.151	3.1
63	b	0.12	1370	0.41	55.6	61.8	63.1	0.67	0.85	2.1	3.0	2.3	0.263	4.3
63	c	0.18	1380	0.61	58.8	64.9	66.0	0.65	1.25	2.4	3.3	2.6	0.326	5.0
71	b	0.25	1380	0.68	66.5	69.5	68.7	0.76	1.73	2.1	3.8	2.3	0.800	6.4
71	c	0.37	1415	1.08	65.6	71.3	72.8	0.68	2.51	3.0	4.8	3.3	1.175	8.2
80	a	0.55	1415	1.26	76.3	78.6	78.3	0.79	3.67	2.4	5.4	2.8	2.157	9.7
XSH Type		**6 pole - 1000 min¹**												
71	b	0.12	905	0.52	44.3	51.5	54.1	0.63	1.28	2.1	2.6	2.3	0.800	6.3
71	c	0.18	890	0.66	51.2	57.0	57.1	0.68	1.96	1.9	2.6	2.1	1.175	8.0
80	b	0.25	935	0.77	64.0	68.9	70.4	0.66	2.54	2.6	4.1	2.8	2.043	9.0
80	c	0.37	940	1.10	64.1	70.0	71.5	0.68	3.78	2.8	4.4	3.0	2.517	10.8
90S	a	0.55	935	1.42	72.5	75.4	75.1	0.74	5.63	2.1	4.3	2.5	4.148	13.0
XSH Type		**8 pole - 750 min¹**												
71	b	0.09	685	0.57	30.0	41.1	45.4	0.50	1.26	2.7	2.2	2.8	0.800	6.3
71	c	0.12	685	0.82	28.9	36.9	42.5	0.50	1.68	2.9	2.2	3.1	1.175	8.0
80	b	0.18	695	0.89	41.7	50.8	54.6	0.54	2.49	2.6	2.7	2.7	2.043	9.0
80	c	0.25	695	1.22	41.8	49.9	54.1	0.55	3.42	2.7	2.8	2.8	2.517	10.5
90S	a	0.37	690	1.43	55.5	62.3	63.8	0.59	5.18	1.8	2.5	1.9	3585	11.6
90L	a	0.55	685	2.0	59.1	65.9	67.0	0.57	7.40	1.9	2.5	2.3	4858	14.1

Mn = Full load torque **Ms** = Locked rotor torque **Mm** = Maximum torque **In** = Rated load current **Is** = Locked rotor current

One-speed three-phase motors - High Efficiency (IE2)

TEFC construction – Squirrel cage rotor – Continuous duty S1 – Insulation class F – IP 55 protection

Supply 460 V - 60 Hz

Method of determining the efficiency: IEC 60034-2-1; 2014

XSH	Type	2 pole - 3600 min¹												
Motor size		Rated output	Technical data at rated output V 460 - Hz 60							Direct insertion characteristics			Moment of inertia	Mass (IM B3)
		Pn	n	In	IE2 η			cos φ	Mn	Ms/Mn	Is/In	Mm/Mn	J	
		kW	min-1	A	50 %	75 %	100 %		Nm				10-3 kg.m2	kg
56	b	0.12	3395	0.36	56.4	61.9	64.1	0.71	0.36	3.3	4.4	3.4	0.087	3.0
63	a	0.18	3390	0.47	62.3	68.2	70.0	0.71	0.52	4.0	4.8	4.2	0.129	3.7
63	b	0.25	3435	0.55	65.9	71.0	73.1	0.76	0.69	3.8	5.9	3.6	0.162	4.3
63	c	0.37	3455	0.84	67.1	73.2	75.0	0.74	1.03	3.8	6.6	4.1	0.206	5.0
71	a	0.37	3435	0.88	68.6	73.7	75.4	0.73	1.07	4.0	6.4	4.2	0.342	5.8
XSH	Type	4 pole - 1800 min¹												
63	b	0.12	1690	0.37	57.2	63.9	66.4	0.62	0.69	2.8	3.5	2.8	0.263	4.3
63	c	0.18	1700	0.56	60.4	66.9	69.1	0.59	1.04	3.0	3.9	3.2	0.326	5.0
71	b	0.25	1705	0.61	67.5	71.8	72.9	0.71	1.41	2.5	4.7	2.8	0.800	6.4
71	c	0.37	1730	0.99	65.7	72.4	74.7	0.63	2.06	3.5	5.6	4.0	1.175	8.2
80	a	0.55	1730	1.13	76.7	80.0	80.8	0.76	3.06	2.9	6.5	3.5	2.157	9.7
XSH	Type	6 pole - 1200 min-1												
Tipo		Potenza nominale	Caratteristiche di esercizio alla potenza nominale V 460 - Hz 60							Caratteristiche per inserzione diretta			Momento di inerzia	Massa (IM B3)
		Pn	n	In	IE2 η			cos φ	Mn	Ms/Mn	Is/In	Mm/Mn	J	
		kW	min-1	A	50 %	75 %	100 %		Nm				10-3 kg.m2	kg
71	b	0.12	1130	0.48	45.4	53.1	57.2	0.56	1.02	2.6	2.8	3.0	0.800	6.3
71	c	0.18	1115	0.60	51.5	59.4	61.9	0.60	1.50	2.4	3.1	2.7	1.175	8.0
80	b	0.25	1145	0.71	64.2	69.9	72.4	0.62	2.10	3.0	4.7	3.4	2.043	9.0
80	c	0.37	1145	1.00	64.2	71.1	73.6	0.64	3.09	3.3	5.1	3.6	2.517	10.8
90S	a	0.55	1145	1.27	73.2	77.0	77.9	0.69	4.58	2.4	4.9	2.9	4.148	13.0
XSH	Type	8 pole - 900 min-1												
71	c	0.12	845	0.79	29.6	38.2	44.1	0.44	1.37	3.5	2.4	3.9	1.175	8.0
80	b	0.18	855	0.84	42.4	51.8	56.3	0.48	2.01	3.2	3.0	3.3	2.043	9.0
80	c	0.25	855	1.15	43.3	51.5	56.5	0.49	2.81	3.2	3.1	3.4	2.517	10.5
90S	a	0.37	850	1.31	57.8	65.3	67.9	0.52	4.17	1.9	2.8	2.3	3.585	11.6
90L	a	0.55	850	1.84	61.1	68.6	71.2	0.51	5.96	2.3	2.8	2.7	4.858	14.1

Mn = Full load torque **Ms** = Locked rotor torque **Mm** = Maximum torque **In** = Rated load current **Is** = Locked rotor current

Two-speed three-phase motors - single winding - Dahlander connection (Star-Star/ Delta) - for general use

TEFC construction – Squirrel cage rotor – Continuous duty S1 – Insulation class F – IP 55 protection

Motor size	Rated output Pn kW	Technical data at rated output V 400 - Hz 50 n min-1	In A	Mn Nm	Direct insertion characteristics Ms/Mn	Is/In	Mm/Mn	Moment of inertia J 10-3 kg.m2	Mass (IM B3) kg
XD Type 2/4 pole - 3000/1500 min1									
63 a	**0.15/0.10**	2780/1370	0.41/0.41	0.52/0.70	1.7/1.8	3.9/2.4	2.0/2.0	0.206	3.7
63 b	**0.22/0.15**	2800/1380	0.58/0.58	0.75/1.04	1.8/1.9	4.1/2.6	2.2/2.1	0.263	4.3
63 c	**0.30/0.20**	2800/1380	0.75/0.75	1.02/1.38	1.9/2.0	4.0/2.8	2.3/2.2	0.326	5.0
71 a	**0.30/0.20**	2800/1380	0.78/0.78	1.02/1.38	1.9/2.0	3.8/3.2	2.1/2.1	0.687	5.8
71 b	**0.45/0.30**	2810/1400	1.3/1.1	1.53/2.05	2.0/2.1	4.1/3.4	2.3/2.2	0.800	6.4
71 c	**0.60/0.45**	2840/1400	1.6/1.4	2.02/3.07	2.1/2.3	4.5/3.6	2.6/2.5	1.175	8.2
80 a	**0.60/0.45**	2780/1400	1.6/1.2	2.06/3.07	1.8/1.8	3.6/3.7	2.1/2.1	1.499	7.6
80 b	**0.85/0.65**	2820/1400	2.4/1.7	2.88/4.43	1.8/2.0	3.8/3.6	2.4/2.3	2.043	9.1
80 c	**1.10/0.85**	2830/1410	2.8/2.1	3.71/5.76	2.0/2.1	4.4/4.5	2.4/2.4	2.517	10.6
90S a	**1.50/1.10**	2850/1410	3.3/2.7	5.03/7.45	2.2/2.0	4.8/4.3	2.9/2.4	2.210	11.8
90L a	**1.85/1.40**	2850/1410	4.1/3.1	6.20/9.48	2.4/2.1	5.0/4.9	3.0//2.9	2.843	14.1
90L b	**2.20/1.70**	2850/1410	5.0/3.9	7.37/11.5	2.5/2.3	5.6/5.1	3.2/3.0	3.327	16.0
100L a	**2.60/2.00**	2850/1420	6.1/4.8	8.71/13.5	2.8/2.6	5.0/5.3	3.2/3.1	4.637	19.1
100L b	**3.50/2.70**	2870/1420	8.0/6.4	11.6/18.2	2.7/2.7	5.7/4.9	3.2/2.9	6.034	22.9
112M a	**4.00/3.20**	2880/1430	8.8/7.1	13.3/21.4	2.1/2.0	6.0/5.1	2.9/1.9	9.550	28.2
112M b	**4.80/3.70**	2890/1430	9.8/8.2	15.9/24.7	2.0/2.0	6.2/5.0	2.7/1.8	11.08	31.2
132S b	**6.00/4.60**	2890/1440	13.1/9.9	19.8/30.5	2.3/2.0	5.1/5.0	2.5/2.4	22.43	43.1
132M b	**8.20/6.60**	2910/1440	17.5/13.5	26.9/43.8	2.5/2.2	6.1/5.3	2.8/1.8	29.61	53.5
132M c	**9.60/7.80**	2920/1440	20.0/16.0	31.4/51.7	2.5/2.3	6.2/5.3	2.8/1.8	34.21	59.9
160M b	**11.0/9.20**	2930/1450	25.4/19.2	35.9/60.6	2.4/2.0	6.0/5.2	2.6/2.4	59.13	78.3
160L a	**15.0/12.5**	2930/1450	34.2/25.5	48.9/82.3	2.5/2.1	6.3/5.5	2.8/2.5	77.80	95.8
XD Type 4/8 pole - 1500/750 min1									
71 a	**0.10/0.05**	1360/670	0.36/0.36	0.70/0.71	1.3/1.9	2.5/1.9	1.4/2.1	0.687	5.5
71 b	**0.14/0.07**	1370/670	0.45/0.50	0.98/1.00	1.7/1.9	3.0/1.9	2.1/2.1	0.800	6.3
71 c	**0.20/0.10**	1380/660	0.57/0.63	1.38/1.45	1.6/2.0	3.3/1.8	1.9/2.0	1.175	8.2
80 a	**0.25/0.13**	1360/680	0.65/0.65	1.76/1.83	1.3/1.6	3.3/1.9	1.5/1.9	1.499	7.5
80 b	**0.37/0.20**	1370/680	0.92/0.92	2.58/2.81	1.4/1.7	3.7/2.4	1.7/2.0	2.043	9.0
80 c	**0.50/0.26**	1370/680	1.2/1.2	3.49/3.65	2.0/2.1	3.5/2.4	1.8/2.0	2.517	10.5
90S a	**0.70/0.36**	1380/690	1.8/2.0	4.84/4.98	1.8/2.0	3.5/2.5	2.2/2.5	3.585	11.8
90L a	**1.00/0.52**	1380/690	2.5/2.5	6.92/7.20	1.8/1.8	3.6/2.1	2.1/2.0	4.858	14.2
100L a	**1.10/0.60**	1410/700	2.5/2.6	7.45/8.19	1.5/1.7	4.5/3.0	2.3/2.6	7.840	19.0
100L b	**1.50/0.80**	1410/710	3.3/3.2	10.2/10.8	1.5/1.8	4.1/3.4	2.1/2.6	10.31	22.6
112M a	**2.20/1.20**	1400/700	4.5/3.9	15.0/16.4	1.6/1.9	4.3/3.6	1.9/2.4	13.94	27.5
112M b	**2.60/1.40**	1410/710	5.3/4.9	17.6/18.8	1.8/2.0	5.3/4.0	2.5/3.2	16.51	30.6
132S a	**3.00/1.70**	1420/720	6.2/6.1	20.2/22.5	1.6/1.8	5.4/3.6	2.4/2.7	24.12	37.5
132S b	**4.00/2.20**	1430/720	8.3/8.3	26.7/29.2	1.7/2.0	5.7/4.0	2.5/2.7	31.79	44.2
132M b	**5.50/3.00**	1440/720	11.4/10.7	36.5/39.8	1.7/2.2	6.3/4.3	2.7/2.8	41.60	54.3
160M b	**7.50/4.30**	1440/720	15.0/14.0	49.7/57.0	1.8/2.2	5.5/4.2	2.5/2.7	89.20	80.3
160L a	**11.0/6.30**	1450/720	20.0/19.0	72.4/83.6	1.9/2.3	5.7/4.3	2.7/2.9	120.1	99.5

Mn = Full load torque **Ms** = Locked rotor torque **Mm** = Maximum torque **In** = Rated load current **Is** = Locked rotor current

Two-speed three-phase motors - double winding - Star/Star connection - for general use

TEFC construction – Squirrel cage rotor – Continuous duty S1 – Insulation class F – IP 55 protection

XDD Type		2/6 pole - 3000/1000 min¹								
Motor size		Rated output	Technical data at rated output V 400 - Hz 50			Direct insertion characteristics			Moment of inertia	Mass (IM B3)
		Pn	n	In	Mn	Ms/Mn	Is/In	Mm/Mn	J	
		kW	min-¹	A	Nm				10-³ kg.m²	kg
71	c	0.42/0.14	2810/885	0.95/0.64	1.43/1.51	1.6/1.7	4.1/2.2	2.0/1.8	1.175	8.2
80	a	0.42/0.14	2770/930	1.07/0.57	1.45/1.44	1.6/1.4	3.6/2.4	1.9/1.8	1.499	7.5
80	b	0.60/0.20	2820/930	1.40/0.89	2.03/2.05	1.6/1.5	4.0/2.4	1.9/1.9	2.043	9.0
80	c	0.90/0.30	2820/940	1.88/1.08	3.05/3.05	1.5/1.6	4.4/2.9	2.0/2.2	2.517	10.5
90S	a	1.10/0.37	2750/930	2.6/1.3	3.82/3.80	1.8/1.7	3.5/2.7	2.2/2.0	2.210	11.7
90L	a	1.50/0.50	2810/950	3.4/1.7	5.10/5.03	1.8/2.1	3.9/3.2	2.3/2.4	2.843	14.1
90L	b	1.80/0.60	2840/930	4.1/2.1	6.05/6.16	1.8/1.9	4.4/2.9	2.4/2.2	3.327	15.7
100L	a	2.20/0.75	2810/930	5.2/2.2	7.48/7.70	1.7/1.6	3.9/3.0	2.2/2.0	4.637	19.1
100L	b	3.00/1.00	2820/910	6.4/3.1	10.2/10.5	1.8/1.5	4.4/2.6	2.4/1.7	6.034	22.9
112M	b	4.00/1.35	2900/950	8.3/4.0	13.2/13.6	1.9/2.0	5.8/3.9	2.7/2.4	11.08	31.5
132S	b	5.50/1.85	2905/965	11.1/5.2	18.1/18.3	2.3/1.7	6.2/3.7	2.7/2.2	31.79	41.7
132M	b	7.50/2.50	2910/960	14.8/7.1	24.6/24.9	2.1/1.8	6.2/3.8	2.5/2.3	41.60	51.0
XDD Type		2/8 pole - 3000/750 min¹								
71	c	0.33/0.08	2830/680	0.83/0.65	1.11/1.12	2.1/1.7	4.8/2.1	2.5/1.9	1.175	8.2
80	a	0.33/0.08	2830/690	0.83/0.44	1.11/1.11	1.5/1.6	3.2/1.9	2.0/1.8	1.499	7.5
80	b	0.44/0.11	2890/690	1.10/0.73	1.45/1.52	1.6/1.8	4.1/2.0	2.3/2.0	2.043	9.0
80	c	0.60/0.15	2890/690	1.50/0.75	1.98/2.08	1.6/1.6	4.4/2.1	2.5/1.9	2.517	10.5
90S	a	0.75/0.18	2860/680	1.80/0.94	2.50/2.53	2.0/1.7	4.2/2.1	2.7/1.9	2.210	11.7
90L	a	1.00/0.25	2880/690	2.3/1.3	3.32/3.46	2.0/1.7	4.6/2.2	2.4/2.1	2.843	14.1
90L	b	1.20/0.30	2900/700	2.7/1.5	3.95/4.09	2.0/1.9	5.2/2.3	2.8/2.2	3.327	15.7
100L	a	1.50/0.37	2890/700	3.3/1.7	4.96/5.05	1.6/1.8	4.6/2.4	2.4/2.1	4.637	19.1
100L	b	2.00/0.50	2900/700	4.4/2.2	6.59/6.82	1.8/1.7	6.0/2.5	2.8/2.1	6.034	22.9
112M	a	2.60/0.65	2810/710	5.9/2.3	8.84/8.74	1.9/1.5	5.8/3.4	2.0/1.9	13.94	26.2
112M	b	3.20/0.80	2850/710	7.0/2.9	10.7/10.8	2.0/1.6	6.1/3.5	2.1/2.0	16.51	29.2
132S	b	4.40/1.10	2900/720	9.2/3.8	14.5/14.6	2.0/1.5	6.3/3.5	2.3/2.1	31.79	41.7
132M	b	6.00/1.50	2910/720	12.5/5.1	19.7/19.9	2.1/1.6	6.5/3.7	2.5/2.3	41.60	51.0
XDD Type		4/6 pole - 1500/1000 min¹								
71	c	0.25/0.18	1390/890	0.98/0.87	1.72/1.93	1.6/1.5	2.7/2.0	2.1/1.7	1.175	8.1
80	a	0.25/0.18	1420/920	0.72/0.64	1.68/1.87	1.4/1.3	3.9/2.7	2.1/1.8	1.499	7.5
80	b	0.37/0.25	1440/930	1.00/0.87	2.45/2.57	1.5/1.4	4.1/2.9	2.4/2.0	2.043	9.0
80	c	0.55/0.37	1430/920	1.5/1.3	3.67/3.84	1.5/1.4	3.9/2.8	2.2/1.9	2.517	10.5
90S	a	0.75/0.50	1420/920	2.0/1.7	5.04/5.19	1.6/1.5	3.5/2.6	2.2/1.8	2.210	11.8
90L	a	0.90/0.60	1440/940	2.6/2.2	5.97/6.10	2.3/1.8	4.1/2.9	2.8/2.1	2.843	14.2
100L	a	1.10/0.75	1430/910	2.7/2.3	7.35/7.87	2.1/1.5	4.3/2.5	2.6/1.7	4.637	19.3
100L	b	1.50/1.00	1440/920	3.7/3.0	9.95/10.4	2.2/1.6	4.6/2.9	2.8/1.9	6.034	23.2
112M	a	2.20/1.50	1450/950	4.6/3.9	14.5/15.1	1.6/1.6	4.4/4.0	2.3/2.3	13.94	27.5
112M	b	2.60/1.80	1450/960	5.6/4.7	17.1/17.9	1.7/1.6	4.4/4.0	2.3/2.3	16.51	30.6
132S	a	3.00/2.00	1450/960	6.8/5.1	19.8/19.9	1.7/1.5	5.6/4.0	2.7/2.1	24.12	37.5
132S	b	4.00/2.70	1450/960	9.0/6.7	26.3/26.9	1.8/1.5	5.8/4.2	2.9/2.3	31.79	44.2
132M	b	5.50/3.60	1450/960	12.0/9.2	36.2/35.8	1.8/1.6	5.7/4.1	2.9/2.4	41.60	54.3
160M	b	7.50/4.90	1460/960	15.4/11.5	49.1/48.7	2.3/1.9	6.7/4.4	2.7/2.5	89.20	80.3
160L	a	11.0/7.20	1460/960	23.3/17.8	72.0/71.6	2.5/2.1	7.0/4.6	2.8/2.6	120.1	99.5

Mn = Full load torque **Ms** = Locked rotor torque **Mm** = Maximum torque **In** = Rated load current **Is** = Locked rotor current

Two-speed three-phase motors - single winding - Dahlander connection (Star-Star/Star) - for centrifugal machines

TEFC construction – Squirrel cage rotor – Continuous duty S1 – Insulation class F – IP 55 protection

Motor size		Rated output Pn kW	Technical data at rated output V 400 - Hz 50 n min-1	In A	Mn Nm	Direct insertion characteristics Ms/Mn	Is/In	Mm/Mn	Moment of inertia J 10-3 kg.m2	Mass (IM B3) kg
XDV Type 2/4 pole - 3000/1500 min1										
63	**c**	**0.37/0.07**	2780/1400	0.88/0.28	1.27/0.48	1.7/2.5	4.0/3.0	2.1/2.6	0.326	5.0
71	**a**	**0.37/0.07**	2760/1380	1.14/0.44	1.28/0.48	1.8/2.4	3.4/2.3	2.1/2.6	0.342	5.7
71	**b**	**0.55/0.11**	2760/1380	1.70/0.65	1.90/0.76	1.8/2.2	3.5/2.3	2.1/2.5	0.424	6.6
71	**c**	**0.75/0.17**	2780/1380	2.10/0.80	2.58/1.18	1.9/2.2	3.6/2.4	2.0/2.3	0.505	7.6
80	**a**	**0.75/0.17**	2780/1400	1.95/0.65	2.58/1.16	1.9/2.0	4.2/3.3	2.1/2.2	0.704	7.9
80	**b**	**1.10/0.25**	2840/1410	2.50/0.85	3.69/1.69	2.1/2.5	4.4/4.3	2.9/3.2	0.923	9.4
90S	**a**	**1.50/0.35**	2830/1420	3.5/0.9	5.06/2.35	2.3/2.2	4.1/4.0	2.6/2.5	2.210	11.6
90L	**a**	**1.85/0.45**	2850/1430	4.2/1.1	6.20/3.01	2.4/2.3	4.6/4.3	2.7/2.6	2.843	14.1
90L	**b**	**2.20/0.55**	2850/1430	5.0/1.3	7.37/3.67	2.5/2.3	5.0/4.5	2.8/2.6	3.327	16.0
100L	**a**	**3.00/0.75**	2840/1410	6.9/1.7	10.1/5.08	2.3/2.0	4.9/4.8	2.7/2.5	4.637	19.1
100L	**b**	**4.00/1.00**	2850/1420	8.2/2.1	13.4/6.73	2.4/2.1	5.2/4.9	2.7/2.7	6.034	22.9
112M	**b**	**4.80/1.20**	2880/1430	10.0/2.6	15.9/8.01	2.6/2.1	5.8/6.4	2.8/2.5	11.08	31.2
132S	**a**	**5.50/1.50**	2880/1440	11.6/3.4	18.2/9.95	2.0/1.9	4.8/4.5	2.4/2.4	10.03	36.2
132S	**b**	**7.50/2.00**	2910/1450	15.0/4.5	24.6/13.2	2.1/2.1	5.8/5.1	2.7/2.6	12.71	42.2
132M	**a**	**9.20/2.50**	2930/1450	18.4/5.5	30.0/16.5	2.9/2.4	7.7/4.9	3.2/2.5	15.40	49.8
132M	**b**	**11.0/3.00**	2930/1460	22.2/6.6	35.9/19.6	2.6/2.3	7.3/5.5	2.9/2.6	18.10	56.0
160M	**b**	**12.5/3.40**	2940/1450	25.0/8.0	40.6/22.4	2.7/2.8	8.8/6.4	2.7/2.8	42.67	85.5
160L	**a**	**15.0/4.00**	2940/1450	30.0/9.4	48.7/26.3	2.7/2.8	8.9/6.5	2.8/2.8	50.15	97.6
XDV Type 4/8 pole - 1500/750 min1										
71	**b**	**0.37/0.06**	1380/680	1.20/0.46	2.56/0.84	1.4/2.0	3.0/1.8	2.0/2.2	0.800	6.4
80	**a**	**0.55/0.09**	1390/690	1.50/0.57	3.78/1.25	1.4/2.1	3.6/2.3	2.1/2.6	1.499	7.6
80	**b**	**0.75/0.12**	1400/700	2.10/0.96	5.12/1.64	1.6/2.5	3.6/2.3	2.4/3.0	2.043	9.1
90S	**a**	**1.10/0.18**	1390/700	2.8/1.1	7.56/2.46	1.8/2.1	3.3/2.1	2.0/2.3	2.210	13.4
90L	**a**	**1.50/0.25**	1390/700	3.8/1.5	10.3/3.41	2.0/2.6	3.8/2.7	2.3/3.1	2.843	15.8
90L	**b**	**1.85/0.30**	1400/700	4.7/1.8	12.6/4.09	2.1/2.7	3.9/2.8	2.5/3.1	3.327	17.5
100L	**a**	**2.20/0.40**	1400/700	5.3/1.9	15.0/5.46	2.0/2.2	3.7/2.3	2.2/2.1	4.637	21.3
100L	**b**	**3.00/0.55**	1410/710	6.5/2.4	20.3/7.40	2.2/2.3	4.1/2.5	2.4/2.2	6.034	25.0
112M	**a**	**4.00/0.75**	1420/710	8.6/3.2	26.9/10.1	2.0/2.2	4.7/3.1	2.4/2.6	9.550	30.9
112M	**b**	**4.80/0.90**	1420/710	9.8/3.8	32.3/12.1	2.1/2.3	4.8/3.1	2.5/2.6	11.08	33.3
132S	**b**	**5.50/1.10**	1430/720	11.8/3.5	36.7/14.6	2.2/1.9	4.9/3.5	2.5/2.4	31.79	44.3
132M	**b**	**7.50/1.50**	1440/720	15.0/4.5	49.7/19.9	2.3/2.1	5.2/3.7	2.7/2.5	41.60	54.5
160M	**b**	**9.20/1.85**	1450/720	21.4/5.8	60.6/24.5	2.2/2.3	6.8/4.7	2.9/3.0	89.20	80.2
160L	**a**	**12.5/2.50**	1460/720	25.5/7.6	81.8/33.2	2.3/2.3	6.9/4.9	3.1/3.2	120.1	99.5
160L	**b**	**15.0/3.00**	1460/720	30.4/8.8	98.1/39.8	2.3/2.2	7.0/5.0	3.0/3.1	129.0	106
XDV Type 6/12 pole - 1000/500 min1										
80	**b**	**0.25/0.04**	920/450	1.00/0.46	2.60/0.85	1.5/1.6	2.6/1.5	1.8/1.9	2.043	9.0
80	**c**	**0.37/0.05**	930/460	1.25/0.53	3.80/1.04	1.6/2.5	2.9/1.7	2.0/2.8	2.517	10.4
90S	**a**	**0.55/0.08**	900/450	1.80/0.65	5.84/1.70	1.6/1.5	2.4/1.6	1.8/1.6	3.585	11.5
90L	**a**	**0.75/0.11**	900/430	2.45/0.88	7.96/2.44	1.5/1.5	2.4/1.6	1.7/1.5	4.858	14.0
100L	**a**	**1.10/0.16**	930/460	3.2/1.2	11.3/3.32	1.6/2.3	3.4/1.9	1.9/2.4	6.054	17.9
100L	**b**	**1.50/0.22**	920/460	3.9/1.5	15.6/4.57	1.5/2.3	3.5/2.0	1.8/2.4	7.720	21.2
112M	**a**	**1.85/0.28**	940/460	4.8/1.7	18.8/5.81	1.6/2.0	3.6/1.9	1.9/2.1	13.94	26.9
112M	**b**	**2.20/0.33**	940/470	5.7/2.0	22.4/6.71	1.6/2.1	3.7/2.1	2.0/2.3	16.51	30.0
132S	**a**	**2.60/0.40**	950/470	6.8/2.4	26.1/8.13	1.5/2.1	4.5/2.6	2.3/2.5	24.12	36.9
132S	**b**	**3.00/0.45**	960/480	7.8/2.7	29.8/8.95	1.6/2.3	4.7/2.7	2.6/2.7	31.79	43.9
132M	**b**	**4.00/0.60**	960/480	10.2/3.6	39.8/11.9	1.7/2.3	5.0/2.9	2.8/2.8	41.60	53.9
160M	**b**	**5.50/0.85**	960/480	13.6/5.6	54.7/16.9	1.7/3.4	6.1/3.3	3.1/4.1	89.20	79.6
160L	**a**	**7.50/1.20**	960/480	19.2/7.7	74.6/23.9	1.8/3.4	6.2/3.4	3.2/4.3	120.1	98.8

Mn = Full load torque **Ms** = Locked rotor torque **Mm** = Maximum torque **In** = Rated load current **Is** = Locked rotor current

Two-speed three-phase motors - double winding - (Star/Star) connection - for centrifugal machines

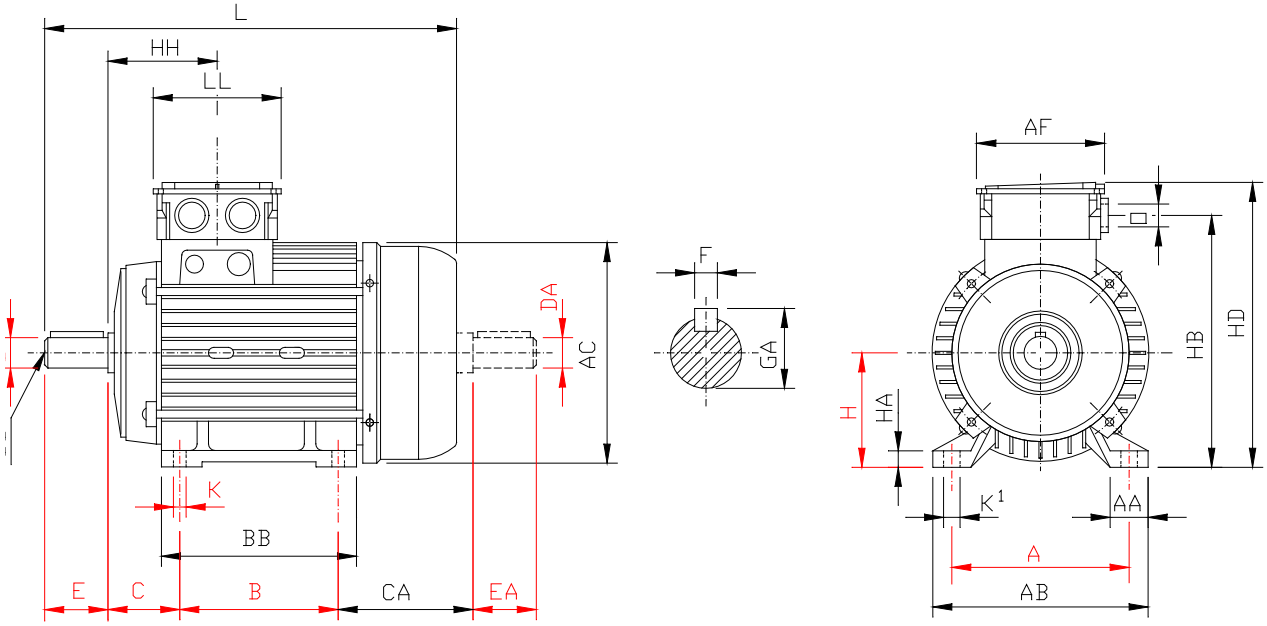
TEFC construction – Squirrel cage rotor – Continuous duty S1 – Insulation class F – IP 55 protection

Motor size		Rated output Pn kW	Technical data at rated output V 400 - Hz 50 n min-1	In A	Mn Nm	Direct insertion characteristics Ms/Mn	Is/In	Mm/Mn	Moment of inertia J 10-3 kg.m2	Mass (IM B3) kg
XDDV Type 4/6 pole - 1500/1000 min1										
71	**b**	**0.25/0.08**	1400/900	0.8/0.4	1.71/0.85	1.7/1.5	3.1/1.9	2.1/1.6	0.800	6.3
71	**c**	**0.37/0.12**	1400/900	1.2/0.6	2.52/1.27	1.8/1.5	3.3/2.1	2.2/1.8	1.175	8.1
80	**a**	**0.37/0.12**	1420/910	1.1/0.4	2.49/1.26	1.2/1.0	3.9//2.3	2.1//1.3	1.499	7.5
80	**b**	**0.55/0.18**	1440/930	1.5/0.6	3.65/1.85	1.3/1.0	4.4/2.5	2.5/1.6	2.043	9.0
80	**c**	**0.75/0.24**	1430/900	2.0/0.8	5.01/2.55	1.7/1.0	4.2/2.3	2.4/1.3	2.517	10.5
90S	**a**	**0.75/0.24**	1430/930	1.9/0.9	5.01/2.46	1.7/1.0	3.8/2.2	2.1/1.4	2.210	13.6
90L	**a**	**1.10/0.35**	1420/930	2.7/1.3	7.40/3.59	2.1/1.3	4.3/2.2	2.4/1.6	2.843	16.0
90L	**b**	**1.50/0.50**	1410/920	3.6/1.6	10.2/5.19	2.1/1.3	4.7/2.2	2.7/1.4	3.327	17.7
100L	**a**	**1.85/0.60**	1420/940	4.4/1.9	12.4/6.10	2.1/1.6	4.8/2.8	2.7/1.9	4.637	21.3
100L	**b**	**2.20/0.70**	1420/940	5.0/2.2	14.8/7.11	2.1/1.7	4.9/2.9	2.3/1.8	6.034	25.1
112M	**a**	**3.00/0.96**	1440/950	6.7/2.7	19.9/9.65	1.9/1.6	5.2/3.3	2.6/1.9	9.550	30.5
132S	**a**	**4.00/1.30**	1420/960	8.6/3.5	26.9/12.9	1.6/1.1	5.2/3.4	2.3/1.9	24.12	37.5
132S	**b**	**5.50/1.80**	1420/960	11.6/4.7	37.0/17.9	1.8/1.1	5.1/3.8	2.2/2.0	31.94	44.6
132M	**b**	**6.50/2.20**	1440/970	13.8/5.8	43.1/21.7	1.9/1.1	5.6/4.0	2.4/2.1	41.60	55.1
160M	**a**	**7.50/2.50**	1440/970	15.0/6.6	49.7/24.6	1.7/1.6	5.1/4.8	2.2/2.5	68.80	68.0
160M	**b**	**9.20/3.10**	1440/970	18.8/8.5	61.0/30.5	1.8/1.6	6.0/5.2	2.5/2.6	89.20	80.3
160L	**a**	**12.5/4.20**	1460/980	24.9/10.0	81.8/40.9	1.9/1.6	7.0/5.7	2.8/2.8	120.1	99.2
XDDV Type 4/8 pole - 1500/750 min1										
80	**a**	**0.37/0.05**	1420/680	1.1/0.4	2.49/0.70	1.2/1.4	3.9/2.2	2.1/1.6	1.499	7.5
80	**b**	**0.55/0.07**	1440/700	1.5/0.6	3.65/0.96	1.3/1.5	4.4/2.3	2.5/1.7	2.043	9.0
80	**c**	**0.75/0.10**	1430/700	2.0/0.8	5.01/1.36	1.7/1.6	4.2/2.3	2.4/1.8	2.517	10.5
90S	**a**	**0.75/0.10**	1430/700	1.9/0.8	5.01/1.36	1.7/1.7	3.8/1.8	2.1/1.8	2.210	11.7
90L	**a**	**1.10/0.15**	1420/700	2.7/1.1	7.40/2.05	2.1/1.8	4.3/1.9	2.4/1.9	2.843	14.2
90L	**b**	**1.50/0.20**	1410/700	3.6/1.5	10.2/2.73	2.1/1.8	4.7/1.9	2.7/1.9	3.327	16.0
100L	**a**	**1.85/0.25**	1420/700	4.4/1.3	12.4/3.41	2.1/1.8	4.8/2.2	2.7/2.3	4.637	18.9
100L	**b**	**2.20/0.30**	1420/700	5.0/1.6	14.8/4.09	2.1/1.9	4.9/2.3	2.3/2.5	6.034	22.7
112M	**a**	**3.00/0.40**	1440/710	6.7/1.6	19.9/5.38	1.9/1.7	5.6/2.6	2.4/1.9	9.550	27.5
132S	**a**	**4.00/0.55**	1420/720	8.6/1.9	26.9/7.30	1.6/1.4	5.2/2.7	2.3/1.9	24.12	37.1
132S	**b**	**5.50/0.75**	1420/720	11.6/2.5	37.0/9.95	1.8/1.1	5.1/2.9	2.2/1.7	31.79	44.1
132M	**b**	**6.50/0.90**	1440/720	13.8/3.0	43.1/11.9	1.9/1.5	5.6/3.0	2.4/2.2	41.60	55.0
160M	**a**	**7.50/1.10**	1440/720	15.0/3.7	49.7/14.6	1.7/1.4	5.1/2.9	2.2/2.1	68.80	68.0
160M	**b**	**9.20/1.30**	1440/720	18.8/4.3	61.0/17.2	1.8/1.5	6.0/3.1	2.5/2.4	89.20	80.3
160L	**a**	**12.5/1.80**	1460/720	24.9/5.7	81.8/23.9	1.9/1.6	7.0/3.2	2.8/2.5	120.1	99.5
XDDV Type 6/8 pole - 1000/750 min1										
80	**b**	**0.25/0.11**	910/690	1.0/0.6	2.62/1.52	1.5/1.3	2.8/1.8	1.8/1.6	2.043	9.0
80	**c**	**0.37/0.16**	920/690	1.4/0.9	3.80/2.21	1.7/1.4	3.1/2.0	1.9/1.7	2.517	10.5
90S	**a**	**0.37/0.16**	920/700	1.1/0.8	3.84/2.18	1.4/1.3	2.9/2.4	1.8/2.1	2.210	11.9
90L	**a**	**0.55/0.25**	900/690	1.7/1.2	5.84/3.46	1.4/1.6	3.0/2.4	1.9/2.2	2.843	13.9
90L	**b**	**0.65/0.30**	910/690	1.9/1.4	6.82/4.15	1.8/1.7	3.3/2.4	2.1/2.1	3.327	15.6
100L	**a**	**0.75/0.37**	940/700	2.7/1.6	7.62/5.05	1.8/1.6	3.7/2.7	2.5/1.9	7.840	18.6
100L	**b**	**1.10/0.55**	950/710	3.6/2.2	11.1/7.40	1.7/1.5	3.6/2.5	2.2/1.8	10.31	22.2
112M	**a**	**1.50/0.70**	950/710	4.2/2.3	15.1/9.42	1.5/1.2	4.8/3.1	2.4/1.6	13.94	27.0
112M	**b**	**1.85/0.85**	960/710	4.8/2.7	18.4/11.4	1.6/1.2	5.2/3.4	2.6/1.8	16.51	29.4
132S	**b**	**2.60/1.30**	970/720	6.5/4.0	25.6/17.2	1.5/1.4	5.3/3.5	2.7/2.1	31.79	43.6
132M	**b**	**3.50/1.70**	970/720	8.8/5.3	34.5/22.5	1.7/1.6	5.5/3.6	2.7/2.1	41.60	53.7
160M	**a**	**4.00/2.00**	960/720	9.8/5.5	39.8/26.5	1.6/1.4	5.1/3.7	2.5/1.9	68.80	68.3
160M	**b**	**5.50/2.70**	970/720	12.4/7.3	54.1/35.8	1.8/1.5	5.3/3.9	2.6/2.1	89.20	80.3
160L	**a**	**7.50/3.70**	970/720	16.8/9.5	73.8/49.1	1.9/1.7	5.4/4.0	2.7/2.1	120.1	99.5

Mn = Full load torque **Ms** = Locked rotor torque **Mm** = Maximum torque **In** = Rated load current **Is** = Locked rotor current

Mounting arrangement IM B3

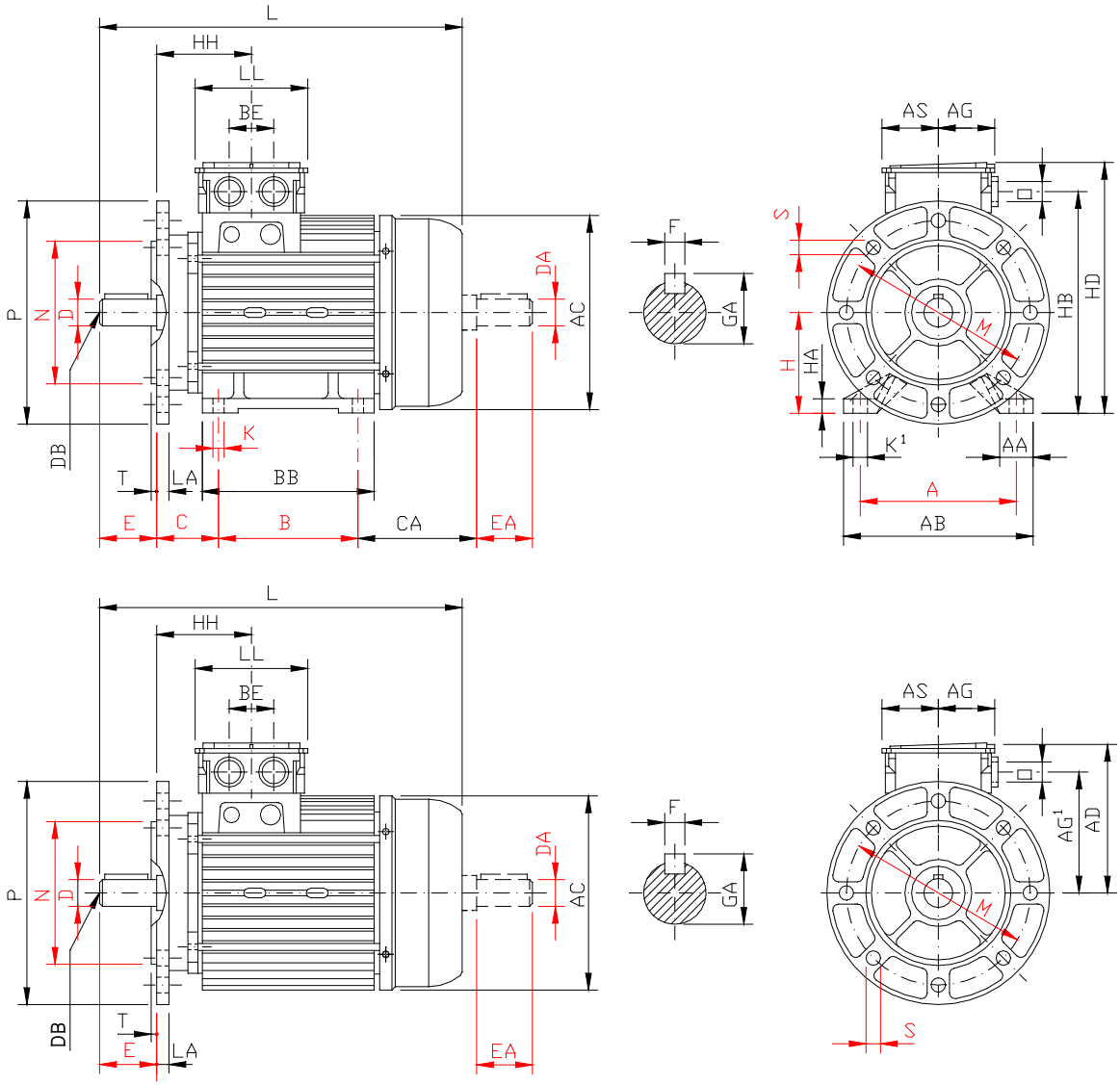
Three-phase motors - **X Type**



Motor size	Coupling									Overall								Shaft end				
	A	AA	AB	**B**	BB	**C**	CA	**H**	K	AC	AF	HB	HD	HH	L	LL	O	**D** **DA**	DB	**E** **EA**	F	GA
56	**90**	18	108	**71**	91	**36**	66	**56**	**7**	110	88	130	155	65	189	88	M16+M20 x 1.5	**9**	M3	**20**	3	10.2
63	**100**	22	120	**80**	100	**40**	73	**63**	**7**	124	88	143	164	68	214	88	M16+M20 x 1.5	**11**	M4	**23**	4	12.5
71	**112**	26	135	**90**	112	**45**	85	**71**	**7**	141	88	161	183	73	247	88	M16+M20 x 1.5	**14**	M5	**30**	5	16
80	**125**	28	152	**100**	124	**50**	95	**80**	**9**	160	102	182	202	82	282	102	M20+M25 x 1.5	**19**	M6	**40**	6	21.5
90S	**140**	30	170	**100**	130	**56**	102	**90**	**9**	180	102	197	219	86	305	102	M20+M25 x 1.5	**24**	M8	**50**	8	27
90L	**140**	30	170	**125**	155	**56**	102	**90**	**9**	180	102	197	219	86	330	102	M20+M25 x 1.5	**24**	M8	**50**	8	27
100L	**160**	35	192	**140**	163	**63**	115	**100**	**12**	200	102	220	241	96	374	102	M20+M25 x 1.5	**28**	M10	**60**	8	31
112M	**190**	40	220	**140**	183	**70**	130	**112**	**12**	224	134	255	280	106	395	134	M32+M32 x 1.5	**28**	M10	**60**	8	31
132S	**216**	44	260	**140**	180	**89**	158	**132**	**12**	260	134	303	328	114	460	134	M32+M32 x 1.5	**38**	M12	**80**	10	41
132M	**216**	44	260	**178**	218	**89**	158	**132**	**12**	260	134	303	328	114	498	134	M32+M32 x 1.5	**38**	M12	**80**	10	41
160M	**254**	65	319	**210**	261	**108**	188	**160**	**14**	310	176	360	395	148	608	176	M32+M32 x 1.5	**42**	M16	**110**	12	45
160L	**254**	65	319	**254**	305	**108**	188	**160**	**14**	310	176	360	395	148	652	176	M32+M32 x 1.5	**42**	M16	**110**	12	45

Mounting arrangement IM B35 - IM B5

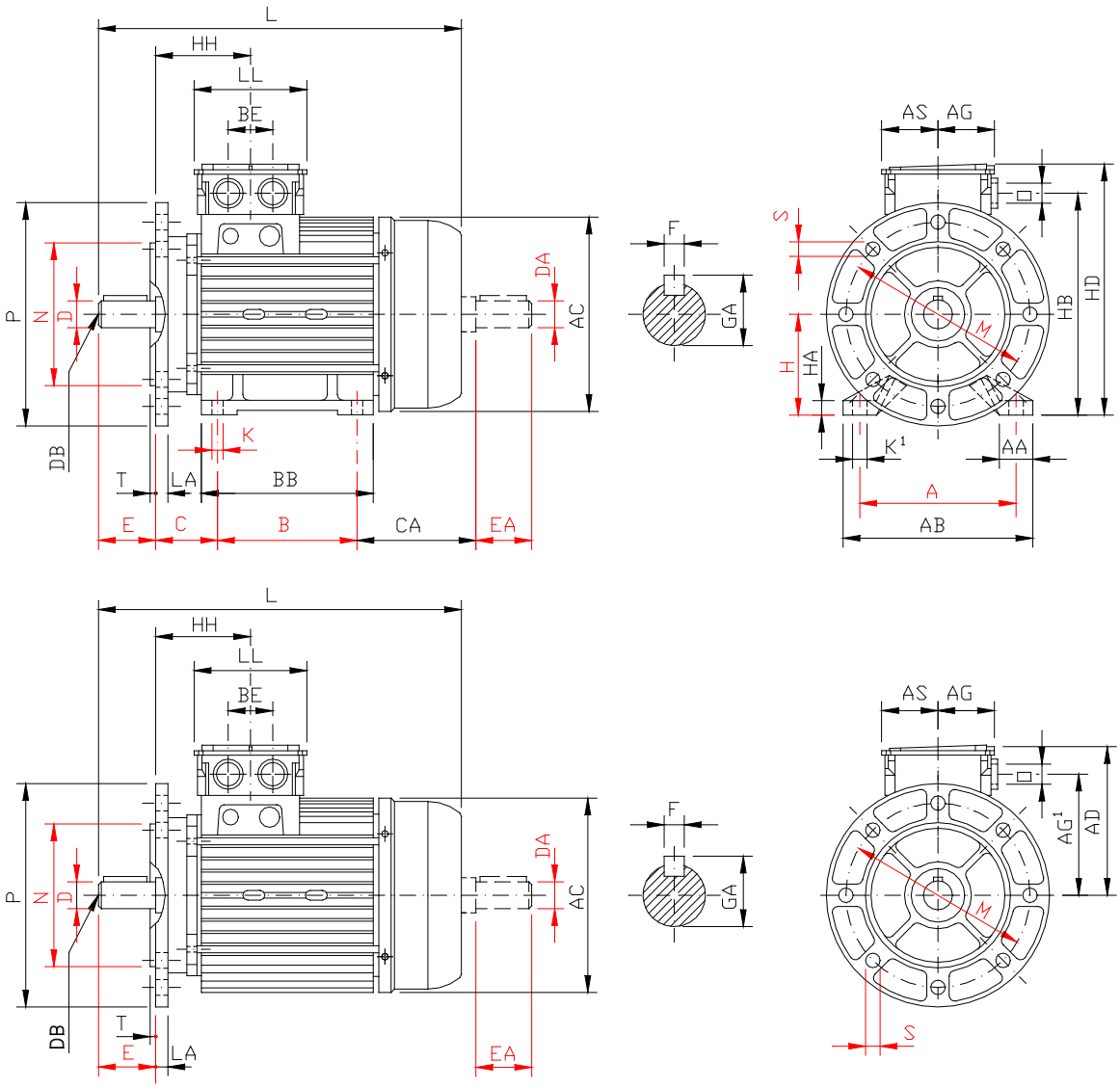
Three-phase motors - **X Type**



Motor size	Overall dimensions											
	AC	AD	AG	AG¹	AS	BE	HB	HD	HH	L	LL	O
56	110	99	44	74	44	34	130	155	65	189	88	M16+M20 x 1.5
63	124	101	44	80	44	34	143	164	68	214	88	M16+M20 x 1.5
71	141	112	44	90	44	34	161	183	73	247	88	M16+M20 x 1.5
80	160	125	51	102	51	39	182	205	82	282	102	M20+M25 x 1.5
90S	180	129	51	107	51	39	197	219	86	305	102	M20+M25 x 1.5
90L	180	129	51	107	51	39	197	219	86	330	102	M20+M25 x 1.5
100L	200	141	51	120	51	39	220	241	96	374	102	M20+M25 x 1.5
112M	224	168	67	143	67	45	255	280	106	395	134	M32+M32 x 1.5
132S	260	196	67	171	67	45	303	328	114	460	134	M32+M32 x 1.5
132M	260	196	67	171	67	45	303	328	114	498	134	M32+M32 x 1.5
160M	310	235	88	200	88	55	360	395	148	608	176	M32+M32 x 1.5
160L	310	235	88	200	88	55	360	395	148	652	176	M32+M32 x 1.5

Mounting arrangement IM B35 - IM B5

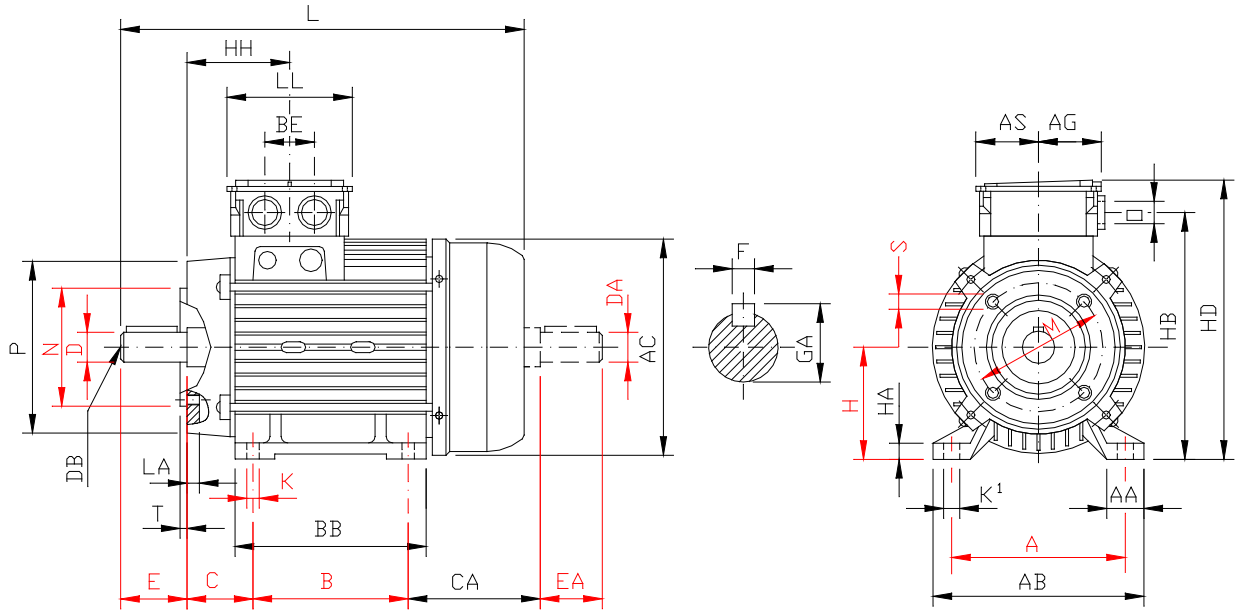
Three-phase motors - **X Type**

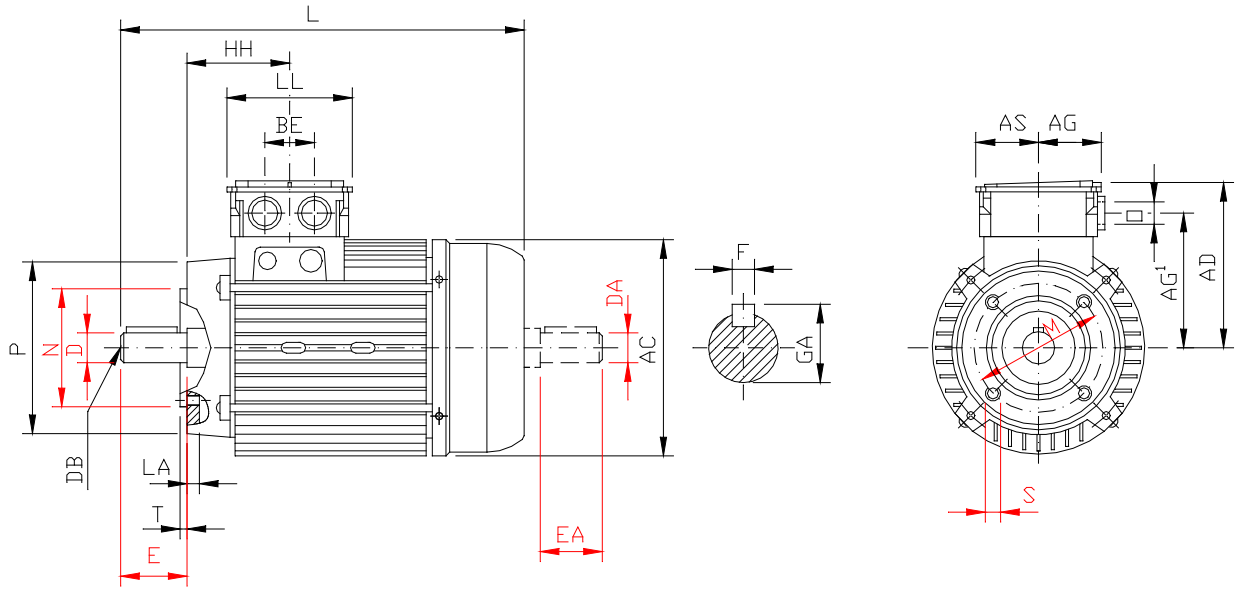


Motor size	Coupling											Shaft end									
	A	AA	AB	**B**	BB	**C**	CA	**H**	HA	**K**	K¹	LA	**M**	**N**	P	**S**	T	**D** **DA**	DB	**E** **EA**	F	GA
56	**90**	18	108	**71**	91	**36**	66	**56**	7	**7**	9	8	**100**	**80**	120	**7**	2.5	**9**	M3	**20**	3	10.2
63	**100**	22	120	**80**	100	**40**	73	**63**	7	**7**	10	8	**115**	**95**	140	**9**	3	**11**	M4	**23**	4	12.5
71	**112**	26	135	**90**	112	**45**	85	**71**	8	**7**	12	8	**130**	**110**	160	**9**	3.5	**14**	M5	**30**	5	16
80	**125**	28	152	**100**	124	**50**	95	**80**	11	**9**	13	9	**165**	**130**	200	**11**	3.5	**19**	M6	**40**	6	21.5
90S	**140**	30	170	**100**	130	**56**	102	**90**	13	**9**	13	10	**165**	**130**	200	**11**	3.5	**24**	M8	**50**	8	27
90L	**140**	30	170	**125**	155	**56**	102	**90**	13	**9**	13	10	**165**	**130**	200	**11**	3.5	**24**	M8	**50**	8	27
100L	**160**	35	192	**140**	163	**63**	115	**100**	14	**12**	17	11	**215**	**180**	250	**14**	4	**28**	M10	**60**	8	31
112M	**190**	40	220	**140**	183	**70**	130	**112**	14	**12**	19	12	**215**	**180**	250	**14**	4	**28**	M10	**60**	8	31
132S	**216**	44	260	**140**	180	**89**	158	**132**	16	**12**	22	18	**265**	**230**	300	**14**	4	**38**	M12	**80**	10	41
132M	**216**	44	260	**178**	218	**89**	158	**132**	16	**12**	22	18	**265**	**230**	300	**14**	4	**38**	M12	**80**	10	41
160M	**254**	65	319	**210**	261	**108**	188	**160**	20	**14**	24	14	**300**	**250**	350	**18**	5	**42**	M16	**110**	12	45
160L	**254**	65	319	**254**	305	**108**	188	**160**	20	**14**	24	14	**300**	**250**	350	**18**	5	**42**	M16	**110**	12	12.5

Mounting arrangement IM B34 - IM B14

Three-phase motors - **X Type**

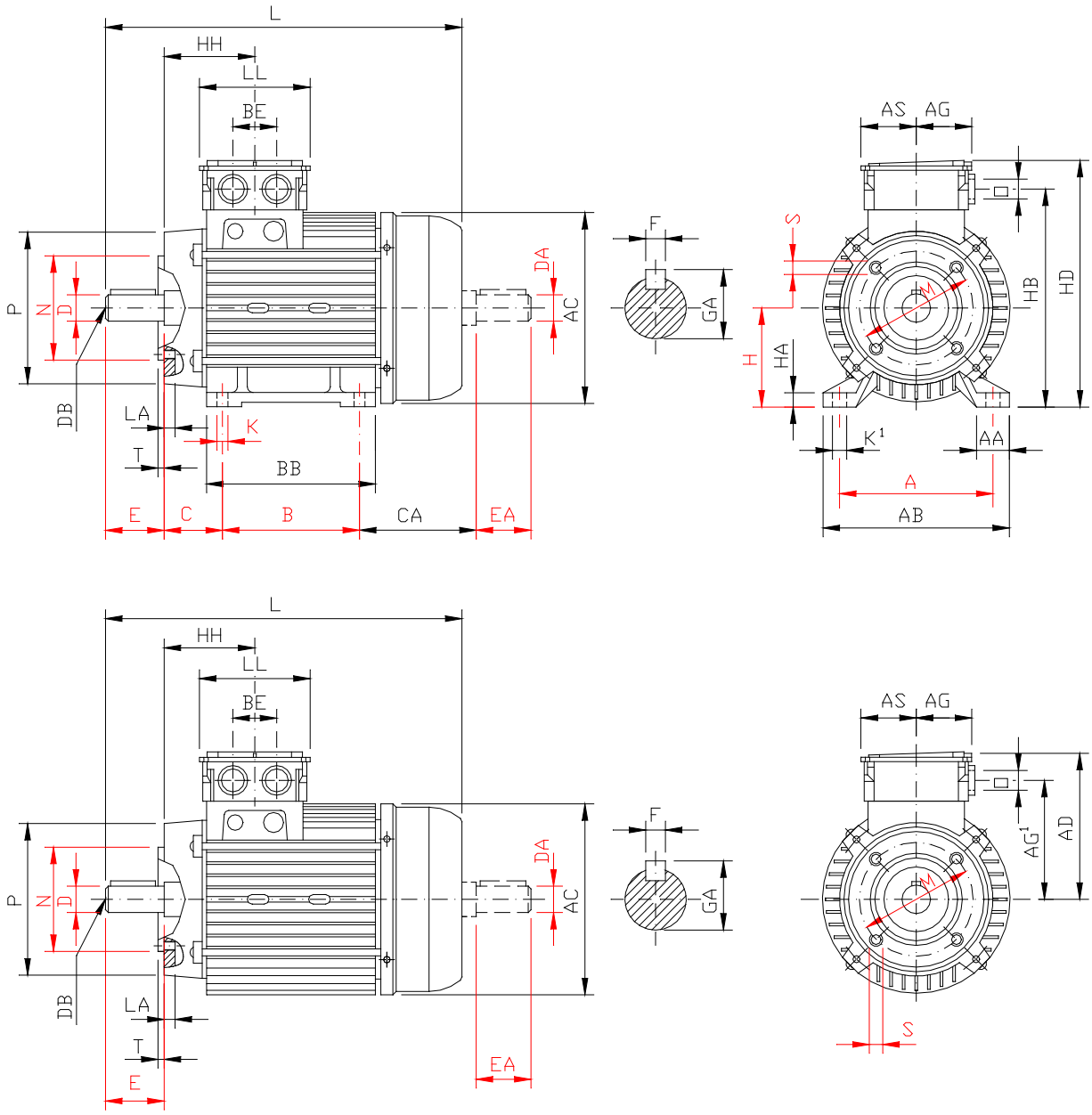




Motor size	Overall dimensions											
	AC	AD	AG	AG1	AS	BE	HB	HD	HH	L	LL	O
56	110	99	44	74	44	34	130	155	65	189	88	M16+M20 x 1.5
63	124	101	44	80	44	34	143	164	68	214	88	M16+M20 x 1.5
71	141	112	44	90	44	34	161	183	73	247	88	M16+M20 x 1.5
80	160	125	51	102	51	39	182	205	82	282	102	M20+M25 x 1.5
90S	180	129	51	107	51	39	197	219	86	305	102	M20+M25 x 1.5
90L	180	129	51	107	51	39	197	219	86	330	102	M20+M25 x 1.5
100L	200	141	51	120	51	39	220	241	96	374	102	M20+M25 x 1.5
112M	224	168	67	143	67	45	255	280	106	395	134	M32+M32 x 1.5
132S	260	196	67	171	67	45	303	328	114	460	134	M32+M32 x 1.5
132M	260	196	67	171	67	45	303	328	114	498	134	M32+M32 x 1.5
160M	310	235	88	200	88	55	360	395	148	608	176	M32+M32 x 1.5
160L	310	235	88	200	88	55	360	395	148	652	176	M32+M32 x 1.5

Mounting arrangement IM B34 - IM B14

Three-phase motors - **X Type**

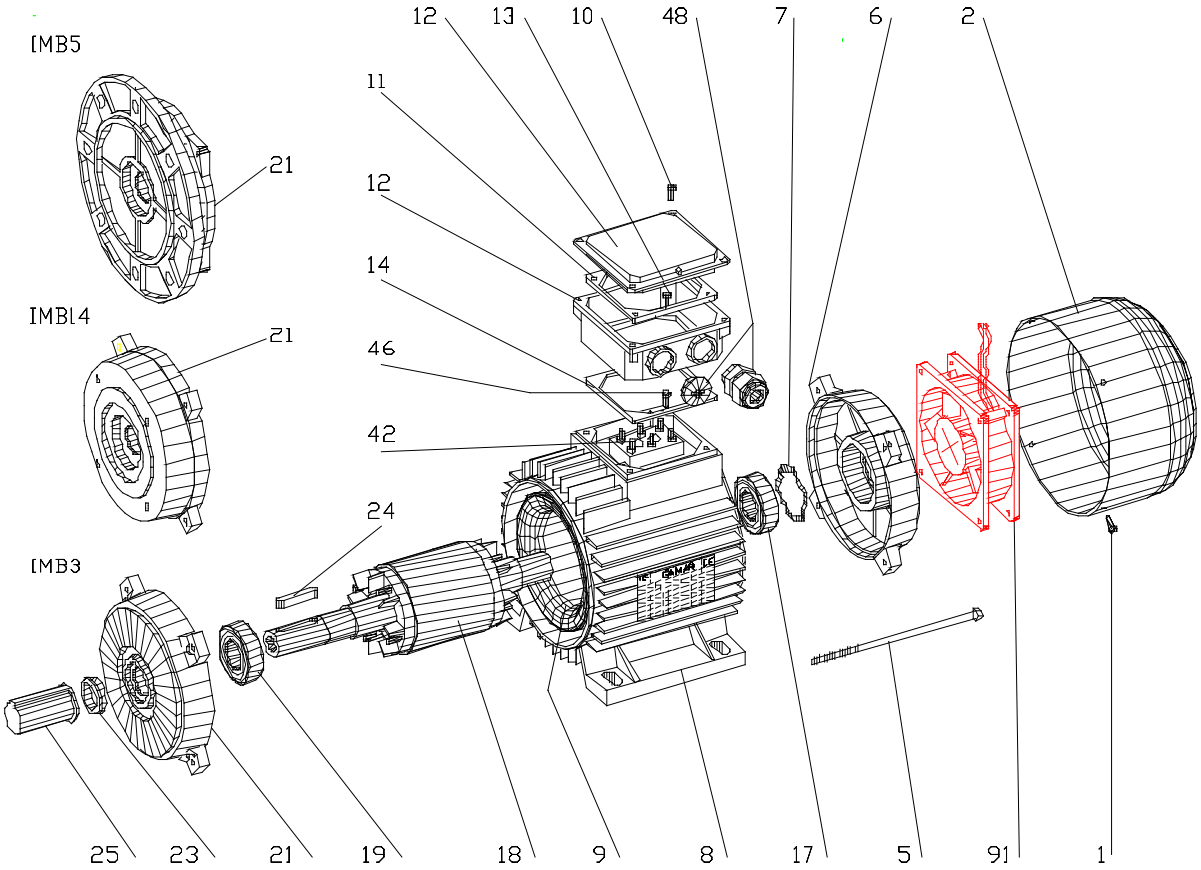


Motor size	Coupling											Shaft end									
	A	AA	AB	**B**	BB	**C**	CA	**H**	HA	**K**	K^1	LA	**M**	**N**	P	**S**	T	**D** **DA**	DB	**E** **EA**	F	GA
56	**90**	18	108	**71**	91	**36**	66	**56**	7	**7**	9	7	**65**	**50**	80	**M5**	2.5	**9**	M3	**20**	3	10.2
63	**100**	22	120	**80**	100	**40**	73	**63**	7	**7**	10	7	**75**	**60**	90	**M5**	2.5	**11**	M4	**23**	4	12.5
71	**112**	26	135	**90**	112	**45**	85	**71**	8	**7**	12	8	**85**	**70**	105	**M6**	2.5	**14**	M5	**30**	5	16
80	**125**	28	152	**100**	124	**50**	95	**80**	11	**9**	13	17	**100**	**80**	120	**M6**	3	**19**	M6	**40**	6	21.5
90S	**140**	30	170	**100**	130	**56**	102	**90**	13	**9**	13	10	**115**	**95**	140	**M8**	3	**24**	M8	**50**	8	27
90L	**140**	30	170	**125**	155	**56**	102	**90**	13	**9**	13	10	**115**	**95**	140	**M8**	3	**24**	M8	**50**	8	27
100L	**160**	35	192	**140**	163	**63**	115	**100**	14	**12**	17	10	**130**	**110**	160	**M8**	3.5	**28**	M10	**60**	8	31
112M	**190**	40	220	**140**	183	**70**	130	**112**	14	**12**	19	13	**130**	**110**	160	**M8**	3.5	**28**	M10	**60**	8	31
132S	**216**	44	260	**140**	180	**89**	158	**132**	16	**12**	22	15	**165**	**130**	200	**M10**	3.5	**38**	M12	**80**	10	41
132M	**216**	44	260	**178**	218	**89**	158	**132**	16	**12**	22	15	**165**	**130**	200	**M10**	3.5	**38**	M12	**80**	10	41
160M	**254**	65	319	**210**	261	**108**	188	**160**	20	**14**	24	18	**215**	**180**	250	**M12**	4	**42**	M16	**110**	12	45
160L	**254**	65	319	**254**	305	**108**	188	**160**	20	**14**	24	18	**215**	**180**	250	**M12**	4	**42**	M16	**110**	12	12.5

Asynchronous three-phase forced ventilated motors

Three-phase motor - WP_ Type

With forced ventilation Papst

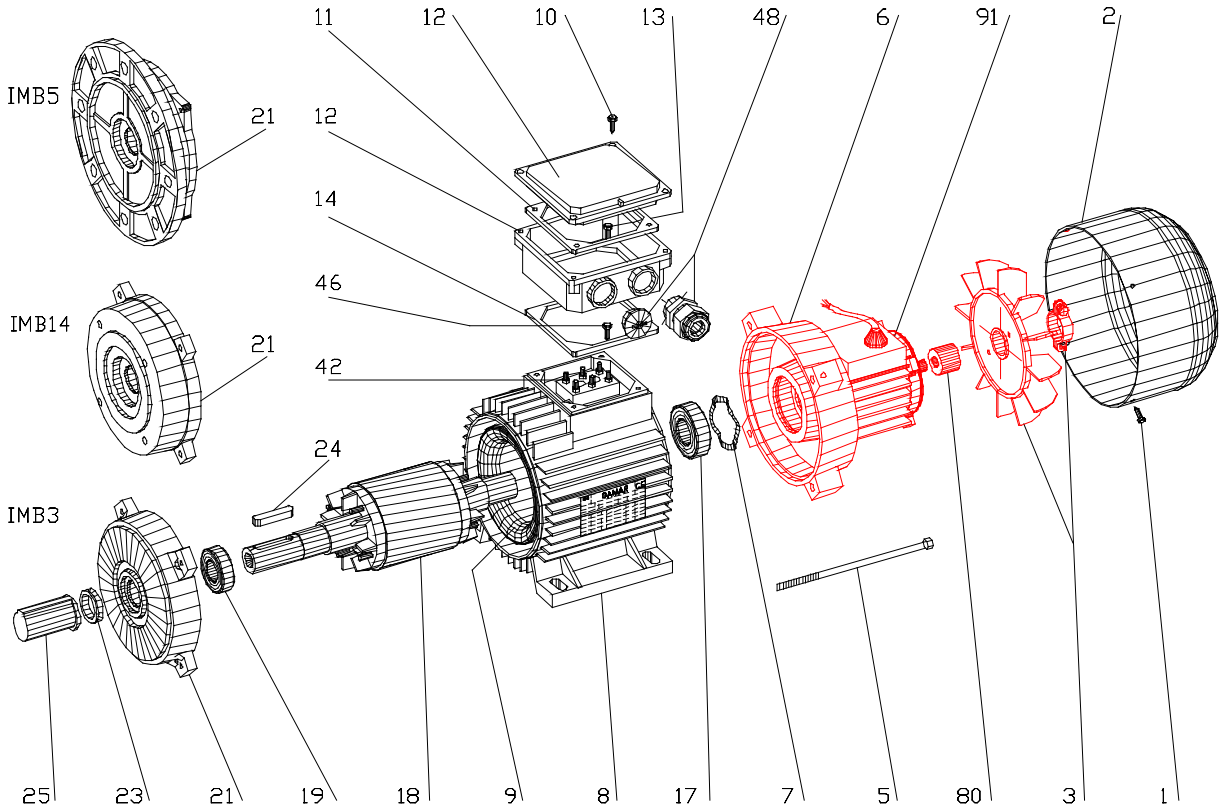


Spare parts nomenclature

1. Screw for fan cover
2. Fan cover
5. Rod
6. N-end shield
7. Spring ring
8. Frame
9. Stator package
10. Screw for terminal box cover
11. Gasket for terminal box cover
12. Terminal box
13. Screw for terminal box
14. Gasket for terminal box
17. Rear bearing
18. Rotor
19. Front bearing
21. D-end shield/flange
23. Sealing ring
24. Key
25. Shaft cap
42. Terminal board
46. Grounding screw
48. Cable gland
91. Motor for axial forced ventilation

Three-phase motor – WS_ Type

With forced three-phase ventilation



Spare parts nomenclature

1. Screw for fan cover
2. Fan cover
3. Fan
5. Rod
6. N-end shield
7. Spring ring
8. Frame
9. Stator package
10. Screw for terminal box cover
11. Gasket for terminal box cover
12. Terminal box
14. Gasket for terminal box
17. Rear bearing
18. Rotor
19. Front bearing
21. D-end shield/flange
23. Sealing ring
24. Key
25. Shaft cap
42. Terminal board
46. Grounding screw
48. Cable gland
80. Fan adapter
91. Motor for axial forced ventilation

Three-phase motors - High Efficiency (IE2) - with forced ventilation Papst

TEFC construction – Squirrel cage rotor – Continuous duty S1 – Insulation class F – IP 55 protection
IP 20 forced ventilation protection

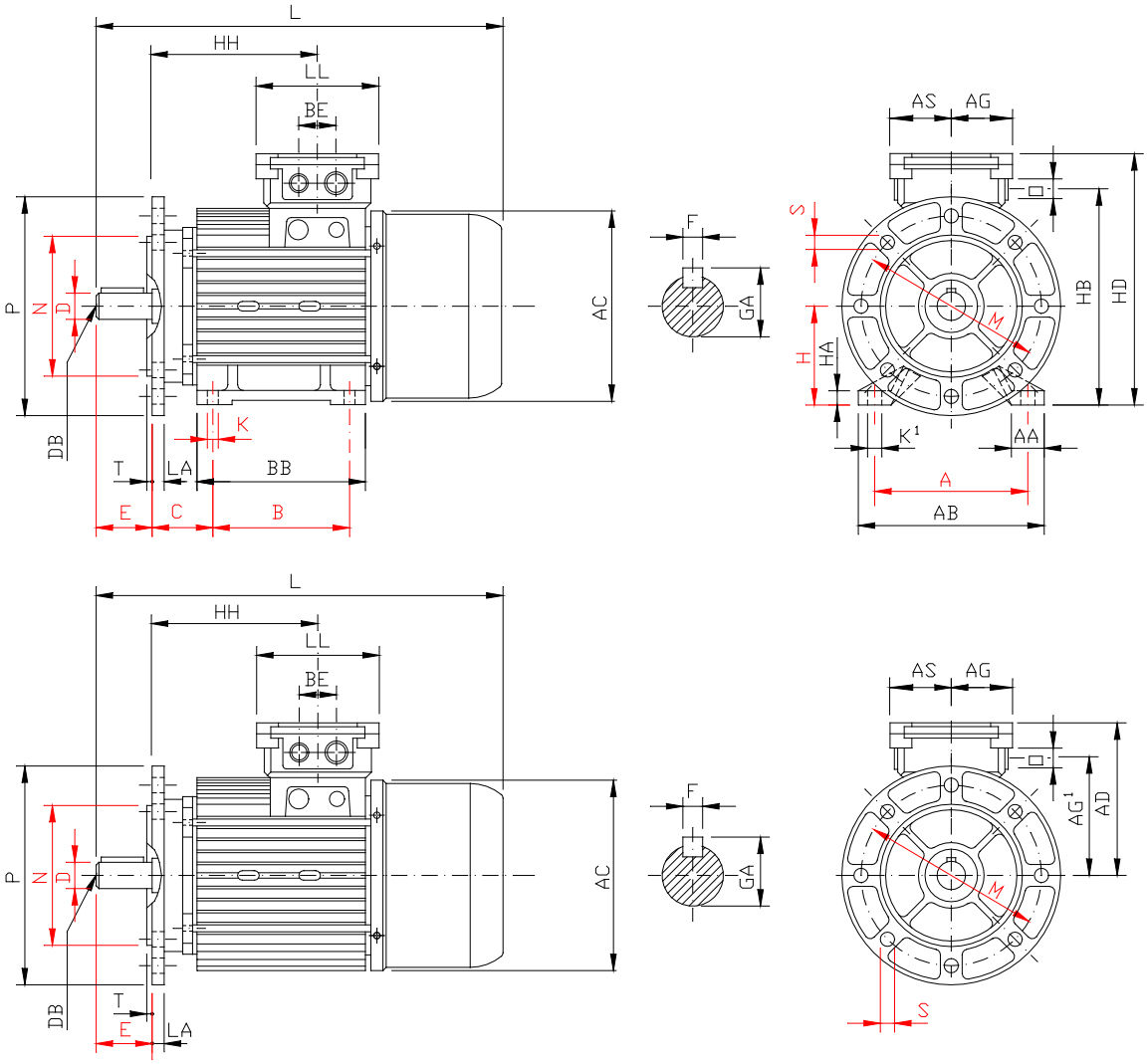
Method of determining the efficiency: IEC 60034-2-1; 2014

Motor size		Rated output Pn	Technical data at rated output V 400 - Hz 50 n	In	IE2 η 50 %	75 %	100 %	cos φ	Mn	Direct insertion characteristics Ms/Mn	Is/In	Mm/Mn	Moment of inertia J	Mass (IM B3)
		kW	min-1	A					Nm				10-3 kg.m2	kg
WPH Type 2 pole - 3000 min1														
63	**a**	**0.18**	2815	0.49	64.2	69.5	70.5	0.76	0.62	2.9	4.7	2.9	0.129	4.3
63	**b**	**0.25**	2800	0.64	68.1	71.6	71.7	0.81	0.89	2.9	5.0	3.1	0.162	4.9
63	**c**	**0.37**	2825	0.91	69.7	73.9	74.2	0.80	1.26	3.4	5.6	3.2	0.206	5.6
71	**a**	**0.37**	2820	0.95	68.6	73.6	74.4	0.75	1.24	3.3	5.5	3.4	0.342	6.3
71	**b**	**0.55**	2815	1.38	71.6	74.9	75.3	0.77	1.87	3.5	5.7	3.4	0.424	7.2
WPH Type 4 pole - 1500 min1														
63	**b**	**0.12**	1370	0.41	55.6	61.8	63.1	0.67	0.85	2.1	3.0	2.3	0.263	4.8
63	**c**	**0.18**	1380	0.61	58.8	64.9	66.0	0.65	1.25	2.4	3.3	2.6	0.326	5.6
71	**b**	**0.25**	1380	0.68	66.5	69.5	68.7	0.76	1.73	2.1	3.8	2.3	0.800	6.9
71	**c**	**0.37**	1415	1.08	65.6	71.3	72.8	0.68	2.51	3.0	4.8	3.3	1.175	8.8
80	**a**	**0.55**	1415	1.26	76.3	78.6	78.3	0.79	3.67	2.4	5.4	2.8	2.157	10.3
WPH Type 6 pole - 1000 min1														
71	**b**	**0.12**	905	0.52	44.3	51.5	54.1	0.63	1.28	2.1	2.6	2.3	0.800	6.3
71	**c**	**0.18**	890	0.66	51.2	57.0	57.1	0.68	1.96	1.9	2.6	2.1	1.175	8.0
80	**b**	**0.25**	935	0.77	64.0	68.9	70.4	0.66	2.54	2.6	4.1	2.8	2.043	9.0
80	**c**	**0.37**	940	1.10	64.1	70.0	71.5	0.68	3.78	2.8	4.4	3.0	2.517	10.8
90S	**a**	**0.55**	935	1.42	72.5	75.4	75.1	0.74	5.63	2.1	4.3	2.5	4.148	13.0

Mn = Full load torque **Ms** = Locked rotor torque **Mm** = Maximum torque **In** = Rated load current **Is** = Locked rotor current

Mounting arrangement IM B35 - IM B5

Three-phase motors **WP_ Type – with forced ventilation Papst**



Motor size	Overall dimensions											
	AC	AD	AG	AG¹	AS	BE	HB	HD	HH	L	LL	O
63	123	101	44	80	44	34	143	164	89	236	88	M16+M20 x 1.5
71	138	112	44	90	44	34	161	183	103	263	88	M16+M20 x 1.5
80	156	125	51	102	51	39	182	202	117	296	102	M20+M25 x 1.6
90S	176	129	51	107	51	39	197	219	127	320	102	M20+M25 x 1.5
90L	176	129	51	107	51	39	197	219	152	345	102	M20+M25 x 1.5
100L	194	141	51	120	51	39	220	241	171	391	102	M20+M25 x 1.5
112M	220	168	67	143	67	45	255	280	175	405	134	M32+M32 x 1.5

Three-phase motors - Premium Efficiency (IE3) - with forced ventilation Papst

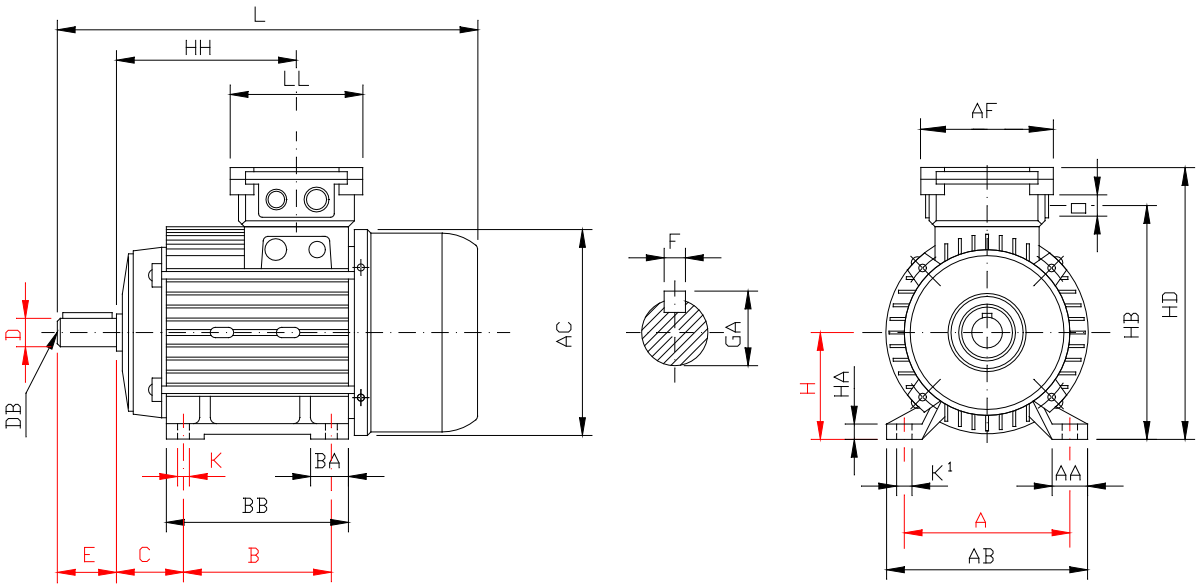
TEFC construction – Squirrel cage rotor – Continuous duty S1 – Insulation class F – IP 55 protection
IP 20 forced ventilation protection

Motor size		Rated output Pn kW	Technical data at rated output V 400 - Hz 50 n min-1	In A	IE2 η 50 %	75 %	100 %	cos φ	Mn Nm	Direct insertion characteristics Ms/Mn	Is/In	Mm/Mn	Moment of inertia J 10-3 kg.m2	Mass (IM B3) kg
WPP Type 2 poli - 3000 min-1														
71	**d**	**0.75**	2820	1.84	74.9	78.1	80.7*	0.75	2.53	4.0	6.1	3.9	0.505	8.3
80	**a**	**0.75**	2845	1.64	81.9	83.2	82.5	0.80	2.52	3.3	6.6	3.4	0.850	9.7
80	**b**	**1.1**	2865	2.36	83.9	85.3	84.8	0.80	3.68	3.7	7.4	3.6	1.129	11.7
80	**c**	**1.5**	2830	3.4	81.7	82.9	84.2*	0.79	5.07	3.3	6.4	3.4	1.129	11.7
90S	**a**	**1.5**	2900	3.1	82.3	84.7	84.8	0.82	5.01	3.3	7.9	3.6	1.469	14.6
90S	**b**	**1.8**	2870	3.7	83.7	84.6	85.0*	0.85	5.99	2.6	6.6	2.8	1.469	14.6
90L	**a**	**2.2**	2890	4.5	85.7	86.8	86.2	0.84	7.38	3.1	8.1	3.6	1.888	17.6
90L	**b**	**2.6**	2850	5.2	86.4	86.4	86.5*	0.87	8.80	2.8	6.6	3.0	1.888	17.6
100L	**a**	**3**	2900	5.7	88.7	89.2	88.3	0.87	9.93	2.8	7.7	3.4	3.542	23.8
100L	**b**	**4**	2875	7.9	88.1	88.1	88.1*	0.85	13.4	2.6	7.2	3.2	3.542	23.8
112M	**a**	**4**	2920	7.3	86.6	88.4	88.6	0.88	12.9	3.9	9.9	5.5	5.191	29.6
112M	**b**	**4.7**	2925	9.3	86.7	88.9	89.4	0.81	15.2	5.1	11.7	5.8	6.336	32.9
112M	**c**	**5.5**	2910	10.5	87.6	88.9	89.2*	0.84	18.1	4.3	9.9	6.3	6.336	32.9
WPP Type 4 poli - 1500 min-1														
80	**c**	**0.75**	1425	1.70	78.6	81.2	82.5*	0.79	5.02	3.0	6.4	3.5	2.789	12.2
90S	**r**	**0.75**	1440	1.77	81.0	83.5	83.8	0.73	4.96	3.0	6.2	3.5	2.566	14
90S	**a**	**1.1**	1425	2.6	80.8	82.8	84.1*	0.75	7.37	2.4	5.2	2.9	2.566	14.1
90L	**r**	**1.1**	1440	2.5	82.8	85.1	85.3	0.73	7.26	3.1	6.6	3.7	3.327	16.9
90L	**a**	**1.5**	1425	3.4	82.8	84.4	85.3*	0.76	10.1	2.7	5.8	3.2	3.327	17
100L	**r**	**1.5**	1445	3.3	83.9	86.1	86.1	0.75	9.90	2.8	6.1	3.6	5.036	21.3
100L	**s**	**1.8**	1455	4.1	83.1	85.9	86.5	0.70	11.6	3.3	7.4	4.3	6.446	25.3
100L	**c**	**2.2**	1440	4.9	85.0	86.8	86.7	0.76	14.5	3.0	6.6	3.6	6.446	25.4
112M	**s**	**2.6**	1460	5.6	85.6	88.0	88.5	0.75	16.9	3.2	8.0	4.1	11.08	32.7
112M	**a**	**3.7**	1450	7.8	87.4	88.8	88.5	0.77	24.2	2.9	7.4	3.8	12.29	35.5
112M	**b**	**4**	1440	8.0	87.3	88.1	88.6*	0.82	26.3	2.4	6.5	3.1	11.08	35.5
WPP Type 6 poli - 1000 min-1														
90L	**b**	**0.75**	935	2.0	75.4	78.2	78.9*	0.72	7.83	2.3	4.7	2.9	5.421	16.6
100L	**r**	**0.75**	950	2.0	75.0	78.5	79.2	0.67	7.54	2.9	5.3	3.5	8.032	19.3
100L	**a**	**1.1**	950	2.8	78.8	82.0	82.0	0.70	11.1	2.7	5.7	3.5	10.59	23.3
100L	**b**	**1.5**	940	3.7	78.5	80.6	82.5*	0.74	15.3	2.3	5.1	3.0	10.59	23.8
112M	**a**	**1.5**	965	3.6	80.9	83.3	83.5	0.73	14.9	1.7	5.7	3.0	16.51	31.3
112M	**b**	**1.8**	965	4.2	81.4	83.5	83.4	0.73	17.8	1.7	5.5	2.9	16.51	31.3
112M	**c**	**2.2**	960	5.3	80.2	82.5	84.3*	0.73	21.8	1.6	5.4	2.8	16.51	31.3

Mn = Full load torque **Ms** = Locked rotor torque **Mm** = Maximum torque **In** = Rated load current **Is** = Locked rotor current

Mounting arrangement IM B3

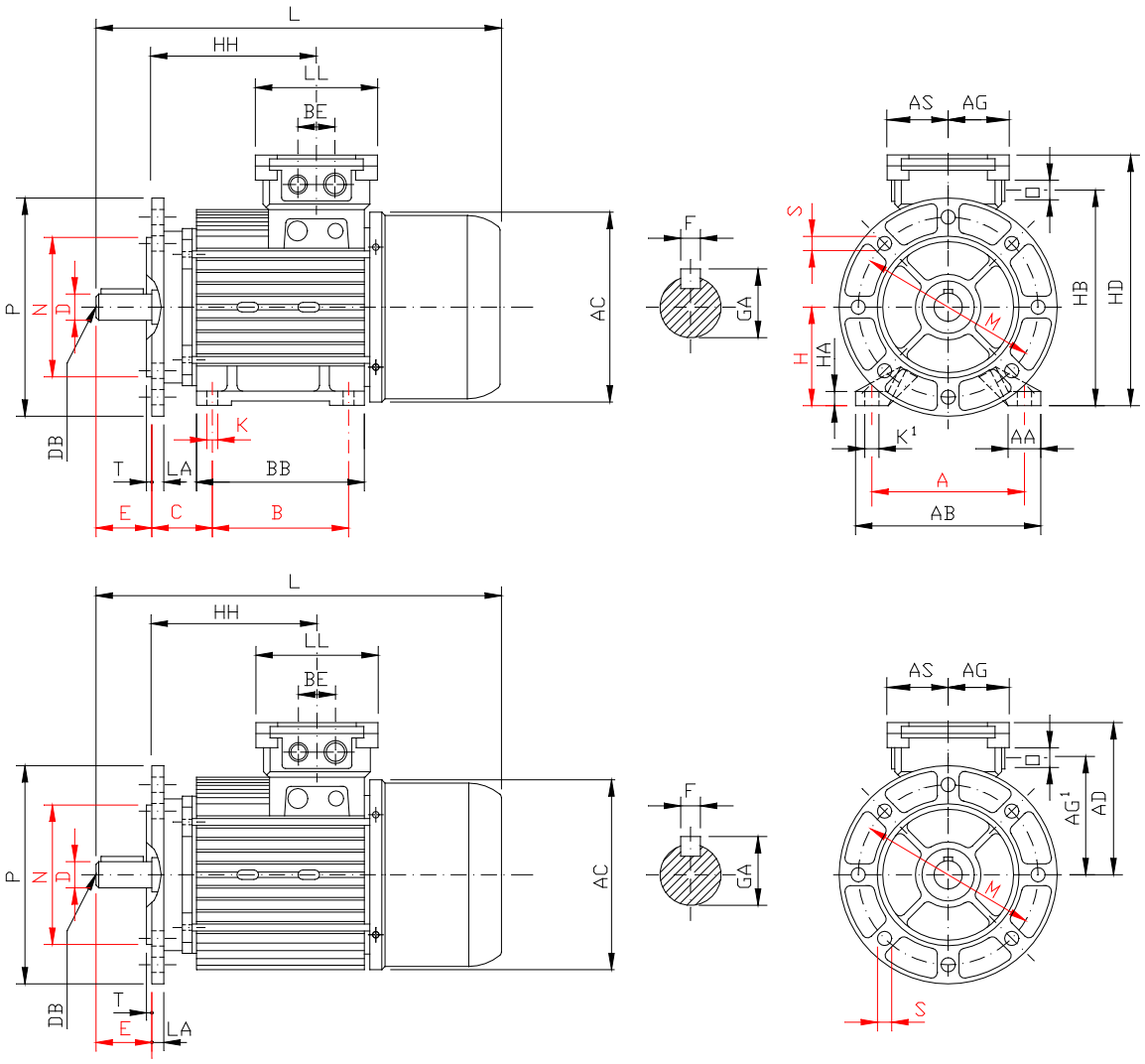
Three-phase motors **WP_ Type – with forced ventilation Papst**



Motor size	Coupling									Overall								Shaft end				
	A	AA	AB	**B**	BA	BB	**C**	**H**	K	AC	AF	HB	HD	HH	L	LL	O	**D**	DB	**E**	F	GA
63	**100**	22	120	**80**	23	100	**40**	**63**	**7**	123	88	143	164	89	236	88	M16+M20 x 1.5	**11**	M4	**23**	4	12.5
71	**112**	26	135	**90**	25	112	**45**	**71**	**7**	138	88	161	183	103	263	88	M16+M20 x 1.5	**14**	M5	**30**	5	16
80	**125**	28	152	**100**	30	124	**50**	**80**	**9**	156	102	182	202	117	296	102	M20+M25 x 1.5	**19**	M6	**40**	6	21.5
90S	**140**	30	170	**100**	32	130	**56**	**90**	**9**	176	102	197	219	127	320	102	M20+M25 x 1.5	**24**	M8	**50**	8	27
90L	**140**	30	170	**125**	32	155	**56**	**90**	**9**	176	102	197	219	152	345	102	M20+M25 x 1.5	**24**	M8	**50**	8	27
100L	**160**	35	192	**140**	35	163	**63**	**100**	**12**	194	102	220	241	171	391	102	M20+M25 x 1.5	**28**	M10	**60**	8	31
112M	**190**	40	220	**140**	40	183	**70**	**112**	**12**	220	134	255	280	175	405	134	M32+M32 x 1.5	**28**	M10	**60**	8	31

Mounting arrangement IM B35 - IM B5

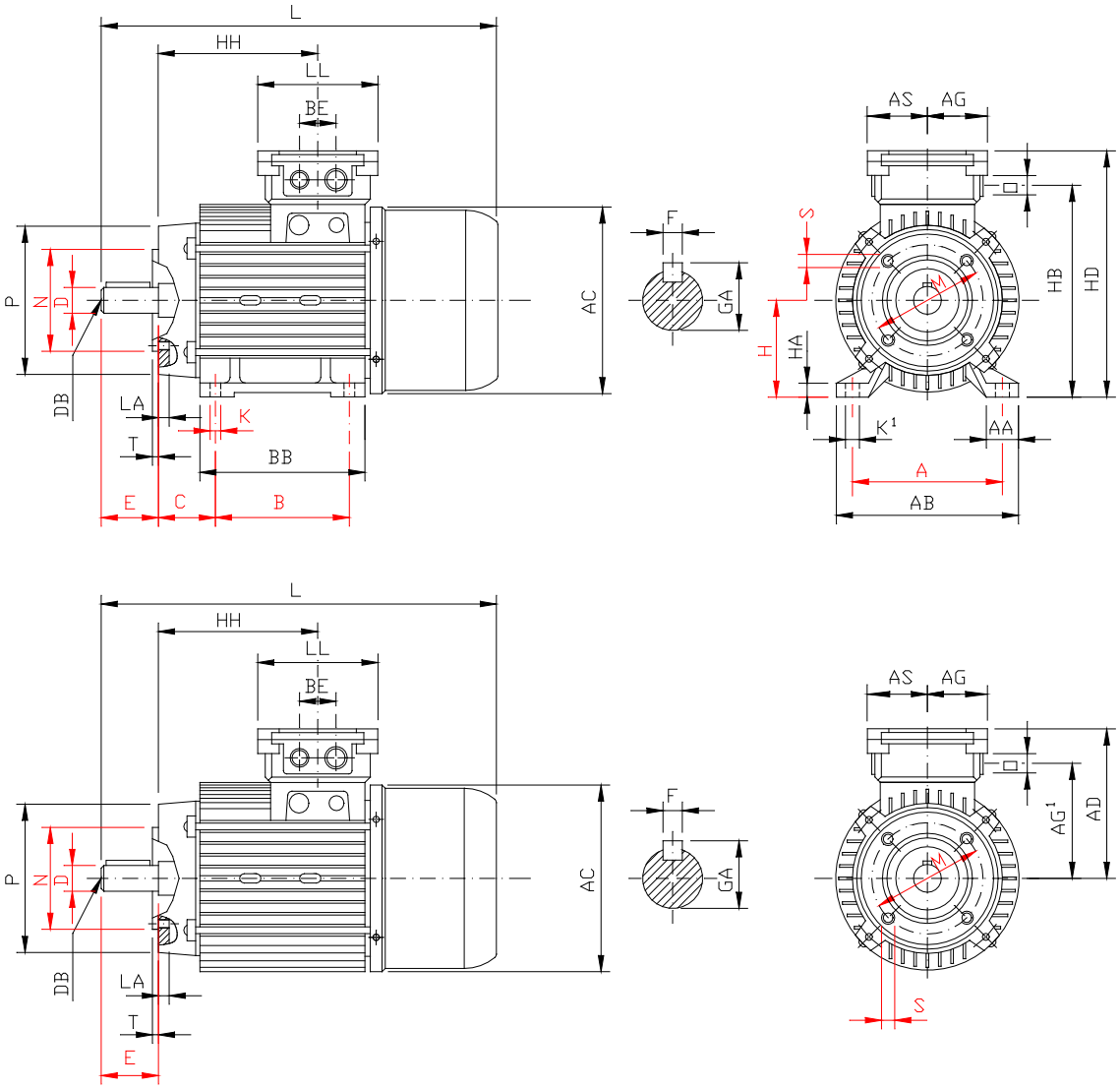
Three-phase motors **WP_ Type – with forced ventilation Papst**



Motor size	Coupling																Shaft end				
	A	AA	AB	**B**	BB	**C**	CA	**H**	HA	**K**	K¹	LA	**M**	**N**	P	**S**	T	**D**	DB	**E**	F	GA
63	**100**	22	120	**80**	100	**40**	97	**63**	7	**7**	10	8	**115**	**95**	140	**9**	3	**11**	M4	**23**	4	12.5
71	**112**	26	135	**90**	112	**45**	102	**71**	8	**7**	12	8	**130**	**110**	160	**9**	3.5	**14**	M5	**30**	5	16
80	**125**	28	152	**100**	124	**50**	110	**80**	11	**9**	13	9	**165**	**130**	200	**11**	3.5	**19**	M6	**40**	6	21.5
90S	**140**	30	170	**100**	130	**56**	119	**90**	13	**9**	13	10	**165**	**130**	200	**11**	3.5	**24**	M8	**50**	8	27
90L	**140**	30	170	**125**	155	**56**	119	**90**	13	**9**	13	10	**165**	**130**	200	**11**	3.5	**24**	M8	**50**	8	27
100L	**160**	35	192	**140**	163	**63**	133	**100**	14	**12**	17	11	**215**	**180**	250	**14**	4	**28**	M10	**60**	8	31
112M	**190**	40	220	**140**	183	**70**	141	**112**	14	**12**	19	12	**215**	**180**	250	**14**	4	**28**	M10	**60**	8	31

Mounting arrangement IM B34 - IM B14

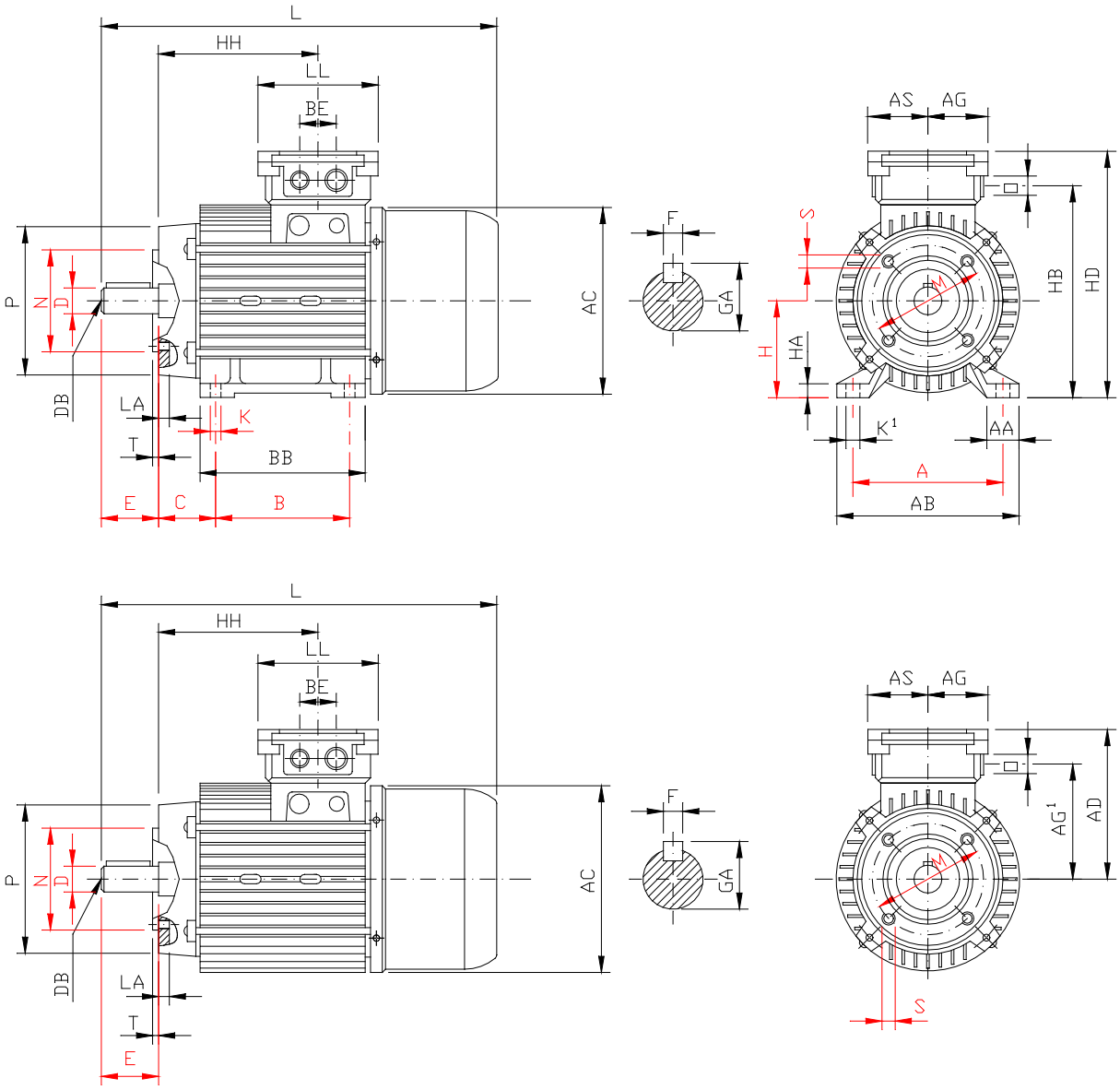
Three-phase motors **WP_ Type – with forced ventilation Papst**



Motor size	Overall dimensions											
	AC	AD	AG	AG¹	AS	BE	HB	HD	HH	L	LL	O
63	123	101	44	80	44	34	143	164	89	236	88	M16+M20 x 1.5
71	138	112	44	90	44	34	161	183	103	263	88	M16+M20 x 1.5
80	156	125	51	102	51	39	182	202	117	296	102	M20+M25 x 1.5
90S	176	129	51	107	51	39	197	219	127	320	102	M20+M25 x 1.5
90L	176	129	51	107	51	39	197	219	152	345	102	M20+M25 x 1.5
100L	194	141	51	120	51	39	220	241	171	391	102	M20+M25 x 1.5
112M	220	168	67	143	67	45	255	280	175	405	134	M32+M32 x 1.5

Mounting arrangement IM B34 - IM B14

Three-phase motors **WP_ Type – with forced ventilation Papst**



Motor size	Coupling											Shaft end									
	A	AA	AB	**B**	BB	**C**	CA	**H**	HA	**K**	K¹	LA	**M**	**N**	P	**S**	T	**D**	DB	**E**	F	GA
63	**100**	22	120	**80**	100	**40**	97	**63**	7	**7**	10	7	**75**	**60**	90	**M5**	2.5	**11**	M4	**23**	4	12.5
71	**112**	26	135	**90**	112	**45**	102	**71**	8	**7**	12	8	**85**	**70**	105	**M6**	2.5	**14**	M5	**30**	5	16
80	**125**	28	152	**100**	124	**50**	110	**80**	11	**9**	13	17	**100**	**80**	120	**M6**	3	**19**	M6	**40**	6	21.5
90S	**140**	30	170	**100**	130	**56**	119	**90**	13	**9**	13	10	**115**	**95**	140	**M8**	3	**24**	M8	**50**	8	27
90L	**140**	30	170	**125**	155	**56**	119	**90**	13	**9**	13	10	**115**	**95**	140	**M8**	3	**24**	M8	**50**	8	27
100L	**160**	35	192	**140**	163	**63**	133	**100**	14	**12**	17	10	**130**	**110**	160	**M8**	3.5	**28**	M10	**60**	8	31
112M	**190**	40	220	**140**	183	**70**	141	**112**	14	**12**	19	13	**130**	**110**	160	**M8**	3.5	**28**	M10	**60**	8	31

Three-phase motors - High Efficiency (IE2) - with forced ventilation three-phase motor

TEFC construction – Squirrel cage rotor – Continuous duty S1 – Insulation class F – IP 55 protection

Method of determining the efficiency: IEC 60034-2-1; 2014

Motor size		Rated output	Technical data at rated output V 400 - Hz 50							Direct insertion characteristics			Moment of inertia	Mass (IM B3)
		Pn	n	In	IE2 η			cos φ	Mn	Ms/Mn	Is/In	Mm/Mn	J	
		kW	min-1	A	50 %	75 %	100 %		Nm				10-3 kg.m2	kg
WSH Type 2 pole - 3000 min1														
80	**a**	**0.75**	2840	1.7	78.9	80.7	80.2	0.80	2.54	3.3	6.6	3.4	0.850	11.3
80	**b**	**1.1**	2860	2.4	83.1	84.5	84,0	0.80	3.69	3.7	7.4	3.6	1.129	13.3
80	**c**	**1.5**	2830	3.4	81.7	82.9	82.0	0.80	5.07	3.3	6.4	3.4	1.129	13.3
90S	**a**	**1.5**	2900	3.2	82.6	84.9	84.8	0.82	4.94	3.3	7.9	3.6	1.469	16.0
90S	**b**	**1.8**	2870	3.7	83.7	84.6	83.6	0.85	5.99	2.6	6.6	2.8	1.469	16.0
90L	**a**	**2.2**	2890	4.4	84.1	85.9	85.7	0.84	7.26	3.1	8.1	3.6	1.888	19.0
90L	**b**	**2.6**	2850	5.2	86.4	86.4	84.8	0.87	8.80	2.8	6.6	3.0	1.888	19.0
100L	**a**	**3**	2900	5.9	88.0	88.5	87.7	0.84	9.89	2.6	7.3	3.3	3.147	23.3
100L	**b**	**4**	2875	7.9	88.1	88.1	86.8	0.85	13.3	2.6	7.2	3.2	3.542	25.4
112M	**a**	**4**	2915	7.3	86.6	88.4	88.6	0.88	12.9	3.9	9.9	5.5	5.191	30.7
112M	**b**	**5.5**	2910	10.5	87.6	88.9	88.8	0.84	18.0	4.3	9.9	6.3	6.336	34.0
132S	**a**	**5.5**	2920	10.5	87.2	88.6	88.5	0.85	17.9	2.4	7.4	3.4	10.96	41.8
132S	**b**	**7.5**	2940	14.2	88.0	89.6	89.7	0.84	24.3	3.6	8.8	4.0	14.41	49.8
132M	**a**	**9.2**	2940	17.8	88.9	90.4	90.6	0.82	29.9	4.5	9.6	4.5	17.06	57.3
132M	**b**	**11**	2940	21.1	89.6	90.6	90.7	0.83	35.7	4.2	10.1	4.6	19.58	63.2
160M	**a**	**11**	2955	20.7	89.0	90.5	90.7	0.85	35.5	4.3	9.9	3.8	35.55	83.3
160M	**b**	**15**	2960	28.2	90.1	91.4	91.5	0.84	48.4	4.1	10.1	4.2	45.51	97.9
160L	**a**	**18.5**	2960	34.6	90.8	92.0	92.1	0.84	59.8	4.3	10.4	3.6	53.71	111
160L	**b**	**22**	2950	38.9	91.9	92.5	92.1	0.89	71.4	4.1	9.9	3.0	61.66	122
WSH Type 4 pole - 1500 min1														
80	**b**	**0.75**	1430	1.7	77.3	80.1	80.2	0.78	4.96	2.9	6.2	3.4	2.789	13.4
90S	**a**	**1.1**	1420	2.5	80.9	82.7	82.1	0.76	7.40	2.4	5.3	2.9	2.566	15.5
90L	**a**	**1.5**	1425	3.4	82.8	84.4	83.8	0.76	10.1	2.7	5.8	3.2	3.327	18.4
100L	**a**	**2.2**	1430	5.0	83.7	85.3	84.7	0.75	14.7	2.6	5.7	3.2	5.036	23.0
100L	**b**	**3**	1430	6.8	85.1	86.4	85.8	0.75	19.9	2.8	6.0	3.4	6.446	26.9
112M	**a**	**4**	1435	8.2	87.2	87.9	87.1	0.81	26.6	2.4	6.3	3.2	11.08	33.6
132S	**b**	**5.5**	1445	11.0	89.2	89.3	88.2	0.82	36.4	2.3	5.7	2.7	24.79	49.3
132M	**b**	**7.5**	1450	14.8	90.0	90.1	89.1	0.82	49.4	2.4	6.1	2.7	32.74	60.7
160M	**b**	**11**	1470	22.1	89.9	90.8	90.4	0.79	71.4	2.8	6.5	2.6	65.67	89.6
160L	**a**	**15**	1470	29.0	91.1	91.6	91.1	0.82	97.3	2.6	6.5	2.8	85.48	109
WSH Type 6 pole - 1000 min1														
90L	**a**	**0.75**	935	2.0	75.4	78.2	77.9	0.72	7.83	2.3	4.7	2.9	5.421	18.1
100L	**r**	**1.1**	940	2.7	76.5	79.1	78.7	0.73	11.0	2.3	4.9	2.9	8.032	21.0
100L	**a**	**1.5**	940	3.7	78.4	80.5	80.1	0.74	15.3	2.3	5.1	3.0	10.59	24.9
112M	**a**	**2.2**	960	5.3	80.2	82.5	82.4	0.73	21.8	1.6	5.4	2.8	16.51	32.2
132S	**a**	**3**	960	6.8	83.6	84.7	83.9	0.76	30.0	1.6	5.0	2.6	27.20	42.9
132M	**a**	**4**	960	8.9	84.8	86.0	85.3	0.76	39.7	1.6	5.4	2.9	34.77	50.9
132M	**b**	**5.5**	960	12.4	85.5	86.7	86.2	0.75	54.5	1.8	5.6	2.9	45.65	61.3
160M	**b**	**7.5**	965	15.3	87.7	88.4	87.7	0.80	74.4	2.2	5.9	2.8	89.20	85.2
160L	**a**	**11**	965	22.4	88.7	89.6	89.0	0.79	108.3	2.4	6.8	3.3	126.4	109

Mn = Full load torque **Ms** = Locked rotor torque **Mm** = Maximum torque **In** = Rated load current **Is** = Locked rotor current

Three-phase motors - Premium Efficiency (IE3) - with forced ventilation three-phase motor

TEFC construction – Squirrel cage rotor – Continuous duty S1 – Insulation class F – IP 55 protection.

WSP Type 2 poli - 3000 min^{-1}

Motor size		Rated output	Technical data at rated output V 400 - Hz 50							Direct insertion characteristics			Moment of inertia	Mass (IM B3)
		Pn	n	In	IE2 η			cos φ	Mn	Ms/Mn	Is/In	Mm/Mn	J	
		kW	min^{-1}	A	50 %	75 %	100 %		Nm				10^{-3} kg.m^2	kg
80	**a**	**0.75**	2845	1.64	81.9	83.2	82.5	0.80	2.52	3.3	6.6	3.4	0.850	11.2
80	**b**	**1.1**	2865	2.36	83.9	85.3	84.8	0.80	3.68	3.7	7.4	3.6	1.129	13.2
80	**c**	**1.5**	2830	3.4	81.7	82.9	84.2*	0.79	5.07	3.3	6.4	3.4	1.129	13.2
90S	**a**	**1.5**	2900	3.1	82.3	84.7	84.8	0.82	5.01	3.3	7.9	3.6	1.469	15.9
90S	**b**	**1.8**	2870	3.7	83.7	84.6	85.0*	0.85	5.99	2.6	6.6	2.8	1.469	15.9
90L	**a**	**2.2**	2890	4.5	85.7	86.8	86.2	0.84	7.38	3.1	8.1	3.6	1.888	18.9
90L	**b**	**2.6**	2850	5.2	86.4	86.4	86.5*	0.87	8.80	2.8	6.6	3.0	1.888	18.9
100L	**a**	**3**	2900	5.7	88.7	89.2	88.3	0.87	9.93	2.8	7.7	3.4	3.542	25.4
100L	**b**	**4**	2875	7.9	88.1	88.1	88.1*	0.85	13.4	2.6	7.2	3.2	3.542	25.4
112M	**a**	**4**	2920	7.3	86.6	88.4	88.6	0.88	12.9	3.9	9.9	5.5	5.191	30.8
112M	**b**	**4.7**	2925	9.3	86.7	88.9	89.4	0.81	15.2	5.1	11.7	5.8	6.336	31.2
112M	**c**	**5.5**	2910	10.5	87.6	88.9	89.2*	0.84	18.1	4.3	9.9	6.3	6.336	34.2
132S	**a**	**5.5**	2950	10.3	86.5	88.9	89.6	0.86	17.7	4.0	10.8	4.7	14.41	49.7
132S	**b**	**7.5**	2945	14.1	88.6	90.3	90.5	0.85	24.3	3.6	10.2	4.6	17.06	55.2
132M	**a**	**9.2**	2945	16.9	89.8	91.1	91.1	0.86	29.8	3.6	10.4	4.5	19.58	62.5
132M	**b**	**11**	2940	21.1	89.0	90.6	91.2*	0.83	35.7	4.2	10.1	4.6	19.58	63.0
160M	**a**	**11**	2960	20.0	90.0	91.6	91.8	0.87	35.4	4.7	10.9	3.9	41.45	89.8
160M	**b**	**15**	2960	27.2	90.4	91.8	92.1	0.87	48.4	4.7	11.5	4.0	53.42	109

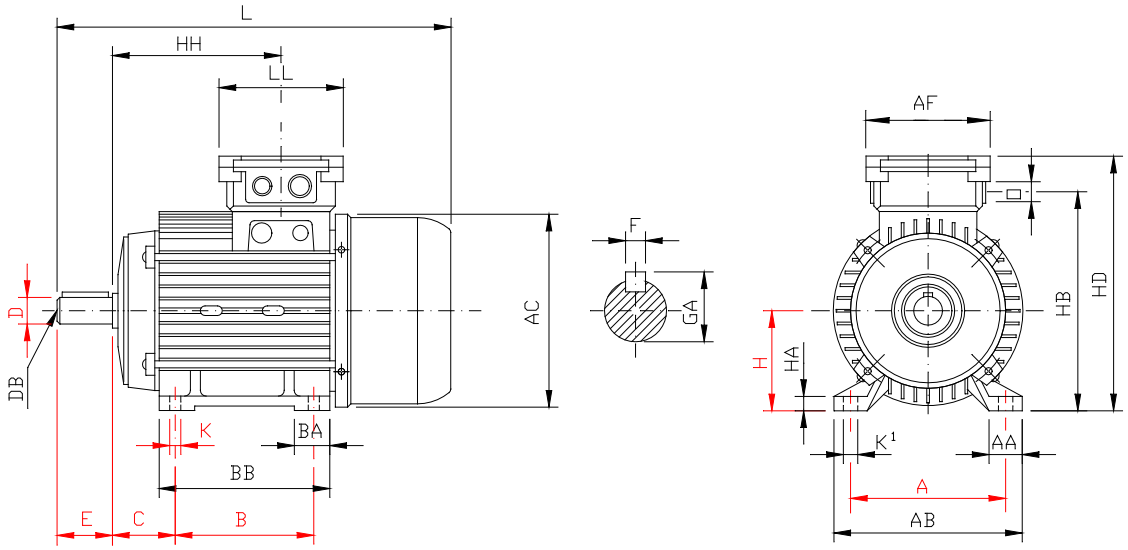
WSP Type 4 poli - 1500 min^{-1}

80	**c**	**0.75**	1425	1.70	78.6	81.2	82.5*	0.79	5.02	3.0	6.4	3.5	2.789	13.7
90S	**r**	**0.75**	1440	1.77	81.0	83.5	83.8	0.73	4.96	3.0	6.2	3.5	2.566	15.5
90S	**a**	**1.1**	1425	2.6	80.8	82.8	84.1*	0.75	7.37	2.4	5.2	2.9	2.566	15.5
90L	**r**	**1.1**	1440	2.5	82.8	85.1	85.3	0.73	7.26	3.1	6.6	3.7	3.327	18.4
90L	**a**	**1.5**	1425	3.4	82.8	84.4	85.3*	0.76	10.1	2.7	5.8	3.2	3.327	18.4
100L	**r**	**1.5**	1445	3.3	83.9	86.1	86.1	0.75	9.90	2.8	6.1	3.6	5.036	22.9
100L	**s**	**1.8**	1455	4.1	83.1	85.9	86.5	0.70	11.6	3.3	7.4	4.3	6.446	27.0
100L	**c**	**2.2**	1440	4.9	85.0	86.8	86.7	0.76	14.5	3.0	6.6	3.6	6.446	27.0
112M	**s**	**2.6**	1460	5.6	85.6	88.0	88.5	0.75	16.9	3.2	8.0	4.1	11.08	33.9
112M	**a**	**3.7**	1450	7.8	87.4	88.8	88.5	0.77	24.2	2.9	7.4	3.8	12.29	36.7
112M	**b**	**4**	1440	8.0	87.3	88.1	88.6*	0.82	26.3	2.4	6.5	3.1	11.08	36.7
132M	**r**	**5.5**	1460	11.1	89.3	90.4	90.2	0.79	35.8	2.9	7.1	3.3	32.74	60.8
132M	**b**	**7.5**	1450	14.8	90.0	90.1	90.4*	0.82	49.4	2.4	6.1	2.7	32.74	60.8
160M	**r**	**7.5**	1480	15.4	89.7	91.2	91.5	0.77	48.3	3.4	7.6	3.1	65.67	89.7
160M	**s**	**9.2**	1470	18.1	90.6	91.5	91.2	0.80	59.6	2.9	6.2	2.5	65.67	89.7
160M	**b**	**11**	1475	20.8	92.1	92.8	92.5	0.82	71.3	2.7	7.2	2.9	85.19	106.9
160L	**a**	**15**	1475	29.6	91.8	92.6	92.4	0.79	97.1	3.1	7.3	2.9	98.50	117.8

Mn = Full load torque **Ms** = Locked rotor torque **Mm** = Maximum torque **In** = Rated load current **Is** = Locked rotor current

Mounting arrangement IM B3

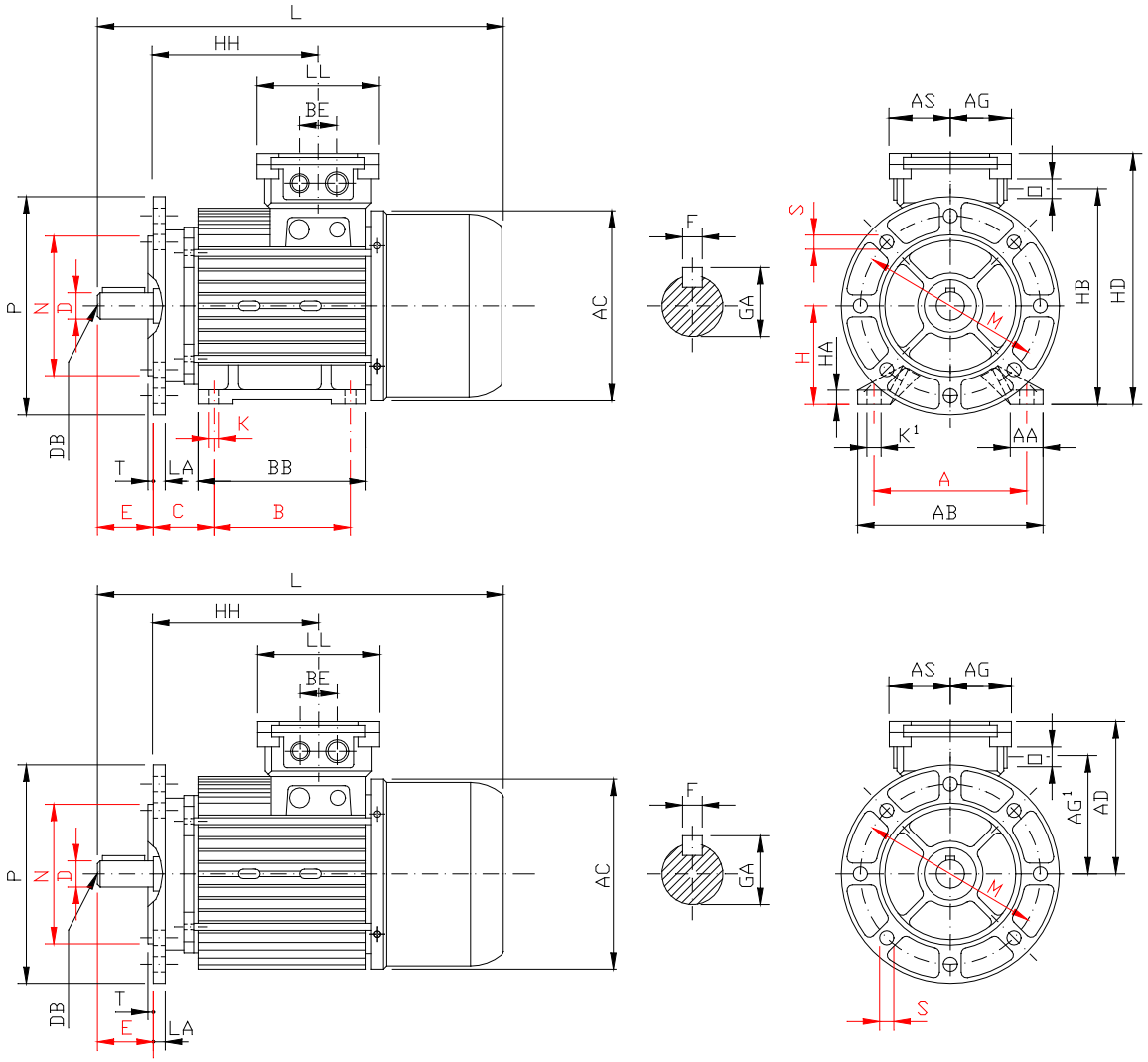
Three-phase motors **WS_ Type – with forced ventilation three-phase motor**



Motor size	Coupling									Overall								Shaft end				
	A	AA	AB	B	BA	BB	C	H	K	AC	AF	HB	HD	HH	L	LL	O	D	DB	E	F	GA
80	**125**	28	152	**100**	30	124	**50**	**80**	**9**	156	102	182	202	117	376	102	M20+M25x1.5	**19**	M6	**40**	6	21.5
90S	**140**	30	170	**100**	32	130	**56**	**90**	**9**	176	102	197	219	127	395	102	M20+M25x1.5	**24**	M8	**50**	8	27
90L	**140**	30	170	**125**	32	155	**56**	**90**	**9**	176	102	197	219	152	420	102	M20+M25x1.5	**24**	M8	**50**	8	27
100L	**160**	35	192	**140**	35	163	**63**	**100**	**12**	194	102	220	241	171	461	102	M20+M25x1.5	**28**	M10	**60**	8	31
112M	**190**	40	220	**140**	40	183	**70**	**112**	**12**	220	134	255	280	175	485	134	M32+M32x1.5	**28**	M10	**60**	8	31
132S	**216**	44	260	**140**	40	180	**89**	**132**	**12**	260	134	303	328	206	560	134	M32+M32x1.5	**38**	M12	**80**	10	41
132M	**216**	44	260	**178**	40	218	**89**	**132**	**12**	260	134	303	328	244	598	134	M32+M32x1.5	**38**	M12	**80**	10	41
160M	**254**	65	319	**210**	57	261	**108**	**160**	**14**	310	176	360	395	234	738	176	M32+M32x1.5	**42**	M16	**110**	12	45
160L	**254**	65	319	**254**	57	305	**108**	**160**	**14**	310	176	360	395	278	782	176	M32+M32x1.5	**42**	M16	**110**	12	45

Mounting arrangement IM B35 - IM B5

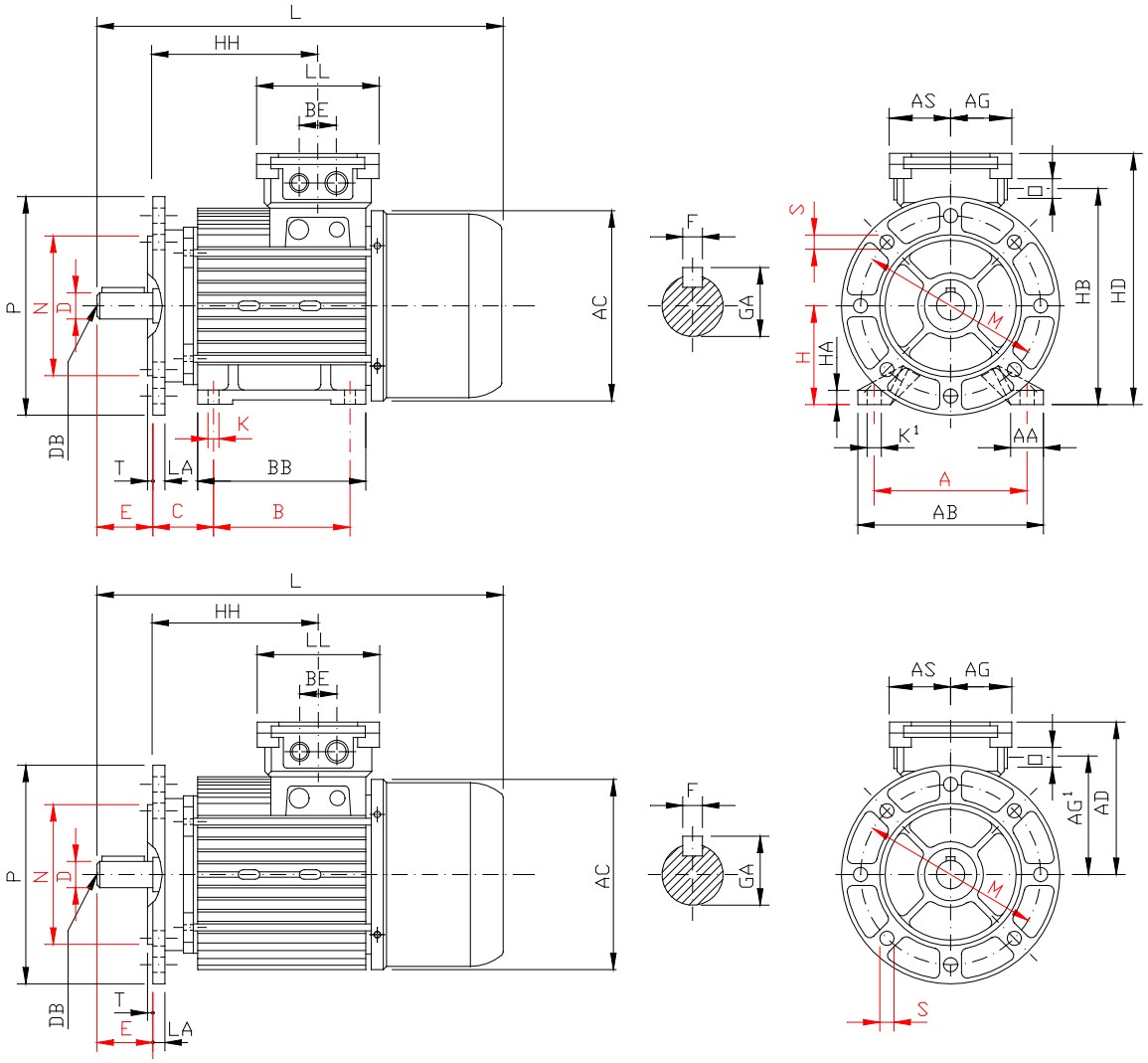
Three-phase motors **WS_ Type – with forced ventilation three-phase motor**



Motor size	Overall dimensions											
	AC	AD	AG	AG¹	AS	BE	HB	HD	HH	L	LL	O
80	156	125	51	102	51	39	182	202	117	376	102	M20+M25 x 1.5
90S	176	129	51	107	51	39	197	219	127	395	102	M20+M25 x 1.5
90L	176	129	51	107	51	39	197	219	152	420	102	M20+M25 x 1.5
100L	194	141	51	120	51	39	220	241	171	461	102	M20+M25 x 1.5
112M	220	168	67	143	67	45	255	280	175	485	134	M32+M32 x 1.5
132S	260	196	67	171	67	45	303	328	206	560	134	M32+M32 x 1.5
132M	260	196	67	171	67	45	303	328	244	598	134	M32+M32 x 1.5
160M	310	235	88	200	88	55	360	395	234	738	176	M32+M32 x 1.5
160L	310	235	88	200	88	55	360	395	278	782	176	M32+M32 x 1.5

Mounting arrangement IM B35 - IM B5

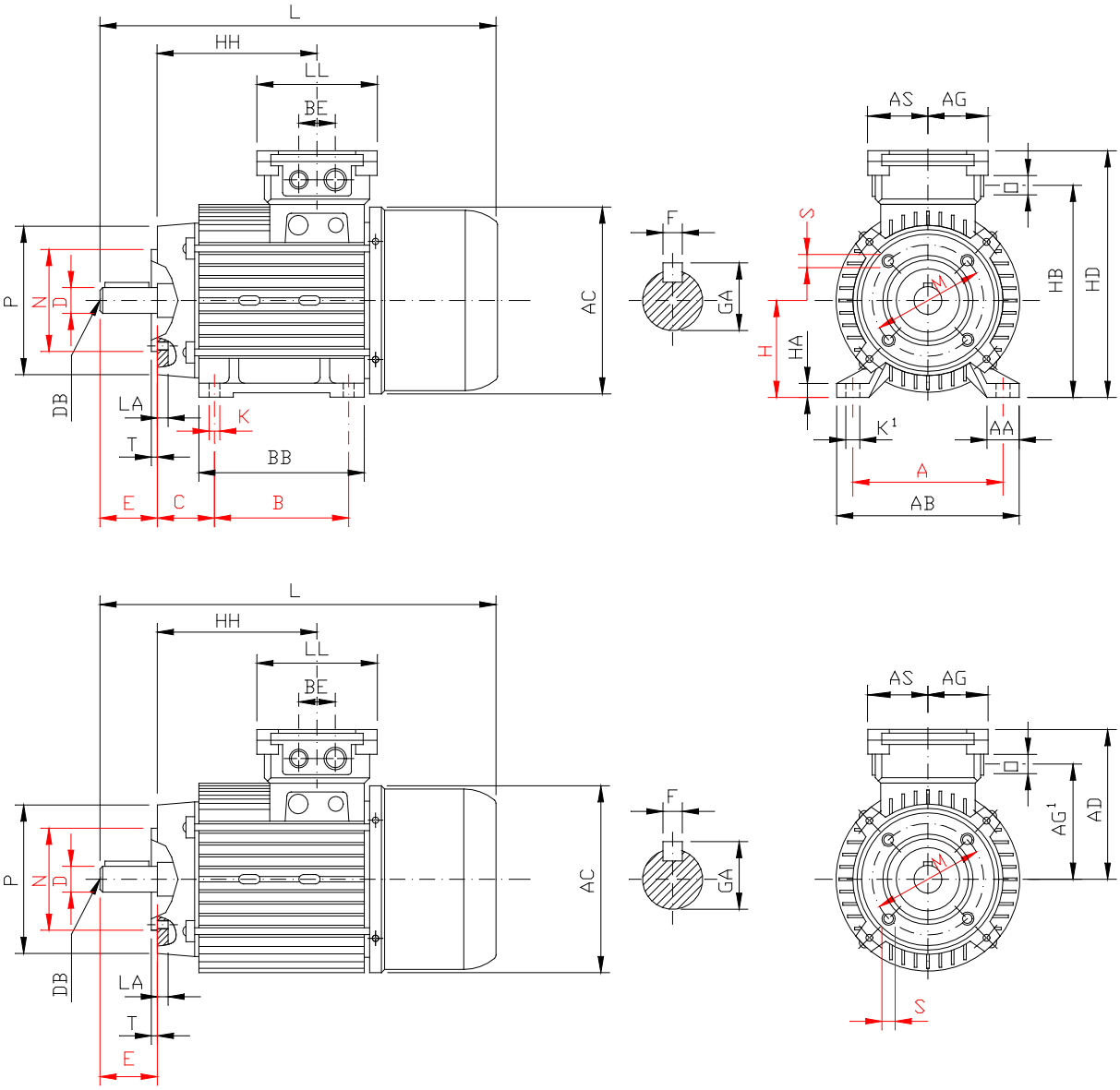
Three-phase motors **WS_ Type – with forced ventilation three-phase motor**



Motor size	Accoppiamento																	Albero				
	A	AA	AB	**B**	BB	**C**	CA	**H**	HA	**K**	K¹	LA	**M**	**N**	P	**S**	T	**D**	DB	**E**	F	GA
80	**125**	28	152	**100**	124	**50**	165	**80**	11	**9**	13	9	**165**	**130**	200	**11**	3.5	**19**	M6	**40**	6	21.5
90S	**140**	30	170	**100**	130	**56**	184	**90**	13	**9**	13	10	**165**	**130**	200	**11**	3.5	**24**	M8	**50**	8	27
90L	**140**	30	170	**125**	155	**56**	184	**90**	13	**9**	13	10	**165**	**130**	200	**11**	3.5	**24**	M8	**50**	8	27
100L	**160**	35	192	**140**	163	**63**	203	**100**	14	**12**	17	11	**215**	**180**	250	**14**	4	**28**	M10	**60**	8	31
112M	**190**	40	220	**140**	183	**70**	221	**112**	14	**12**	19	12	**215**	**180**	250	**14**	4	**28**	M10	**60**	8	31
132S	**216**	44	260	**140**	180	**89**	258	**132**	16	**12**	22	18	**265**	**230**	300	**14**	4	**38**	M12	**80**	10	41
132M	**216**	44	260	**178**	218	**89**	258	**132**	16	**12**	22	18	**265**	**230**	300	**14**	4	**38**	M12	**80**	10	41
160M	**254**	65	319	**210**	261	**108**	318	**160**	20	**14**	24	14	**300**	**250**	350	**18**	5	**42**	M16	**110**	12	45
160L	**254**	65	319	**254**	305	**108**	318	**160**	20	**14**	24	14	**300**	**250**	350	**18**	5	**42**	M16	**110**	12	12.5

Mounting arrangement IM B34 - IM B14

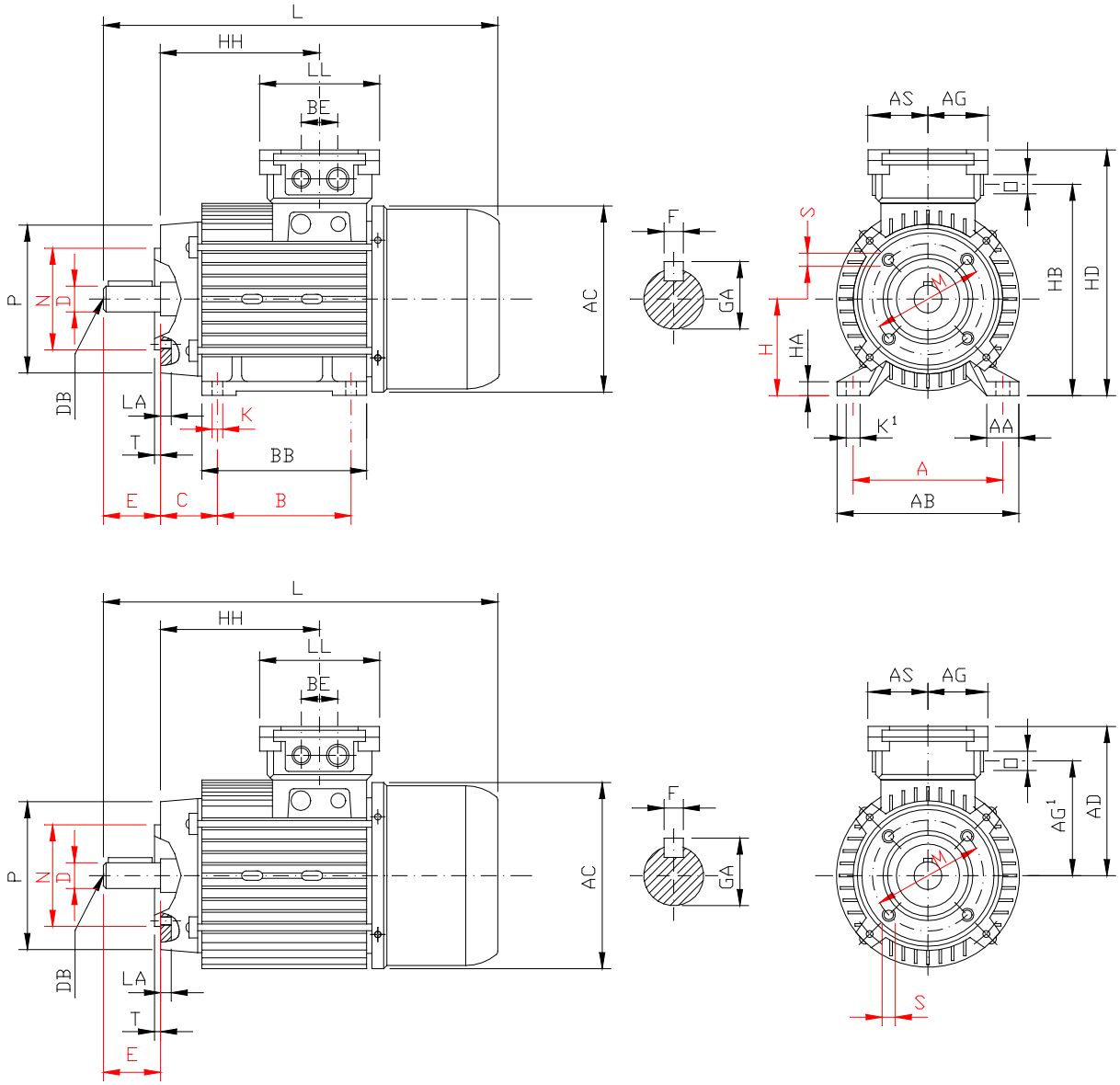
Three-phase motors **WS_ Type – with forced ventilation three-phase motor**



Motor size	Overall dimensions											
	AC	AD	AG	AG¹	AS	BE	HB	HD	HH	L	LL	O
80	156	125	51	102	51	39	182	202	117	376	102	M20+M25 x 1.5
90S	176	129	51	107	51	39	197	219	127	395	102	M20+M25 x 1.5
90L	176	129	51	107	51	39	197	219	152	420	102	M20+M25 x 1.5
100L	194	141	51	120	51	39	220	241	171	461	102	M20+M25 x 1.5
112M	220	168	67	143	67	45	255	280	175	485	134	M32+M32 x 1.5
132S	260	196	67	173	67	45	303	328	206	560	134	M32+M32 x 1.5
132M	260	196	67	173	67	45	303	328	244	598	134	M32+M32 x 1.5
160M	310	235	88	200	88	55	360	395	234	738	176	M32+M32 x 1.5
160L	310	235	88	200	88	55	360	395	278	782	176	M32+M32 x 1.5

Mounting arrangement IM B34 - IM B14

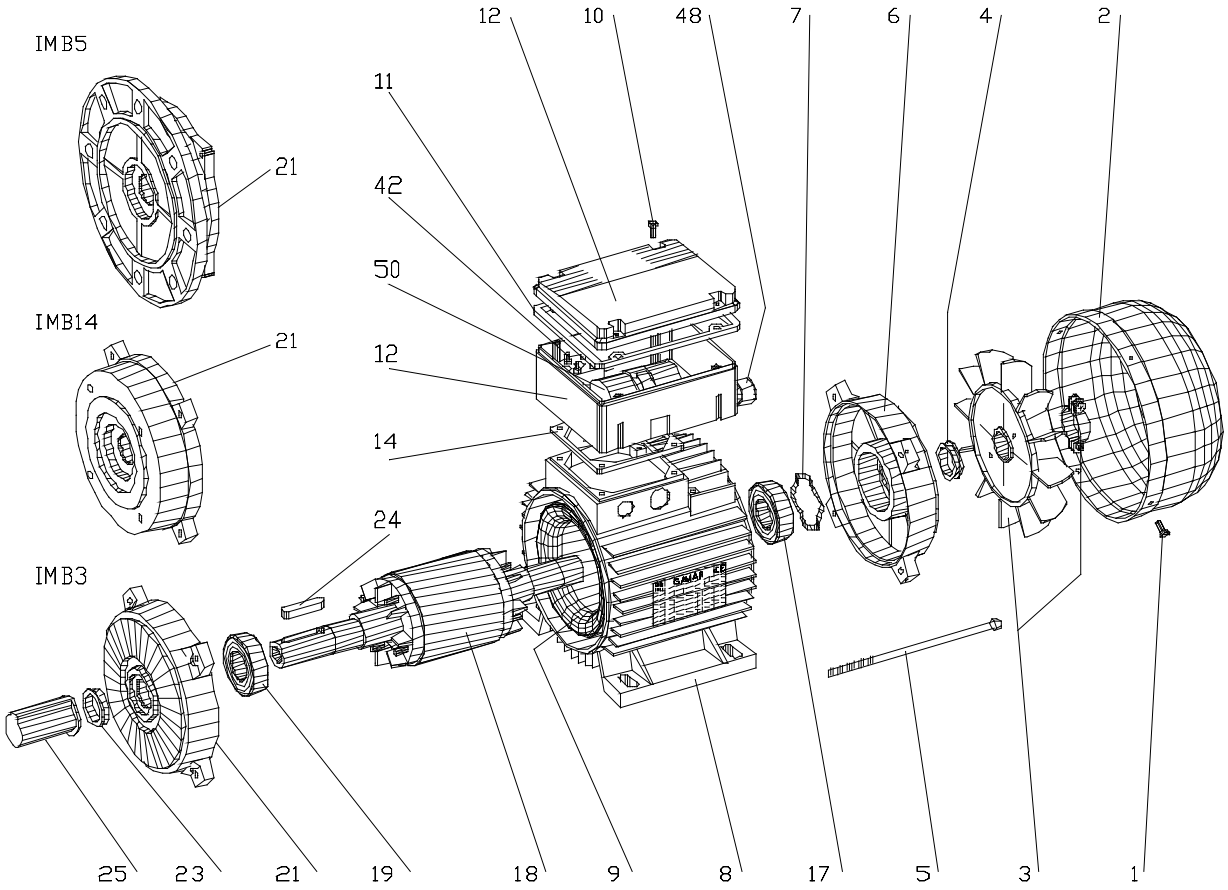
Three-phase motors **WS.. Type – with forced ventilation three-phase motor**



Motor size	Accoppiamento																	Albero				
	A	AA	AB	**B**	BB	**C**	CA	**H**	HA	**K**	K¹	LA	**M**	**N**	P	**S**	T	**D**	DB	**E**	F	GA
80	**125**	28	152	**100**	124	**50**	165	**80**	11	**9**	13	17	**100**	**80**	120	**M6**	3	**19**	M6	**40**	6	21.5
90S	**140**	30	170	**100**	130	**56**	184	**90**	13	**9**	13	10	**115**	**95**	140	**M8**	3	**24**	M8	**50**	8	27
90L	**140**	30	170	**125**	155	**56**	184	**90**	13	**9**	13	10	**115**	**95**	140	**M8**	3	**24**	M8	**50**	8	27
100L	**160**	35	192	**140**	163	**63**	203	**100**	14	**12**	17	10	**130**	**110**	160	**M8**	3.5	**28**	M10	**60**	8	31
112M	**190**	40	220	**140**	183	**70**	221	**112**	14	**12**	19	13	**130**	**110**	160	**M8**	3.5	**28**	M10	**60**	8	31
132S	**216**	44	260	**140**	180	**89**	258	**132**	16	**12**	22	15	**165**	**130**	200	**M10**	3.5	**38**	M12	**80**	10	41
132M	**216**	44	260	**178**	218	**89**	258	**132**	16	**12**	22	15	**165**	**130**	200	**M10**	3.5	**38**	M12	**80**	10	41
160M	**254**	65	319	**210**	261	**108**	318	**160**	20	**14**	24	18	**215**	**180**	250	**M12**	4	**42**	M16	**110**	12	45
160L	**254**	65	319	**254**	305	**108**	318	**160**	20	**14**	24	18	**215**	**180**	250	**M12**	4	**42**	M16	**110**	12	12.5

Asinchronous single-phase motors

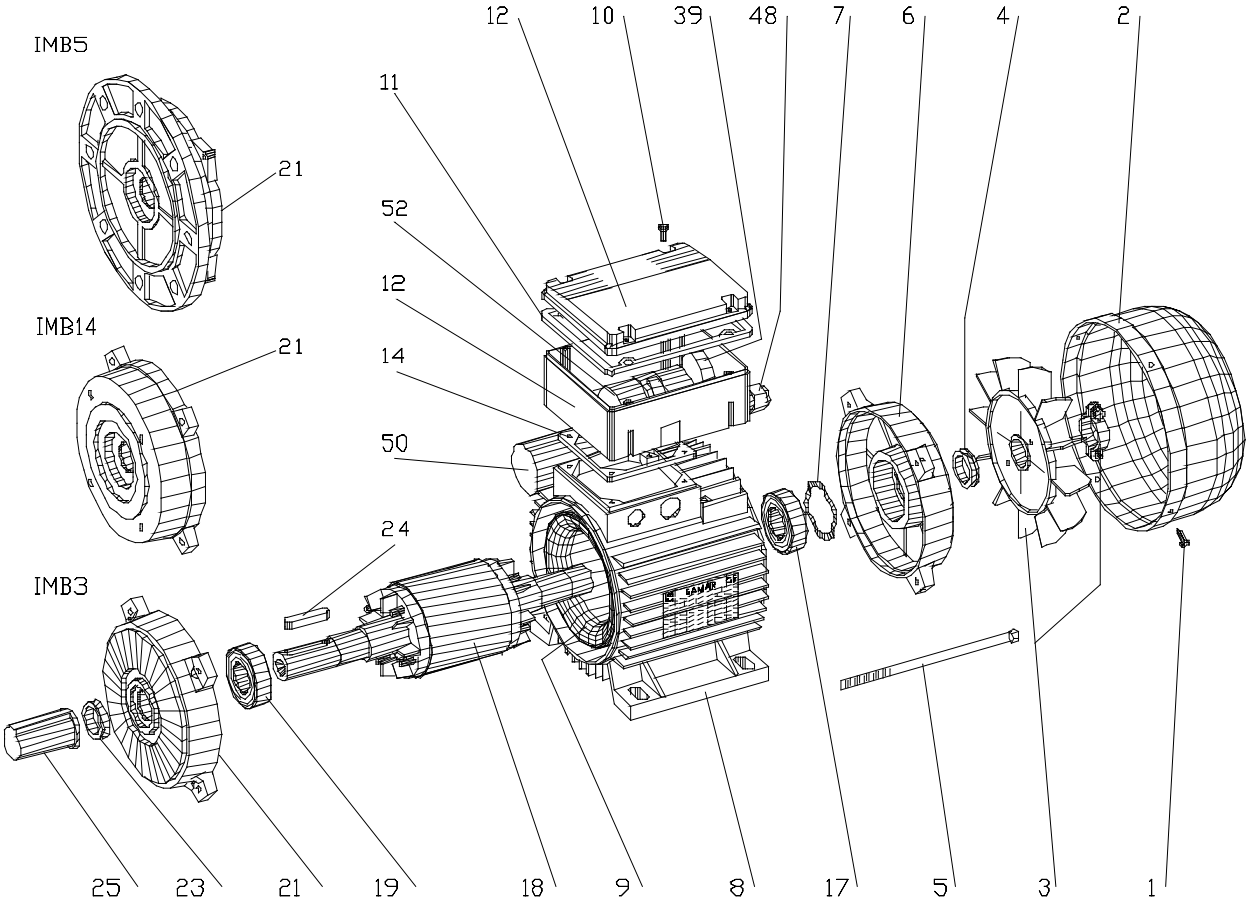
Single-phase motor - ZCO and ZCB Type



Spare parts nomenclature

1. Screw for fan cover
2. Fan cover
3. Fan
4. Sealing ring
5. Rod
6. N-end shield
7. Spring ring
8. Frame
9. Stator package
10. Screw for capacitor box cover
11. Gasket for capacitor box cover
12. Capacitor box
14. Gasket for capacitor box
17. Rear bearing
18. Rotor
19. Front bearing
21. D-end shield/flange
23. Sealing ring
24. Key
25. Shaft cap
42. Terminal board
48. Cable gland
50. Run capacitor

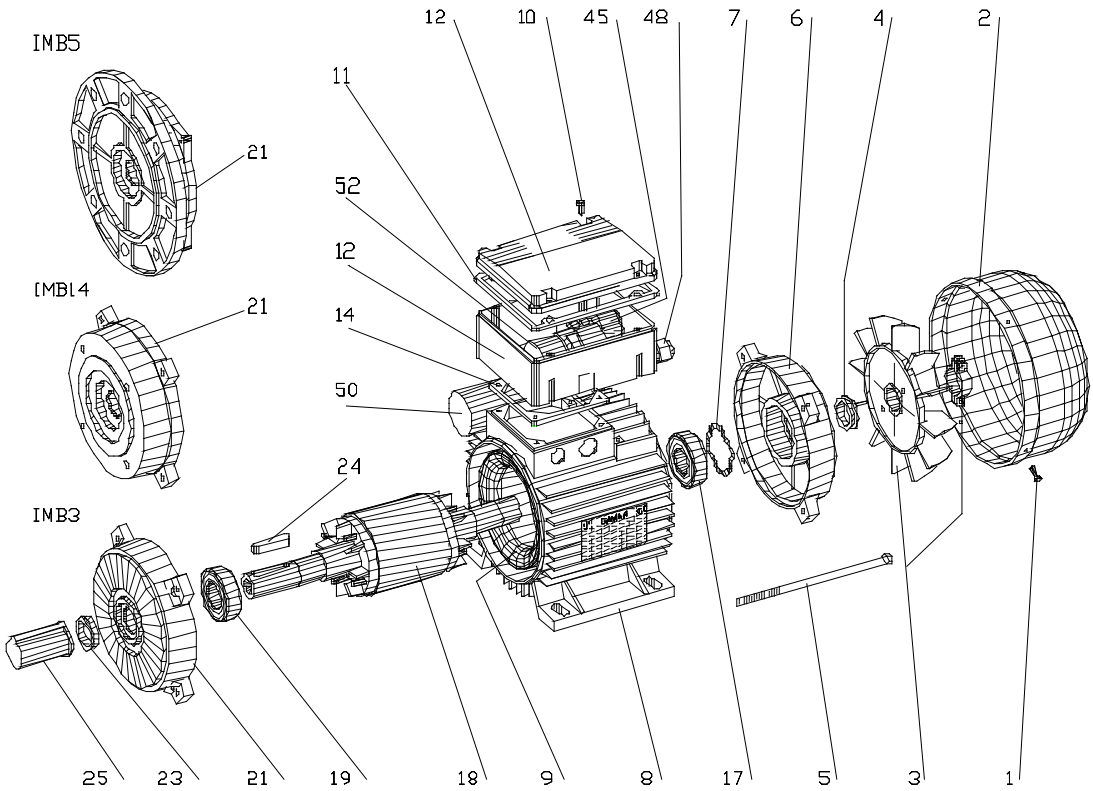
Single-phase motor - ZSE and ZSET Type



Spare parts nomenclature

1. Screw for fan cover
2. Fan cover
3. Fan
4. Sealing ring
5. Rod
6. N-end shield
7. Spring ring
8. Frame
9. Stator package
10. Screw for capacitor box cover
11. Gasket for capacitor box cover
12. Capacitor box
14. Gasket for capacitor box
17. Rear bearing
18. Rotor
19. Front bearing
21. D-end shield/flange
23. Sealing ring
24. Key
25. Shaft cap
39. Electronic starter
48. Cable gland
50. Run capacitor
52. Start capacitor

Single-phase motor - ZIT and ZIV Type

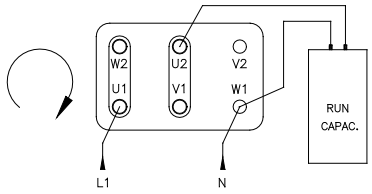


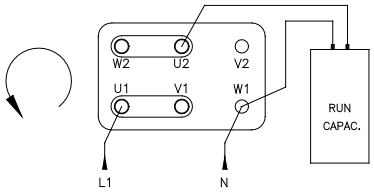
Spare parts nomenclature

1. Screw for fan cover
2. Fan cover
3. Fan
4. Sealing ring
5. Rod
6. N-end shield
7. Spring ring
8. Frame
9. Stator package
10. Screw for capacitor box cover
11. Gasket for capacitor box cover
12. Capacitor box
14. Gasket for capacitor box
17. Rear bearing
18. Rotor
19. Front bearing
21. D-end shield/flange
23. Sealing ring
24. Key
25. Shaft cap
45. Switch
48. Cable gland
50. Run capacitor
52. Start capacitor

Connection for motors ZCO Type

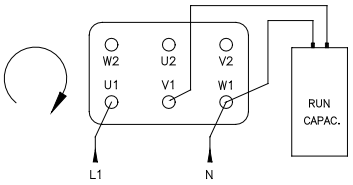
Single-phase motors with permanent capacitor

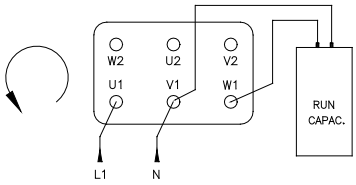




Connection for motors ZCB Type

Single-phase motors with permanent capacitor - with balanced windings

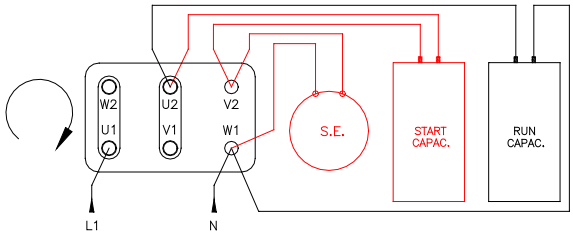


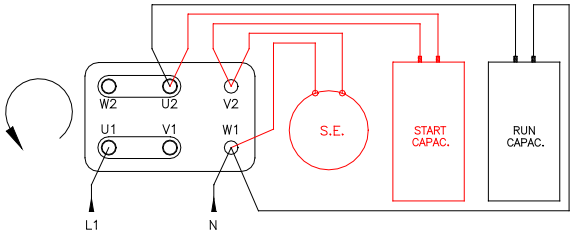


Connection for motors ZSE Type

Single-phase motors with electromechanical relay for high starting torque

Suitable for insertions with at least 2 minute-interval

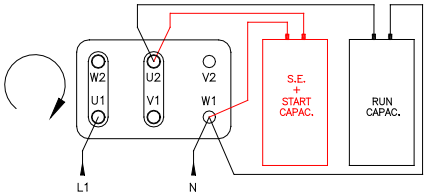


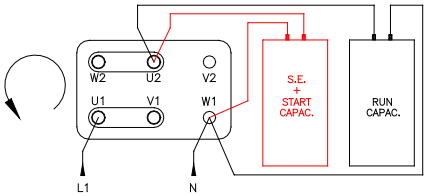


Connection for motors ZSE Type

Single-phase motors with electronic starter for high starting torque

Suitable for insertions with about 6 second-interval

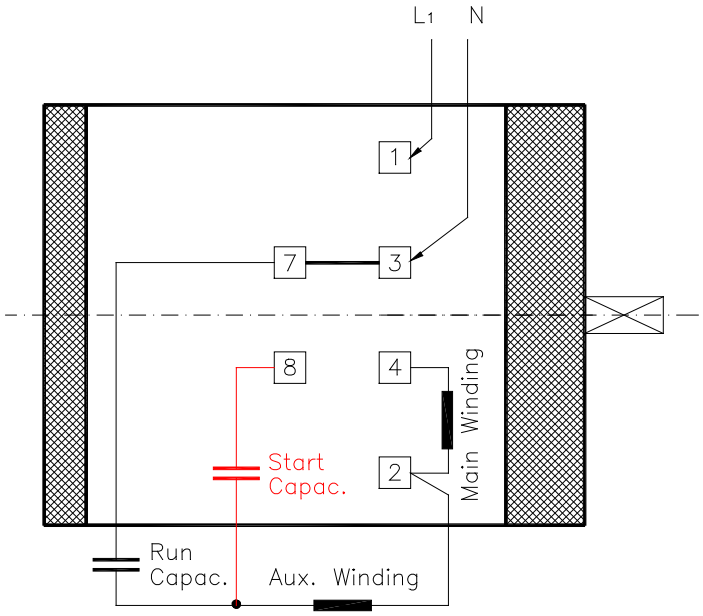




Connection for motors ZIT Type

Single-phase motors with switch for high starting torque

With run capacitor + start capacitor

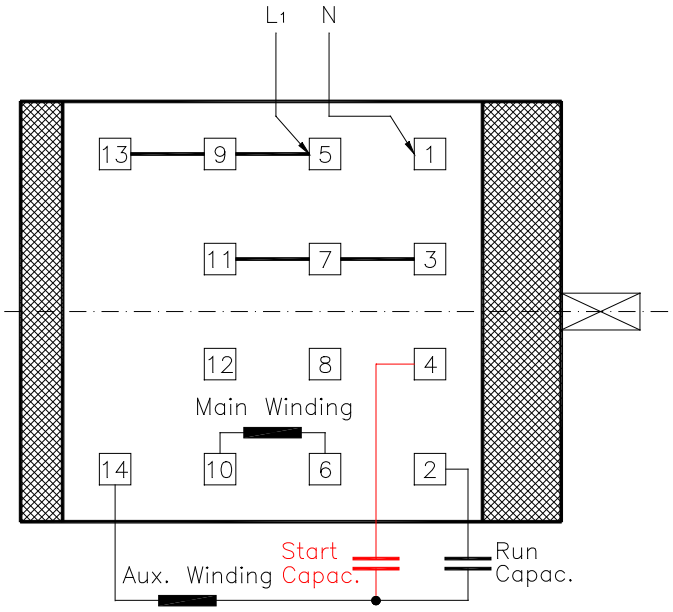


To reverse rotation, interchange the wires of the main winding

Connection for motors ZIV Type

Single-phase motors with reversing switch for high starting torque

With run capacitor + start capacitor



Single-phase motors

With permanent capacitor

TEFC construction – Squirrel cage rotor – Continuous duty S1 – Insulation class F – IP 55 protection

Motor size		Rated output	Technical data at rated output V 230 - Hz 50					Direct insertion characteristics			Run capacitor	Moment of inertia	Mass (IM B3)
		Pn	n	In	η	cos φ	Mn	Ms/Mn	Is/In	Mm/Mn	V 450	J	
		kW	min-1	A	%		Nm				µF	10-3 kg.m2	kg
ZCO Type 2 pole - 3000 min1													
56	**a**	**0.09**	2700	0.73	55.8	0.96	0.32	0.55	2.2	1.6	3.15	0.073	2.8
56	**b**	**0.12**	2740	0.96	56.6	0.96	0.42	0.56	2.3	1.5	4	0.087	3.1
63	**a**	**0.18**	2850	1.35	61.0	0.95	0.60	0.65	3.6	2.1	6.3	0.129	3.9
63	**b**	**0.25**	2860	1.74	67.2	0.93	0.84	0.65	3.8	2.1	8	0.162	4.5
63	**c**	**0.37**	2870	2.5	67.7	0.95	1.23	0.67	3.9	2.3	12.5	0.206	5.3
71	**a**	**0.37**	2780	2.7	63.4	0.94	1.27	0.56	3.1	1.9	12.5	0.342	5.9
71	**b**	**0.55**	2810	3.7	71.8	0.90	1.87	0.54	3.1	1.8	16	0.424	6.9
71	**c**	**0.75**	2840	4.6	75.4	0.94	2.52	0.50	3.8	1.8	20	0.505	7.8
80	**a**	**0.55**	2830	3.5	72.0	0.95	1.86	0.64	3.5	1.9	20	0.704	7.9
80	**b**	**0.75**	2870	4.5	76.3	0.95	2.50	0.65	3.7	1.9	25	0.923	9.4
80	**c**	**1.1**	2850	6.3	79.9	0.95	3.69	0.65	3.7	2.0	31.5	1.153	11.0
90S	**a**	**1.1**	2830	7.4	71.8	0.90	3.71	0.61	3.8	2.2	35	1.266	12.4
90L	**a**	**1.5**	2840	10.0	72.5	0.90	5.05	0.62	4.1	2.3	40	1.619	14.9
90L	**b**	**1.8**	2840	11.2	77.2	0.93	6.05	0.62	4.2	2.4	50	1.888	16.8
100L	**a**	**2.2**	2850	12.2	80.0	0.98	7.38	0.61	3.4	2.2	50	2.666	18.9
ZCO Type 4 pole - 1500 min1													
56	**a**	**0.06**	1360	0.65	42.7	0.94	0.42	0.65	1.7	1.4	3.15	0.117	2.8
56	**b**	**0.09**	1360	0.96	45.3	0.90	0.63	0.61	2.0	1.5	5	0.151	3.1
63	**a**	**0.09**	1400	0.80	54.3	0.90	0.61	0.62	2.3	1.8	4	0.206	3.8
63	**b**	**0.12**	1400	1.0	58.0	0.90	0.82	0.62	2.5	1.8	5	0.263	4.4
63	**c**	**0.18**	1400	1.4	60.1	0.93	1.23	0.62	2.5	1.8	8	0.326	5.1
71	**a**	**0.18**	1370	1.7	51.2	0.90	1.26	0.72	2.4	1.7	10	0.687	5.8
71	**b**	**0.25**	1370	2.1	55.7	0.93	1.74	0.74	2.4	1.8	12.5	0.800	6.4
71	**c**	**0.37**	1370	2.7	64.1	0.93	2.58	0.78	2.6	1.8	20	1.175	8.3
80	**a**	**0.37**	1370	2.9	61.0	0.91	2.58	0.55	2.8	1.6	14	1.499	7.6
80	**b**	**0.55**	1380	3.8	65.5	0.96	3.81	0.64	3.1	1.8	16	2.043	9.2
80	**c**	**0.75**	1360	5.3	64.8	0.95	5.27	0.55	2.9	1.8	20	2.517	10.7
90L	**a**	**1.1**	1370	7.2	73.0	0.91	7.67	0.56	3.3	1.8	35	2.843	14.3
90L	**b**	**1.5**	1380	9.5	73.8	0.93	10.4	0.56	3.4	1.9	40	3.327	16.2
100L	**a**	**1.8**	1380	11.4	76.7	0.92	12.4	0.44	3.5	1.8	35	4.637	18.9
100L	**b**	**2.2**	1410	14.0	75.1	0.91	14.9	0.45	3.6	1.9	50	60.34	22.9
ZCO Type 6 pole - 1000 min1													
63	**b**	**0.06**	930	0.75	35.5	0.98	0.62	1.00	1.6	1.7	6.3	0.263	4.4
63	**c**	**0.09**	930	0.98	42.0	0.95	0.92	0.80	1.8	1.7	8	0.326	5.1
71	**a**	**0.12**	920	1.15	50.4	0.90	1.25	0.65	1.9	1.6	10	0.687	5.7
71	**b**	**0.18**	920	1.7	50.6	0.91	1.87	0.65	1.9	1.6	14	0.800	6.3
80	**a**	**0.25**	930	2.1	55.7	0.93	2.60	0.53	2.6	1.7	14	1.499	7.6
80	**b**	**0.37**	920	3.1	57.0	0.91	3.84	0.53	2.7	1.7	16	2.043	9.1
80	**c**	**0.55**	920	4.1	63.4	0.92	5.71	0.52	2.7	1.7	25	2.517	10.6
90S	**a**	**0.55**	920	3.9	65.9	0.93	5.71	0.51	2.6	1.7	25	2.210	11.7
90L	**a**	**0.75**	920	5.1	67.3	0.95	7.79	0.51	2.8	1.7	35	2.843	14.2
100L	**a**	**1.1**	930	7.3	71.2	0.92	11.3	0.41	3.3	1.7	35	6.054	19.2
100L	**b**	**1.5**	930	9.8	72.3	0.92	15.4	0.42	3.5	1.7	50	7.720	22.6

Mn = Full load torque **Ms** = Locked rotor torque **Mm** = Maximum torque **In** = Rated load current **Is** = Locked rotor current

Single-phase motors - with balanced windings

With permanent capacitor

TEFC construction – Squirrel cage rotor – Continuous duty S1 – Insulation class F – IP 55 protection

ZCB Type 4 pole - 1500 min¹													
Motor size		Rated output	Technical data at rated output V 230 - Hz 50					Direct insertion characteristics			Run capacitor	Moment of inertia	Mass (IM B3)
		Pn	n	In	η	cos φ	Mn		Pn	n	In	η	cos φ
		kW	min-¹	A	%		Nm		**kW**	min-¹	A	%	
63	**a**	**0.09**	1420	0.80	51.0	0.96	0.61	0.62	2.4	1.5	6.3	0.206	3.8
63	**b**	**0.12**	1420	1.07	51.9	0.94	0.81	0.54	2.4	1.8	8	0.263	4.4
63	**c**	**0.18**	1400	1.4	58.2	0.96	1.23	0.56	2.5	1.7	10	0.326	5.2
71	**a**	**0.18**	1370	1.4	57.0	0.98	1.26	0.93	2.3	1.7	12.5	0.687	5.8
71	**b**	**0.25**	1370	1.9	58.4	0.98	1.74	0.92	2.4	1.7	16	0.800	6.4
71	**c**	**0.37**	1380	2.6	64.5	0.96	2.56	0.92	2.9	1.7	20	1.175	8.3
80	**a**	**0.37**	1360	2.8	61.1	0.94	2.60	0.56	1.9	1.5	20	1.499	7.6
80	**b**	**0.55**	1360	4.2	61.2	0.93	3.86	0.54	2.1	1.7	31.5	2.043	9.2
80	**c**	**0.75**	1360	5.0	67.9	0.96	5.27	0.54	2.2	1.6	40	2.517	10.7
90S	**a**	**0.75**	1390	5.2	65.3	0.93	5.15	0.82	2.2	1.8	40	2.210	11.8
90L	**a**	**1.1**	1370	6.7	72.8	0.98	7.67	0.66	2.6	1.6	45	2.843	14.3

Mn = Full load torque **Ms** = Locked rotor torque **Mm** = Maximum torque **In** = Rated load current **Is** = Locked rotor current

Single-phase motors with electromechanical relay for high starting torque

Suitable for insertions at least 2 minute-interval.
With permanent capacitor + start capacitor.
TEFC construction – Squirrel cage rotor – Continuous duty S1 – Insulation class F – IP 55 protection

Motor size	Rated output	Technical data at rated output V 230 – Hz 50					Direct insertion characteristics			Run capacit.	Start capacit.	Moment of inertia	Mass (IM B3)
	Pn kW	n min-1	In A	η %	cos φ	Mn Nm	Ms/Mn	Is/In	Mm/Mn	V 450 µF	V 250 µF	J 10-3 kg.m2	kg
ZSE Type 2 pole - 3000 min1													
71 a	**0.37**	2780	2.7	63.4	0.94	1.27	2.0	4.1	1.9	12.5	80-100	0.342	6.0
71 b	**0.55**	2810	3.7	71.8	0.90	1.87	2.0	4.1	1.8	16	80-100	0.424	7.0
71 c	**0.75**	2840	4.6	75.4	0.94	2.52	2.0	4.8	1.8	20	80-100	0.505	7.9
80 a	**0.55**	2830	3.5	72.0	0.95	1.86	2.0	4.5	1.9	20	80-100	0.704	7.9
80 b	**0.75**	2870	4.5	76.3	0.95	2.50	2.0	4.8	1.9	25	80-100	0.923	9.5
80 c	**1.1**	2850	6.3	79.9	0.95	3.69	2.0	4.8	2.0	31.5	100-125	1.153	11.1
90S a	**1.5**	2880	9.3	77.1	0.91	4.98	2.0	4.8	2.4	40	125-156	1.266	12.5
90L a	**1.8**	2900	11.0	78.6	0.93	5.93	2.0	5.0	2.5	40	125-156	1.619	15.0
90L b	**2.2**	2900	13.0	79.1	0.93	7.25	2.0	5.1	2.5	50	156-200	1.888	16.9
100L a	**2.2**	2850	12.2	80.0	0.98	7.38	2.0	4.6	2.2	50	156-200	2.666	19.0
ZSE Type 4 pole - 1500 min1													
71 a	**0.25**	1350	1.9	61.5	0.93	1.77	2.0	4.2	1.6	10	50-63	0.687	5.9
71 b	**0.37**	1350	2.7	62.1	0.96	2.62	2.0	4.2	1.7	12.5	50-63	0.800	6.6
71 c	**0.55**	1360	3.6	68.5	0.97	3.86	2.0	4.2	1.5	20	50-63	1.175	8.4
80 a	**0.37**	1370	2.9	61.0	0.91	2.58	2.0	3.8	1.6	14	50-63	1.499	7.7
80 b	**0.55**	1380	3.8	65.5	0.96	3.81	2.0	4.0	1.8	16	50-63	2.043	9.2
80 c	**0.75**	1360	5.3	64.8	0.95	5.27	2.0	4.1	1.8	20	80-100	2.517	10.7
90S a	**1.1**	1400	7.2	69.2	0.96	7.50	2.0	3.8	1.5	31.5	100-125	2.210	11.9
90L a	**1.5**	1420	9.5	74.6	0.92	10.1	2.0	4.5	1.7	35	100-125	2.843	14.4
90L b	**1.8**	1410	11.2	77.2	0.93	12.2	2.0	4.3	1.7	40	125-156	3.327	16.4
100L a	**1.8**	1380	11.4	76.7	0.92	12.4	2.0	4.5	1.8	35	156-200	4.637	19.0
100L b	**2.2**	1410	14.0	75.1	0.91	14.9	2.0	4.7	1.9	50	156-200	6.034	23.1
ZSE Type 6 pole - 1000 min1													
71 a	**0.12**	920	1.15	50.4	0.90	1.25	2.0	2.4	1.6	10	50-63	0.687	5.9
71 b	**0.18**	920	1.7	50.6	0.91	1.87	2.0	2.4	1.6	14	50-63	0.800	6.5
80 a	**0.25**	930	2.1	55.7	0.93	2.60	2.0	3.3	1.7	14	50-63	1.499	7.7
80 b	**0.37**	920	3.1	57.0	0.91	3.84	2.0	3.5	1.7	16	50-63	2.043	9.2
80 c	**0.55**	920	4.1	63.4	0.92	5.71	2.0	3.5	1.7	25	50-63	2.517	10.7
90S a	**0.55**	920	3.9	65.9	0.93	5.71	2.0	3.4	1.7	25	50-63	2.210	11.8
90L a	**0.75**	920	5.1	67.3	0.95	7.79	2.0	3.6	1.7	35	80-100	2.843	14.3
100L a	**1.1**	930	7.3	71.2	0.92	11.3	2.0	4.2	1.7	35	125-156	6.054	19.3
100L b	**1.5**	930	9.8	72.3	0.92	15.4	2.0	4.5	1.7	50	156-200	7.720	22.7

Mn = Full load torque **Ms** = Locked rotor torque **Mm** = Maximum torque **In** = Rated load current **Is** = Locked rotor current

Single-phase motors with electronic starter for high starting torque

Suitable for insertions with about 6 second-interval.
With permanent capacitor + start capacitor.
TEFC construction – Squirrel cage rotor – Continuous duty S1 – Insulation class F – IP 55 protection

Motor size		Rated output Pn	Technical data at rated output V 230 – Hz 50 n	In	η	cos φ	Mn	Direct insertion characteristics Ms/Mn	Is/In	Mm/Mn	Run capacit. V 450	Start capacit. V 320	Moment of inertia J	Mass (IM B3)
		kW	min-1	A	%		Nm				µF	µF	10-3 kg.m2	kg
ZSET Type 2 pole - 3000 min1														
71	**a**	**0.37**	2780	2.7	63.4	0.94	1.27	2.0	4.1	1.9	12.5	50	0.342	6.3
71	**b**	**0.55**	2810	3.7	71.8	0.90	1.87	2.0	4.1	1.8	16	50	0.424	7.3
71	**c**	**0.75**	2840	4.6	75.4	0.94	2.52	2.0	4.8	1.8	20	50	0.505	8.2
80	**a**	**0.55**	2830	3.5	72.0	0.95	1.86	2.0	4.5	1.9	20	50	0.704	8.3
80	**b**	**0.75**	2870	4.5	76.3	0.95	2.50	2.0	4.8	1.9	25	50	0.923	9.8
80	**c**	**1.1**	2850	6.3	79.9	0.95	3.69	2.0	4.8	2.0	31.5	50	1.153	11.4
90S	**a**	**1.5**	2880	9.3	77.1	0.91	4.98	2.0	4.8	2.4	40	80	1.266	12.8
90L	**a**	**1.8**	2900	11.0	78.6	0.93	5.93	2.0	5.0	2.5	40	80	1.619	15.3
90L	**b**	**2.2**	2900	13.0	79.1	0.93	7.25	2.0	5.1	2.5	50	80	1.888	17.2
100L	**a**	**2.2**	2850	12.2	80.0	0.98	7.38	2.0	4.6	2.2	50	80	2.666	19.3
ZSET Type 4 pole - 1500 min1														
71	**a**	**0.25**	1350	1.9	61.5	0.93	1.77	2.0	4.2	1.6	10	50	0.687	6.3
71	**b**	**0.37**	1350	2.7	62.1	0.96	2.62	2.0	4.2	1.7	12.5	50	0.800	6.9
71	**c**	**0.55**	1360	3.6	68.5	0.97	3.86	2.0	4.2	1.5	20	50	1.175	8.8
80	**a**	**0.37**	1370	2.9	61.0	0.91	2.58	2.0	3.8	1.6	14	50	1.499	8.0
80	**b**	**0.55**	1380	3.8	65.5	0.96	3.81	2.0	4.0	1.8	16	50	2.043	9.6
80	**c**	**0.75**	1360	5.3	64.8	0.95	5.27	2.0	4.1	1.8	20	50	2.517	11.0
90S	**a**	**1.1**	1400	7.2	69.2	0.96	7.50	2.0	3.8	1.5	31.5	80	2.210	12.2
90L	**a**	**1.5**	1420	9.5	74.6	0.92	10.1	2.0	4.5	1.7	35	80	2.843	14.7
90L	**b**	**1.8**	1410	11.2	77.2	0.93	12.2	2.0	4.3	1.7	40	80	3.327	16.6
100L	**a**	**1.8**	1380	11.4	76.7	0.92	12.4	2.0	4.5	1.8	35	80	4.637	19.3
100L	**b**	**2.2**	1410	14.0	75.1	0.91	14.9	2.0	4.7	1.9	50	80	6.034	23.3
ZSET Type 6 pole - 1000 min1														
71	**a**	**0.12**	920	1.15	50.4	0.90	1.25	2.0	2.4	1.6	10	50	0.687	6.2
71	**b**	**0.18**	920	1.7	50.6	0.91	1.87	2.0	2.4	1.6	14	50	0.800	6.8
80	**a**	**0.25**	930	2.1	55.7	0.93	2.60	2.0	3.3	1.7	14	50	1.499	8.0
80	**b**	**0.37**	920	3.1	57.0	0.91	3.84	2.0	3.5	1.7	16	50	2.043	9.5
80	**c**	**0.55**	920	4.1	63.4	0.92	5.71	2.0	3.5	1.7	25	50	2.517	11.0
90S	**a**	**0.55**	920	3.9	65.9	0.93	5.71	2.0	3.4	1.7	25	80	2.210	12.1
90L	**a**	**0.75**	920	5.1	67.3	0.95	7.79	2.0	3.6	1.7	35	80	2.843	14.6
100L	**a**	**1.1**	930	7.3	71.2	0.92	11.3	2.0	4.2	1.7	35	80	6.054	19.6
100L	**b**	**1.5**	930	9.8	72.3	0.92	15.4	2.0	4.5	1.7	50	80	7.720	23.0

Mn = Full load torque **Ms** = Locked rotor torque **Mm** = Maximum torque **In** = Rated load current **Is** = Locked rotor current

Single-phase motors with switch for high starting torque

With permanent capacitor + start capacitor.

TEFC construction – Squirrel cage rotor – Continuous duty S1 – Insulation class F – IP 55 protection

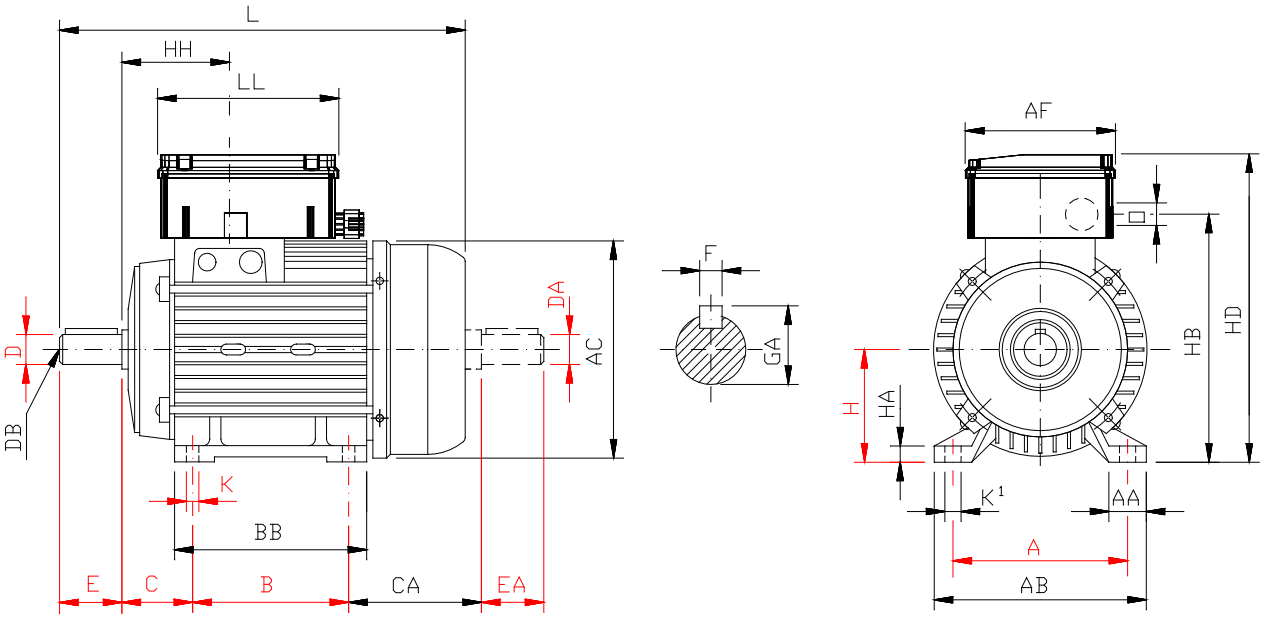
Note:
On request we supply motors with reversing gear (**ZIV Type**).
The data of **ZIV Type** correspond of those of the under schedule.

Motor size	Rated output	Technical data at rated output V 230 – Hz 50					Direct insertion characteristics			Run capacit.	Start capacit.	Moment of inertia	Mass (IM B3)
	Pn	n	In	η	cos φ	Mn	Ms/Mn	Is/In	Mm/Mn	V 450	V 250	J	
	kW	min-1	A	%		Nm				µF	µF	10-3 kg.m2	kg
ZIT Type 2 pole - 3000 min1													
71 a	**0.37**	2780	2.7	63.4	0.94	1.27	2.0	4.1	1.9	12.5	80-100	0.342	6.2
71 b	**0.55**	2810	3.7	71.8	0.90	1.87	2.0	4.1	1.8	16	80-100	0.424	7.2
71 c	**0.75**	2840	4.6	75.4	0.94	2.52	2.0	4.8	1.8	20	80-100	0.505	8.1
80 a	**0.55**	2830	3.5	72.0	0.95	1.86	2.0	4.5	1.9	20	80-100	0.704	8.2
80 b	**0.75**	2870	4.5	76.3	0.95	2.50	2.0	4.8	1.9	25	80-100	0.923	9.7
80 c	**1.1**	2850	6.3	79.9	0.95	3.69	2.0	4.8	2.0	31.5	100-125	1.153	11.3
90S a	**1.5**	2880	9.3	77.1	0.91	4.98	2.0	4.8	2.4	40	125-156	1.266	12.8
90L a	**1.8**	2900	11.0	78.6	0.93	5.93	2.0	5.0	2.5	40	125-156	1.619	15.3
90L b	**2.2**	2900	13.0	79.1	0.93	7.25	2.0	5.1	2.5	50	156-200	1.888	17.2
100L a	**2.2**	2850	12.2	80.0	0.98	7.38	2.0	4.6	2.2	50	156-200	2.666	19.3
ZIT Type 4 pole - 1500 min1													
71 a	**0.25**	1350	1.9	61.5	0.93	1.77	2.0	4.2	1.6	10	50-63	0.687	6.1
71 b	**0.37**	1350	2.7	62.1	0.96	2.62	2.0	4.2	1.7	12.5	50-63	0.800	6.8
71 c	**0.55**	1360	3.6	68.5	0.97	3.86	2.0	4.2	1.5	20	50-63	1.175	8.6
80 a	**0.37**	1370	2.9	61.0	0.91	2.58	2.0	3.8	1.6	14	50-63	1.499	7.9
80 b	**0.55**	1380	3.8	65.5	0.96	3.81	2.0	4.0	1.8	16	50-63	2.043	9.5
80 c	**0.75**	1360	5.3	64.8	0.95	5.27	2.0	4.1	1.8	20	80-100	2.517	11.0
90S a	**1.1**	1400	7.2	69.2	0.96	7.50	2.0	3.8	1.5	31.5	100-125	2.210	12.2
90L a	**1.5**	1420	9.5	74.6	0.92	10.1	2.0	4.5	1.7	35	100-125	2.843	14.6
90L b	**1.8**	1410	11.2	77.2	0.93	12.2	2.0	4.3	1.7	40	125-156	3.327	16.6
100L a	**1.8**	1380	11.4	76.7	0.92	12.4	2.0	4.5	1.8	35	156-200	4.637	19.3
100L b	**2.2**	1410	14.0	75.1	0.91	14.9	2.0	4.7	1.9	50	156-200	6.034	23.3
ZIT Type 6 pole - 1000 min1													
71 a	**0.12**	920	1.15	50.4	0.90	1.25	2.0	2.4	1.6	10	50-63	0.687	6.1
71 b	**0.18**	920	1.7	50.6	0.91	1.87	2.0	2.4	1.6	14	50-63	0.800	6.7
80 a	**0.25**	930	2.1	55.7	0.93	2.60	2.0	3.3	1.7	14	50-63	1.499	7.9
80 b	**0.37**	920	3.1	57.0	0.91	3.84	2.0	3.5	1.7	16	50-63	2.043	9.4
80 c	**0.55**	920	4.1	63.4	0.92	5.71	2.0	3.5	1.7	25	50-63	2.517	11.0
90S a	**0.55**	920	3.9	65.9	0.93	5.71	2.0	3.4	1.7	25	50-63	2.210	12.1
90L a	**0.75**	920	5.1	67.3	0.95	7.79	2.0	3.6	1.7	35	80-100	2.843	14.6
100L a	**1.1**	930	7.3	71.2	0.92	11.3	2.0	4.2	1.7	35	125-156	6.054	19.5
100L b	**1.5**	930	9.8	72.3	0.92	15.4	2.0	4.5	1.7	50	156-200	7.720	23.0

Mn = Full load torque **Ms** = Locked rotor torque **Mm** = Maximum torque **In** = Rated load current **Is** = Locked rotor current

Mounting arrangement IM B3

Single-phase motors **ZCO and ZCB Type**

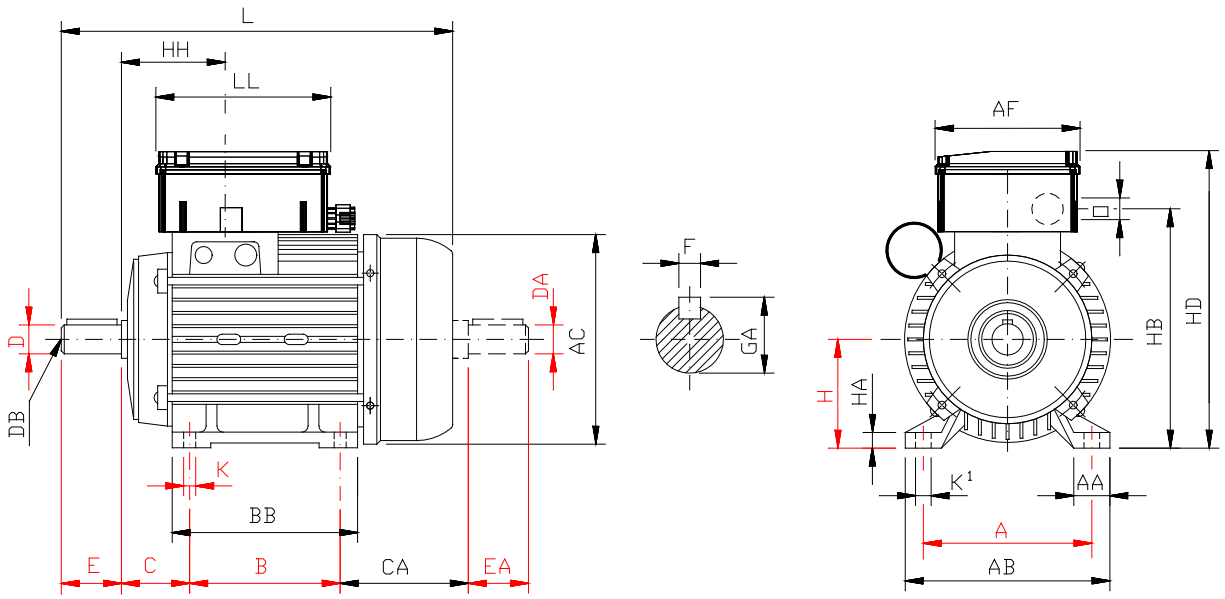


Measures for coupling, IM B5 mounting see page 34 - 35
Measures for coupling, IM B14 mounting see page 36 - 37

Motor size	Coupling											Overall								Shaft end				
	A	AA	AB	**B**	BB	**C**	CA	**H**	HA	**K**	K¹	AC	AF	HB	HD	HH	L	LL	O	**D** **DA**	DB	**E** **EA**	F	GA
56	**90**	18	108	**71**	91	**36**	66	**56**	7	**7**	9	110	92	132	169	65	189	121	PG11	**9**	M3	**20**	3	10.2
63	**100**	22	120	**80**	100	**40**	73	**63**	7	**7**	10	124	92	145	178	68	214	121	PG11	**11**	M4	**23**	4	12.5
71	**112**	26	135	**90**	112	**45**	85	**71**	8	**7**	12	141	92	163	197	73	247	121	PG11	**14**	M5	**30**	5	16
80	**125**	28	152	**100**	124	**50**	95	**80**	11	**9**	13	160	120	173	226	82	282	145	PG16	**19**	M6	**40**	6	21.5
90S	**140**	30	170	**100**	130	**56**	102	**90**	13	**9**	13	180	120	188	240	86	305	145	PG16	**24**	M8	**50**	8	27
90L	**140**	30	170	**125**	155	**56**	102	**90**	13	**9**	13	180	120	188	240	86	330	145	PG16	**24**	M8	**50**	8	27
100L	**160**	35	192	**140**	163	**63**	115	**100**	14	**12**	17	200	120	211	262	96	374	145	PG16	**28**	M10	**60**	8	31

Mounting arrangement IM B3

Single-phase motors **ZSE and ZSET Type**



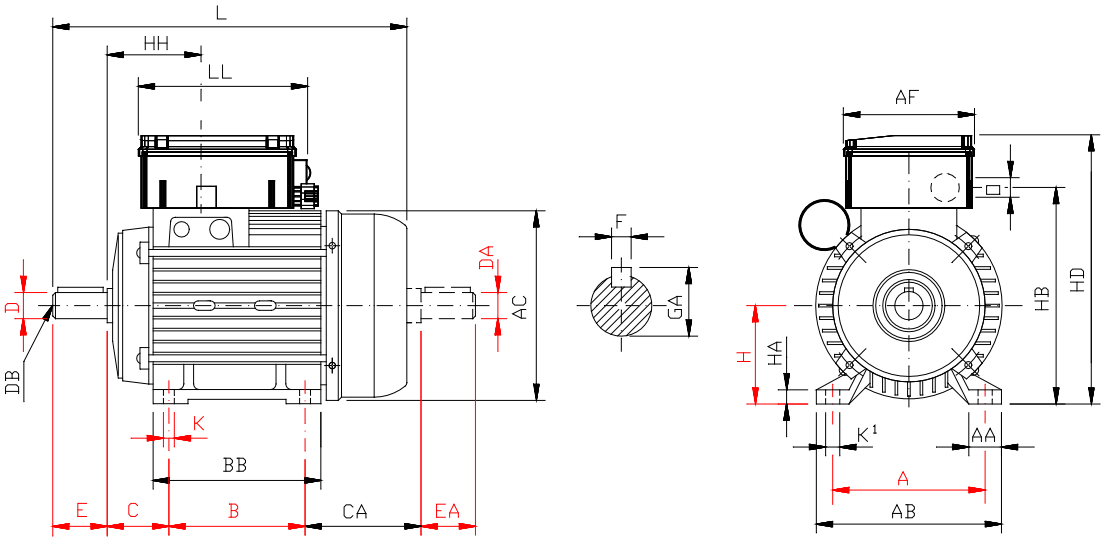
Measures for coupling, IM B5 mounting see page 34 - 35
Measures for coupling, IM B14 mounting see page 36 - 37

Note: It is possible, in certain cases, the application of an external capacitor as from the figure.

Motor size	Coupling											Overall								Shaft end				
	A	AA	AB	B	BB	C	CA	H	HA	K	K¹	AC	AF	HB	HD	HH	L	LL	O	D DA	DB	E EA	F	GA
71	**112**	26	135	**90**	112	**45**	85	**71**	8	**7**	12	141	120	155	211	73	247	145	PG16	**14**	M5	**30**	5	16
80	**125**	28	152	**100**	124	**50**	95	**80**	11	**9**	13	160	120	173	226	82	282	145	PG16	**19**	M6	**40**	6	21.5
90S	**140**	30	170	**100**	130	**56**	102	**90**	13	**9**	13	180	120	188	240	86	305	145	PG16	**24**	M8	**50**	8	27
90L	**140**	30	170	**125**	155	**56**	102	**90**	13	**9**	13	180	120	188	240	86	330	145	PG16	**24**	M8	**50**	8	27
100L	**160**	35	192	**140**	163	**63**	115	**100**	14	**12**	17	200	120	211	262	96	374	145	PG16	**28**	M10	**60**	8	31

Mounting arrangement IM B3

Single-phase motors **ZIT and ZIV Type**



Measures for coupling, IM B5 mounting see page 34 - 35
Measures for coupling, IM B14 mounting see page 36 - 37

Note: It is possible, in certain cases, the application of an external capacitor as from the figure.

Motor size	Coupling											Overall								Shaft end				
	A	AA	AB	**B**	BB	**C**	CA	**H**	HA	**K**	K¹	AC	AF	HB	HD	HH	L	LL	O	**D** **DA**	DB	**E** **EA**	F	GA
71	**112**	26	135	**90**	112	**45**	85	**71**	8	**7**	12	141	120	155	211	73	247	165	PG16	**14**	M5	**30**	5	16
80	**125**	28	152	**100**	124	**50**	95	**80**	11	**9**	13	160	120	173	226	82	282	165	PG16	**19**	M6	**40**	6	21.5
90S	**140**	30	170	**100**	130	**56**	102	**90**	13	**9**	13	180	120	188	240	86	305	165	PG16	**24**	M8	**50**	8	27
90L	**140**	30	170	**125**	155	**56**	102	**90**	13	**9**	13	180	120	188	240	86	330	165	PG16	**24**	M8	**50**	8	27
100L	**160**	35	192	**140**	163	**63**	115	**100**	14	**12**	17	200	120	211	262	96	374	165	PG16	**28**	M10	**60**	8	31

Self-braking three-phase and single-phase motors

Notes and calculations

Calculation of the braking torque

The value of the braking torque M_b required for a particular application is obtained by the formula:

$$M_b = K \cdot \left(\frac{2\pi.n}{60} \cdot \frac{J_t}{t_b} \pm M_l \right)$$

were:

K = Safety factor (~2)

n = Speed of rotation of the motor (min^{-1})

J_t = Total moment of inertia of the rotating shaft reduced ($kg.m^2$)

t_b = Time allowed for braking (ms)

M_l = Moment of resistance in Nm load applied ***

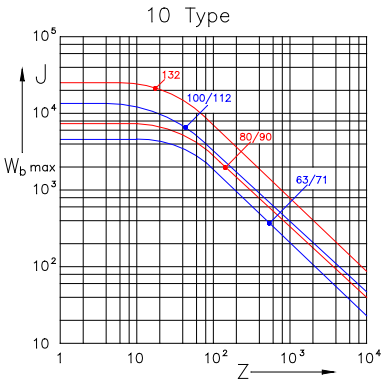
*** Use "**-**" sign in the case of normal or braking loads uphill (who oppose the rotation of the motor).
Use "**+**" sign in the case of downward loads (which favour the rotation of the motor).

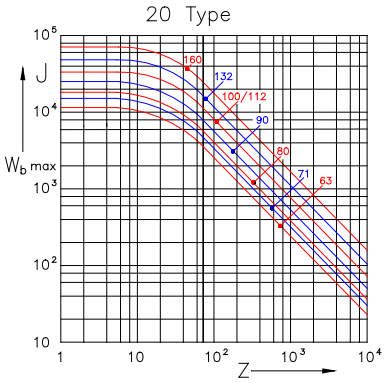
Verification of the heat dissipation

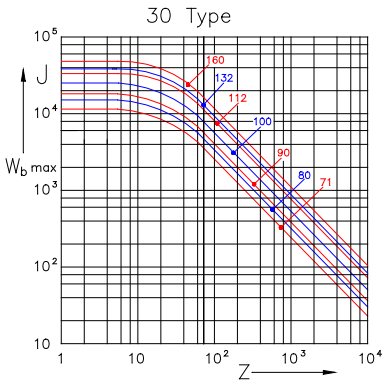
In each cycle, the energy possessed by the braked weight is transformed into heat by friction.
The braking work is calculated using the formula:

$$W_b = \frac{J_t}{2} \cdot \left(\frac{2\pi \cdot n}{60} \right)^2 \cdot \frac{M_b}{M_b \pm M_l}$$

Knowing the braking work W_b, he number of braking/time Z must be less than the planned number of cycles/hour max. eligible for the selected type of brake, detectable by the graphs below W_b max. and Z.
Conversely, the known number of cycles/hour Z, max. eligible W_b must be greater than that calculated.







Notes and calculations

Duration of the friction linings
The wear of the friction surfaces depends on many factors (number of interventions, brake torque, work done at each stop, environmental conditions, etc..).
The indicative number of permitted braking is achieved by the formula:

$$N_t = \frac{W_t}{W_b}$$

While the number allowed to be indicative of braking interval between two adjustments is:

$$N = \frac{W_1}{W_b}$$

The values of and are obtainable from the selected table to the brake.

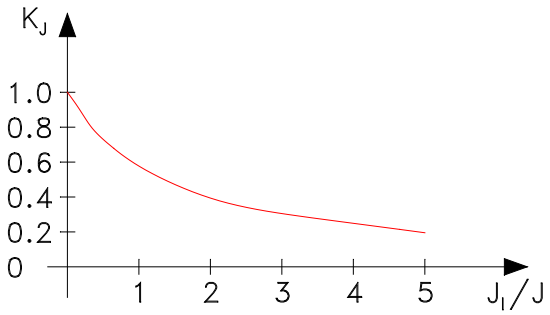
Number of interventions
In general, the max. number of operations/hour, which can hold up to an motor load can be calculated as follows:

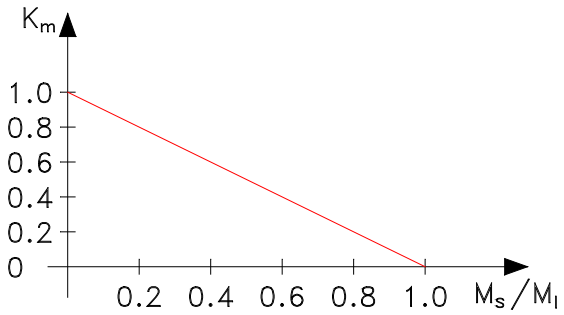
$$Z = K_J \cdot K_m \cdot Z_o$$

where:

K_J = Coefficient detected by the table function J_l/J
K_m = Coefficient detected by the table function M_s/M_l
J_l = Moment of inertia of the load
J = Moment of inertia of the motor
M_l = Moment resistance of the load
M_s = Starting torque of the motor
Z_o = Number of operation/hour sustainable by the motor without load (see table on page 68).

The number of starts thus calculated must be less than the number of operations/hour eligible by the brake.
If it does not mean that the brake is not able to dissipate the heat generated during braking and therefore reduces the frequency or goodwill, or you have to oversize the brake.
If the value ofis close toit is recommended to control the temperature of the motor windings by using, for example, thermal protectors.

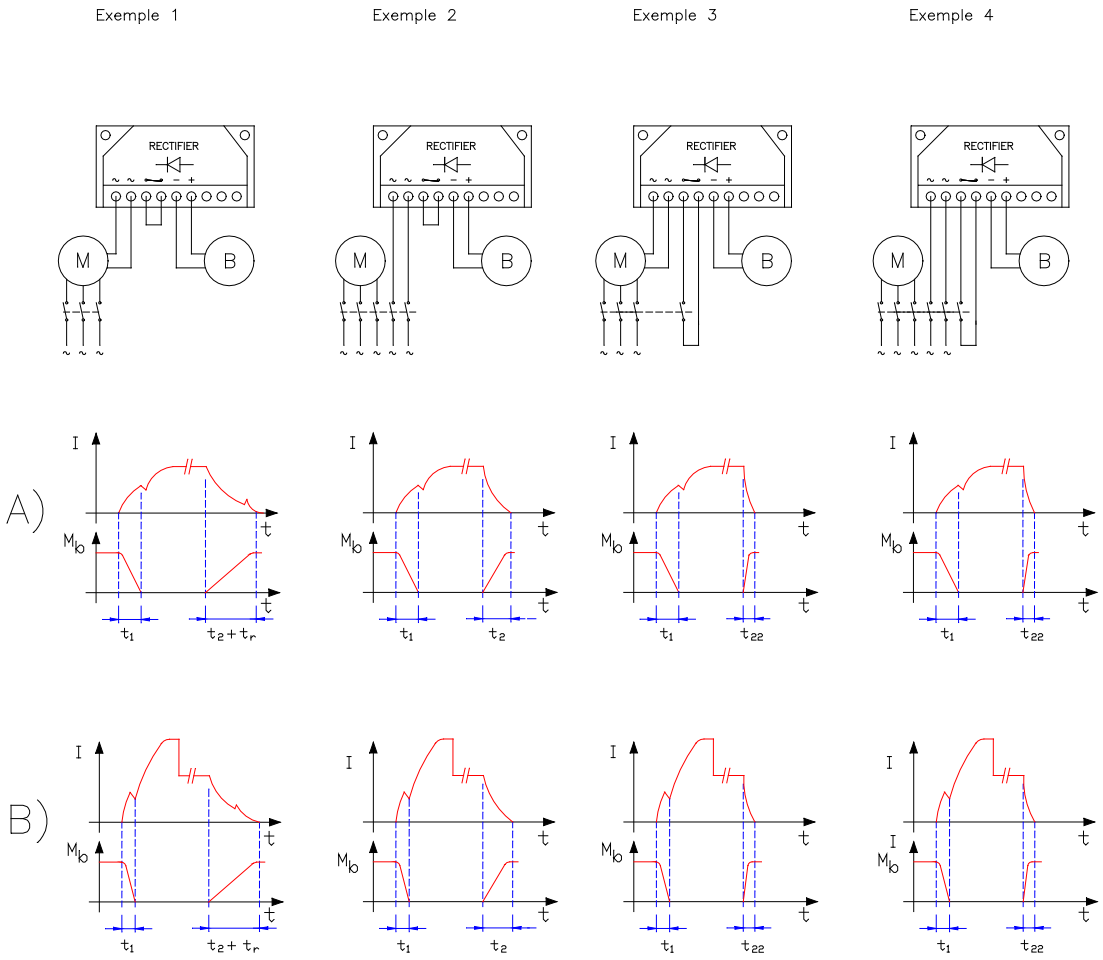




Starts per hour with no load

Motor size		Starts per hour (Zo) - 10S Type				Starts per hour (Zo) - 20S and 30S Type			
		2 Pole	4 Pole	6 Pole	8 Pole	2 Pole	4 Pole	6 Pole	8 Pole
63	a	4200	13000	-	-	6000	18000	-	-
63	b	4000	12000	16000	-	5700	17000	23000	-
63	c	3800	10500	15000	-	5500	15000	21000	-
71	a	3800	11000	15500	-	5500	16000	22000	-
71	b	3600	10700	15000	17000	5200	15500	21000	24000
71	c	3500	9800	13500	16000	5000	14000	19000	23000
80	a	3800	7000	-	-	5500	10000	-	-
80	b	3600	6900	10500	14700	5200	9800	15000	21000
80	c	3400	6600	9800	14000	4800	9500	14000	20000
90S	a	3000	7700	9000	10500	4200	11000	13000	15000
90S	b	2900	-	-	-	4100	-	-	-
90L	a	2800	7000	7700	9100	4000	10000	11000	13000
90L	b	2600	6000	-	-	3700	8500	-	-
100L	a	1900	5200	6300	7000	2700	7400	9000	10000
100L	b	1700	4800	5300	5600	2500	6800	7500	8000
112M	a	1100	2300	3500	-	1600	3300	5000	-
112M	b	1000	2100	2800	3800	1500	3000	4000	5500
132S	a	450	-	1400	-	600	-	2000	-
132S	b	390	900	-	1600	550	1300	-	2300
132M	a	350	-	1260	-	500	-	1800	-
132M	b	300	770	1050	1500	430	1100	1500	2100
132M	c	-	700	-	-	-	1000	-	-
160M	a	-	-	-	-	-	-	-	1800
160M	b	-	-	-	-	-	820	1100	1700
160L	a	-	-	-	-	-	750	1000	1600
160L	b	-	-	-	-	-	-	-	-

Diagrams of the times of the dc brake

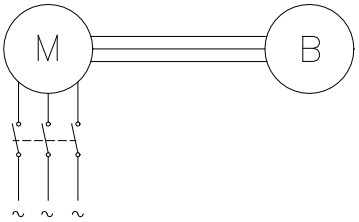


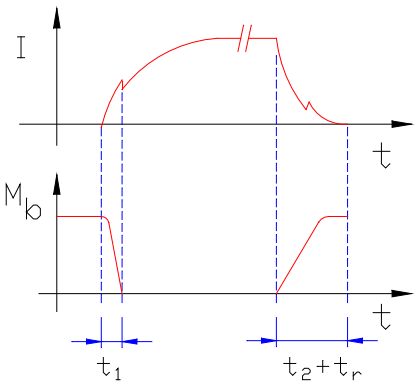
A) = Standard rectifier
B) = Increased rectifier

Note: The timing of intervention (**t**1 - **t**2 - **t**11 - **t**22) are shown in the tables on pages following while the delay time (**t**r), since it depends on the inertia of the load and the energy stored by the motor, can not be estimated because it varies from motor to motor.

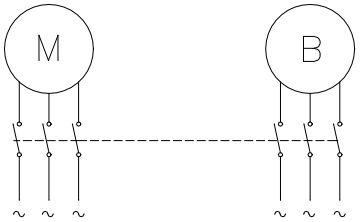
Diagrams of the times of the ac brake

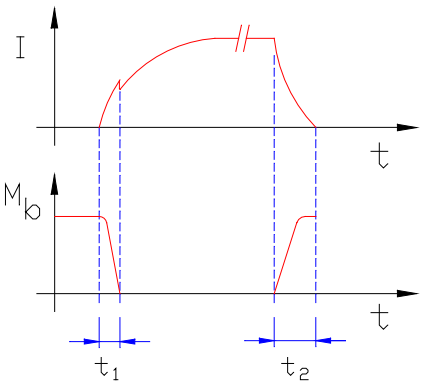
Exemple 1





Exemple 2





Note: The timing of intervention (**t**1 - **t**2) are shown in the tables on pages following while the delay time (**t**r), since it depends on the inertia of the load and the energy stored by the motor, can not be estimated because it varies from motor to motor.

Self-braking three-phase motors Braking-torque fixed

Self-braking three-phase motors - 10 Type

Typical applications:

- Machines for woodworking.
- Machines with long braking and high braking works.
- Machines that require arrests but not controlled precision.

Mechanical characteristics:

- Small brake.
- Rear brake mounting flange: aluminium.
- Fan cast iron brake.
- Seal friction asbestos-free and silent.
- Braking torques and other technical data: see table below.
- Mechanical release lever on request.

Electrical characteristics:

- Direct current brake.
- The dc power is obtained by a brake rectifier already built into the motor terminal box.
- The brake power can be independent or derived from the motor, depending on motor type and the needs of employment.
- The preparation of standard rectifiers opening of the dc circuit, to obtain necessary permits rapid ascent of the braking torque according to table below.
- For very intermittent and services for specifics uses you can get a fast action of the brake is in the release that, with the use of appropriately designed and fast rectifiers supplied on request.

Table of braking torques and other technical data of brake

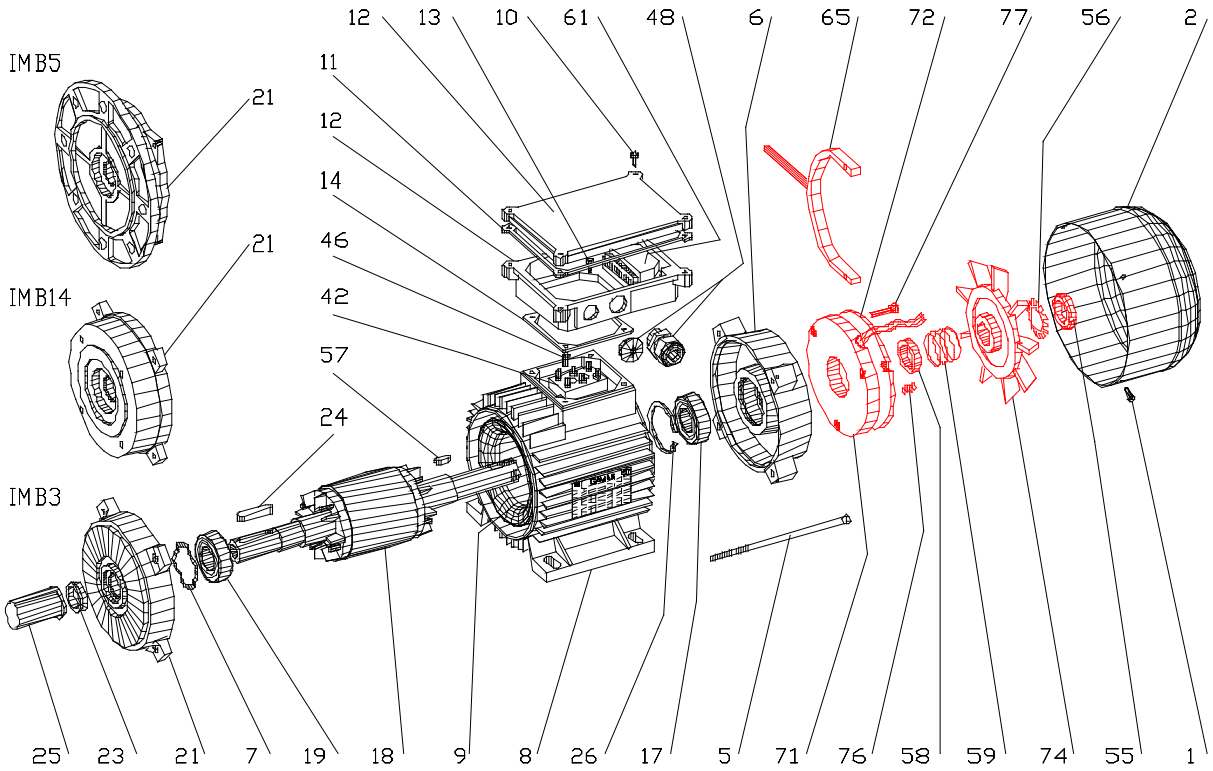
Motor size	Rated braking torque **Mb** Nm	Air-gap **sn** mm	**smax** mm	Maximum speed **nmax** min-1	Brake life **Wt** 1) MJ	**W1** 2) MJ	Brake release time **t1** 3) ms	**t11** 4) ms	Braking torque rise time *** **t2** 5) ms	**t22** 6) ms	Brake power input **Pa** W
63	3	0.20	0.50	6000	250	30	30	15	80	8	21
71	4	0.20	0.60	6000	250	40	40	20	100	10	21
80	7	0.20	0.60	6000	375	60	60	30	150	15	34
90	7	0.20	0.60	3600	375	60	60	30	150	15	34
100	13	0.25	0.65	3600	500	80	100	45	250	15	38
112	13	0.25	0.65	3600	500	80	-	50	250	25	38
132	30	0.30	0.70	3600	1650	132	-	70	400	40	57

1) For wear of the friction linings up to a thickness of 1 mm
2) Between two wear adjustments from **sn** to **smax**
3) With standard rectifier
4) With increased rectifier
5) Opening on ac side
6) Opening on dc side or with rapid rectifier

***** -** The time table is valid for a power independent of a brake motor.
If the brake power is derived from the motor, the time table must be increased as dependent inertia and stored energy from the motor. Again, with the opening or using the dc-side rectifier fast, time is much improved.

For any further information you should contact our Technical Department.

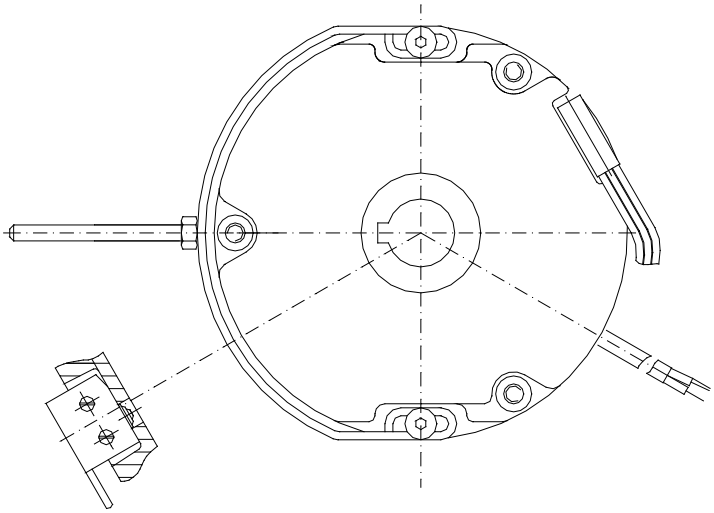
Self-braking three-phase motor - 10 Type

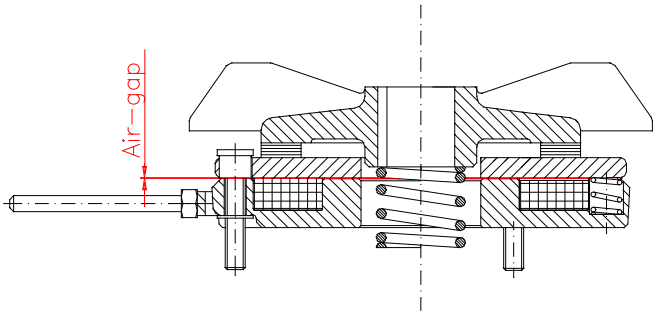


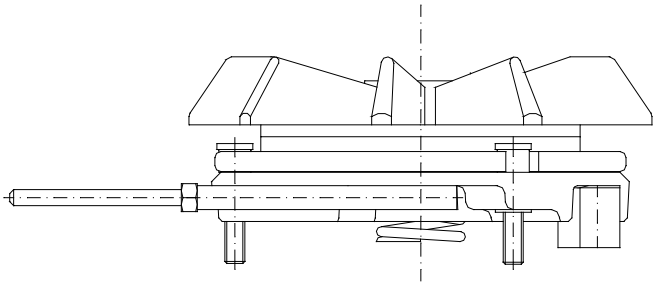
Spare parts nomenclature

1. Screw for fan cover
2. Fan cover
5. Rod
6. N-end shield
7. Spring ring
8. Frame
9. Stator package
10. Screw for terminal box cover
11. Gasket for terminal box cover
12. Terminal box
13. Screw for terminal box
14. Gasket for terminal box
17. Rear bearing
18. Rotor
19. Front bearing
21. D-end shield/flange
23. Sealing ring
24. Key
25. Shaft cap
26. Retaining ring
42. Terminal board
46. Grounding screw
48. Cable gland
55. Nut
56. Ring
57. Key
58. Spacer
59. Spring
61. Rectifier
65. Manual release
71. Electromagnet
72. Movable armature
74. Brake fan
76. Spring
77. Screw for brake

Direct current brake - 10 Type

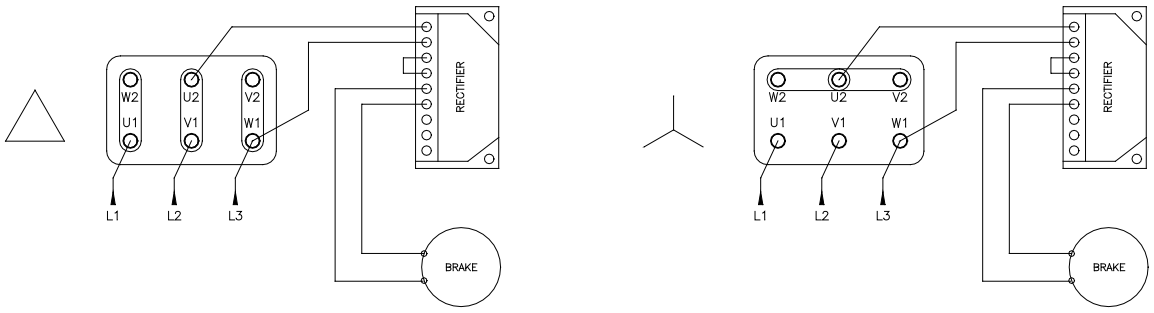






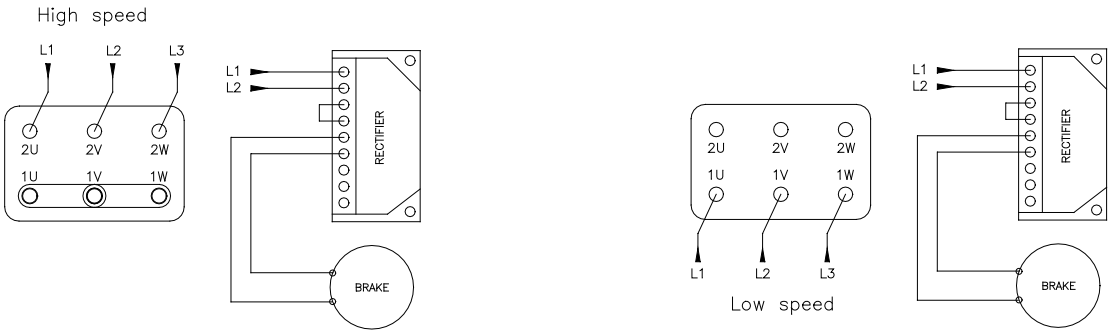
Connection for motors 10S Type

Self-braking three-phase **one-speed** motors - with **dc brake**



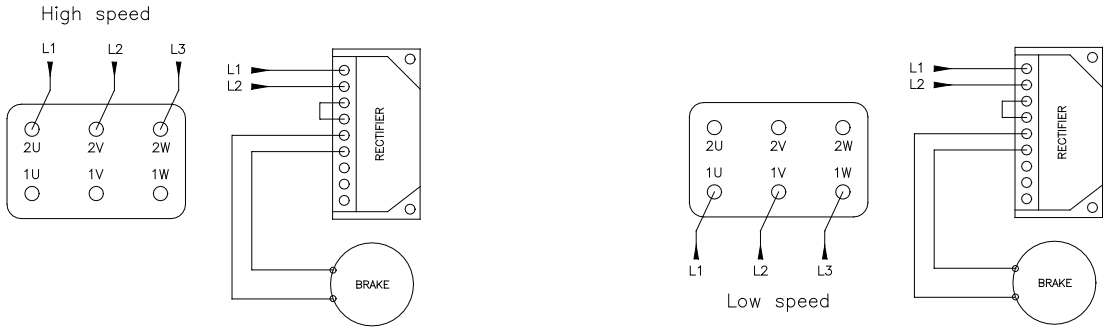
Connection for motors 10D Type

Self-braking three-phase **two-speed** motors - **single winding** - with **dc brake**



Connection for motors 10DD Type

Self-braking three-phase **two-speed** motors - **double winding** - with **dc brake**



One-speed self-braking three-phase motors - High Efficiency (IE2)

TEFC construction – Squirrel cage rotor – Continuous duty S1 – Insulation class F – IP 54 protection
Direct current brake power supply

Method of determining the efficiency: IEC 60034-2-1; 2014

Motor size	Rated output Pn	Technical data at rated output V 400 - Hz 50							Direct insertion characteristics			Braking torque	Moment of inertia	Mass (IM B3)
		n	In	IE2 η			cos φ	Mn	Ms/Mn	Is/In	Mm/Mn	Mb	J	
	kW	min-1	A	50 %	75 %	100 %		Nm				Nm	10-3 kg.m2	kg
10SH Type 2 pole - 3000 min1														
63 a	**0.18**	2815	0.49	64.2	69.5	70.5	0.76	0.62	2.9	4.7	2.9	3	0.429	5.4
63 b	**0.25**	2800	0.64	68.1	71.6	71.7	0.81	0.89	2.9	5.0	3.1	3	0.462	6.0
63 c	**0.37**	2825	0.91	69.7	73.9	74.2	0.80	1.26	3.4	5.6	3.2	3	0.506	6.7
71 a	**0.37**	2820	0.95	68.6	73.6	74.4	0.75	1.24	3.3	5.5	3.4	4	0.842	7.8
71 b	**0.55**	2815	1.38	71.6	74.9	75.3	0.77	1.87	3.5	5.7	3.4	4	0.924	8.7
80 a	**0.75**	2840	1.7	78.9	80.7	80.2	0.81	2.54	3.3	6.6	3.4	7	1.850	12.2
80 b	**1.1**	2865	2.4	83.1	84.5	84,0	0.80	3.69	3.7	7.4	3.6	7	2.129	14.2
80 c	**1.5**	2830	3.4	81.7	82.9	82.0	0.79	5.07	3.3	6.4	3.4	7	2.129	14.2
90S a	**1.5**	2900	3.2	82.6	84.9	84.8	0.82	4.94	3.3	7.9	3.6	7	2.569	17.2
90S b	**1.8**	2870	3.7	83.7	84.6	83.6	0.85	5.99	2.6	6.6	2.8	7	2.569	17.2
90L a	**2.2**	2890	4.4	84.1	85.9	85.7	0.84	7.26	3.1	8.1	3.6	7	2.988	20.2
90L b	**2.6**	2850	5.2	86.4	86.4	84.8	0.87	8.80	2.8	6.6	3.0	7	2.988	20.2
100L a	**3**	2900	5.9	88.0	88.5	87.7	0.84	9.89	2.6	7.3	3.3	13	6.147	26.3
100L b	**4**	2875	7.9	88.1	88.1	86.8	0.85	13.4	2.6	7.2	3.2	13	6.542	28.4
112M a	**4**	2920	7.3	86.6	88.4	88.6	0.88	12.9	3.9	9.9	5.5	13	8.591	33.8
112M b	**5.5**	2910	10.5	87.6	88.9	88.8	0.84	18.1	4.3	9.9	6.3	13	9.736	37.1
132S a	**5.5**	2920	10.5	87.2	88.6	88.5	0.85	17.9	2.4	7.4	3.4	30	15.96	48.0
132S b	**7.5**	2940	14.2	88.0	89.6	89.7	0.84	24.3	3.6	8.8	4.0	30	19.41	55.9
132M a	**9.2**	2940	17.8	88.9	90.4	90.6	0.82	29.9	4.5	9.6	4.5	30	22.06	63.3
132M b	**11**	2940	21.1	89.0	90.6	90.7	0.83	35.7	4.2	10.1	4.6	30	24.58	69.2
10SH Type 4 pole - 1500 min1														
63 b	**0.12**	1370	0.41	55.6	61.8	63.1	0.67	0.85	2.1	3.0	2.3	3	0.563	5.9
63 c	**0.18**	1380	0.61	58.8	64.9	66.0	0.65	1.25	2.4	3.3	2.6	3	0.626	6.7
71 b	**0.25**	1380	0.68	66.5	69.5	68.7	0.76	1.73	2.1	3.8	2.3	4	1.300	8.4
71 c	**0.37**	1415	1.08	65.6	71.3	72.8	0.68	2.51	3.0	4.8	3.3	4	1.675	10.2
80 a	**0.55**	1415	1.26	76.3	78.6	78.3	0.79	3.67	2.4	5.4	2.8	7	3.157	12.8
80 b	**0.75**	1430	1.7	77.3	80.1	80.2	0.78	4.96	2.9	6.2	3.4	7	3.789	14.7
90S a	**1.1**	1425	2.5	80.9	82.7	82.1	0.76	7.37	2.4	5.3	2.9	7	3.666	16.7
90L a	**1.5**	1425	3.4	82.8	84.4	83.8	0.76	10.1	2.7	5.8	3.2	7	4.427	19.6
100L a	**2.2**	1430	5.0	83.7	85.3	84.7	0.75	14.7	2.6	5.7	3.2	13	8.036	25.9
100L b	**3**	1430	6.7	85.1	86.4	85.8	0.75	19.9	2.8	6.0	3.4	13	9.450	29.8
112M a	**4**	1440	8.0	87.3	88.1	87.2	0.82	26.3	2.4	6.5	3.1	13	14.48	36.6
132S b	**5.5**	1445	11.0	89.2	89.3	88.2	0.82	36.4	2.3	5.7	2.7	30	29.79	55.5
132M b	**7.5**	1450	14.8	90.0	90.1	89.1	0.82	49.4	2.4	6.1	2.7	30	37.74	66.9

Mn = Full load torque **Ms** = Locked rotor torque **Mm** = Maximum torque **In** = Rated load current **Is** = Locked rotor current

One-speed self-braking three-phase motors - High Efficiency (IE2)

TEFC construction – Squirrel cage rotor – Continuous duty S1 – Insulation class F – IP 54 protection
Direct current brake power supply

Method of determining the efficiency: IEC 60034-2-1; 2014

Motor size	Rated output Pn kW	Technical data at rated output V 400 - Hz 50 n min-1	In A	IE2 η 50 %	75 %	100 %	cos φ	Mn Nm	Direct insertion characteristics Ms/Mn	Is/In	Mm/Mn	Braking torque Mb Nm	Moment of inertia J 10-3 kg.m2	Mass (IM B3) kg
10SH Type 6 pole - 1000 min1														
71 b	**0.12**	905	0.52	44.3	51.5	54.1	0.63	1.28	2.1	2.6	2.3	4	1.300	8.3
71 c	**0.18**	890	0.66	51.2	57.0	57.1	0.68	1.96	1.9	2.6	2.1	4	1.675	10.0
80 b	**0.25**	935	0.77	64.0	68.9	70.4	0.66	2.54	2.6	4.1	2.8	7	3.043	12.3
80 c	**0.37**	940	1.10	64.1	70.0	71.5	0.68	3.78	2.8	4.4	3.0	7	3.517	13.6
90S a	**0.55**	935	1.42	72.5	75.4	75.1	0.74	5.63	2.1	4.3	2.5	7	5.248	16.4
90L a	**0.75**	935	2.0	75.4	78.2	77.9	0.72	7.83	2.3	4.7	2.9	7	6.521	19.3
100L r	**1.1**	940	2.7	76.5	79.1	78.7	0.73	11.0	2.3	4.9	2.9	13	11.03	23.9
100L a	**1.5**	940	3.7	78.5	80.6	80.1	0.74	15.3	2.3	5.1	3.0	13	13.59	27.9
112M a	**2.2**	960	5.3	80.2	82.5	82.4	0.73	21.8	1.6	5.4	2.8	13	19.91	35.4
132S a	**3**	955	6.8	83.6	84.7	83.9	0.76	30.0	1.6	5.0	2.6	30	32.20	48.9
132M a	**4**	960	8.9	84.8	86.0	85.3	0.76	39.7	1.6	5.4	2.9	30	39.77	58.9
132M b	**5.5**	960	11.7	86.8	87.8	87.1	0.78	54.2	1.7	5.9	3.0	30	50.65	72.1
10SH Type 8 pole - 750 min1														
71 b	**0.09**	685	0.57	30.0	41.1	45.4	0.50	1.26	2.7	2.2	2.8	4	1.300	8.3
71 c	**0.12**	685	0.82	28.9	36.9	42.5	0.50	1.68	2.9	2.2	3.1	4	1.675	10.1
80 b	**0.18**	695	0.89	41.7	50.8	54.6	0.54	2.49	2.6	2.7	2.7	7	3.043	12.1
80 c	**0.25**	695	1.22	41.8	49.9	54.1	0.55	3.42	2.7	2.8	2.8	7	3.517	13.6
90S a	**0.37**	690	1.43	55.5	62.3	63.8	0.59	5.18	1.8	2.5	1.9	7	4.685	15.0
90L a	**0.55**	685	2.0	59.1	65.9	67.0	0.57	7.40	1.9	2.5	2.3	7	5.958	17.5
100L r	**0.75**	685	2.6	60.0	65.2	66.5	0.62	10.4	2.2	3.2	2.8	13	10.84	24.0
100L a	**1.1**	690	3.5	64.8	70.1	71.1	0.63	15.1	2.1	3.5	2.6	13	13.31	27.6
112M a	**1.5**	705	4.3	71.1	74.5	74.4	0.67	20.3	1.2	3.5	2.1	13	19.91	35.1
132S b	**2.2**	715	6.1	74.8	78.2	78.5	0.66	29.0	1.5	3.8	2.3	30	36.79	52.2
132M b	**3**	720	8.0	76.4	79.8	80.1	0.67	39.5	1.4	4.1	2.5	30	46.60	62.5

Mn = Full load torque **Ms** = Locked rotor torque **Mm** = Maximum torque **In** = Rated load current **Is** = Locked rotor current

Two-speed self-braking three-phase motors - single winding - Dahlander connection (Star-Star/ Delta)

TEFC construction – Squirrel cage rotor – Continuous duty S1 – Insulation class F – IP 54 protection
Direct current brake power supply

10D Type 2/4 pole - 3000/1500 min¹											
Motor size		Rated output Pn **kW**	Technical data at rated output **V 400 - Hz 50** n min-¹	In A	Mn Nm	Direct insertion characteristics Ms/Mn	Is/In	Mm/Mn	Braking torque Mb Nm	Moment of inertia J 10-³ kg.m²	Mass (IM B3) kg
63	**a**	0.15/0.10	2780/1370	0.41/0.41	0.52/0.70	1.7/1.8	3.9/2.4	2.0/2.0	3	0.506	5.4
63	**b**	0.22/0.15	2800/1380	0.58/0.58	0.75/1.04	1.8/1.9	4.1/2.6	2.2/2.1	3	0.563	6.0
63	**c**	0.30/0.20	2800/1380	0.75/0.75	1.02/1.38	1.9/2.0	4.0/2.8	2.3/2.2	3	0.626	6.7
71	**a**	0.30/0.20	2800/1380	0.78/0.78	1.02/1.38	1.9/2.0	3.8/3.2	2.1/2.1	4	1.187	7.8
71	**b**	0.45/0.30	2810/1400	1.3/1.1	1.53/2.05	2.0/2.1	4.1/3.4	2.3/2.2	4	1.300	8.4
71	**c**	0.60/0.45	2840/1400	1.6/1.4	2.02/3.07	2.1/2.3	4.5/3.6	2.6/2.5	4	1.675	10.3
80	**a**	0.60/0.45	2780/1400	1.6/1.2	2.06/3.07	1.8/1.8	3.6/3.7	2.1/2.1	7	2.499	10.7
80	**b**	0.85/0.65	2820/1400	2.4/1.7	2.88/4.43	1.8/2.0	3.8/3.6	2.4/2.3	7	3.043	12.2
80	**c**	1.10/0.85	2830/1410	2.8/2.1	3.71/5.76	2.0/2.1	4.4/4.5	2.4/2.4	7	3.517	13.6
90S	**a**	1.50/1.10	2850/1410	3.3/2.7	5.03/7.45	2.2/2.0	4.8/4.3	2.9/2.4	7	3.310	15.2
90L	**a**	1.85/1.40	2850/1410	4.1/3.1	6.20/9.48	2.4/2.1	5.0/4.9	3.0//2.9	7	3.943	17.4
90L	**b**	2.20/1.70	2850/1410	5.0/3.9	7.37/11.5	2.5/2.3	5.6/5.1	3.2/3.0	7	4.427	19.3
100L	**a**	2.60/2.00	2850/1420	6.1/4.8	8.71/13.5	2.8/2.6	5.0/5.3	3.2/3.1	13	7.637	24.2
100L	**b**	3.50/2.70	2870/1420	8.0/6.4	11.6/18.2	2.7/2.7	5.7/4.9	3.2/2.9	13	9.030	27.9
112M	**a**	4.00/3.20	2880/1430	8.8/7.1	13.3/21.4	2.1/2.0	6.0/5.1	2.9/1.9	13	12.95	33.4
112M	**b**	4.80/3.70	2890/1430	9.8/8.2	15.9/24.7	2.0/2.0	6.2/5.0	2.7/1.8	13	14.48	36.4
132S	**b**	6.00/4.60	2890/1440	13.1/9.9	19.8/30.5	2.3/2.0	5.1/5.0	2.5/2.4	30	27.43	51.7
132M	**b**	8.20/6.60	2910/1440	17.5/13.5	26.9/43.8	2.5/2.2	6.1/5.3	2.8/1.8	30	34.61	62.1
132M	**c**	9.60/7.80	2920/1440	20.0/16.0	31.4/51.7	2.5/2.3	6.2/5.3	2.8/1.8	30	39.21	68.5
10D Type 4/8 pole - 1500/750 min¹											
71	**a**	0.10/0.05	1360/670	0.36/0.36	0.70/0.71	1.3/1.9	2.5/1.9	1.4/2.1	4	1.187	7.6
71	**b**	0.14/0.07	1370/670	0.45/0.50	0.98/1.00	1.7/1.9	3.0/1.9	2.1/2.1	4	1.300	8.3
71	**c**	0.20/0.10	1380/660	0.57/0.63	1.38/1.45	1.6/2.0	3.3/1.8	1.9/2.0	4	1.675	10.2
80	**a**	0.25/0.13	1360/680	0.65/0.65	1.76/1.83	1.3/1.6	3.3/1.9	1.5/1.9	7	2.499	10.6
80	**b**	0.37/0.20	1370/680	0.92/0.92	2.58/2.81	1.4/1.7	3.7/2.4	1.7/2.0	7	3.043	12.1
80	**c**	0.50/0.26	1370/680	1.2/1.2	3.49/3.65	2.0/2.1	3.5/2.4	1.8/2.0	7	3.517	13.5
90S	**a**	0.70/0.36	1380/690	1.8/2.0	4.84/4.98	1.8/2.0	3.5/2.5	2.2/2.5	7	4.685	15.2
90L	**a**	1.00/0.52	1380/690	2.5/2.5	6.92/7.20	1.8/1.8	3.6/2.1	2.1/2.0	7	5.958	17.6
100L	**a**	1.10/0.60	1410/700	2.5/2.6	7.45/8.19	1.5/1.7	4.5/3.0	2.3/2.6	13	10.84	24.1
100L	**b**	1.50/0.80	1410/710	3.3/3.2	10.2/10.8	1.5/1.8	4.1/3.4	2.1/2.6	13	13.31	27.7
112M	**a**	2.20/1.20	1400/700	4.5/3.9	15.0/16.4	1.6/1.9	4.3/3.6	1.9/2.4	13	17.34	32.8
112M	**b**	2.60/1.40	1410/710	5.3/4.9	17.6/18.8	1.8/2.0	5.3/4.0	2.5/3.2	13	19.91	35.8
132S	**a**	3.00/1.70	1420/720	6.2/6.1	20.2/22.5	1.6/1.8	5.4/3.6	2.4/2.7	30	29.12	46.0
132S	**b**	4.00/2.20	1430/720	8.3/8.3	26.7/29.2	1.7/2.0	5.7/4.0	2.5/2.7	30	36.79	52.8
132M	**b**	5.50/3.00	1440/720	11.4/10.7	36.5/39.8	1.7/2.2	6.3/4.3	2.7/2.8	30	46.60	62.9

Mn = Full load torque **Ms** = Locked rotor torque **Mm** = Maximum torque **In** = Rated load current **Is** = Locked rotor current

Two-speed self-braking three-phase motors - double winding - Star/Star connection

TEFC construction – Squirrel cage rotor – Continuous duty S1 – Insulation class F – IP 54 protection

Direct current brake power supply

10DD Type 2/6 pole - 3000/1000 min¹

Motor size	Rated output Pn kW	Technical data at rated output V 400 - Hz 50 n min-¹	In A	Mn Nm	Direct insertion characteristics Ms/Mn	Is/In	Mm/Mn	Braking torque Mb Nm	Moment of inertia J 10-³ kg.m²	Mass (IM B3) kg
71 c	0.42/0.14	2810/885	0.95/0.64	1.43/1.51	1.6/1.7	4.1/2.2	2.0/1.8	4	1.675	10.3
80 a	0.42/0.14	2770/930	1.07/0.57	1.45/1.44	1.6/1.4	3.6/2.4	1.9/1.8	7	2.499	10.6
80 b	0.60/0.20	2820/930	1.40/0.89	2.03/2.05	1.6/1.5	4.0/2.4	1.9/1.9	7	3.043	12.1
80 c	0.90/0.30	2820/940	1.88/1.08	3.05/3.05	1.5/1.6	4.4/2.9	2.0/2.2	7	3.517	13.5
90S a	1.10/0.37	2750/930	2.6/1.3	3.82/3.80	1.8/1.7	3.5/2.7	2.2/2.0	7	3.310	15.1
90L a	1.50/0.50	2810/950	3.4/1.7	5.10/5.03	1.8/2.1	3.9/3.2	2.3/2.4	7	3.943	17.4
90L b	1.80/0.60	2840/930	4.1/2.1	6.05/6.16	1.8/1.9	4.4/2.9	2.4/2.2	7	4.427	19.1
100L a	2.20/0.75	2810/930	5.2/2.2	7.48/7.70	1.7/1.6	3.9/3.0	2.2/2.0	13	7.637	24.2
100L b	3.00/1.00	2820/910	6.4/3.1	10.2/10.5	1.8/1.5	4.4/2.6	2.4/1.7	13	9.034	27.9
112M b	4.00/1.35	2900/950	8.3/4.0	13.2/13.6	1.9/2.0	5.8/3.9	2.7/2.4	13	14.48	36.7
132S b	5.50/1.85	2905/965	11.1/5.2	18.1/18.3	2.3/1.7	6.2/3.7	2.7/2.2	30	36.79	50.3
132M b	7.50/2.50	2910/960	14.8/7.1	24.6/24.9	2.1/1.8	6.2/3.8	2.5/2.3	30	46.60	59.5

10DD Type 2/8 pole - 3000/750 min¹

71 c	0.33/0.08	2830/680	0.83/0.65	1.11/1.12	2.1/1.7	4.8/2.1	2.5/1.9	4	1.675	10.3
80 a	0.33/0.08	2830/690	0.83/0.44	1.11/1.11	1.5/1.6	3.2/1.9	2.0/1.8	7	2.499	10.6
80 b	0.44/0.11	2890/690	1.10/0.73	1.45/1.52	1.6/1.8	4.1/2.0	2.3/2.0	7	3.043	12.1
80 c	0.60/0.15	2890/690	1.50/0.75	1.98/2.08	1.6/1.6	4.4/2.1	2.5/1.9	7	3.517	13.5
90S a	0.75/0.18	2860/680	1.80/0.94	2.50/2.53	2.0/1.7	4.2/2.1	2.7/1.9	7	3.310	15.1
90L a	1.00/0.25	2880/690	2.3/1.3	3.32/3.46	2.0/1.7	4.6/2.2	2.4/2.1	7	3.943	17.4
90L b	1.20/0.30	2900/700	2.7/1.5	3.95/4.09	2.0/1.9	5.2/2.3	2.8/2.2	7	4.427	19.1
100L a	1.50/0.37	2890/700	3.3/1.7	4.96/5.05	1.6/1.8	4.6/2.4	2.4/2.1	13	7.637	24.2
100L b	2.00/0.50	2900/700	4.4/2.2	6.59/6.82	1.8/1.7	6.0/2.5	2.8/2.1	13	9.034	27.9
112M a	2.60/0.65	2810/710	5.9/2.3	8.84/8.74	1.9/1.5	5.8/3.4	2.0/1.9	13	17.34	31.4
112M b	3.20/0.80	2850/710	7.0/2.9	10.7/10.8	2.0/1.6	6.1/3.5	2.1/2.0	13	19.91	34.4
132S b	4.40/1.10	2900/720	9.2/3.8	14.5/14.6	2.0/1.5	6.3/3.5	2.3/2.1	30	36.79	50.3
132M b	6.00/1.50	2910/720	12.5/5.1	19.7/19.9	2.1/1.6	6.5/3.7	2.5/2.3	30	46.60	59.5

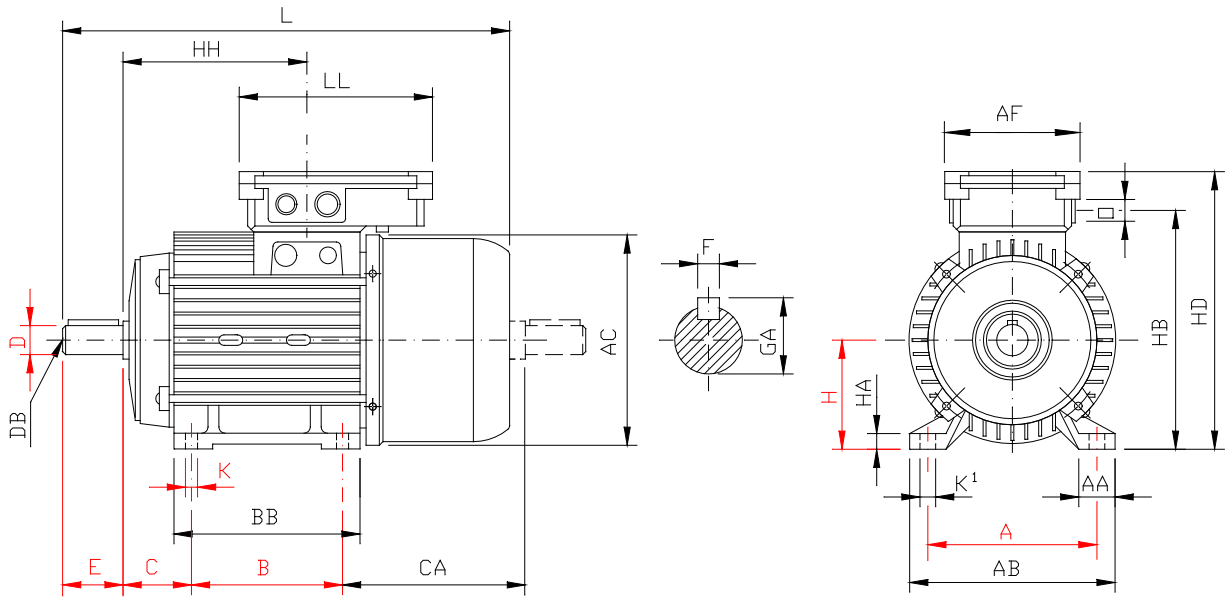
10DD Type 4/6 pole - 1500/1000 min¹

71 c	0.25/0.18	1390/890	0.98/0.87	1.72/1.93	1.6/1.5	2.7/2.0	2.1/1.7	4	1.675	10.2
80 a	0.25/0.18	1420/920	0.72/0.64	1.68/1.87	1.4/1.3	3.9/2.7	2.1/1.8	7	2.499	10.6
80 b	0.37/0.25	1440/930	1.00/0.87	2.45/2.57	1.5/1.4	4.1/2.9	2.4/2.0	7	3.043	12.1
80 c	0.55/0.37	1430/920	1.5/1.3	3.67/3.84	1.5/1.4	3.9/2.8	2.2/1.9	7	3.517	13.5
90S a	0.75/0.50	1420/920	2.0/1.7	5.04/5.19	1.6/1.5	3.5/2.6	2.2/1.8	7	3.310	15.2
90L a	0.90/0.60	1440/940	2.6/2.2	5.97/6.10	2.3/1.8	4.1/2.9	2.8/2.1	7	3.943	17.6
100L a	1.10/0.75	1430/910	2.7/2.3	7.35/7.87	2.1/1.5	4.3/2.5	2.6/1.7	13	7.637	24.4
100L b	1.50/1.00	1440/920	3.7/3.0	9.95/10.4	2.2/1.6	4.6/2.9	2.8/1.9	13	9.030	28.2
112M a	2.20/1.50	1450/950	4.6/3.9	14.5/15.1	1.6/1.6	4.4/4.0	2.3/2.3	13	17.34	32.8
112M b	2.60/1.80	1450/960	5.6/4.7	17.1/17.9	1.7/1.6	4.4/4.0	2.3/2.3	13	19.91	35.8
132S a	3.00/2.00	1450/960	6.8/5.1	19.8/19.9	1.7/1.5	5.6/4.0	2.7/2.1	30	29.12	46.0
132S b	4.00/2.70	1450/960	9.0/6.7	26.3/26.9	1.8/1.5	5.8/4.2	2.9/2.3	30	36.79	52.8
132M b	5.50/3.60	1450/960	12.0/9.2	36.2/35.8	1.8/1.6	5.7/4.1	2.9/2.4	30	46.60	62.9

Mn = Full load torque **Ms** = Locked rotor torque **Mm** = Maximum torque **In** = Rated load current **Is** = Locked rotor current

Mounting arrangement IM B3

Self-braking three-phase motors - **10 Type**

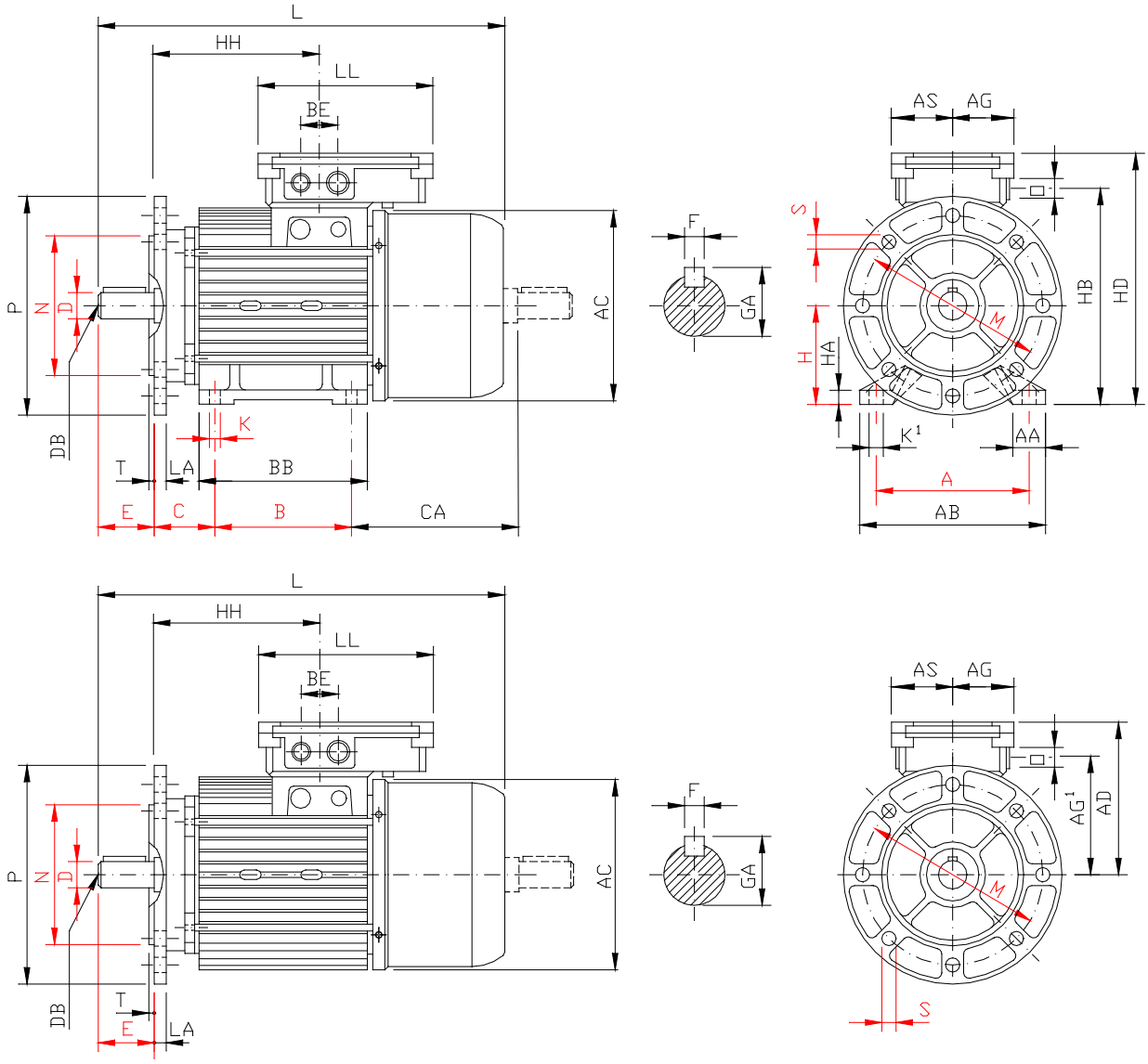


Note: Ledge of the second shaft, from size 71 upwards, is reduced to a size.

Motor size	Coupling											Overall								Shaft end				
	A	AA	AB	**B**	BB	**C**	CA	**H**	HA	**K**	K1	AC	AF	HB	HD	HH	L	LL	O	**D**	DB	**E**	F	GA
63	**100**	22	120	**80**	100	**40**	97	**63**	7	**7**	10	123	104	149	174	89	236	148	M16+M20x1.5	**11**	M4	**23**	4	12.5
71	**112**	26	135	**90**	112	**45**	102	**71**	8	**7**	12	138	104	167	193	103	263	148	M16+M20x1.5	**14**	M5	**30**	5	16
80	**125**	28	152	**100**	124	**50**	110	**80**	11	**9**	13	156	114	185	210	117	296	158	M20+M25x1.5	**19**	M6	**40**	6	21.5
90S	**140**	30	170	**100**	130	**56**	119	**90**	13	**9**	13	176	114	200	224	127	320	158	M20+M25x1.5	**24**	M8	**50**	8	27
90L	**140**	30	170	**125**	155	**56**	119	**90**	13	**9**	13	176	114	200	224	152	345	158	M20+M25x1.5	**24**	M8	**50**	8	27
100L	**160**	35	192	**140**	163	**63**	133	**100**	14	**12**	17	194	114	223	246	171	391	158	M20+M25x1.5	**28**	M10	**60**	8	31
112M	**190**	40	220	**140**	183	**70**	141	**112**	14	**12**	19	220	138	257	280	175	405	202	M32+M32x1.5	**28**	M10	**60**	8	31
132S	**216**	44	260	**140**	180	**89**	183	**132**	16	**12**	22	260	138	305	328	206	485	202	M32+M32x1.5	**38**	M12	**80**	10	41
132M	**216**	44	260	**178**	218	**89**	183	**132**	16	**12**	22	260	138	305	328	244	523	202	M32+M32x1.5	**38**	M12	**80**	10	41

Mounting arrangement IM B35 - IM B5

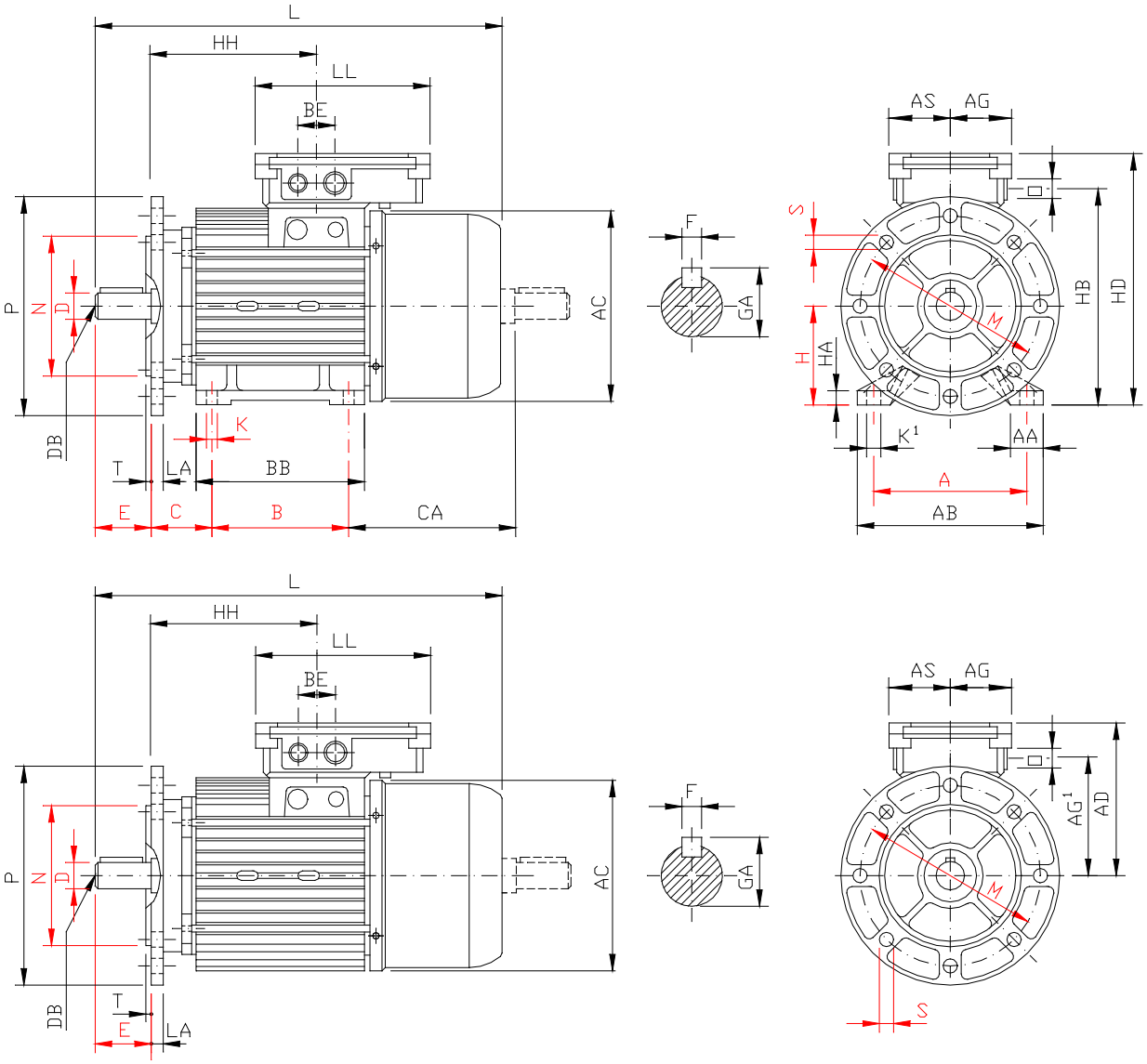
Self-braking three-phase motors - **10 Type**



Motor size	Overall dimensions											
	AC	AD	AG	AG¹	AS	BE	HB	HD	HH	L	LL	O
63	123	111	52	86	52	35	149	174	89	236	148	M16+M20 x 1.5
71	138	122	52	96	52	35	167	193	103	263	148	M16+M20 x 1.5
80	156	130	57	105	57	35	185	210	117	296	158	M20+M25 x 1.6
90S	176	134	57	110	57	35	200	224	127	320	158	M20+M25 x 1.5
90L	176	134	57	110	57	35	200	224	152	345	158	M20+M25 x 1.5
100L	194	146	57	123	57	35	223	246	171	391	158	M20+M25 x 1.5
112M	220	168	57	145	69	45	257	280	175	405	202	M32+M32 x 1.5
132S	260	196	69	173	69	45	305	328	206	485	202	M32+M32 x 1.5
132M	260	196	69	173	69	45	305	328	244	523	202	M32+M32 x 1.5

Mounting arrangement IM B35 - IM B5

Self-braking three-phase motors - **10 Type**

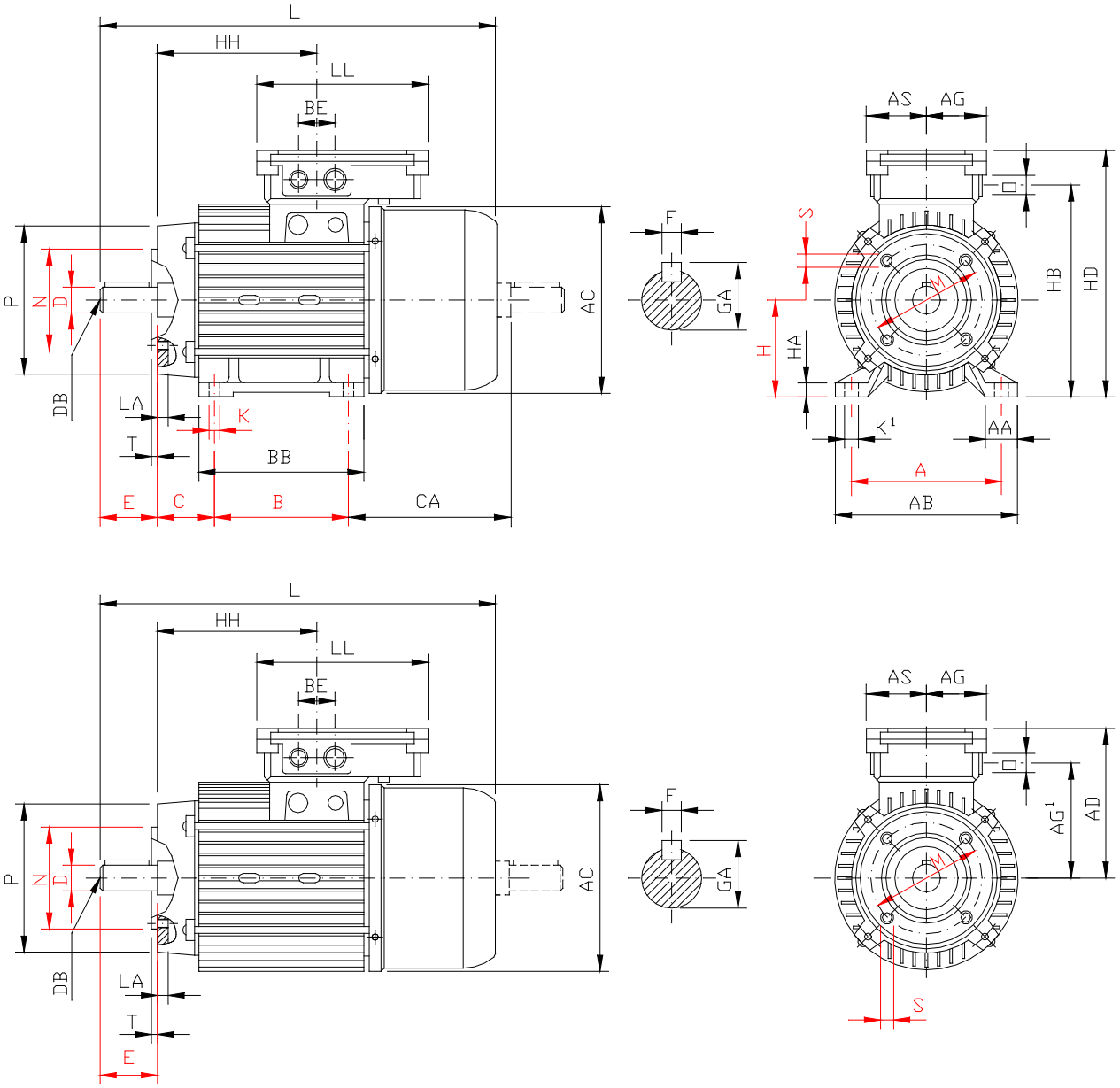


Note: Ledge of the second shaft, from size 71 upwards, is reduced to a size.

Motor size	Coupling																Shaft end				
	A	AA	AB	**B**	BB	**C**	CA	**H**	HA	**K**	K¹	LA	**M**	**N**	P	**S**	T	**D**	DB	**E**	F	GA
63	**100**	22	120	**80**	100	**40**	97	**63**	7	**7**	10	8	**115**	**95**	140	**9**	3	**11**	M4	**23**	4	12.5
71	**112**	26	135	**90**	112	**45**	102	**71**	8	**7**	12	8	**130**	**110**	160	**9**	3.5	**14**	M5	**30**	5	16
80	**125**	28	152	**100**	124	**50**	110	**80**	11	**9**	13	9	**165**	**130**	200	**11**	3.5	**19**	M6	**40**	6	21.5
90S	**140**	30	170	**100**	130	**56**	119	**90**	13	**9**	13	10	**165**	**130**	200	**11**	3.5	**24**	M8	**50**	8	27
90L	**140**	30	170	**125**	155	**56**	119	**90**	13	**9**	13	10	**165**	**130**	200	**11**	3.5	**24**	M8	**50**	8	27
100L	**160**	35	192	**140**	163	**63**	133	**100**	14	**12**	17	11	**215**	**180**	250	**14**	4	**28**	M10	**60**	8	31
112M	**190**	40	220	**140**	183	**70**	141	**112**	14	**12**	19	12	**215**	**180**	250	**14**	4	**28**	M10	**60**	8	31
132S	**216**	44	260	**140**	180	**89**	183	**132**	16	**12**	22	18	**265**	**230**	300	**14**	4	**38**	M12	**80**	10	41
132M	**216**	44	260	**178**	218	**89**	183	**132**	16	**12**	22	18	**265**	**230**	300	**14**	4	**38**	M12	**80**	10	41

Mounting arrangement IM B34 - IM B14

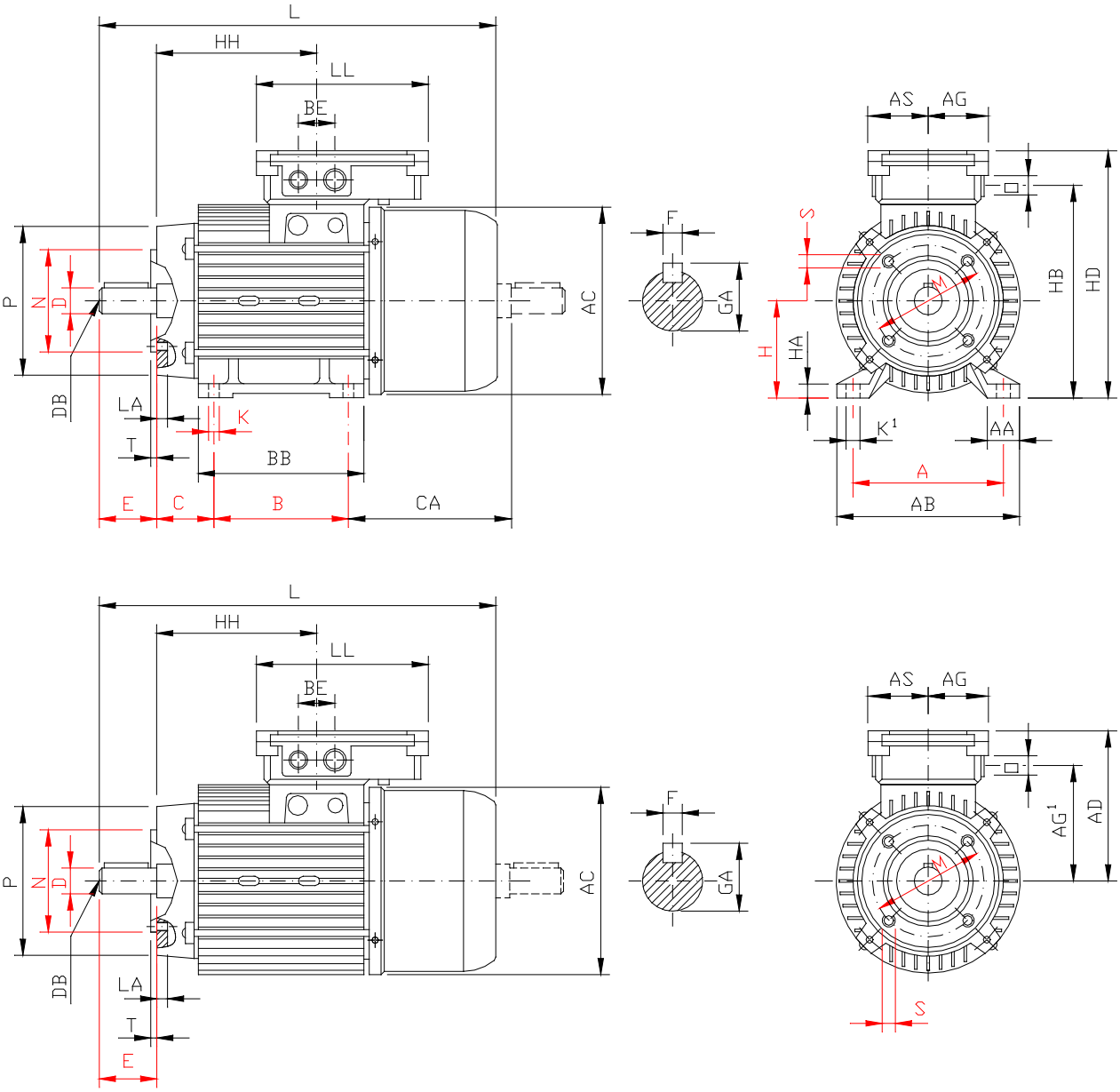
Self-braking three-phase motors - **10 Type**



Motor size	Overall dimensions											
	AC	AD	AG	AG¹	AS	BE	HB	HD	HH	L	LL	O
63	123	111	52	86	52	35	149	174	89	236	148	M16+M20 x 1.5
71	138	122	52	96	52	35	167	193	103	263	148	M16+M20 x 1.5
80	156	130	57	105	57	35	185	210	117	296	158	M20+M25 x 1.5
90S	176	134	57	110	57	35	200	224	127	320	158	M20+M25 x 1.5
90L	176	134	57	110	57	35	200	224	152	345	158	M20+M25 x 1.5
100L	194	146	57	123	57	35	223	246	151	391	158	M20+M25 x 1.5
112M	220	168	69	145	69	45	257	280	175	405	202	M32+M32 x 1.5
132S	260	196	69	173	69	45	305	328	206	485	202	M32+M32 x 1.5
132M	260	196	69	173	69	45	305	328	244	523	202	M32+M32 x 1.5

Mounting arrangement IM B34 - IM B14

Self-braking three-phase motors - **10 Type**



Note: Ledge of the second shaft, from size 71 upwards, is reduced to a size.

Motor size	Coupling																	Shaft end				
	A	AA	AB	**B**	BB	**C**	CA	**H**	HA	**K**	K¹	LA	**M**	**N**	P	**S**	T	**D**	DB	**E**	F	GA
63	**100**	22	120	**80**	100	**40**	97	**63**	7	**7**	10	7	**75**	**60**	90	**M5**	2.5	**11**	M4	**23**	4	12.5
71	**112**	26	135	**90**	112	**45**	102	**71**	8	**7**	12	8	**85**	**70**	105	**M6**	2.5	**14**	M5	**30**	5	16
80	**125**	28	152	**100**	124	**50**	110	**80**	11	**9**	13	17	**100**	**80**	120	**M6**	3	**19**	M6	**40**	6	21.5
90S	**140**	30	170	**100**	130	**56**	119	**90**	13	**9**	13	10	**115**	**95**	140	**M8**	3	**24**	M8	**50**	8	27
90L	**140**	30	170	**125**	155	**56**	119	**90**	13	**9**	13	10	**115**	**95**	140	**M8**	3	**24**	M8	**50**	8	27
100L	**160**	35	192	**140**	163	**63**	133	**100**	14	**12**	17	10	**130**	**110**	160	**M8**	3.5	**28**	M10	**60**	8	31
112M	**190**	40	220	**140**	183	**70**	141	**112**	14	**12**	19	13	**130**	**110**	160	**M8**	3.5	**28**	M10	**60**	8	31
132S	**216**	44	260	**140**	180	**89**	183	**132**	16	**12**	22	15	**165**	**130**	200	**M10**	3.5	**38**	M12	**80**	10	41
132M	**216**	44	260	**178**	218	**89**	183	**132**	16	**12**	22	15	**165**	**130**	200	**M10**	3.5	**38**	M12	**80**	10	41

Self-braking single-phase motors Braking-torque fixed

Self-braking single-phase motors - 10 Type

Typical applications:

- Machines for woodworking.
- Machines with long braking and high braking works.
- Machines that require arrests but not controlled precision.

Mechanical characteristics:

- Small brake.
- Rear brake mounting flange: aluminium.
- Fan cast iron brake.
- Seal friction asbestos-free and silent.
- Braking torques and other technical data: see table below.
- Mechanical release lever on request.

Electrical characteristics:

- Direct current brake.
- The dc power is obtained by a brake rectifier already built into the motor terminal box.
- The brake power can be independent or derived from the motor, depending on motor type and the needs of employment.
- The preparation of standard rectifiers opening of the dc circuit, to obtain necessary permits rapid ascent of the braking torque according to table below.
- For very intermittent and services for specifics uses you can get a fast action of the brake is in the release that, with the use of appropriately designed and fast rectifiers supplied on request.

Table of braking torques and other technical data of brake

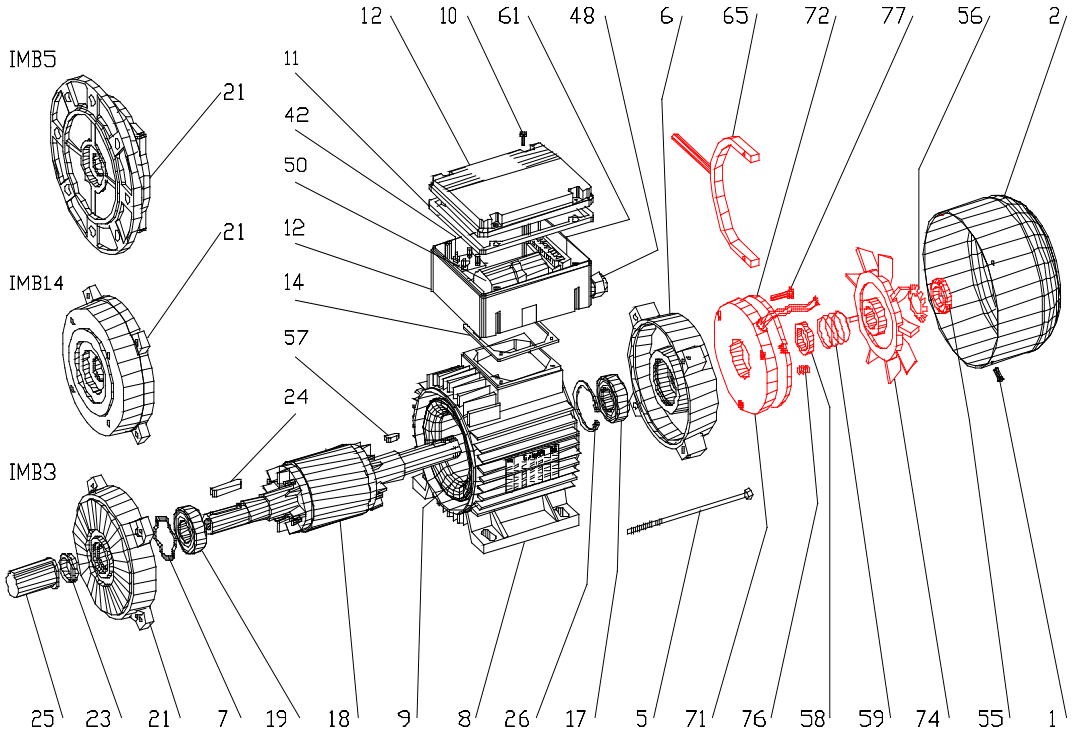
Motor size	Rated braking torque **Mb**	Air-gap **sn**	**smax**	Maximum speed **nmax**	Brake life **Wt** 1)	**W1** 2)	Brake release time **t1** 3)	**t11** 4)	Braking torque rise time *** **t2** 5)	**t22** 6)	Brake power input **Pa**
	Nm	mm		min-1	MJ		ms		ms		W
63	3	0.20	0.50	6000	250	30	30	15	80	8	21
71	4	0.20	0.60	6000	250	40	40	20	100	10	21
80	7	0.20	0.60	6000	375	60	60	30	150	15	34
90	7	0.20	0.60	3600	375	60	60	30	150	15	34
100	13	0.25	0.65	3600	500	80	100	45	250	15	38

1) For wear of the friction linings up to a thickness of 1 mm
2) Between two wear adjustments from **sn** to **smax**
3) With standard rectifier
4) With increased rectifier
5) Opening on ac side
6) Opening on dc side or with rapid rectifier

***** -** The time table is valid for a power independent of a brake motor.
If the brake power is derived from the motor, the time table must be increased as dependent inertia and stored energy from the motor. Again, with the opening or using the dc-side rectifier fast, time is much improved.

For any further information you should contact our Technical Department.

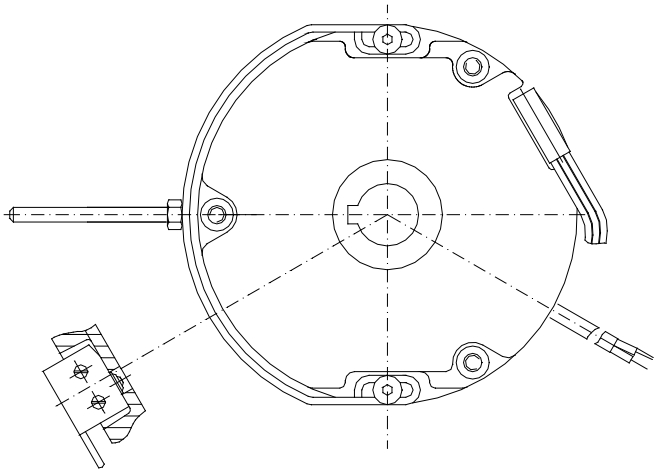
Self-braking single-phase motor - 10 Type

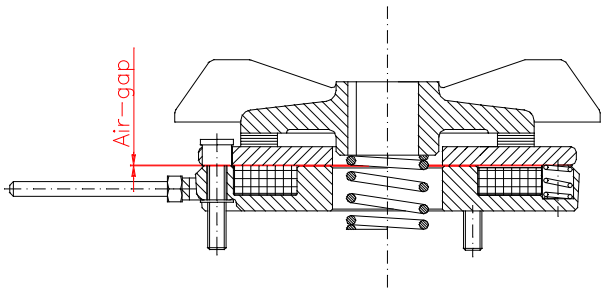


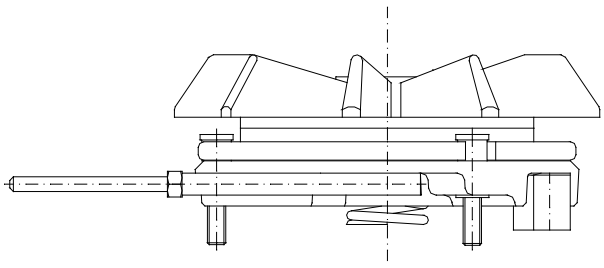
Spare parts nomenclature

1. Screw for fan cover
2. Fan cover
5. Rod
6. N-end shield
7. Spring ring
8. Frame
9. Stator package
10. Screw for capacitor box cover
11. Gasket for capacitor box cover
12. Capacitor box
14. Gasket for capacitor box
17. Rear bearing
18. Rotor
19. Front bearing
21. D-end shield/flange
23. Sealing ring
24. Key
25. Shaft cap
26. Retaining ring
42. Terminal board
48. Cable gland
50. Run capacitor
55. Nut
56. Ring
57. Key
58. Spacer
59. Spring
61. Rectifier
65. Manual release
71. Electromagnet
72. Movable armature
74. Fan brake
76. Spring
77. Screw for brake

Direct current brake - 10 Type

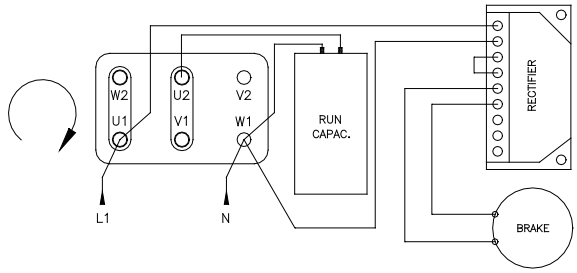


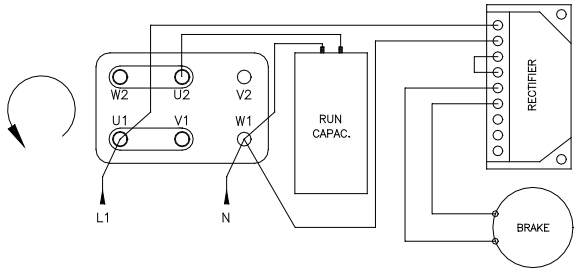




Connection for motors 10CO Type

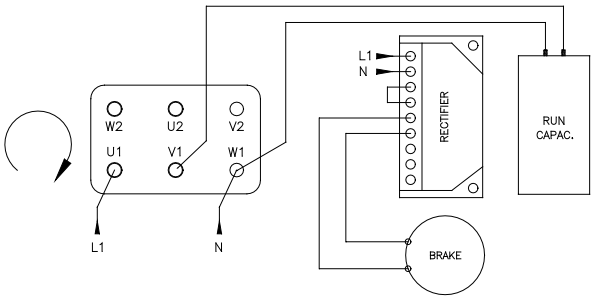
Self-braking single-phase motors - with **dc brake**

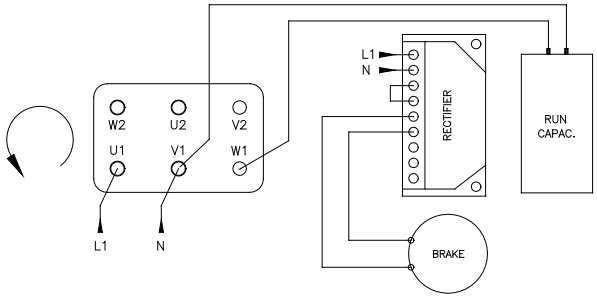




Connection for motors 10CB Type

Self-braking single-phase motors - with **balanced winding** - with **dc brake**





Self-braking single-phase motors

With permanent capacitor

TEFC construction – Squirrel cage rotor – Continuous duty S1 – Insulation class F – IP 54 protection

Direct current brake power supply

Motor size	Rated output Pn kW	Technical data at rated output V 230 - Hz 50 n min-1	In A	η %	cos φ	Mn Nm	Direct insertion characteristics Ms/Mn	Is/In	Mm/Mn	Run capacitor V 450 µF	Braking torque Mb Nm	Moment of inertia J 10-3 kg.m2	Mass (IM B3) kg
10CO Type 2 pole - 3000 min1													
63 a	**0.18**	2850	1.35	61.0	0.95	0.60	0.65	3.6	2.1	6.3	3	0.429	5.4
63 b	**0.25**	2860	1.74	67.2	0.93	0.84	0.65	3.8	2.1	8	3	0.462	6.0
63 c	**0.37**	2870	2.5	67.7	0.95	1.23	0.67	3.9	2.3	12.5	3	0.506	6.8
71 a	**0.37**	2780	2.7	63.4	0.94	1.27	0.56	3.1	1.9	12.5	4	0.842	7.7
71 b	**0.55**	2810	3.7	71.8	0.90	1.87	0.54	3.1	1.8	16	4	0.924	8.7
71 c	**0.75**	2840	4.6	75.4	0.94	2.52	0.50	3.8	1.8	20	4	1.005	9.6
80 a	**0.55**	2830	3.5	72.0	0.95	1.86	0.64	3.5	1.9	20	7	1.704	10.6
80 b	**0.75**	2870	4.5	76.3	0.95	2.50	0.65	3.7	1.9	25	7	1.923	12.1
80 c	**1.1**	2850	6.3	79.9	0.95	3.69	0.65	3.7	2.0	31.5	7	2.153	13.7
90S a	**1.1**	2830	7.4	71.8	0.90	3.71	0.61	3.8	2.2	35	7	2.366	15.4
90L a	**1.5**	2840	10.0	72.5	0.90	5.05	0.62	4.1	2.3	40	7	2.719	17.9
90L b	**1.8**	2840	11.2	77.2	0.93	6.05	0.62	4.2	2.4	50	7	2.988	19.8
100L a	**2.2**	2850	12.2	80.0	0.98	7.38	0.61	3.4	2.2	50	13	5.666	23.5
10CO Type 4 pole - 1500 min1													
63 a	**0.09**	1400	0.80	54.3	0.90	0.61	0.62	2.3	1.8	4	3	0.506	5.3
63 b	**0.12**	1400	1.0	58.0	0.90	0.82	0.62	2.5	1.8	5	3	0.563	5.9
63 c	**0.18**	1400	1.4	60.1	0.93	1.23	0.62	2.5	1.8	8	3	0.626	6.7
71 a	**0.18**	1370	1.7	51.2	0.90	1.26	0.72	2.4	1.7	10	4	1.187	7.6
71 b	**0.25**	1370	2.1	55.7	0.93	1.74	0.74	2.4	1.8	12.5	4	1.300	8.3
71 c	**0.37**	1370	2.7	64.1	0.93	2.58	0.78	2.6	1.8	20	4	1.675	10.1
80 a	**0.37**	1370	2.9	61.0	0.91	2.58	0.55	2.8	1.6	14	7	2.499	10.3
80 b	**0.55**	1380	3.8	65.5	0.96	3.81	0.64	3.1	1.8	16	7	3.043	11.9
80 c	**0.75**	1360	5.3	64.8	0.95	5.27	0.55	2.9	1.8	20	7	3.517	13.4
90L a	**1.1**	1370	7.2	73.0	0.91	7.67	0.56	3.3	1.8	35	7	3.943	17.3
90L b	**1.5**	1380	9.5	73.8	0.93	10.4	0.56	3.4	1.9	40	7	4.427	19.3
100L a	**1.8**	1380	11.4	76.7	0.92	12.4	0.44	3.5	1.8	35	13	7.637	23.5
100L b	**2.2**	1410	14.0	75.1	0.91	14.9	0.45	3.6	1.9	50	13	9.030	27.6
10CO Type 6 pole - 1000 min1													
63 b	**0.06**	930	0.75	35.5	0.98	0.62	1.00	1.6	1.7	6.3	3	0.563	5.9
63 c	**0.09**	930	0.98	42.0	0.95	0.92	0.80	1.8	1.7	8	3	0.626	6.6
71 a	**0.12**	920	1.15	50.4	0.90	1.25	0.65	1.9	1.6	10	4	1.187	7.6
71 b	**0.18**	920	1.7	50.6	0.91	1.87	0.65	1.9	1.6	14	4	1.300	8.2
80 a	**0.25**	930	2.1	55.7	0.93	2.60	0.53	2.6	1.7	14	7	2.499	10.3
80 b	**0.37**	920	3.1	57.0	0.91	3.84	0.53	2.7	1.7	16	7	3.043	11.8
80 c	**0.55**	920	4.1	63.4	0.92	5.71	0.52	2.7	1.7	25	7	3.517	13.3
90S a	**0.55**	920	3.9	65.9	0.93	5.71	0.51	2.6	1.7	25	7	3.310	14.7
90L a	**0.75**	920	5.1	67.3	0.95	7.79	0.51	2.8	1.7	35	7	3.943	17.2
100L a	**1.1**	930	7.3	71.2	0.92	11.3	0.41	3.3	1.7	35	13	9.050	23.8
100L b	**1.5**	930	9.8	72.3	0.92	15.4	0.42	3.5	1.7	50	13	10.72	27.3

Mn = Full load torque **Ms** = Locked rotor torque **Mm** = Maximum torque **In** = Rated load current **Is** = Locked rotor current

Self-braking single-phase motors - with balanced windings

With permanent capacitor

TEFC construction – Squirrel cage rotor – Continuous duty S1 – Insulation class F – IP 54 protection

Direct current brake power supply

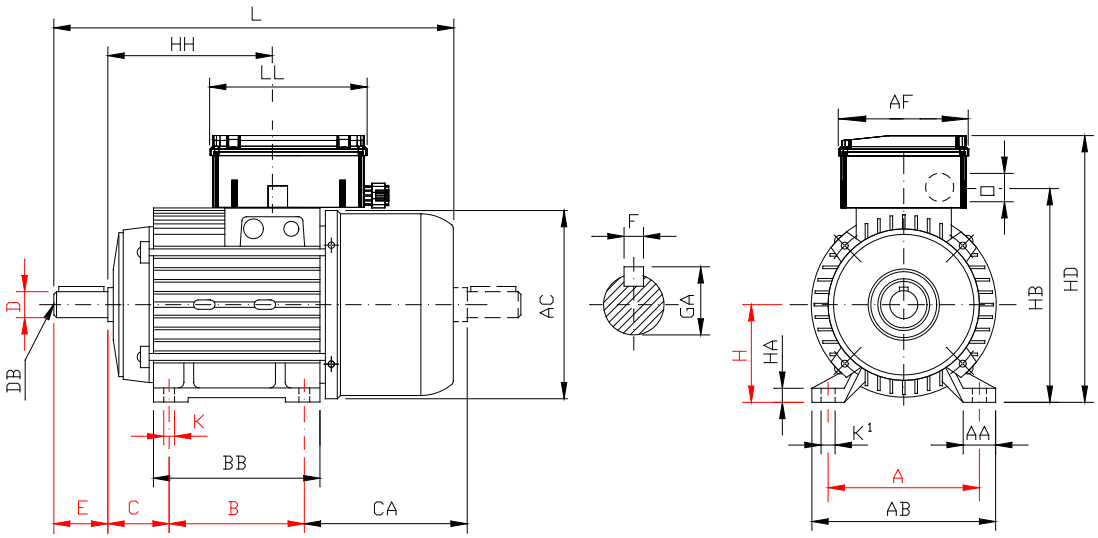
10CB Type 4 pole - 1500 min¹

Motor size	Rated output Pn kW	Technical data at rated output V 230 - Hz 50 n min-¹	In A	η %	cos φ	Mn Nm	Direct insertion characteristics Ms/Mn	Is/In	Mm/Mn	Run capacitor V 450 µF	Braking torque Mb Nm	Moment of inertia J 10-³ kg.m²	Mass (IM B3) kg
63 a	**0.09**	1420	0.80	51.0	0.96	0.61	0.62	2.4	1.5	6.3	3	0.506	5.3
63 b	**0.12**	1420	1.07	51.9	0.94	0.81	0.54	2.4	1.8	8	3	0.563	5.9
63 c	**0.18**	1400	1.4	58.2	0.96	1.23	0.56	2.5	1.7	10	3	0.626	6.7
71 a	**0.18**	1370	1.4	57.0	0.98	1.26	0.93	2.3	1.7	12.5	4	1.187	7.6
71 b	**0.25**	1370	1.9	58.4	0.98	1.74	0.92	2.4	1.7	16	4	1.300	8.3
71 c	**0.37**	1380	2.6	64.5	0.96	2.56	0.92	2.9	1.7	20	4	1.675	10.1
80 a	**0.37**	1360	2.8	61.1	0.94	2.60	0.56	1.9	1.5	20	7	2.499	10.3
80 b	**0.55**	1360	4.2	61.2	0.93	3.86	0.54	2.1	1.7	31.5	7	3.043	11.9
80 c	**0.75**	1360	5.0	67.9	0.96	5.27	0.54	2.2	1.6	40	7	3.517	13.4
90S a	**0.75**	1390	5.2	65.3	0.93	5.15	0.82	2.2	1.8	40	7	3.310	14.9
90L a	**1.1**	1370	6.7	72.8	0.98	7.67	0.66	2.6	1.6	45	7	3.943	17.3

Mn = Full load torque **Ms** = Locked rotor torque **Mm** = Maximum torque **In** = Rated load current **Is** = Locked rotor current

Mounting arrangement IM B3

Self-braking single-phase motors - **10 Type**



Measures for coupling, IM B5 mounting see page 83
Measures for coupling, IM B14 mounting see page 85

Note: Ledge of the second shaft, from size 71 upwards, is reduced to a size.

Motor size	Coupling											Overall								Shaft end				
	A	AA	AB	**B**	BB	**C**	CA	**H**	HA	**K**	K¹	AC	AF	HB	HD	HH	L	LL	O	**D**	DB	**E**	F	GA
63	**100**	22	120	**80**	100	**40**	97	**63**	7	**7**	10	123	120	137	192	89	236	145	PG16	**11**	M4	**23**	4	12.5
71	**112**	26	135	**90**	112	**45**	102	**71**	8	**7**	12	138	120	155	211	103	263	145	PG16	**14**	M5	**30**	5	16
80	**125**	28	152	**100**	124	**50**	110	**80**	11	**9**	13	156	120	173	226	117	296	145	PG16	**19**	M6	**40**	6	21.5
90S	**140**	30	170	**100**	130	**56**	119	**90**	13	**9**	13	176	120	188	240	127	320	145	PG16	**24**	M8	**50**	8	27
90L	**140**	30	170	**125**	155	**56**	119	**90**	13	**9**	13	176	120	188	240	152	345	145	PG16	**24**	M8	**50**	8	27
100L	**160**	35	192	**140**	163	**63**	133	**100**	14	**12**	17	194	120	211	262	171	391	145	PG16	**28**	M10	**60**	8	31

Self-braking three-phase motors Braking-torque adjustable

Self-braking three-phase motors - 30 Type
For normal use

Typical applications:
- Application with a high number of interventions (ac brake).
- Lifting and transportation.
- Machines for packaging.
- Gear motors.

Mechanical characteristics:
- Rear brake mounting flange: cast iron.
- Brake disc steel.
- Cogged hub with steel anti-vibration system.
- Seal friction asbestos-free and silent.
- Braking torque and other technical data: see table below.
- The braking torque can be adjusted by adjusting the screws.
Unscrewing the screws will not decrease the braking torque under the safe value of 35%.
The motors are supplied with screws flush with the posterior surface of the brake, a brake torque of proximally 50% of the maximum value.
- Braking torque lower standard may be provided on request.
- Brake Kit for the protection provided on request.
- Mechanical release lever on request.

Electrical characteristics:
- Standard brake ac; alternatively can be supplied in dc.
- Both the brake for the ac dc, the power can be independent or derived from the motor, depending on motor type and the needs of employment.
- **In the case of dc brake**, power is obtained with a rectifier already built into the terminal box.
- The preparation of standard rectifiers opening of the dc circuit, to obtain necessary permits rapid ascent of the braking torque according to table below.
- For very intermittent and services for specifics uses you can get a fast action of the brake is in the release that, with the use of appropriately designed and fast rectifiers supplied on request.

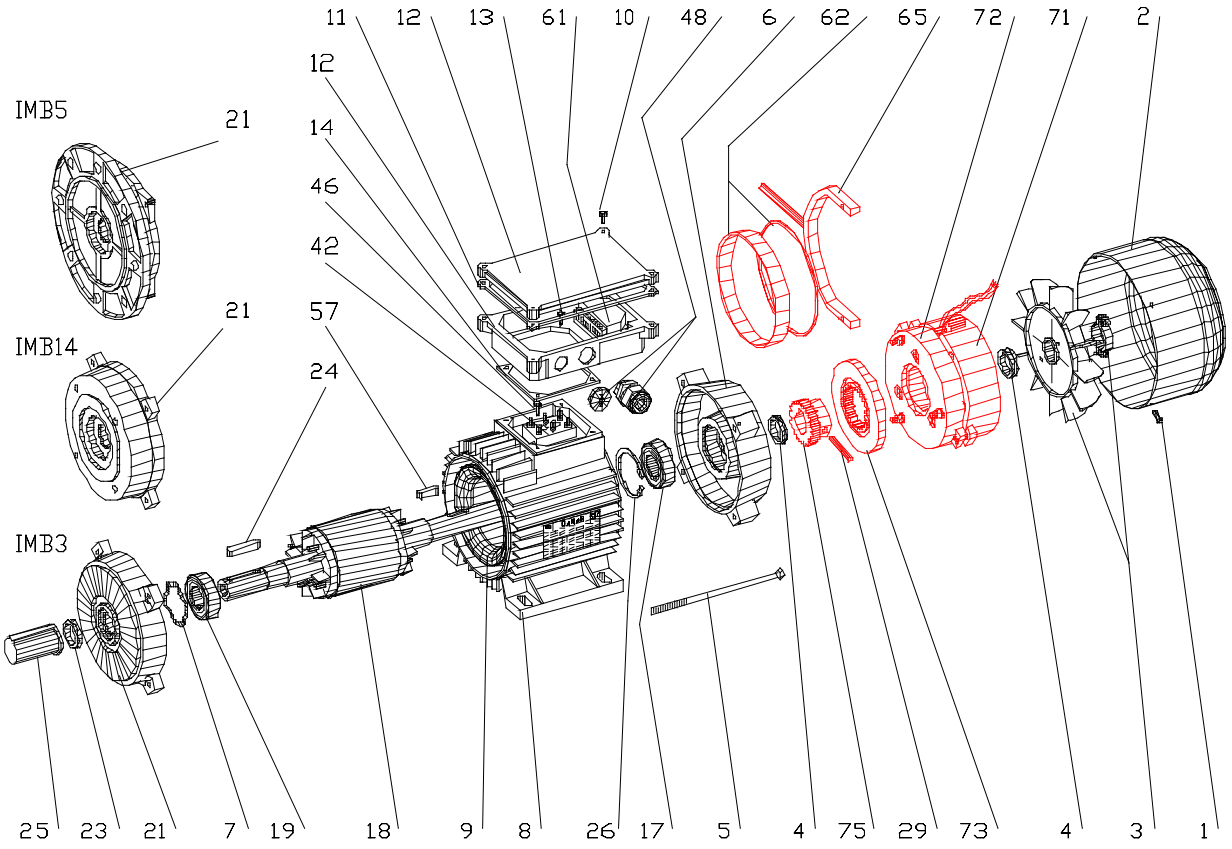
Table of braking torques and other technical data of brake

Motor **size**	Maximum braking torque **Mb max.** Nm	Air-gap **sn** mm	**smax** mm	Maximum speed **nmax** min-1	Brake life **Wt** 1) MJ	**W1** 2) MJ	Brake release time ac **t1** ms	dc **t1** 3) ms	dc **t11** 4) ms	Braking torque rise time *** ac **t2** ms	dc **t2** 5) ms	dc **t22** 6) ms	Brake power input ac **Pa** VA	dc **Pa** W
63	5	0.20	0.50	3600	260	15.6	4	30	15	20	100	10	60	16
71	5	0.20	0.50	3600	260	15.6	4	30	15	20	100	10	60	16
80	10	0.20	0.50	3600	370	22.4	4	60	25	40	120	10	80	20
90	20	0.30	0.60	3600	500	30	6	100	40	60	150	10	110	30
100	40	0.30	0.60	3600	750	45	8	120	50	90	220	15	250	40
112	70	0.35	0.70	3600	1000	70	16	-	80	120	300	30	470	50
132	100	0.35	0.70	3000	1100	77	16	-	80	140	200	20	550	65
160	150	0.40	0.80	3000	1650	132	16	-	100	180	200	20	600	65

1) For wear of the friction linings up to a thickness of 1 mm
2) Between two wear adjustments from **sn** to **smax**
3) With standard rectifier
4) With increased rectifier
5) Opening on ac side
6) Opening on dc side or with rapid rectifier

*** - The time table is valid for a power independent of a brake motor.
If the brake power is derived from the motor, the time table must be increased as dependent inertia and stored energy from the motor. Again, if the brake is in dc, the times are much improved with the opening of the circuit or by using the dc-side rectifier fast.
For any further information you should contact our Technical Department.

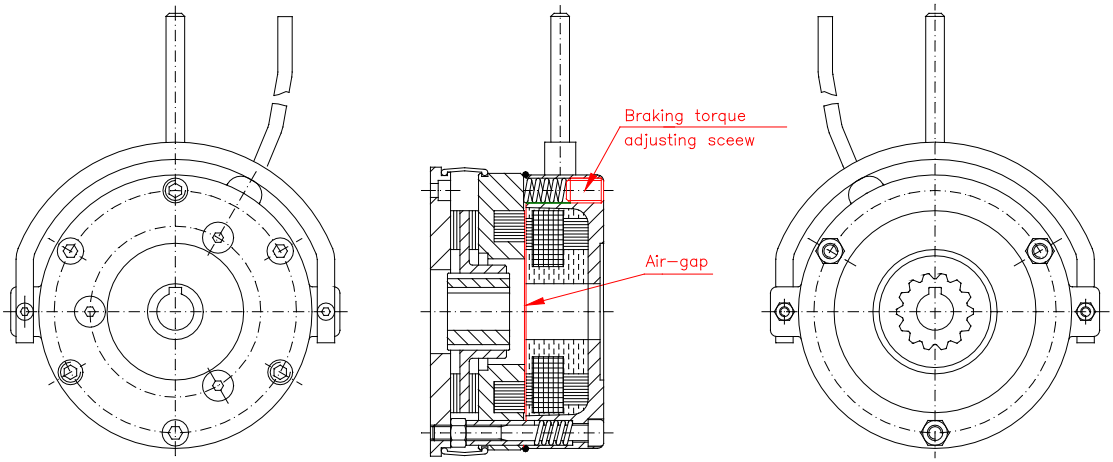
Self-braking three-phase motor - 30 Type



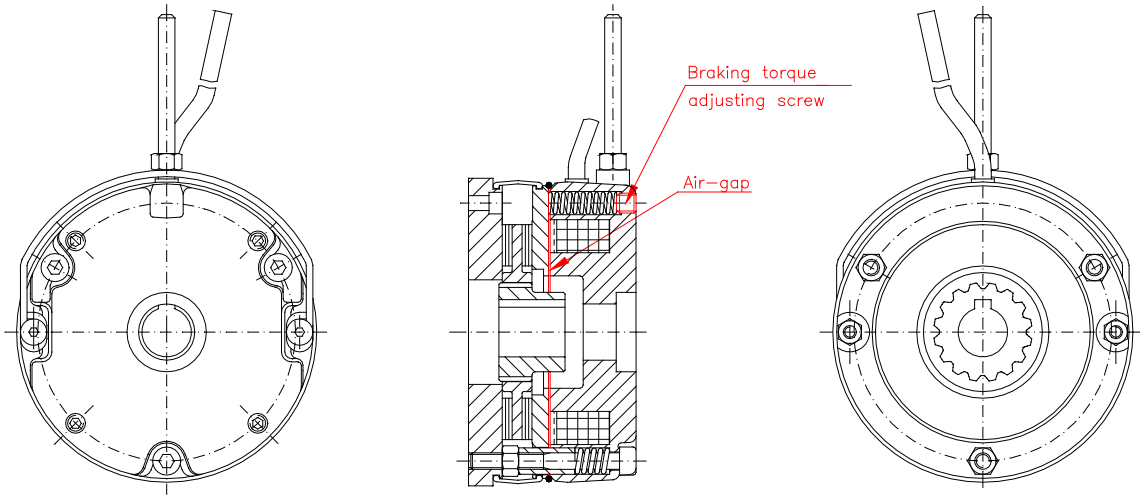
Spare parts nomenclature

1. Screw for fan cover
2. Fan cover
3. Fan
4. Sealing ring
5. Rod
6. N-end shield
7. Spring ring
8. Frame
9. Stator package
10. Screw for terminal box cover
11. Gasket for terminal box cover
12. Terminal box
13. Screw for terminal box
14. Gasket for terminal box
17. Rear bearing
18. Rotor
19. Front bearing
21. D-end shield/flange
23. Sealing ring
24. Key
25. Shaft cap
26. Retaining ring
29. Gear pin
42. Terminal board
46. Grounding screw
48. Cable gland
57. Key
61. Rectifier
62. O-ring for brake
65. Manual release
71. Electromagnet
72. Movable armature
73. Brake disc
75. Cogged hub

Alternating current brake – 30 Type

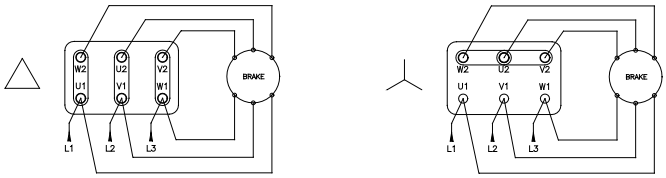


Direct current brake – 30 Type

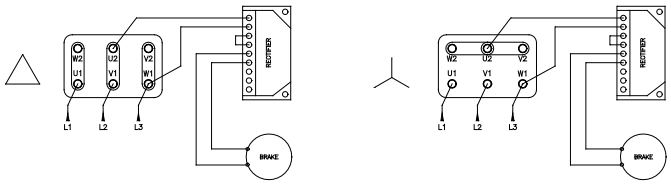


Connection for motors 30S Type

Self-braking three-phase **one-speed** motors - with **ac brake**

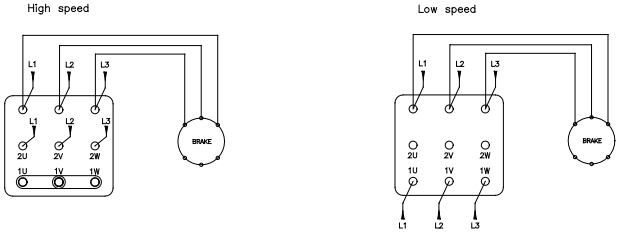


Self-braking three-phase **one-speed** motors - with **dc brake**

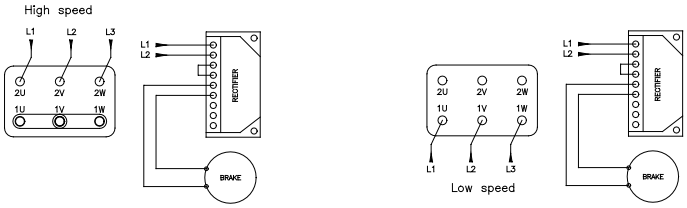


Connection for motors 30D Type

Self-braking three-phase **two-speed** motors - **single winding** - with **ac brake**

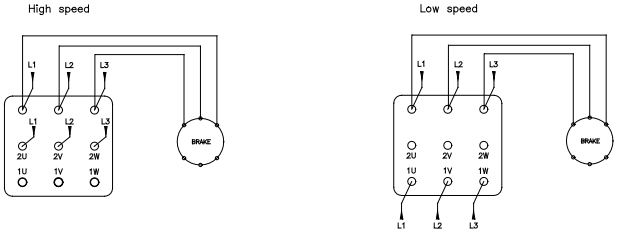


Self-braking three-phase **two-speed** motors - **single winding** - with **dc brake**

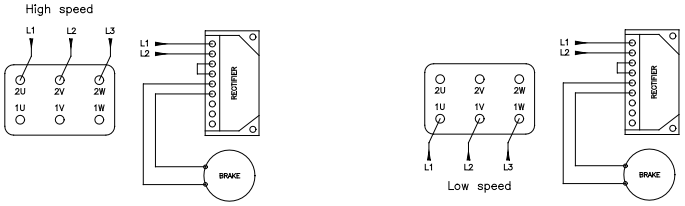


Connection for motors 30DD Type

Self-braking three-phase **two-speed** motors - **double winding** - with **ac brake**



Self-braking three-phase **two-speed** motors - **double winding** - with **dc brake**



One-speed self-braking three-phase motors - High Efficiency (IE2)

TEFC construction – Squirrel cage rotor – Continuous duty S1 – Insulation class F – IP 54 protection
Brake power with alternating current (direct current on request).

Method of determining the efficiency: IEC 60034-2-1; 2014

30SH Type 2 pole - 3000 min¹															
Motor size	Rated output	Technical data at rated output V 400 - Hz 50							Direct insertion characteristics			Braking torque	Moment of inertia	Mass (IM B3)	
	Pn	n	In	IE2 η			cos φ	Mn	Ms/Mn	Is/In	Mm/Mn	Mb max.	J		
	kW	min-1	A	50 %	75 %	100 %		Nm				Nm	10-3 kg.m2		kg
63 a	0.18	2815	0.49	64.2	69.5	70.5	0.76	0.62	2.9	4.7	2.9	5	0.189		6.2
63 b	0.25	2800	0.64	68.1	71.6	71.7	0.81	0.89	2.9	5.0	3.1	5	0.222		6.8
63 c	0.37	2825	0.91	69.7	73.9	74.2	0.80	1.26	3.4	5.6	3.2	5	0.266		7.5
71 a	0.37	2820	0.95	68.6	73.6	74.4	0.75	1.24	3.3	5.5	3.4	5	0.402		8.5
71 b	0.55	2815	1.38	71.6	74.9	75.3	0.77	1.87	3.5	5.7	3.4	5	0.484		9.4
80 a	0.75	2840	1.7	78.9	80.7	80.2	0.81	2.54	3.3	6.6	3.4	10	0.960		13.2
80 b	1.1	2865	2.4	83.1	84.5	84,0	0.80	3.69	3.7	7.4	3.6	10	1.239		15.2
80 c	1.5	2830	3.4	81.7	82.9	82.0	0.79	5.07	3.3	6.4	3.4	10	1.239		15.2
90S a	1.5	2900	3.2	82.6	84.9	84.8	0.82	4.94	3.3	7.9	3.6	20	1.629		20.0
90S b	1.8	2870	3.7	83.7	84.6	83.6	0.85	5.99	2.6	6.6	2.8	20	1.629		20.0
90L a	2.2	2890	4.4	84.1	85.9	85.7	0.84	7.26	3.1	8.1	3.6	20	2.048		22.8
90L b	2.6	2850	5.2	86.4	86.4	84.8	0.87	8.80	2.8	6.6	3.0	20	2.048		22.8
100L a	3	2900	5.9	88.0	88.5	87.7	0.84	9.89	2.6	7.3	3.3	40	3.497		30.1
100L b	4	2875	7.9	88.1	88.1	86.8	0.85	13.4	2.6	7.2	3.2	40	3.892		32.3
112M a	4	2920	7.3	86.6	88.4	88.6	0.88	12.9	3.9	9.9	5.5	70	6.071		42.0
112M b	5.5	2910	10.5	87.6	88.9	88.8	0.84	18.1	4.3	9.9	6.3	70	7.216		45.1
132S a	5.5	2920	10.5	87.2	88.6	88.5	0.85	17.9	2.4	7.4	3.4	100	11.99		56.0
132S b	7.5	2940	14.2	88.0	89.6	89.7	0.84	24.3	3.6	8.8	4.0	100	15.44		63.9
132M a	9.2	2940	17.8	88.9	90.4	90.6	0.82	29.9	4.5	9.6	4.5	100	18.09		71.2
132M b	11	2940	21.1	89.0	90.6	90.7	0.83	35.7	4.2	10.1	4.6	100	20.61		77.1
30SH Type 4 pole - 1500 min¹															
63 b	0.12	1370	0.41	55.6	61.8	63.1	0.67	0.85	2.1	3.0	2.3	5	0.323		6.8
63 c	0.18	1380	0.61	58.8	64.9	66.0	0.65	1.25	2.4	3.3	2.6	5	0.686		7.5
71 b	0.25	1380	0.68	66.5	69.5	68.7	0.76	1.73	2.1	3.8	2.3	5	0.747		9.1
71 c	0.37	1415	1.08	65.6	71.3	72.8	0.68	2.51	3.0	4.8	3.3	5	0.860		10.9
80 a	0.55	1415	1.26	76.3	78.6	78.3	0.79	3.67	2.4	5.4	2.8	10	2.267		13.7
80 b	0.75	1430	1.7	77.3	80.1	80.2	0.78	4.96	2.9	6.2	3.4	10	2.899		15.6
90S a	1.1	1425	2.5	80.9	82.7	82.1	0.76	7.37	2.4	5.3	2.9	20	2.726		19.3
90L a	1.5	1425	3.4	82.8	84.4	83.8	0.76	10.1	2.7	5.8	3.2	20	3.487		22.9
100L a	2.2	1430	5.0	83.7	85.3	84.7	0.75	14.7	2.6	5.7	3.2	40	5.386		29.8
100L b	3	1430	6.7	85.1	86.4	85.8	0.75	19.9	2.8	6.0	3.4	40	6.796		33.7
112M a	4	1440	8.0	87.3	88.1	87.2	0.82	26.3	2.4	6.5	3.1	70	11.96		44.6
132S b	5.5	1445	11.0	89.2	89.3	88.2	0.82	36.4	2.3	5.7	2.7	100	25.82		63.4
132M b	7.5	1450	14.8	90.0	90.1	89.1	0.82	49.4	2.4	6.1	2.7	100	33.77		74.8
160M b	11	1470	22.1	89.9	90.8	90.4	0.79	71.4	2.8	6.5	2.6	150	67.92		119
160L a	15	1470	29.0	91.1	91.6	91.1	0.82	97.3	2.6	6.5	2.8	150	87.70		138

Mn = Full load torque **Ms** = Locked rotor torque **Mm** = Maximum torque **In** = Rated load current **Is** = Locked rotor current

One-speed self-braking three-phase motors - High Efficiency (IE2)

TEFC construction – Squirrel cage rotor – Continuous duty S1 – Insulation class F – IP 54 protection
Brake power with alternating current (direct current on request).

Method of determining the efficiency: IEC 60034-2-1; 2014

30SH Type 6 pole - 1000 min¹															
Motor size		Rated output	Technical data at rated output V 400 - Hz 50							Direct insertion characteristics			Braking torque	Moment of inertia	Mass (IM B3)
		Pn	n	In	IE2 η			cos φ	Mn	Ms/Mn	Is/In	Mm/Mn	Mb max.	J	
		kW	min-1	A	50 %	75 %	100 %		Nm				Nm	10-3 kg.m2	kg
71	b	0.12	905	0.52	44.3	51.5	54.1	0.63	1.28	2.1	2.6	2.3	5	0.860	9.0
71	c	0.18	890	0.66	51.2	57.0	57.1	0.68	1.96	1.9	2.6	2.1	5	1.235	10.7
80	b	0.25	935	0.77	64.0	68.9	70.4	0.66	2.54	2.6	4.1	2.8	10	2.153	13.3
80	c	0.37	940	1.10	64.1	70.0	71.5	0.68	3.78	2.8	4.4	3.0	10	2.627	14.5
90S	a	0.55	935	1.42	72.5	75.4	75.1	0.74	5.63	2.1	4.3	2.5	20	4.308	19.0
90L	a	0.75	935	2.0	75.4	78.2	77.9	0.72	7.83	2.3	4.7	2.9	20	5.581	21.9
100L	r	1.1	940	2.7	76.5	79.1	78.7	0.73	11.0	2.3	4.9	2.9	40	8.382	27.8
100L	a	1.5	940	3.7	78.5	80.6	80.1	0.74	15.3	2.3	5.1	3.0	40	10.94	31.7
112M	a	2.2	960	5.3	80.2	82.5	82.4	0.73	21.8	1.6	5.4	2.8	70	17.39	43.4
132S	a	3	955	6.8	83.6	84.7	83.9	0.76	30.0	1.6	5.0	2.6	100	28.23	57.0
132M	a	4	960	8.9	84.8	86.0	85.3	0.76	39.7	1.6	5.4	2.9	100	35.80	67.8
132M	b	5.5	960	11.7	86.8	87.8	87.1	0.78	54.2	1.7	5.9	3.0	100	46.68	78.0
160M	b	7.5	965	15.3	87.7	88.4	87.7	0.80	74.4	2.2	5.9	2.8	150	91.40	114
160L	a	11	970	22.4	88.7	89.6	89.0	0.79	108	2.4	6.8	2.3	150	128.6	138
30SH Type 8 pole - 750 min¹															
71	b	0.09	685	0.57	30.0	41.1	45.4	0.50	1.26	2.7	2.2	2.8	5	0.860	9.0
71	c	0.12	685	0.82	28.9	36.9	42.5	0.50	1.68	2.9	2.2	3.1	5	1.235	10.8
80	b	0.18	695	0.89	41.7	50.8	54.6	0.54	2.49	2.6	2.7	2.7	10	2.153	13.0
80	c	0.25	695	1.22	41.8	49.9	54.1	0.55	3.42	2.7	2.8	2.8	10	2.627	14.5
90S	a	0.37	690	1.43	55.5	62.3	63.8	0.59	5.18	1.8	2.5	1.9	20	4.308	18.1
90L	a	0.55	685	2.0	59.1	65.9	67.0	0.57	7.40	1.9	2.5	2.3	20	5.581	20.7
100L	r	0.75	685	2.6	60.0	65.2	66.5	0.62	10.4	2.2	3.2	2.8	40	8.382	27.8
100L	a	1.1	690	3.5	64.8	70.1	71.1	0.63	15.1	2.1	3.5	2.6	40	10.94	31.4
112M	a	1.5	705	4.3	71.1	74.5	74.4	0.67	20.3	1.2	3.5	2.1	70	17.39	43.1
132S	b	2.2	715	6.1	74.8	78.2	78.5	0.66	29.0	1.5	3.8	2.3	100	32.82	60.1
132M	b	3	720	8.0	76.4	79.8	80.1	0.67	39.5	1.4	4.1	2.5	100	42.63	70.4

Mn = Full load torque **Ms** = Locked rotor torque **Mm** = Maximum torque **In** = Rated load current **Is** = Locked rotor current

Two-speed self-braking three-phase motors - single winding - Dahlander connection (Star-Star/ Delta)

TEFC construction – Squirrel cage rotor – Continuous duty S1 – Insulation class F – IP 54 protection
Brake power with alternating current (direct current on request).

30D Type	2/4 pole - 3000/1500 min¹									
Motor size	Rated output Pn kW	Technical data at rated output V 400 - Hz 50 n min-1	In A	Mn Nm	Direct insertion characteristics Ms/Mn	Is/In	Mm/Mn	Braking torque Mb max. Nm	Moment of inertia J 10-3 kg.m2	Mass (IM B3) kg
63 a	**0.15/0.10**	2780/1370	0.41/0.41	0.52/0.70	1.7/1.8	3.9/2.4	2.0/2.0	5	0.226	6.2
63 b	**0.22/0.15**	2800/1380	0.58/0.58	0.75/1.04	1.8/1.9	4.1/2.6	2.2/2.1	5	0.283	6.8
63 c	**0.30/0.20**	2800/1380	0.75/0.75	1.02/1.38	1.9/2.0	4.0/2.8	2.3/2.2	5	0.386	7.5
71 a	**0.30/0.20**	2800/1380	0.78/0.78	1.02/1.38	1.9/2.0	3.8/3.2	2.1/2.1	5	0.747	8.5
71 b	**0.45/0.30**	2810/1400	1.3/1.1	1.53/2.05	2.0/2.1	4.1/3.4	2.3/2.2	5	0.860	9.1
71 c	**0.60/0.45**	2840/1400	1.6/1.4	2.02/3.07	2.1/2.3	4.5/3.6	2.6/2.5	5	1.235	10.9
80 a	**0.60/0.45**	2780/1400	1.6/1.2	2.06/3.07	1.8/1.8	3.6/3.7	2.1/2.1	10	1.609	11.7
80 b	**0.85/0.65**	2820/1400	2.4/1.7	2.88/4.43	1.8/2.0	3.8/3.6	2.4/2.3	10	2.153	13.2
80 c	**1.10/0.85**	2830/1410	2.8/2.1	3.71/5.76	2.0/2.1	4.4/4.5	2.4/2.4	10	2.627	14.6
90S a	**1.50/1.10**	2850/1410	3.3/2.7	5.03/7.45	2.2/2.0	4.8/4.3	2.9/2.4	20	2.370	17.8
90L a	**1.85/1.40**	2850/1410	4.1/3.1	6.20/9.48	2.4/2.1	5.0/4.9	3.0//2.9	20	3.003	20.1
90L b	**2.20/1.70**	2850/1410	5.0/3.9	7.37/11.5	2.5/2.3	5.6/5.1	3.2/3.0	20	3.487	22.0
100L a	**2.60/2.00**	2850/1420	6.1/4.8	8.71/13.5	2.8/2.6	5.0/5.3	3.2/3.1	40	4.987	28.1
100L b	**3.50/2.70**	2870/1420	8.0/6.4	11.6/18.2	2.7/2.7	5.7/4.9	3.2/2.9	40	6.384	31.8
112M a	**4.00/3.20**	2880/1430	8.8/7.1	13.3/21.4	2.1/2.0	6.0/5.1	2.9/1.9	70	10.43	41.4
112M b	**4.80/3.70**	2890/1430	9.8/8.2	15.9/24.7	2.0/2.0	6.2/5.0	2.7/1.8	70	11.96	44.4
132S b	**6.00/4.60**	2890/1440	13.1/9.9	19.8/30.5	2.3/2.0	5.1/5.0	2.5/2.4	100	23.46	59.6
132M b	**8.20/6.60**	2910/1440	17.5/13.5	26.9/43.8	2.5/2.2	6.1/5.3	2.8/1.8	100	30.64	70.0
132M c	**9.60/7.80**	2920/1440	20.0/16.0	31.4/51.7	2.5/2.3	6.2/5.3	2.8/1.8	100	35.24	76.4
30D Type	**4/8 pole - 1500/750 min¹**									
71 a	**0.10/0.05**	1360/670	0.36/0.36	0.70/0.71	1.3/1.9	2.5/1.9	1.4/2.1	5	0.747	8.3
71 b	**0.14/0.07**	1370/670	0.45/0.50	0.98/1.00	1.7/1.9	3.0/1.9	2.1/2.1	5	0.860	9.0
71 c	**0.20/0.10**	1380/660	0.57/0.63	1.38/1.45	1.6/2.0	3.3/1.8	1.9/2.0	5	1.235	10.9
80 a	**0.25/0.13**	1360/680	0.65/0.65	1.76/1.83	1.3/1.6	3.3/1.9	1.5/1.9	10	1.609	11.6
80 b	**0.37/0.20**	1370/680	0.92/0.92	2.58/2.81	1.4/1.7	3.7/2.4	1.7/2.0	10	2.153	13.1
80 c	**0.50/0.26**	1370/680	1.2/1.2	3.49/3.65	2.0/2.1	3.5/2.4	1.8/2.0	10	2.627	14.5
90S a	**0.70/0.36**	1380/690	1.8/2.0	4.84/4.98	1.8/2.0	3.5/2.5	2.2/2.5	20	3.745	17.8
90L a	**1.00/0.52**	1380/690	2.5/2.5	6.92/7.20	1.8/1.8	3.6/2.1	2.1/2.0	20	5.018	20.3
100L a	**1.10/0.60**	1410/700	2.5/2.6	7.45/8.19	1.5/1.7	4.5/3.0	2.3/2.6	40	8.190	27.9
100L b	**1.50/0.80**	1410/710	3.3/3.2	10.2/10.8	1.5/1.8	4.1/3.4	2.1/2.6	40	10.66	31.6
112M a	**2.20/1.20**	1400/700	4.5/3.9	15.0/16.4	1.6/1.9	4.3/3.6	1.9/2.4	70	14.82	40.8
112M b	**2.60/1.40**	1410/710	5.3/4.9	17.6/18.8	1.8/2.0	5.3/4.0	2.5/3.2	70	17.39	43.9
132S a	**3.00/1.70**	1420/720	6.2/6.1	20.2/22.5	1.6/1.8	5.4/3.6	2.4/2.7	100	25.15	54.0
132S b	**4.00/2.20**	1430/720	8.3/8.3	26.7/29.2	1.7/2.0	5.7/4.0	2.5/2.7	100	32.82	60.7
132M b	**5.50/3.00**	1440/720	11.4/10.7	36.5/39.8	1.7/2.2	6.3/4.3	2.7/2.8	100	42.63	70.8
160M b	**7.50/4.30**	1440/720	15.0/14.0	49.7/57.0	1.8/2.2	5.5/4.2	2.5/2.7	150	91.40	114
160L a	**11.0/6.30**	1450/720	20.0/19.0	72.4/83.6	1.9/2.3	5.7/4.3	2.7/2.9	150	122.3	133

Mn = Full load torque **Ms** = Locked rotor torque **Mm** = Maximum torque **In** = Rated load current **Is** = Locked rotor current

Two-speed self-braking three-phase motors - double winding - Star/Star connection

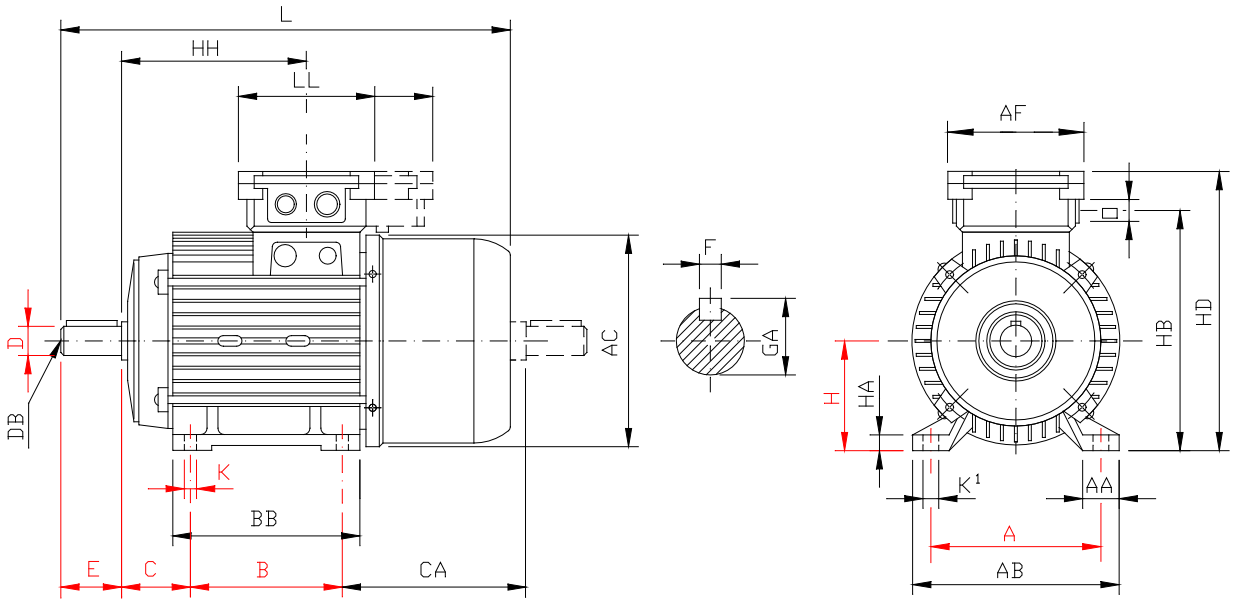
TEFC construction – Squirrel cage rotor – Continuous duty S1 – Insulation class F – IP 54 protection
Brake power with alternating current (direct current on request).

Motor size		Rated output Pn	Technical data at rated output V 400 - Hz 50 n	In	Mn	Direct insertion characteristics Ms/Mn	Is/In	Mm/Mn	Braking torque Mb max.	Moment of inertia J	Mass (IM B3)
		kW	min-1	A	Nm				Nm	10-3 kg.m2	kg
30DD Type 2/6 pole - 3000/1000 min1											
71	**c**	**0.42/0.14**	2810/885	0.95/0.64	1.43/1.51	1.6/1.7	4.1/2.2	2.0/1.8	5	1.235	11.0
80	**a**	**0.42/0.14**	2770/930	1.07/0.57	1.45/1.44	1.6/1.4	3.6/2.4	1.9/1.8	10	1.609	11.6
80	**b**	**0.60/0.20**	2820/930	1.40/0.89	2.03/2.05	1.6/1.5	4.0/2.4	1.9/1.9	10	2.153	13.1
80	**c**	**0.90/0.30**	2820/940	1.88/1.08	3.05/3.05	1.5/1.6	4.4/2.9	2.0/2.2	10	2.627	14.5
90S	**a**	**1.10/0.37**	2750/930	2.6/1.3	3.82/3.80	1.8/1.7	3.5/2.7	2.2/2.0	20	2.370	17.8
90L	**a**	**1.50/0.50**	2810/950	3.4/1.7	5.10/5.03	1.8/2.1	3.9/3.2	2.3/2.4	20	3.003	20.1
90L	**b**	**1.80/0.60**	2840/930	4.1/2.1	6.05/6.16	1.8/1.9	4.4/2.9	2.4/2.2	20	3.487	21.8
100L	**a**	**2.20/0.75**	2810/930	5.2/2.2	7.48/7.70	1.7/1.6	3.9/3.0	2.2/2.0	40	4.987	28.1
100L	**b**	**3.00/1.00**	2820/910	6.4/3.1	10.2/10.5	1.8/1.5	4.4/2.6	2.4/1.7	40	6.384	31.8
112M	**b**	**4.00/1.35**	2900/950	8.3/4.0	13.2/13.6	1.9/2.0	5.8/3.9	2.7/2.4	70	11.96	44.8
132S	**b**	**5.50/1.85**	2905/965	11.1/5.2	18.1/18.3	2.3/1.7	6.2/3.7	2.7/2.2	100	32.82	58.2
132M	**b**	**7.50/2.50**	2910/960	14.8/7.1	24.6/24.9	2.1/1.8	6.2/3.8	2.5/2.3	100	42.63	67.4
30DD Type 2/8 pole - 3000/750 min1											
71	**c**	**0.33/0.08**	2830/680	0.83/0.65	1.11/1.12	2.1/1.7	4.8/2.1	2.5/1.9	5	1.235	11.0
80	**a**	**0.33/0.08**	2830/690	0.83/0.44	1.11/1.11	1.5/1.6	3.2/1.9	2.0/1.8	10	1.609	11.6
80	**b**	**0.44/0.11**	2890/690	1.10/0.73	1.45/1.52	1.6/1.8	4.1/2.0	2.3/2.0	10	2.153	13.1
80	**c**	**0.60/0.15**	2890/690	1.50/0.75	1.98/2.08	1.6/1.6	4.4/2.1	2.5/1.9	10	2.627	14.5
90S	**a**	**0.75/0.18**	2860/680	1.80/0.94	2.50/2.53	2.0/1.7	4.2/2.1	2.7/1.9	20	2.370	17.8
90L	**a**	**1.00/0.25**	2880/690	2.3/1.3	3.32/3.46	2.0/1.7	4.6/2.2	2.4/2.1	20	3.003	20.1
90L	**b**	**1.20/0.30**	2900/700	2.7/1.5	3.95/4.09	2.0/1.9	5.2/2.3	2.8/2.2	20	3.487	21.8
100L	**a**	**1.50/0.37**	2890/700	3.3/1.7	4.96/5.05	1.6/1.8	4.6/2.4	2.4/2.1	40	4.987	28.1
100L	**b**	**2.00/0.50**	2900/700	4.4/2.2	6.59/6.82	1.8/1.7	6.0/2.5	2.8/2.1	40	6.384	31.8
112M	**a**	**2.60/0.65**	2810/710	5.9/2.3	8.84/8.74	1.9/1.5	5.8/3.4	2.0/1.9	70	14.82	39.5
112M	**b**	**3.20/0.80**	2850/710	7.0/2.9	10.7/10.8	2.0/1.6	6.1/3.5	2.1/2.0	70	17.39	42.5
132S	**b**	**4.40/1.10**	2900/720	9.2/3.8	14.5/14.6	2.0/1.5	6.3/3.5	2.3/2.1	100	32.82	58.2
132M	**b**	**6.00/1.50**	2910/720	12.5/5.1	19.7/19.9	2.1/1.6	6.5/3.7	2.5/2.3	100	42.63	67.4
30DD Type 4/6 pole - 1500/1000 min1											
71	**c**	**0.25/0.18**	1390/890	0.98/0.87	1.72/1.93	1.6/1.5	2.7/2.0	2.1/1.7	5	1.235	10.9
80	**a**	**0.25/0.18**	1420/920	0.72/0.64	1.68/1.87	1.4/1.3	3.9/2.7	2.1/1.8	10	1.609	11.6
80	**b**	**0.37/0.25**	1440/930	1.00/0.87	2.45/2.57	1.5/1.4	4.1/2.9	2.4/2.0	10	2.153	13.1
80	**c**	**0.55/0.37**	1430/920	1.5/1.3	3.67/3.84	1.5/1.4	3.9/2.8	2.2/1.9	10	2.627	14.5
90S	**a**	**0.75/0.50**	1420/920	2.0/1.7	5.04/5.19	1.6/1.5	3.5/2.6	2.2/1.8	20	2.370	17.8
90L	**a**	**0.90/0.60**	1440/940	2.6/2.2	5.97/6.10	2.3/1.8	4.1/2.9	2.8/2.1	20	3.003	20.2
100L	**a**	**1.10/0.75**	1430/910	2.7/2.3	7.35/7.87	2.1/1.5	4.3/2.5	2.6/1.7	40	4.987	28.3
100L	**b**	**1.50/1.00**	1440/920	3.7/3.0	9.95/10.4	2.2/1.6	4.6/2.9	2.8/1.9	40	6.384	32.1
112M	**a**	**2.20/1.50**	1450/950	4.6/3.9	14.5/15.1	1.6/1.6	4.4/4.0	2.3/2.3	70	14.82	40.8
112M	**b**	**2.60/1.80**	1450/960	5.6/4.7	17.1/17.9	1.7/1.6	4.4/4.0	2.3/2.3	70	17.39	43.9
132S	**a**	**3.00/2.00**	1450/960	6.8/5.1	19.8/19.9	1.7/1.5	5.6/4.0	2.7/2.1	100	25.15	54.0
132S	**b**	**4.00/2.70**	1450/960	9.0/6.7	26.3/26.9	1.8/1.5	5.8/4.2	2.9/2.3	100	32.82	60.7
132M	**b**	**5.50/3.60**	1450/960	12.0/9.2	36.2/35.8	1.8/1.6	5.7/4.1	2.9/2.4	100	42.63	70.8
160M	**b**	**7.50/4.90**	1460/960	15.4/11.5	49.1/48.7	2.3/1.9	6.7/4.4	2.7/2.5	150	91.40	114
160L	**a**	**11.0/7.20**	1460/960	23.3/17.8	72.0/71.6	2.5/2.1	7.0/4.6	2.8/2.6	150	122.3	133

Mn = Full load torque **Ms** = Locked rotor torque **Mm** = Maximum torque **In** = Rated load current **Is** = Locked rotor current

Mounting arrangement IM B3

Self-braking three-phase motors - **30 Type**

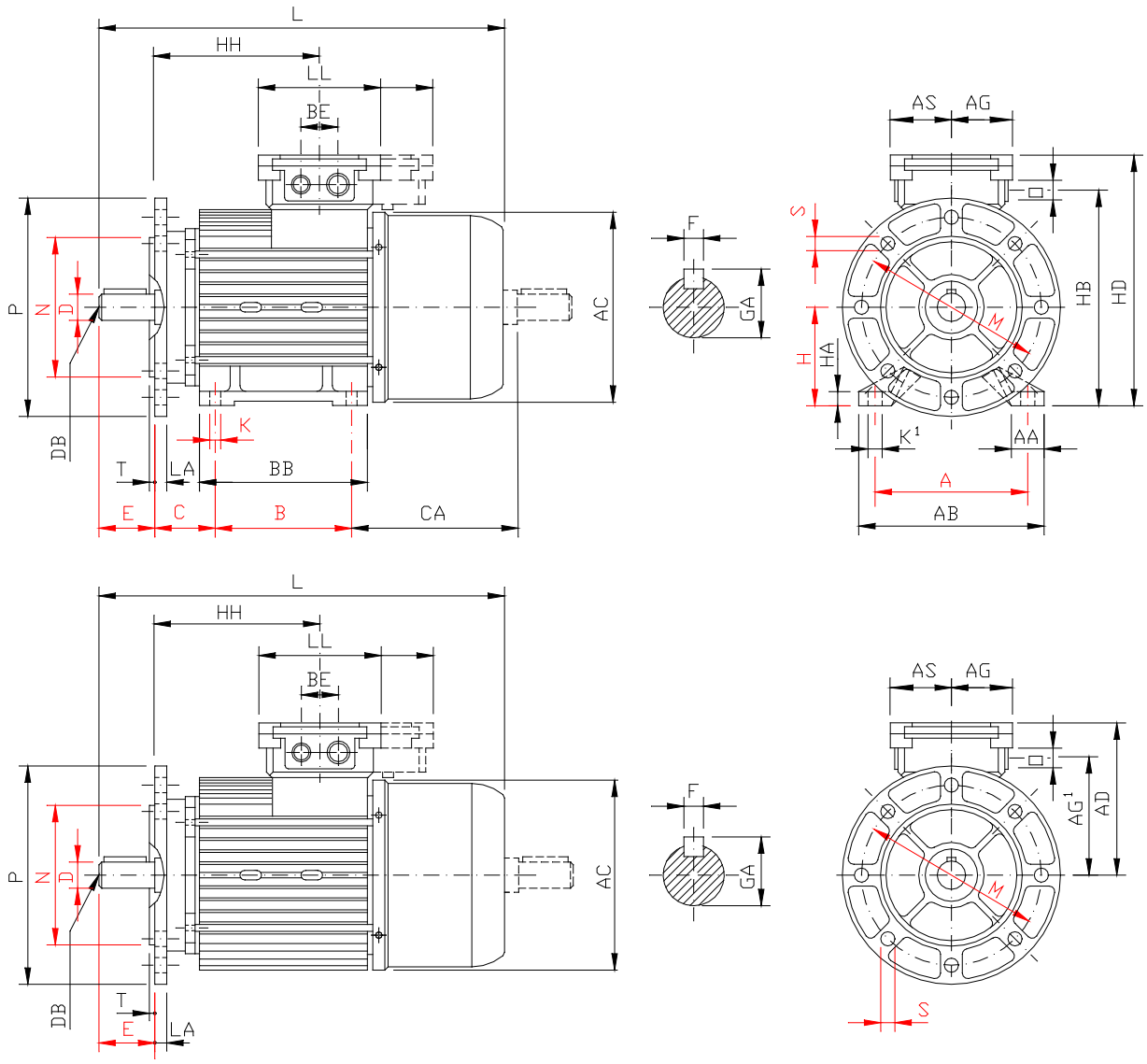


Note: Ledge of the second shaft, from size 71 upwards, is reduced to a size.

Motor size	Coupling										Overall								Shaft end				
	A	AA	AB	**B**	BB	**C**	CA	**H**	HA	K	AC	AF	HB	HD	HH	L	LL	O	**D**	DB	**E**	F	GA
63	**100**	22	120	**80**	100	**40**	127	**63**	7	**7**	123	104	149	174	89	266	148	M16+M20x1.5	**11**	M4	**23**	4	12.5
71	**112**	26	135	**90**	112	**45**	147	**71**	8	**7**	138	104	167	193	103	308	148	M16+M20x1.5	**14**	M5	**30**	5	16
80	**125**	28	152	**100**	124	**50**	165	**80**	11	**9**	156	114	185	210	117	351	158	M20+M25x1.5	**19**	M6	**40**	6	21.5
90S	**140**	30	170	**100**	130	**56**	184	**90**	13	**9**	176	114	200	224	127	385	158	M20+M25x1.5	**24**	M8	**50**	8	27
90L	**140**	30	170	**125**	155	**56**	184	**90**	13	**9**	176	114	200	224	152	410	158	M20+M25x1.5	**24**	M8	**50**	8	27
100L	**160**	35	192	**140**	163	**63**	203	**100**	14	**12**	194	114	223	246	171	461	158	M20+M25x1.5	**28**	M10	**60**	8	31
112M	**190**	40	220	**140**	183	**70**	221	**112**	14	**12**	220	138	257	280	175	485	202	M32+M32x1.5	**28**	M10	**60**	8	31
132S	**216**	44	260	**140**	180	**89**	258	**132**	16	**12**	260	138	305	328	206	560	202	M32+M32x1.5	**38**	M12	**80**	10	41
132M	**216**	44	260	**178**	218	**89**	258	**132**	16	**12**	260	138	305	328	244	598	202	M32+M32x1.5	**38**	M12	**80**	10	41
160M	**254**	65	319	**210**	261	**108**	318	**160**	20	**14**	310	176	360	395	234	738	176	M32+M32x1.5	**42**	M16	**110**	12	45
160L	**254**	65	319	**254**	305	**108**	318	**160**	20	**14**	310	176	360	395	278	782	176	M32+M32x1.5	**42**	M16	**110**	12	45

Mounting arrangement IM B35 - IM B5

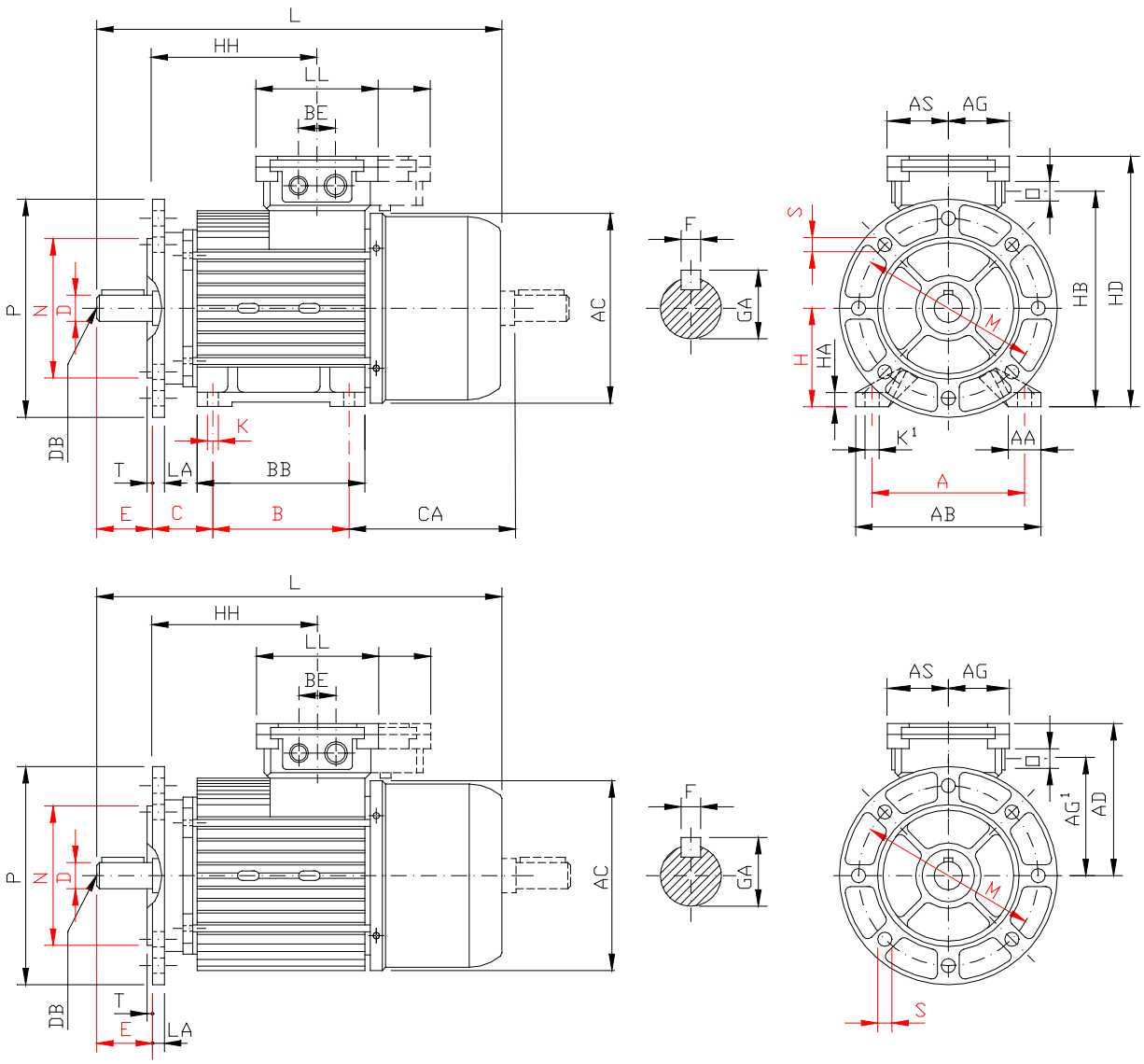
Self-braking three-phase motors - **30 Type**



Motor size	Overall dimensions											
	AC	AD	AG	AG¹	AS	BE	HB	HD	HH	L	LL	O
63	123	111	52	86	52	35	149	174	89	266	148	M16+M20 x 1.5
71	138	122	52	96	52	35	167	193	103	308	148	M16+M20 x 1.5
80	156	130	57	105	57	35	185	210	117	351	158	M20+M25 x 1.5
90S	176	134	57	110	57	35	200	224	127	385	158	M20+M25 x 1.5
90L	176	134	57	110	57	35	200	224	152	410	158	M20+M25 x 1.5
100L	194	146	57	123	57	35	223	246	171	461	158	M20+M25 x 1.5
112M	220	168	69	145	69	45	257	280	175	485	202	M32+M32 x 1.5
132S	260	196	69	173	69	45	305	328	206	560	202	M32+M32 x 1.5
132M	260	196	69	173	69	45	305	328	244	598	202	M32+M32 x 1.5
160M	310	235	88	200	88	55	360	395	234	738	176	M32+M32 x 1.5
160L	310	235	88	200	88	55	360	395	278	782	176	M32+M32 x 1.5

Mounting arrangement IM B35 - IM B5

Self-braking three-phase motors - **30 Type**

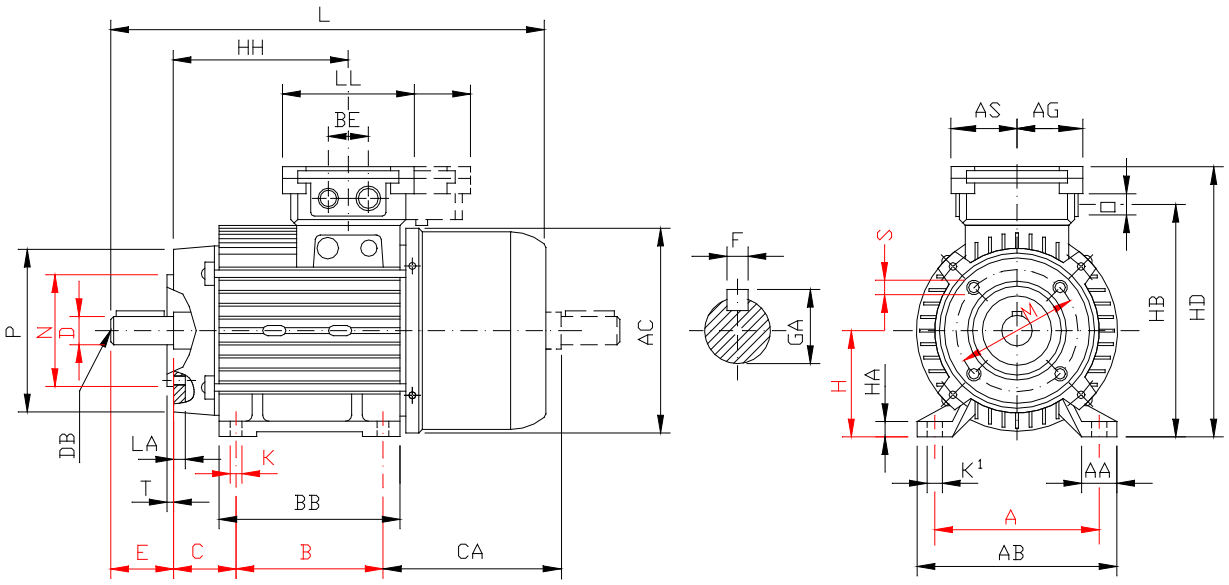


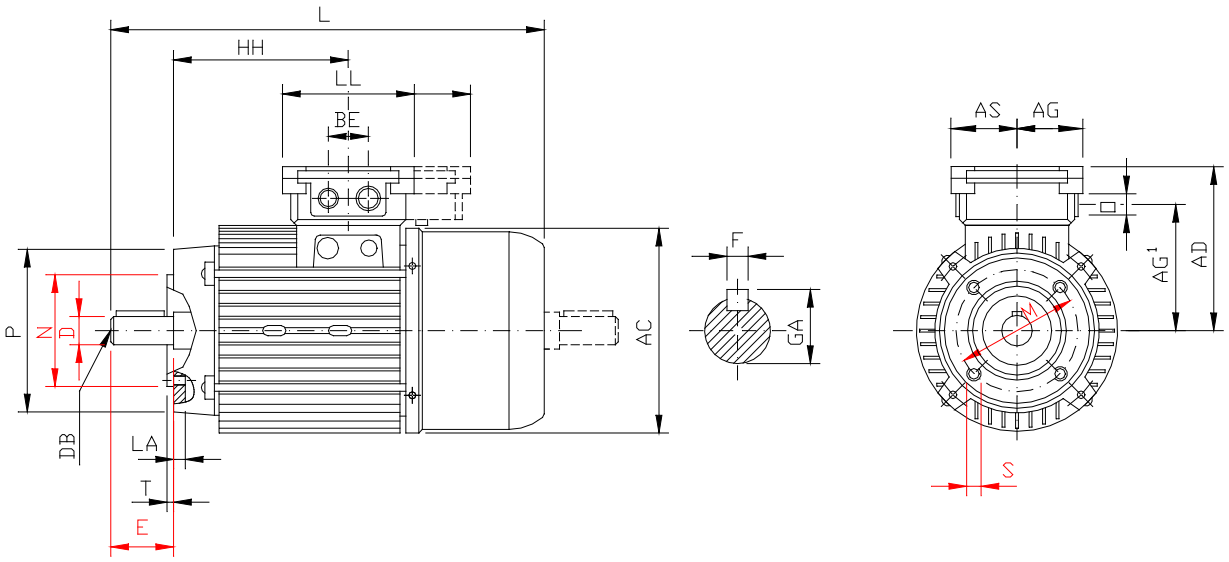
Note: Ledge of the second shaft, from size 71 upwards, is reduced to a size.

Motor size	Coupling																	Shaft end				
	A	AA	AB	**B**	BB	**C**	CA	**H**	HA	**K**	K¹	LA	**M**	**N**	P	**S**	T	**D**	DB	**E**	F	GA
63	**100**	22	120	**80**	100	**40**	127	**63**	7	**7**	10	8	**115**	**95**	140	**9**	3	**11**	M4	**23**	4	12.5
71	**112**	26	135	**90**	112	**45**	147	**71**	8	**7**	12	8	**130**	**110**	160	**9**	3.5	**14**	M5	**30**	5	16
80	**125**	28	152	**100**	124	**50**	165	**80**	11	**9**	13	9	**165**	**130**	200	**11**	3.5	**19**	M6	**40**	6	21.5
90S	**140**	30	170	**100**	130	**56**	184	**90**	13	**9**	13	10	**165**	**130**	200	**11**	3.5	**24**	M8	**50**	8	27
90L	**140**	30	170	**125**	155	**56**	184	**90**	13	**9**	13	10	**165**	**130**	200	**11**	3.5	**24**	M8	**50**	8	27
100L	**160**	35	192	**140**	163	**63**	203	**100**	14	**12**	17	11	**215**	**180**	250	**14**	4	**28**	M10	**60**	8	31
112M	**190**	40	220	**140**	183	**70**	221	**112**	14	**12**	19	12	**215**	**180**	250	**14**	4	**28**	M10	**60**	8	31
132S	**216**	44	260	**140**	180	**89**	258	**132**	16	**12**	22	18	**265**	**230**	300	**14**	4	**38**	M12	**80**	10	41
132M	**216**	44	260	**178**	218	**89**	258	**132**	16	**12**	22	18	**265**	**230**	300	**14**	4	**38**	M12	**80**	10	41
160M	**254**	65	319	**210**	261	**108**	318	**160**	20	**14**	24	14	**300**	**250**	350	**18**	5	**42**	M16	**110**	12	45
160L	**254**	65	319	**254**	305	**108**	318	**160**	20	**14**	24	14	**300**	**250**	350	**18**	5	**42**	M16	**110**	12	12.5

Mounting arrangement IM B34 - IM B14

Self-braking three-phase motors - **30 Type**

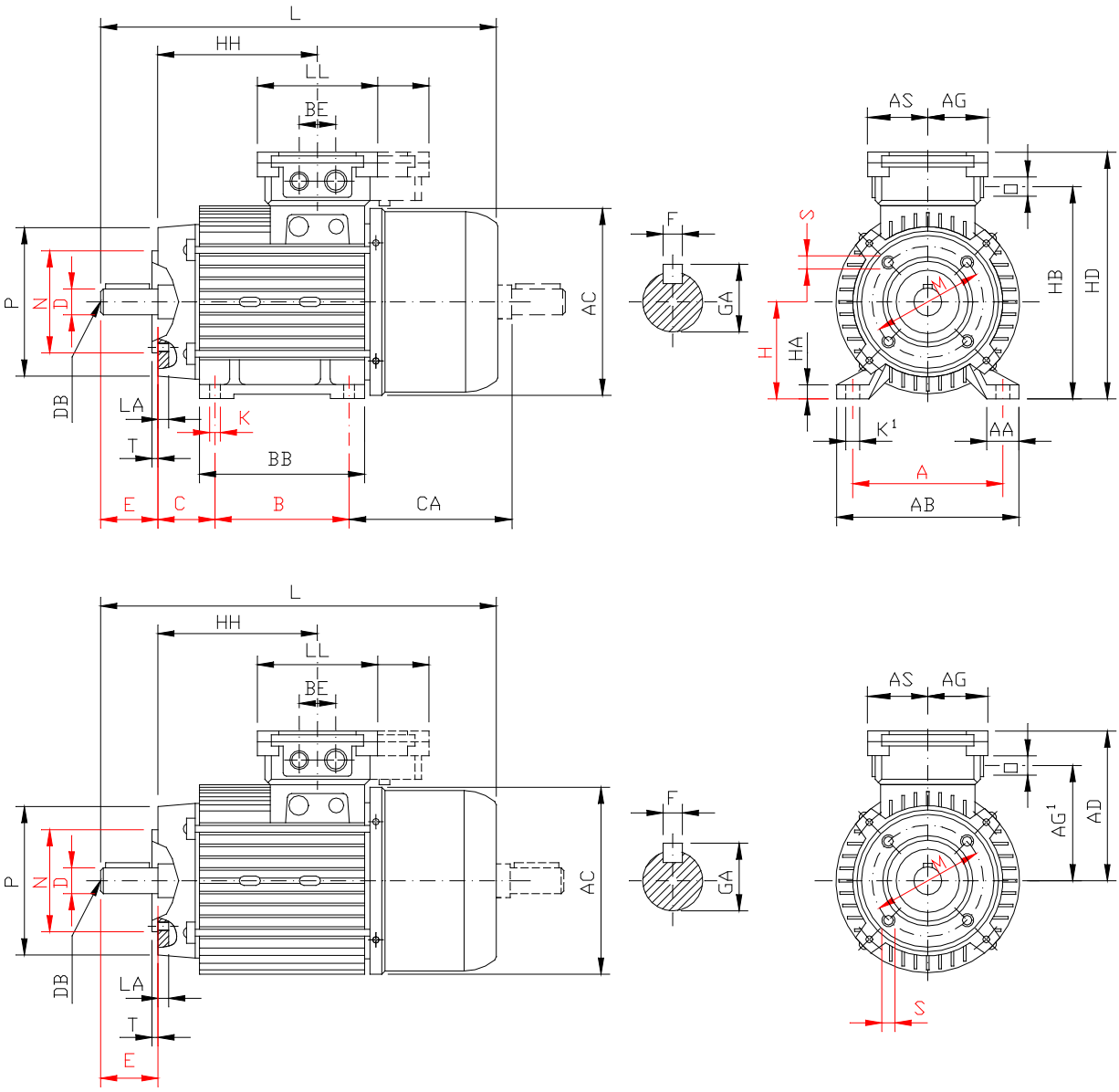




Motor size	Overall dimensions											
	AC	AD	AG	AG¹	AS	BE	HB	HD	HH	L	LL	O
63	123	111	52	86	52	35	149	174	89	266	148	M16+M20 x 1.5
71	138	122	52	96	52	35	167	193	103	308	148	M16+M20 x 1.5
80	156	130	57	105	57	35	185	210	117	351	158	M20+M25 x 1.5
90S	176	134	57	110	57	35	200	224	127	385	158	M20+M25 x 1.5
90L	176	134	57	110	57	35	200	224	152	410	158	M20+M25 x 1.5
100L	194	146	57	123	57	35	223	246	151	461	158	M20+M25 x 1.5
112M	220	168	69	145	69	45	257	280	175	485	202	M32+M32 x 1.5
132S	260	196	69	173	69	45	305	328	206	560	202	M32+M32 x 1.5
132M	260	196	69	173	69	45	305	328	244	598	202	M32+M32 x 1.5
160M	310	235	88	200	88	55	360	395	234	738	176	M32+M32 x 1.5
160L	310	235	88	200	88	55	360	395	278	782	176	M32+M32 x 1.5

Mounting arrangement IM B34 - IM B14

Self-braking three-phase motors - **30 Type**



Note: Ledge of the second shaft, from size 71 upwards, is reduced to a size.

Motor size	Coupling																	Shaft end				
	A	AA	AB	**B**	BB	**C**	CA	**H**	HA	**K**	K¹	LA	**M**	**N**	P	**S**	T	**D**	DB	**E**	F	GA
63	**100**	22	120	**80**	100	**40**	127	**63**	7	**7**	10	7	**75**	**60**	90	**M5**	2.5	**11**	M4	**23**	4	12.5
71	**112**	26	135	**90**	112	**45**	147	**71**	8	**7**	12	8	**85**	**70**	105	**M6**	2.5	**14**	M5	**30**	5	16
80	**125**	28	152	**100**	124	**50**	165	**80**	11	**9**	13	17	**100**	**80**	120	**M6**	3	**19**	M6	**40**	6	21.5
90S	**140**	30	170	**100**	130	**56**	184	**90**	13	**9**	13	10	**115**	**95**	140	**M8**	3	**24**	M8	**50**	8	27
90L	**140**	30	170	**125**	155	**56**	184	**90**	13	**9**	13	10	**115**	**95**	140	**M8**	3	**24**	M8	**50**	8	27
100L	**160**	35	192	**140**	163	**63**	203	**100**	14	**12**	17	10	**130**	**110**	160	**M8**	3.5	**28**	M10	**60**	8	31
112M	**190**	40	220	**140**	183	**70**	221	**112**	14	**12**	19	13	**130**	**110**	160	**M8**	3.5	**28**	M10	**60**	8	31
132S	**216**	44	260	**140**	180	**89**	258	**132**	16	**12**	22	15	**165**	**130**	200	**M10**	3.5	**38**	M12	**80**	10	41
132M	**216**	44	260	**178**	218	**89**	258	**132**	16	**12**	22	15	**165**	**130**	200	**M10**	3.5	**38**	M12	**80**	10	41
160M	**254**	65	319	**210**	261	**108**	318	**160**	20	**14**	24	18	**215**	**180**	250	**M12**	4	**42**	M16	**110**	12	45
160L	**254**	65	319	**254**	305	**108**	318	**160**	20	**14**	24	18	**215**	**180**	250	**M12**	4	**42**	M16	**110**	12	12.5

Self-braking single-phase motors Braking-torque adjustable

Self-braking single-phase motors - 30 Type
For normal use

Typical applications:
- Lifting and transportation.
- Machines for packaging.
- Gear motors.

Mechanical characteristics:
- Rear brake mounting flange: cast iron.
- Brake disc steel.
- Cogged hub with steel anti-vibration system.
- Seal friction asbestos-free and silent.
- Braking torque and other technical data: see table below.
- The braking torque can be adjusted by adjusting the screws.
Unscrewing the screws will not decrease the braking torque under the safe value of 35%.
The motors are supplied with screws flush with the posterior surface of the brake, a brake torque of proximally 50% of the maximum value.
- Braking torque lower standard may be provided on request.
- Brake Kit for the protection provided on request.
- Mechanical release lever on request.

Electrical characteristics:
- Direct current brake.
- The brake power is derived directly from the motor factory.
- **On request it is possible to have a separate power brake**.
- The preparation of standard rectifiers opening of the dc circuit, to obtain necessary permits rapid ascent of the braking torque according to table below.
- For very intermittent and services for specifics uses you can get a fast action of the brake is in the release that, with the use of appropriately designed and fast rectifiers supplied on request.

Table of braking torques and other technical data of brake

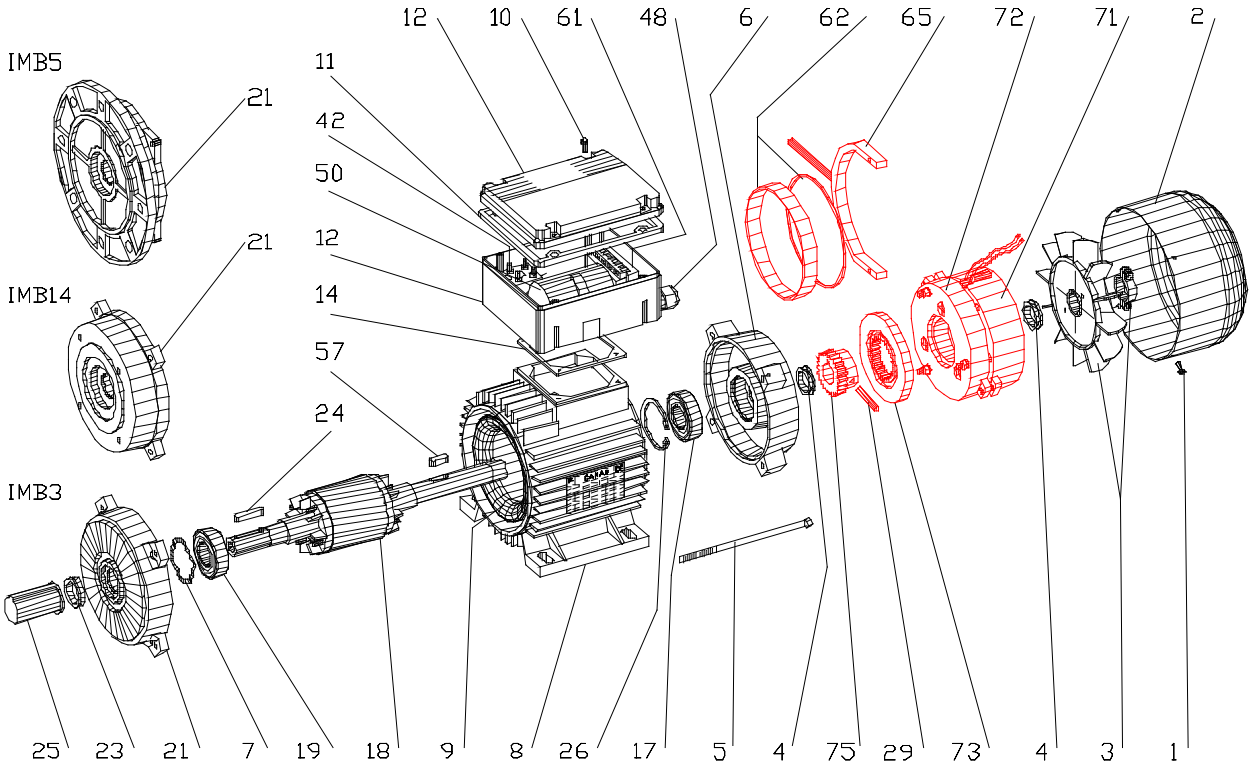
Motor size	Maximum braking torque **Mb max.** Nm	Air-gap **sn** mm	**smax** mm	Maximum speed **nmax** min-1	Brake life **Wt** 1) MJ	**W1** 2) MJ	Brake release time **t1** 3) ms	**t11** 4) ms	Braking torque rise time *** **t2** 5) ms	**t22** 6) ms	Brake power input **Pa** W
63	5	0.20	0.50	3600	260	15.6	30	15	100	10	16
71	5	0.20	0.50	3600	260	15.6	30	15	100	10	16
80	10	0.20	0.50	3600	370	22.4	60	25	120	10	20
90	20	0.30	0.60	3600	500	30	100	40	150	10	30
100	40	0.30	0.60	3600	750	45	120	50	220	15	40

1) For wear of the friction linings up to a thickness of 1 mm
2) Between two wear adjustments from **sn** to **smax**
3) With standard rectifier
4) With increased rectifier
5) Opening on ac side
6) Opening on dc side or with rapid rectifier

***** -** The time table is valid for a power independent of a brake motor.
If the brake power is derived from the motor, the time table must be increased as dependent inertia and stored energy from the motor. Again, with the opening of the circuit or by using the dc-side rectifier fast, time are much improved.

For any further information you should contact our Technical Department.

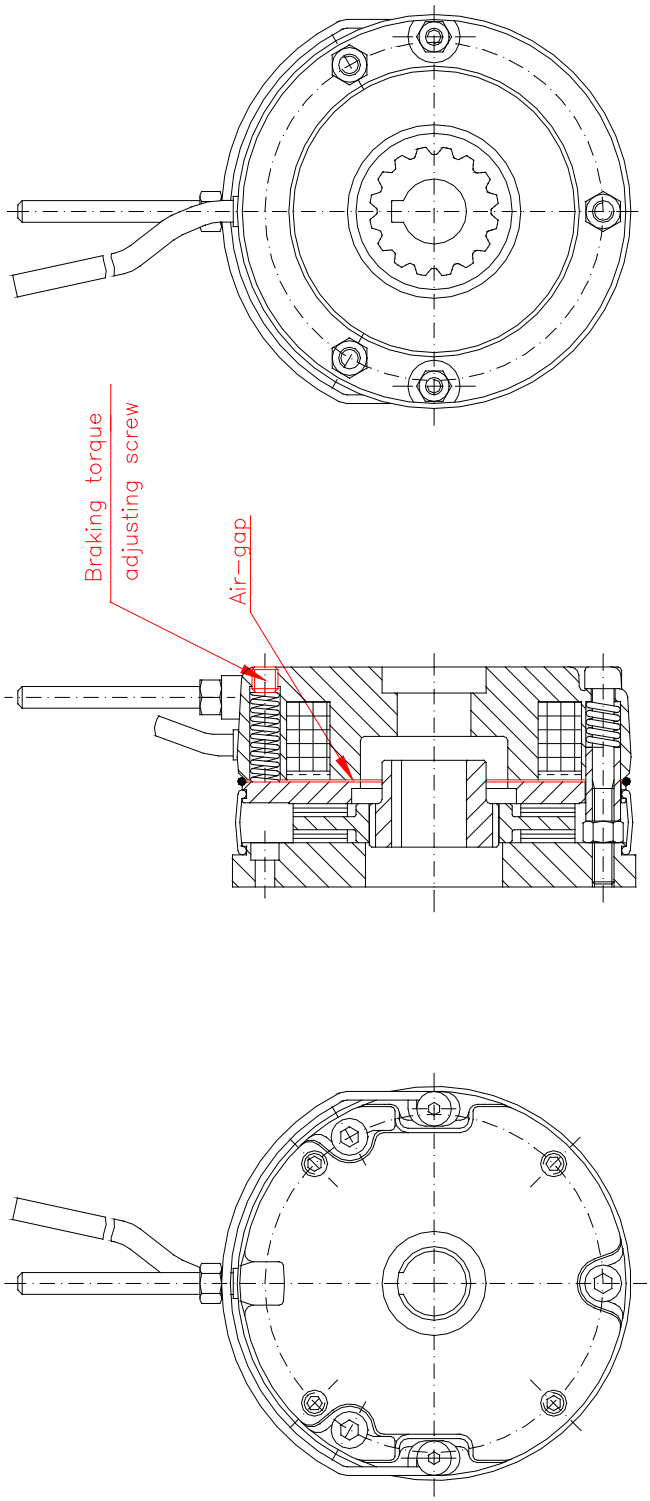
Self-braking single-phase motor - 30 Type



Spare parts nomenclature

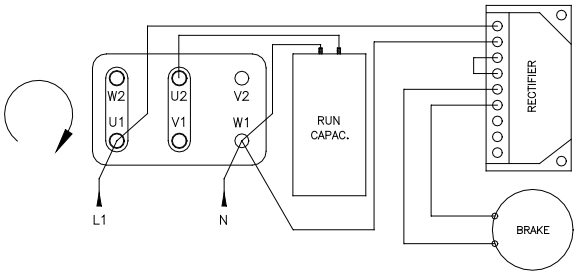
1. Screw for fan cover
2. Fan cover
3. Fan
4. Sealing ring
5. Rod
6. N-end shield
7. Spring ring
8. Frame
9. Stator package
10. Screw for capacitor box cover
11. Gasket for capacitor box cover
12. Capacitor box
14. Gasket for capacitor box
17. Rear bearing
18. Rotor
19. Front bearing
21. D-end shield/flange
23. Sealing ring
24. Key
25. Shaft cap
26. Retaining ring
29. Gear pin
42. Terminal board
48. Cable gland
50. Run capacitor
57. Key
61. Rectifier
62. O-ring for brake
65. Manual release
71. Electromagnet
72. Movable armature
73. Brake disc
74. Cogged hub

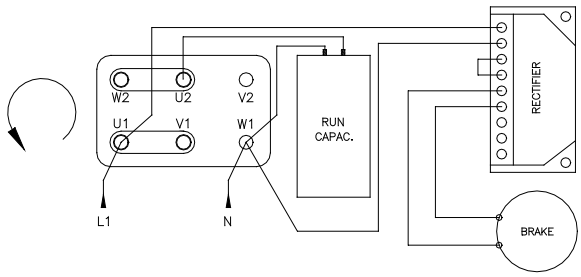
Direct current brake – 30 Type



Connection for motors 30CO Type

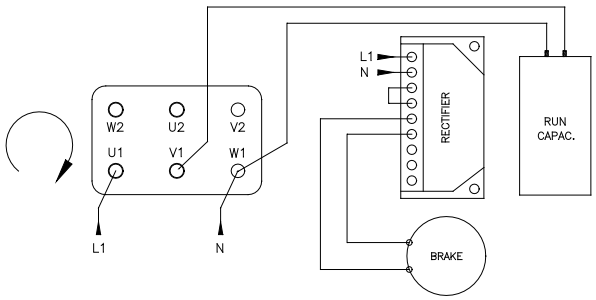
Self-braking single-phase motors - with **dc brake**

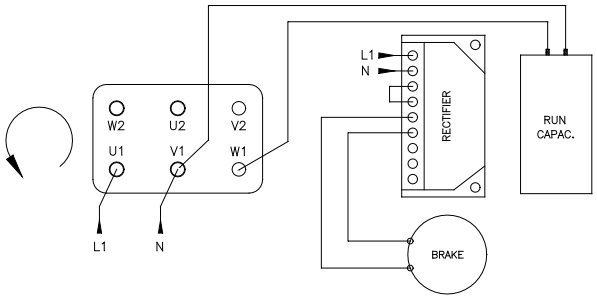




Connection for motors 30CB Type

Self-braking single-phase motors - with **balanced windings** - with **dc brake**





Self-braking single-phase motors

With permanent capacitor

TEFC construction – Squirrel cage rotor – Continuous duty S1 – Insulation class F – IP 54 protection

Direct current power supply

Motor size	Rated output Pn kW	Technical data at rated output V 230 - Hz 50 n min-1	In A	η %	cos φ	Mn Nm	Direct insertion characteristics Ms/Mn	Is/In	Mm/Mn	Run capacitor V 450 µF	Braking torque Mb max. Nm	Moment of inertia J 10-3 kg.m2	Mass (IM B3) kg
30CO Type 2 pole - 3000 min1													
63 a	**0.18**	2850	1.35	61.0	0.95	0.60	0.65	3.6	2.1	6.3	5	0.189	6.4
63 b	**0.25**	2860	1.74	67.2	0.93	0.84	0.65	3.8	2.1	8	5	0.222	6.9
63 c	**0.37**	2870	2.5	67.7	0.95	1.23	0.67	3.9	2.3	12.5	5	0.266	7.7
71 a	**0.37**	2780	2.7	63.4	0.94	1.27	0.56	3.1	1.9	12.5	5	0.402	8.5
71 b	**0.55**	2810	3.7	71.8	0.90	1.87	0.54	3.1	1.8	16	5	0.484	9.5
71 c	**0.75**	2840	4.6	75.4	0.94	2.52	0.50	3.8	1.8	20	5	0.565	10.5
80 a	**0.55**	2830	3.5	72.0	0.95	1.86	0.64	3.5	1.9	20	10	0.814	11.8
80 b	**0.75**	2870	4.5	76.3	0.95	2.50	0.65	3.7	1.9	25	10	1.033	13.4
80 c	**1.1**	2850	6.3	79.9	0.95	3.69	0.65	3.7	2.0	31.5	10	1.263	14.9
90S a	**1.1**	2830	7.4	71.8	0.90	3.71	0.61	3.8	2.2	35	20	1.426	18.2
90L a	**1.5**	2840	10.0	72.5	0.90	5.05	0.62	4.1	2.3	40	20	1.779	20.7
90L b	**1.8**	2840	11.2	77.2	0.93	6.05	0.62	4.2	2.4	50	20	2.048	22.6
100L a	**2.2**	2850	12.2	80.0	0.98	7.38	0.61	3.4	2.2	50	40	3.016	27.5
30CO Type 4 pole - 1500 min1													
63 a	**0.09**	1400	0.80	54.3	0.90	0.61	0.62	2.3	1.8	4	5	0.266	6.2
63 b	**0.12**	1400	1.0	58.0	0.90	0.82	0.62	2.5	1.8	5	5	0.323	6.8
63 c	**0.18**	1400	1.4	60.1	0.93	1.23	0.62	2.5	1.8	8	5	0.386	7.6
71 A	**0.18**	1370	1.7	51.2	0.90	1.26	0.72	2.4	1.7	10	5	0.747	8.5
71 b	**0.25**	1370	2.1	55.7	0.93	1.74	0.74	2.4	1.8	12.5	5	0.860	9.1
71 c	**0.37**	1370	2.7	64.1	0.93	2.58	0.78	2.6	1.8	20	5	1.235	11.0
80 a	**0.37**	1370	2.9	61.0	0.91	2.58	0.55	2.8	1.6	14	10	1.609	11.5
80 b	**0.55**	1380	3.8	65.5	0.96	3.81	0.64	3.1	1.8	16	10	2.153	13.1
80 c	**0.75**	1360	5.3	64.8	0.95	5.27	0.55	2.9	1.8	20	10	2.627	14.6
90L a	**1.1**	1370	7.2	73.0	0.91	7.67	0.56	3.3	1.8	35	20	3.003	20.0
90L b	**1.5**	1380	9.5	73.8	0.93	10.4	0.56	3.4	1.9	40	20	3.487	22.0
100L a	**1.8**	1380	11.4	76.7	0.92	12.4	0.44	3.5	1.8	35	40	4.987	27.5
100L b	**2.2**	1410	14.0	75.1	0.91	14.9	0.45	3.6	1.9	50	40	6.384	31.6
30CO Type 6 pole - 1000 min1													
63 b	**0.06**	930	0.75	35.5	0.98	0.62	1.00	1.6	1.7	6.3	5	0.323	6.9
63 c	**0.09**	930	0.98	42.0	0.95	0.92	0.80	1.8	1.7	8	5	0.386	7.6
71 a	**0.12**	920	1.15	50.4	0.90	1.25	0.65	1.9	1.6	10	5	0.747	8.4
71 b	**0.18**	920	1.7	50.6	0.91	1.87	0.65	1.9	1.6	14	5	0.860	9.0
80 a	**0.25**	930	2.1	55.7	0.93	2.60	0.53	2.6	1.7	14	10	1.609	11.6
80 b	**0.37**	920	3.1	57.0	0.91	3.84	0.53	2.7	1.7	16	10	2.153	13.0
80 c	**0.55**	920	4.1	63.4	0.92	5.71	0.52	2.7	1.7	25	10	2.627	14.6
90S a	**0.55**	920	3.9	65.9	0.93	5.71	0.51	2.6	1.7	25	20	2.370	17.5
90L a	**0.75**	920	5.1	67.3	0.95	7.79	0.51	2.8	1.7	35	20	3.003	20.0
100L a	**1.1**	930	7.3	71.2	0.92	11.3	0.41	3.3	1.7	35	40	6.404	27.8
100L b	**1.5**	930	9.8	72.3	0.92	15.4	0.42	3.5	1.7	50	40	8.070	31.2

Mn = Full load torque **Ms** = Locked rotor torque **Mm** = Maximum torque **In** = Rated load current **Is** = Locked rotor current

Self-braking single-phase motors - with balanced windings

With permanent capacitor

TEFC construction – Squirrel cage rotor – Continuous duty S1 – Insulation class F – IP 54 protection

Direct current power supply

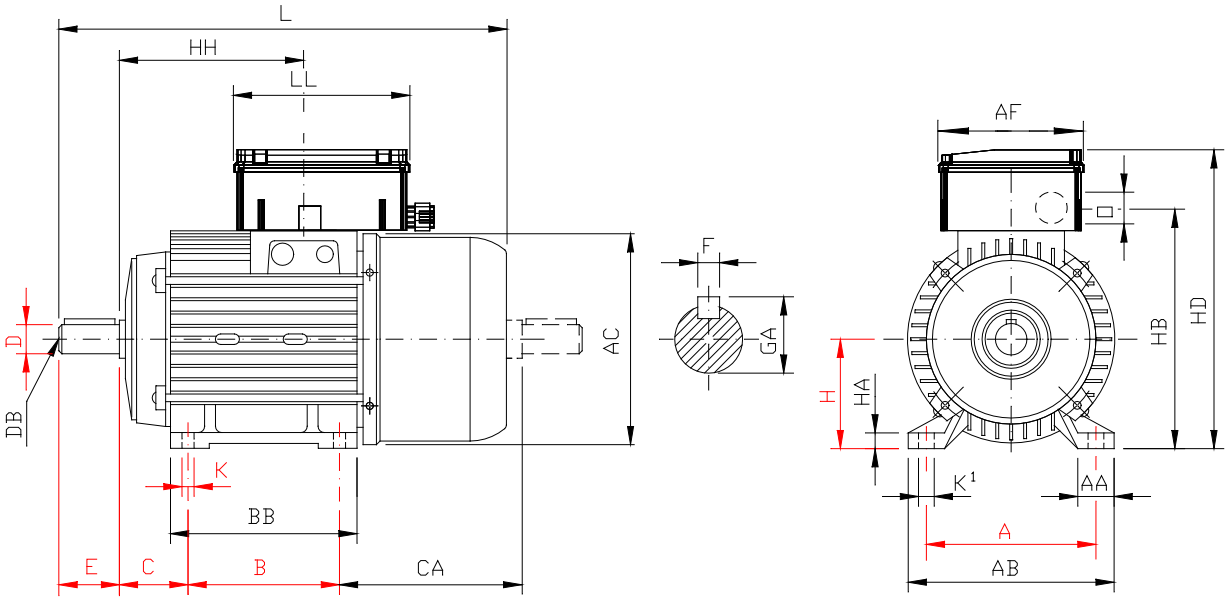
30CB Type 4 pole - 1500 min¹

Motor size		Rated output	Technical data at rated output V 230 - Hz 50					Direct insertion characteristics			Run capacitor	Braking torque	Moment of inertia	Mass (IM B3)
		Pn	n	In	η	cos φ	Mn	Ms/Mn	Is/In	Mm/Mn	V 450	Mb max.	J	
		kW	min-¹	A	%		Nm				µF	Nm	10^{-3} kg.m²	kg
63	**a**	**0.09**	1420	0.80	51.0	0.96	0.61	0.62	2.4	1.5	6.3	5	0.266	6.3
63	**b**	**0.12**	1420	1.07	51.9	0.94	0.81	0.54	2.4	1.8	8	5	0.323	6.8
63	**c**	**0.18**	1400	1.4	58.2	0.96	1.23	0.56	2.5	1.7	10	5	0.386	7.6
71	**a**	**0.18**	1370	1.4	57.0	0.98	1.26	0.93	2.3	1.7	12.5	5	0.747	8.5
71	**b**	**0.25**	1370	1.9	58.4	0.98	1.74	0.92	2.4	1.7	16	5	0.860	9.1
71	**c**	**0.37**	1380	2.6	64.5	0.96	2.56	0.92	2.9	1.7	20	5	1.235	11.0
80	**a**	**0.37**	1360	2.8	61.1	0.94	2.60	0.56	1.9	1.5	20	10	1.609	11.6
80	**b**	**0.55**	1360	4.2	61.2	0.93	3.86	0.54	2.1	1.7	31.5	10	2.153	13.2
80	**c**	**0.75**	1360	5.0	67.9	0.96	5.27	0.54	2.2	1.6	40	10	2.627	14.7
90S	**a**	**0.75**	1390	5.2	65.3	0.93	5.15	0.82	2.2	1.8	40	20	2.370	17.6
90L	**a**	**1.1**	1370	6.7	72.8	0.98	7.67	0.66	2.6	1.6	45	20	3.003	20.1

Mn = Full load torque **Ms** = Locked rotor torque **Mm** = Maximum torque **In** = Rated load current **Is** = Locked rotor current

Mounting arrangement IM B3

Self-braking single-phase motors – **30 Type**



Measures for coupling, IM B5 mounting see page 107
Measures for coupling, IM B14 mounting see page 109

Note: Ledge of the second shaft, from size 71 upwards, is reduced to a size.

Motor size	Coupling											Overall								Shaft end				
	A	AA	AB	**B**	BB	**C**	CA	**H**	HA	**K**	K^1	AC	AF	HB	HD	HH	L	LL	O	**D**	DB	**E**	F	GA
63	**100**	22	120	**80**	100	**40**	127	**63**	7	**7**	10	123	120	137	192	89	266	145	PG16	**11**	M4	**23**	4	12.5
71	**112**	26	135	**90**	112	**45**	147	**71**	8	**7**	12	138	120	155	211	103	308	145	PG16	**14**	M5	**30**	5	16
80	**125**	28	152	**100**	124	**50**	165	**80**	11	**9**	13	156	120	173	226	117	351	145	PG16	**19**	M6	**40**	6	21.5
90S	**140**	30	170	**100**	130	**56**	184	**90**	13	**9**	13	176	120	180	240	127	385	145	PG16	**24**	M8	**50**	8	27
90L	**140**	30	170	**125**	155	**56**	184	**90**	13	**9**	13	176	120	180	240	152	410	145	PG16	**24**	M8	**50**	8	27
100L	**160**	35	192	**140**	163	**63**	203	**100**	14	**12**	17	194	120	211	262	171	461	145	PG16	**28**	M10	**60**	8	31

Self-braking three-phase motors Starting and progressive braking

One-speed self-braking three-phase motors - 33S Type - starting and progressive braking - (special rotor)

Note: translation movements pose the problem of smooth starts and progressive braking to avoid the oscillation of the suspended load and sliding on the guide rails.
This engine series meets these particular problems due to a rotor and a brake appropriately designed.
It is natural that when selecting the motor should be noted that the use of insufficient power can cause excessive heating, wile exuberant power can reduce the progression.
The adoption of special rotor which reduces starting currents can request the engine starts quickly, provided they are not excessively long time.
For more information you should contact our Technical Department.

Typical applications:
- Translations of cranes and overhead cranes.

Mechanical characteristics:
- Aluminium front flange, (cast iron on request).
- Rear brake mounting flange: cast iron.
- Brake disc steel.
- Cogged hub with steel anti-vibration system.
- Seal friction asbestos-free and silent.
- Braking torque and other technical data: see table below.
- The braking torque can be adjusted by adjusting the screws.

Unscrewing the screws will not decrease the braking torque under the safe value of 35%.
The motors are supplied with screws flush with the posterior surface of the brake, a brake torque of proximally 50% of the maximum value.
- Brake Kit for the protection provided on request.
- Mechanical release lever on request.

Electrical characteristics:
- Direct current brake.
- The dc power is obtained by a brake rectifier already built into the motor terminal box.
- The brake power is independent of motor.
- The preparation of standard rectifiers opening of the dc circuit, to obtain necessary permits rapid ascent of the braking torque according to table below.
- For specifics uses you can get a fast action of the brake is in the release that, with the use of appropriately designed and fast rectifiers supplied on request.

Table of braking torques and other technical data of brake

Motor size	Maximum braking torque **Mb max.** Nm	Air-gap **sn** **smax** mm	Maximum speed **nmax** min-1	Brake life **Wt** 1) **W1** 2) MJ	Brake release time **t1** 3) ms	Braking torque rise time **t2** 5) **t22** 6) ms	Brake power input **Pa** W
71	5	0.20 0.50	3600	260 15.6	30	100 10	16
80	10	0.20 0.50	3600	370 22.4	60	120 10	20
90	20	0.30 0.60	3600	500 30	100	150 10	30
100	40	0.30 0.60	3600	750 45	120	220 15	40

1) For wear of the friction linings up to a thickness of 1 mm
2) Between two wear adjustments from **sn** to **smax**
3) With standard rectifier
4) -
5) Opening on ac side
6) Opening on dc side or with rapid rectifier

For any further information you should contact our Technical Department.

Two-speed self-braking three-phase motors - 33DD Type - double winding - Star/Star connection - starting and progressive braking - (special rotor)

Note: translation movements pose the problem of smooth starts and progressive braking to avoid the oscillation of the suspended load and sliding on the guide rails.
This engine series meets these particular problems due to a rotor and a brake appropriately designed.
It is natural that when selecting the motor should be noted that the use of insufficient power can cause excessive heating, wile exuberant power can reduce the progression.
The adoption of special rotor which reduces starting currents can request the engine starts quickly, provided they are not excessively long time.
For more information you should contact our Technical Department.

Typical applications:
- Translations of cranes and overhead cranes.

Mechanical characteristics:
- Aluminium front flange, (cast iron on request).
- Rear brake mounting flange: cast iron.
- Brake disc steel.
- Cogged hub with steel anti-vibration system.
- Seal friction asbestos-free and silent.
- Braking torque and other technical data: see table below.
- The bricking torque can be adjusted by adjusting the screws.
Unscrewing the screws will not decrease the braking torque under the safe value of 35%.
The motors are supplied with screws flush with the posterior surface of the brake, a brake torque of proximally 50% of the maximum value.
- Brake Kit for the protection provided on request.
- Mechanical release lever on request.

Electrical characteristics:
- Direct current brake.
- The dc power is obtained by a brake rectifier already built into the motor terminal box.
- The brake power is independent of motor.
- The preparation of standard rectifiers opening of the dc circuit, to obtain necessary permits rapid ascent of the braking torque according to table below.
- For specifics uses you can get a fast action of the brake is in the release that, with the use of appropriately designed and fast rectifiers supplied on request.

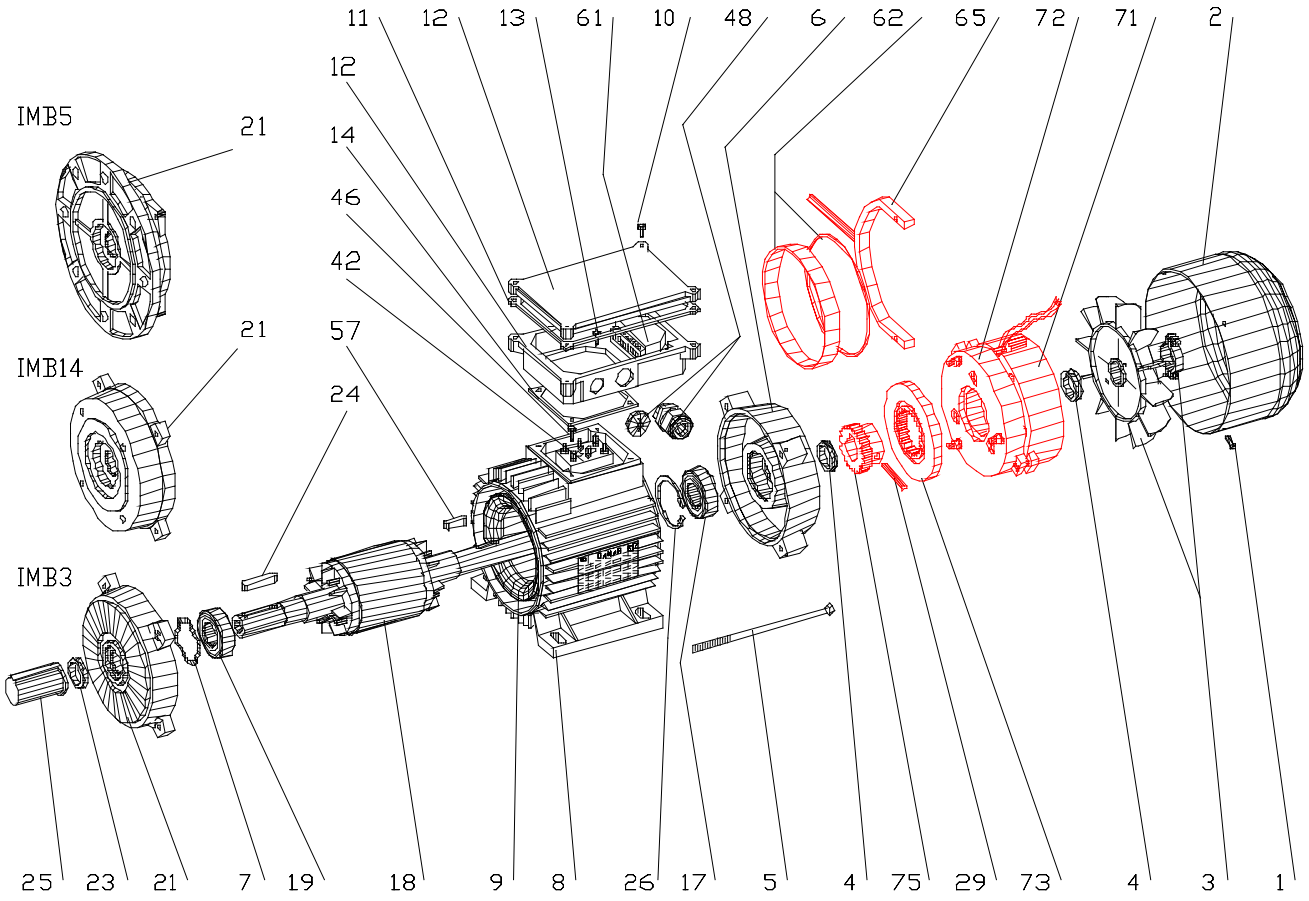
Table of braking torques and other technical data of brake

Motor size	Maximum brake torque **Mb max.** Nm	Air-gap **sn** **smax** mm		Maximum speed **nmax** min-1	Brake life **Wt** 1) MJ	**W1** 2) MJ	Brake release time **t1** 3) ms	Braking torque rise time **t2** 5) ms	**t22** 6) ms	Brake power input **Pa** W
71	2	0.20	0.50	3600	260	15.6	30	100	10	16
80	4	0.20	0.50	3600	370	22.4	60	120	10	20
90	8	0.30	0.60	3600	500	30	100	150	10	30
100	17	0.30	0.60	3600	750	45	120	220	15	40

1) For wear of the friction linings up to a thickness of 1 mm
2) Between two wear adjustments from **sn** to **smax**
3) With standard rectifier
4) -
5) Opening on ac side
6) Opening on dc side or with rapid rectifier

For any further information you should contact our Technical Department.

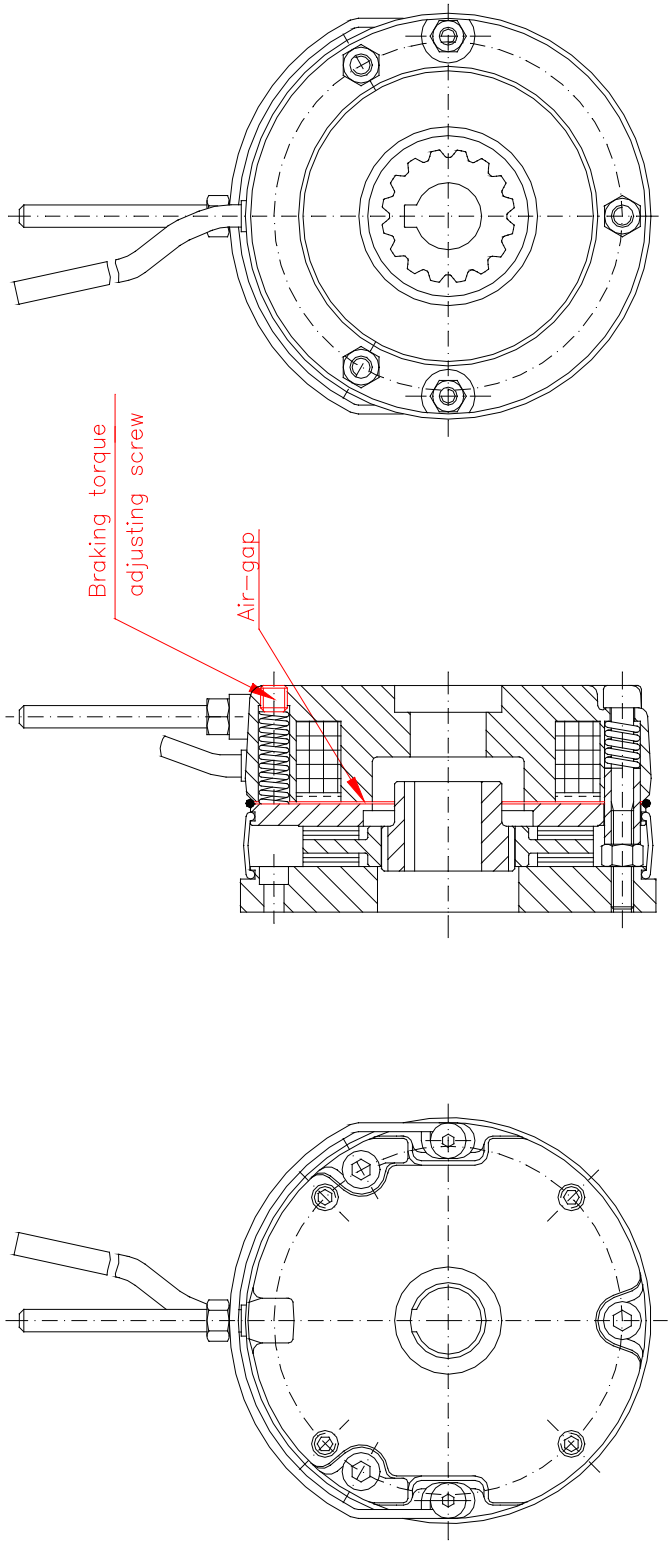
Self-braking three-phase motor - 33 Type



Spare parts nomenclature

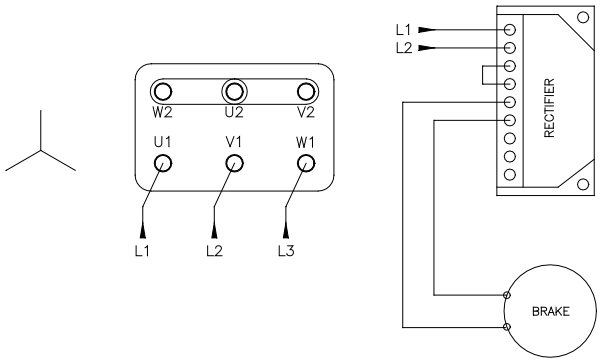
1. Screw for fan cover
2. Fan cover
3. Fan
4. Sealing ring
5. Rod
6. N-end shield
7. Spring ring
8. Frame
9. Stator package
10. Screw for terminal box cover
11. Gasket for terminal box cover
12. Terminal box
13. Screw for terminal box
14. Gasket for terminal box
17. Rear bearing
18. Rotor
19. Front bearing
21. D-end shield/flange
23. Sealing ring
24. Key
25. Shaft cap
26. Retaining ring
29. Gear pin
42. Terminal board
46. Grounding screw
48. Cable gland
57. Key
61. Rectifier
62. O-ring for brake
65. Manual release
71. Electromagnet
72. Movable armature
73. Brake disc
75. Cogged hub

Direct current brake - 33 Type



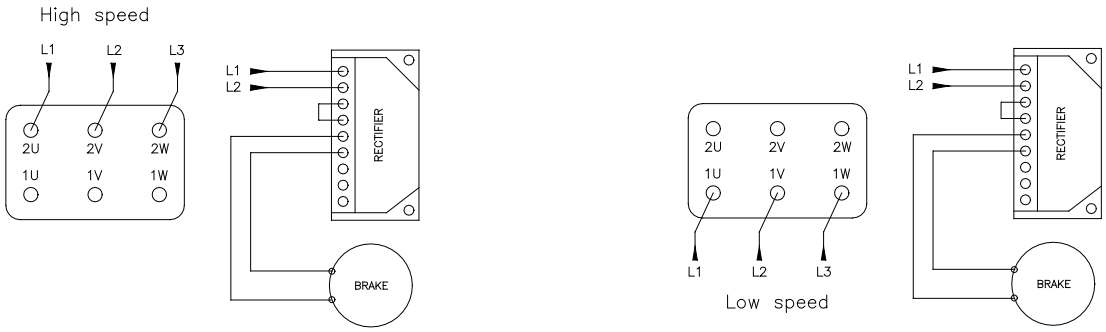
Connection for motors 33S Type

Self-braking three-phase **one-speed** motors - with **dc brake**



Connection for motors 33DD Type

Self-braking three-phase **two-speed** motors - **double winding** - with **ac brake**



One-speed self braking three-phase motors - starting and progressive braking - (special rotor)

TEFC construction – Squirrel cage rotor – **Duty S3-40%** – Insulation class F – IP 54 protection
Direct current power supply

33S	**Type**	**4 pole - 1500 min¹**										
Motor size	Rated output Pn **kW**	Technical data at rated output **V 400 - Hz 50** n min-¹	In A	η %	cos φ	Mn Nm	Direct insertion characteristics Ms/Mn	Is/In	Mm/Mn	Braking torque Mb max. Nm	Moment of inertia J 10^{-3} kg.m²	Mass **(IM B5)** kg
71 a	**0.25**	1250	0.81	62.0	0.72	1.91	2.2	2.4	2.2	5	0.747	8.8
71 b	**0.33**	1250	1.08	60.5	0.73	2.52	2.3	2.5	2.3	5	0.860	9.4
71 c	**0.55**	1270	1.7	62.4	0.75	4.14	2.7	2.9	2.7	5	1.235	11.3
80 a	**0.55**	1270	1.5	66.2	0.80	4.14	2.5	2.9	2.5	10	1.609	12.3
80 b	**0.75**	1300	2.0	67.7	0.80	5.51	2.5	3.2	2.5	10	2.153	13.7
80 c	**1.1**	1310	2.9	68.5	0.80	8.02	2.4	3.4	2.4	10	2.627	15.2
90S a	**1.1**	1320	3.0	68.8	0.77	7.96	2.6	3.4	2.6	20	2.370	18.2
90L a	**1.5**	1320	3.9	71.3	0.78	10.9	2.7	3.4	2.7	20	3.003	20.6
90L b	**1.85**	1330	4.5	74.3	0.80	13.3	2.7	3.6	2.7	20	3.487	22.3
100L a	**2.2**	1350	5.6	73.7	0.77	15.6	2.8	3.8	2.8	40	4.987	28.7
100L b	**3**	1360	7.1	79.3	0.77	21.1	2.8	4.2	2.8	40	6.384	32.4

Mn = Full load torque **Ms** = Locked rotor torque **Mm** = Maximum torque **In** = Rated load current **Is** = Locked rotor current

Two-speed self-braking three-phase motors - double winding – Star/Star connection - starting and progressive braking – (special rotor)

TEFC construction – Squirrel cage rotor – **Duty S3-40%** – Insulation class F – IP 54 protection
Direct current power supply

33DD Type 2/6 pole - 3000/1000 min¹

Motor size	Rated output Pn kW	Technical data at rated output V 400 - Hz 50 n min-¹	In A	Mn Nm	Direct insertion characteristics Ms/Mn	Is/In	Mm/Mn	Braking torque Mb max. Nm	Moment of inertia J 10-³ kg.m²	Mass (IM B5) kg
71 c	0.30/0.10	2780/860	0.7/0.6	1.03/1.11	2.9/2.7	4.7/1.8	3.0/2.7	2	1.235	11.3
80 a	0.30/0.10	2800/920	0.9/0.5	1.02/1.04	2.5/2.5	3.6/2.4	2.6/2.5	4	1.609	12.1
80 b	0.42/0.14	2800/920	1.1/0.7	1.43/1.45	2.7/2.7	4.3/2.5	2.8/2.8	4	2.153	13.7
80 c	0.60/0.20	2800/920	1.5/1.0	2.05/2.08	2.8/3.0	4.5/2.4	2.9/3.1	4	2.627	15.1
90S a	0.80/0.27	2800/920	2.0/1.2	2.73/2.80	2.9/2.9	4.1/2.8	3.0/2.9	8	2.370	18.0
90L a	1.10/0.37	2800/920	2.7/1.6	3.75/3.84	3.2/3.2	4.3/2.9	3.3/3.2	8	3.003	20.4
90L b	1.30/0.45	2800/920	3.1/1.8	4.43/4.67	3.6/3.0	5.4/3.1	3.8/3.1	8	3.487	22.1
100L a	1.50/0.50	2840/920	3.7/1.9	5.04/5.19	3.1/2.6	5.1/3.1	3.3/2.7	17	4.987	28.6
100L b	2.20/0.75	2840/920	5.0/2.6	7.40/7.79	3.1/2.6	5.6/3.2	3.5/2.7	17	6.384	32.4

33DD Type 2/8 pole - 3000/750 min¹

71 c	0.25/0.06	2800/660	0.7/0.7	0.85/0.87	2.8/2.9	4.0/1.6	2.8/2.9	2	1.235	11.3
80 a	0.25/0.06	2800/660	0.8/0.4	0.85/0.87	2.5/2.3	3.5/1.9	2.5/2.3	4	1.609	12.1
80 b	0.37/0.09	2800/660	1.0/0.6	1.26/1.30	2.7/2.6	4.2/2.0	2.7/2.6	4	2.153	13.7
80 c	0.55/0.14	2800/660	1.4/0.7	1.88/2.03	2.4/2.2	4.2/2.0	2.4/2.2	4	2.627	15.1
90S a	0.75/0.19	2800/660	1.8/0.9	2.56/2.75	2.7/2.1	3.8/2.1	2.7/2.1	8	2.370	18.0
90L a	0.90/0.23	2800/660	2.1/1.1	3.07/3.33	2.9/2.4	4.4/2.3	2.9/2.4	8	3.003	20.4
90L b	1.10/0.28	2800/660	2.6/1.4	3.75/4.05	3.2/2.3	5.0/2.3	3.2/2.3	8	3.487	22.0
100L a	1.50/0.38	2820/660	3.7/1.7	5.08/5.50	2.2/1.8	3.8/2.1	2.2/1.8	17	4.987	28.6
100L b	2.20/0.55	2820/660	4.8/2.4	7.45/7.96	2.3/2.0	4.6/2.2	2.3/2.0	17	6.384	32.4

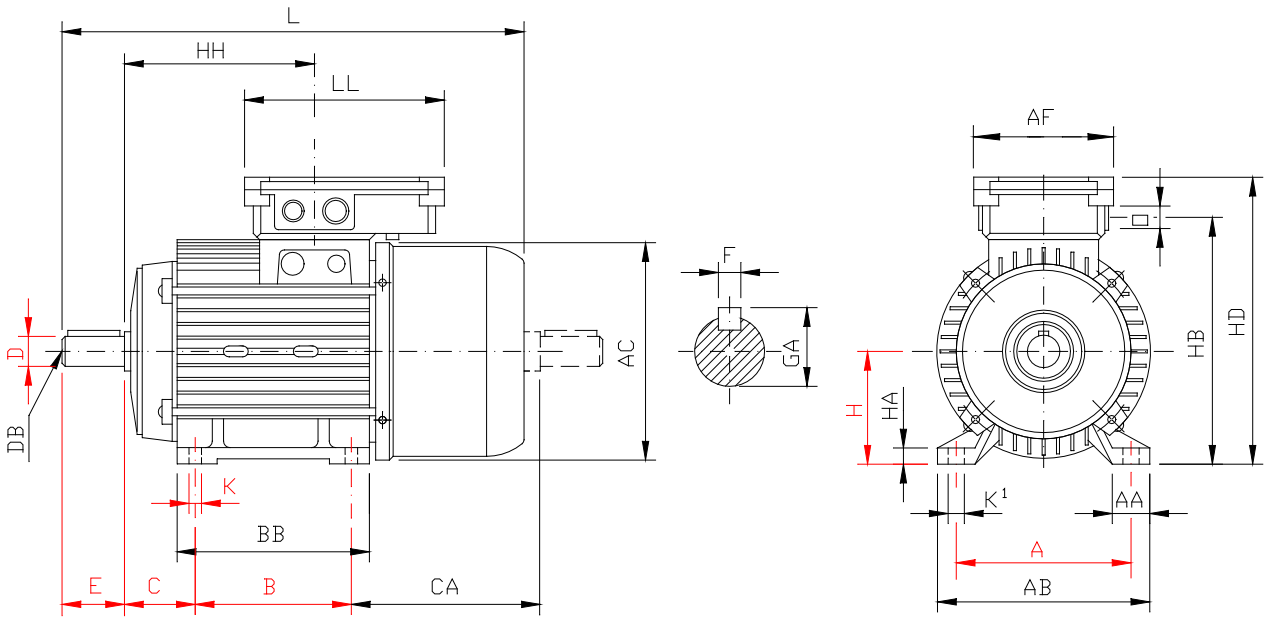
33DD Type 4/8 pole - 1500/750 min¹

71 c	0.12/0.06	1420/660	0.6/0.7	0.81/0.87	3.0/2.9	3.5/1.6	3.0/2.9	2	1.235	11.3
80 a	0.12/0.06	1420/660	0.5/0.4	0.81/0.87	3.0/2.3	3.3/1.9	3.0/2.3	4	1.609	11.9
80 b	0.18/0.09	1420/660	0.7/0.6	1.21/1.30	3.0/2.6	3.5/2.0	3.0/2.6	4	2.153	13.5
80 c	0.28/0.14	1420/660	0.9/0.7	1.88/2.03	2.8/2.2	3.7/2.0	2.8/2.2	4	2.627	14.9
90S a	0.37/0.19	1420/660	1.1/0.9	2.49/2.75	3.0/2.1	3.9/2.1	3.0/2.1	8	2.370	17.8
90L a	0.46/0.23	1420/660	1.5/1.1	3.09/3.33	3.9/2.4	4.6/2.3	3.9/2.4	8	3.003	20.2
90L b	0.55/0.28	1420/660	1.7/1.4	3.70/4.05	3.6/2.3	4.7/2.3	3.6/2.3	8	3.487	21.9
100L a	0.75/0.38	1430/660	2.1/1.7	5.01/5.50	3.1/1.8	4.7/2.1	3.1/1.8	17	4.987	28.3
100L b	1.10/0.55	1430/660	3.0/2.4	7.35/7.96	3.3/2.0	4.8/2.2	3.3/2.0	17	6.384	32.4

Mn = Full load torque **Ms** = Locked rotor torque **Mm** = Maximum torque **In** = Rated load current **Is** = Locked rotor current

Mounting arrangements IM B3

Self-braking three-phase motors - **33 Type**

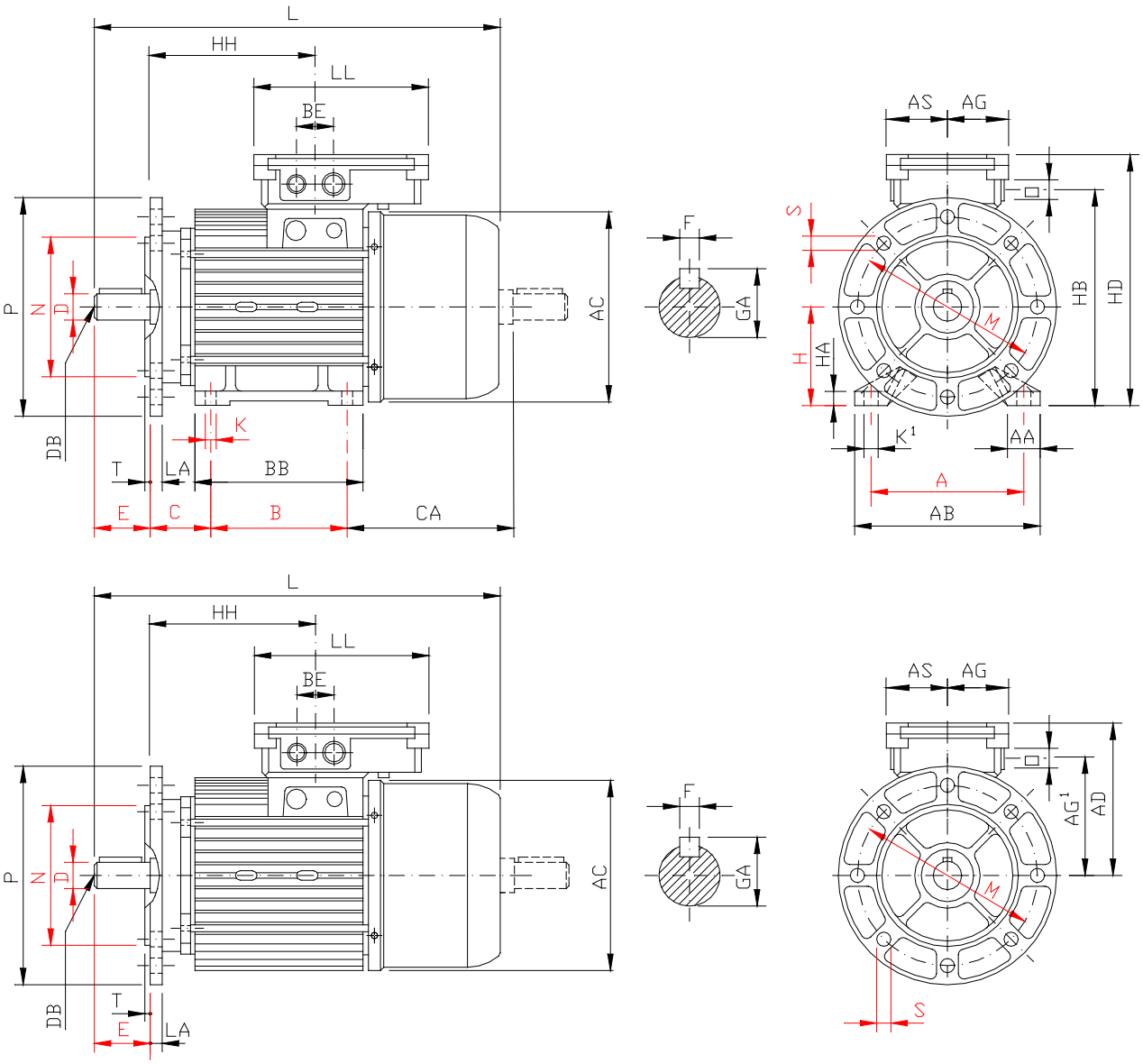


Note: Ledge of the second shaft is reduced to a size.

Motor size	Coupling										Overall								Shaft end				
	A	AA	AB	**B**	BB	**C**	CA	**H**	HA	K	AC	AF	HB	HD	HH	L	LL	O	**D**	DB	**E**	F	GA
71	**112**	26	135	**90**	112	**45**	147	**71**	8	**7**	138	104	167	193	103	308	148	M16+M20x1.5	**14**	M5	**30**	5	16
80	**125**	28	152	**100**	124	**50**	165	**80**	11	**9**	156	114	185	210	117	351	158	M20+M25x1.5	**19**	M6	**40**	6	21.5
90S	**140**	30	170	**100**	130	**56**	184	**90**	13	**9**	176	114	200	224	127	385	158	M20+M25x1.5	**24**	M8	**50**	8	27
90L	**140**	30	170	**125**	155	**56**	184	**90**	13	**9**	176	114	200	224	152	410	158	M20+M25x1.5	**24**	M8	**50**	8	27
100L	**160**	35	192	**140**	163	**63**	203	**100**	14	**12**	194	114	223	246	171	461	158	M20+M25x1.5	**28**	M10	**60**	8	31

Mounting arrangement IM B35 - IM B5

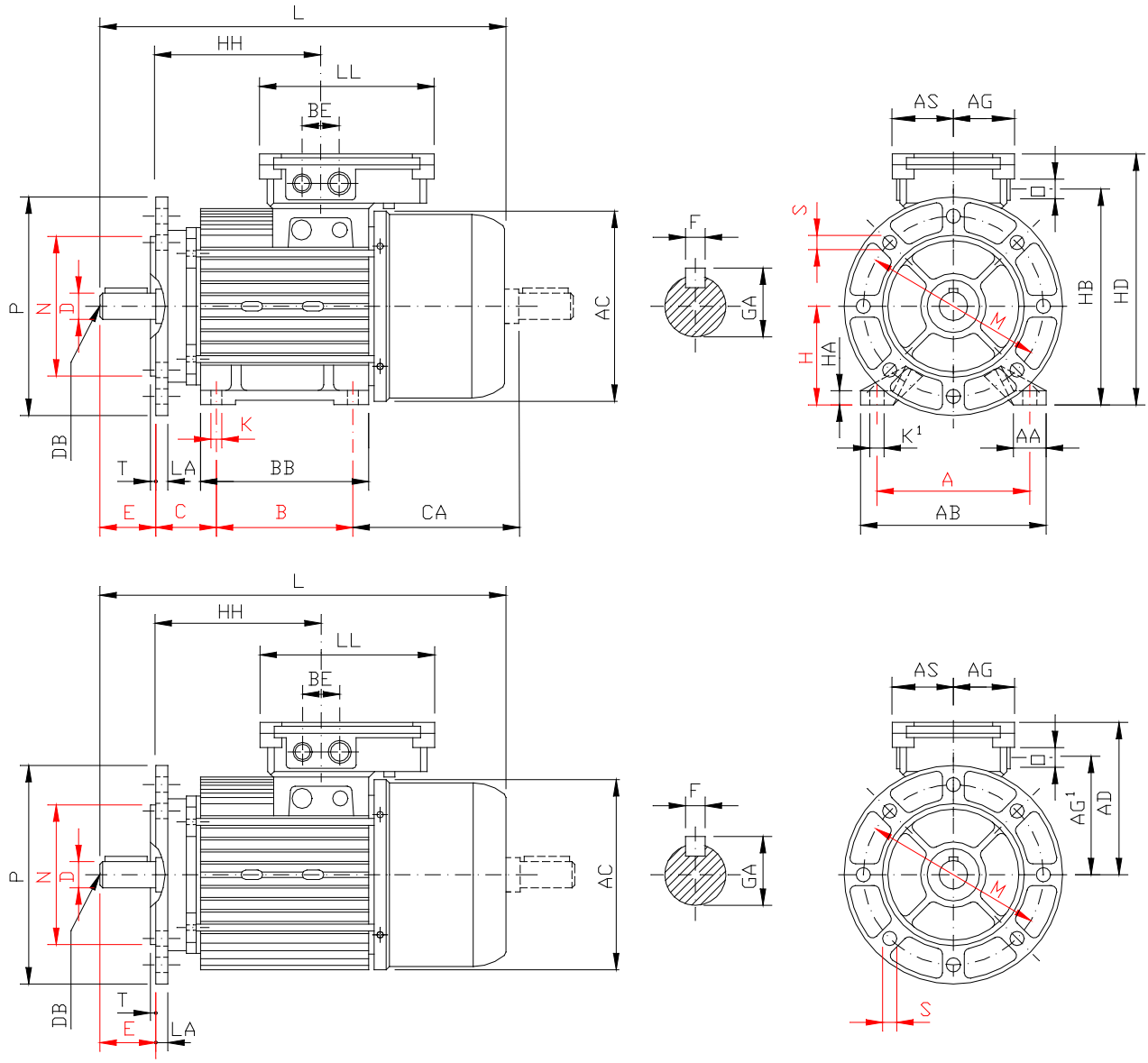
Self-braking three-phase motor – **33 Type**



Motor size	Overall dimensions											
	AC	AD	AG	AG¹	AS	BE	HB	HD	HH	L	LL	O
71	138	122	52	96	52	35	167	193	103	308	148	M16+M20 x 1.5
80	156	130	57	105	57	35	185	210	117	351	158	M20+M25 x 1.5
90S	176	134	57	110	57	35	200	224	127	385	158	M20+M25 x 1.5
90L	176	134	57	110	57	35	200	224	152	410	158	M20+M25 x 1.5
100L	194	146	57	123	57	35	223	246	171	461	158	M20+M25 x 1.5

Mounting arrangement IM B35 - IM B5

Self-braking three-phase motor – **33 Type**

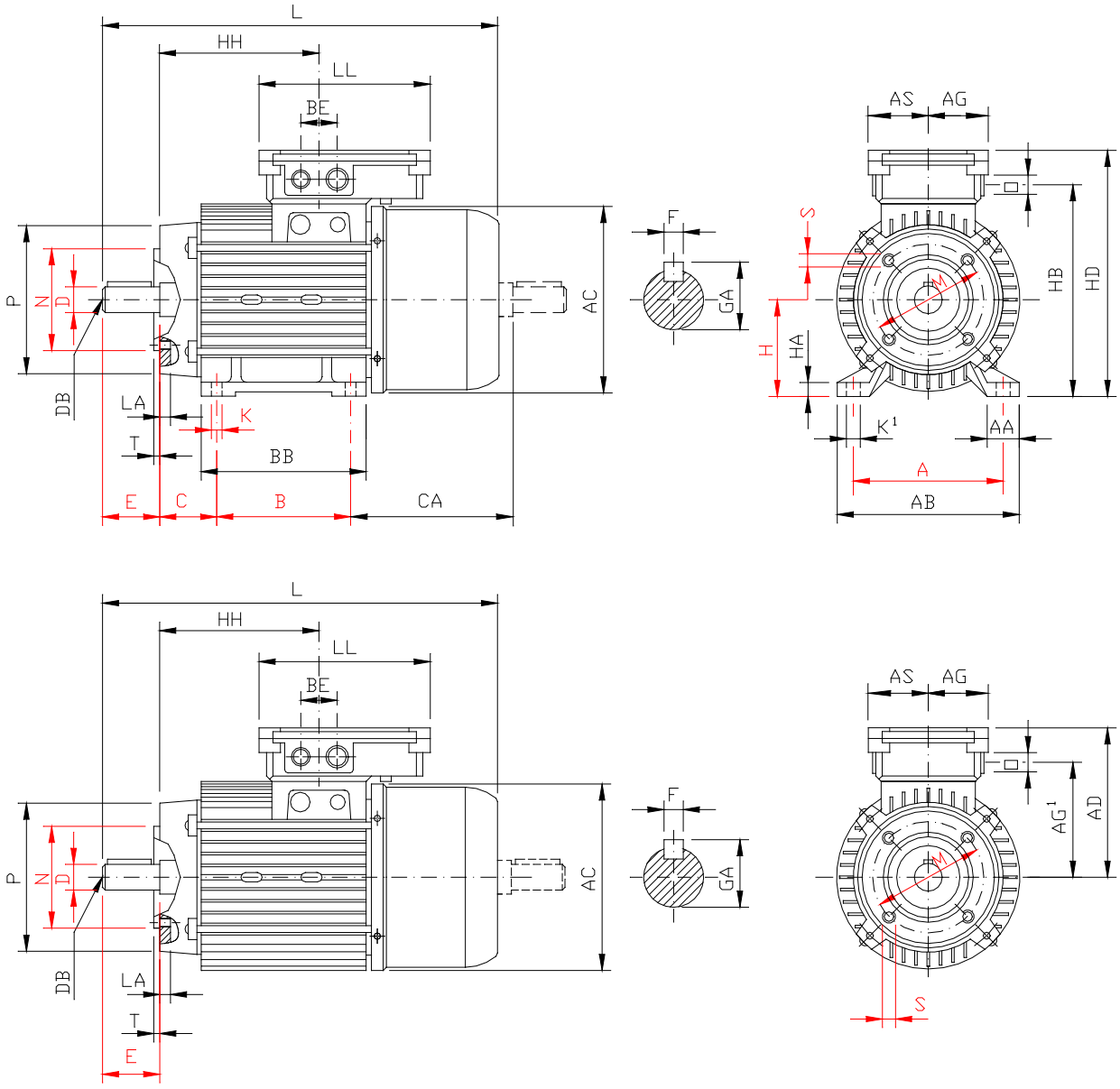


Note: Ledge of the second shaft is reduced to a size.

Motor size	Coupling											Shaft end									
	A	AA	AB	**B**	BB	**C**	CA	**H**	HA	**K**	K¹	LA	**M**	**N**	P	**S**	T	**D**	DB	**E**	F	GA
71	**112**	26	135	**90**	112	**45**	147	**71**	8	**7**	12	8	**130**	**110**	160	**9**	3.5	**14**	M5	**30**	5	16
80	**125**	28	152	**100**	124	**50**	165	**80**	11	**9**	13	9	**165**	**130**	200	**11**	3.5	**19**	M6	**40**	6	21.5
90S	**140**	30	170	**100**	130	**56**	184	**90**	13	**9**	13	10	**165**	**130**	200	**11**	3.5	**24**	M8	**50**	8	27
90L	**140**	30	170	**125**	155	**56**	184	**90**	13	**9**	13	10	**165**	**130**	200	**11**	3.5	**24**	M8	**50**	8	27
100L	**160**	35	192	**140**	163	**63**	203	**100**	14	**12**	17	11	**215**	**180**	250	**14**	4	**28**	M10	**60**	8	31

Mounting arrangement IM B34 - IM B14

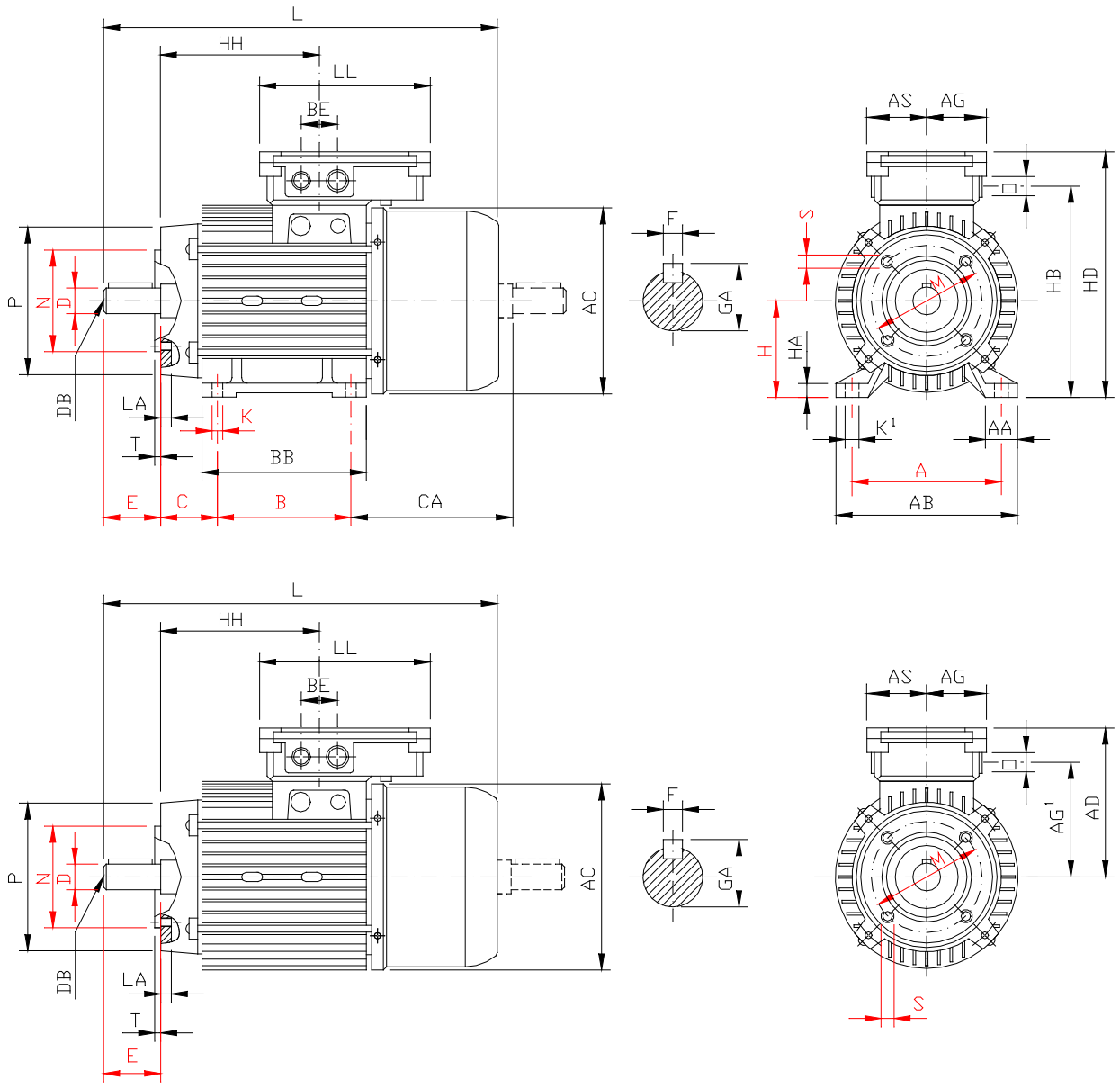
Self-braking three-phase motor – **33 Type**



Motor size	Overall dimensions											
	AC	AD	AG	AG¹	AS	BE	HB	HD	HH	L	LL	O
71	138	122	52	96	52	35	167	193	103	308	148	M16+M20 x 1.5
80	156	130	57	105	57	35	185	210	117	351	158	M20+M25 x 1.5
90S	176	134	57	110	57	35	200	224	127	385	158	M20+M25 x 1.5
90L	176	134	57	110	57	35	200	224	152	410	158	M20+M25 x 1.5
100L	194	146	57	123	57	35	223	246	151	461	158	M20+M25 x 1.5

Mounting arrangement IM B34 - IM B14

Self-braking three-phase motor – **33 Type**



Note: Ledge of the second shaft is reduced to a size.

Motor size	Coupling											Shaft end										
	A	AA	AB	**B**	BB	**C**	CA	**H**	HA	**K**	K^1	LA	**M**	**N**	P	**S**	T	**D**	DB	**E**	F	GA
71	**112**	26	135	**90**	112	**45**	147	**71**	8	**7**	12	8	**85**	**70**	105	**M6**	2.5	**14**	M5	**30**	5	16
80	**125**	28	152	**100**	124	**50**	165	**80**	11	**9**	13	17	**100**	**80**	120	**M6**	3	**19**	M6	**40**	6	21.5
90S	**140**	30	170	**100**	130	**56**	184	**90**	13	**9**	13	10	**115**	**95**	140	**M8**	3	**24**	M8	**50**	8	27
90L	**140**	30	170	**125**	155	**56**	184	**90**	13	**9**	13	10	**115**	**95**	140	**M8**	3	**24**	M8	**50**	8	27
100L	**160**	35	192	**140**	163	**63**	203	**100**	14	**12**	17	10	**130**	**110**	160	**M8**	3.5	**28**	M10	**60**	8	31

Use and maintenance

Three-phase and single-phase motors

General information

This instruction and maintenance handbook forms an integral part of the motor and must be thoroughly read before operating the motor.
This document must be kept for future consultation.
SACEMI-GAMAR S.r.l. cannot be held responsible for any breakage, accidents or inconveniences resulting from inappropriate usage of the motor as described in his handbook.
You are strongly recommended to contact ***SACEMI-GAMAR S.r.l.*** Technical Department if the motors are to be connected to electronic or other equipment and for any other particular uses.

CE marching

With the CE trademark the manufacturer declares that the product conforms to Community Directives LVD 2006/95/EC, EMC 2004/108/EC, MD 2006/42/EC and to RoHS 2002/95/EC, and complies with all legal obligations applied by EC countries.

Range of products and construction features

This handbook refers to serial three-phase motors, from size 56 to 160, to three-phase servo-ventilated motors from size 63 to 160 and to single-phase motors from size 56 to 100.
With regards to the self-braking models, these refer to three-phase motors from size 63 to 160, equipped with a three-phase or single-phase brake in direct current and to single-phase motors, from size 63 to 100, with a single-phase brake in direct current.
The motor unit is serially built with protection IP 55 (IEC 60034-5).
It has been designed for continuous operation S1 according to its power rating.
The dynamic balance of the rotor is by half key (ISO 8821).

-Serial three-phase and servo-ventilated motors

These motors belong to family "A".
The servo-ventilator, is firmly attached to the fan cover on the motor.

-Self-braking three-phase and single-phase motors

These motors belong to family "B".
Construction-wise, the self-braking model is formed by a motor unit and a brake set.
The brake-unit is firmly welded to an appropriate flange at the back of the motor and is part of the motor itself.
-The electro-magnet is designed for continual use S1 at a room temperature between -5 and +40°C.
-The set of brakes in motors rated for S1 service, is designed for emergency stalls and has static braking couples stated in the catalogue for every type and size of motor.
A particular use of the brake (i.e. frequent intermittent operation or duty affecting the variation of thermal load) must be agreed with ***SACEMI-GAMAR S.r.l.*** Technical Department.

Electromagnetic compatibility

If the brake-unit is built with a three-phase electromagnet, according to laboratory tests in accordance with EN 50081-1 and EN 50081-2 standards concerning emissivity, self-braking models of this kind do not present operating anomaly, even in the presence of surrounding electromagnetic interference.
In the case of serial self-braking models with the brake in direct current, feeding of the brake is provided by an electronic type of feeder appropriately constructed and geared for standard EMC 2004/108/EC.
A different solution could be adopted by ***SACEMI-GAMAR S.r.l.*** for whatever reason and it is therefore recommendable to check electrical connection systems inside the motor terminal-box.
The above self-braking motors, with a three-phase motor, can be indifferently used both in residential and industrial environments.
A restriction is made for single-phase motors which in certain cases can only be used in industrial environments. Further details must be requested to ***SACEMI-GAMAR S.r.l.*** Technical Department.

⚠ Check on receipt of goods and handling

Make sure that the motor has not been damaged during transportation. Check rating.
If the motor is self-braking and has a manual release turn the shaft manually to check easy rotation.
The motor must be handled with care, a sudden impact could damage the framework, bearings or other parts.
The appropriate eyebolt, if provided, must be used for lifting and the axis must be maintained horizontal.
The motor should never, under any circumstances, be lifted by the shaft.

Storage

The motor must be stored in a clean, dry and closed environment, free from vibration, gas or corrosive atmospheres. The room temperature should never be less than -15°C.
It is advisable that unvarnished metal parts (shafts, flanges, etc.) are treated with a protective lubricant.
In case of long -term storage it is advisable to periodically rotate the shaft manually.

⚠ ⚠ Installation and assembly

Before operating the motor, measure the insulation resistance of all winding and towards earth with the appropriate instrument in direct current (500 V). Dry if inferior to 10 Mega ohm.
Installation must be carried out by personnel, qualified (definition according IEC 364) for handling mechanical and electrical equipment and who are also well adjourned on local safety regulations.
To avoid accidental starting, during installation phase the motors must be literally disconnected from feeder cables or an electric security system, which complies with current rules and regulations, must be activated.
Even if the motor is equipped with this electrical security device, it is advisable to check the absolute absence of power on the motor terminal, using the appropriate instruments.
After the mechanical functionality of the motor has been visibly and manually (where possible) checked, assembly must be carried out on adequately sized bases or flanges which have been previously checked for planning and orthogonality.
Connection of transmission gears must be carried out with caution. Avoid striking with a hammer or similar item when inserting the pulley axle or joints.
When using the latter, make sure that the alignment is correct and in certain cases check their state of dynamic balancing.
Tension of the belt must not be superior to data indicated in the catalogue.
Anti-condensation holes must be aligned correctly.

⚠ ⚠ Electrical connection

Connection of the motor to the mains must be carried out by qualified personnel only. Before connecting, check that the line is correctly rated and that power and frequency available at the ends coincide with those on the rating-plate.
The supply leads must be inserted in the terminal box through the appropriate cable presses, with a metric threading, and the earth terminal connected to the suitable terminal ⏚ inside the terminal box.

- Three-phase and single-phase motors

In three-phase motors, rotation is hourly respecting the sequence of phases L1⇒U1, L2⇒V1, L3⇒W1.
Direction of rotation can be reversed by changing the 2 phases. In serial motors, the terminal boxes should be arranged for star connection (horizontal lines) or delta connection (vertical lines) respecting the enclosed diagram and the voltage as indicated on the rating-plate.
Three-phase servo-ventilated motors are equipped with two terminal boxes (to feed the motor and servo ventilator separately) it is therefore essential to follow the wiring diagram accurately. In serial single-phase motors, the rotation direction set in the factory is hourly and can be changed by following the diagram inside the terminal box.

- Self-braking single-phase and three-phase motors

Serial self-braking motors (one speed) are fitted with electrical wiring of the brake in parallel to the motor inside the terminal box. Except for particular cases, it is necessary only to connect the line to the terminal box in accordance with the diagram supplied with the motor.
Bearing the above in mind for serial motors other considerations must be made.
The choice of connection, star or delta, automatically modifies feeding of the three-phase brake.
In the case of self-braking motors in the standard model where the brake is in direct current, the variation of star or delta connection involves a change in wiring the brake feeder.
In this case the enclosed wiring diagram must be scrupulously followed.
In the case of delta or star connection starting, the gear voltage is delta: therefore the enclosed diagram for feeding the brake must be respected.
In self-braking single-phase motors, normally a dc brake is supplied and wired to the terminal box in parallel to the motor. In this case it is sufficient to connect the terminals following the diagram enclosed in the motor.

Operation

During operation and for several minutes after shutdown of motor, the exterior frame of the motor will reach a temperature of over 60°C. Bearing this in mind, great precaution must be adopted in handling the motor and suitable protective garments should be worn (gloves, arm and leg guards).

Maintenance

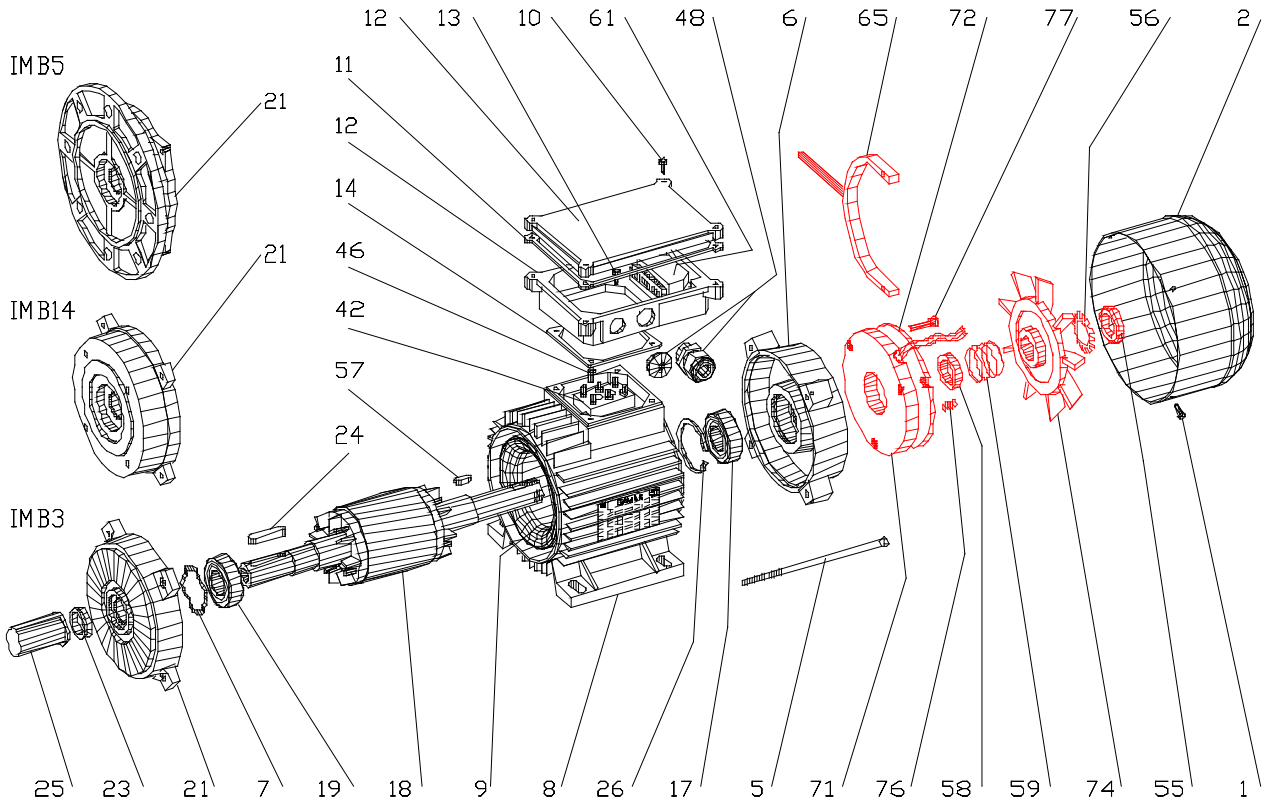
Before carrying out any maintenance or cleaning operation make sure that the motor is switched off and that it can in no way be accidentally re-started.
Any physical contact during maintenance must always be carried out with caution considering the high temperature reached during operation. In any case when the temperature of the motor frame has dropped sufficiently, disconnect feeding from the mains and check inside the terminal box, using the appropriate instruments, that there are no live phases.
In the case of single-phase motors, wait a few minutes before checking with the appropriate instruments for residue tension on the capacitors.
The self-braking motor requires a more severe maintenance schedule than required for an electric motor without a brake.
All personnel employed in the maintenance of the motors, must have specific competency in dealing with electrical equipment, a good background in mechanics and knowledge of the environment and the machine onto which the motor is fitted. It must be recalled that a brake which maintains a mechanism in suspension or locked, could cause very serious accidents, should it become released.
A periodical check-up, according to the kind of use, should particularly investigate the following parts:
- width of the friction packing, which should never be less than 1mm;
- clearance between the brake-disk and the gear;
- clearance between the key and its seating on the hub;
- clearance between the gear and the motor axis;
- the air gap, which if necessary should be adjusted to nominal values, according to the type of brake; this is explained in detail in the following pages. If necessary replace used parts.

Motor frames, protective casing of the brakes and the brakes themselves must be freed from stagnant dust or other agents preventing a normal thermal exchange and adequate ventilation.
The wear of the bearings depends on the type of service the motor is exposed to. These components too are subject to a periodical check-up. For normal service S1, they should wear for more than 20.000 working hours.
Pulleys or pinions should be extracted from the axis using appropriate pullers.
Disassembly and re-assembly of motors should be carried out according to the detailed diagram, according to the type of motor or brake concerned.

Further instructions, details and features for each type of brake are to be found in the following pages

SACEMI-GAMAR S.r.l. Technical Department is at your disposal for more specific details in order to improve safety measures concerning the machines and work environments.

Self-braking motors - 10 Type
Braking torque fixed



Adjustment of the braking torque
The braking torque depends on the type of spring fit to the brake and cannot be modified.

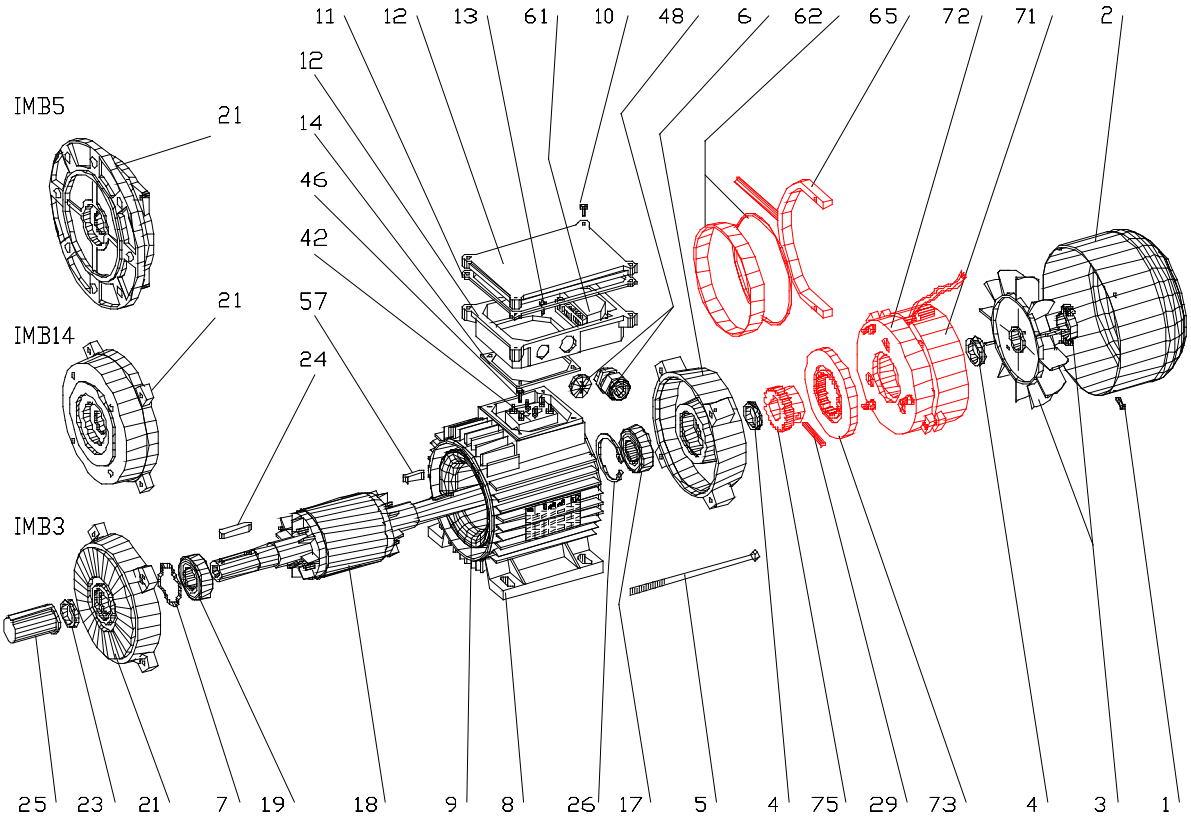
Re-adjustment of air-gap

Series 10 brakes are emergency brakes and reduce the braking couple until extinction, according to their wear. Therefore it is important to check and re-adjust the air-gap more frequently than with other types of brakes.
Once the motor fan-cover has been removed (2), using a suitable tool, lift the key of the safety- ring, (56) which secures the lock nut (55) of the brake fan (74) or the flywheel (67).
Insert the brake-lining laminate between the movable armature (72) and the electromagnet (71).
Adjust the air-gap in accordance with below table by turning the nut.
Bend the safety ring key at the nearest slit of the nut and to finish insert the fan cover.

Measure table for air-gap in series 10 brakes

	Motor-size							
	63	**71**	**80**	**90**	**100**	**112**	**132**	**160**
Air-gap 10 Type	0.20	0.20	0.20	0.20	0.25	0.25	0.30	-

Self-braking motors – 20, 30 and 33 Type
Braking torque adjustable



Adjustment of the braking torque

The braking torque is normally regulated in the factory at a medium level. Slight alterations can be made to the embedded hexagonal headed grooves to be found on the rear of the electromagnet (71).

Re-adjustment of air-gap

Unmount motor fan cover (2), take off cooling fan (3) then lift (where they are provided) O-rings for brakes (62) and loosen screws of brake-unit (recognised by the cylindrical head with embedded hexagonal grooves) and at the same time unengaged lock nuts on the cast iron flange.
Insert the brake-lining laminate between electromagnet (71) and movable armature (72), tighten locking screws to required air-gap.
Fix lock nuts on brake supporting flange (6) to conclude operation.
Re-assemble O-rings, cooling fan and fan cover and check intermittent operation of the brake and motor.

Table for air-gap sizes in series 20, 30 and 33 brakes

	Motor-size							
	63	**71**	**80**	**90**	**100**	**112**	**132**	**160**
Air-gap 20 Type	0.20	0.20	0.30	0.30	0.35	0.35	0.40	0.50
Air-gap 30 Type	0.20	0.20	0.20	0.30	0.30	0.35	0.35	0.40
Air-gap 33 Type	-	0.20	0.20	0.30	0.30	-	-	-

SACEMI-GAMAR S.r.l. Technical Department is at your disposal for more specific details in order to improve safety measures concerning the machines and work environments.

The data shown here are indicative and not binding. SACEMI-GAMAR S.r.l. reserves at any time, without notice to change the signs, according to the technical development of manufacturing. This catalogue supersedes all previous versions.

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