

Technical Documentation



LOW VOLTAGE THREE PHASE TEFC CAGE MOTORS
IE2 High Efficiency

Vision



We set your ideas in motion. We do not merely manufacture motors, but instead turn the ambitious concepts of our customers into modern, innovative and reliable products, which are unique and point the way to the future. We bring our customers closer to their goals with reliability, creativity and flexibility.

Business Units



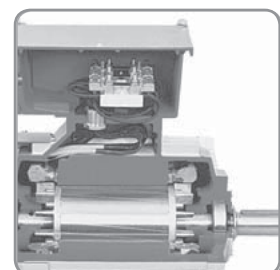
Serial Motors



New Businesses



Home Appliances



Project Motors

LOW VOLTAGE TEFC CAGE MOTORS

IE2 High Efficiency

Main characteristics	2
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Electrical data

Series ZKE 2p=2	4
Series ZKE 2p=4	5
Series ZKE 2p=6	6

Motor dimensions

ZKE 200 - ZKE 315; IM B3 - IM 1001	7
ZKE 200 - ZKE 315; IM B5, V1 - IM 3001, 3011	8
ZKIE 315; IM B3 - IM 1001	9
ZKIE 315; IM B35 - IM 2001	10
ZKIE 315; IM V1 - IM 3011	11
ZKIE 355 - 450; IM B3 - IM 1001	12
ZKIE 355; IM B35 - IM 2001	13
ZKIE 355 - 450; IM V1 - IM 3011	14

LOW VOLTAGE TEFC CAGE MOTORS

IE2 High Efficiency

2 Main characteristics

Changing the nomenclature of the IEC motor efficiency level

New labelling and definition methods of IEC motor efficiency level according to IEC 60034-30:2008 and IEC 60034-2-1:2007

Definition of efficiency classes has been done according to different standards. For the purposes of international harmonization, a new standard has been created IEC 60034-30:2008 (Rotation electric machines Part 30: Efficiency level class of one speed, three-phase asynchronous motors with a cage rotor (marking IE)). According to this standard, motors have been defined into new efficiency level classes. This standard has been valid since October 2008. Since then the new nomenclature has been put into practice.

New method of loss measurement according to IEC 60034-2-1:2007

The efficiency level according to IEC 60034-30:2008 is based on determining motor losses by using the standard IEC 60034-2-1:2007, which has been valid since November 2007 and serves as a substitute for the standard IEC 60034-2:1996. With this new measuring technique additional losses are not determined as a percentage (0.5%), but are determined through the process of measuring (by using the standard IEC 60034-2-1:2007). According to the new standard, the nomenclature of the efficiency level is changed from EFF1 to IE2 and from EFF2 to IE1.

Determining loss according to the old and new standard:

Before: $P_{LL} = 0,5\% P$

Now: $P_{LL} = \text{individual measuring}$

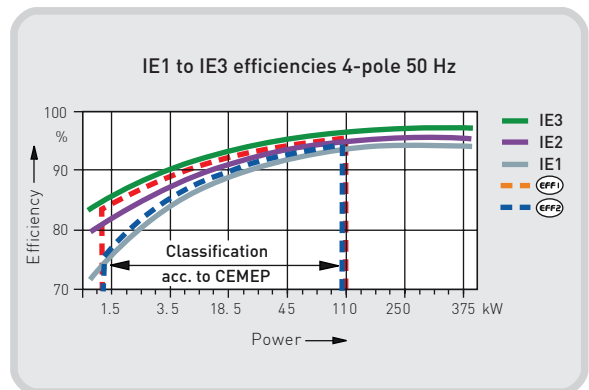
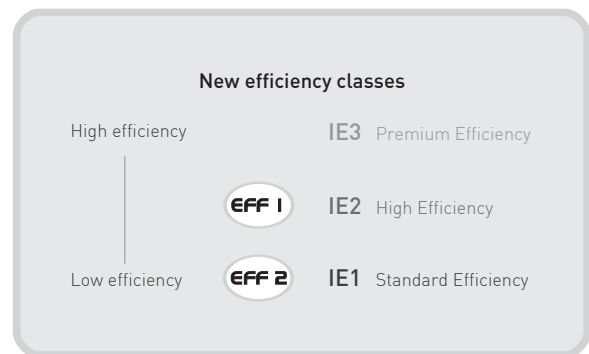
(P_{LL} - additional losses dependent on the work load)

New standard class of the motor efficiency level

A new signification method is applied to new classes of efficiency levels:

- IE1 standard efficiency
- IE2 high efficiency
- IE3 premium efficiency

(IE marking International efficiency)



Example of rating plates

SEVER		3~Mot. C.L.F	
ZKE 225 M-6		123456009 -1/10	
①	D/Y 400/690 V	IMB3 IP55	} 50 Hz data
②	58,4/33,7 A cos φ 0,81	30 kW 50 Hz	
③	IE2 - 91,7(100%) - 91,5(75%) - 89,6(50%)	975 min ⁻¹	} 60 Hz data
④	S1 460 V	30 kW 60 Hz	
⑤	48,6 A cos φ 0,84	1170 min ⁻¹	
⑥	IE2 - 92,4(100%) - 92,0(75%) - 90,0(50%)		
⑦	IE2 ID# 1234567 330 kg	Made in Serbia	⑧
		EN 60034	

1. Rated voltage at 50 Hz
2. Rated current at 50 Hz
3. IE efficiency class and nominal efficiency at 50 Hz
4. Rated voltage at 60 Hz
5. Rated current at 60 Hz
6. IE efficiency class and nominal efficiency at 60 Hz
7. Efficiency class logo
8. Country of origin

LOW VOLTAGE TEFC CAGE MOTORS

IE2 High Efficiency

The most important changes in the application of the new standard

The nomenclature of the efficiency level class has so far been EFF and the marking was done voluntarily, in arrangement with CEMEP (European sector committee of Manufacturers of Electrical Machines and Power Electronics).

According to the new standard, the identification marking is done with the label IE and it is obligatory. This standard applies to a wider motor power range than the one previously used, and involves motors with power supply directly from the network.

The following table shows motors which are under the obligation of the new standard and the most important characteristics of the new signification method.

Nomenclature	Signification method on voluntary arrangement between the EU board and the European sector committee of Manufacturers of Electrical Machines and Power Electronics (CEMEP)	Signification method on EuP directive, which is based on IEC 60034-30:2008
Number of poles	2, 4	2, 4, 6
Power range	1,1 - 90 kW	0,75 - 375 kW
Efficiency degree	Standard efficiency - EFF3	Standard efficiency - IE1
	High efficiency - EFF2	High efficiency - IE2
	Premium efficiency - EFF1	Premium efficiency - IE3
Voltage	400 V, 50 Hz	< 1000 V, 50/60 Hz
Protection degree	IP5X	All
Brake motor	No	Arrangement
Motor reducers	No	Yes
Ex-motors	No	Yes (provided that explosion prevention has higher priority)
Validity	Voluntary arrangement, will be substituted after the implementation of the EuP directive into national laws and norms	Standard IEC 60034-30 has been valid since October 2008. EuP directive needs to be implemented into national laws and norms

Usage of motors with a determined efficiency level

Motors with a standard efficiency level IE1 are the most frequent types found on the market, but their efficiency has a time limit.

Starting from 16.06.2011, all motors should not be less efficient than IE2.

Starting from 01.01.2015, all motors with a rated output of 7,5 - 375 kW should not be less efficient than the IE3 efficiency level or meet the IE2 efficiency level and be equipped with a variable speed drive.

Starting from 01.01.2017, all motors with a rated output of 0,75 - 375 kW should not be less efficient than the IE3 efficiency level or meet the IE2 efficiency level and be equipped with a variable speed drive.

Using of motors with a high efficiency level

Using motors with a high efficiency level brings significant savings when it comes to energy consumption, and thus decreases the electric energy costs.

The table presents the comparison of electric energy consumption by motors class IE1 and IE2. This particular comparison was given based on motor efficiency during one shift of the year, 2000 work hours.

Motor power kW	Efficiency level class	Efficiency level	Electric energy consumption per year kWh	Electric energy savings per year kWh
55	IE1	92,1	119450	1800
	IE2	93,5	117650	

LOW VOLTAGE TEFC CAGE MOTORS

IE2 High Efficiency

4 Electrical data

Voltage: 400 V, 50 Hz,
F/B, IP55

Series ZKE

Type	Output P _n kW	Full load R.P.M. min ⁻¹	IE	Efficiency η_n			Power factor cos ϕ_n	Full load Current I _n A	Rated torque M _n Nm	Moment of inertia J kgm ²	Weight kg
				100%P _n	75%P _n	50%P _n					

3000 min⁻¹

ZKE 200 La-2	30	2935	IE2	92,1	92,1	90,9	0,88	53	98	0,173	199
ZKE 200 Lb-2	37	2940	IE2	92,5	92,5	91,0	0,87	66	120	0,208	215
ZKE 225 Mb-2	45	2960	IE2	92,9	92,9	90,8	0,87	80	145	0,25	290
ZKE 250 Ma-2	55	2960	IE2	93,3	93,3	92,1	0,89	96	177	0,44	395
ZKE 280 Sa-2	75	2960	IE2	93,8	93,6	92,2	0,89	130	242	0,74	510
ZKE 280 Mb-2	90	2960	IE2	94,1	94,1	93,3	0,92	150	290	0,88	600
ZKIE 315 Sa-2	110	2970	IE2	94,3	93,6	91,8	0,88	192	354	1,57	890
ZKIE 315 Mb-2	132	2970	IE2	94,6	93,6	91,0	0,88	229	424	1,8	1070
ZKIE 315 Mc-2	160	2973	IE2	94,8	94,0	91,9	0,91	268	514	2,0	1120
ZKIE 315 Md-2	200	2976	IE2	95,1	94,9	93,3	0,93	327	642	2,5	1290
ZKIE 315 Lf-2	250	2977	IE2	95,1	94,8	93,0	0,92	413	802	4,7	1450
ZKIE 315 Lg-2	315	2982	IE2	95,1	94,7	92,6	0,92	520	1009	5,4	1720
ZKIE 355 Ma-2	250	2977	IE2	95,1	94,8	93,8	0,92	413	802	4,7	1700
ZKIE 355 Mb-2	315	2982	IE2	95,1	95,0	94,1	0,92	520	1009	5,4	1920
ZKIE 355 Mc-2	355	2982	IE2	95,1	94,9	93,4	0,92	586	1137	5,7	2150

Bigger motors on request

LOW VOLTAGE TEFC CAGE MOTORS

IE2 High Efficiency

Electrical data **5**

Voltage: 400 V, 50 Hz,
F/B, IP55

Series ZKE

Type	Output P _n kW	Full load R.P.M. min ⁻¹	IE	Efficiency η_n			Power factor cos ϕ_n	Full load Current I _n A	Rated torque M _n Nm	Moment of inertia J kgm ²	Weight kg
				100%P _n	75%P _n	50%P _n					
1500 min⁻¹											
ZKE 200 Lb-4	30	1470	IE2	92,4	92,3	90,0	0,84	56	195	0,32	260
ZKE 225 Sa-4	37	1470	IE2	92,8	92,6	90,3	0,83	69	240	0,40	290
ZKE 225 Mb-4	45	1470	IE2	93,1	93,0	92,2	0,82	85	292	0,47	320
ZKE 250 Ma-4	55	1480	IE2	93,5	93,6	92,2	0,85	100	355	0,74	415
ZKE 280 Sa-4	75	1480	IE2	94,0	93,8	92,6	0,86	134	484	1,06	545
ZKE 280 Mb-4	90	1480	IE2	94,2	93,9	92,4	0,86	161	581	1,36	603
ZKIE 315 Sa-4	110	1482	IE2	94,5	93,7	91,6	0,88	191	709	2,66	890
ZKIE 315 Mb-4	132	1477	IE2	94,7	94,3	93,0	0,89	226	853	3,16	1000
ZKIE 315 Mc-4	160	1486	IE2	94,9	94,4	93,0	0,90	271	1028	3,6	1090
ZKIE 315 Md-4	200	1486	IE2	95,1	94,9	93,3	0,91	334	1285	4,3	1250
ZKIE 315 Lf-4	250	1488	IE2	95,1	95,0	94,2	0,87	437	1605	5,0	1450
ZKIE 315 Lg-4	315	1487	IE2	95,1	94,9	93,5	0,88	544	2023	6,0	1720
ZKIE 355 Ma-4	250	1491	IE2	95,1	94,7	93,3	0,90	422	1601	7,6	1750
ZKIE 355 Mb-4	315	1492	IE2	95,1	94,3	92,8	0,90	532	2016	9,9	1950
ZKIE 355 Mc-4	355	1492	IE2	95,1	94,6	93,1	0,89	606	2272	11	2250
ZKIE 355 Ld-4	400	1490		96,0	96,0	95,5	0,87	692	2564	13	2380
ZKIE 355 Le-4	450	1490		95,5	95,2	94,1	0,87	783	2884	15	2550
ZKIE 355 Lf-4	500	1492		96,1	96,0	95,2	0,86	874	3200	17	2700
ZKIE 400 La-4	560	1492		96,0	95,8	94,9	0,86	568	3584	19	3000
ZKIE 400 Lb-4	630	1492		96,3	96,1	95,3	0,89	616	4033	21	3300
ZKIE 400 Lc-4	710	1492		96,2	96,1	95,4	0,89	695	4545	24	3600
ZKIE 450 La-4	800	1492		96,5	96,6	96,2	0,89	780	5121	27	4400
ZKIE 450 Lb-4	900	1492		96,5	96,6	96,2	0,89	878	5761	30	4650
ZKIE 450 Lc-4	1000	1491		96,4	96,5	96,0	0,89	976	6405	33	4900

With FS 400 and 450 the current data is given for 690 V

LOW VOLTAGE TEFC CAGE MOTORS

IE2 High Efficiency

6 Electrical data

Voltage: 400 V, 50 Hz,
F/B, IP55

Series ZKE

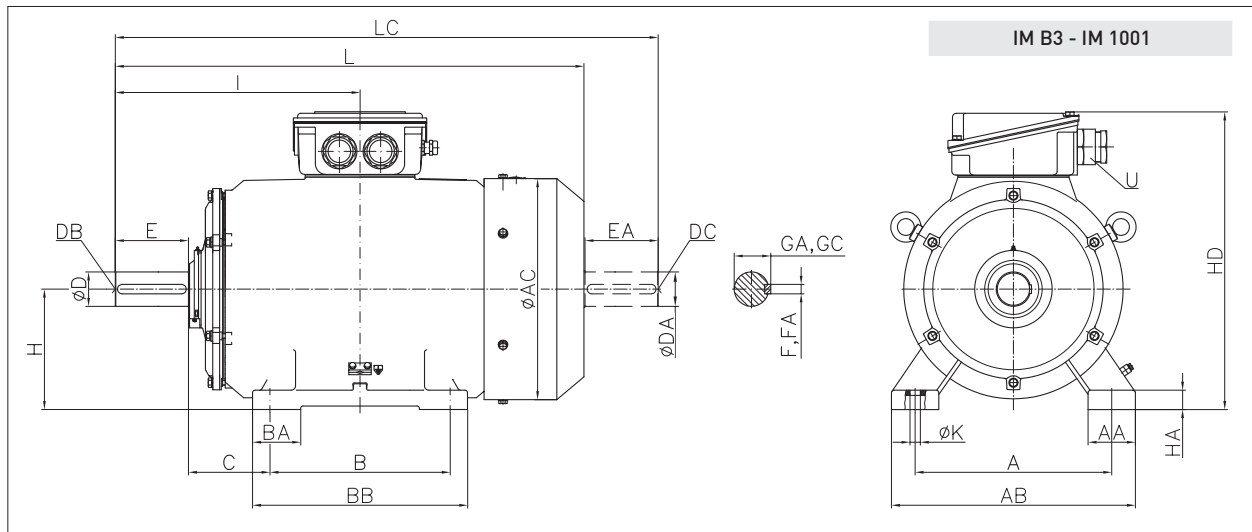
Type	Output P _n kW	Full load R.P.M. min ⁻¹	IE	Efficiency η_n			Power factor cos ϕ_n	Full load Current I _n A	Rated torque M _n Nm	Moment of inertia J kgm ²	Weight kg
				100%P _n	75%P _n	50%P _n					
1000 min⁻¹											
ZKE 200 La-6	18,5	970	IE2	90,4	90,1	88,3	0,81	37	182	0,53	201
ZKE 200 Lb-6	22	970	IE2	90,9	90,6	88,2	0,80	44	217	0,62	220
ZKE 225 Mb-6	30	975	IE2	91,7	91,5	89,6	0,81	58	294	0,70	330
ZKE 250 Ma-6	37	980	IE2	92,2	91,8	89,7	0,83	70	361	0,95	390
ZKE 280 Sa-6	45	982	IE2	92,7	92,4	90,3	0,85	83	438	1,59	500
ZKE 280 Mb-6	55	982	IE2	93,1	92,7	90,7	0,84	102	535	1,9	560
ZKIE 315 Sa-6	75	987	IE2	93,7	93,5	91,6	0,85	136	726	4,2	870
ZKIE 315 Mb-6	90	988	IE2	94,0	93,7	91,5	0,85	163	870	4,8	990
ZKIE 315 Mc-6	110	987	IE2	94,3	94,0	92,2	0,87	194	1064	5,5	1070
ZKIE 315 Md-6	132	988	IE2	94,6	94,4	92,8	0,87	232	1276	6,6	1140
ZKIE 315 Me-6	160	989	IE2	94,8	94,8	94,0	0,87	280	1545	7,0	1260
ZKIE 315 Lf-6	200	987	IE2	95,0	95,0	93,4	0,84	362	1935	7,5	1450
ZKIE 315 Lg-6	250	986	IE2	95,0	94,9	93,0	0,85	447	2421	9,3	1720
ZKIE 355 Ma-6	200	989	IE2	95,0	94,8	92,8	0,87	350	1931	13,1	1800
ZKIE 355 Mb-6	250	988	IE2	95,0	94,7	94,1	0,87	437	2416	14,9	1950
ZKIE 355 Mc-6	315	988	IE2	95,0	95,0	93,8	0,88	545	3045	16,5	2170
ZKIE 355 Ld-6	355	990	IE2	95,0	94,9	93,7	0,89	607	3424	18	2400
ZKIE 355 Le-6	400	992		95,4	95,5	95,0	0,85	715	3851	20	2700
ZKIE 400 La-6	450	995		95,8	95,5	94,4	0,85	463	4319	28	3100
ZKIE 400 Lb-6	500	995		96,3	96,2	95,5	0,86	506	4799	31	3300
ZKIE 400 Lc-6	560	994		95,9	95,9	95,3	0,86	569	5380	34	3500
ZKIE 450 La-6	630	993		95,9	95,7	94,9	0,85	647	6059	49	4450
ZKIE 450 Lb-6	710	994		95,9	95,8	95,2	0,86	721	6821	54	4700
ZKIE 450 Lc-6	800	995		96,1	96,0	95,4	0,84	830	7678	58	4950

With FS 400 and 450 the current data is given for 690 V

LOW VOLTAGE TEFC CAGE MOTORS IE2 High Efficiency

Motor dimensions

7



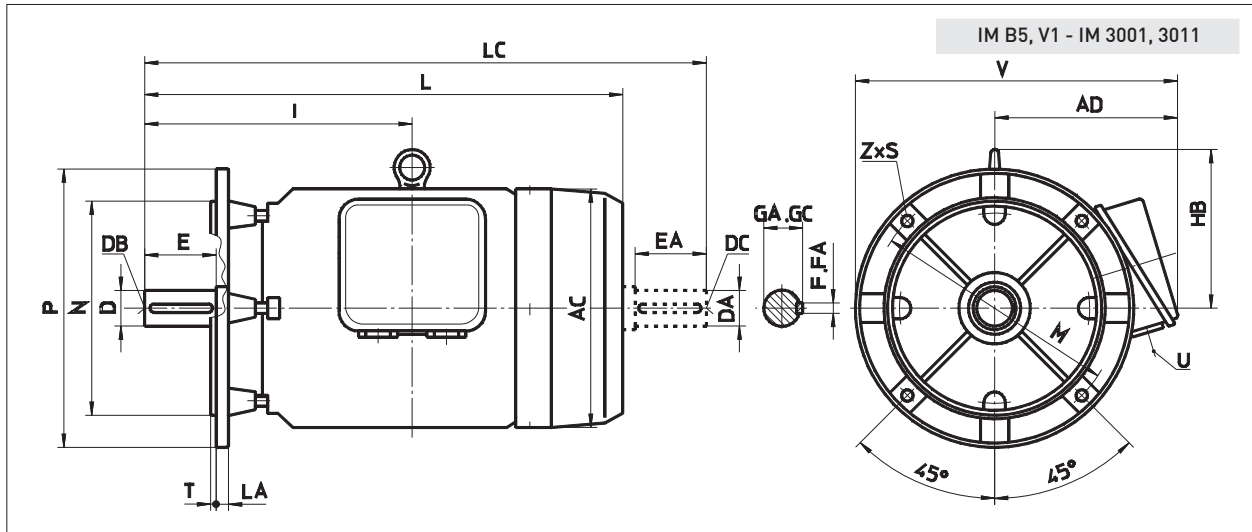
Type	Poles	A	AA	AB	AC	B	BA	BB	C	D	DA	DB	DC	E	EA	F	FA	GA	GC	H	HA	HC	HD	I	K	L	LC	U	
ZKE 200	La	2, 6	318	80	398	395	305	95	375	133	55	55	M20	M20	110	110	16	16	59	59	200	35	398	514	395.5	18	764	876	M50x1.5
	Lb	2, 4, 6																											
ZKE 225	Sa	4				286		355		60	60			140	140	18	18	64	64					432		805	962		
	Mb	2	356	90	446	418		110	149	55	55	M20	M20	110	110	16	16	59	59	225	35	438	562	414.5	18	800	927	M50x1.5	
ZKE 250	Ma	2				286		355		60	60			140	140	18	18	64	64					432		805	962		
	Mb	4, 6	311					380		60	60			140	140	18	18	64	64	225	35	438	562	444.5		830	987		
ZKE 250	Ma	2				286		355		60	60			140	140	18	18	64	64					432		805	962		
	Mb	4, 6	311					380		60	60			140	140	18	18	64	64	225	35	438	562	444.5		830	987		
ZKE 280	Sa	2				368		450		65	65			180	180	20	20	79,5	79,5					514		973	1128		
	Mb	4, 6	457	110	567	510		112	190	65	65	M20	M20	140	140	18	18	69	69	280	45	536	659	539.5	24	1024	1179	M50x1.5	
ZKIE 315	Sa	2				406		500		65	65			140	140	18	18	69	69					559		1072	1217		
	Mb	4, 6	508	125	633	562		120	216	65	65	M20	M20	170	170	22	22	85	85	315	50	599	742	589	28	1102	1277	M63x1.5	
ZKIE 315	Sa	2				406		500		65	65			140	140	18	18	69	69					559		1072	1217		
	Mb	4, 6	508	125	633	562		120	216	65	65	M20	M20	170	170	22	22	85	85	315	50	599	742	584.5	28	1123	1268	M63x1.5	
ZKIE 315	Sa	2				406		500		65	65			140	140	18	18	69	69					559		1072	1217		
	Mb	4, 6	508	125	633	562		120	216	65	65	M20	M20	170	170	22	22	85	85	315	50	599	742	614.5	28	1153	1328	M63x1.5	

The fixing dimensions given in thick figures are obligatory according to the recommendation of IEC. All other technical data and dimensions during the future development of motors may undergo some changes and therefore they can be considered as obligatory after our confirmation only. All dimensions are given in millimetres.

LOW VOLTAGE TEFC CAGE MOTORS

IE2 High Efficiency

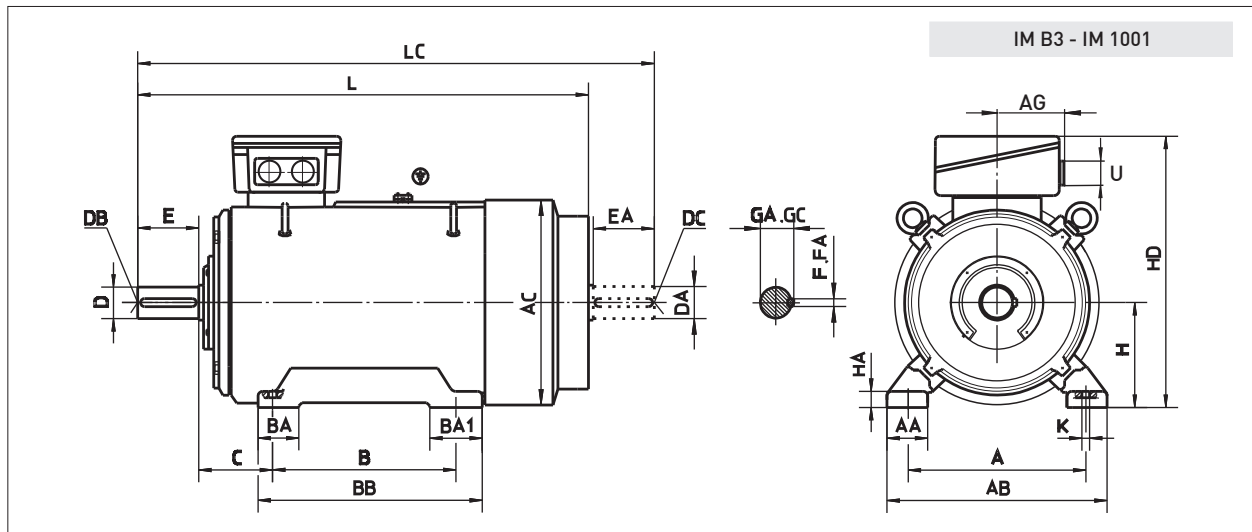
8 Motor dimensions



Type	Poles	Flange	AC	AD	D	DA	DB	DC	E	EA	F	FA	GA	GC	HB	I	L	LA	LC	M	N	P	S	Z	T	V	U	
ZKE 200	La	2, 6	FF 350	395	314	55	55	M20	M20	110	110	16	16	59	59	260	395.5	764	20	876	350	300	400	Ø18.5	4	5	499	M50 x 1.5
	Lb	2, 4, 6																										
ZKE 225	Sa	4				60	60			140	140	18	18	64	64		432	805		962								
	Mb	2, 4, 6	FF 400	418	337	55	55	M20	M20	110	110	16	16	59	59	275	414.5	800	20	927	400	350	450	Ø18.5	8	5	537	M50 x 1.5
ZKE 250	Ma	2, 4, 6	FF 500	474	360	60	60	M20	M20	140	140	18	18	64	64	299	482.5	906	22	1060	500	450	550	Ø18.5	8	5	635	M50 x 1.5
	Sa	2, 4, 6				65	65																					
ZKE 280	Mb	2, 4, 6	FF 500	510	379	65	65	M20	M20	140	140	18	18	69	69	327				514	973							
	Sa	2, 4, 6				75	75																					
ZKIE 315	Mb	2, 4, 6	FF 600	562	427	65	65	M20	M20	140	140	18	18	69	69	345	589	1102	25	1292	600	550	660	Ø24	8	6	757	M63 x 1.5
	Sa	2, 4, 6				80	80			170	170	22	22	85	85		559	1072		1232								

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LOW VOLTAGE TEFC CAGE MOTORS IE2 High Efficiency



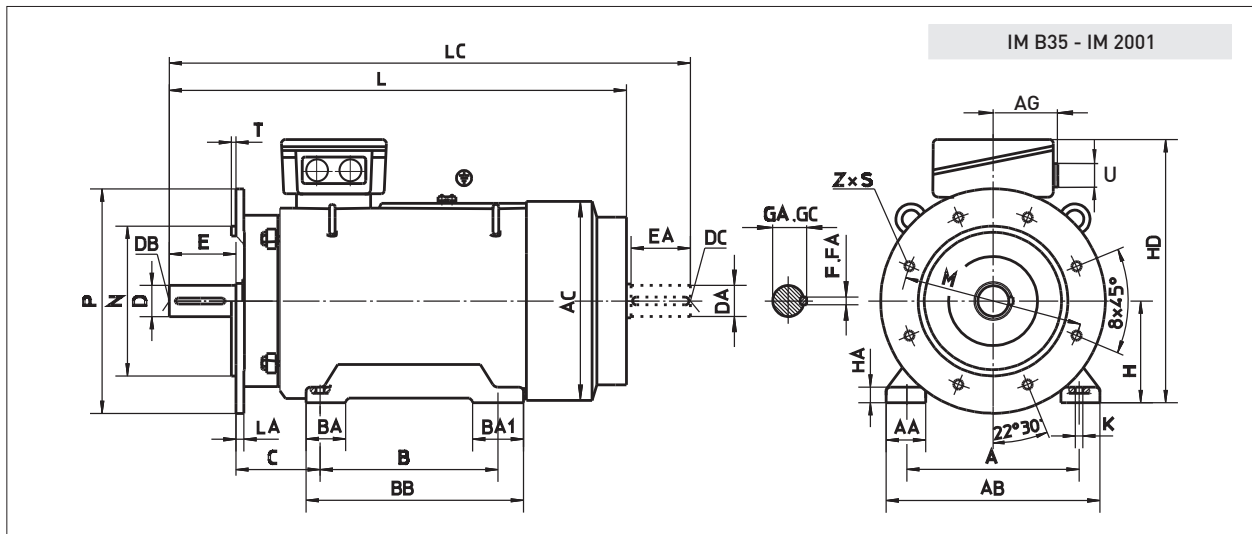
Type	Poles	A	AA	AB	AC	AG	B	BA	BA1	BB	C	D	DA	DB	DC	E	EA	F	FA	GA	GC	H	HA	HD	K	L	LC	U		
ZKIE 315	Mc, Md	2	508	125	633	626	403	457	508	101	152	588	216	65	65	M20	M20	140	140	18	18	69	69	315	45	890	Ø28	1238	1393	2xM63x1.5
	Mc, Md, Me	4, 6												90	90	M24	M24	170	170	25	25	95	95					1268	1453	
	Le, Lf	2	560	120	680	655	-	560	630	120	200	780	200	65	65	M20	M20	140	140	18	18	69	69	315	40	850	Ø28	1587	1732	
	Lf, Lg	4, 6													90	90	M24	M24	170	170	25	25	95	95					1617	

The fixing dimensions given in thick figures are obligatory according to the recommendation of IEC. All other technical data and dimensions during the future development of motors may undergo some changes and therefore they can be considered as obligatory after our confirmation only. All dimensions are given in millimetres.

LOW VOLTAGE TEFC CAGE MOTORS

IE2 High Efficiency

10 Motor dimensions



Type	Poles	Flange	A	AA	AB	AC	AG	B	BA	BA1	BB	C	H	HA	HD	K	L	LA	LC	M	N	P	S	Z	T	U	
ZKIE 315	Mc, Md	2															1238	1393									
	Mc, Md, Me	4, 6	FF 600	508	125	633	626	403	457	508	101	152	588	216	315	45	890	Ø28	25	600	550	660	Ø24	8	6		
	Le, Lf	2															1587	1732									
	Lf, Lg	4, 6	FF 740	560	120	680	655	-	560	630	120	200	780	216	315	40	850	Ø28	25	740	680	800	Ø24	8	6		

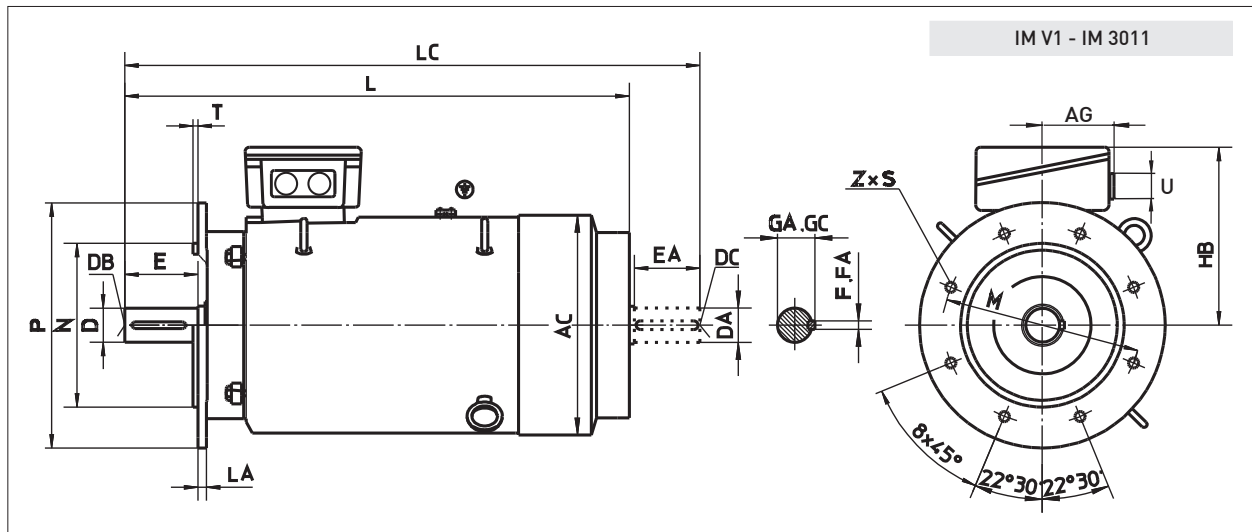
Type	Poles	D	DA	DB	DC	E	EA	F	FA	GA	GC	
ZKIE 315	Mc, Md	2	65	65	M20	M20	140	140	18	18	69	69
	Mc, Md, Me	4, 6	90	90	M24	M24	170	170	25	25	95	95
	Le, Lf	2	65	65	M20	M20	140	140	18	18	69	69
	Lf, Lg	4, 6	90	90	M24	M24	170	170	25	25	95	95

The fixing dimensions given in thick figures are obligatory according to the recommendation of IEC. All other technical data and dimensions during the future development of motors may undergo some changes and therefore they can be considered as obligatory after our confirmation only. All dimensions are given in millimetres.

LOW VOLTAGE TEFC CAGE MOTORS IE2 High Efficiency

Motor dimensions

11



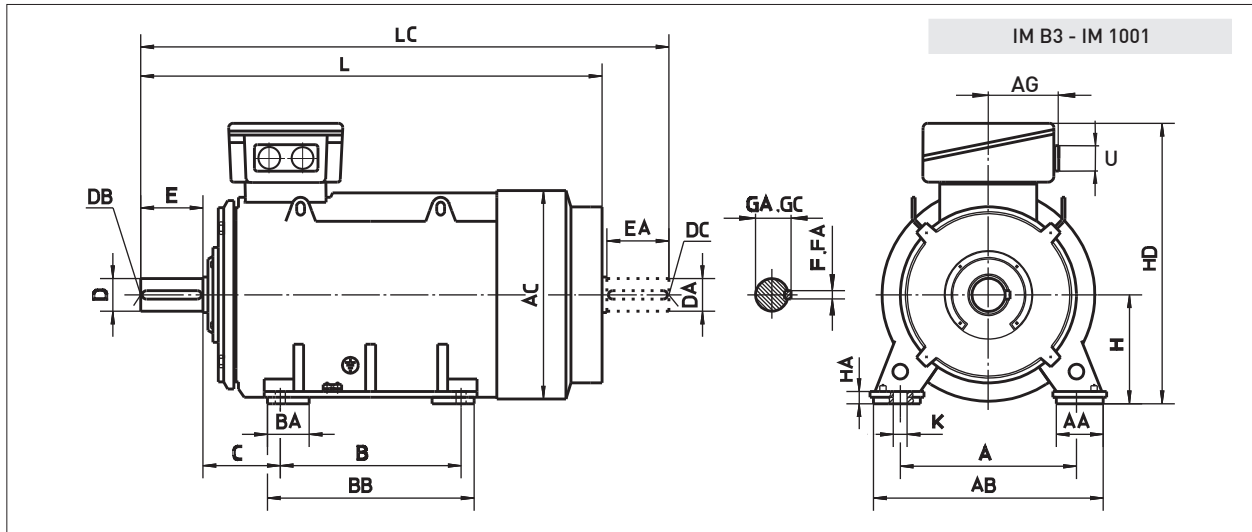
Type	Pole	Flange	AC	AG	D	DA	DB	DC	E	EA	F	FA	GA	GC	HB	L	LA	LC	M	N	P	S	Z	T	U	
ZKIE 315	Mc, Md	2			65	65	M20	M20	140	140	18	18	69	69	575	1238	1393									
	Mc, Md, Me	4, 6	FF 600	626	403	90	90	M24	M24	170	170	25	25	95	95	1268	1453		600	550	660	Ø24	8	6	2xM63x1.5	
	Le, Lf	2			65	65	M20	M20	140	140	18	18	69	69	535	1587	1732									
	Lf, Lg	4, 6	FF 740	655	-	90	90	M24	M24	170	170	25	25	95	95	1617	1792		740	680	800	Ø24	8	6		

The fixing dimensions given in thick figures are obligatory according to the recommendation of IEC. All other technical data and dimensions during the future development of motors may undergo some changes and therefore they can be considered as obligatory after our confirmation only. All dimensions are given in millimetres.

LOW VOLTAGE TEFC CAGE MOTORS

IE2 High Efficiency

12 Motor dimensions



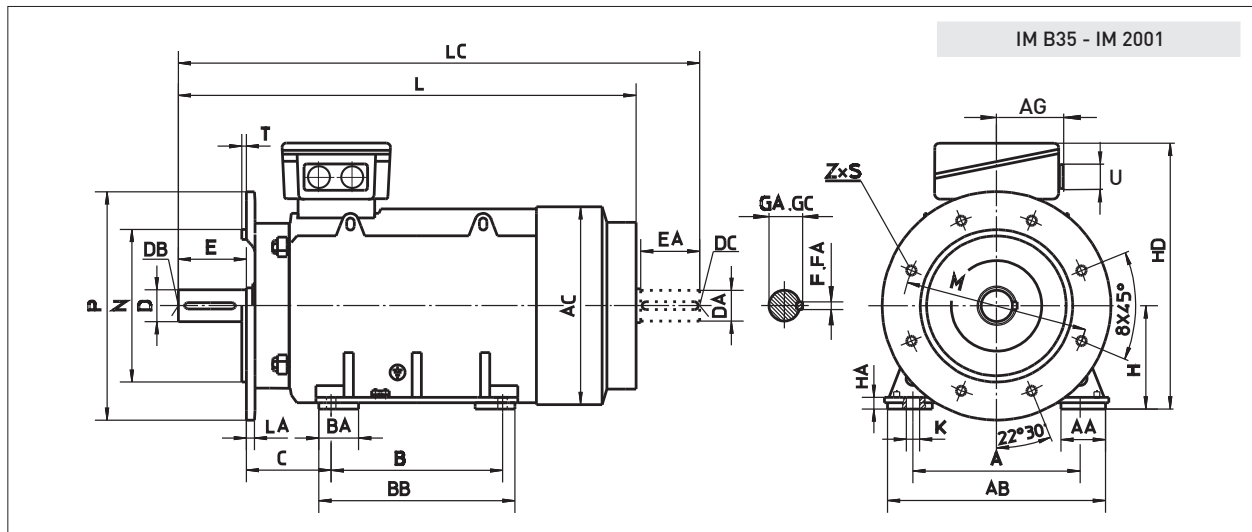
Type	Poles	A	AA	AB	AC	AG	B	BA	BB	C	D	DA	DB	DC	E	EA	F	FA	GA	GC	H	HA	HD	K	L	LC	U			
ZKIE 355	2	610					560	140	660	254	75	75	M20	M20	140	140	20	20	79,5	79,5					1463	1618				
	4, 6	150	780	750	403																									
		630						800	220	980	200	100	100	M24	M24	210	210	28	28	106	106									
ZKIE 400	2										80	80	M20	M20	170	170	22	22	85	85										
	4, 6	710	150	860	855	403	900	220	1045	224																				
												110	100	M24	M24	210	210	28	28	116	116									
ZKIE 450	2										90	90			170	170	25	25	95	95										
	4, 6	800	180	980	975	403	1000	260	1220	250					210	210	28	28	116	116										

The fixing dimensions given in thick figures are obligatory according to the recommendation of IEC. All other technical data and dimensions during the future development of motors may undergo some changes and therefore they can be considered as obligatory after our confirmation only. All dimensions are given in millimetres.

LOW VOLTAGE TEFC CAGE MOTORS IE2 High Efficiency

Motor dimensions

13



Type	Poles	Flange	A	AA	AB	AC	AG	B	BA	BB	C	H	HA	HD	K	L	LA	LC	M	N	P	S	Z	T	U
ZKIE 355	2							560	140	660	254														
		FF 740	150	780	750	735	403					355	35	945											
	Ld, Le	4, 6						800	220	980	200														2xM75x1.5
	Lf																								

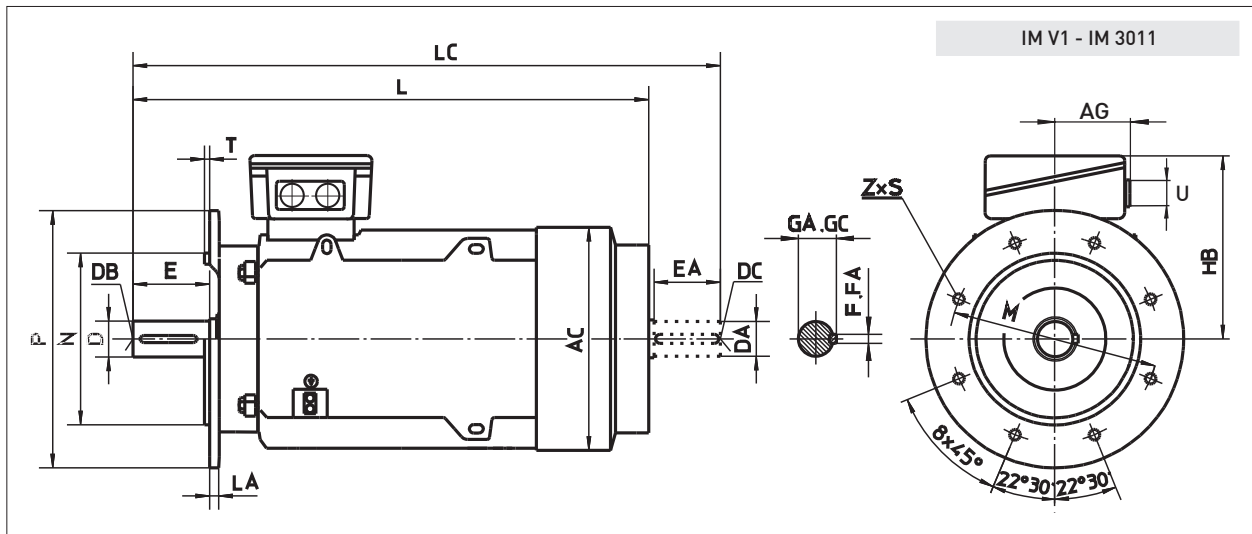
Type	Poles	D	DA	DB	DC	E	EA	F	FA	GA	GC	
ZKIE 355	2	75	75	M20	M20	140	140	20	20	79.5	79.5	
	Ld, Le	4, 6	100	100	M24	M24	210	210	28	28	106	106
	Lf											

The fixing dimensions given in thick figures are obligatory according to the recommendation of IEC. All other technical data and dimensions during the future development of motors may undergo some changes and therefore they can be considered as obligatory after our confirmation only. All dimensions are given in millimetres.

LOW VOLTAGE TEFC CAGE MOTORS

IE2 High Efficiency

14 Motor dimensions

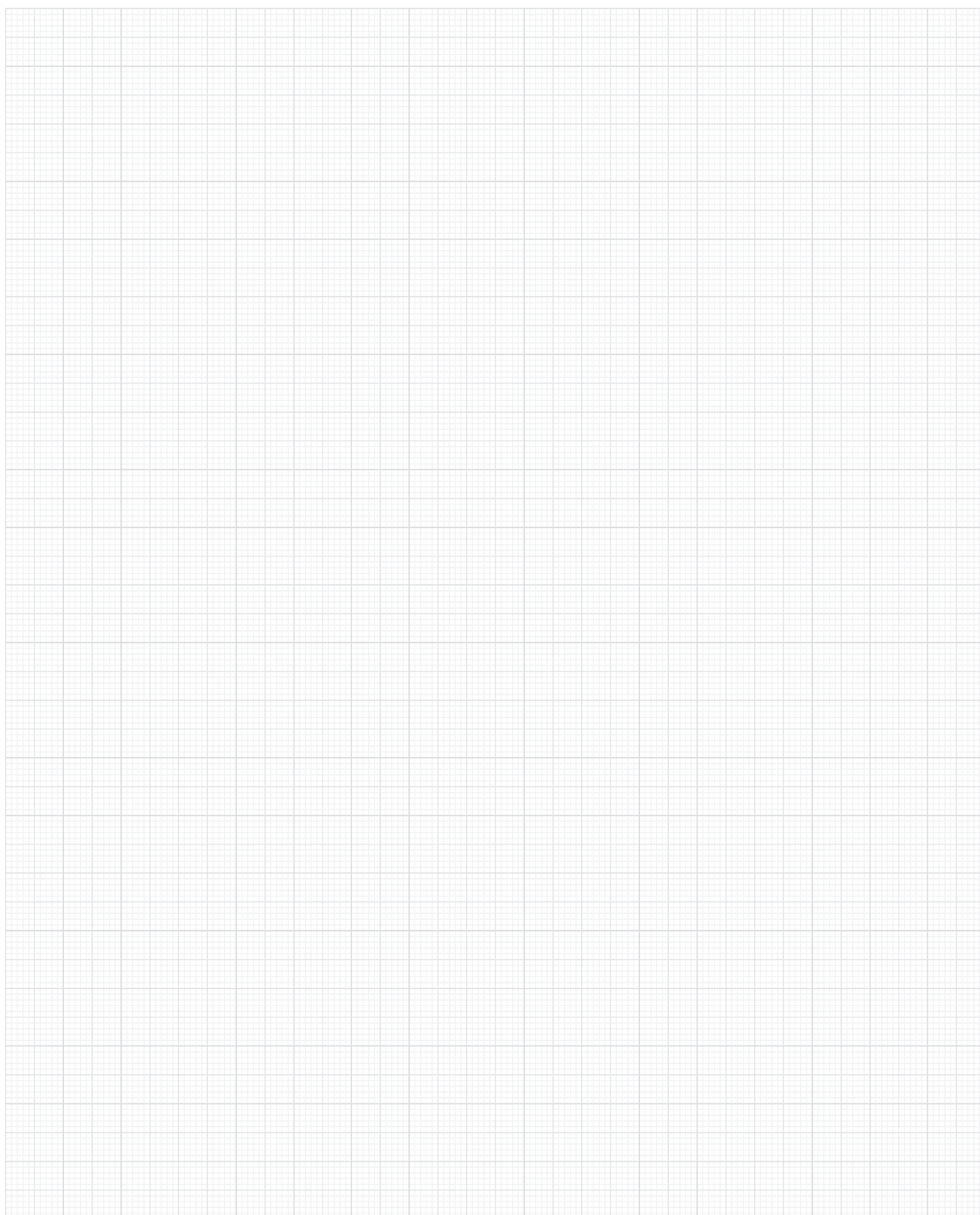


Type	Poles	Flange	AC	AG	D	DA	DB	DC	E	EA	F	FA	GA	GC	HB	L	LA	LC	M	N	P	S	Z	T	U
ZKIE 355	2				75	75	M20	M20	140	140	20	20	79.5	79.5	590	1463	1618								
	4, 6	FF 740	735	403	100	100	M24	M24	210	210	28	28	106	106	644	1533	1758	740	680	800	Ø24	8	6	2xM75x1.5	
ZKIE 400	2				80	80	M20	M20	170	170	22	22	85	85	644	1938	2128								
	4, 6	FF 940	855	403	110	100	M24	M24	210	210	28	28	116	106	800	1978	2208	940	880	1000	Ø28	8	6	4xM63x1.5	
ZKIE 450	2				90	90	M24	M24	170	170	25	25	95	95	800	2118	2308								
4, 6	FF 1080	975	403	120	100	M24	M24	210	210	32	28	127	106	800	2158	2388	1080	1000	1150	Ø40	12	6	4xM63x1.5		

The fixing dimensions given in thick figures are obligatory according to the recommendation of IEC. All other technical data and dimensions during the future development of motors may undergo some changes and therefore they can be considered as obligatory after our confirmation only. All dimensions are given in millimetres.

LOW VOLTAGE TEFC CAGE MOTORS IE2 High Efficiency

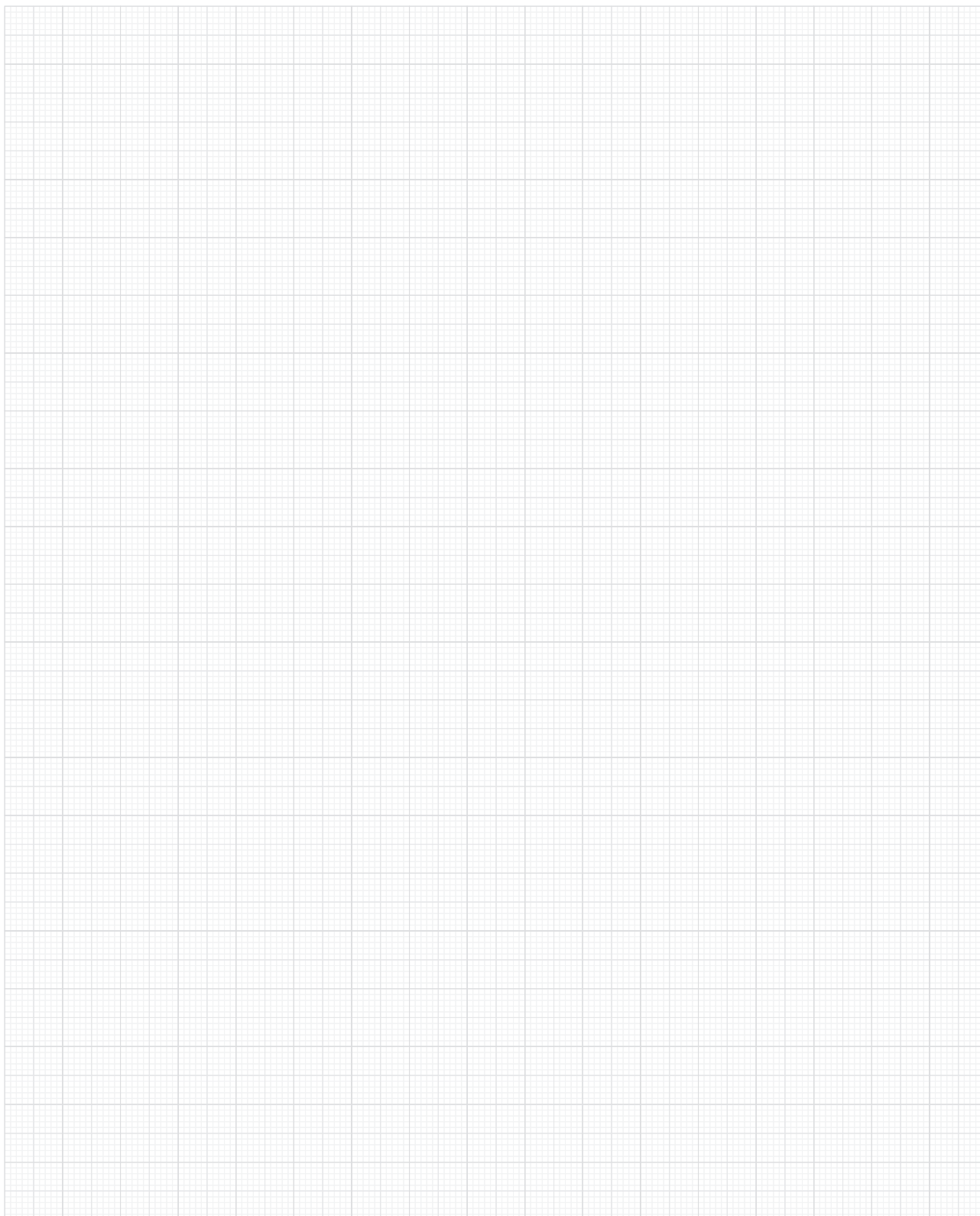
Note 15



LOW VOLTAGE TEFC CAGE MOTORS

IE2 High Efficiency

16 Note



QUESTIONNAIRE FOR THE OFFER OF ASYNCHRONOUS ELECTRIC MOTORS



Enquiry Number: _____

Customer: _____

ITEM: _____

Qty: _____

A MOTOR DATA

1 Motor type: Three phase

2 Rotor type: Squirrel cage: Slip-ring:

3 Rated output: $P_N =$ _____ kW

4 Rated voltage: $U_N =$ _____ V Connection: Star Delta

5 Rated frequency: $f_N =$ _____ Hz

6 Rated speed: $n_N =$ _____ rpm

7 Insulation class F B H

8 Duty type: S1 S2 S3 S4 S5 S6 S7 S8 S9 S10
ED %

--	--	--	--	--	--	--	--	--	--

starts /h _____ min _____ J_{mot} _____ kgm^2

9 Standard: IEC _____ or _____

10 Cooling method: IC _____

11 Mounting arrangement: IMB3 IMB5 or _____

12 Protection degree: Motor IP: _____ Terminal box IP: _____

13 Sense of rotation (DE side view): CW CCW Both

14 Motor brake: yes no
Brake torque: _____ Nm
Brake voltage: _____ V/Hz _____ V,DC

15 Rotor data for slip-ring motors: $U_R =$ _____ V $I_R =$ _____ A

D POWER TRANSMISSION AND STARTING CONDITIONS

1 Coupling type: _____

2 Starting: _____

3 Number of consecutive startings:
Hot state: _____ per hour Cold state: _____ per hour
_____ per day _____ per day

E ADDITIONAL REQUESTS FOR MOTOR EXECUTION

1 Motor overload: _____ % P_N
Duration: _____ min

2 Temperature rise: F B

3 Request for: vibration level _____ mm/s
noise level (Lp(A)) _____ dB (A)

4 Terminal box position (DE side view):
left right top

5 Shaft load:
axial load _____ N radial load _____ N

6 Variable speed drive: yes no
Power of converter supplied motor _____ kW
Converter type: _____
Manufacturer: _____
Speed range: from _____ up to _____ rpm

7 Speed sensor: Tacho gen. Resolver
Encoder Absolute encoder
Sensor Type: _____

8 Motor flange size: M _____ mm, P _____ mm, N _____ mm

9 Second shaft end: yes no
DA= _____ mm EA= _____ mm

10 Other requests and limits: _____

B DATA ABOUT THE DRIVEN MACHINE

1 Type: _____

2 Required power: _____

3 Required speed: _____

4 Load torque characteristic:
Constant Squared or _____
Speed %:

0	25	50	75	100
---	----	----	----	-----

Torque Nm:

--	--	--	--	--

5 Moment of inertia referred to motor shaft: $J =$ _____ kgm^2

6 Driven machine special data: _____

C AMBIENT CONDITIONS

1 Ambient temperature: _____ °C

2 Relative humidity: _____ %

3 Altitude (above sea level): _____ m

4 Specific ambient conditions: _____

F ADDITIONAL EQUIPMENT, SPARE PARTS AND DOCUMENTATION

1 Winding temperature protection: PTC _____, _____ per phase
Pt100, _____ per phase

2 Bearing temperature sensor Pt100, _____ per bearing

3 Anti-condensation heaters yes _____ V

4 Packaging: standard
oversea

H CUSTOMER

1 Company: _____

2 Address: _____

3 City: _____

4 Country: _____

5 Person: _____

6 Telefon / Fax: _____

7 e-mail: _____

Note:

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