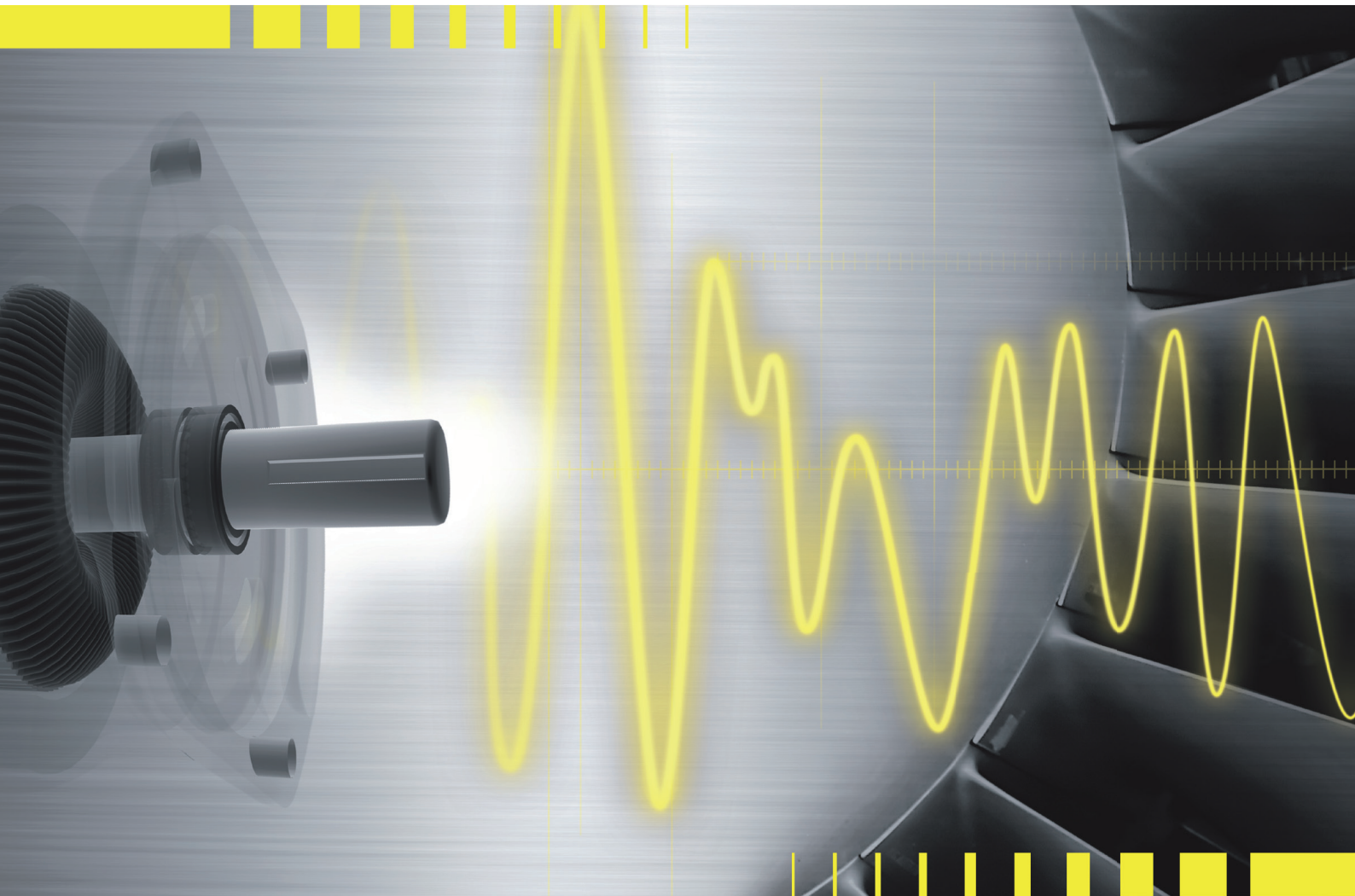


# ATB ECODRIVE



## Specification

Specification	Standard product
Frame material	80- 160 aluminium 80 - 315 cast iron
Enclosure	IP55
Mounting option	IM B3. IMB5. IMB14 IMB35. IMB34
Terminal box position	Top
Voltage	≤ 3 kW: 400/230 V Y/Δ ≥ 4 kW: 690/400 V Y/Δ
Frequency	50 / 60 Hz
Cooling	IC411
Bearing location	80 - 160 aluminium frame - drive end 80 - 315 cast iron frame - drive end
Lubrication	80 - 225 for live with 2Z-type bearings 250- 315 with regreasing bearings
Insulation	class F
Temperature rise	class B
Paint colour	black RAL 9005 low gloss
Thermal protection	F.s. 80 - 315 - thermistors
Inverter Duty (with derating)	Variable Torque: 10:1 Constant Torque: 2:1
Ambient temperature	-20°C to + 40°C

The above specification gives a brief summary of features available for the ATB Ecodrive range. For further requests, please contact ATB sales.

## ATB - Keeping the industry turning

ATB is recognized as a leading supplier of high quality electric motors that are used worldwide in many different industries. With products ranging from 0.06kW up to 25MW ATB manufactures motors for most applications.

Based on its 80 years of experience ATB can offer ideal motion control solutions. This includes competitively priced standard motors or highly customized motor designs.

On request, we can offer complete power drive system with inverters to provide a complete drive solution from a single source.

One of ATB's key attributes is the ability to meet your exact needs. We are committed to listening to your needs and responding in a way that meets those requirements, whether that be from stock with one of our standard products, through local modification of a stock motor or the production of a product customized to meet your specific needs.

Shaping the future of electric motors, ATB is focused on the development of new products that improve energy efficiency, offer lower cost of ownership throughout the motor lifetime and reduce the environmental impact.

ATB has a long-standing reputation for efficient customer service, supporting customers through its global network.

ATB Motor Centers operate alongside approved product distributors throughout the world.

Know-how, experience and reliability - this is what ATB stands for!

## Quality assurance

Stringent quality procedures are observed from initial design to finished product in accordance with the ISO9001 documented quality systems.

All factories have been assessed to meet these requirements.

## ATB Ecodrive IE3 Series

The ATB Ecodrive range is a high quality standard series of electric motors with a specification suitable for most industrial applications. It covers outputs from 0.75 kW up to 200 kW in frame sizes 80 to 315.

## Benefits include:

- ⚡ Full output range to meet your requirements
- ⚡ Efficiencies are within the IE3 bands
- ⚡ Robust construction for long life
- ⚡ Mountings: foot, flange, face or combination
- ⚡ Multi-mount-aluminium range - frame 80 to 160
- ⚡ Integrated feet cast iron - frame 80 to 315.
- ⚡ Dual voltage: up to 3 kW 230/400V / 265/460V  
4 kW and above 400 / 460V
- ⚡ Dual frequency (50 / 60Hz)
- ⚡ IP55 (TEFC)
- ⚡ Metal fan cover
- ⚡ Metric entries
- ⚡ Thermal protection fitted as standard
- ⚡ Inverter duty capability

## Standards

### ATB Ecodrive motors are manufactured to the international standards listed below

Performance	IEC 60034-1
Dimensions	IEC 60072-1
Mounting	IEC 60034-7
Enclosure protection	IEC 60034-5
Vibration	IEC 60034-14 (grade A)
Noise	IEC60034-9

## Environment Enclosure

All motors have degrees of IP protection as defined in IEC EN 60034-5. The normal arrangement is IP55.

## Motor cooling

Motors are cooled in accordance with IEC 60034-6. The normal arrangement is IC411 (Totally Enclosed Fan Cooled), which means that the motor is cooled by a fan mounted at the non-drive end side.

## European directives

The following European directives apply:

### Compliance with European directives applying to AC induction motors

Directives	Low voltage (LV)	Machinery (MD)	Electromagnetic compatibility (EMC)	Energy related products (EuP)
Reference numbers	2006/95/EC	2006/42/EC	2004/108/EC	2009/125/EC
Relevant for motor CE marking	SCs	No	No	SCs
Standards	EN 60034	Not applicable	EN 60034-1	EN 60034-30
Documentation for customers' technical file	Declaration of conformity	Certificate of incorporation	Statement <sup>(1)</sup>	Declaration of conformity
Safety instructions with every motor	SCs	SCs	SCs	—
Comment	Relevant electrical equipment operating between 50 to 1000 volts AC	Statement <sup>(2)</sup>	Component	Minimum efficiency levels for motor outputs 0.75 - 375kW 2-6 pole

<sup>(1)</sup> Motors operating from a correctly applied, sinusoidal (AC) supply meet the requirements of the EMC directive and are within the limits specified in standard EN 60034-1

<sup>(2)</sup> When installed in accordance with our customer safety and installation and maintenance instructions, they can be put into service only when the machinery into which they are being incorporated, has been declared to be in conformity with the machinery directive 2006/42/EC

## Minimum Energy Efficiency Performance Requirements

The EU MEPS scheme sets new mandatory minimum efficiency levels for most single speed 3ph induction motors up to 375 kW rated up to 1000 V, unlike the narrow definition of the CEMEP voluntary scheme which only covered a small number of standard motors.

The Voluntary Agreement, since 1998, of CEMEP for motor manufactures has expired (Efficiency classes EFF3 /EFF2/EFF1).

The scope of EU MEPS covers 2, 4 & 6 pole single speed 3ph induction motors from 0.75 to 375 kW, rated up to 1000 V based on continuous duty operation.

Aiming to reduce energy consumption throughout Europe and the rest of the world, it comes into effect in 3 stages. The effect of this is maximise potential savings in electric motor driven systems. Based on the

regulation is a new international IEC 60034-30 standard. It defines the following efficiency classes:

- IE1 - Standard Efficiency (comparable to former EFF2)
- IE2 - High Efficiency (EFF1 and USA EPACT 60 Hz)
- IE3 - Premium Efficiency (USA „NEMA Premium“ 60 Hz)

## New mandatory efficiency levels in Europe (time line):

Since 16<sup>th</sup> June 2011:

Minimum efficiency requirement IE2 for all motors within the output range of 0.75 - 375 kW

From 1<sup>st</sup> January 2015:

Minimum efficiency requirement IE3 for 7.5 - 375 kW motors and/or IE2 for motors operated with an appropriate variable speed drive.

From 1<sup>st</sup> January 2017:

Minimum efficiency requirement IE3 for 0.75 - 375 kW motors and/or IE2 for motors operated with an appropriate variable speed drive.

# Three-phase low-voltage motors with induction rotors

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**IE 3**

DIN EN 60034-30-1

400/230 V Y/Δ 50 Hz

690/400 V Y/Δ 50 Hz

Th. cl. F, utilization according to Th. cl. B

## Aluminium construction

Frame surface cooled

3000 min<sup>-1</sup> (2-pole)

Frame-size	Type	Rated Output	Rated Speed	Rated Current at 400 V	Efficiency	Power Factor	Starting Torque	Breakdown Torque	Starting Current	Weight	Noise
		P <sub>2</sub> (kW)	n (min <sup>-1</sup> )	I (A)	100% Load η <sub>1</sub> (%)	100% Load cos φ	T <sub>st</sub> /T <sub>N</sub>	T <sub>M</sub> /T <sub>N</sub>	I <sub>st</sub> /I <sub>N</sub>	IM B3 ca. m <sub>M</sub> kg	ca. SWL dB(A)
80M	SAE3-80M1-2	0.75	2865	1.64	80.7	0.82	2.3	2.3	6.8	10.5	62
80M	SAE3-80M2-2	1.1	2885	2.31	82.7	0.83	2.2	2.3	7.3	12.5	62
90S	SAE3-90S-2	1.5	2885	3.06	84.2	0.84	2.2	2.3	7.6	16	67
90L	SAE3-90L-2	2.2	2895	4.35	85.9	0.85	2.2	2.3	7.8	18	67
100L	SAE3-100L-2	3.0	2915	5.71	87.1	0.87	2.2	2.3	8.1	26	74
112M	SAE3-112M-2	4.0	2895	7.45	88.1	0.88	2.2	2.3	8.3	35	77
132S	SAE3-132S1-2	5.5	2925	10.1	89.2	0.88	2.0	2.3	8.0	55	79
132S	SAE3-132S2-2	7.5	2925	13.7	90.1	0.88	2.0	2.3	7.8	62	79
160M	SAE3-160M1-2	11	2930	19.6	91.2	0.89	2.0	2.3	7.9	86	81
160M	SAE3-160M2-2	15	2930	26.5	91.9	0.89	2.0	2.3	8.0	94	81
160L	SAE3-160L-2	18.5	2930	32.5	92.4	0.89	2.0	2.3	8.1	117	81

1500 min<sup>-1</sup> (4-pole)

Frame-size	Type	Rated Output	Rated Speed	Rated Current at 400 V	Efficiency	Power Factor	Starting Torque	Breakdown Torque	Starting Current	Weight	Noise
		P <sub>2</sub> (kW)	n (min <sup>-1</sup> )	I (A)	100% Load η <sub>1</sub> (%)	100% Load cos φ	T <sub>st</sub> /T <sub>N</sub>	T <sub>M</sub> /T <sub>N</sub>	I <sub>st</sub> /I <sub>N</sub>	IM B3 ca. m <sub>M</sub> kg	ca. SWL dB(A)
80M	SAE3-80M2-4	0.75	1425	1.75	82.5	0.75	2.3	2.3	6.5	14	56
90S	SAE3-90S-4	1.1	1420	2.48	84.1	0.76	2.3	2.3	6.5	16	59
90L	SAE3-90L-4	1.5	1420	3.30	85.3	0.77	2.3	2.3	6.5	19	59
100L	SAE3-100L1-4	2.2	1455	4.52	86.7	0.81	2.3	2.3	7.5	26.5	64
100L	SAE3-100L2-4	3.0	1450	6.02	87.7	0.82	2.3	2.3	7.5	30.5	64
112M	SAE3-112M-4	4.0	1445	7.95	88.6	0.82	2.2	2.3	7.5	36	65
132S	SAE3-132S-4	5.5	1445	10.7	89.6	0.83	2.0	2.3	7.5	60	71
132M	SAE3-132M-4	7.5	1460	14.3	90.4	0.84	2.0	2.3	7.5	63	71
160M	SAE3-160M-4	11	1455	20.4	91.4	0.85	2.2	2.3	7.5	90	73
160L	SAE3-160L-4	15	1455	27.3	92.1	0.86	2.2	2.3	7.5	113	73

# Three-phase low-voltage motors with induction rotors

## IE 3

DIN EN 60034-30-1

400/230 V Y/Δ 50 Hz

690/400 V Y/Δ 50 Hz

Th. cl. F, utilization according to Th. cl. B

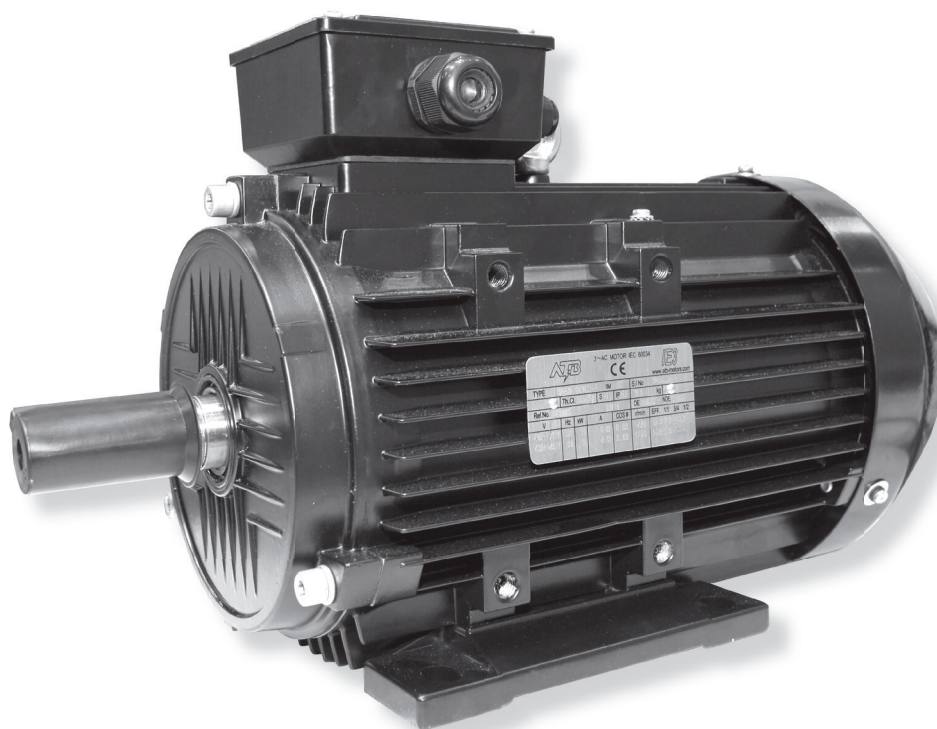
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Aluminium construction

Frame surface cooled

1000 min<sup>-1</sup> (6-pole)

Frame-size	Type	Rated Output	Rated Speed	Rated Current at 400 V	Efficiency	Power Factor	Starting Torque	Breakdown Torque	Starting Current	Weight	Noise
		P <sub>2</sub> (kW)	n (min <sup>-1</sup> )	I (A)	100% Load η <sub>1</sub> (%)	100% Load cos φ	T <sub>st</sub> /T <sub>N</sub>	T <sub>M</sub> /T <sub>N</sub>	I <sub>st</sub> /I <sub>N</sub>	IM B3 ca. m <sub>M</sub> kg	ca. SWL dB(A)
90S	SAE3-90S-6	0.75	935	1.93	78.9	0.71	2.0	2.1	5.8	21	57
90L	SAE3-90L-6	1.1	935	2.69	81.0	0.73	2.0	2.1	5.9	26	57
100L	SAE3-100L-6	1.5	950	3.60	82.5	0.73	2.0	2.1	6.0	31.5	61
112M	SAE3-112M-6	2.2	940	5.09	84.3	0.74	2.0	2.1	6.0	37	65
132S	SAE3-132S-6	3.0	960	6.84	85.6	0.74	2.0	2.1	6.2	47	69
132M	SAE3-132M1-6	4.0	960	8.99	86.8	0.74	2.0	2.1	6.8	57	69
132M	SAE3-132M2-6	5.5	960	12.0	88.0	0.75	2.0	2.1	7.1	63	69
160M	SAE3-160M-6	7.5	970	15.4	89.1	0.79	2.0	2.1	6.7	85	73
160L	SAE3-160L-6	11	970	22.0	90.3	0.80	2.0	2.1	6.9	108	73



# Three-phase low-voltage motors with induction rotors

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## IE 3

DIN EN 60034-30-1

400/230 V Y/Δ 50 Hz

690/400 V Y/Δ 50 Hz

Th. cl. F, utilization according to Th. cl. B

Cast iron construction

Frame surface cooled

3000 min<sup>-1</sup> (2-pole)

Frame-size	Type	Rated Output	Rated Speed	Rated Current at 400 V	Efficiency	Power Factor	Starting Torque	Breakdown Torque	Starting Current	Weight	Noise
		P <sub>2</sub> (kW)	n (min <sup>-1</sup> )	I (A)	η <sub>1</sub> (%)	cos φ	T <sub>st</sub> /T <sub>N</sub>	T <sub>M</sub> /T <sub>N</sub>	I <sub>st</sub> /I <sub>N</sub>	m <sub>M</sub> kg	ca. SWL dB(A)
80M	SCE3-80M1-2	0.75	2860	1.64	80.7	0.82	2.2	2.3	7	*)	67
80M	SCE3-80M2-2	1.1	2860	2.31	82.7	0.83	2.2	2.3	7.9	*)	67
90S	SCE3-90S-2	1.5	2870	3.06	84.2	0.84	2.2	2.3	7.9	*)	78
90L	SCE3-90L-2	2.2	2870	4.35	85.9	0.85	2.2	2.3	7.9	*)	78
100L	SCE3-100L-2	3.0	2880	5.71	87.1	0.87	2.2	2.3	8.1	*)	82
112M	SCE3-112M-2	4.0	2890	7.45	88.1	0.88	2.2	2.3	8.1	*)	83
132S	SCE3-132S1-2	5.5	2900	10.1	89.2	0.88	2.2	2.3	8.1	*)	85
132S	SCE3-132S2-2	7.5	2900	13.7	90.1	0.88	2.2	2.3	8.1	*)	85
160M	SCE3-160M1-2	11	2940	19.6	91.2	0.89	2.2	2.3	8.1	*)	87
160M	SCE3-160M2-2	15	2940	26.5	91.9	0.89	2.2	2.3	8.1	*)	87
160L	SCE3-160L-2	18.5	2940	32.5	92.4	0.89	2.2	2.3	8.1	*)	87
180M	SCE3-180M-2	22	2950	38.5	92.7	0.89	2.0	2.3	8.1	*)	88
200L	SCE3-200L1-2	30	2960	52.2	93.3	0.89	2.0	2.3	8.1	*)	90
200L	SCE3-200L2-2	37	2960	64.1	93.7	0.89	2.0	2.3	8.1	*)	90
225M	SCE3-225M-2	45	2970	76.8	94.0	0.90	2.0	2.3	8.1	*)	92
250M	SCE3-250M-2	55	2970	93.5	94.3	0.90	2.0	2.3	8.1	*)	92
280S	SCE3-280S-2	75	2980	127	94.7	0.90	2.0	2.3	8.1	*)	94
280M	SCE3-280M-2	90	2980	152	95.0	0.90	2.0	2.3	8.1	*)	94
315S	SCE3-315S-2	110	2980	185	95.2	0.90	1.8	2.2	7.7	*)	98
315M	SCE3-315M-2	132	2980	222	95.4	0.90	1.8	2.2	7.7	*)	98
315L	SCE3-315L1-2	160	2980	265	95.6	0.91	1.8	2.2	7.7	*)	98
315L	SCE3-315L2-2	200	2980	331	95.8	0.91	1.8	2.2	7.7	*)	98

\*)on request

1500 min<sup>-1</sup> (4-pole)

Frame-size	Type	Rated Output	Rated Speed	Rated Current at 400 V	Efficiency	Power Factor	Starting Torque	Breakdown Torque	Starting Current	Weight	Noise
		P <sub>2</sub> (kW)	n (min <sup>-1</sup> )	I (A)	η <sub>1</sub> (%)	cos φ	T <sub>st</sub> /T <sub>N</sub>	T <sub>M</sub> /T <sub>N</sub>	I <sub>st</sub> /I <sub>N</sub>	m <sub>M</sub> kg	ca. SWL dB(A)
80M	SCE3-80M2-4	0.75	1420	1.75	82.5	0.75	2.2	2.3	6.5	*)	58
90S	SCE3-90S-4	1.1	1420	2.48	84.1	0.76	2.2	2.3	6.5	*)	66
90L	SCE3-90L-4	1.5	1420	3.30	85.3	0.77	2.2	2.3	6.5	*)	66
100L	SCE3-100L1-4	2.2	1440	4.52	86.7	0.81	2.2	2.3	7.5	*)	70
100L	SCE3-100L2-4	3.0	1440	6.02	87.7	0.82	2.2	2.3	7.5	*)	70
112M	SCE3-112M-4	4.0	1450	7.95	88.6	0.82	2.2	2.3	7.5	*)	72
132S	SCE3-132S-4	5.5	1460	10.7	89.6	0.83	2.2	2.3	7.5	*)	75
132M	SCE3-132M-4	7.5	1460	14.3	90.4	0.84	2.2	2.3	7.5	*)	75
160M	SCE3-160M-4	11	1470	20.4	91.4	0.85	2.1	2.3	7.5	*)	77
160L	SCE3-160L-4	15	1470	27.3	92.1	0.86	2.1	2.3	7.5	*)	77
180M	SCE3-180M-4	18.5	1475	33.5	92.6	0.86	2.1	2.3	7.9	*)	80
180L	SCE3-180L-4	22	1475	39.7	93.0	0.86	2.1	2.3	7.9	*)	80
200L	SCE3-200L-4	30	1475	53.8	93.6	0.86	2.1	2.3	7.9	*)	83
225S	SCE3-225S-4	37	1480	66.1	93.9	0.86	2.1	2.3	7.9	*)	84
225M	SCE3-225M-4	45	1480	80.2	94.2	0.86	2.1	2.3	7.9	*)	84
250M	SCE3-250M-4	55	1480	97.6	94.6	0.86	2.1	2.3	7.9	*)	85
280S	SCE3-280S-4	75	1485	129	95.0	0.88	2.1	2.3	7.9	*)	88
280M	SCE3-280M-4	90	1485	155	95.2	0.88	2.1	2.3	7.9	*)	88
315S	SCE3-315S-4	110	1490	187	95.4	0.89	2.1	2.2	7.6	*)	94
315M	SCE3-315M-4	132	1490	224	95.6	0.89	2.1	2.2	7.6	*)	94
315L	SCE3-315L1-4	160	1490	271	95.8	0.89	2.1	2.2	7.6	*)	94
315L	SCE3-315L1-4	200	1490	334	96.0	0.90	2.1	2.2	7.6	*)	94

\*)on request

Subject to modifications

# Three-phase low-voltage motors with induction rotor

## IE 3

DIN EN 60034-30-1

400/230 V Y/Δ 50 Hz

690/400 V Y/Δ 50 Hz

Th. cl. F, utilization according to Th. cl. B

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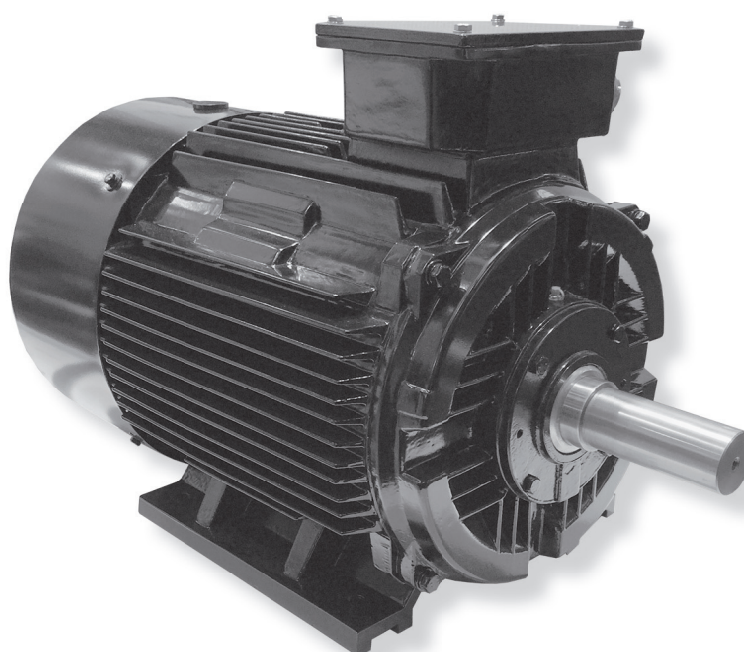
Cast iron construction

Frame surface cooled

1000 min<sup>-1</sup> (6-pole)

Frame- size	Type	Rated Output	Rated Speed	Rated Current at 400 V	Efficiency	Power Factor	Starting Torque	Breakdown Torque	Starting Current	Weight	Noise
		P <sub>2</sub> (kW)	n (min <sup>-1</sup> )	I (A)	η <sub>1</sub> (%)	cos φ	T <sub>st</sub> /T <sub>N</sub>	T <sub>M</sub> /T <sub>N</sub>	I <sub>st</sub> /I <sub>N</sub>	m <sub>M</sub> kg	ca. SWL dB(A)
90S	SCE3-90S-6	0.75	920	1.93	78.9	0.71	2.0	2.1	6.0	*)	63
90L	SCE3-90L-6	1.1	920	2.69	81.0	0.73	2.0	2.1	6.0	*)	63
100L	SCE3-100L-6	1.5	950	3.60	82.5	0.73	2.0	2.1	6.0	*)	64
112M	SCE3-112M-6	2.2	950	5.09	84.3	0.74	2.0	2.1	6.9	*)	70
132S	SCE3-132S-6	3.0	970	6.84	85.6	0.74	2.0	2.1	6.9	*)	73
132M	SCE3-132M1-6	4.0	970	8.99	86.8	0.74	2.0	2.1	6.9	*)	73
132M	SCE3-132M2-6	5.5	970	12.0	88.0	0.75	2.0	2.1	6.9	*)	73
160M	SCE3-160M-6	7.5	975	15.4	89.1	0.79	2.0	2.1	6.9	*)	73
160L	SCE3-160L-6	11	975	22.0	90.3	0.80	2.0	2.1	6.9	*)	73
180L	SCE3-180L-6	15	975	29.3	91.2	0.81	2.0	2.1	7.5	*)	77
200L	SCE3-200L1-6	18.5	975	36.0	91.7	0.81	2.0	2.1	7.5	*)	80
200L	SCE3-200L2-6	22	975	42.5	82.2	0.81	2.0	2.1	7.5	*)	80
225M	SCE3-225M-6	30	980	56.2	92.9	0.83	2.0	2.1	7.5	*)	80
250M	SCE3-250M-6	37	980	68.1	93.3	0.84	2.0	2.1	7.5	*)	82
280S	SCE3-280S-6	45	980	81.6	93.7	0.85	2.0	2.0	7.5	*)	85
280M	SCE3-280M-6	55	980	98.1	94.1	0.86	2.0	2.0	7.5	*)	85
315S	SCE3-315S-6	75	990	136	94.6	0.84	2.0	2.0	7.5	*)	89
315m	SCE3-315M-6	90	990	161	94.9	0.85	2.0	2.0	7.5	*)	89
315L	SCE3-315L1-6	110	990	196	95.1	0.85	2.0	2.0	7.3	*)	89
315L	SCE3-315L2-6	132	990	232	95.4	0.86	2.0	2.0	7.3	*)	89

\*)on request

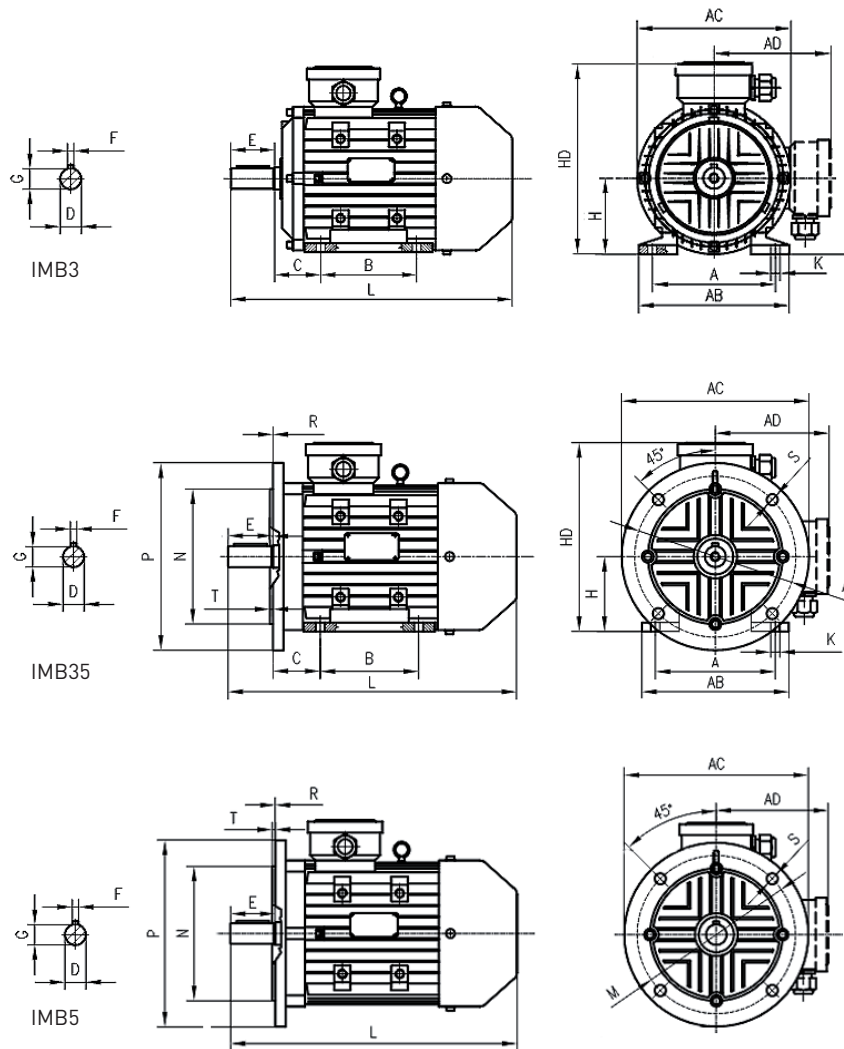


# Three-phase low-voltage motors with induction rotors

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## Mounting and Appearance Dimensions

### Aluminium construction



### IMB3, IMB 35, IMB5

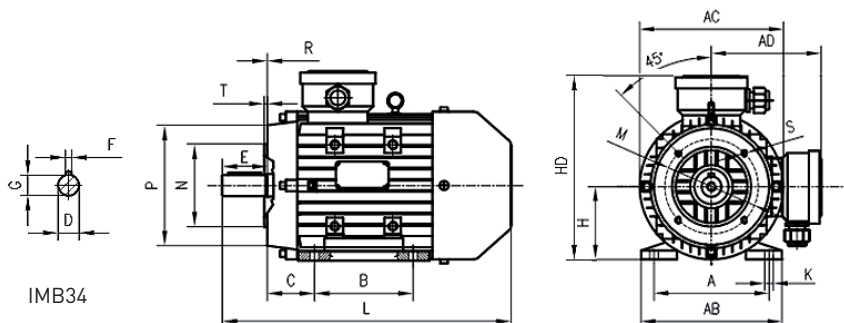
Dimensions in mm

Frame-size	No. of poles	A	B	C	D	E	F	G	H	K	M	N	P	R	S	T	AB	AC	AD	HD	HF	L
80M	2-4-6	125	100	50	19	40	6	15.5	80	10	165	130	200	0	4-12	3.5	156	175	140	220	185	300
90S	2-4-6	140	100	56	24	50	8	20	90	10	165	130	200	0	4-12	3.5	180	195	160	255	195	350
90L	2-4-6	140	125	56	24	50	8	20	90	10	165	130	200	0	4-12	3.5	180	195	160	255	195	380
100L	2-4-6	160	140	63	28	60	8	24	100	12	215	180	250	0	4-14.5	4	190	215	172	270	245	430
112M	2-4-6	190	140	70	28	60	8	24	112	12	215	180	250	0	4-14.5	4	230	240	190	300	265	450
132S	2-4-6	216	140	89	38	80	10	33	132	12	265	230	300	0	4-14.5	4	270	275	210	345	315	470
132M	2-4-6	216	178	89	38	80	10	33	132	12	265	230	300	0	4-14.5	4	270	275	210	345	315	510
160M	2-4-6	254	210	108	42	110	12	37	160	14.5	300	250	350	0	4-18.5	5	305	330	255	420	385	620
160L	2-4-6	254	254	108	42	110	12	37	160	14.5	300	250	350	0	4-18.5	5	305	330	255	420	385	665

# Three-phase low-voltage motors with induction rotors

## Mounting and Appearance Dimensions

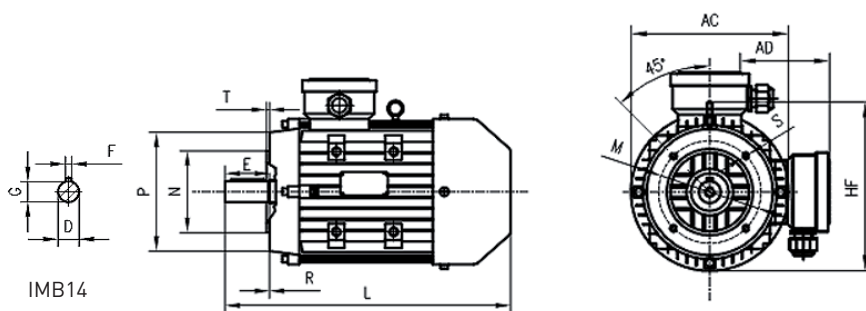
### Aluminium construction



### IMB34

Dimensions in mm

Frame-size	No. of poles	D	E	F	G	M	N	P	R	S	T	AC	AD	HF	L
80M	2-4-6	125	100	50	19	40	6	15.5	80	10	100	80	120	0	M6 3.0 156 175 140 220 300
90S	2-4-6	140	100	56	24	50	8	20	90	10	115	95	140	0	M8 3.0 180 195 160 255 350
90L	2-4-6	140	125	56	24	50	8	20	90	10	115	95	140	0	M8 3.0 180 195 160 255 380
100L	2-4-6	160	140	63	28	60	8	24	100	12	130	110	160	0	M8 3.5 190 215 172 270 430
112M	2-4-6	190	140	70	28	60	8	24	112	12	130	110	160	0	M8 3.5 230 240 190 300 450
132S	2-4-6	216	140	89	38	80	10	33	132	12	165	130	218	0	M10 4 270 275 210 345 470
132M	2-4-6	216	178	89	38	80	10	33	132	12	165	130	218	0	M10 4 270 275 210 345 510



### IMB14

Dimensions in mm

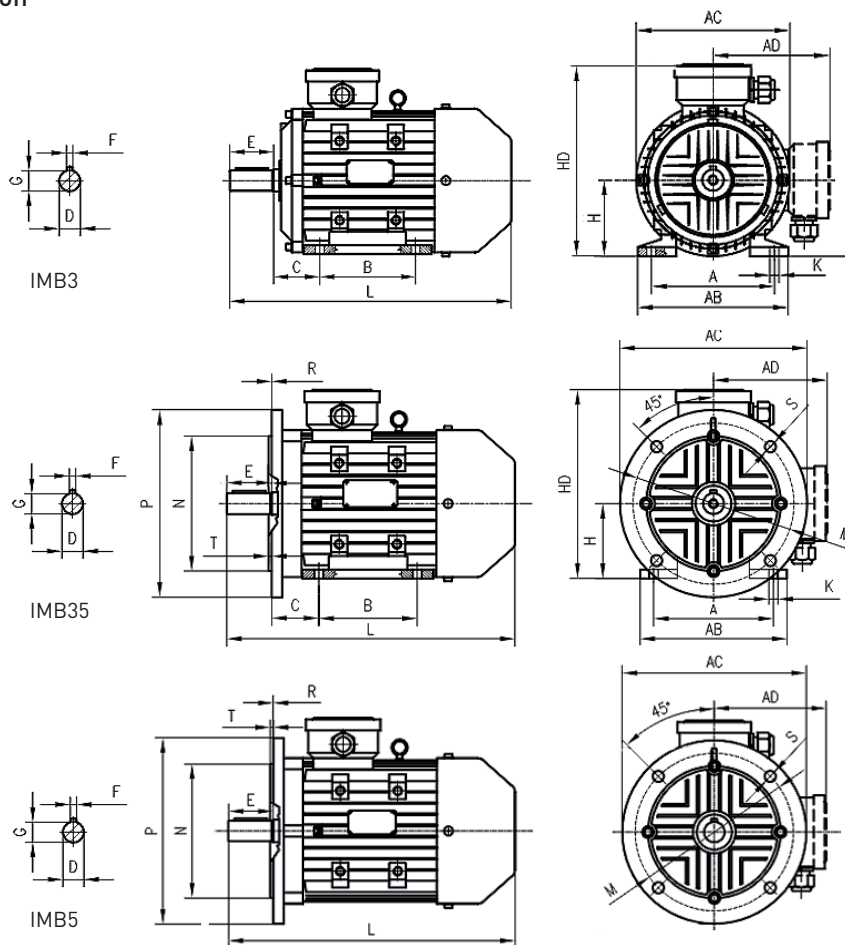
Frame-size	No. of poles	D	E	F	G	M	N	P	R	S	T	AC	AD	HF	L
80M	2-4-6	19	40	6	15.5	100	80	120	0	M6 3.0 175 140 185 300					
90S	2-4-6	24	50	8	20	115	95	140	0	M8 3.0 195 160 195 350					
90L	2-4-6	24	50	8	20	115	95	140	0	M8 3.0 195 160 195 380					
100L	2-4-6	28	60	8	24	130	110	160	0	M8 3.5 215 172 245 430					
112M	2-4-6	28	60	8	24	130	110	160	0	M8 3.5 240 190 265 450					
132S	2-4-6	38	80	10	33	165	130	218	0	M10 4 275 210 315 470					
132M	2-4-6	38	80	10	33	165	130	218	0	M10 4 275 210 315 510					

# Three-phase low-voltage motors with induction rotors

10

## Mounting and Appearance Dimensions

### Cast iron construction



### IMB3, IMB 35, IMB5

Dimensions in mm

Frame-size	No. of poles	A	B	C	D	E	F	G	H	K	M	N	P	R	S	T	AB	AC	AD	HD	L
80M	2-4-6	125	100	50	19	40	6	15,5	80	10	165	130	200	-	4-12	3,5	160	162	136	216	333
90S	2-4-6	140	100	56	24	50	8	20	90	10	165	130	200	-	4-12	3,5	176	168	153	243	348
90L	2-4-6	140	125	56	24	50	8	20	90	10	165	130	200	-	4-12	3,5	176	168	153	243	378
100L	2-4-6	160	140	63	28	60	8	24	100	12	215	180	250	-	4-14,5	4	200	200	171	271	427
112M	2-4-6	190	140	70	28	60	8	24	112	12	215	180	250	-	4-14,5	4	226	216	183	295	426
132S	2-4-6	216	140	89	38	80	10	33	132	12	265	230	300	-	4-14,5	4	262	254	208	340	459
132M	2-4-6	216	178	89	38	80	10	33	132	12	265	230	300	-	4-14,5	4	262	254	208	340	497
160M	2-4-6	254	210	108	42	110	12	37	160	14,5	300	250	350	-	4-18,5	5	314	336	285	445	693
160L	2-4-6	254	254	108	42	110	12	37	160	14,5	300	250	350	-	4-18,5	5	314	336	285	445	738
180M	2-4-6	279	241	121	48	110	14	42,5	180	14,5	300	250	350	-	4-18,5	5	349	376	303	503	751
180L	2-4-6	279	279	121	48	110	14	42,5	180	14,5	300	250	350	-	4-18,5	5	349	362	303	503	781
200L	2-4-6	318	305	133	55	110	16	49	200	18,5	350	300	400	-	4-18,5	5	388	421	323	523	844
225S	2-4-6	356	286	149	60	140	18	53	225	18,5	400	350	450	-	8-18,5	5	431	463	349	574	877
225M	2	356	311	149	55	110	16	49	225	18,5	400	350	450	-	8-18,5	5	431	463	349	574	867
	60				140	18	35	897													
250M	2	406	349	168	60	140	18	53	250	24	500	450	550	-	8-18,5	5	484	505	418	632	1016
	65				58																
280S	2	457	368	190	65	140	18	58	280	24	910	450	550	-	8-18,5	5	542	563	557	698	1031
	75				20			67,5													
280M	2	457	419	190	65	140	18	58	280	24	970	450	550	-	8-18,5	5	542	563	557	698	1092
	75				20			67,5													
315S	2	508	406	216	65	140	170	58	315	28	1125	550	660	-	8-24	6	826	618	557	872	1283
	80				170			71													1313
315M	2	508	457	216	65	140	170	58	315	28	1315	550	660	-	8-24	6	826	620	557	872	1473
	80				170			71													1503
315L	2	508	508	216	65	140	170	58	315	28	1315	550	660	-	8-24	6	826	620	557	872	1473
	80				170			71													1503

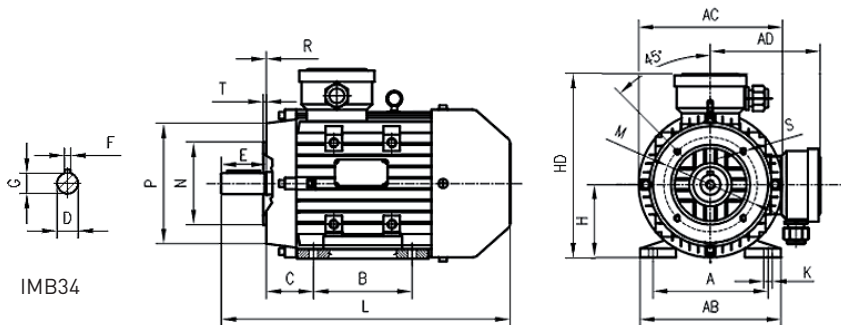
Subject to modifications

Drawings for information purpose only

# Three-phase low-voltage motors with induction rotors

## Mounting and Appearance Dimensions

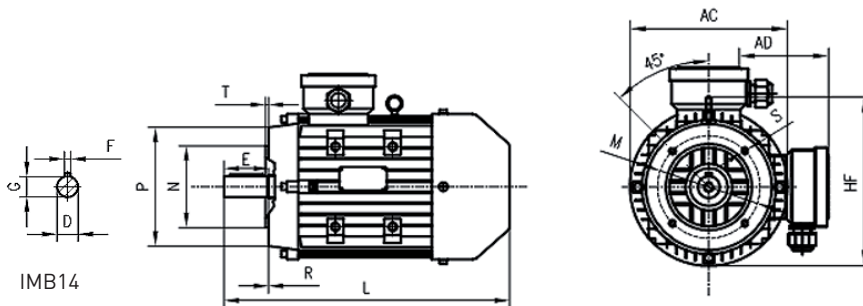
### Cast iron construction



### IMB34

Dimensions in mm

Frame-size	No. of poles	A	B	C	D	E	F	G	H	K	M	N	P	R	S	T	AB	AC	AD	HD	L
80M	2-4-6	125	100	50	19	40	6	15.5	80	10	100	80	120	0	4-6	3.0	160	162	136	216	333
90S	2-4-6	140	100	56	24	50	8	20	90	10	115	95	140	0	4-8	3.0	176	168	153	243	348
90L	2-4-6	140	125	56	24	50	8	20	90	10	115	95	140	0	4-8	3.0	176	168	153	243	378
100L	2-4-6	160	140	63	28	60	8	24	100	12	130	110	160	0	4-8	3.5	200	200	171	271	427
112M	2-4-6	190	140	70	28	60	8	24	112	12	130	110	160	0	4-8	3.5	226	216	183	295	426
132S	2-4-6	2-4-6	216	140	89	80	10	33	132	12	265	230	218	0	4-14.5	4	262	254	208	340	459
132M	2-4-6	2-4-6	216	178	89	80	10	33	132	12	265	230	218	0	4-14.5	4	262	254	208	340	497



### IMB14

Dimensions in mm

Frame-size	No. of poles	D	E	F	G	M	N	P	R	S	T	AC	AD	L
80M	2-4-6	19	40	6	15.5	100	80	120	0	4-6	3.0	162	136	333
90S	2-4-6	24	50	8	20	115	95	140	0	4-8	3.0	168	153	348
90L	2-4-6	24	50	8	20	115	95	140	0	4-8	3.0	168	153	378
100L	2-4-6	28	60	8	24	130	110	160	0	4-8	3.5	200	171	427
112M	2-4-6	28	60	8	24	130	110	160	0	4-8	3.5	216	183	426
132S	2-4-6	38	80	10	33	265	230	218	0	4-14.5	4	254	208	459
132M	2-4-6	38	80	10	33	265	230	218	0	4-14.5	4	254	208	497

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**BROOK  
CROMPTON**

**DLONG 卧龙**

# Technical Documentation



## LOW VOLTAGE THREE PHASE TEFC CAGE MOTORS IE3 Premium Efficiency

IE316EN

## Mission, Vision, Targets



Our electric motors and generators are optimized in accordance with our client's technical and economical requests. Our clients will receive from us, within a very short notice, most advanced and high quality technical solutions of electric motors, generators, electric drives and complete technical solutions of small and middle sized hydroelectric power plants, along with economically most favourable conditions.

We are constantly moving your ideas. We are not just manufacturing motors and generators, we turn ambitious concepts of our clients into advanced, innovative and reliable products, which are unique and future oriented. Our reliability, creativity and flexibility will assist our clients in achieving their goals.

Keeping track with newest technological and technical solutions, our products are being constantly developed and therefore we are improving all our activities aimed to fulfil our client's requests. Our view of the future is oriented towards development of high power and big sized electric motors, hydrogenerators for small and middle sized hydroelectric power plants, as well as electric motors designed for extreme working conditions and most complex technical requirements.

# LOW VOLTAGE TEFC CAGE MOTORS

## IE3 Premium Efficiency

<b>Main characteristics</b> . . . . .	<b>2</b>
---------------------------------------	----------

### Electrical data

Series 3.ZKE 2p=2 . . . . .	4
Series 3.ZKE 2p=4 . . . . .	5
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Series 3.ZKE 2p=8 . . . . .	7

### Motor dimensions

3.ZKE 200 - 3.ZKE 315; IM B3 - IM 1001 . . . . .	8
3.ZKE 200 - 3.ZKE 315; IM B5, V1 - IM 3001, 3011 . . . . .	9
3.ZKIE 315; IM B3 - IM 1001 . . . . .	10
3.ZKIE 315; IM B35 - IM 2001 . . . . .	11
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# LOW VOLTAGE TEFC CAGE MOTORS

## IE3 Premium 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:  $P_L = 0,5\% P$

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

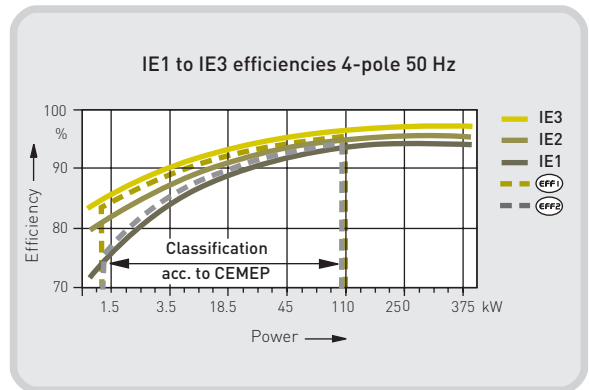
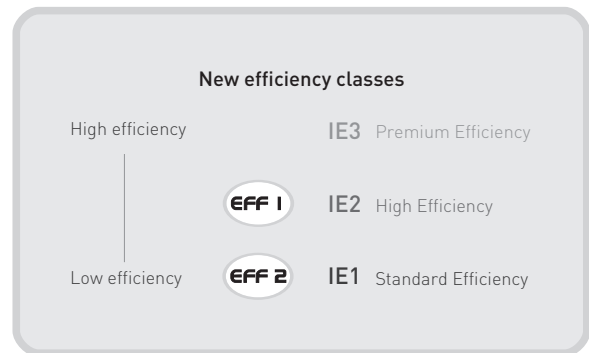
( $P_L$  - additional losses dependent on the work load)

##### 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

<b>SEVER</b>		3~Mot. C.L.F	123456009 -1/10
①	3.ZKE 225 M-6	IMB3 IP55	
②	D/Y 400/690 V	30 kW 50 Hz	} 50 Hz data
③	55/32 A $\cos\phi$ 0,85	985 min <sup>-1</sup>	
④	IE3 - 93,1(100%) - 93,1(75%) - 90,6(50%)		
⑤	S1 460 V	30 kW 60 Hz	} 60 Hz data
⑥	46 A $\cos\phi$ 0,87	1182 min <sup>-1</sup>	
⑦	IE3 - 94,1(100%) - 94,0(75%) - 91,2(50%)		
⑧	IE3 ID# 1234567 340 kg	Made in Serbia	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

## IE3 Premium 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 IE2 and IE3. 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	IE2	93,5	119646	1244
	IE3	94,5	118402	

# LOW VOLTAGE TEFC CAGE MOTORS

## IE3 Premium Efficiency

### 4 Electrical data

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

#### Series 3.ZKE

Type	Output P <sub>n</sub> kW	Full load R.P.M. min <sup>-1</sup>	IE	Efficiency $\eta_n$			Power factor $\cos\phi_n$	Full load Current I <sub>n</sub> A	Rated torque T <sub>n</sub> Nm	Moment of inertia J kgm <sup>2</sup>	Weight kg
				100%P <sub>n</sub>	75%P <sub>n</sub>	50%P <sub>n</sub>					
<b>3000 min<sup>-1</sup></b>											
3.ZKE 200 La-2	30	2960	IE3	93,3	93,2	92,2	0,87	53	97	0,173	205
3.ZKE 200 Lb-2	37	2965	IE3	93,7	93,7	92,8	0,87	66	119	0,208	220
3.ZKE 225 Mb-2	45	2965	IE3	94,0	94,0	93,3	0,88	79	145	0,25	300
3.ZKE 250 Ma-2	55	2972	IE3	94,3	93,8	92,4	0,90	94	177	0,44	400
3.ZKE 280 Sa-2	75	2973	IE3	94,7	94,7	93,8	0,91	129	241	0,74	520
3.ZKE 280 Mb-2	90	2975	IE3	95,0	95,0	94,3	0,92	149	289	0,88	610
3.ZKIE 315 Sa-2	110	2970	IE3	95,2	95,2	94,4	0,91	183	354	1,17	695
3.ZKIE 315 Mb-2	132	2970	IE3	95,4	95,4	94,5	0,91	220	424	1,4	870
3.ZKIE 315 Mc-2	160	2985	IE3	95,6	95,0	93,5	0,90	269	512	2,0	1150
3.ZKIE 315 Md-2	200	2980	IE3	95,8	95,6	94,9	0,91	332	641	2,5	1310
3.ZKIE 315 Lf-2	250	2980	IE3	95,8	95,5	94,7	0,91	414	801	4,7	1460
3.ZKIE 315 Lg-2	315	2982	IE3	95,8	95,5	94,5	0,90	528	1009	5,4	1740
3.ZKIE 355 Ma-2	250	2984	IE3	95,8	95,3	93,8	0,89	424	800	4,7	1550
3.ZKIE 355 Mb-2	315	2983	IE3	95,8	95,8	94,9	0,91	522	1008	5,4	1770
3.ZKIE 355 Mc-2	355	2983	IE3	95,8	95,7	95,2	0,92	582	1137	5,7	1980
3.ZKIE 355 Ld-2	400	2982		96,7			0,92	650	1281	6,5	2550
3.ZKIE 355 Le-2	450	2982		96,7			0,92	730	1441	6,9	2770
3.ZKIE 355 Lf-2	500	2982		96,7			0,92	812	1600	7,5	2910

Bigger motors on request

# LOW VOLTAGE TEFC CAGE MOTORS

## IE3 Premium Efficiency

Electrical data **5**

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

### Series 3.ZKE

Type	Output P <sub>n</sub> kW	Full load R.P.M. min <sup>-1</sup>	IE	Efficiency $\eta_n$			Power factor $\cos\phi_n$	Full load Current I <sub>n</sub> A	Rated torque T <sub>n</sub> Nm	Moment of inertia J kgm <sup>2</sup>	Weight kg
				100%P <sub>n</sub>	75%P <sub>n</sub>	50%P <sub>n</sub>					
				1500 min <sup>-1</sup>							
3.ZKE 200 Lb-4	30	1475	IE3	93,6	93,3	91,8	0,84	55	194	0,320	250
3.ZKE 225 Sa-4	37	1475	IE3	93,9	93,8	92,1	0,84	68	240	0,4	300
3.ZKE 225 Mb-4	45	1475	IE3	94,2	94,1	92,5	0,85	81	291	0,47	330
3.ZKE 250 Ma-4	55	1482	IE3	94,6	94,5	93,5	0,87	97	354	0,74	445
3.ZKE 280 Sa-4	75	1483	IE3	95,0	94,8	93,6	0,85	134	483	1,06	570
3.ZKE 280 Mb-4	90	1483	IE3	95,2	95,0	93,9	0,86	159	580	1,36	630
3.ZKIE 315 Sa-4	110	1485	IE3	95,4	94,9	92,5	0,87	192	707	2,12	800
3.ZKIE 315 Mb-4	132	1485	IE3	95,6	95,4	94,1	0,88	227	849	2,54	910
3.ZKIE 315 Mc-4	160	1485	IE3	95,8	95,7	94,6	0,89	271	1029	3,6	1110
3.ZKIE 315 Md-4	200	1485	IE3	96,0	95,8	94,9	0,90	335	1286	4,3	1250
3.ZKIE 315 Lf-4	250	1486	IE3	96,0	95,8	94,4	0,87	433	1607	5,0	1500
3.ZKIE 315 Lg-4	315	1486	IE3	96,0	95,7	94,1	0,88	539	2016	6,0	1770
3.ZKIE 355 Ma-4	250	1487	IE3	96,0	95,9	95,2	0,88	428	1606	7,6	1750
3.ZKIE 355 Mb-4	315	1489	IE3	96,0	95,7	94,6	0,87	545	2020	9,9	1960
3.ZKIE 355 Mc-4	355	1490	IE3	96,0	96,0	95,1	0,88	607	2275	13,0	2150
3.ZKIE 355 Ld-4	400	1492		96,3			0,90	666	2560	14,5	2545
3.ZKIE 355 Le-4	450	1492		96,4			0,90	748	2880	17	2770
3.ZKIE 355 Lf-4	500	1492		96,5			0,91	822	3200	19	2920

# LOW VOLTAGE TEFC CAGE MOTORS

## IE3 Premium Efficiency

### 6 Electrical data

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

#### Series 3.ZKE

Type	Output P <sub>n</sub> kW	Full load R.P.M. min <sup>-1</sup>	IE	Efficiency $\eta_n$			Power factor $\cos\phi_n$	Full load Current I <sub>n</sub> A	Rated torque T <sub>n</sub> Nm	Moment of inertia J kgm <sup>2</sup>	Weight kg
				100%P <sub>n</sub>	75%P <sub>n</sub>	50%P <sub>n</sub>					
<b>1000 min<sup>-1</sup></b>											
3.ZKE 200 La-6	18,5	983	IE3	91,7	91,9	89,9	0,82	36	180	0,225	230
3.ZKE 200 Lb-6	22	980	IE3	92,2	92,3	90,2	0,81	43	214	0,270	260
3.ZKE 225 Mb-6	30	985	IE3	92,9	93,1	90,6	0,85	55	291	0,656	340
3.ZKE 250 Ma-6	37	987	IE3	93,3	93,2	91,7	0,84	68	358	0,90	400
3.ZKE 280 Sa-6	45	988	IE3	93,7	93,6	91,8	0,86	81	435	1,50	515
3.ZKE 280 Mb-6	55	989	IE3	94,1	93,8	92,1	0,87	97	531	1,82	570
3.ZKIE 315 Sa-6	75	988	IE3	94,6	94,3	92,6	0,87	132	725	2,70	760
3.ZKIE 315 Mb-6	90	988	IE3	94,9	94,8	93,3	0,87	158	870	3,18	870
3.ZKIE 315 Mc-6	110	988	IE3	95,1	95,0	93,1	0,86	194	1063	5,5	1080
3.ZKIE 315 Md-6	132	988	IE3	95,4	95,2	93,0	0,86	232	1276	6,6	1200
3.ZKIE 315 Me-6	160	987	IE3	95,6	95,5	93,9	0,88	275	1548	7,0	1300
3.ZKIE 315 Lf-6	200	990	IE3	95,8	95,4	93,2	0,86	351	1929	7,5	1500
3.ZKIE 315 Lg-6	250	990	IE3	95,8	95,5	93,1	0,86	439	2412	9,3	1750
3.ZKIE 355 Ma-6	200	990	IE3	95,8	95,5	93,9	0,88	343	1929	13,1	1700
3.ZKIE 355 Mb-6	250	990	IE3	95,8	95,7	94,8	0,88	429	2412	14,9	1980
3.ZKIE 355 Mc-6	315	990	IE3	95,8	95,9	95,5	0,88	540	3039	16,5	2240
3.ZKIE 355 Ld-6	355	990	IE3	95,8	96,0	95,6	0,88	609	3424	18	2500
3.ZKIE 355 Le-6	400	990		96,0			0,89	676	3858	20	2700

# LOW VOLTAGE TEFC CAGE MOTORS

## IE3 Premium Efficiency

Electrical data **7**

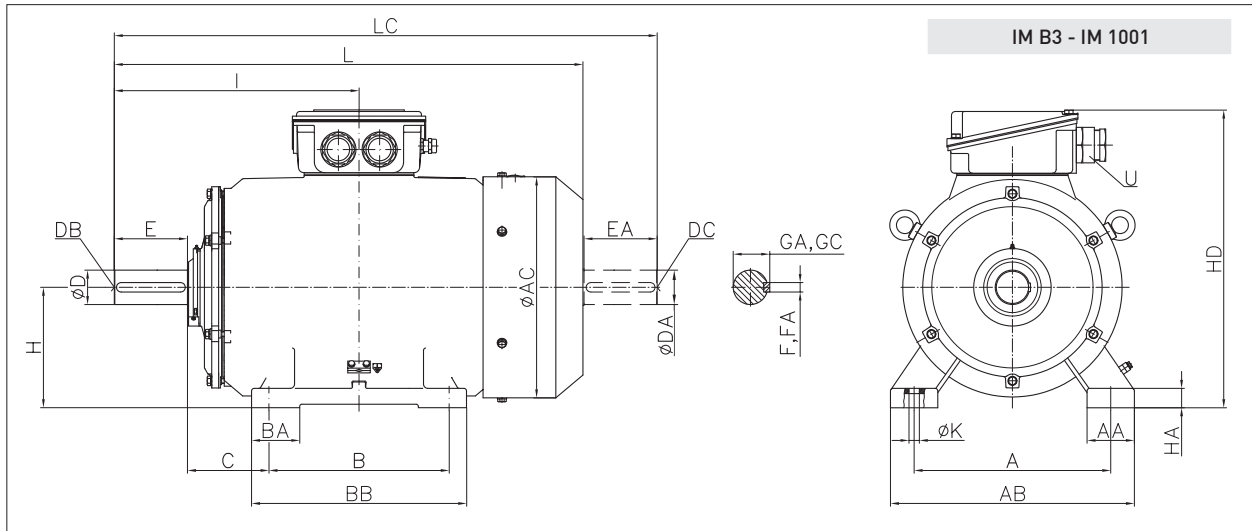
Voltage: 400 V, 50 Hz,  
F/B, IP55

### Series 3.ZKE

Type	Output P <sub>n</sub> kW	Full load R.P.M. min <sup>-1</sup>	Efficiency $\eta_n$			Power factor $\cos\phi_n$	Full load Current I <sub>n</sub> A	Rated torque T <sub>n</sub> Nm	Moment of inertia J kgm <sup>2</sup>	Weight kg
			IE							
			100%P <sub>n</sub>	75%P <sub>n</sub>	50%P <sub>n</sub>					
<b>750 min<sup>-1</sup></b>										
3.ZKE 200 Lb-8	15	725	87,9	87,9	86,2	0,70	35,2	199	0,23	205
3.ZKE 225 Sa-8	18,5	735	89,1	88,9	87,4	0,75	40	240	0,47	245
3.ZKE 225 Mb-8	22	735	90,2	90,1	89,2	0,75	47	286	0,56	285
3.ZKE 250 Ma-8	30	735	91,1	90,8	89,4	0,78	61	390	0,87	370
3.ZKE 280 Sa-8	37	735	91,7	91,6	90,3	0,78	75	481	1,5	495
3.ZKE 280 Mb-8	45	735	92,3	92,1	90,9	0,78	90	585	1,8	580
3.ZKIE 315 Sa-8	55	739	92,7	92,4	91,1	0,81	106	710	2,6	750
3.ZKIE 315 Mb-8	75	740	93,4	93,0	91,6	0,81	143	970	3,3	803
3.ZKIE 315 Mc-8	90	742	93,8	93,6	92,3	0,78	178	1158	6,3	1045
3.ZKIE 315 Md-8	110	742	94,1	94,0	92,6	0,79	214	1416	7,8	1150
3.ZKIE 315 Me-8	132	742	94,5	94,4	93,2	0,79	256	1699	8,9	1270
3.ZKIE 315 Lf-8	160	739	94,7	94,5	93,3	0,81	301	2068	7,5	1450
3.ZKIE 315 Lg-8	200	739	94,9	94,8	93,8	0,80	381	2585	9,3	1720
3.ZKIE 355 Ma-8	160	743	94,7	94,6	93,5	0,82	298	2060	19,2	1825
3.ZKIE 355 Mb-8	200	744	94,9	94,9	93,9	0,82	381	2570	22,4	2090
3.ZKIE 355 Mc-8	250	744	94,9	94,7	93,4	0,82	464	3209	26,2	2440
3.ZKIE 355 Ld-8	315	745	94,9	94,9	93,8	0,82	585	4038	28,0	2810
3.ZKIE 355 Le-8	355	745	94,9	94,9	94,0	0,82	659	4550	30,0	3035

# LOW VOLTAGE TEFC CAGE MOTORS IE3 Premium Efficiency

## 8 Motor dimensions



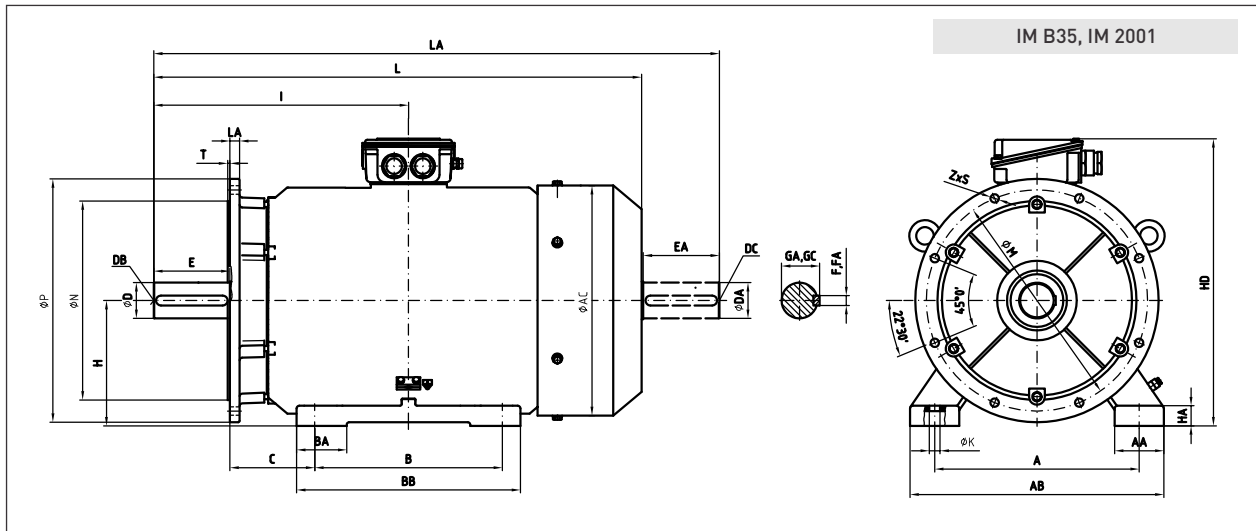
Type	Poles	A	AA	AB	AC	B	BA	BB	C	D	DA	DB	DC	E	EA	F	FA	GA	GC	H	HA	HD	I	K	L	LC	U		
3.ZKE 200	La	2,6	318	80	398	395	305	95	375	133	55	55	M20	M20	110	110	16	16	59	59	200	35	514	395.5	18	764	876		
	Lb	2,4,6,8																											
3.ZKE 225	Sa	4,8	356	90	446	418	286	110	355	60	60			140	140	18	18	64	64					432	805	962			
	Mb	2																											
3.ZKE 250	Ma	2	406	96	506	474	349	95	430	168	60	60	M20	M20	140	140	18	18	64	64	250	40	610	482.5	24	906	1060	M50x1.5	
	Mb	4,6,8																											
3.ZKE 280	Sa	2	457	110	567	510	368	112	450	65	65			18	18	69	69							514	973	1128			
	Mb	4,6,8																											
3.ZKE 280	Ma	2	457	110	567	510	368	112	450	65	65			18	18	69	69								514	973	1128		
	Mb	4,6,8																											

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 IE3 Premium Efficiency

Motor dimensions

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Type	Poles	Flange	A	AA	AB	AC	B	BA	BB	C	H	HA	HD	I	K	L	LA	LC	M	N	P	S	Z	T	U
3.ZKE 200	La	2, 6	FF350	318	80	398	395	305	95	375	133	200	35	514	18	764	20	876	350	300	400	Ø18,5	4	5	
	Lb	2, 4, 6, 8																							
3.ZKE 225	Sa	4, 8	FF400	356	90	446	418	286	355	149	225	35	562	432	18	805	20	962	400	350	450	Ø18,5	8	5	
	Mb	2 4, 6, 8																							
3.ZKE 250	Ma	2 4, 6, 8	FF500	406	96	506	474	349	95	430	168	250	40	610	24	906	22	1060	500	450	550	Ø18,5	8	5	M50x1,5
	Sa	2																							
3.ZKE 280	Sa	4, 6, 8	FF500	457	110	567	510	368	112	190	280	45	659	514	24	973	22	1128	500	450	550	Ø18,5	8	5	
	Mb	2 4, 6, 8																							

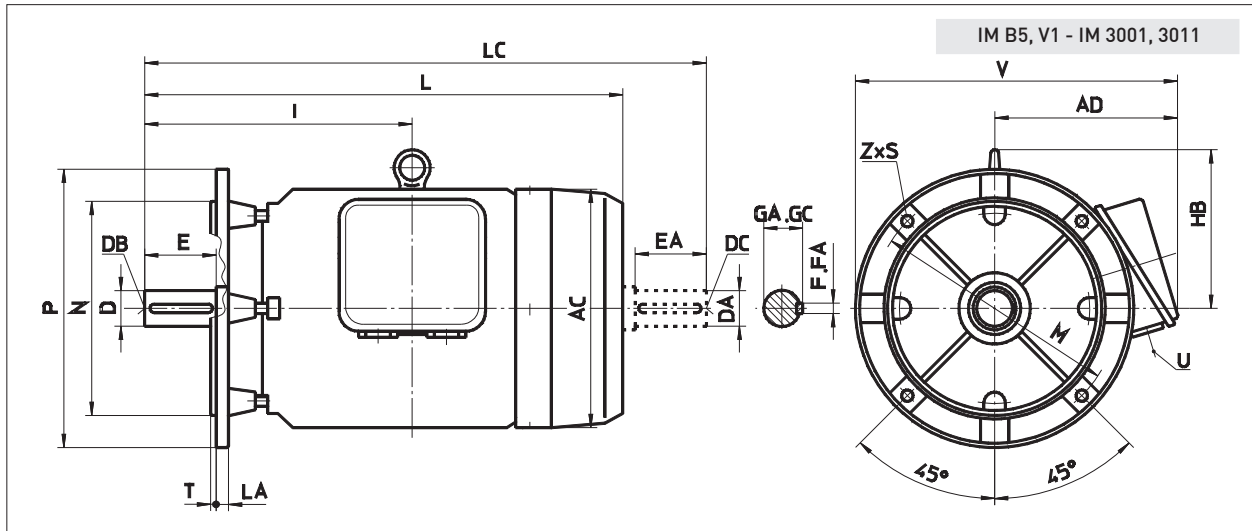
Type	Poles	D	DA	DB	DC	E	EA	F	FA	GA	GC		
3.ZKE 200	La	2, 6	FF350	55	55	M20	M20	110	110	16	16	59	59
	Lb	2, 4, 6, 8											
3.ZKE 225	Sa	4, 8	FF400	60	60	M20	M20	110	110	16	16	59	59
	Mb	2 4, 6, 8											
3.ZKE 250	Ma	2 4, 6, 8	FF500	60	60	M20	M20	140	140	18	18	64	64
	Sa	2											
3.ZKE 280	Sa	4, 6, 8	FF500	65	65	M20	M20	140	140	18	18	69,5	79,5
	Mb	2 4, 6, 8											

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

## IE3 Premium Efficiency

### 10 Motor dimensions

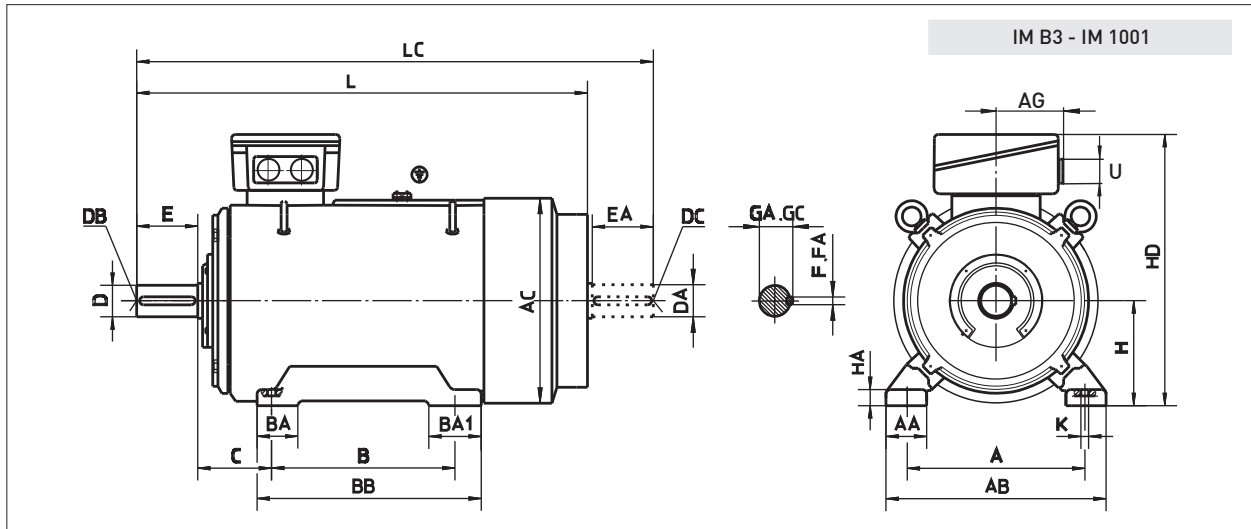


Type	Poles	Flange	AC	AD	D	DA	DB	DC	E	EA	F	FA	GA	GC	HB	I	L	LA	LC	M	N	P	S	Z	T	V	U	
3.ZKE 200	La	2,6	FF 350	395	314	55	55	M20	M20	110	110	16	16	59	59	260	395.5	764	20	876	350	300	400	Ø18.5	4	5	514	
	Lb	2,4,6,8																										
3.ZKE 225	Sa	4,8	FF 400	418	337	60	60	M20	M20	110	110	16	18	64	64	275	432	805	20	927	400	350	450	Ø18.5	8	5	562	
	Mb	2, 4,6,8																										
3.ZKE 250	Ma	2	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
		4,6,8																										
3.ZKE 280	Sa	2	FF 500	510	379	65	65	M20	M20	140	140	18	18	69	69	327	514	973	22	1128	500	450	550	Ø18.5	8	5	654	
		4,6,8																										
	Mb	2																										
		4,6,8																										

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

## IE3 Premium Efficiency



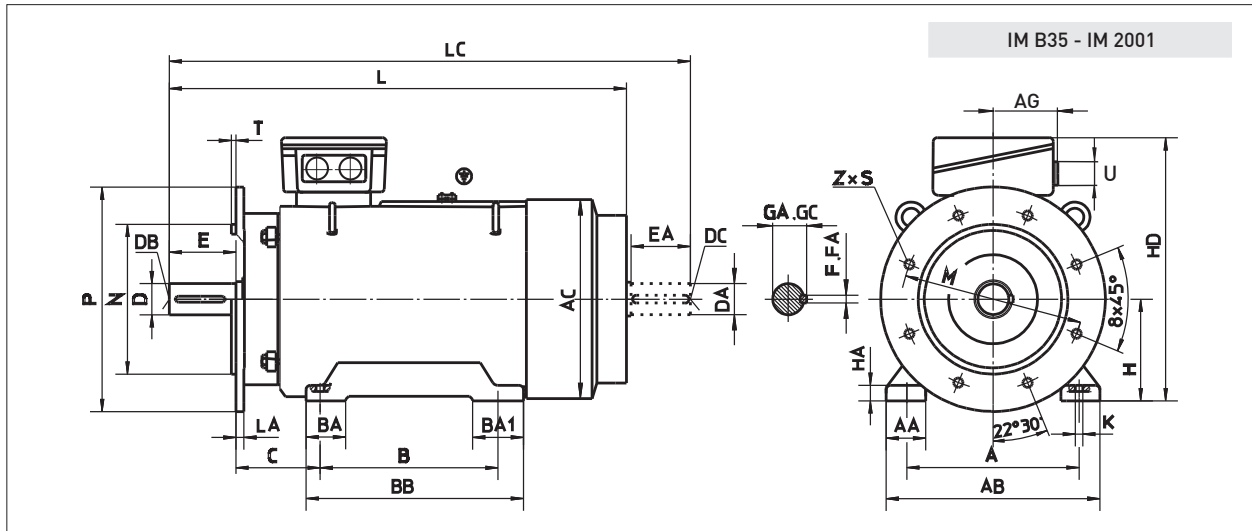
Type	Poles	A	AA	AB	AC	AG	B	BA	BA1	BB	C	D	DA	DB	DC	E	EA	F	FA	GA	GC	H	HA	HD	K	L	LC	U			
3.ZKIE 315	Sa	2	<b>508</b>	120	633	655	403	<b>406</b>	-	120	120	500	<b>216</b>	65	65			<b>140</b>	140	<b>18</b>	18	<b>69</b>	69					1176	1326	2xM63x1.5	
		4,6,8												<b>80</b>	80	M20	M20	<b>170</b>	170	<b>22</b>	22	<b>85</b>	85			<b>315</b>	40	850	<b>Ø28</b>		1206
	Mb, Mc, Md	2	<b>508</b>	120	633	655	403	<b>457</b>	<b>508</b>	120	152	588	<b>216</b>	65	65	M20	M20	<b>140</b>	140	<b>18</b>	18	<b>69</b>	69					1276	1426		
		4,6,8												<b>90</b>	90	M24	M24	<b>170</b>	170	<b>25</b>	25	<b>95</b>	95			<b>315</b>	40	850	<b>Ø28</b>		1306
	Le, Lf	2	<b>560</b>	120	680	655	-	<b>560</b>	<b>630</b>	120	220	780	<b>216</b>	65	65	M20	M20	<b>140</b>	140	<b>18</b>	18	<b>69</b>	69					1587	1732		
		4,6,8												<b>90</b>	90	M24	M24	<b>170</b>	170	<b>25</b>	25	<b>95</b>	95			<b>315</b>	40	850	<b>Ø28</b>		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

## IE3 Premium Efficiency

### 12 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	
3.ZKIE 315	Sa	2	FF600	<b>508</b>	120	633	655	403	<b>406</b>	-	120	120	500	<b>216</b>	315	40	850	<b>Ø28</b>	1176	1326	600	550	660	24	8	6	
		4,6,8																	1206	1386							
	Mb, Mc, Md	2	FF 600	<b>508</b>	120	633	655	403	<b>457</b>	<b>508</b>	120	152	588	<b>216</b>	315	40	850	<b>Ø28</b>	1276	1426	600	550	660	Ø24	8	6	2xM63x1,5
		4,6,8																	1306	1486							
	Le, Lf	2	FF 740	<b>560</b>	120	680	655	-	<b>560</b>	<b>630</b>	120	220	780	<b>216</b>	315	40	850	<b>Ø28</b>	1587	1732	740	680	800	Ø24	8	6	
Lf, Lg	4,6,8																	1617	1792								

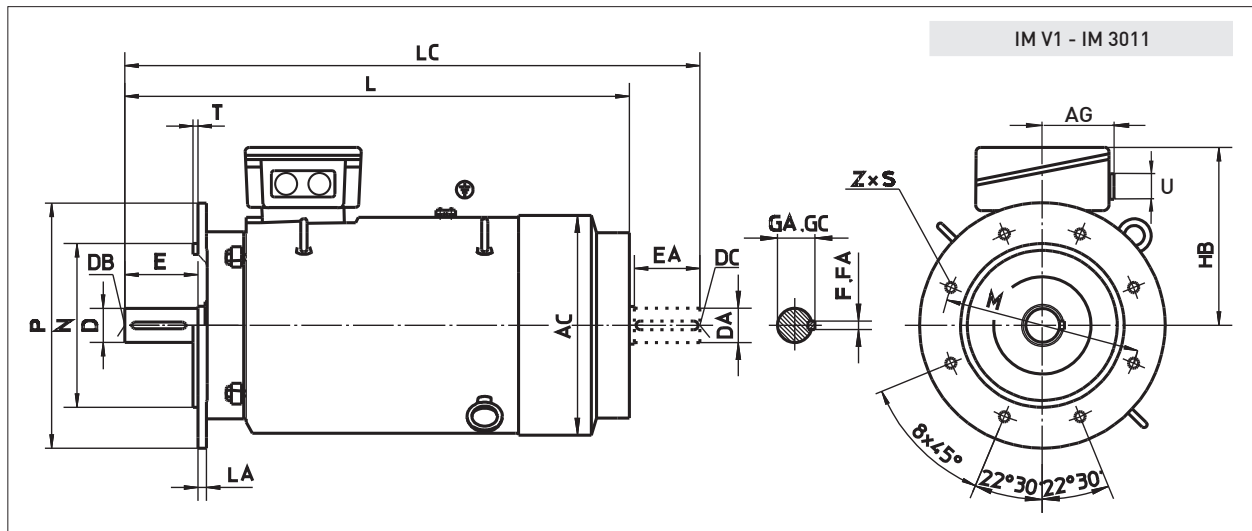
Type	Poles	D	DA	DB	DC	E	EA	F	FA	GA	GC
3.ZKIE 315	Sa	2	<b>65</b>	65		<b>140</b>	140	<b>18</b>	18	<b>69</b>	69
		4,6,8	<b>80</b>	80	M20 M20	<b>170</b>	170	<b>22</b>	22	<b>85</b>	85
	Mb, Mc, Md	2	<b>65</b>	65	M20 M20	<b>140</b>	140	<b>18</b>	18	<b>69</b>	69
		4,6,8	<b>90</b>	90	M24 M24	<b>170</b>	170	<b>25</b>	25	<b>95</b>	95
	Le, Lf	2	<b>65</b>	65	M20 M20	<b>140</b>	140	<b>18</b>	18	<b>69</b>	69
Lf, Lg	4,6,8	<b>90</b>	90	M24 M24	<b>170</b>	170	<b>25</b>	25	<b>95</b>	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 IE3 Premium Efficiency

Motor dimensions

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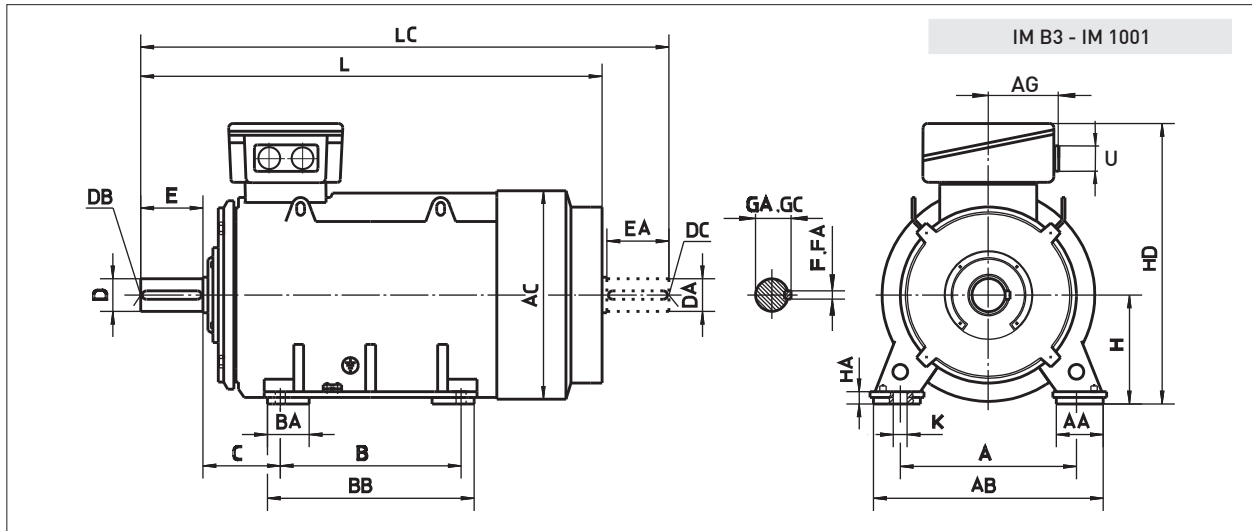
Type	Pole	Flange	AC	AG	D	DA	DB	DC	E	EA	F	FA	GA	GC	HB	L	LA	LC	M	N	P	S	Z	T	U
3.ZKIE 315	Sa	2	FF600	655	403	<b>65</b>	65	M20	M20	<b>140</b>	140	<b>18</b>	18	<b>69</b>	69	1176	25	1326	<b>600</b>	<b>550</b>	<b>660</b>	<b>24</b>	<b>8</b>	<b>6</b>	2xM63x1,5
		4,6,8				<b>80</b>	80			<b>170</b>	170	<b>22</b>	22	<b>85</b>	85	1206		1386							
	2	FF 600	655	403	<b>65</b>	65	M20	M20	<b>140</b>	140	<b>18</b>	18	<b>69</b>	69	1276	25	1426	<b>600</b>	<b>550</b>	<b>660</b>	<b>Ø24</b>	<b>8</b>	<b>6</b>		
	4,6,8				<b>90</b>	90	M24	M24	<b>170</b>	170	<b>25</b>	25	<b>95</b>	95	1306		1486								
Le, Lf	2	FF 740	655	-	<b>65</b>	65	M20	M20	<b>140</b>	140	<b>18</b>	18	<b>69</b>	69	1587	25	1732	<b>740</b>	<b>680</b>	<b>800</b>	<b>Ø24</b>	<b>8</b>	<b>6</b>	2xM63x1,5	
	4,6,8				<b>90</b>	90	M24	M24	<b>170</b>	170	<b>25</b>	25	<b>95</b>	95	1617		1792								

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

## IE3 Premium Efficiency

### 14 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	
3.ZKIE 355	Ma, Mb, Mc	2	610				560	150	660	254	75	75	M20	M20	140	140	20	20	79,5	79,5						1493	1648	2xM75x1,5
	Ld, Le	4, 6, 8	150	780	750	403	800	220	980	254	100	100	M24	M24	210	210	28	28	106	106	355	35	945			1760	1980	
	Lf	4	630																							1890	2110	2xM80x1,5
																										2060	2280	

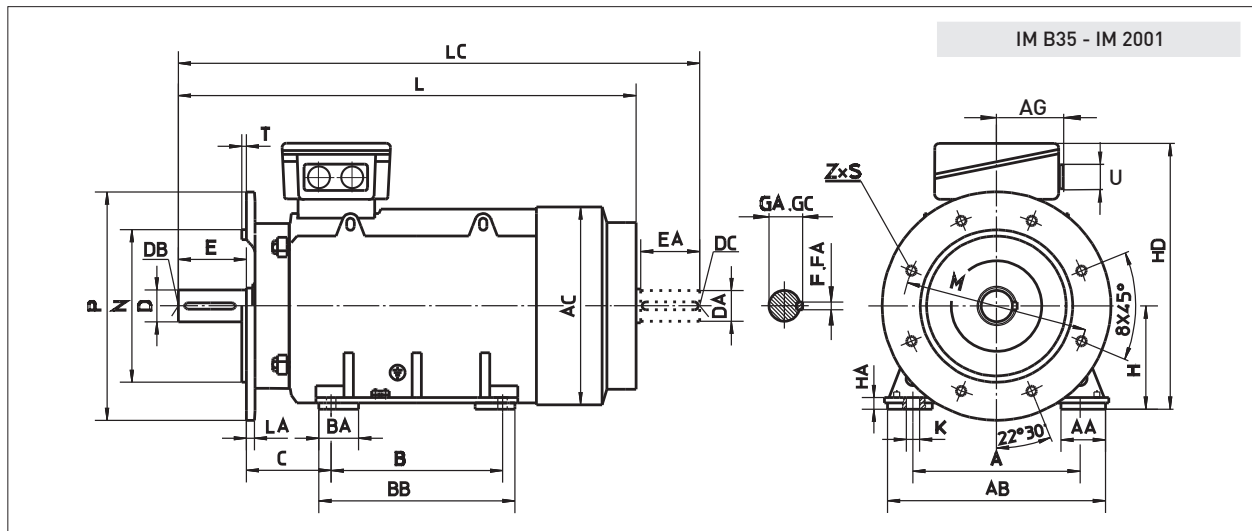
The fixing dimensions given in thick figures are obligatory according to the recommendation of IEC. All other technical data and dimensions during the future development of motors may undergo some changes and therefore they can be considered as obligatory after our confirmation only. All dimensions are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

# LOW VOLTAGE TEFC CAGE MOTORS

## IE3 Premium Efficiency

Motor dimensions

15



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	
3.ZKIE 355	Ma, Mb, Mc	2	610					560	150	660	254					Ø28	1493	1648								2xM75x1,5
	Ld, Le	4, 6, 8	FF 740	150	780	750	403					355	35	945		25		740	680	800	Ø24	8	6			
	Lf	4	630					630	220	800	254					Ø35	1890	2110								2xM80x1,5
																	2060	2280								

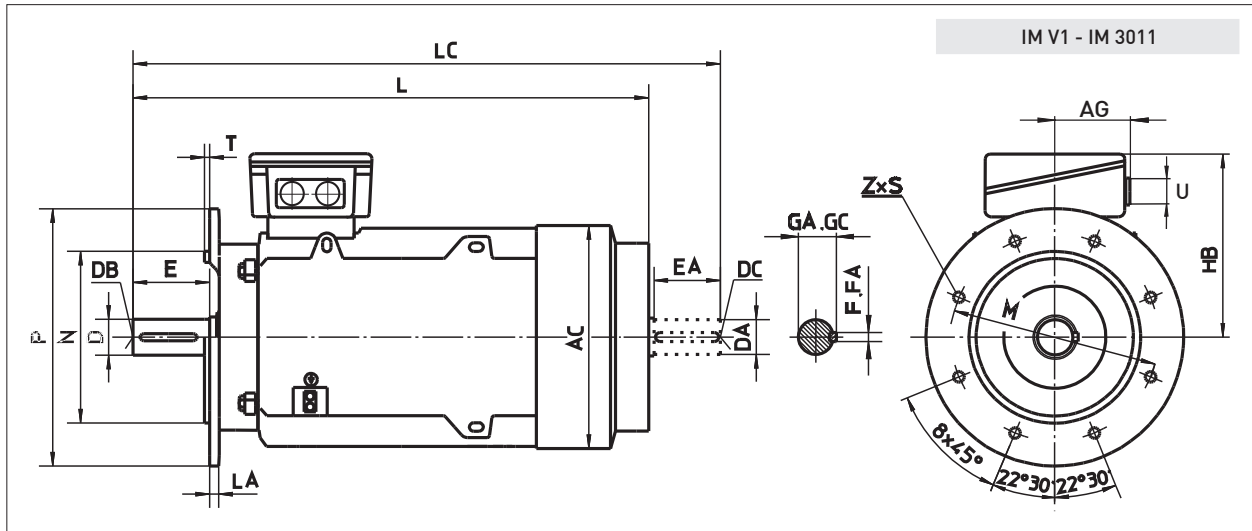
Type	Poles	D	DA	DB	DC	E	EA	F	FA	GA	GC	
3.ZKIE 355	Ma, Mb, Mc	2	75	75	M20	M20	140	140	20	20	79.5	79.5
	Ld, Le	4, 6, 8	100	100	M24	M24	210	210	28	28	106	106
	Lf	4										

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

## IE3 Premium Efficiency

### 16 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	
3.ZKIE 355	Ma, Mb, Mc	2			<b>75</b>	75	M20	M20	<b>140</b>	140	<b>20</b>	20	<b>79.5</b>	79.5		1493		1648								2xM75x1.5
	Ld, Le	4, 6, 8	FF 740	755	403										590	25			<b>740</b>	<b>680</b>	<b>800</b>	Ø24	8	6		
	Lf	4				<b>100</b>	100	M24	M24	<b>210</b>	210	<b>28</b>	28	<b>106</b>	106											2xM80x1.5

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.

# 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 \_\_\_\_\_  $J_m$  \_\_\_\_\_  $kgm^2$

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 ot \_\_\_\_\_

## 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:

**ATB SEVER DOO**

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Serbia

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[sever@rs.atb-motors.com](mailto:sever@rs.atb-motors.com)



# Technical Documentation



LOW VOLTAGE THREE PHASE TEFC CAGE MOTORS  
**IE2 High Efficiency**

## Mission, Vision, Targets



Our electric motors and generators are optimized in accordance with our client's technical and economical requests. Our clients will receive from us, within a very short notice, most advanced and high quality technical solutions of electric motors, generators, electric drives and complete technical solutions of small and middle sized hydroelectric power plants, along with economically most favourable conditions.

We are constantly moving your ideas. We are not just manufacturing motors and generators, we turn ambitious concepts of our clients into advanced, innovative and reliable products, which are unique and future oriented. Our reliability, creativity and flexibility will assist our clients in achieving their goals.

Keeping track with newest technological and technical solutions, our products are being constantly developed and therefore we are improving all our activities aimed to fulfil our client's requests. Our view of the future is oriented towards development of high power and big sized electric motors, hydrogenerators for small and middle sized hydroelectric power plants, as well as electric motors designed for extreme working conditions and most complex technical requirements.

# LOW VOLTAGE TEFC CAGE MOTORS

## IE2 High Efficiency

<b>Main characteristics</b> . . . . .	<b>2</b>
---------------------------------------	----------

### Electrical data

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

### Motor dimensions

ZKE 160 - ZKE 315; IM B3 - IM 1001 . . . . .	7
ZKE 160 - 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:  $P_{LL} = \text{individual measuring}$

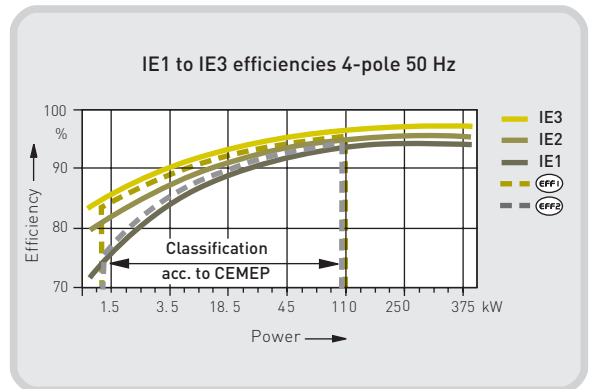
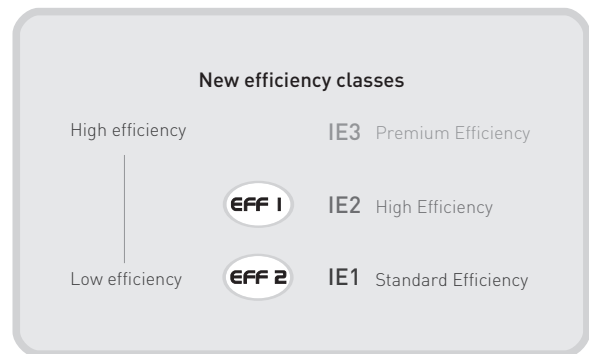
( $P_{LL}$  - additional losses dependent on the work load)

#### 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

<b>ATB SEVER</b>		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 <sup>-1</sup>	} 60 Hz data
④	S1 460 V	30 kW 60 Hz	
⑤	48,6 A cos φ 0,84	1170 min <sup>-1</sup>	
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

### Main characteristics 3

#### 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 <sub>n</sub> kW	Full load R.P.M. min <sup>-1</sup>	IE	Efficiency $\eta_n$			Power factor $\cos\phi_n$	Full load Current I <sub>n</sub> A	Rated torque M <sub>n</sub> Nm	Moment of inertia J kgm <sup>2</sup>	Weight kg
				100%P <sub>n</sub>	75%P <sub>n</sub>	50%P <sub>n</sub>					
<b>3000 min<sup>-1</sup></b>											
ZKE 160 Ma-2	11	2910	IE2	89,4	89,3	87,2	0,87	20,4	36	0,046	126
ZKE 160 Mb-2	15	2910	IE2	90,3	90,2	89,1	0,88	27,2	49	0,061	140
ZKE 160 Lc-2	18,5	2910	IE2	90,9	90,8	89,0	0,88	33,4	61	0,071	150
ZKE 180 Ma-2	22	2920	IE2	91,3	91,3	90,2	0,88	39,5	72	0,125	190
ZKE 200 La-2	30	2935	IE2	92,0	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	93,2	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	95,0	94,9	93,3	0,93	327	642	2,5	1290
ZKIE 315 Lf-2	250	2977	IE2	95,0	94,8	93,0	0,92	413	802	4,7	1450
ZKIE 315 Lg-2	315	2982	IE2	95,0	94,7	92,6	0,92	520	1009	5,4	1720
ZKIE 355 Ma-2	250	2977	IE2	95,0	94,8	93,8	0,92	413	802	4,7	1700
ZKIE 355 Mb-2	315	2982	IE2	95,0	95,0	94,1	0,92	520	1009	5,4	1920
ZKIE 355 Mc-2	355	2982	IE2	95,0	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 <sub>n</sub> kW	Full load R.P.M. min <sup>-1</sup>	IE	Efficiency $\eta_n$			Power factor cos $\phi_n$	Full load Current I <sub>n</sub> A	Rated torque M <sub>n</sub> Nm	Moment of inertia J kgm <sup>2</sup>	Weight kg
				100%P <sub>n</sub>	75%P <sub>n</sub>	50%P <sub>n</sub>					
1500 min <sup>-1</sup>											
ZKE 160 Mb-4	11	1440	IE2	89,8	89,8	87,9	0,83	21,3	73	0,069	130
ZKE 160 Lc-4	15	1440	IE2	90,6	90,4	88,9	0,82	29,1	99	0,091	145
ZKE 180 Ma-4	18,5	1460	IE2	91,2	91,1	89,4	0,82	35,7	121	0,24	205
ZKE 180 Lb-4	22	1460	IE2	91,6	91,4	89,8	0,81	42,8	144	0,28	225
ZKE 200 Lb-4	30	1470	IE2	92,3	92,3	90,0	0,84	56	195	0,32	240
ZKE 225 Sa-4	37	1470	IE2	92,7	92,6	90,3	0,83	69	240	0,40	290
ZKE 225 Mb-4	45	1475	IE2	93,1	93,0	92,2	0,85	82	292	0,47	320
ZKE 250 Ma-4	55	1480	IE2	93,5	93,6	92,2	0,85	100	355	0,74	430
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 <sub>n</sub> kW	Full load R.P.M. min <sup>-1</sup>	Efficiency $\eta_n$			Power factor $\cos\phi_n$	Full load Current I <sub>n</sub> A	Rated torque M <sub>n</sub> Nm	Moment of inertia J kgm <sup>2</sup>	Weight kg	
			IE	100%P <sub>n</sub>	75%P <sub>n</sub>						50%P <sub>n</sub>
1000 min <sup>-1</sup>											
ZKE 160 Mb-6	7,5	950	IE2	87,2	87,1	85,7	0,77	16,1	75	0,102	125
ZKE 160 Lc-6	11	950	IE2	88,7	88,6	87,1	0,78	23	111	0,14	145
ZKE 180 Lb-6	15	960	IE2	89,7	89,7	88,5	0,82	29,5	149	0,37	220
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	0,86	627	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

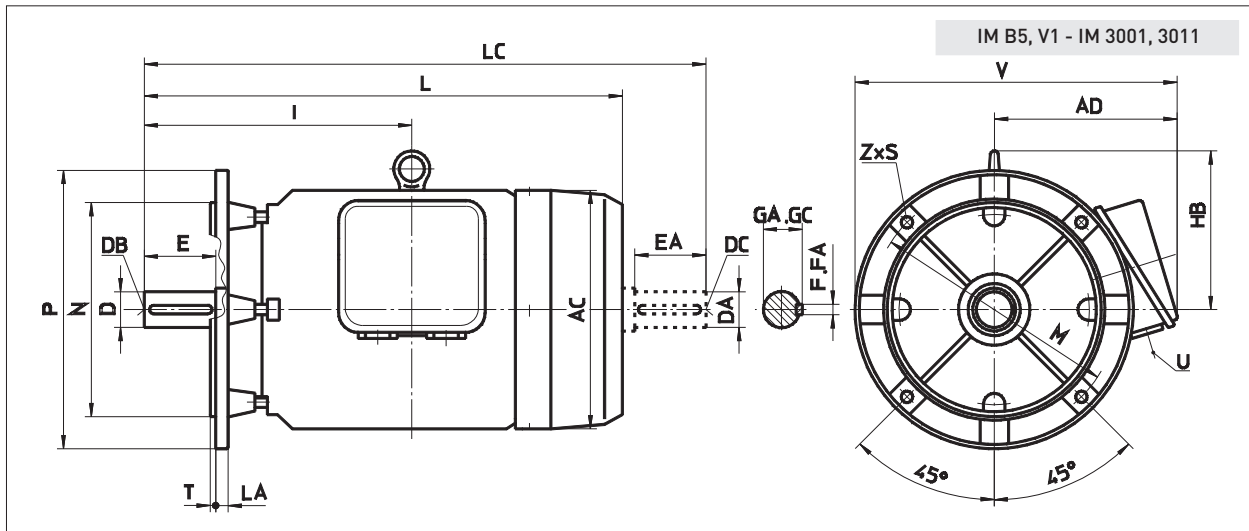
With FS 400 and 450 the current data is given for 690 V



# LOW VOLTAGE TEFC CAGE MOTORS

## IE2 High Efficiency

### 8 Motor dimensions



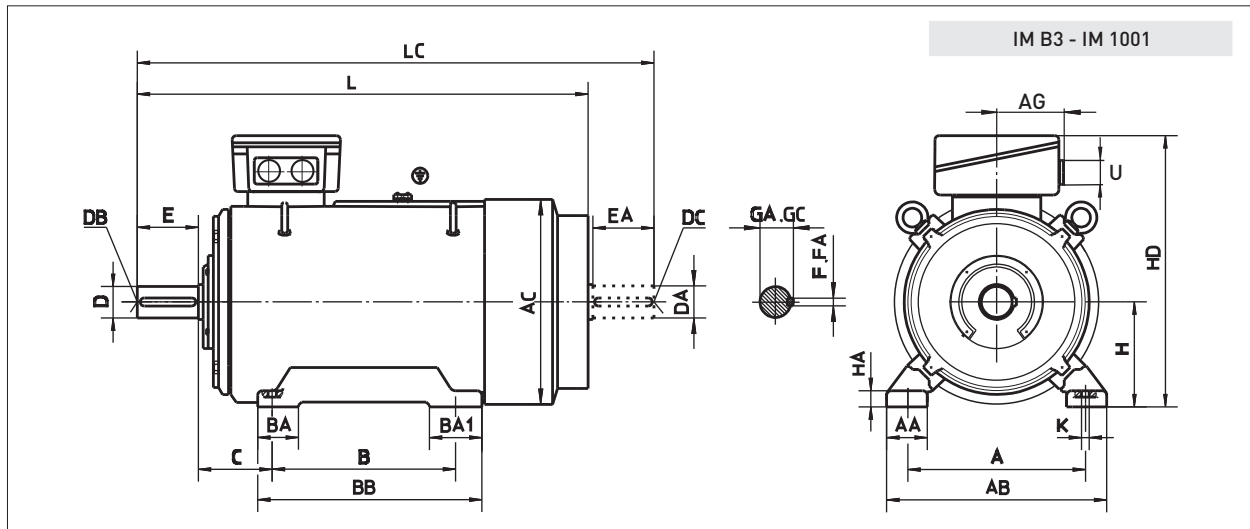
Type	Poles	Flange	AC	AD	D	DA	DB	DC	E	EA	F	FA	GA	GC	HB	I	L	LA	LC	M	N	P	S	Z	T	V	U	
ZKE 160	Ma	2																										
	Mb	2,4,6	FF 300	318	258	42	42	M16	M16	110	110	12	12	45	45	208	323	589	20	709	300	250	350	Ø18.5	4	4	421	M40 x 1.5
	Lc	2,4,6															345	633	753									
ZKE 180	Ma	2,4	FF 300	354	278	48	48	M16	M16	110	110	14	14	51,5	51,5	237	351.5	652	20	772	300	250	350	Ø18.5	4	5	435	M40 x 1.5
	Lb	4,6															370.5	690	810									
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	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
		4,6				60	60			140	140	18	18	64	64		444.5	830		987								
ZKE 250	Ma	2	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
	4,6				65	65			140	140	18	18	69	69														
ZKE 280	Sa	2			65	65			18	18	18	18	69	69		514	973		1128									
	Mb	4,6	FF 500	510	379	75	75	M20	M20	140	140	20	20	79,5	79,5	327			22		500	450	550	Ø18.5	8	5	654	M50 x 1.5
		2				65	65			140	140	18	18	69	69													
ZKIE 315	Sa	2			65	65			140	140	18	18	69	69		559	1072		1232									
	Mb	4,6	FF 600	562	427	80	80	M20	M20	170	170	22	22	85	85	345	589	1102	25	1292	600	550	660	Ø24	8	6	757	M63 x 1.5
		2				65	65			140	140	18	18	69	69		584.5	1123		1283								
	4,6				80	80			170	170	22	22	85	85		614.5	1153		1328									

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

9



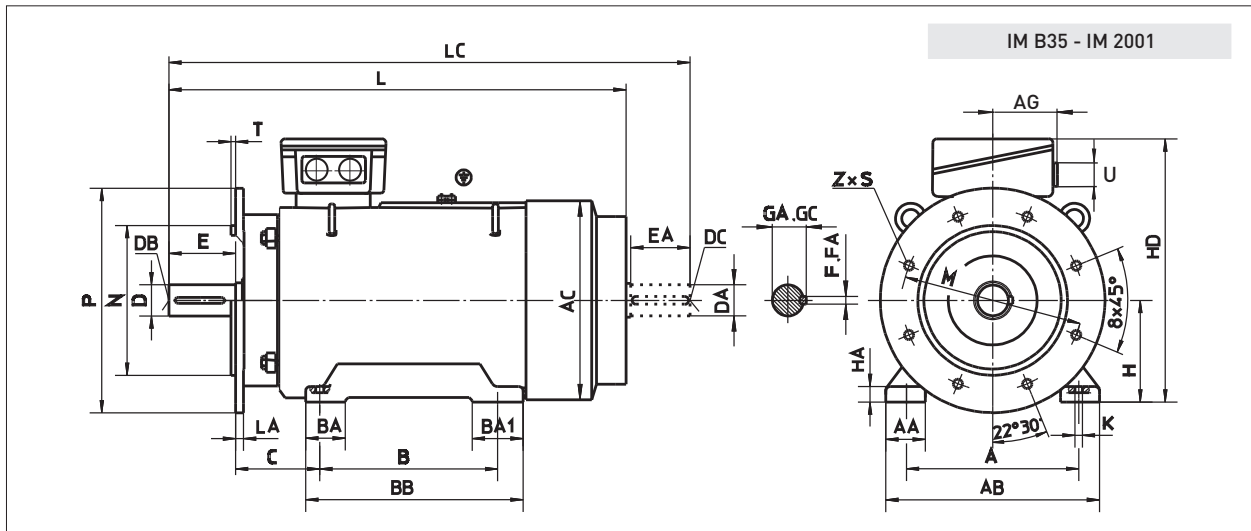
Type	Poles	A	AA	AB	AC	AG	B	BA	BA1	BB	C	D	DA	DB	DC	E	EA	F	FA	GA	GC	H	HA	HD	K	L	LC	U		
ZKIE 315	Mc, Md	2	<b>508</b>	125	633	626	403	<b>457</b>	<b>508</b>	101	152	588	<b>216</b>	65	65	M20	M20	<b>140</b>	140	<b>18</b>	18	<b>69</b>	69	315	40	850	<b>Ø28</b>	1238	1393	2xM63x1.5
	Mc, Md, Me	4, 6												90	90	M24	M24	<b>170</b>	170	<b>25</b>	25	<b>95</b>	95					1306	1486	
	Le, Lf	2	<b>560</b>	120	680	655	-	<b>560</b>	<b>630</b>	120	200	780	<b>216</b>	65	65	M20	M20	<b>140</b>	140	<b>18</b>	18	<b>69</b>	69	315	40	850	<b>Ø28</b>	1587	1732	
	Lf, Lg	4, 6												90	90	M24	M24	<b>170</b>	170	<b>25</b>	25	<b>95</b>	95					1617	1792	

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	<b>508</b>	125	633	626	403	<b>457</b>	<b>508</b>	101	152	588	<b>216</b>	315	45	890	<b>Ø28</b>	25	1268	1453	600	550	660	Ø24	8	6
	Le, Lf	2															1587	1732									
	Lf, Lg	4, 6	FF 740	<b>560</b>	120	680	655	-	<b>560</b>	<b>630</b>	120	200	780	<b>216</b>	315	40	850	<b>Ø28</b>	25	1617	1792	740	680	800	Ø24	8	6

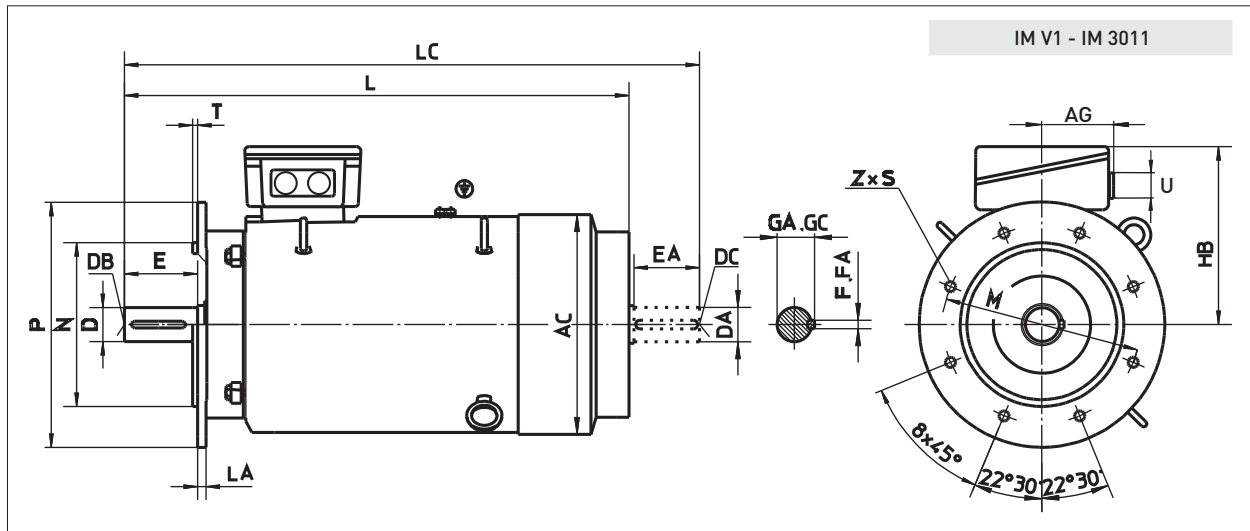
Type	Poles	D	DA	DB	DC	E	EA	F	FA	GA	GC	
ZKIE 315	Mc, Md	2	<b>65</b>	65	M20	M20	<b>140</b>	140	<b>18</b>	18	<b>69</b>	69
	Mc, Md, Me	4, 6	<b>90</b>	90	M24	M24	<b>170</b>	170	<b>25</b>	25	<b>95</b>	95
	Le, Lf	2	<b>65</b>	65	M20	M20	<b>140</b>	140	<b>18</b>	18	<b>69</b>	69
	Lf, Lg	4, 6	<b>90</b>	90	M24	M24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



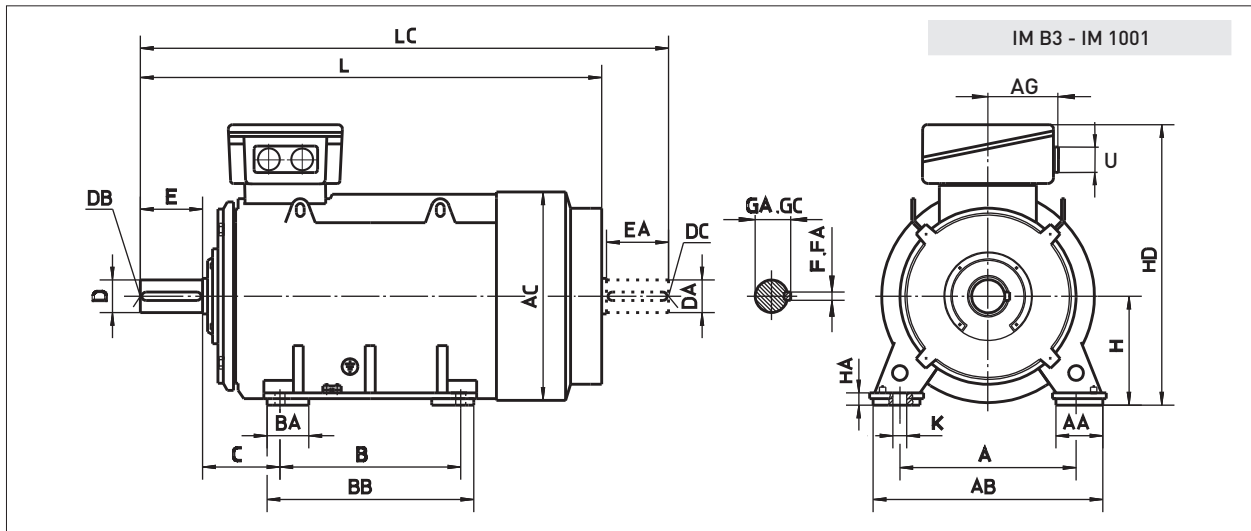
Type	Pole	Flange	AC	AG	D	DA	DB	DC	E	EA	F	FA	GA	GC	HB	L	LA	LC	M	N	P	S	Z	T	U
ZKIE 315	Mc, Md	2	FF 600	626	403	65	65	M20	M20	140	140	18	18	69	69	1238	25	1393	600	550	660	Ø24	8	6	2xM63x1.5
	Mc, Md, Me	4, 6				90	90	M24	M24	170	170	25	25	95	95										
	Le, Lf	2	FF 740	655	-	65	65	M20	M20	140	140	18	18	69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

### 12 Motor dimensions



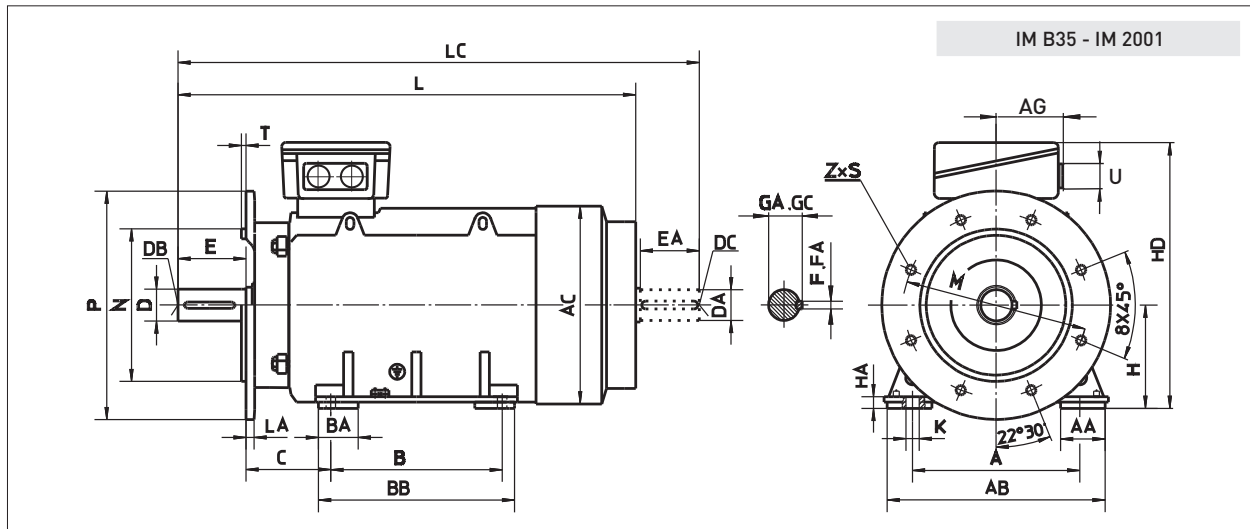
Type	Poles	A	AA	AB	AC	AG	B	BA	BB	C	D	DA	DB	DC	E	EA	F	FA	GA	GC	H	HA	HD	K	L	LC	U	
ZKIE 355	2	<b>610</b>					<b>560</b>	140	660	<b>254</b>	<b>75</b>	75	M20	M20	<b>140</b>	140	<b>20</b>	20	<b>79,5</b>	79,5					1463	1618		
			150	780	750	403															<b>355</b>	35	945		1533	1758		2xM75x1.5
	4, 6	<b>630</b>					<b>800</b>	220	980	<b>200</b>	<b>100</b>	100	M24	M24	<b>210</b>	210	<b>28</b>	28	<b>106</b>	106					1890	2110		
	Lf																								2060	2280		
ZKIE 400	2										<b>80</b>	80	M20	M20	<b>170</b>	170	<b>22</b>	22	<b>85</b>	85					1938	2128		
	4, 6	<b>710</b>	150	860	855	403	<b>900</b>	220	1045	<b>224</b>	<b>110</b>	100	M24	M24	<b>210</b>	210	<b>28</b>	28	<b>116</b>	116	<b>400</b>	40	1044	<b>Ø35</b>	1978	2208		4xM63x1.5
	Lc																								2108	2338		
ZKIE 450	2										<b>90</b>	90	M24	M24	<b>170</b>	170	<b>25</b>	25	<b>95</b>	95	<b>450</b>	42	1250	<b>Ø42</b>	2118	2308		4xM63x1.5
	4, 6	<b>800</b>	180	980	975	403	<b>1000</b>	260	1220	<b>250</b>	<b>120</b>	100			<b>210</b>	210	<b>28</b>	28	<b>116</b>	116					2158	2388		

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					1463		1618							
		FF 740	150	780	750	735	403					355	35	945	Ø28		25		740	680	800	Ø24	8	6	2xM75x1.5
	Ld, Le	4, 6						800	220	980	200				Ø35										
	Lf															2060		2280							

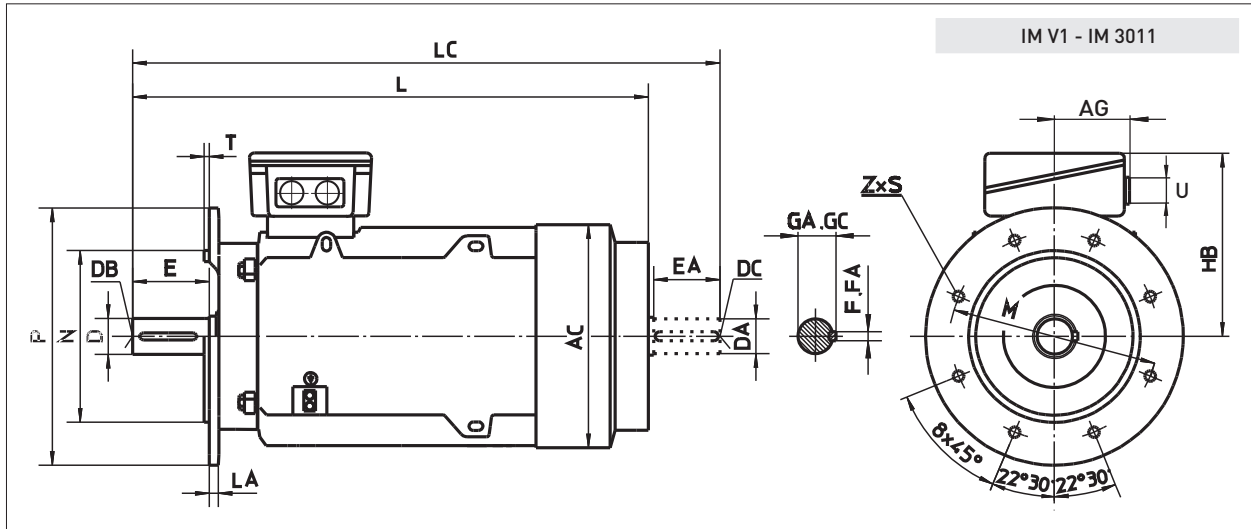
Type	Poles	D	DA	DB	DC	E	EA	F	FA	GA	GC	
ZKIE 355	2	75	75	M20	M20	140	140	20	20	79.5	79.5	
	Ld, Le	4, 6	100	100	M24	M24	210	210	28	28	106	106
	Lf											

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

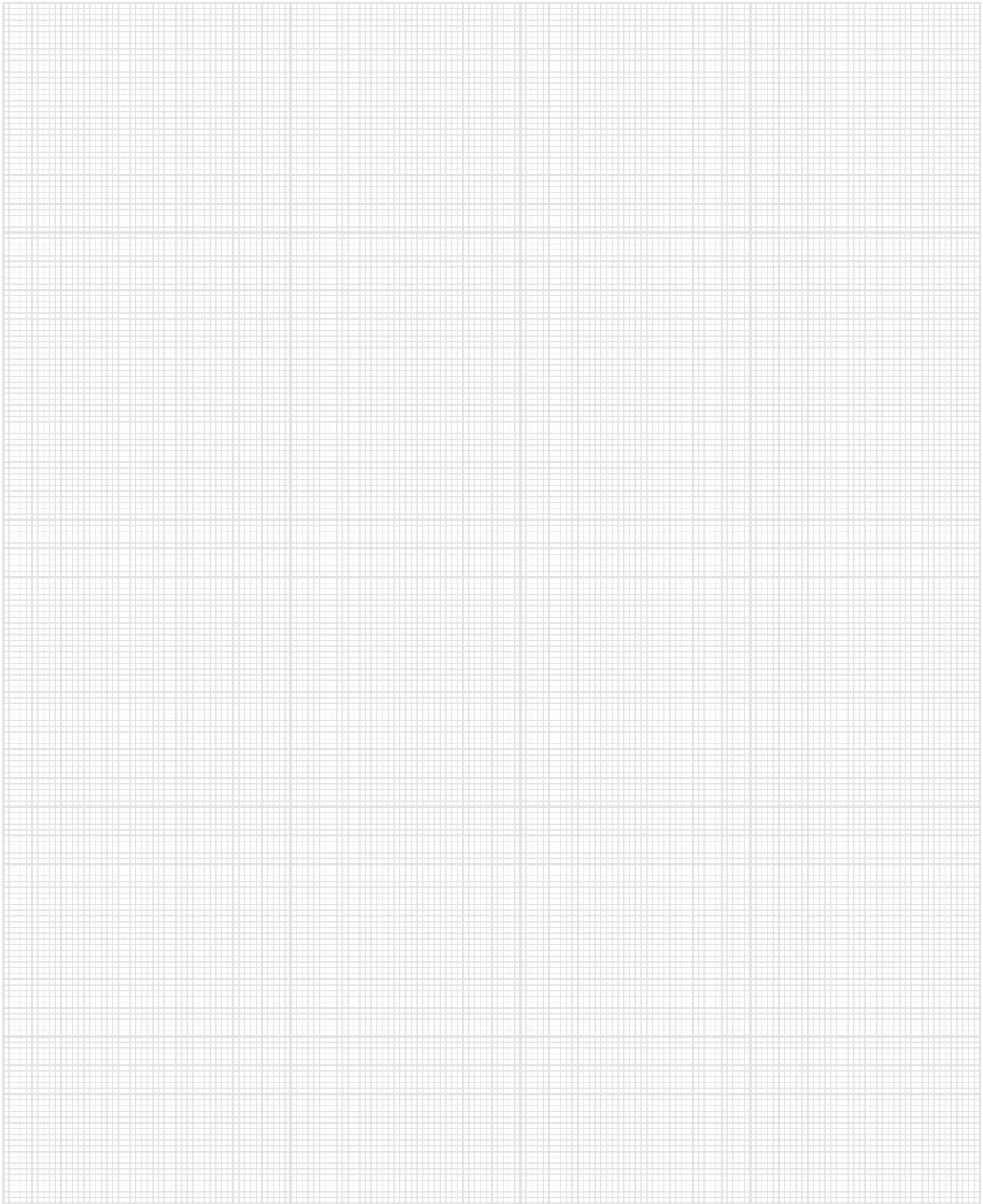


Type	Poles	Flange	AC	AG	D	DA	DB	DC	E	EA	F	FA	GA	GC	HB	L	LA	LC	M	N	P	S	Z	T	U	
ZKIE 355	2				<b>75</b>	75	M20	M20	<b>140</b>	140	<b>20</b>	20	<b>79.5</b>	79.5	590	1463	1618									
	4, 6	FF 740	735	403	<b>100</b>	100	M24	M24	<b>210</b>	210	<b>28</b>	28	<b>106</b>	106		1533	1758									
Ld, Le																1890	2110									
Lf																2060	2280									
ZKIE 400	2				<b>80</b>	80	M20	M20	<b>170</b>	170	<b>22</b>	22	<b>85</b>	85	644	1938	2128									
	4, 6	FF 940	855	403	<b>110</b>	100	M24	M24	<b>210</b>	210	<b>28</b>	28	<b>116</b>	106		1978	2208									
Lc																2108	2338									
ZKIE 450	2				<b>90</b>	90	M24	M24	<b>170</b>	170	<b>25</b>	25	<b>95</b>	95	800	2118	2308									
La, Lb, Lc	4, 6	FF 1080	975	403	<b>120</b>	100			<b>210</b>	210	<b>32</b>	28	<b>127</b>	106		2158	2388									

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.

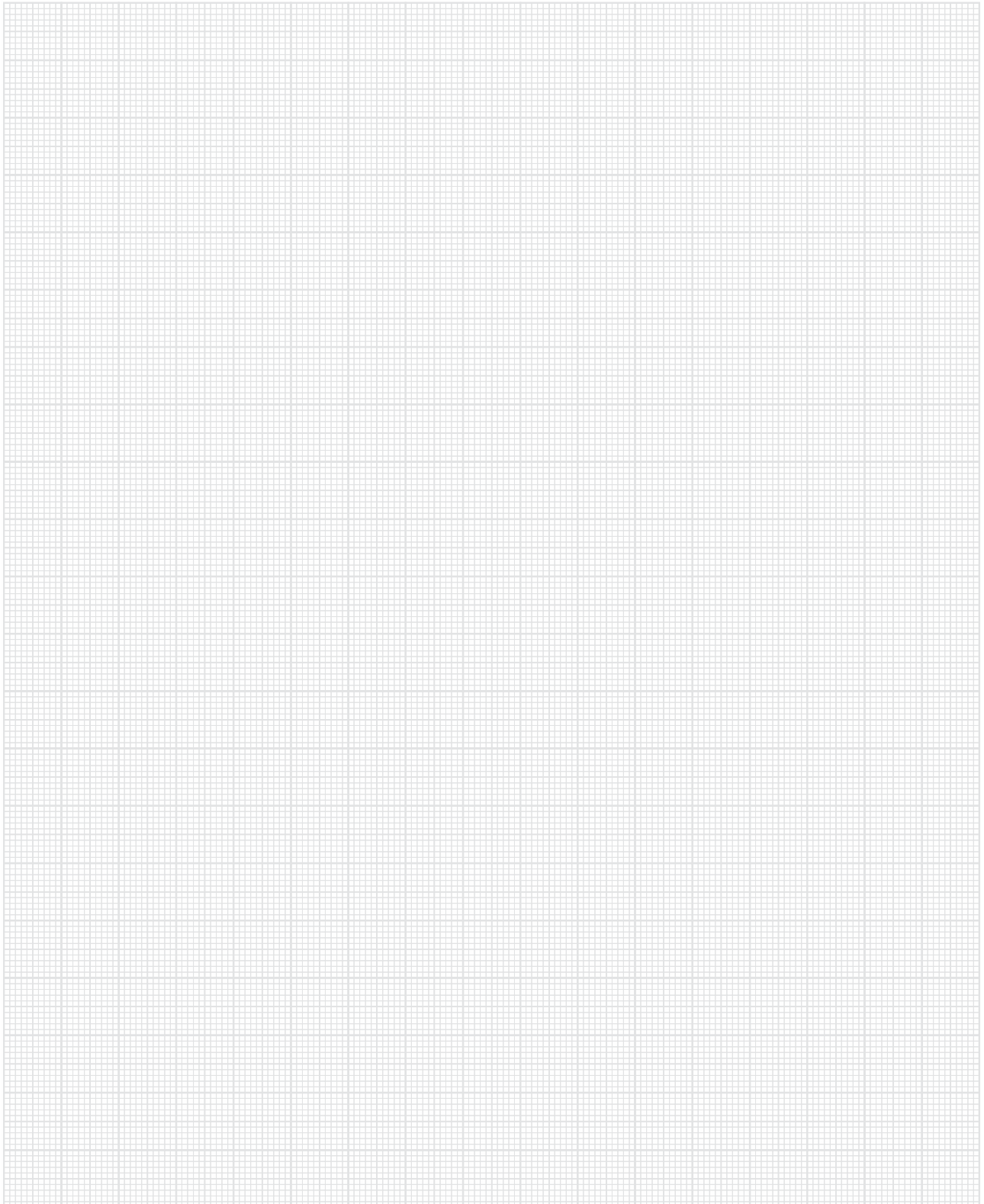
# LOW VOLTAGE TEFC CAGE MOTORS IE2 High Efficiency

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 \_\_\_\_\_  $J_m$  \_\_\_\_\_  $kgm^2$

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

## 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: \_\_\_\_\_

Note:

## 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 (LpA) \_\_\_\_\_ 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: \_\_\_\_\_

## 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: \_\_\_\_\_

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