Electric Motors

AEG

Asynchronous three-phase motors

2.1e

Technical Catalogue

2005

EFF 1

EFF 2

ENERGY C US

LAFERTGROUP

All technical data, outputs, dimensions and weights stated in this catalogue are subject to change without prior notice.

The illustrations are not binding.

Contents

Standard Quality

The strictness of our quality control assures the flawless operation and reliability of our products. That our quality scale fulfils your demands is confirmed by the certificate awarded by the TÜV-CERT Certification body of TÜV Rheinland and the CERMET, a Certification body authorized by SINCERT.

CE Marking

Our three-phase induction motors comply with the requirements of the following international standard:

IEC 60034

as well as with the Low Voltage Directive 73/23 (1973), modified by the Directive 93/68 (1993) and the EMC-Directive 89/336.

The above named products comply with the requirements of the EC Directive Machines 89/392. In accordance with this Directive induction motors are components and intended solely for integration into other machines. Commissioning is forbidden until conformity of the end product with this Directive is proved!

The CE symbol was applied for the first time in 1995.

The safety instructions in the Operation Manual of the manufacturer and EN 60204-1 have to be observed.

CEMEP Voluntary Agreement

Motors covered by this agreement are defined as totally enclosed fan-cooled (normally IP 54 or IP 55), three-phase AC squirrel cage induction motors 1.1 to 90 kW, with 2 or 4 poles, rated for 400 V-line, 50 Hz, duty class S1. (Standard design can be interpreted as design N according to EN 60034-12 and HD 231). They are divided in three classes of efficiency levels, defined by 2 values of full load efficiency per output, designated eff1, eff2 and eff3.

All motors with standard rating included in this catalogue comply with efficiency class eff2 and bear the corresponding label on the rating plate. For efficiency data at 50%, 75% and full load, please refer to the electrical data tables.

The motors comply with the relevant standards and regulations, especially:

Title	IEC	EU CENELEC	D DIN/VDE	I CEI/UNEL	GB BS	F NFC	E UNE
Electrical							
General stipulations for electrical machines	60034-1	EN 60034-1	DIN EN 60034-1	CEI EN 60034-1	4999-1 4999-69	51-200 51-111	UNE EN 60034-1
Rotating electrical machines: methods for determining losses and efficiency using tests	60034-2	HD 53 2	DIN EN 60034-2	CEI EN 60034-2	4999-34	51-112	UNE EN 60034-2
Terminal markings and direction of rotation of rotating electrical machines	60034-8	HD 53 8 S4	DIN VDE 0530-8	CEI 2-8	4999-3	51-118	20113-8-96
Starting performance	60034-12	EN 60034-12	DIN EN 60034-12	CEI EN 60034-12	4999-112		UNE EN 60034-12
Standard voltages	60038	HD 472 S1	DIN IEC 60038	CEI 8-6			
Insulating materials	60085		DIN IEC 60085	CEI 15-26			
Mechanical							
Dimensions and output ratings	60072		DIN EN 50347	UNEL 13113			
Mounting dimensions and relationship frame sizes-output ratings, IM B3	60072		DIN 42673-1	UNEL 13113	4999-10 51-110	51-105 51-104	UNE EN 50347 1980
Mounting dimensions and relationship frame sizes-output ratings, IM B5	60072		DIN 42677-1	UNEL 13117		20106-2-74	
Mounting dimensions and relationship frame sizes-output ratings, IM B14	60072		DIN 42677-1	UNEL 13118	4999-10 51-110	51-105 51-104	UNE EN 50347
Cylindrical shaft ends for electric motors	60072	HD 231	DIN 748-3	UNEL 13502	4999-10	51-111	
Degrees of protection	60034-5	EN 60034-5	DIN EN 60034-5	CEI EN 60034-5	4999-20	EN60034-5	20111-5
Methods of cooling	60034-6	EN 60034-6	DIN EN 60034-6	CEI EN 60034-6	4999-21		EN 60034-6
Mounting arrangements	60034-7	EN 60034-7	DIN EN 60034-7	CEI EN 60034-7	4999-22	51-117	EN 60034-7
Noise limits	60034-9	EN 60034-9	DIN EN 60034-9	CEI EN 60034-9	4999-51	51-119	EN 60034-9
Mechanical vibration	60034-14	EN60034-14	DIN EN 60034-14	CEI EN 60034-14	4999-50	51-111	EN 60034-14
Mounting flanges			DIN 42948	UNEL 13501			
Tolerances of mounting and shaft extensions			DIN 42955	UNEL 13501/ 13502			
Classification of environmental conditions	600721-2-1		DIN IEC 60721-2-1	CEI 75-1			
Mechanical vibration; balancing	ISO 8821		DIN ISO 8821				

Motors to special regulations:

- Motors to VIK regulations (German Society for Industrial Energy and Power Stations) to VIK recommendation *Technical Requirements April 1999*
- Motors with UL and/or CSA approval (performance data on request)
- Motors with CUL_{US} ($_{C}UR_{US}$) approval

The motors can furthermore be designed according to the stipulations for floating installations of the most important classification societies. For further details see our technical catalogue *Three-phase motors for marine applications.*

The motors are designed for operation at altitudes ≤ 1000 m above sea-level and at ambient temperatures of up to 40° C. Exceptions are indicated on the rating plate.

Permissible temperature rises to various standards

Standard/Regulation	Temperature of coolant	Permissible temperature rise in K (measured by resistance method) Temperature class		
	°C	B	F	H
VDE 0530 part 1	40	80	105	125
International IEC 34-1	40	80	105	125
Britain BS 2613	40	80	105	
Canada CSA	40	80	105	
USA NEMA and ANSI	40	80	105	
Italy CEI	40	80	105	
Sweden SEN	40	80	105	
Norway NEK	40	80	105	
Belgium NBN	40	80	105	
France NF	40	80	105	
Switzerland SEV	40	80	105	
India IS	40	80	-	
Germanischer Lloyd [1]	45	75	90	
American Bureau of Shipping [1]	50	70	95	
Bureau Veritas [1]	45	70	100	
Norske Veritas [1]	45	70	90 [2]	
Lloyds Register [1]	45	70	90	
Registro Italiano Navale [1]	45	70	90	
Korean Register [1]	50	70	90	
China Classification Society [1]	45	75	95	

on request

[1] Classification societies for marine motors

[2] Only with special approval

The motors conform to degree of protection IP 55 to IEC 60034-5. Higher protection on request.

The standard design for horizontal mounting is suitable for indoor and protected outdoor installation, climate group MODERATE (see page 15) (temperature of coolant -20° to +40° C).

For unprotected outdoor installation or severe climatic conditions (moisture category wet, climate group WORLDWIDE, extremely dusty site conditions, aggressive industrial atmosphere, danger of storm rain and coastal climate, danger of attack by termites, etc.), as well as vertical mounting, special protective measures are recommended, such as:

- Protective cowl (for vertical *shaft-down* motors)
- For vertical *shaft-up* motors additional bearing seal and flange drainage
- Special paint finish
- Treatment of winding with protective moisture-proof varnish
- Anti-condensation heating (possibly winding heating)
- Condensation drain holes

The special measures to be applied have to be agreed with the factory once the conditions of installation have been settled.

The corresponding conditions of installation have to be clearly indicated in the order.

Tolerances

For industrial motors to EN 60034-1, certain tolerances must be allowed on guaranteed values, taking into consideration the necessary tolerances for the manufacture of such motors and the materials used. The standard includes the following remarks:

1. It is not intended that guarantees necessarily have to be given for all or any of the items involved. Quotations including guaranteed values subject to tolerances should say so, and the tolerances should be in accordance with the table.
2. Attention is drawn to the different interpretation of the term guarantee. In some countries a distinction is made between guaranteed values and typical or declared values.
3. Where a tolerance is stated in only one direction, the value is not limited in the other direction.

Values for	Tolerance
Efficiency (η) (by indirect determination)	- 0.15 (1 - η) at $P_N \leq 50$ kW - 0.1 (1 - η) at $P_N > 50$ kW
Power factor ($\cos \varphi$)	$\frac{1 - \cos \varphi}{6}$, minimum 0.02, maximum 0.07
Slip (s) (at rated load and at working temperature)	± 20 % of the guaranteed slip at $P_N \geq 1$ kW ± 30 % of the guaranteed slip at $P_N < 1$ kW
Breakaway starting current (I_A) (in the starting circuit envisaged)	+ 20 % of the guaranteed starting current (no lower limit)
Breakaway torque (M_A)	- 15 % and + 25 % of the guaranteed breakaway torque (+ 25 % may be exceeded by agreement)
Pull-up torque (M_S)	- 15 % of the guaranteed value
Pull-out torque (M_K)	- 10 % of the guaranteed value (after allowing for this tolerance, M_K/M_N not less than 1.6)
Moment of inertia (J)	± 10 % of the guaranteed value

Mechanical tolerances

According to IEC 72-1, the following tolerances on mechanical dimensions of electric motors are permitted:

Parameter	Code	Tolerances	
Shaft length	H	- up to 250 - over 250	-0,5 mm -1 mm
Diameter of shaft end	D-DA	- from 11 to 28 mm - from 38 to 48 mm - from 55 to 100 mm	j6 k6 m6
Hub key width	F-FA		h9
Flange spigot	N	- up to 132 - over size 132	j6 h6

Note: The holes at the shaft end conform with DIN 332

Degrees of protection

Degrees of protection for mechanical machines are designated in accordance with IEC 60034-5 by the letters **IP** and two characteristic numerals.

First numeral: Protection against contact and ingress of foreign bodies

IP	Description
0	No special protection
1	Protection against solid foreign bodies larger than 50 mm (Example: inadvertent contact with the hand)
2	Protection against solid foreign bodies larger than 12 mm (Example: inadvertent contact with the fingers)
3	Protection against solid foreign bodies larger than 2.5 mm (Example: Wires, tools)
4	Protection against solid foreign bodies larger than 1 mm (Example: Wires, bands)
5	Protection against dust (harmful deposits of dust)
6	Complete protection against dust. Is not described for electrical machines to IEC 34-5.

Second numeral: Protection against ingress of water

IP	Description
0	No special protection
1	Protection against vertically falling water drops (condensation)
2	Protection against dropping water when inclined by up to 15°
3	Protection against waterspray at up to 60° from vertical
4	Protection against water splashed from any direction
5	Protection against water projected by a nozzle from any direction
6	Protection against heavy seas or water projected in powerful jets
7	Protection when submerged between 0.15 and 1 m
8	Protection when continuously submerged in water at conditions agreed between the manufacturer and the user.

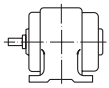
Mounting arrangements

Mounting arrangements for rotating electrical machines are designated according to IEC 60034-7, *Code I* (in brackets Code II).

Our motors are available with the mounting arrangements listed below, depending on design and frame size. Motors with aluminium frame are equipped with removable feet that allow easy change of mounting arrangement.

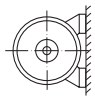
Foot mounting

IM B3 (IM 1001)



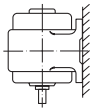
IM B6 (IM 1051) *

IM B7 (IM 1061) *

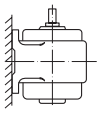


IM B8 (IM 1071) *

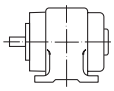
IM V5 (IM 1011) *



IM V6 (IM 1031) *



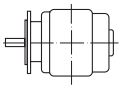
IM B34 (IM 2101)



Flange type C to DIN 42 948 at drive end

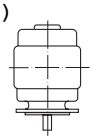
Flange mounting

IM B5 (IM 3001)



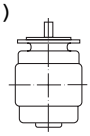
Flange type A to DIN 42 948 at drive end

IM V1 (IM 3011)



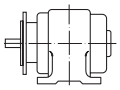
Flange type A to DIN 42 948 at drive end

IM V3 (IM 3031)



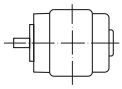
Flange type A to DIN 42 948 at drive end

IM B35 (IM 2001)



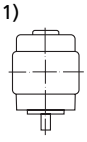
Flange type A to DIN 42 948 at drive end

IM B14 (IM 3601)



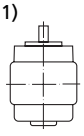
Flange type C to DIN 42 948 at drive end

IM V18 (IM 3611)



Flange type C to DIN 42 948 at drive end

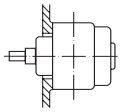
IM V19 (IM 3631)



Flange type C to DIN 42 948 at drive end

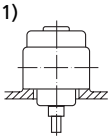
Motors without endshield

IM B9 (IM 9101)



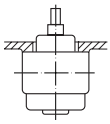
without endshield and without ball bearings on drive end

IM V8 (IM 9111)



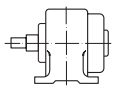
without endshield and without ball bearings on drive end

IM V9 (IM 9131)



without endshield and without ball bearings on drive end

IM B15 (IM 1201)



without endshield and without ball bearings on drive end

* From frame size 225 on request

It is essential to state the desired mounting arrangement when ordering, as the constructive design depends partly on the mounting arrangement.

Terminal boxes

The location of the terminal box in standard design is on top; on the right or on the left are possible.

For motors with mountings IM B6, IM B7, IM B8, IM V5, IM V6 the location of the terminal box is related to an IM B3 mounting.

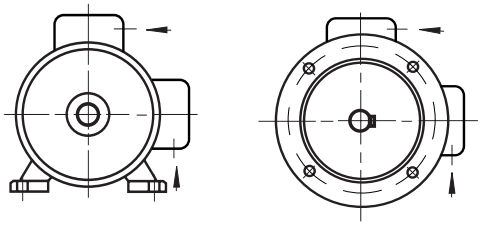
The position of the entry openings can be adjusted to suit the existing connection facilities by turning through 90°. Should special accessories be used (temperature detectors, anti-condensation heating, etc.) please enquire.

For motors in standard design, the cable gland does not belong to our scope of delivery.

For plastic terminal boxes, only plastic glands may be used (shock protection).

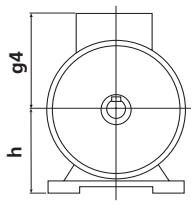
When using screened leads, a metal terminal box is required.

Direction of cable entries

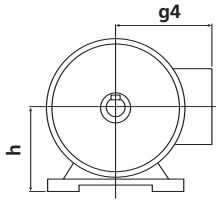


Frame size	Degree of protection	Thread for cable entry		Connection for temperature detector		Max. cable section	Terminal thread	Max. external cable diam.
		Pg [1]	Metric [2]	Pg [1]	Metric [2]	mm²		mm
56 - 71	IP 55	1 x Pg 11 x Pg 13.5	1 x M16 x M20	-	-	2.5	M4	12
80	IP 55	1 x Pg 13.5 x Pg 16	1 x M25 x M20	-	-	2.5	M4	16
90-112	IP 55	1 x Pg 13.5 x Pg 16	1 x M25 x M20	-	-	4	M5	16
132	IP 55	2 x Pg 21	2 x M32	-	-	4	M5	20
160	IP 55	2 x Pg 29	2 x M40	Pg 11	M20	16	M6	28
180	IP 55	2 x Pg 29	2 x M40	Pg 13.5	M20	35	M8	28
200	IP 55	2 x Pg 36	2 x M50	Pg 16	M25	35	M8	34
225	IP 55	2 x Pg 36	2 x M50	Pg 16	M25	50	M10	34
250 - 280	IP 55	2 x Pg 42	2 x M63	Pg 16	M25	50	M10	40
315	IP 55	2 x Pg 48 [3]	2 x M63 [3]	2 x Pg 16	M25	185	M12	48

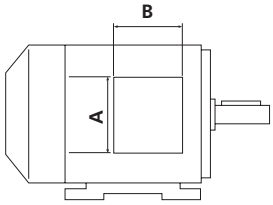
[1] Pg thread to DIN 40 430
[2] Pitch 1.5
[3] Terminal box with unscrewable cable entry plate



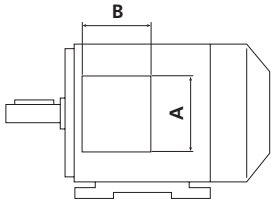
Terminal box on top



Terminal box at the side



left [1]



right

Frame size h	g4	A	B	Design	Material
Standard design					
56	98	91	93	Z	K
63	103	91	93	Z	K
71	112	91	93	Z	K
80 [2]	129	111	116	Z	K
90 [2]	138	111	116	Z	K
100 [2]	145	111	116	Z	K
112 [2]	161	111	116	Z	K
132	198	133	133	Z	AL
160	246	149	149	Z	AL
180	266	204	180	Z	SB
200	341	258	265	Z	SB
225	360	258	265	Z	SB
250	390	258	265	Z	SB
280	423	258	265	Z	SB
315	515	400	285	Z	GG

Frame size h	g4	A	B	Design	Material
Special design					
56	100	94	94	Z	Al
63	105	94	94	Z	Al
71	114	94	94	Z	Al
80	139	110	110	Z	Al
90	148	110	110	Z	Al
100	155	110	110	Z	Al
112	171	110	110	Z	Al
132	205	143	143	Z	GG
160	250	168	168	Z	GG
180	285	209	220	Z	GG
200	310	241	246	Z	GG
225	334	272	254	Z	GG
250	375	272	254	Z	GG
280	409	272	254	Z	GG

Frame size h	g4	A	B	Design	Material
Special design gland cover					
56	64	70	70	E	K
63	69	70	70	E	K
71	78	70	70	E	K
80	125 [3]	91	91	E	Al
90	137 [3]	91	91	E	Al
100	141 [3]	91	91	E	Al
112	154 [3]	91	91	E	Al
132	183	111	111	E	GG
160	225	130	130	E	GG
180	250 [3]	144	144	E	GG
200	280 [3]	172	172	E	GG
225	300 [3]	172	172	E	GG
250	340	208	208	E	GG
280	375	208	208	E	GG

[1] On frame size 56-71 the terminal box is supplied displaced towards the non-drive end
[2] For metric thread, increase g4 by 6mm
[3] Maximum height with screw joint

Design: E = Single part
Z = Two parts

Material: K = Plastics
SB = Sheet steel
AL = Aluminium
GG = Cast iron

Materials

Motor parts	Frame size	Material
Stator frame	56 - 180	Aluminium alloy
	132 - 180	Cast iron (optional)
	225 - 315	Cast iron
Endshield	56 - 112	Aluminium alloy
	132 - 315	Cast iron
Flanged endshield	56 - 112	Aluminium alloy
	132 - 315	Cast iron
Fan cover	56 - 63	Sheet steel
	71 - 112	Plastics
	80 - 112	Sheet steel (optional)
	132 - 315	Sheet steel
Fan	56-315	Plastics
Terminal box	56 - 112	Plastics
	56 - 112	Aluminium alloy (optional)
	132 - 160	Aluminium alloy
	180 - 280 + 315SY	Sheet steel
	315	Cast iron

Paint finish

Normal finish

Suitable for climate group **Moderate** to DIN 600 721-2-1, e.g. indoor and outdoor installation
for short periods: up to 100 % rel. humidity at temperatures up to +30° C
continuously: up to 85 % rel. humidity at temperatures up to +25° C

Special finish K1

Suitable for climate group **Worldwide** to DIN 600 721-2-1, e.g. outdoor installation in corrosive chemical and marine atmospheres
for short periods: up to 100 % rel. humidity at temperatures up to +35° C
continuously: up to 98 % rel. humidity at temperatures up to +30° C

Special finishes (on request)

- Special finish K2 (additional treatment of internal motor parts)
- Special paint for exposure to the action of alkalis
- Special finishes to customers' requirements

Bearings

Classification of bearings (standard design) [1)]
Ball bearings to ISO15 (DIN 625)

Frame size	No. of poles	Drive end	Non-drive end
56	2 + 4	6201-2Z	6201-2Z
63	2 + 4	6202-2Z	6202-2Z
71	2 - 8	6202-2Z	6202-2Z
80	2 - 8	6204-2Z C3	6204-2Z C3
90	2 - 8	6205-2Z C3	6205-2Z C3
100	2 - 8	6206-2Z C3	6206-2Z C3
112	2 - 8	6306-2Z C3	6306-2Z C3
132	2 - 8	6208-2Z C3	6208-2Z C3

Frame size	No. of poles	Drive end	Non-drive end
160 [2)]	2 - 8	6209-2Z C3	6209-2Z C3
180	2 - 8	6210-2Z C3	6210-2Z C3
200	2 - 8	6212-2Z C3	6212-2Z C3
225	2 - 8	6213-Z C3	6213-Z C3
250	2 - 8	6214 C3	6214 C3
280	2 - 8	6216 C3	6216 C3
315	2	6316 C3	6316 C3
	4 - 8	6319 C3	6319 C3
315SY	4 - 8	6319 C3	6316 C3

[1)] In frame sizes 132 to 280 bearings type 63 also possible at drive and non-drive end (preferably locating bearing non-drive end), or bearings NU 3 at drive end in frame sizes 160 to 280 (only locating bearing at non-drive end).

[2)] IM B14 bearing drive end 6309-2Z C3

Bearing arrangement (AM, AMV)

Frame size	Bearing drive end	Bearing non-drive end	Spring-loaded
56 - 112	Non-locating bearing	Non-locating bearing	Non-drive end
132 - 280	Locating bearing	Non-locating bearing	Non-drive end
315	Non-locating bearing	Locating bearing	Drive end

Maximum permissible axial forces without additional radial forces *

Frame size	Horizontal shaft				Vertical shaft - force upwards				Vertical shaft - force downwards			
	3000 min $^{-1}$ kN	1500 min $^{-1}$ kN	1000 min $^{-1}$ kN	750 min $^{-1}$ kN	3000 min $^{-1}$ kN	1500 min $^{-1}$ kN	1000 min $^{-1}$ kN	750 min $^{-1}$ kN	3000 min $^{-1}$ kN	1500 min $^{-1}$ kN	1000 min $^{-1}$ kN	750 min $^{-1}$ kN
56	0.16	0.21	-	-	0.18	0.22	-	-	0.15	0.19	-	-
63	0.19	0.26	-	-	0.21	0.28	-	-	0.17	0.24	-	-
71	0.23	0.33	0.33	0.37	0.26	0.35	0.36	0.39	0.21	0.30	0.31	0.34
80	0.32	0.44	0.46	0.50	0.34	0.47	0.48	0.53	0.29	0.41	0.43	0.47
90	0.34	0.48	0.49	0.54	0.38	0.47	0.53	0.58	0.31	0.44	0.46	0.51
100	0.48	0.68	0.70	0.77	0.54	0.74	0.76	0.83	0.43	0.62	0.64	0.71
112	0.48	0.68	0.70	0.77	0.56	0.75	0.77	0.84	0.40	0.60	0.62	0.69
132	0.6	0.9	1.1	1.3	1.0	1.3	1.5	1.9	0.5	0.75	0.75	1.05
160	0.5	0.8	1.2	1.5	1	1.4	1.8	2	0.2	0.4	0.6	0.9
180	0.5	0.8	1.2	1.5	1.1	1.4	1.8	2.1	0.2	0.4	0.6	0.9
200	0.8	1.3	1.5	1.8	1.8	2.3	2.5	2.8	0.2	0.7	0.9	1.1
225	1.0	1.6	1.9	2.4	2.1	2.6	2.9	3.4	0.3	0.70	1.0	1.5
250	1.1	1.6	2.0	2.5	2.3	2.7	3.2	3.7	0.2	0.60	1.1	1.5
280	1.7	1.9	2.4	2.9	2.9	3.1	3.6	3.7	0.15	0.3	0.8	1.0
315	3.5	4.0	4.5	5.0	6.0	7.0	7.5	8.0	1.0	1.9	2.4	2.9

Values for 50 Hz. For service on 60 Hz, reduce values by 10%

* Consult according to direction of force

Permissible radial forces

without additional axial force

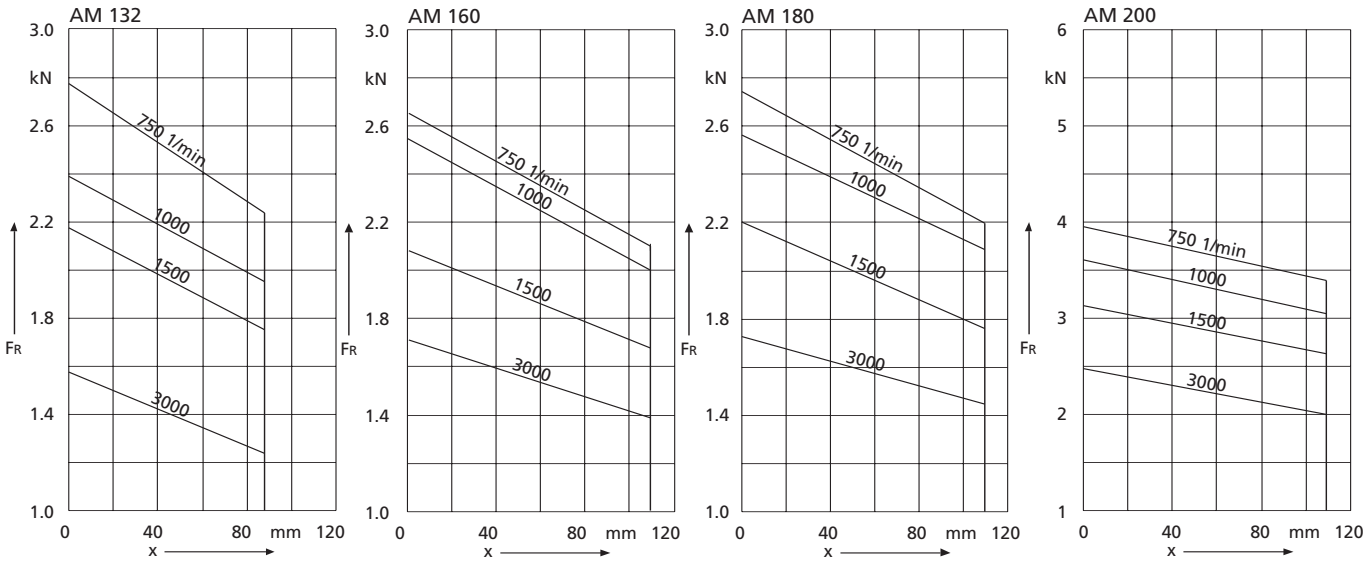
(Ball bearings)

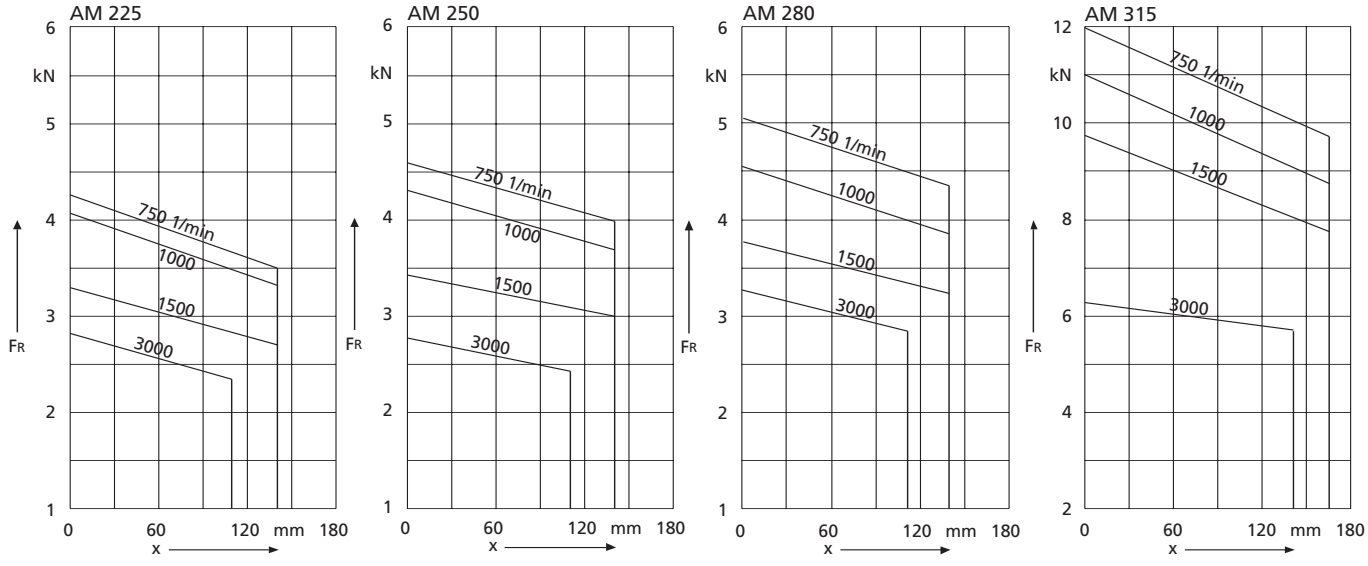
Nominal life = 20.000 h (Lh10)

F_R = permissible radial force in kN

X = Distance between point of application of force and shaft shoulder (e.g. half pulley width)

Size	F_R in N when 2p= 2	4	6	8
56	340	428	-	-
63	385	485	-	-
71	463	583	668	735
80	590	830	860	945
90SL	675	940	975	1070
100L	925	1295	1335	1470
112M	930	1300	1340	1476





Reinforced bearings (special design)

Roller bearings to DIN 5412

Frame size	No. of poles	Drive end	Non-drive end
160	2 - 8	NU 209 E	6209-2Z C3
180	2 - 8	NU 210 E	6210-2Z C3
200	2 - 8	NU 212 E	6212-2Z C3
225	2 - 8	NU 213 E	6213-Z C3

Frame size	No. of poles	Drive end	Non-drive end
250	2 - 8	NU 214 E	6214 C3
280	2 - 8	NU 216 E	6216 C3
315	2	NU 316 E	6316 C3
	4 - 8	NU 319 E	6319 C3
315SY	4 - 8	NU 319 E	6316 C3

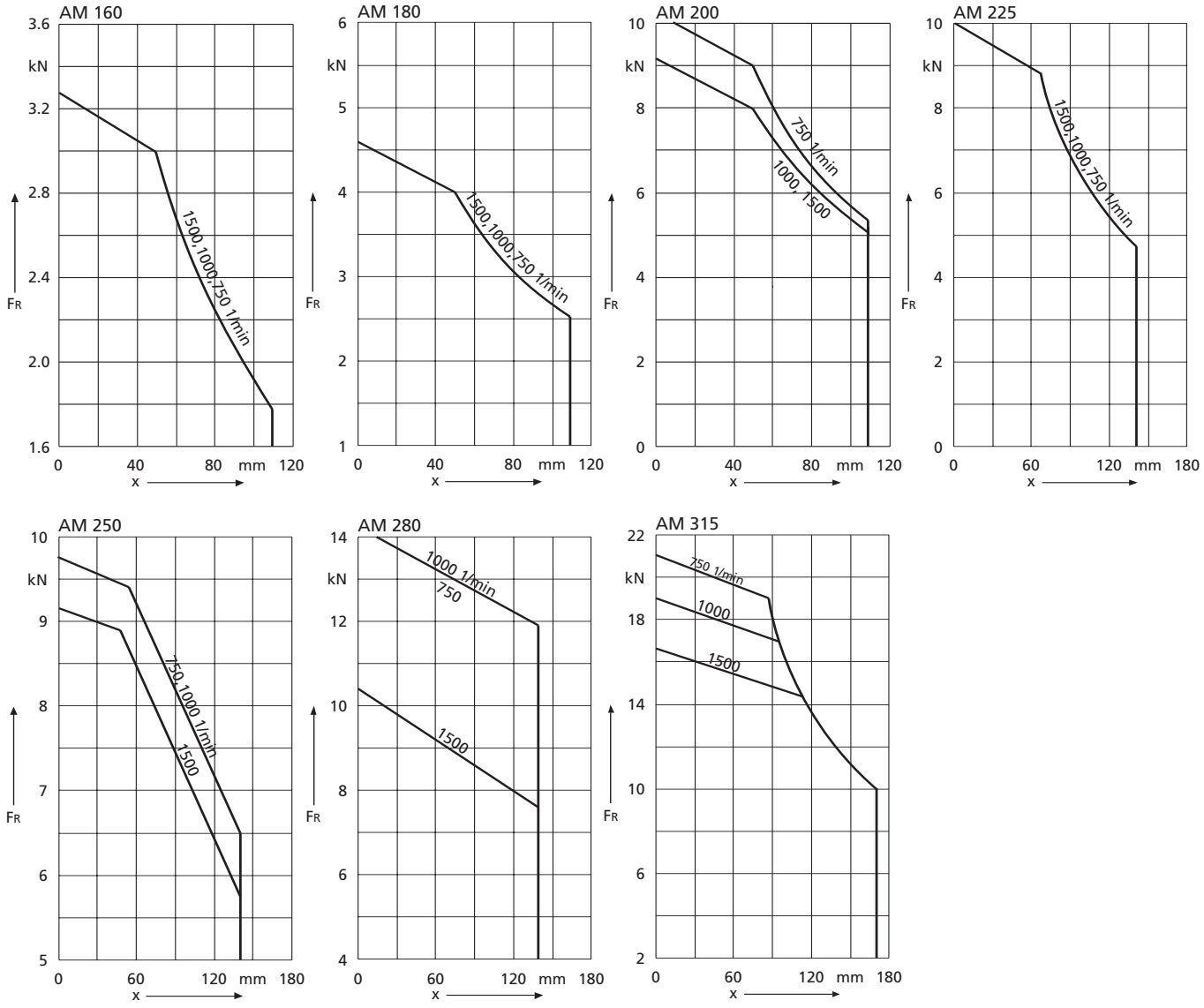
The modification from standard design to roller bearings is not possible, except for frame size 315.

Permissible radial forces

without additional axial forces (Roller bearings)

F_R = permissible radial force in kN

X = Distance between point of application of force and shaft shoulder (e.g. half pulley width)



Special bearings and flanges

Frame size	IM B3 / IM B5 Oversized bearing	IM B14 Oversized bearing	IM B5 Reduced flange
132	6308	-	A250*
160	6309	C250-6309	A300
180	6310	-	A300
200	6312	-	A350*
225	6313	-	A400
250	6314	-	A450
280	6316	-	A450*
315	-	-	-

*not interchangeable with standard motors

Belt drive

The data apply only to the normal drive end shaft extension of IM B3 motors with one speed.

Calculation of belt drive:

$$F_R = \frac{19120 \cdot P \cdot k}{D_1 \cdot n}$$

F_R = Radial shaft load in N
P = Output in kW
n = Speed in min^{-1}
D_1 = Pulley diameter in m
k = Belt tension factor, varying with the type of belt, assumed to be approximately:
3-4 for normal flat belt without idler pulley
2-2.5 for normal flat belt with idler pulley
2.2-2.5 for V-belt
For exact data apply to the belt manufacturer.

Lubrication and maintenance of bearings

Bearings of standard motors up to frame size 250 have permanent lubrication. Bearing grease K3N to DIN 51 825 (e.g. KLÜBER ASONIC GHY72, ESSO UNIREX N3 or similar) is used.

Maintenance-free life for motors with permanent lubrication at ambient temperature of 40° C and service at 50 Hz:

2 and 4/2 pole motors 10,000 h
4 and more pole motors 20,000 h, but not more than 4 years.

From frame size 280 upwards the motors are equipped with regreasing device and grease slinger (possible from frame size 160 at extra cost).

First lubrication is made with grease K3N to DIN 51 825 (lithium-based, water resistant to DIN 51 807 part 1: grade 0 or 1).

For motors with regreasing device, regreasing interval and required quantity of grease is indicated on the nameplate.

For regreasing please observe the Operating Instructions.

Where unfavourable conditions prevail (e.g. high ambient temperature, dusty conditions, corrosive atmosphere, operation by frequency converter), relubrication should be carried out more frequently.

Lubricating nipples

Flat lubricating nipples M 10x1 to DIN 3404.

Cooling

Surface cooling, independent of the direction of rotation.

Motors type AM available without internal fan as type AG, e.g. for installation in a directed air stream (outputs on request).

Vibration

The amplitude of vibration in electric motors is governed by EN 60034-14 *Mechanical vibration of rotating electrical machines with shaft heights 56 and larger - methods of measurement and limits.*

Standard motors are designed to vibration grade A (normal). Vibration grade B are available at extra cost.

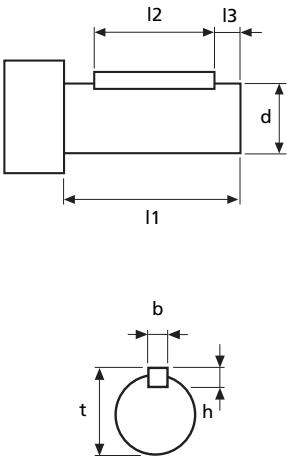
Pole-changing motors in Dahlander connection can only be supplied in vibration grade A.

Rotors are at present dynamically balanced with **half** key fitted as per DIN ISO 8821. Other balancing only on request.

The motors are identified as follows:

"H" or "blank" means balanced with *half key*
"F" means balanced with *full key*
"N" means *no key*

Position and dimensions of key



Frame size	d x l1	b x h	l2	l3	t
56	9 x 20	3 x 3	15	2.5	10.2
63	11 x 23	4 x 4	15	4	12.5
71	14 x 30	5 x 5	20	5	16
80	19 x 40	6 x 6	30	6	21.5
90	24 x 50	8 x 7	40	6	27
100	28 x 60	8 x 7	50	6	31
112	28 x 60	8 x 7	50	6	31
132	38 x 80	10 x 8	70	5	41
160	42 x 110	12 x 8	100	5	45
180	48 x 110	14 x 9	100	5	51.5
200	55 x 110	16 x 10	100	5	59
225 2 poles	55 x 110	16 x 10	100	5	59
225 4 poles	60 x 140	18 x 11	110	10	64
250 2 poles	60 x 140	18 x 11	110	10	64
250 4 poles	65 x 140	18 x 11	110	10	69
280 2 poles	65 x 140	18 x 11	100	10	69
280 4 poles	75 x 140	20 x 12	100	10	79.5
315 2 poles	65 x 140	18 x 11	125	7.5	69
315 4 poles	80 x 170	22 x 14	140	10	85

Dimensions in mm
For larger shafts in special design the dimensions l2 and l3 are maintained.

Anti-condensation heater

On request, motors which due to strong temperature fluctuations are exposed to condensation during standstill, can be fitted against surcharge with an anti-condensation heater (space heater).

For supply voltage and heater rating please refer to the following table:

Frame size	Supply voltage (V)	Heater rating per motor (W)
112 - 160	110 or 230	40
180 - 225	"	50
250 - 280	"	65
315	"	99

During operation of the motor, the heating must be switched off.

Noise

The noise level of an electrical machine is determined by measuring the sound pressure level in accordance with curve A of the sound level meter to EN 60651 and is indicated in dB (A).

The permitted noise levels of electrical machines are fixed in EN 60034-9 (IEC 34-9). The noise level of our motors is well below these limit values.

Air-borne sound measurements are carried out in an anechoic testing chamber to EN 21680-ISO 1680.

Speed corresponding to a mains frequency of 50 Hz and the number of poles.

Measures for noise reduction

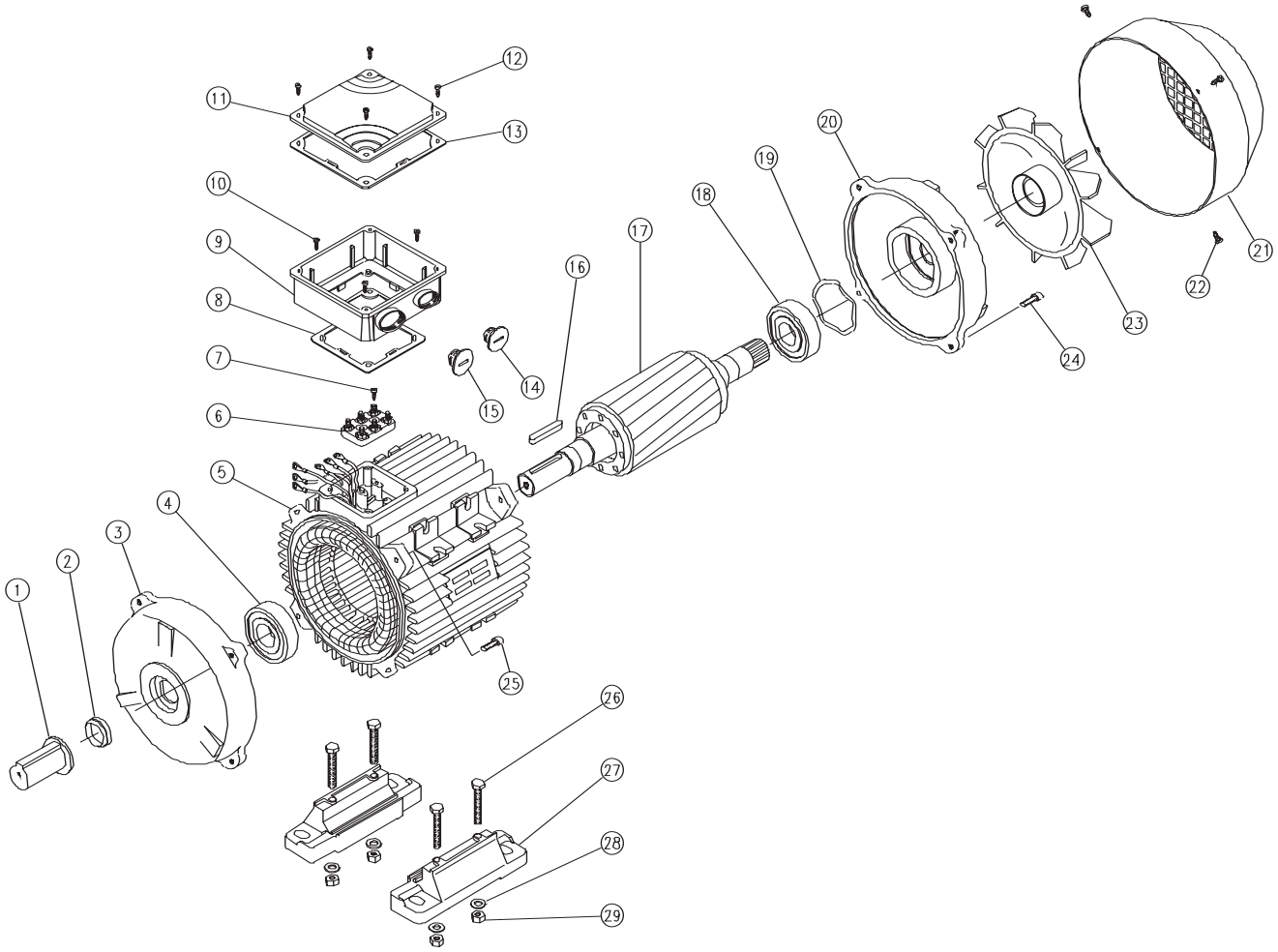
With special measures noise level can be reduced (special fan, noise reducing hood, etc.).

Noise levels

The noise values listed below refer to 50 Hz at rated voltage with a tolerance of up to + 3 dB(A). Values for pole-changing motors on request. For 60 Hz supply values are 3-5 dB(A) higher.

Sound pressure level L_{pA} and sound power level L_{WA} for three-phase single-speed motors with dimensions and output ratings to IEC 60072

Frame size	2 pole		4 pole		6 pole		8 pole	
	L_{WA}	L_{pA}	L_{WA}	L_{pA}	L_{WA}	L_{pA}	L_{WA}	L_{pA}
56	57	48	47	38				
63	58	49	47	38				
71	61	52	51	42	49	40		
80	72	60	60	48	52	40	47	35
90	74	62	61	49	58	46	54	42
100	78	66	62	50	62	51	58	46
112	80	68	65	53	65	53	58	46
132	81	69	71	59	69	57	64	52
160	87	74	75	62	71	58	69	56
180	87	74	77	64	72	59	71	58
200	87	74	78	65	73	60	72	59
225	88	75	79	66	75	62	73	60
250	90	76	81	67	77	63	74	60
280	92	78	83	69	80	66	75	61
315	93	79	85	71	82	68	79	65



Part description

1	Shaft protection
2	Dust seal drive end
3	Endshield drive end
4	Bearing drive end
5	Stator frame
6	Terminal board
7	Fixing screw terminal board
8	Gasket terminal box
9	Terminal box
10	Fixing screw terminal box
11	Terminal box lid
12	Fixing screw terminal box lid
13	Gasket terminal box lid
14	Blank gland plug
15	Blank gland plug
16	Key
17	Rotor complete
18	Bearing non-drive end
19	Pre-load washer
20	Endshield non-drive end
21	Fan cover
22	Fixing screw fan cover
23	Fan
24	Fixing bolt endshield non-drive end
25	Fixing bolt endshield drive end
26	Fixing bolt motor feet
27	Motor feet
28	Fixing washer motor feet
29	Fixing nut motor feet

In enquires and orders for spare parts please state always:
Designation of spare part, motor type, mounting arrangement, motor serial number (Product No. when available)
Enquires and orders cannot be handled without these data.

Rated voltage

For the rated voltage of the motors, EN 60 034-1 allows a tolerance of ± 5 %. According to IEC 60038, the mains voltages may have a tolerance of ± 10 %.

Therefore the motors are designed for the following rated voltage ranges (exceptions are shown in the data tables):

Mains voltage to DIN IEC 38	Rated voltage range of motor
230 V ± 10%	218-242 V ± 5%
400 V ± 10%	380-420 V ± 5%
690 V ± 10%	655-725 V ± 5%

Within the rated motor voltage range, the permissible maximum temperature is not exceeded. When the motors are operated at the limits of the voltage tolerance, the permissible overtemperature of the stator winding may be exceeded by 10 K.

For frame sizes 56 to 132 nameplates are marked with the maximum rated currents within the stated voltage ranges.

For motors in 500 V, 50 Hz design, as well as all abnormal voltages, no voltage range is marked. The voltage tolerances to EN 60034-1 apply.

Rated frequency

50 Hz motors can also be operated on 60 Hz mains, provided the mains voltage increases proportionally to the frequency. The relative values for starting and breakaway torque remain nearly unchanged and slightly increase for the starting current. The rated speed increases by the factor 1.2 and output by factor 1.15. Should a motor designed for 50 Hz be operated at 60 Hz without the voltage being increased, the rated output of the motor cannot be increased. Under these operating conditions, rated speed increases by factor 1.2. The relative values for starting and breakaway torque are reduced by factor 0.82 and for starting current by factor 0.9.

Additionally to the voltage range for 50 Hz operation, single-speed motors in frame sizes 56 to 315 are also marked with the voltage range for 60 Hz operation.
Example:

Frame sizes 56-132

Frame sizes 160-315

Rated current

The rated currents listed in the data tables apply to an operating voltage of 400 V. The conversion to other operating voltages, with output and frequency remaining unchanged, is to be made as follows:

Nominal voltage (V)	230	380	**400**	440	500	660	690
Conversion factor **x** I_N	1.74	1.05	**1.0**	0.91	0.80	0.61	0.58

Rated torque

$$\text{Rated torque in Nm} = 9550 \times \frac{\text{Rated voltage in kW}}{\text{Rated speed in min}^{-1}}$$

Output

The outputs stated in this catalogue are for constant load in continuous running duty S1 according to EN 60034-1, based on an ambient temperature of 40° C and installation at altitudes up to 1000 m above sea level.

For severe operating conditions, e.g. high switching rate, long run-up time or electric braking, a thermal reserve is necessary, which could call for higher thermal class or the use of a motor with a higher rating. In these cases we recommend to enquire with detailed information on the operating conditions.

Overload

At operating temperature three-phase motors are capable of withstanding an overload for 15 seconds at 1.5 times the rated torque at rated voltage. This overload is according to EN 60034-1 and will not result in excessive heating.

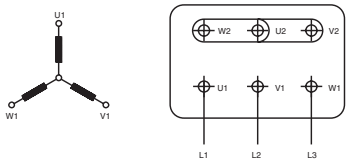
Utilizing thermal class F, motors can be operated continuously with an overload of 12 %. Nevertheless this is not valid for motors which to catalogue are utilized to thermal class F.

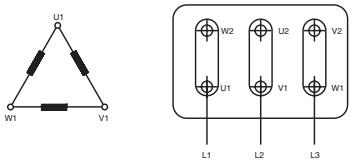
Connection

Motor output at 50 Hz	230 V Δ 400 V Y	400 V Δ 690 V Y	500 V Y	500 V Δ	690 V Δ
under 1.5 kW	standard	on request	on request	on request [1)]	-
1.5 to 4 kW	standard	standard	on request	on request	-
5.5 to 90 kW	standard	standard	on request	standard	standard
≥ 110 kW	on request	standard	on request	standard	standard

[1)] Available from 0.25 kW

Connection diagrams





Windings of standard three-phase motors can be connected either in star or delta connection.

Star connection

A star connection is obtained by connecting W2, U2, V2 terminals to eachother and the U1, V1, W1 terminals to the mains. The phase current and voltage are:

Iph = In ; Uph = Un / $\sqrt{3}$

where In is the line current and Vn the line voltage referred to the star connection.

Delta connection

A delta connection is obtained by connecting the end of a phase to the beginning of the next phase.

The phase current Iph and the phase voltage Uph are:

Iph = In / $\sqrt{3}$; Uph = Un

where In and Un are referred to the delta connection.

Star-delta starting

Star-delta starting allows a peak current reduction, ensuring however that the peak torque obtained is bigger than the resistant torque. Actually, it should be noted that the torque of an induction squirrel-cage motor is directly proportional to the square of the voltage. Motors whose rated voltage with delta connection corresponds to the mains voltage, can be started with the star-delta method.

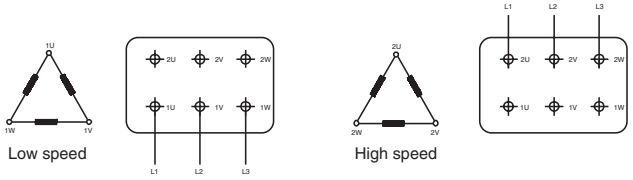
All motors can be supplied with windings designed for star-delta starting (for example: 400 V Δ / 690 V Y).

Pole-changing motors

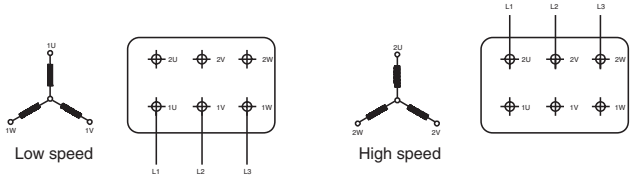
Standard pole-changing motors are designed for single voltage and direct-on-line starting (special design for Y-Δ-connection on request).

When the ratio between the two speeds is from 1 to 2, the standard motors have one single winding (Dahlander connection). For the other speeds, the motors have two separate windings.

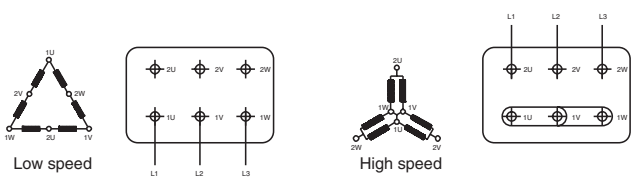
AM/AMV - two separate windings Δ/Δ



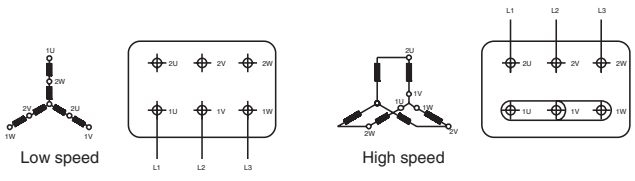
AM/AMV - two separate windings Y/Y



AM - Dahlander connection Δ/YY



AMV - Dahlander connection Y/YY



Insulation and temperature rise

Class F insulation to EN 60034-1 is used throughout.

In standard design motors are intended for operation at 40° C ambient temperature with class B temperature rise only, with an overtemperature limit of 80 K. This also applies for the rated voltage range to IEC 60038. Exceptions are shown on the data tables.

Temperature rise (ΔT^*) and maximum temperatures at the hottest points of the winding (T_{max}) according to the temperature classes of EN 60034-1.

	ΔT^*	T_{max}
Class B	80 K	125° C
Class F	105 K	155° C
Class H	125 K	180° C

*Measurement by resistance method

Output reduction at ambient temperatures over 40° C

Ambient temperature	45° C	50° C	55° C	60° C
Reduction of nominal output to approx.	95 %	90 %	85 %	80 %

When a winding is utilized to temperature class F (105K), no output reduction is required up to an ambient temperature of 60° C. *This does not apply to motors which in their standard design are already utilized to thermal class F.*

Installation at altitudes of more than 1000 m above sea level (see also EN 60034-1)

Altitude of installation	2000 m	3000 m	4000 m
At 40°C ambient temperature and thermal class B Rated output reduced to approx.	92 %	84 %	76 %
At 40°C ambient temperature and thermal class F Rated output reduced to approx.	89 %	79 %	68 %
Full nominal output to data tables with thermal class B and ambient temperature of	32° C	24° C	16° C
Full nominal output to data tables with thermal class F and ambient temperature of	30° C	19° C	9° C

Starting rate

The permissible number of starts per hour can be taken as given in the table below, provided the following conditions are met:

Additional moment of inertia ≤ moment of inertia of the rotor: load torque rising with the square of the speed up to nominal torque; starts at even intervals.

Shaft height	Permissible No. of starts per hour for 2p		
	= 2	= 4	≥ 6
56 - 71	100	250	350
80 - 100	60	140	160
112 - 132	30	60	80
160 - 180	15	30	50
200 - 225	8	15	30
250 - 315	4	8	12

For permissible number of starts for larger and pole-changing motors please consult us, indicating the complete operating conditions.

Thermal protection

The decision on a particular type of thermal protection should be taken according to the actual operating conditions. Motors may be protected by means of current-dependent thermal protection switches, overcurrent relays and temperature detectors.

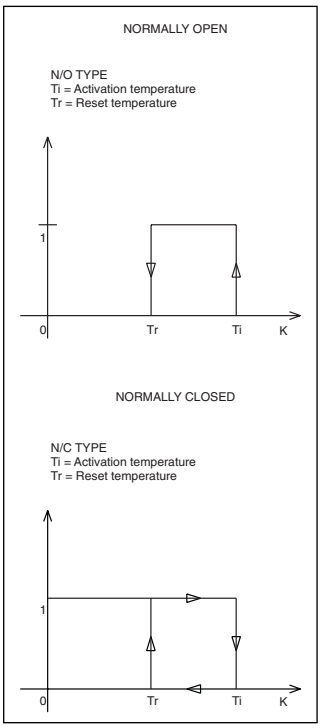
Thermal protection is possible as follows:

- Thermal protection switch with bimetal release
- Thermistor protection with semiconductor temperature detectors (PTC) in the stator winding in connection with release (if required, with additional motor protection switch).
- Bimetal temperature detector as N/C or N/O in the stator winding (if required, with additional motor protection switch).
- Resistance thermometer for monitoring winding and bearing temperature.

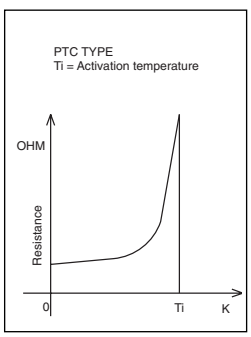
Should protection of the motor be required, we install protection switch with bimetal release up to frame size 112 and semiconductor temperature detectors in motors ≥ 132.

Although there are motors available from stock with built-in semiconductor temperature detector, a special remark has to be made in the enquiry or order when motor protection is required.

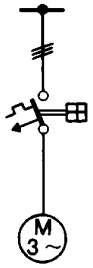
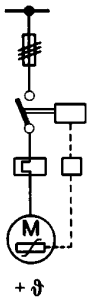
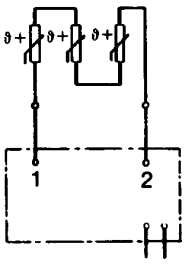
Operating specifications
Thermal cut-out



Operating specifications
of the thermistors



Examples of connection

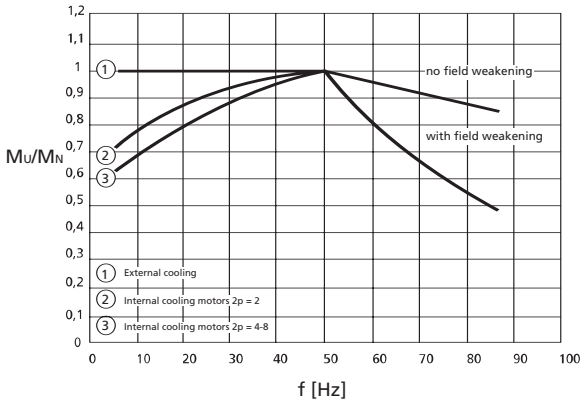
	Protection method	Protection
	Motor protection switch with thermal and electromagnetic overcurrent release	against: • Overload in continuous service • Locked rotor
	Contactor with overcurrent relay Thermistor protection and fuse	in service against: • Overload in continous service • Long starting and braking periods • High switching rate in case of fault against: • Obstruction of cooling • Increased ambient temperature • Single-phase operation • Frequency fluctuations • Switching against locked rotor
	Semiconductor temperature detector with release	in service against: • Overload in continous service • Long starting and braking periods • High switching rate in case of fault against: • Obstruction of cooling • Increased ambient temperature • Single-phase operation • Frequency fluctuations • Switching against locked rotor

The motors frame sizes 90 upwards in standard design are suitable for operation on static frequency converters, taking into account the following remarks:

- Maximum converter output voltage 500V at peak voltages $\hat{U} \leq 1460V$ and $du/dt \leq 13$ kV/us. For higher converter output voltages or stresses, a special insulation is required.
- With square characteristic of the load torque, motors can be driven with their rated torque.
- For constant torque, the rated torque of motors with internal cooling must be reduced due to reduced cooling air inlet. Depending on the control range, the use of an external fan would be advisable.
- The motors frame sizes 90 – 112 are suitable for a maximum output frequency of the converter of 60 Hz (e.g. applications with square torque, control range 1 : 10, such as pumps and fans). For higher frequencies, a special range with type designation AMI is available on request. From frame size 132 upwards, motors designed Δ/Y 230/400 V, 50 Hz can be operated in delta with a maximum frequency of 87 Hz (observe mechanical limit speed).
- Insulated or hybride bearings may be necessary on critical applications. We generally recommend the use of insulated bearings for motors frame size 225 upwards.

The motors frame size 56 – 80 can be operated on single-phase converters up to maximum 60 Hz. (Special range with type designation AMI for operation on three-phase converters with output voltage ≥ 400 V and output frequency > 60 Hz).

The electrical values and dimensions of the range AMI in frame size 56 to 112 are identical to AM motors (see data tables pages 36-41).



Thermal maximum-torque curve for approximate determination of the required torque reduction with constant load torque curve

Noise

Depending on the operating point and converter type, converter-fed motors produce between approx. 4 - 10 dB(A) higher noise values than when supplied from the mains. For motors driven with a frequency over 50 Hz, more fan noise is produced. We recommend the use of an external fan.

Degree of protection

Depending on the accessories used.

Mechanical limit speeds

For motors of standard design, the following maximum operating speeds are permitted:

Frame size	2p = 2 min $^{-1}$	2 p = 4 - 8 min $^{-1}$
56-112 [1)]	3600	1800
132-180	6000	6000
200	5000	5000
225	4500	4500
250	4300	4300
280, 315S YE	4300	3800
315S / M ZE	3600	3600
315 L	3600	3000

[1)] Higher speeds with special range AMI

Vibration amplitude

When operating at high speeds (according to frequency > 60 Hz) a reduced vibration amplitude "R" to DIN ISO 2373/DIN VDE 0530, part 14 may be required, measured at a mains frequency of 50 Hz or 60 Hz and sinusoidal mains voltage.

Accessories

Motors are available with the following accessory:
· *Encoder* with internal or external cooling

Encoder (standard design)

Supply voltage U_B	5 V	
Pulses per revolution	500-2048	
Outputs	2 signals with rectangular pulses A, B 2 signals with inverted rectangular pulses A, B zero pulse and inverted zero pulse	
Pulse displacement between	outputs	90°
Output amplitude	U_{High}	2.5 V
	U_{Low}	0.5 V
Maximum frequency	100 kHz	
Maximum speed	3,000 (6,000) min $^{-1}$	
Temperature range	-20°C to + 85°C	
Degree of protection	IP 54	

Motors for normal continuous duty (S1) and normal operating conditions

Quotation (if submitted)	No./Date
Quantity	Units
Designation	Type
Output (for pole-changing motors, outputs referred to speeds)	kW
Speed (for pole-changing motors, outputs referred to outputs)	min^{-1}
Direction of rotation (viewed on shaft extension)	
Mounting arrangement (to IEC 60034-7)	
Degree of protection, motor/terminal box (to IEC 60034-5)	
Mains voltage	V
Mains frequency	Hz
Method of starting (direct-on-line or Y-Δ)	
Location of terminal box	
Machine to be driven	

Dimensions of cables, if these differ from those allocated by VDE 0100, referred to an ambient temperature of 40° C, or when aluminium conductors are used. It should be stated when parallel connected conductors are used.

Additional information for special designs

Second or non-standard shaft extension
Radial sealing ring
Paint coating
Corrosive protection
Vibration level
Anti-condensation heating
Temperature detectors
Noise requirements
Mechanical or electrical brake
Special stipulations

Additional information for special duties and difficult operating conditions

S 2: ... min (short-time duty)

S 3: ... % - ... min (intermittent duty)

S 4: ... % - J_M ... kgm² - J_{ext} ... kgm²
(intermittent duty with starting)

S 5: ... % - J_M ... kgm² - J_{ext} ... kgm²
(intermittent duty with electric braking)

S 6: ... % - min
(continuous-operation periodic duty with intermittent load)

S 7: J_M ... kgm² - J_{ext} ... kgm²
(continuous-operation periodic duty with electric braking)

S 8: J_M ... kgm² - J_{ext} ... kgm²
(continuous-operation periodic duty with speed changes)

S 9: ... kW equ (continuous duty with non-periodic load and speed variations). For this duty type suitable full load values should be taken as the overload concept.

S10: p/Δt .... r .... TL (Duty with discrete constant loads).
Starting conditions (no-load or loaded starting)

Shock loads

Load torque curve during run-up (characteristic)

Moment of inertia (J_{ext}) referred to the motor shaft	kgm²
Description of the type of drive (direct coupling, flat or V-belt, straight or helical gears, sprocket, crank, eccentric cam, etc.)	
Radial force (or diameter of drive element)	N
Direction of force and point of application (distance from shaft shoulder or width of drive element)	mm
Axial force and direction of application (pull/thrust)	N

Ambient conditions (e.g. increased humidity, dust accumulation, corrosive gases or vapours, increased or extremely low ambient temperature, outdoor installation, installation at altitudes over 1000 m above sea level, extraneous vibration, etc.)

Type designation

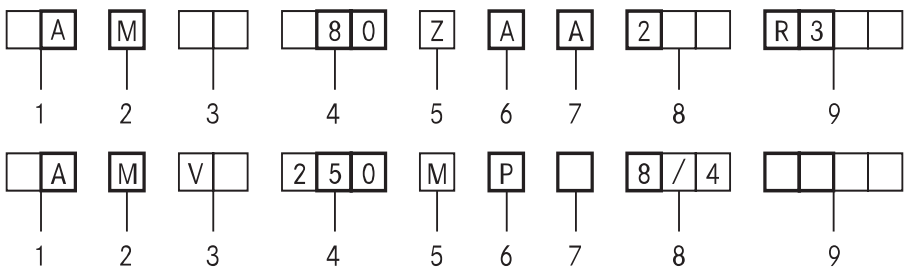
Apart from other information, it is necessary to specify the exact type designation in all enquiries, when ordering spare parts or replacement motors or when asking for documentary information.

The type designation of our motors comprises 9 points of reference, each of which may consist of several letters and/or numerals. The meaning of each symbol can be seen from the following table. For motors not included in our standard range, special symbols may be used which are not listed here.

Meaning of the symbols

Ref. point	Meaning	Description of symbols used for our motors				
1	Type of motor	A	Asynchronous motor			
2	Cooling	M G MFV	Surface cooled with external fan, cooling fins Surface cooled without external fan, cooling fins Surface cooled with forced ventilation, cooling fins			
3	Type of motor	blank V H HE I	Three-phase motor Three-phase pole-changing motor for driving fans Three-phase motor, efficiency to EPACT regulations Three-phase motor, efficiency eff 1 to CEMEP Voluntary Agreement Special design for three-phase motor driven with frequency converter			
4	Shaft centre height	56, 63, 71, 80, 90, 100, 112, 132,160, 180, 200, 225, 250, 280, 315				
5	Frame length	Z S M L	 Mechanical dimension (short) Mechanical dimension (medium) Mechanical dimension (long)			
6	Mechanical design and output value	A B C D	Frame size 56-112	Stage of development	X,P,J Y,R,L Z,V,T	Frame size 132-315
7	Frame material and/or stage of development	A G E	Aluminium frame Cast iron frame Stage of development			
8	Number of poles	2 4 6 8	4/2 8/4 4/6 6/8			
9	Special features	R3	High resistance rotor			

Examples



Three-phase squirrel cage motors designed for range of rated voltage 380-420 V ± 5% - 50 Hz

EFF 2

For mains voltage to IEC 60038 400 V ± 10% - 50 Hz

Temperature rise to class B

Type		Rated output		Rated speed	Efficiency			Power factor	Rated current at		Direct-on-line starting			Pull-out torque ratio	Moment of inertia	Weight
						η		$\cos\varphi$	I_N		Starting current ratio I_A/I_N	Breakaway torque ratio M_A/M_N	Pull-up torque ratio M_S/M_N	M_K/M_N	J	
		kW	HP	min^{-1}	50%	75%	100%		400V	380-420V					10^{-3} kgm²	kg
3000 min^{-1} (2 poles)																**Aluminium frame**
AM 56Z AA	**2**	0.09	0.12	2810	49	53	58.3	0.62	0.38	0.4	3.9	3.8	3.8	3.9	0.09	3.4
AM 56Z BA	**2**	0.12	0.16	2800	51	56	61.6	0.70	0.4	0.42	3.9	3.8	3.8	3.9	0.1	3.5
AM 63Z AA	**2**	0.18	0.25	2790	54	58	63	0.77	0.6	0.66	4.2	3	3.1	3.2	0.13	4.1
AM 63Z BA	**2**	0.25	0.33	2790	56.4	61.2	65.3	0.77	0.71	0.75	4.5	3.2	3.2	3.3	0.19	4.6
AM 63Z CA	**2***	0.37 [1]	0.50 [1]	2800	54	58	63	0.75	1.13	1.25	4.6	3.4	3.3	3.4	0.20	4.7
AM 71Z AA	**2**	0.37	0.50	2820	54	60.5	65.3	0.70	1.1	1.2	4.7	3.6	3.4	3.6	0.36	5.7
AM 71Z BA	**2**	0.55	0.75	2830	57	64	70.8	0.70	1.6	1.7	4.8	3.2	3.1	3.3	0.46	6.3
AM 71Z CA	**2***	0.75 [1]	1.0 [1]	2800	58	64.3	71	0.75	1.9	2.0	5.2	3.1	3.2	3.1	0.58	6.9
AM 80Z AA	**2**	0.75		2840	67.7	73.0	74.5	0.78	1.9	2.0	5.0	2.8	2.8	2.9	0.75	8.4
AM 80Z BA	**2**	1.1	1.5	2810	74.3	77.3	77.6	0.82	2.5	2.6	4.6	2.4	2.8	2.9	0.89	9.5
AM 80Z CA	**2***	1.5 [1]	2.0 [1]	2825	76.5	79.4	79.1	0.83	3.3	3.4	5.0	2.9	3.0	3.3	1.05	11.1
AM 90S AA	**2**	1.5	2.0	2830	75.4	78.4	78.6	0.82	3.4	3.5	5.0	3.1	2.9	3.0	1.37	12.7
AM 90S BA	**2***	1.8	2.5	2805	75.18	78.3	78.5	0.80	4.2	4.3	4.5	2.6	2.4	2.5	1.37	12.7
AM 90L CA	**2**	2.2	3.0	2860	78.6	81.4	81.8	0.81	4.9	4.9	7.1	4.1	3.6	4.0	1.8	16.0
AM 90L DA	**2***	3 [1]	4.0 [1]	2860	78.8	81.9	82.3	0.80	6.5	6.8	7.2	3.9	3.4	3.8	2.09	18.7
AM 100L AA	**2**	3	4.0	2860	81.7	82.2	82.6	0.85	6.4	6.7	6.0	3.1	3.1	3.3	2.80	19.3
AM 100L BA	**2***	4 [1]	5.5 [1]	2835	82.4	83.8	83.0	0.88	8.0	8.1	6.2	2.9	2.5	2.9	3.35	19.7
AM 100L CA	**2***	5.5 [1]	7.5 [1]	2865	83.5	85.3	85.0	0.85	10.8	11.0	7.2	3.5	3.4	4.1	4.5	25.9
AM 112M AA	**2**	4	5.5	2900	80.9	84.2	85.0	0.84	8.5	8.7	8.1	3.8	3.6	4.0	6.48	27.4
AM 112M BA	**2***	5.5 [1]	7.5 [1]	2930	81.0	84.7	86.2	0.81	11.5	12.3	9.0	4.2	2.6	3.6	8.58	33.6
AM 132S YA	**2**	5.5	7.5	2885	84.7	86.2	85.7	0.86	10.8	11.0	6.6	2.5	2.1	2.9	10.0	40
AM 132S ZA	**2**	7.5	10.0	2890	86.5	87.6	87.0	0.89	14.1	14.5	7.2	2.6	2.2	3.0	14.0	45
AM 132M ZA	**2***	9.2 [1]	12.5 [1]	2870	84.5	86.6	86.7	0.83	18.7	19.8	7.0	2.8	2.4	3.2	14.0	48
AM 132M RA	**2***	11	15.0	2900	88.2	89.2	88.7	0.87	20.6	21	7.8	2.9	2.5	3.3	20.5	53
AM 132M TA	**2***	15 [1]	20.0 [1]	2890	88.0	89.0	88.5	0.88	28.0	28.5	7.8	3.1	2.6	3.4	25.0	59
AM 160M VA	**2**	11	15	2925	86.6	88.5	88.7	0.84	21.5	22	6.7	2.3	2.2	3.0	28	81
AM 160M XA	**2**	15	20	2920	88.0	89.6	89.7	0.85	28.5	29.5	7.2	2.4	2.2	3.1	36	93
AM 160L XA	**2**	18.5	25	2925	88.8	90.3	90.4	0.86	34.5	35	7.6	2.7	2.5	3.3	42	101
AM 160L RA	**2***	22 [1]	30 [1]	2920	89.0	90.8	90.8	0.87	41	42	7.9	2.7	2.5	3.3	52	114
AM 180M XA	**2**	22	30	2925	89.1	90.7	90.8	0.86	41	42	7.4	2.5	2.3	3.2	65	130
AM 180M RA	**2***	30 [1]	40 [1]	2925	89.3	91.4	91.5	0.86	56	57.5	7.9	2.7	2.5	3.4	88	150

1) Temperature rise to class F

***** Higher output (progressive motor)

Temperature rise to class B

Type		Rated output		Rated speed	Efficiency			Power factor	Rated current at		Direct-on-line starting				Moment of inertia	Weight
						η		$\cos\varphi$	I_N		Starting current ratio I_A/I_N	Breakaway torque ratio M_A/M_N	Pull-up torque ratio M_S/M_N	Pull-out torque ratio M_K/M_N	J	
		kW	HP	min^{-1}	50%	75%	100%		400V	380-420V					10^{-3} kgm²	kg
3000 min^{-1} (2 poles)																**Cast iron frame**
AM 132S YG	**2**	5.5	7.5	2885	84.7	86.2	85.7	0.86	10.8	11.0	6.6	2.5	2.1	2.9	10.0	55
AM 132S ZG	**2**	7.5	10.0	2890	86.5	87.6	87.0	0.89	14.1	14.5	7.2	2.6	2.2	3.0	14.0	60
AM 132M ZG	**2***	9.2 [1]	12.5 [1]	2870	84.5	86.6	86.7	0.83	18.7	19.8	7.0	2.8	2.4	3.2	14.0	63
AM 132M RG	**2***	11	15.0	2900	88.2	89.2	88.7	0.87	20.6	21	7.8	2.9	2.5	3.3	20.5	68
AM 132M TG	**2***	15 [1]	20.0 [1]	2890	88.0	89.0	88.5	0.88	28.0	28.5	7.8	3.1	2.6	3.4	25.0	74
AM 160M VG	**2**	11	15	2925	86.6	88.5	88.7	0.84	21.5	22	6.7	2.3	2.2	3.0	28	101
AM 160M XG	**2**	15	20	2920	88.0	89.6	89.7	0.85	28.5	29.5	7.2	2.4	2.2	3.1	36	113
AM 160L XG	**2**	18.5	25	2925	88.8	90.3	90.4	0.86	34.5	35	7.6	2.7	2.5	3.3	42	121
AM 160L RG	**2***	22 [1]	30 [1]	2920	89.0	90.8	90.8	0.87	41	42	7.9	2.7	2.5	3.3	52	134
AM 180M XG	**2**	22	30	2925	89.1	90.7	90.8	0.86	41	42	7.4	2.5	2.3	3.2	65	155
AM 180M RG	**2***	30 [1]	40 [1]	2925	89.3	91.4	91.5	0.86	56	57.5	7.9	2.7	2.5	3.4	88	175
AM 200L LG	**2**	30	40	2945	89.2	91.1	91.6	0.85	56	57	7.8	2.2	2.0	3.0	120	212
AM 200L NG	**2**	37	50	2950	90.0	91.8	92.2	0.86	67.5	69	7.7	2.2	2.0	3.0	145	230
AM 225M N	**2**	45	60	2945	90.9	92.4	92.6	0.89	80	83	7.8	2.4	1.9	2.8	270	310
AM 250M N	**2**	55	75	2950	90.9	92.7	93.1	0.89	96	101	7.5	2.3	1.8	3.0	424	410
AM 280S T	**2**	75	100	2975	90.9	92.9	93.7	0.87	134	136	7.2	1.9	1.5	3.2	770	540
AM 280M T	**2**	90	125	2975	93.6	94.8	94.1	0.89	156	161	7.3	1.9	1.5	3.2	957	615
AM 315S YE	**2**	110	150	2975	92.8	94.4	95.0	0.87	193	198	7.8	1.9	1.5	3.2	1000	650
AM 315M ZE	**2**	132	180	2980	94.1	95.2	95.5	0.88	227	235	6.8	2.4	1.3	2.6	1200	810
AM 315L YE	**2**	160	220	2980	94.7	95.7	95.9	0.90	267	280	7.2	2.5	1.3	2.6	1400	900
AM 315L ZE	**2**	200 [1]	270 [1]	2980	95.2	96.1	96.3	0.91	329	347	7.8	2.7	1.3	2.7	1600	1000

1) Temperature rise to class F

***** Higher output (progressive motor)

Three-phase squirrel cage motors designed for range of rated voltage 380-420 V ± 5% - 50 Hz

EFF 2

For mains voltage to IEC 60038 400 V ± 10% - 50 Hz

Temperature rise to class B

Type		Rated output		Rated speed	Efficiency			Power factor	Rated current at		Direct-on-line starting				Moment of inertia	Weight
						η		$\cos\varphi$	I_N		Starting current ratio I_A/I_N	Breakaway torque ratio M_A/M_N	Pull-up torque ratio M_S/M_N	Pull-out torque ratio M_K/M_N	J	
		kW	HP	min^{-1}	50%	75%	100%		400V	380-420V					10^{-3} kgm^2	kg
1500 min^{-1} (4 poles)																**Aluminium frame**
AM 56Z AA	**4**	0.06	0.08	1300	42	44	48	0.55	0.35	0.4	2.6	2.1	2.0	2.1	0.14	3.2
AM 56Z BA	**4***	0.09	0.12	1330	43	47	51	0.60	0.4	0.45	2.5	2.2	2.1	2.2	0.14	3.3
AM 63Z AA	**4**	0.12	0.16	1350	46	50	54	0.69	0.45	0.5	2.4	2.0	1.9	2.0	0.25	4.1
AM 63Z BA	**4**	0.18	0.25	1330	47	50	56	0.70	0.6	0.65	2.3	1.9	1.8	1.9	0.27	4.6
AM 63Z CA	**4***	0.25	0.33	1360	49	52.5	58	0.60	1.0	1.2	2.7	2.2	2.0	2.1	0.30	4.9
AM 71Z AA	**4**	0.25	0.33	1340	55	59	64	0.71	0.7	0.8	3.2	1.9	1.8	2.0	0.63	5.2
AM 71Z BA	**4**	0.37	0.50	1370	60	63	67	0.67	1.18	1.25	3.3	2.2	2.1	2.2	0.76	5.4
AM 71Z CA	**4***	0.55 [1]	0.75 [1]	1380	61	64	68	0.67	1.73	1.8	3.6	2.4	2.3	2.4	0.98	6.3
AM 80Z AA	**4**	0.55	0.75	1400	67.0	69.0	70.0	0.72	1.6	1.7	3.6	2.6	2.5	2.6	1.58	8.2
AM 80Z BA	**4**	0.75	1.0	1410	62.5	69.0	70.6	0.71	2.2	2.3	4.4	2.8	2.3	2.8	2.00	9.3
AM 80Z CA	**4***	1.1 [1]	1.5 [1]	1385	74.1	76.4	75.9	0.77	2.8	2.9	4.4	2.5	2.5	2.6	2.41	10.6
AM 90S AA	**4**	1.1	1.5	1400	69.6	75.4	76.5	0.78	2.7	2.9	5.2	2.5	2.4	2.8	2.5	12.5
AM 90L BA	**4**	1.5	2.0	1400	75.6	78.7	78.6	0.77	3.6	3.7	5.7	2.8	2.6	3.0	3.13	14.5
AM 90L CA	**4***	1.8 [1]	2.5 [1]	1380	75.1	77.8	77.3	0.80	4.2	4.3	5.5	2.7	2.5	2.9	3.13	14.5
AM 90L DA	**4***	2.2 [1]	3.0 [1]	1400	76.3	79.3	79.3	0.75	5.3	5.5	4.8	2.9	2.8	3.2	4.05	17
AM 100L AA	**4**	2.2	3.0	1435	77.5	80.2	81.0	0.74	5.4	5.6	5.3	2.5	2.4	2.7	4.6	19.5
AM 100L BA	**4**	3	4.0	1425	81.7	83.4	82.8	0.76	6.8	6.9	4.6	2.4	2.3	2.5	5.58	22.5
AM 100L CA	**4***	4 [1]	5.5 [1]	1400	82.1	83.0	81.6	0.78	9.2	9.3	6.0	2.6	2.4	2.9	6.05	25
AM 112M AA	**4**	4	5.5	1430	84.5	85.3	84.2	0.81	8.5	8.8	6.3	2.2	2.0	2.8	12.2	29.5
AM 112M BA	**4***	5.5 [1]	7.5 [1]	1430	85.9	86.2	85.2	0.83	11.4	11.7	6.5	2.2	2.0	2.9	15.2	34
AM 132S ZA	**4**	5.5	7.5	1445	85.6	86.6	85.7	0.82	11.3	11.7	6.2	2.4	2.1	2.9	22	46
AM 132M ZA	**4**	7.5	10.0	1445	87.7	88.1	87.0	0.84	14.8	15.5	6.5	2.6	2.1	2.9	30	55
AM 132M ZA	**4***	9.2 [1]	12.5 [1]	1440	87.3	88.1	87.2	0.83	18.5	19.2	6.4	2.7	2.2	3.0	30	56
AM 132M TA	**4***	11 [1]	15.0 [1]	1430	87.5	87.9	86.8	0.84	22	22.5	6.7	2.8	2.2	3.1	36	65
AM 160M XA	**4**	11	15	1460	88.4	89.2	88.6	0.83	21.5	22.5	6.8	2.3	2.1	2.9	59	86
AM 160L XA	**4**	15	20	1460	89.6	90.3	89.6	0.85	29	29.5	7.2	2.4	2.1	3.0	82	102
AM 160L ZA	**4***	18.5 [1]	25 [1]	1450	89.2	90.2	90.2	0.81	37	38	7.4	2.7	2.4	3.3	82	102
AM 160L RA	**4***	22 [1]	30 [1]	1455	89.8	90.7	90.5	0.82	42	43	7.5	2.7	2.4	3.3	93	112
AM 180M XA	**4**	18.5	25	1460	90.0	90.8	90.3	0.84	35.5	36.5	7.2	2.7	2.2	3.0	105	125
AM 180L XA	**4**	22	30	1460	90.4	91.1	90.5	0.84	42	43.5	7.3	2.7	2.2	3.0	118	135
AM 180L RA	**4***	30 [1]	40 [1]	1455	90.4	91.4	91.4	0.82	58	60	7.8	3.0	2.4	3.2	150	150

1) Temperature rise to class F

***** Higher output (progressive motor)

Temperature rise to class B

Type		Rated output		Rated speed	Efficiency			Power factor	Rated current at		Direct-on-line starting			Pull-out torque ratio	Moment of inertia	Weight
						η		$\cos\varphi$	I_N		Starting current ratio I_A/I_N	Breakaway torque ratio M_A/M_N	Pull-up torque ratio M_S/M_N	M_K/M_N	J	
		kW	HP	min^{-1}	50%	75%	100%		400V	380-420V					10^{-3} kgm²	kg
1500 min^{-1} (4 poles)																**Cast iron frame**
AM 132S ZG	**4**	5.5	7.5	1445	85.6	86.6	85.7	0.82	11.3	11.7	6.2	2.4	2.1	2.9	22	61
AM 132M ZG	**4**	7.5	10.0	1445	87.7	88.1	87.0	0.84	14.8	15.5	6.5	2.6	2.1	2.9	30	70
AM 132M ZG	**4***	9.2 [1]	12.5 [1]	1440	87.3	88.1	87.2	0.83	18.5	19.2	6.4	2.7	2.2	3.0	30	71
AM 132M TG	**4***	11 [1]	15.0 [1]	1430	87.5	87.9	86.8	0.84	22	22.5	6.7	2.8	2.2	3.1	36	80
AM 160M XG	**4**	11	15	1460	88.4	89.2	88.6	0.83	21.5	22.5	6.8	2.3	2.1	2.9	59	106
AM 160L XG	**4**	15	20	1460	89.6	90.3	89.6	0.85	29	29.5	7.2	2.4	2.1	3.0	82	122
AM 160L ZG	**4***	18.5 [1]	25 [1]	1450	89.2	90.2	90.2	0.81	37	38	7.4	2.7	2.4	3.3	82	122
AM 160L RG	**4***	22 [1]	30 [1]	1455	89.8	90.7	90.5	0.82	42	43	7.5	2.7	2.4	3.3	93	132
AM 180M XG	**4**	18.5	25	1460	90.0	90.8	90.3	0.84	35.5	36.5	7.2	2.7	2.2	3.0	105	150
AM 180L XG	**4**	22	30	1460	90.4	91.1	90.5	0.84	42	43.5	7.3	2.7	2.2	3.0	118	160
AM 180L RG	**4***	30 [1]	40 [1]	1455	90.4	91.4	91.4	0.82	58	60	7.8	3.0	2.4	3.2	150	175
AM 200L NG	**4**	30	40	1465	90.5	91.6	91.5	0.84	56.5	58.5	7.0	2.4	1.8	2.6	195	225
AM 200L FG	**4***	37 [1]	50 [1]	1465	91.7	92.4	92.4	0.83	69.5	71.5	7.4	2.6	2.0	2.8	248	255
AM 225S N	**4**	37	50	1475	90.8	92.1	92.2	0.84	69.5	71.5	7.5	2.3	2.0	2.9	356	290
AM 225M N	**4**	45	60	1475	91.7	92.7	92.6	0.86	81.5	85	7.6	2.3	2.0	2.9	461	330
AM 250M N	**4**	55	75	1475	92.6	93.3	93.1	0.84	103	107	6.5	3.5	2.1	2.4	640	385
AM 250M K	**4***	75	100	1470	92.3	93.4	93.6	0.82	142	146	7.3	3.9	2.3	2.7	812	440
AM 280S T	**4**	75	100	1480	92.4	93.6	93.7	0.84	139	143	6.5	2.1	1.8	2.7	990	510
AM 280M T	**4**	90	125	1480	92.9	94.0	94.1	0.84	165	171	6.6	2.2	1.8	2.7	1260	565
AM 315S YE	**4**	110	150	1480	93.8	94.7	94.7	0.84	200	208	7.1	2.3	1.8	2.8	1400	620
AM 315M YE	**4**	132	180	1485	94.1	95.2	95.5	0.86	228	239	7.3	2.1	1.6	2.8	2200	860
AM 315M ZE	**4**	160	220	1485	94.6	95.5	95.7	0.88	274	288	7.3	2.1	1.5	2.8	2500	940
AM 315L ZE	**4**	200 [1]	270 [1]	1485	95.0	95.8	96.0	0.89	342	359	7.6	2.3	1.6	2.8	3100	1120

1) Temperature rise to class F

***** Higher output (progressive motor)

Three-phase squirrel cage motors designed for range of rated voltage 380-420 V ± 5% - 50 Hz

For mains voltage to IEC 60038 400 V ± 10% - 50 Hz

Temperature rise to class B

Type		Rated output		Rated speed	Efficiency			Power factor	Rated current at		Direct-on-line starting				Moment of inertia	Weight
						η		$\cos\varphi$	I_N		Starting current ratio I_A/I_N	Breakaway torque ratio M_A/M_N	Pull-up torque ratio M_S/M_N	Pull-out torque ratio M_K/M_N	J	
		kW	HP	min^{-1}	50%	75%	100%		400V	380-420V					10^{-3} kgm^2	kg
1000 min^{-1} (6 poles)																**Aluminium frame**
AM 71Z AA	**6**	0.18	0.25	850	44.0	47.0	51.0	0.73	0.7	0.75	2.2	1.6	1.5	1.6	0.6	5.7
AM 71Z BA	**6**	0.25 [1]	0.33 [1]	870	46.0	50.0	54.0	0.68	1.0	1.1	2.5	1.7	1.6	1.7	0.9	6.3
AM 80Z AA	**6**	0.37	0.5	910	47.0	58.0	60.0	0.72	1.2	1.25	2.7	1.6	1.6	2.1	1.97	8
AM 80Z BA	**6**	0.55	0.75	910	60.0	64.0	68.0	0.67	1.8	1.8	2.9	2.2	2.1	2.1	2.47	9.4
AM 90S AA	**6**	0.75	1	910	71.0	73.0	72.0	0.63	2.4	2.5	2.9	1.7	1.5	1.7	3.18	11.6
AM 90L BA	**6**	1.1	1.5	908	71.0	73.0	72.0	0.63	3.5	3.6	3.0	1.7	1.5	1.7	4.78	15
AM 100L AA	**6**	1.5	2	930	70.0	75.0	72.0	0.71	4.2	4.4	3.7	1.8	1.8	2.3	6.73	17.5
AM 100L BA	**6***	1.8	2.5	940	71.0	75.0	76.0	0.67	5.1	5.3	4.2	2.4	2.4	2.8	9.43	22
AM 112M AA	**6**	2.2	3	940	81.0	83.0	82.0	0.72	5.3	5.4	4.4	2.4	2.4	2.6	14.18	26
AM 112M BA	**6***	2.6	3.5	930	82.2	83.7	82.4	0.73	6.3	6.5	4.9	3.0	2.9	3.1	16.73	29.7
AM 112M CA	**6***	3	4	940	83.0	84.0	84.0	0.75	7.0	7.2	5.3	2.9	2.9	2.9	18.7	39
AM 132S ZA	**6**	3	4	955	81.6	83.7	83.4	0.75	7.0	7.1	5.8	2.1	1.8	2.7	27	43
AM 132M YA	**6**	4	5.5	955	83.2	84.9	84.5	0.76	9.1	9.2	6.2	2.3	1.9	2.8	34	49
AM 132M ZA	**6**	5.5	7.5	955	83.8	85.2	84.6	0.77	12.3	12.5	6.2	2.3	1.9	2.8	40	54
AM 132M TA	**6***	7.5 [1]	10 [1]	950	85.0	85.7	85.0	0.77	16.5	16.9	6.3	2.3	1.9	2.8	46	62
AM 160M ZA	**6**	7.5	10	965	86.8	87.7	87.0	0.82	15.2	15.9	5.9	1.9	1.7	2.5	78	83
AM 160L ZA	**6**	11	15	965	88.6	89.0	88.1	0.82	22	22.5	6.1	2.0	1.8	2.6	102	100
AM 180L ZA	**6**	15	20	970	90.5	90.8	90.0	0.83	29	30	6.7	2.2	1.8	2.8	169	130
1000 min^{-1} (6 poles)																**Cast iron frame**
AM 132S ZG	**6**	3	4	955	81.6	83.7	83.4	0.75	7.0	7.1	5.8	2.1	1.8	2.7	27	58
AM 132M YG	**6**	4	5.5	955	83.2	84.9	84.5	0.76	9.1	9.2	6.2	2.3	1.9	2.8	34	64
AM 132M ZG	**6**	5.5	7.5	955	83.8	85.2	84.6	0.77	12.3	12.5	6.2	2.3	1.9	2.8	40	69
AM 132M TG	**6***	7.5 [1]	10 [1]	950	85.0	85.7	85.0	0.77	16.5	16.9	6.3	2.3	1.9	2.8	46	77
AM 160M ZG	**6**	7.5	10	965	86.8	87.7	87.0	0.82	15.2	15.9	5.9	1.9	1.7	2.5	78	103
AM 160L ZG	**6**	11	15	965	88.6	89.0	88.1	0.82	22	22.5	6.1	2.0	1.8	2.6	102	120
AM 180L ZG	**6**	15	20	970	90.5	90.8	90.0	0.83	29	30	6.7	2.2	1.8	2.8	169	155
AM 200L PG	**6**	18.5	25	970	89.3	90.4	90.2	0.82	36	37	5.3	2.2	1.8	2.3	260	210
AM 200L RG	**6**	22	30	975	89.9	91.0	90.8	0.82	42.5	44	5.7	2.2	1.8	2.3	285	220
AM 225M P	**6**	30	40	975	90.7	91.7	91.5	0.83	56	58	5.7	2.3	1.6	2.3	536	290
AM 250M P	**6**	37	50	975	90.8	91.9	91.8	0.84	68	71	7.1	3.2	2.5	2.6	880	380
AM 280S V	**6**	45	60	985	91.4	92.5	92.4	0.86	84	87	5.6	1.8	1.5	2.4	1350	460
AM 280M V	**6**	55	75	985	91.5	92.7	92.6	0.86	102	106	5.6	1.8	1.5	2.4	1640	515
AM 315S YE	**6**	75	100	985	92.9	93.7	93.7	0.86	135	140	6.8	1.9	1.7	2.6	2200	620
AM 315M YE	**6**	90	125	988	94.2	94.8	94.5	0.87	159	167	7.6	2.5	2.0	2.6	3100	790
AM 315M ZE	**6**	110	150	987	94.5	95.0	94.7	0.87	192	202	7.4	2.5	2.0	2.6	3600	860
AM 315L ZE	**6**	132 [1]	180 [1]	987	95.0	95.3	94.9	0.88	229	241	7.7	2.7	2.0	2.5	4300	990

1) Temperature rise to class F

***** Higher output (progressive motor)

Three-phase squirrel cage motors designed for range of rated voltage 380-420 V ± 5% - 50 Hz

For mains voltage to IEC 60038 400 V ± 10% - 50 Hz

Temperature rise to class B

Type		Rated output		Rated speed	Efficiency			Power factor	Rated current at		Direct-on-line starting				Moment of inertia	Weight
											Starting current ratio	Breakaway torque ratio	Pull-up torque ratio	Pull-out torque ratio		
		kW	HP	min^{-1}	50%	η 75%	100%	cos φ	400V	I_N 380-420V	I_A/I_N	M_A/M_N	M_S/M_N	M_K/M_N	J 10^{-3} kgm^2	kg
750 min^{-1} (8 poles)																**Aluminium frame**
AM 71Z AA	**8**	0.12	0.16	670	40	44	49	0.51	0.7	0.75	2.4	2.5	2.4	2.5	0.90	6.3
AM 80Z AA	**8**	0.25	0.33	680	40	47	51	0.62	1.1	1.2	2.2	1.8	1.9	2.0	1.97	8
AM 90S AA	**8**	0.37	0.50	680	52	58	59	0.53	1.7	1.8	2.1	1.4	1.3	1.6	3.18	11.4
AM 90L BA	**8**	0.55	0.75	680	52	58	59	0.54	2.5	2.7	2.1	1.4	1.3	1.6	4.78	15
AM 100L AA	**8**	0.75	1.0	690	59	64	65	0.65	2.6	2.8	3.0	1.6	1.5	1.7	6.72	17.6
AM 100L BA	**8**	1.1	1.5	690	59	67	68	0.62	3.9	4.0	3.0	1.9	1.3	1.4	15.93	22.6
AM 112M AA	**8**	1.5	2.0	696	66	69	70	0.66	4.6	4.8	4	1.8	2.0	2.4	16.70	35
AM 132S ZA	**8**	2.2	3.0	700	79.3	80.5	79.0	0.72	5.70	5.90	4.2	1.7	1.6	2.1	27	43
AM 132M ZA	**8**	3	4.0	700	81.4	82.3	80.5	0.72	7.50	7.90	4.3	1.7	1.6	2.1	34	50
AM 160M YA	**8**	4	5.5	725	83.5	84.9	84.5	0.72	9.40	10.1	4.8	1.7	1.6	2.3	78	83
AM 160M ZA	**8**	5.5	7.5	725	84.3	85.6	85.2	0.72	12.9	14.0	4.8	1.7	1.6	2.3	90	89
AM 160L ZA	**8**	7.5	10.0	725	85.0	86.3	85.8	0.73	17.4	18.2	4.8	1.7	1.6	2.3	110	100
AM 180L ZA	**8**	11	15	725	86.7	87.8	86.9	0.73	25.0	25.5	4.6	2.1	1.4	1.9	215	150
750 min^{-1} (8 poles)																**Cast iron frame**
AM 132S ZG	**8**	2.2	3.0	700	79.3	80.5	79.0	0.72	5.70	5.90	4.2	1.7	1.6	2.1	27	58
AM 132M ZG	**8**	3	4.0	700	81.4	82.3	80.5	0.72	7.50	7.90	4.3	1.7	1.6	2.1	34	65
AM 160M YG	**8**	4	5.5	725	83.5	84.9	84.5	0.72	9.40	10.1	4.8	1.7	1.6	2.3	78	103
AM 160M ZG	**8**	5.5	7.5	725	84.3	85.6	85.2	0.72	12.9	14.0	4.8	1.7	1.6	2.3	90	109
AM 160L ZG	**8**	7.5	10.0	725	85.0	86.3	85.8	0.73	17.4	18.2	4.8	1.7	1.6	2.3	110	120
AM 180L ZG	**8**	11	15	725	86.7	87.8	86.9	0.73	25.0	25.5	4.6	2.1	1.4	1.9	215	175
AM 200L RG	**8**	15	20	730	87.2	88.8	88.5	0.76	32.0	33.5	5.3	2.3	1.9	2.5	285	220
AM 225S P	**8**	18.5	25	730	88.6	89.9	89.5	0.77	39.0	41.0	5.2	2.3	1.9	2.2	438	255
AM 225M P	**8**	22	30	730	88.7	89.9	89.5	0.77	46.6	48.0	5.6	2.5	2.0	2.3	538	285
AM 250M P	**8**	30	40	730	88.7	90.2	90.2	0.78	61.0	65.0	6.5	3.2	2.5	2.6	1080	400
AM 280S V	**8**	37	50	740	91.1	92.3	92.2	0.81	74.0	74.0	6.0	2.1	1.7	2.3	1520	480
AM 280M V	**8**	45	60	740	91.1	92.4	92.3	0.81	90.0	90.0	6.0	2.1	1.7	2.3	1860	500
AM 315S YE	**8**	55	75	738	92.2	93.0	92.7	0.82	105	112	6.1	2.2	1.7	2.3	2200	620
AM 315M YE	**8**	75	100	738	93.2	94.0	93.8	0.82	142	150	6.1	2.4	1.8	2.1	3100	790
AM 315M ZE	**8**	90	125	738	93.4	94.2	94.0	0.82	169	179	6.2	2.5	1.8	2.1	3600	900
AM 315L ZE	**8**	110 [1]	150 [1]	738	93.5	94.3	94.1	0.82	206	218	6.4	2.7	1.8	2.1	4300	990

1) Temperature rise to class F

Three-phase squirrel cage motors
Designed for range of rated voltage
380-420 V ± 5% - 50 Hz

EFF 1

For mains voltage
to IEC 60038
400 V ± 10% - 50 Hz

High efficiency motors, efficiency values to CEMEP Voluntary Agreement **Temperature rise to class B**

Type		Rated output		Rated speed	Efficiency			Power factor	Rated current at		Starting current ratio	Direct-on-line-starting Breakaway torque ratio	Pull-up torque ratio	Pull-out torque ratio	Moment of inertia	Weight
		kW	HP	min^{-1}	50%	η 75%	100%	$cos\ \varphi$	I_N 400V	380-420V	I_A/I_N	M_A/M_N	M_s/M_N	M_K/M_N	J 10^{-3} kgm²	kg
3000 min-1 (2 poles)																
AMHE 80Z BA	**2**	1.1	1.5	2880	82.0	84.0	83.8	0.77	2.5	2.6	4.8	3.6	3.4	3.6	0.89	9.5
AMHE 90S AA	**2**	1.5	2	2880	83.0	83.4	84.1	0.80	3.2	3.3	8.1	3.6	3.1	4.0	1.56	14
AMHE 90L CA	**2**	2.2	3	2860	84.0	85.8	85.6	0.85	4.4	4.6	8.5	3.5	3.2	3.7	1.8	16
AMHE 100L AA	**2**	3	4	2920	85.1	85.8	86.7	0.84	5.9	6.1	12.3	4.2	4.7	6.3	4.05	22.8
AMHE 112M AA	**2**	4	5.5	2940	87.1	89.3	89.9	0.86	7.5	7.8	12.5	4.3	2.2	4.5	8.58	33.6
AMHE 112M BA	**2**	5.5	7.5	2920	85.7	87.5	88.6	0.88	10.1	10.5	8.9	3.0	2.1	3.2	8.58	34
AMHE 132S ZA	**2**	5.5	7.5	2900	85.5	88.6	88.6	0.90	10	10.5	7.6	2.8	2.3	3.3	14	46
AMHE 132S TA	**2**	7.5	10	2900	86.5	89.5	89.5	0.90	13.5	14	7.9	3	2.5	3.5	20.5	53
AMHE 160M YA	**2**	11	15	2930	89.5	90.7	90.7	0.86	20.4	21	7.3	2.4	2.2	3.1	32	85
AMHE 160M ZA	**2**	15	20	2930	90.2	91.6	91.6	0.86	27.5	28	7.6	2.5	2.3	3.1	39	96
AMHE 160L ZA	**2**	18.5	25	2930	90.2	91.8	92.0	0.86	33.5	34.5	7.9	2.8	2.6	3.4	47	106
AMHE 180M ZA	**2**	22	30	2930	91.8	92.5	92.5	0.87	39.5	41	7.7	2.5	2.3	3.2	70	135
AMHE 200L PG	**2**	30	40	2945	91.9	93.1	93.1	0.89	52.5	55	7.8	2.1	1.9	2.8	130	220
AMHE 200L RG	**2**	37	50	2950	92.1	93.4	93.6	0.89	65	68	7.6	2.2	2	2.8	156	240
AMHE 225M P	**2**	45	60	2950	93.0	94.1	94.2	0.88	78	82	7.9	2.5	1.9	2.9	270	315
AMHE 250M P	**2**	55	75	2955	93.2	94.2	94.3	0.89	94	99	7.7	2.4	1.8	3	424	410
AMHE 280S V	**2**	75	100	2975	93.0	94.4	94.9	0.90	132	132	7.5	1.9	1.5	3.2	816	560
AMHE 280M V	**2**	90	125	2975	93.6	94.8	95.2	0.89	161	161	7.5	1.9	1.5	3.2	957	620
1500 min-1 (4 poles)																
AMHE 90S AA	**4**	1.1	1.5	1430	82.8	83.8	83.8	0.76	2.5	2.6	6.1	4.0	3.9	4.1	3.73	16.4
AMHE 90L BA	**4**	1.5	2	1430	84.8	85.3	85.0	0.76	3.4	3.5	6.4	3.9	3.8	4.0	3.73	16.4
AMHE 100L AA	**4**	2.2	3	1450	85.5	86.1	86.4	0.71	5.2	5.4	6	3.2	3.0	3.4	5.58	22.4
AMHE 100L BA	**4**	3	4	1440	86.8	87.8	87.4	0.77	6.5	6.7	6.3	3.4	3.1	3.6	7.3	26.5
AMHE 112M AA	**4**	4	5.5	1450	87.5	88.6	88.3	0.77	8.5	8.8	6.1	3.1	2.8	3.3	13.3	30.4
AMHE 132S RA	**4**	5.5	7.5	1450	87.9	89.2	89.2	0.84	10.8	11.3	7.4	3	2.4	3.3	30	55
AMHE 132M TA	**4**	7.5	10	1450	88.8	90.1	90.1	0.84	14.4	15	7.4	3	2.4	3.3	36	65
AMHE 160M ZA	**4**	11	15	1460	90.0	91.0	91.0	0.82	22	22.5	6.9	2.3	2.1	2.9	59	86
AMHE 160L ZA	**4**	15	20	1460	90.7	91.8	91.8	0.84	29	29.5	7.4	2.5	2.2	3.1	82	102
AMHE 180M ZA	**4**	18.5	25	1460	91.6	92.3	92.3	0.84	35	36	7.5	2.8	2.3	3.1	112	130
AMHE 180L ZA	**4**	22	30	1465	91.8	92.6	92.6	0.85	41	42.5	7.8	3	2.4	3.2	132	140
AMHE 200L RG	**4**	30	40	1465	92.5	93.3	93.2	0.84	56.5	58.5	7	2.4	1.8	2.6	206	230
AMHE 225S P	**4**	37	50	1475	92.3	93.6	93.8	0.84	68	70.5	7.7	2.3	2	2.9	356	290
AMHE 225M P	**4**	45	60	1475	92.5	93.9	94.0	0.86	80.5	84.5	7.7	2.3	2	2.9	461	330
AMHE 250M P	**4**	55	75	1475	93.2	94.4	94.4	0.82	103	107	6.8	3.8	2.3	2.6	677	400
AMHE 280S V	**4**	75	100	1485	93.9	94.7	94.8	0.85	134	140	6.8	2.2	1.8	2.7	1060	530
AMHE 280M V	**4**	90	125	1480	94.1	95.0	95.2	0.85	162	168	6.8	2.2	1.8	2.7	1260	565

Verified by Underwriters Laboratories Inc.

Thermal class F/B – S.F. 1.15

Type	Rated output		Rated speed	Efficiency			Power factor	Rated current at 460 V	Direct-on-line-starting				Moment of inertia	Weight
									Starting current ratio	Breakaway torque ratio	Pull-up torque ratio	Pull-out torque ratio		
					η		$\cos\varphi$	I_N	I_A/I_N	M_A/M_N	M_S/M_N	M_K/M_N	J	
	kW	HP	min^{-1}	50%	75%	100%		A					10^{-3} kgm^2	kg
3600 min^{-1} (2 poles)														
AMH 90S AA	**2** 1.5	2	3470	83.8	84.9	84.3	0.88	2.7	7.7	3.1	3	3.6	1.56	14
AMH 90L BA	**2** 2.2	3	3500	85.4	86.6	86.3	0.84	3.9	7.5	4.4	4	4.4	1.8	16
AMH 100L AA	**2** 2.2	3	3530	86.5	87.9	87.8	0.84	3.9	11.5	4.7	4.1	5.5	3.35	19.7
AMH 100L BA	**2** 3	4	3525	86.4	87.8	87.7	0.82	5	10.5	5.6	5.3	5.8	4.05	22.8
AMH 112M AA	**2** 3.7	5	3530	86.1	88.4	88.1	0.84	6.3	14.3	5.7	2.1	5.8	8.58	33.6
AMH 112M AA	**2** 4	5.5	3540	86.1	88.3	88.0	0.87	6.6	13.7	5.3	1.9	5.4	8.58	33.6
AMH 112M BA	**2** 5.5	7.5	3500	85.0	88.6	88.5	0.85	9.3	10.9	4.5	2.48	4.3	8.58	34
AMH 132S ZA	**2** 5.5	7.5	3520	86.1	88.2	88.5	0.87	9.2	7.9	3.3	2.9	3.7	20.5	53
AMH 132S TA	**2** 7.5	10	3510	89.7	90.1	89.5	0.91	11	8.1	3.4	2.9	3.9	20.5	53
AMH 132M TA	**2** 9.2	12.4	3520	88.8	89.9	89.5	0.91	14	8.1	3.3	2.9	3.9	25	59
AMH 160M YA	**2** 11	15	3550	90.1	91	91.0	0.88	17.3	8.7	2.8	2.2	3.6	39	96
AMH 160M ZA	**2** 15	20	3545	91.2	89.9	91.0	0.88	23.5	8.7	2.8	2.2	3.6	47	104
AMH 160L ZA	**2** 18.5	25	3550	91.5	92	91.7	0.87	28.8	8.9	2.8	2.2	3.6	52	115
AMH 180M ZA	**2** 22	30	3550	92.1	92.6	92.4	0.88	33.5	8.6	2.9	2.3	3.7	88	145
AMH 200L PG	**2** 30	40	3555	90.6	91.7	91.7	0.87	47	8.1	2.4	1.8	2.9	130	220
AMH 200L RG	**2** 37	50	3555	91.7	92.5	92.4	0.88	57.5	7.9	2.3	1.7	2.7	156	240
AMH 225M P	**2** 45	60	3555	91.8	93	93.0	0.88	70	8.1	2.4	1.8	3	270	315
AMH 250M P	**2** 55	75	3560	91.2	92.7	93.0	0.90	81.5	7.5	2.9	1.7	2.5	424	410
AMH 280S V	**2** 75	100	3580	92.8	93.2	93.6	0.89	110	7.6	2.2	1.7	3.4	816	560
AMH 280M V	**2** 90	125	3580	93.0	94.1	94.5	0.89	134	7.7	2.2	1.7	3.4	957	620
AMH 315S ZE	**2** 110	150	3585	93.3	94.4	94.5	0.89	165	8.2	2.8	1.5	3	1200	810
AMH 315M YE	**2** 150	200	3585	94.5	94.8	95.0	0.90	220	8.7	3	1.6	3.2	1600	1000
1800 min^{-1} (4 poles)														
AMH 90L AA	**4** 1.1	1.5	1745	82.2	84.2	84.2	0.76	2.1	7.2	3.8	4	4.6	3.73	16.4
AMH 90L BA	**4** 1.5	2	1735	82.1	84.4	84.4	0.73	3.1	7.5	4	3.9	4.2	3.73	16.4
AMH 90L CA	**4** 1.8	2.4	1720	82.2	84.3	84.3	0.77	3.4	7.4	4.4	3.3	4	3.73	16.4
AMH 100L AA	**4** 2.2	3	1750	85.8	87.6	87.5	0.70	4.6	6.5	3.8	3.1	3.9	5.58	22.4
AMH 100L BA	**4** 3	4	1740	85.7	87.7	87.6	0.76	5.6	7.4	3	2.8	3.2	7.3	26.5
AMH 112M AA	**4** 3.7	5	1750	86.3	87.9	87.8	0.79	6.8	6.9	4.2	3.5	4.5	13.3	30.4
AMH 112M AA	**4** 4	5.5	1745	86.5	88.1	88.0	0.81	7	6.7	3.9	3.2	4.2	13.3	30.4
AMH 132S ZA	**4** 5.5	7.5	1755	88.8	89.8	89.5	0.84	9.4	7.9	3.4	2.8	3.7	30	56
AMH 132M ZA	**4** 7.5	10	1750	89.5	90.2	89.5	0.84	12.4	8.1	3.5	2.9	3.8	36	65
AMH 132M TA	**4** 9.2	12.4	1745	89.2	90	89.5	0.84	16	8.3	3.6	2.9	3.9	36	65
AMH 160M ZA	**4** 11	15	1770	90.8	91.4	91.0	0.84	18.5	8.6	3.2	2.3	3.4	82	98
AMH 160L ZA	**4** 15	20	1770	91.4	91.6	91.0	0.84	24	8.2	3.2	2.3	3.4	93	112
AMH 180M ZA	**4** 18.5	25	1770	92.3	92.8	92.4	0.83	29	8.8	3.2	2.3	3.4	132	140
AMH 180L ZA	**4** 22	30	1770	92.2	92.7	92.4	0.84	36.5	8.6	3.2	2.3	3.4	150	155
AMH 200L RG	**4** 30	40	1780	92.3	93.2	93.0	0.82	49	7.7	2.9	2.2	3	248	255
AMH 225S P	**4** 37	50	1780	92.2	93.2	93.0	0.85	60	7.8	2.3	2	2.8	356	290
AMH 225M P	**4** 45	60	1780	93.4	93.9	93.6	0.84	72	7.9	2.3	2	2.8	461	330
AMH 250M P	**4** 55	75	1775	91.2	93.8	94.1	0.80	91	8.5	4.6	2.7	3.2	750	420
AMH 280S V	**4** 75	100	1785	93.8	94.5	94.5	0.84	119	7.8	2.9	2.1	3.1	1060	550
AMH 280M V	**4** 90	125	1785	94.1	94.6	94.5	0.84	143	7.7	2.9	2.1	3.1	1260	585
AMH 315S ZE	**4** 110	150	1785	93.6	94.7	95.0	0.87	170	7.8	2.2	1.6	2.8	2200	860
AMH 315L ZE	**4** 150	200	1785	94.1	94.9	95.0	0.88	228	8	2.4	1.6	2.9	3100	1120

Pole-changing squirrel-cage motors designed for range of rated voltage 380-420 V ± 5% - 50 Hz

For mains voltage to IEC 60038 400 V ± 10% - 50 Hz

Temperature rise to class B

Type		Rated output		Rated speed	Efficiency	Power factor	Rated current at		Direct-on-line starting		Moment of inertia	Weight
									Starting current ratio	Breakaway torque ratio		
		kW	HP	min^{-1}	η 100%	$\cos\varphi$	400V I_N	380-420V I_N	I_A/I_N	M_A/M_N	J 10^{-3} kgm^2	kg
1500/3000 min^{-1} (4/2 poles) - Dahlander connection Δ/YY												
AM 63Z AA	**4/2**	0.20/0.30	0.27/0.40	1345/2700	56/65	0.65/0.81	0.8/0.83	0.89/0.88	2.4/3.2	2.1/2.1	0.40	4.6
AM 71Z AA	**4/2**	0.30/0.45	0.40/0.65	1374/2830	61/66	0.78/0.73	1.0/1.35	1.2/1.5	3.3/3.0	2.3/2.1	0.76	6.3
AM 80Z AA	**4/2**	0.45/0.60	0.65/0.80	1390/2760	64/68.8	0.75/0.80	1.4/1.6	1.5/1.7	3.8/4.0	2.3/2.2	1.58	8.3
AM 80Z BA	**4/2**	0.55/0.75	0.75/1.0	1435/2850	70/71.2	0.67/0.77	1.7/2.0	1.8/2.1	4.5/5.0	2.6/2.8	2.00	11.5
AM 80Z CA	**4/2**	0.8/1.1	1.1/1.5	1425/2830	76.1/77.2	0.70/0.79	2.2/2.6	2.5/2.8	4.5/4.9	2.5/2.7	2.41	14.7
AM 90L AA	**4/2**	1.2/1.55	1.6/2.1	1435/2850	77.4/78.3	0.71/0.79	3.2/3.7	3.4/3.9	4.7/5.1	2.6/2.7	3.10	15.6
AM 90L BA	**4/2**	1.6/2.0 [1]	2.15/2.7 [1]	1390/2810	73.5/75.5	0.78/0.86	4.0/4.6	4.1/4.7	4.1/5.5	2.7/2.6	3.73	17.1
AM 100L AA	**4/2**	1.8/2.5	2.5/3.35	1420/2865	78.5/77.4	0.76/0.84	4.5/5.6	4.7/5.8	5.2/5.5	2.2/2.2	4.60	21.4
AM 100L BA	**4/2**	2.2/3.0	3.0/4.0	1410/2830	74.6/71.4	0.72/0.82	5.9/7.4	6.1/7.7	4.2/4.3	1.8/2.0	4.60	22.5
AM 100L CA	**4/2**	2.6/3.3	3.5/4.4	1430/2890	82.6/78.6	0.78/0.76	5.9/8.0	6.1/8.5	4.7/5.5	1.9/2.2	5.58	23.2
AM 112M AA	**4/2**	3.3/4.4	4.4/5.9	1410/2800	77.4/75.4	0.82/0.85	7.5/9.9	7.8/10.6	4.5/5.1	2.1/2.4	13.30	36.1
AM 132S ZA	**4/2**	4.7/6	6.4/8	1440/2880	85/83	0.83/0.88	9.7/12	10.2/12.8	5.3/6.0	2.1/2.1	22.00	46
AM 132M ZA	**4/2**	6.4/7.8	8.7/10.5	1440/2900	86/85	0.84/0.89	13/15	13.5/16	5.5/6.7	2.2/2.3	30.00	55
AM 160M ZA	**4/2**	8.7/10.7	11.7/14.5	1450/2925	88/89	0.83/0.85	17.5/21.5	18.5/22.5	6.4/7.3	2.0/2.2	59.00	87
AM 160L ZA	**4/2**	12.5/16.5	17/22.5	1465/2940	89/90	0.84/0.85	25.5/32	27/34	6.8/7.5	2.2/2.4	82.00	102
AM 180M ZA	**4/2**	15/19.5	20/26.5	1465/2955	89/87	0.80/0.88	30/36.5	31.5/38.5	5.8/7.2	2.0/1.8	112.0	130
AM 180L ZA	**4/2**	17.5/23	24/31	1465/2950	90/88	0.81/0.86	34.5/43	36.5/46	6.5/7.5	2.0/1.8	132.0	140
AM 200L PG	**4/2**	24/29	32.5/39	1470/2955	91/89.5	0.83/0.89	46/52	48/55	6.2/7.8	2.1/2.5	206.0	230
AM 200L RG	**4/2**	26/33	35/45	1470/2955	91.5/89.5	0.84/0.91	50/59	52/62	6.4/7.9	2.0/2.2	248.0	255
AM 225S P	**4/2**	30/38	40/52	1470/2965	92/91	0.85/0.91	55/66	58/70	5.8/7.8	1.7/1.8	356.0	325
AM 225M P	**4/2**	34/46 [1]	46/63 [1]	1475/2960	92/91	0.85/0.90	63/81	66/85	6.6/7.8	1.9/1.8	428.0	330
AM 250M P	**4/2**	50/58	68/79	1470/2965	93/92.5	0.85/0.90	92/100	96/104	5.8/8.6	3.0/3.5	750.0	465
AM 280S V	**4/2**	60/72 [1]	82/98 [1]	1480/2975	94/93	0.85/0.91	108/122	114/129	5.9/8.5	2.0/2.2	1200.0	580
AM 280M V	**4/2**	70/84 [1]	95/114 [1]	1480/2975	94/93	0.85/0.91	126/142	133/150	5.9/8.5	2.0/2.2	1400.0	620
AM 315S ZE	**4/2**	85/115	116/156	1485/2970	94.5/93	0.86/0.91	150/195	156/203	6.0/7.4	1.6/1.5	2200.0	860
AM 315M ZE	**4/2**	100/125	136/170	1485/2970	95/94	0.87/0.91	175/210	182/217	6.6/7.9	1.7/1.6	3100.0	940
AM 315L ZE	**4/2**	120/150	163/204	1485/2970	95/94	0.87/0.91	210/255	219/264	6.6/7.9	1.7/1.6	3100.0	1120

1) Temperature rise to class F

Pole-changing squirrel-cage motors designed for range of rated voltage 380-420 V ± 5% - 50 Hz

For mains voltage to IEC 60038 400 V ± 10% - 50 Hz

Temperature rise to class B

Type		Rated output		Rated speed	Efficiency	Power factor	Rated current at		Direct-on-line starting		Moment of inertia	Weight
									Starting current ratio	Breakaway torque ratio		
		kW	HP	min^{-1}	η 100%	$cos\ \varphi$	400V	I_N 380-420V	I_A/I_N	M_A/M_N	J 10^{-3} kgm²	kg
750/1500 min⁻¹ (8/4 poles) - Dahlander connection Δ/YY												
AM 71Z AA	**8/4**	0.09/0.15	0.12/0.20	610/1310	40/56	0.61/0.75	0.53/0.52	0.59/0.57	2.5/3.2	1.6/1.6	0.71	6.3
AM 80Z AA	**8/4**	0.18/0.37	0.25/0.50	700/1370	43.2/58.7	0.63/0.83	1.0/1.1	1.1/1.2	2.6/3.4	1.8/1.6	1.97	7.9
AM 80Z BA	**8/4**	0.26/0.51	0.35/0.68	700/1360	44.1/61.2	0.60/0.88	1.2/1.4	1.3/1.5	2.5/3.6	2.0/1.6	2.47	9.2
AM 90S AA	**8/4**	0.37/0.75	0.50/1.0	690/1385	52.2/67.1	0.58/0.82	1.8/2.0	1.9/2.1	2.8/3.9	1.9/1.8	3.18	13.5
AM 90L BA	**8/4**	0.5/1.0	0.67/1.34	690/1410	52.2/72.5	0.58/0.80	2.4/2.4	2.5/2.5	3.3/4.0	2.3/1.9	4.78	15.7
AM 100L AA	**8/4**	0.7/1.4	0.94/1.9	700/1440	57.2/78.5	0.50/0.78	3.5/3.3	3.7/3.4	2.8/4.3	2.1/1.9	5.58	21.9
AM 100L BA	**8/4**	0.9/1.8 [1]	1.2/2.5 [1]	690/1415	62/76	0.56/0.87	3.8/4.0	4.0/4.3	2.5/4.5	1.9/1.8	6.00	23.7
AM 112M AA	**8/4**	1/1.8	1.34/2.5	710/1445	66.1/78.5	0.61/0.82	4.1/4.1	4.4/4.2	3.9/6.3	2.2/2.1	14.18	31.7
AM 112M BA	**8/4**	1.3/2.6 [1]	1.75/3.0 [1]	705/1420	70.0/76.3	0.65/0.88	4.6/5.7	4.8/5.9	3.2/4.8	2.1/2.0	16.70	34.2
AM 132S ZA	**8/4**	1.8/3.4	2.5/4.6	720/1410	76/82	0.60/0.90	5.7/6.7	6/7.1	4.7/5.5	2.3/1.7	27.00	43
AM 132M ZA	**8/4**	2.3/4.4	3.1/6.0	720/1420	78/83	0.62/0.91	7/8.5	7.5/9	5.0/5.7	2.4/1.8	40.00	54
AM 160M YA	**8/4**	4/7.5	5.5/10	730/1455	82/85.5	0.67/0.91	10.5/14	11.5/14.5	5.4/5.8	2.0/1.5	78.00	84
AM 160M ZA	**8/4**	5.5/9	7.5/12.2	725/1455	83/86.5	0.71/0.89	14/16.5	14.5/17.5	5.3/6.0	1.9/1.6	90.00	90
AM 160L ZA	**8/4**	7.5/12.5	10/17	725/1460	84/87.5	0.69/0.91	18.5/23	19.5/24	5.3/6.0	2.0/1.6	110.0	100
AM 180L ZA	**8/4**	11/18	15/24	730/1465	87/89	0.72/0.90	26/32	27/34	5.8/6.8	2.0/1.6	215.00	150
AM 200L PG	**8/4**	15/23	20/31	730/1465	88/88	0.77/0.92	33.5/41	34/43	5.3/7.0	2.0/2.3	285.00	220
AM 200L RG	**8/4**	18/29	24/39	735/1470	89/89	0.73/0.91	40/51	42/54	5.6/7.5	2.6/2.4	375.00	255
AM 225S P	**8/4**	21/32	28/43	735/1475	89/90	0.79/0.92	44/55	45/59	5.8/7.4	2.2/2.0	576.00	310
AM 225M P	**8/4**	26/37 [1]	35/50 [1]	735/1475	90/90	0.78/0.91	53/65	56/68	5.4/7.2	2.1/2.1	577.00	315
AM 250M P	**8/4**	32/46 [1]	43/63 [1]	730/1470	90/90.5	0.77/0.91	67/81	70/85	6.0/8.8	2.8/2.8	1320.0	490
AM 280S V	**8/4**	44/60 [1]	60/82 [1]	740/1485	91/91	0.80/0.91	88/105	93/110	5.8/8.2	2.1/2.3	2000.0	580
AM 280M V	**8/4**	52/70 [1]	71/95 [1]	740/1485	91/91	0.80/0.91	105/122	110/128	5.8/8.2	2.1/2.3	2320.0	620
AM 315S ZE	**8/4**	60/100	82/136	735/1480	93/93	0.75/0.88	117/170	123/180	6.6/7.5	2.2/2.2	3100.0	790
AM 315M ZE	**8/4**	75/120	100/163	735/1480	93/93	0.76/0.89	152/205	160/215	6.6/7.7	2.3/2.3	3600.0	860
AM 315L ZE	**8/4**	90/150	120/200	735/1480	94/94	0.76/0.89	180/253	190/266	6.9/7.9	2.3/2.5	4300.0	990

1) Temperature rise to class F

Pole-changing squirrel-cage motors designed for range of rated voltage 380-420 V ± 5% - 50 Hz

For mains voltage to IEC 60038 400 V ± 10% - 50 Hz

Temperature rise to class B

Type		Rated output		Rated speed	Efficiency	Power factor	Rated current at I_N			Direct-on-line starting: Starting current ratio I_A/I_N	Direct-on-line starting: Breakaway torque ratio M_A/M_N	Moment of inertia J	Weight
		kW	HP	min^{-1}	η 100%	cos φ	400V	380-420V				10^{-3} kgm^2	kg
1500/1000 min^{-1} (4/6 poles) - separate windings													
AM 71Z AA	**4/6**	0.22/0.15	0.30/0.20	1430/900	61/44	0.7/0.64	0.78/0.68	0.83/0.73		1.9/3.4	1.5/1.8	0.73	6.2
AM 80Z AA	**4/6**	0.37/0.26	0.50/0.35	1385/905	61.4/48.1	0.82/0.80	1.1/1.0	1.1/1.1		3.7/2.6	1.7/1.3	1.97	8.3
AM 80Z BA	**4/6**	0.55/0.37	0.75/0.50	1380/900	60.5/51.1	0.64/0.82	1.5/1.3	1.6/1.4		3.7/2.7	1.6/1.2	2.47	10.0
AM 90S AA	**4/6**	0.75/0.5	1.0/0.67	1400/930	63/64	0.81/0.61	2.2/1.9	2.3/2.1		3.0/3.5	1.4/1.8	4.10	13.4
AM 90L BA	**4/6**	1/0.65	1.34/0.87	1380/920	68.8/67.1	0.81/0.62	2.6/2.3	2.8/2.5		2.9/3.4	1.1/1.6	4.78	16.4
AM 100L AA	**4/6**	1.2/0.8	1.6/1.07	1460/940	76.0/67.9	0.66/0.70	3.5/2.5	3.8/2.6		4.7/3.0	2.1/1.5	4.60	24.4
AM 100L BA	**4/6**	1.6/1.0	2.15/1.34	1445/935	77.6/69.5	0.73/0.63	4.1/3.3	4.3/3.5		5.8/3.0	2.8/1.7	5.58	33.2
AM 112M AA	**4/6**	1.8/1.3	2.5/1.75	1445/950	74.6/69.5	0.85/0.78	4.2/3.6	4.4/3.7		5.9/3.8	1.9/1.3	14.18	33.3
AM 112M BA	**4/6**	2.6/1.85	3.5/2.5	1445/950	73.8/71.6	0.86/0.73	6.0/5.2	6.2/5.4		6.1/4.4	2.0/1.7	17.53	37.0
AM 132S ZA	**4/6**	3.1/2.2	4/3	1440/965	80/78	0.81/0.74	7/5.5	7.5/6		5.8/5.6	2.1/2.0	27.00	43
AM 132M ZA	**4/6**	4.9/3.2	6.7/4.3	1440/965	83/80	0.84/0.77	10/7.5	10.5/8		6.3/5.9	2.2/2.1	40.00	54
AM 160M YA	**4/6**	7.5/5	10/6.8	1460/980	85.5/83	0.83/0.77	15.6/11.4	16.5/12		5.8/6.2	1,6/1,8	78.00	84
AM 160M ZA	**4/6**	9/6	12.2/8	1465/980	85.5/84	0.86/0.77	17.6/13.3	18.5/14		5.8/6.2	1.6/1.8	90.00	90
AM 160L ZA	**4/6**	12/8	16/11	1465/980	86.5/85	0.86/0.79	22.8/17	24/18		6.0/6.3	1.7/1.9	110.0	100
AM 180L ZA	**4/6**	16.5/11	22.5/15	1475/985	89/86	0.87/0.76	31/24	32.5/25.5		7.6/7.8	2.0/2.4	215.0	150
AM 200L PG	**4/6**	21/14	28/19	1470/980	88/87	0.88/0.81	39/28,5	41/30		6.0/6.4	1.8/2.2	285.0	220
AM 200L RG	**4/6**	26/18	35/24	1475/985	89.5/88.5	0.88/0.81	48/36	50/38		7.2/7.4	2.0/2.5	375.0	255
AM 225S P	**4/6**	30/21	40/28	1475/985	91/89	0.89/0.81	53/42	56/44		6.8/7.4	1.9/2.6	583.0	310
AM 225M P	**4/6**	37/25 [1]	50/34	1475/985	90.5/89	0.90/0.83	66/49	69/51		6.2/6.8	1.8/2.2	583.0	315
AM 250M P	**4/6**	45/30	60/40	1475/980	91/90.5	0.90/0.86	79/56	83/59		8.5/7.6	2.8/3.0	1320.0	490
AM 280S V	**4/6**	65/45 [1]	88/60	1485/988	91.5/92	0.88/0.83	117/86	123/90		7.0/6.8	1.7/2.3	1200.0	580
AM 280M V	**4/6**	80/54 [1]	109/73	1485/988	91.5/91	0.88/0.83	144/105	151/110		7.0/6.8	1.7/2.3	1400.0	620
AM 315S ZE	**4/6**	87/58	117/78	1480/985	93/93	0.90/0.85	150/105	157/110		7.8/7.8	1.9/2.2	3100.0	790
AM 315M ZE	**4/6**	95/65	129/88	1480/985	93/93	0.90/0.85	165/118	171/124		7.8/7.8	2.0/2.2	3600.0	860
AM 315L ZE	**4/6**	105/72	141/96	1480/985	94/94	0.93/0.87	175/127	183/135		7.8/8.0	2.0/2.3	4300.0	990

1) Temperature rise to class F

Pole-changing squirrel-cage motors designed for range of rated voltage 380-420 V ± 5% - 50 Hz

For mains voltage to IEC 60038 400 V ± 10% - 50 Hz

Temperature rise to class B

Type		Rated output		Rated speed	Efficiency	Power factor	Rated current at I_N		Direct-on-line starting: Starting current ratio I_A/I_N	Direct-on-line starting: Breakaway torque ratio M_A/M_N	Moment of inertia J	Weight
		kW	HP	min^{-1}	η 100%	$cos\ \varphi$	400V	380-420V			$10^{-3}\ kgm^2$	kg
1000/750 min^{-1} (6/8 poles) - separate windings												
AM 80Z AA	**6/8**	0.37/0.18	0.50/0.25	915/700	51.1/44.2	0.81/0.65	1.3/1.0	1.4/1.0	2.8/2.5	1.4/1.7	2.47	9.5
AM 90L AA	**6/8**	0.55/0.30	0.75/0.40	950/710	65.2/45.1	0.62/0.52	2.0/1.8	2.1/1.9	3.9/2.6	2.5/1.9	4.78	16.2
AM 100L AA	**6/8**	0.75/0.45	1.0/0.60	960/720	72.6/61.8	0.67/0.54	2.2/2.0	2.3/2.1	4.1/2.9	1.9/1.9	6.73	23.4
AM 112M AA	**6/8**	0.95/0.65	1.3/0.90	965/715	65.2/62.1	0.78/0.70	3.0/2.2	3.2/2.3	4.5/3.8	1.4/1.7	14.18	32.0
AM 112M BA	**6/8**	1.5/0.75	2.0/1.0	970/720	75.3/64.6	0.66/0.60	4.4/2.8	4.6/3.0	4.6/3.8	2.2/2.1	18.70	36.2
AM 132S ZA	**6/8**	1.6/1.3	2.2/1.8	965/715	78/75	0.74/0.71	4/3.5	4.5/3.8	5.3/4.4	1.6/1.6	27.00	43
AM 132M ZA	**6/8**	2.9/2.2	3.9/3	965/715	81/77	0.74/0.71	7/5.8	7.5/6.3	5.8/4.7	1.7/1.7	40.00	54
AM 160M YA	**6/8**	4/3	5.5/4	980/730	82/77	0.75/0.72	9.3/7.6	9.8/8.5	5.4/3.8	1.9/1.8	78.00	84
AM 160M ZA	**6/8**	5.5/4	7.5/5.5	975/725	83/78	0.75/0.70	12.5/10.5	13/11	5.4/3.8	1.9/1.9	90.00	90
AM 160L ZA	**6/8**	7.5/5.5	10/7.5	980/725	84/79	0.75/0.73	17/14.5	18/15	5.5/3.8	2.0/2.1	110.0	100
AM 180L ZA	**6/8**	11/8.5	15/11.5	985/730	86/83	0.76/0.74	24/20	26/22	6.8/5.5	2.0/2.1	215.0	150
AM 200L PG	**6/8**	15/11.5	20/15.6	980/735	88/86.5	0.82/0.74	30.5/25.5	32/27	5.8/4.8	1.8/2.3	285.0	220
AM 200L RG	**6/8**	19/14.5	26/19.7	980/735	89/86.5	0.83/0.75	37/32	39/34	6.0/5.5	1.9/2.3	375.0	255
AM 225S P	**6/8**	23/18	31/24	985/735	89/88	0.83/0.78	45/38	47/40	6.2/5.2	1.9/2.0	583.0	310
AM 225M P	**6/8**	28/21 [1]	38/28	985/735	90/88.5	0.82/0.78	54/45	57/47	5.8/5.0	1.9/1.9	583.0	315
AM 250M P	**6/8**	31/24	42/32.5	985/735	91/91	0.84/0.79	59/49	62/51	8.4/7.5	2.6/3.4	1320.0	490
AM 280S V	**6/8**	44/33 [1]	59.5/45	988/738	91/90	0.81/0.75	87/70	91/74	5.2/5.0	1.4/1.7	1200.0	580
AM 280M V	**6/8**	55/42 [1]	75/57	988/738	91/90	0.81/0.75	108/90	113/95	5.2/5.0	1.5/2.1	1400.0	620
AM 315S ZE	**6/8**	65/48	87/64	988/740	92.0/92.0	0.87/0.81	117/90	121/94	7.5/7.4	2.0/2.2	3100.0	790
AM 315M ZE	**6/8**	75/55	100/74	988/740	92.5/92.0	0.87/0.81	135/105	140/109	7.5/7.4	2.1/2.3	3600.0	860
AM 315L ZE	**6/8**	90/70	120/94	988/740	93.0/92.5	0.87/0.81	160/135	166/140	7.5/7.5	2.2	4300.0	9900

1) Temperature rise to class F

Pole-changing squirrel-cage motors for fan drives designed for range of rated voltage 380-420 V ± 5% - 50 Hz

For mains voltage to IEC 60038 400 V ± 10% - 50 Hz

Type		Temp. class	Rated output		Rated speed	Efficiency	Power factor	Rated current at I_N		Direct-on-line starting: Starting current ratio I_A/I_N	Direct-on-line starting: Breakaway torque ratio M_A/M_N	Moment of inertia J	Weight
			kW	HP	min^{-1}	η 100%	$\cos\varphi$	400V	380-420V			10^{-3} kgm^2	kg
1500/3000 min^{-1} (4/2 poles) - Dahlander connection Y/YY													
AMV 63Z AA	**4/2**	B	0.07/0.33	0.095/0.45	1350/2700	55/60	0.70/0.80	0.25/0.95	0.27/1.1	2.5/2.6	1.8/1.6	0.37	5.0
AMV 71Z AA	**4/2**	B	0.08/0.37	0.11/0.5	1350/2870	60/64	0.65/0.68	0.30/1.3	0.35/1.4	3.2/4.3	2.0/2.8	0.82	7.9
AMV 71Z BA	**4/2**	B	0.12/0.55	0.16/0.75	1430/2835	70/68	0.65/0.72	0.40/1.6	0.42/1.7	4.1/4.0	3/2.8	1.08	10.0
AMV 80Z AA	**4/2**	F	0.15/0.75	0.2/1.0	1400/2710	70/68	0.68/0.80	0.45/1.9	0.45/2.0	2.6/4.6	2.8/2.9	1.58	8.3
AMV 80Z BA	**4/2**	B	0.22/1.1	0.3/1.5	1420/2820	70/73	0.75/0.84	0.6/2.5	0.65/2.6	4.6/4.7	2.7/2.9	2.0	11.5
AMV 90L AA	**4/2**	B	0.30/1.5	0.4/2.0	1400/2830	69/70	0.70/0.84	0.9/3.5	1.0/3.7	4.7/5.0	2.7/3.0	3.13	15.6
AMV 90L BA	**4/2**	B	0.44/2.2	0.6/3.0	1430/2830	74/72	0.76/0.89	1.1/4.8	1.2/5.0	4.5/5.2	2.6/2.8	3.73	17.1
AMV 100L AA	**4/2**	B	0.50/2.5	0.67/3.3	1430/2840	72/73	0.77/0.88	1.3/5.3	1.4/5.6	4.6/5.0	2.2/2.3	4.6	21.4
AMV 100L BA	**4/2**	B	0.60/3.0	0.8/4.0	1440/2850	78/77	0.79/0.87	1.3/6.2	1.4/6.5	4.5/4.5	2.2/2.1	5.58	23.2
AMV 112M AA	**4/2**	B	0.75/3.70	1.0/5.0	1440/2850	74/72	0.80/0.90	1.7/7.9	1.9/2.2	4.5/5.1	2.0/2.4	13.3	36.1
AMV 112M BA	**4/2**	B	0.9/4.5	1.2/6.1	1440/2850	75/73	0.82/0.90	2.0/9.5	2.1/9.8	4.5/5.5	2.0/2.3	14.75	40.0
AMV 132S ZA	**4/2**	B	1.2/6	1.6/8	1455/2880	84.5/83	0.81/0.88	2.6/12	2.8/12.5	5.5/6.0	2.4/2.1	22.00	46
		F	1.5/7	2/9.5	1445/2870	84/83	0.83/0.89	3.2/14	3.4/14.5	4.5/5.2	2.0/1.8		
AMV 132M ZA	**4/2**	B	1.6/8	2.1/10.6	1455/2890	86.5/85	0.82/0.89	3.3/15.3	3.5/15.8	5.6/6.4	2.5/2.2	30.00	55
		F	1.85/9	2.5/12	1445/2870	86/84.5	0.84/0.90	3.7/17.2	3.9/18	5.0/5.7	2.2/2.0		
AMV 160M ZA	**4/2**	B	2.8/11	3.8/14.7	1450/2925	86.5/86	0.84/0.85	5.5/22.5	5.8/23	4.7/6.2	1.6/2.0	59.00	87
		F	3.3/13.5	4.4/18	1440/2915	86/85	0.85/0.86	6.5/27	6.8/27.5	4.0/5.2	1.4/1.6		
AMV 160L ZA	**4/2**	B	4/16.5	5.5/22.1	1470/2940	88.5/88	0.82/0.85	8.5/32.5	8.8/33	5.2/7.1	2.1/2.2	82.00	102
		F	4.4/18.5	5.9/24.5	1465/2930	88/87.5	0.83/0.86	9.5/36	10/36.5	4.7/6.4	1.9/2.0		
AMV 180M ZA	**4/2**	B	5/20	6.7/27	1470/2950	89/88	0.83/0.89	10/37.5	10.5/38.5	5.5/7.5	2.0/2.1	112.0	130
		F	5.5/22.5	7.5/30	1465/2940	88.5/87	0.84/0.90	11/42	11.5/43	5.0/6.7	1.8/1.9		
AMV 180L ZA	**4/2**	B	6/24	8/32	1470/2940	90/89	0.83/0.88	11.5/45	13/47	5.5/7.5	2.0/2.1	132.0	140
		F	6.8/27	9/36	1465/2930	89/88	0.84/0.89	13.2/51	13.8/53	4.9/6.6	1.8/1.9		
AMV 200L PG	**4/2**	B	6.5/30	8/40	1480/2950	91.5/90	0.81/0.89	12.2/53	12.6/55	7.1/7.7	2.6/2.3	206.0	230
		F	7/34	9.5/45	1475/2940	91/89	0.82/0.90	13.2/60	13.7/62	6.6/6.8	2.4/2.1		
AMV 200L RG	**4/2**	B	7/35	9.5/47	1480/2950	91.5/90	0.82/0.89	14/62	14.8/64	7.1/7.7	2.6/2.3	248.0	255
		F	7.8/39	10.5/52	1475/2940	91/89	0.83/0.90	15.6/69	16.5/71	6.6/6.8	2.4/2.1		
AMV 225M P	**4/2** [1]	B	8.0/40	10.7/54	1485/2970	92/91	0.81/0.89	15.5/70	16.1/73	7.5/8.5	2.3/2.1	428.0	330
		F	9.2/46	12.3/62	1480/2960	92/91	0.82/0.91	17.5/80	18.2/83	6.5/7.4	2.0/1.8		
AMV 250M P	**4/2**	B	11.0/55	14.7/75	1485/2965	93/92.5	0.82/0.92	21/92	22/96	7.4/8.4	3.6/3.4	750.0	465
		F	12.5/60	17/80	1480/2955	92.5/92	0.83/0.92	24/100	25/103	6.5/7.7	3.2/3.1		
AMV 280S V	**4/2**	B	13/67	17/90	1485/2980	93.5/93	0.83/0.88	24.5/118	26/122	8.4/8.9	2.9/2.5	1200.0	580
		F	15/75	20/100	1480/2975	93.5/93	0.84/0.89	28/131	30/136	7.5/8.0	2.5/2.2		
AMV 280M V	**4/2**	B	16/80	21/107	1485/2980	93.5/93	0.83/0.88	29.5/140	32/144	8.4/8.9	2.9/2.5	1400.0	620
		F	18/90	24/120	1485/2975	93.5/93	0.84/0.89	33/157	36/162	7.5/8.0	2.5/2.2		
AMV 315S ZE	**4/2**	B	20/100	27/134	1492/2975	93.5/93	0.84/0.90	37/174	39/180	7.4/8.3	1.9/1.6	2200.0	860
		F	22/110	30/150	1490/2970	93.5/93	0.85/0.91	40/190	42/196	6.8/7.6	1.7/1.5		
AMV 315M ZE	**4/2**	B	23/120	31/160	1492/2975	94.5/94	0.84/0.90	42/207	45/213	7.8/8.6	2.0/1.8	2500.0	940
		F	26/132	35/175	1490/2970	94.5/94	0.85/0.91	47/225	50/232	7.0/7.9	1.8/1.6		
AMV 315L ZE	**4/2**	B	28/145	38/195	1492/2975	94.5/94	0.84/0.90	51/250	54/257	8.0/8.7	2.0/1.8	3100.0	1120
		F	32/160	43/215	1490/2970	94.5/94	0.85/0.91	58/275	61/282	7.0/7.9	1.8/1.6		

1) Same mounting dimensions 225S

Motors from frame size 132 upwards, with double marking

Pole-changing squirrel-cage motors for fan drives designed for range of rated voltage 380-420 V ± 5% - 50 Hz

For mains voltage to IEC 60038 400 V ± 10% - 50 Hz

Type		Temp. class	Rated output		Rated speed	Efficiency	Power factor	Rated current at		Direct-on-line starting		Moment of inertia	Weight
										Starting current ratio	Breakaway torque ratio		
						η		I_N		I_A/I_N	M_A/M_N	J	
			kW	HP	min^{-1}	100%	$\cos\varphi$	400V	380-420V			10^{-3} kgm^2	kg
750/1500 min^{-1} (8/4 poles) - Dahlander connection Y/YY													
AMV 71Z AA	**8/4**	B	0.08/0.37	0.11/0.5	660/1370	26/57	0.63/0.72	0.60/1.25	0.65/1.35	2.8/3.4	1.9/1.7	1.24	6.8
AMV 80Z AA	**8/4**	B	0.12/0.55	0.16/0.75	685/1420	50/69	0.60/0.74	0.58/1.53	0.65/1.6	1.9/3.3	1.4/1.5	2.47	9.2
AMV 80Z BA	**8/4**	B	0.18/0.75	0.25/1.0	660/1380	53/67	0.73/0.81	0.65/1.9	0.7/2.0	2.0/3.5	1.6/1.7	2.41	10.6
AMV 90L AA	**8/4**	B	0.18/1.1	0.25/1.5	680/1400	60/70	0.65/0.82	0.9/2.7	1.0/2.8	2.8/4.0	1.5/2.0	2.98	15.7
AMV 90L CA	**8/4**	B	0.4/1.6	0.54/2.15	675/1400	61.5/75	0.64/0.79	1.8/4.0	1.8/4.1	3.1/5.0	1.6/2.2	3.70	19.6
AMV 100L AA	**8/4**	F	0.45/2.2	0.60/3.0	680/1420	63.1/75.3	0.60/0.80	1.7/5.0	1.9/5.3	2.7/4.7	1.7/2.0	5.58	21.9
AMV 100L BA	**8/4**	F	0.6/2.6	0.80/3.5	680/1435	64.0/76.2	0.63/0.75	2.2/6.5	2.3/6.7	2.7/4.8	1.7/2.2	6.00	23.7
AMV 112M AA	**8/4**	F	0.7/3.3	0.94/4.5	690/1420	62/78	0.70/0.80	2.2/7.4	2.3/7.6	3.4/6.5	1.8/2.4	16.70	34.2
AMV 112M CA	**8/4**	B	1.0/4.0	1.34/5.5	720/1420	60/77	0.70/0.82	3.1/8.6	3.3/9.0	3.5/5.0	2.3/1.9	19.50	40.0
AMV 132SZA	**8/4**	B	1.4/4.6	1.9/6.2	715/1450	72/84	0.60/0.77	4.7/10.5	5/11	3.3/6.7	1.6/2.4	22.00	46
		F	1.5/5.5	2/7.5	705/1430	72/83	0.62/0.79	5.0/12.5	5.5/13	3.0/5.7	1.5/2.0		
AMV 132M ZA	**8/4**	B	1.7/6.4	2.3/8.7	715/1450	74/85	0.60/0.82	5.6/13.5	6/14.2	3.5/6.8	1.7/2.4	30.00	55
		F	2/7.5	2.7/10	705/1440	74/84	0.62/0.84	6.5/15.8	7/16.5	3.3/5.8	1.5/2.0		
AMV 160M ZA	**8/4**	B	2.2/9.2	3/12.5	725/1465	83/88	0.59/0.82	7/19.2	7.5/20.5	4.0/7.0	1.8/2.2	59.00	87
		F	2.5/10.2	3.3/13.7	720/1460	82/87	0.60/0.83	8/21.5	8.5/23	3.5/6.0	1.6/1.9		
AMV 160L ZA	**8/4**	B	3.5/14	4.7/19	725/1465	84/89	0.61/0.83	10/27.5	11/29	4.0/7.4	1.8/2.4	82.00	102
		F	4/15.5	5.5/21	720/1460	83/88	0.62/0.84	11.5/30.5	12.5/32	3.5/6.7	1.6/2.2		
AMV 180M ZA	**8/4**	B	4/17	5.5/23	730/1465	84/90	0.61/0.83	11.5/33	13/34.5	4.0/7.2	1.7/2.3	112.0	130
		F	4.5/19	6/25.5	715/1455	83/89	0.62/0.84	12.5/35.5	14/37	3.7/6.3	1.6/2.0		
AMV 180L ZA	**8/4**	B	5/20	6.8/27	730/1470	84/90	0.61/0.83	14.5/39	15/41	4.2/7.6	1.7/2.3	132.0	140
		F	5.5/22.5	7.5/30	725/1465	83/89	0.62/0.84	15.5/44	16/46	3.8/6.8	1.6/2.0		
AMV 200L PG	**8/4**	B	6/24	8/32.5	735/1480	87.5/90.5	0.62/0.82	15.5/50	16.5/52	3.6/7.6	1.6/2.4	206	230
		F	6.5/27	8.5/36	730/1470	87/90	0.63/0.83	16.8/56	17.5/58	3.3/6.8	1.4/2.1		
AMV 200L RG	**8/4**	B	7/28	9.5/38	735/1480	88/91	0.60/0.85	19/55	20/58	3.5/7.7	1.7/2.6	248	255
		F	8/32	10.5/43	730/1470	87/90.5	0.61/0.86	21.5/60	22.5/63	3.2/6.7	1.5/2.3		
AMV 225M P	**8/4** [1)]	B	8.5/36	11.5/49	735/1480	89.5/92	0.62/0.82	22/72	23/75	4.0/8.7	1.8/2.5	430	330
		F	11/44	15/60	725/1475	88.5/92	0.63/0.83	29/85	31/89	3.1/7.2	1.4/2.1		
AMV 250M P	**8/4**	B	11/46	15/62	740/1475	91.5/92	0.79/0.88	22/81	23/85	5.3/8.4	2.4/2.9	1110	490
		F	12/50	16/88	735/1465	91/91	0.81/0.90	24/88	25/93	5.8/7.8	2.2/2.7		
AMV 280S V	**8/4**	B	16/66	22/88	740/1485	90/93	0.62/0.85	42/121	44/127	3.3/7.0	1.5/2.4	1200	580
		F	18/74	24/100	735/1475	89.5/92	0.63/0.86	47/135	50/141	3.0/6.3	1.3/2.2		
AMV 280M V	**8/4**	B	19/78	26/106	740/1485	91/93	0.62/0.85	49/143	51/150	3.3/7.0	1.5/2.4	1400	620
		F	21/86	28/115	735/1475	90/92	0.63/0.86	54/157	56/165	3.0/6.3	1.3/2.2		
AMV 315S ZE	**8/4**	B	26/105	35/140	743/1480	92.5/94.0	0.60/0.87	68/185	75/193	4.1/5.5	1.1/1.6	1900	800
		F	29/115	39/155	740/1470	92/94	0.61/0.88	76/200	82/210	3.7/5.1	1.0/1.4		
AMV 315M ZE	**8/4**	B	33/132	45/177	743/1480	93.0/95.0	0.60/0.87	85/230	92/243	4.3/5.7	1.0/1.5	2500	940
		F	36/145	48/194	740/1470	92.5/95	0.61/0.88	93/250	98/260	3.9/5.3	0.9/1.3		
AMV 315L ZE	**8/4**	B	40/165	55/220	743/1480	93.0/95.5	0.61/0.88	103/285	109/300	4.2/6.0	1.2/1.6	3100	1120
		F	44/180	59/240	740/1470	92.5/95	0.62/0.89	113/310	120/325	3.8/5.5	1.1/1.4		

1) Same mounting dimensions 225S

Motors from frame size 132 upwards, with double marking

Pole-changing squirrel-cage motors for fan drives designed for range of rated voltage 380-420 V ± 5% - 50 Hz

For mains voltage to IEC 60038 400 V ± 10% - 50 Hz

Type		Temp. class	Rated output		Rated speed	Efficiency	Power factor	Rated current at I_N		Direct-on-line starting: Starting current ratio I_A/I_N	Direct-on-line starting: Breakaway torque ratio M_A/M_N	Moment of inertia J	Weight
			kW	HP	min^{-1}	η 100%	cos φ	400V	380-420V			10^{-3} kgm^2	kg
1500/1000 min^{-1} (4/6 poles) - separate windings													
AMV 71Z AA	**4/6**	B	0.25/0.08	0.33/0.11	1370/900	60/40	0.80/0.70	0.75/0.4	0.8/0.45	3.0/2.5	1.6/1.6	1.15	6.7
AMV 71Z BA	**4/6**	F	0.37/0.13	0.50/0.18	1360/880	62/44	0.80/0.70	1.0/0.6	1.1/0.7	3.2/2.6	1.6/1.6	1.24	7.2
AMV 80Z AA	**4/6**	B	0.55/0.18	0.75/0.25	1380/920	60/42	0.83/0.82	1.60/0.75	1.7/0.8	3.5/2.4	1.6/1.0	1.97	8.3
AMV 80Z BA	**4/6**	B	0.75/0.25	1.0/0.33	1400/940	70/60	0.82/0.72	1.8/0.8	1.9/0.9	4.2/2.6	1.6/1.3	4.05	14
AMV 90S AA	**4/6**	B	0.75/0.24	1.0/0.32	1400/950	70/60	0.82/0.72	1.9/0.8	2.0/0.9	4.2/2.6	1.6/1.3	4.05	14
AMV 90L BA	**4/6**	B	1.1/0.37	1.5/0.50	1400/930	70/60	0.81/0.74	2.8/1.2	3.0/1.3	4.3/2.7	1.6/1.2	4.78	16.4
AMV 90L CA	**4/6**	B	1.5/0.5	2.0/0.67	1420/950	73/64	0.80/0.70	3.52/1.52	3.7/1.6	4.8/2.6	1.5/1.3	5.98	20.5
AMV 100L AA	**4/6**	B	1.85/0.60	2.5/0.75	1400/920	74/64	0.80/0.73	4.6/1.9	4.8/2.1	4.8/3.1	1.8/1.5	6.73	23.4
AMV 100L BA	**4/6**	B	2.2/0.75	3.0/1.0	1420/950	76/66	0.79/0.75	5.1/2.1	5.3/2.2	5.0/3.5	1.7/1.3	9.25	22.6
AMV 112M AA	**4/6**	B	3/1.0	4.0/1.34	1440/970	80/73	0.81/0.65	6.6/3.0	6.8/3.2	5.8/4.6	2.5/2.1	13.3	30.4
AMV 132S ZA	**4/6**	B	3.8/1.3	5/1.8	1450/970	84/74	0.84/0.71	8/3.7	8.5/4	6.2/4.2	2.2/1.8	22.0	46
		F	4.4/1.5	5.9/2	1440/960	83/73	0.86/0.72	9.2/4.2	9.6/4.5	5.4/3.7	1.9/1.6		
AMV 132M ZA	**4/6**	B	5.2/1.8	7/2.5	1450/970	86/76	0.84/0.71	10.5/5	11/5.5	6.5/4.6	2.4/1.9	30.0	55
		F	6/2	8/2.7	1445/965	85/75	0.85/0.72	13.6/5.8	14/6.3	5.6/4.0	2.1/1.7		
AMV 160M ZA	**4/6**	B	8/2.7	11/3.6	1465/985	87/80	0.84/0.70	15.5/6.6	16/6.8	6.2/5.2	1.7/1.4	59.0	87
		F	8.8/3	12/4	1460/980	86/80	0.85/0.71	17.2/7.3	17.7/7.6	5.6/4.7	1.5/1.4		
AMV 160L ZA	**4/6**	B	12/4	16/5.5	1465/985	88/82	0.85/0.70	23/10	24.5/10.5	6.2/5.5	1.8/1.5	82.0	102
		F	13.8/4.8	18.5/6.4	1460/980	87/81	0.86/0.71	26.5/12	28.2/12.6	5.4/4.6	1.6/1.3		
AMV 180L ZA	**4/6**	B	17/5.5	23/7.5	1470/975	89.5/86	0.86/0.84	31/11	33/11.5	7.6/5.5	1.9/1.5	215	150
		F	19/6	25.5/8	1465/970	89/85	0.87/0.85	34.5/12	36/12.5	6.8/5.1	1.7/1.4		
AMV 200L PG	**4/6**	B	21/7	28/9.5	1470/985	88/87	0.88/0.84	39/14	41/14.5	6.0/6.2	1.8/2.2	285	220
		F	23.5/7.8	31.5/11	1465/980	87.5/87	0.89/0.85	44/15.5	46/16	5.3/5.6	1.6/2.0		
AMV 200L RG	**4/6**	B	26/9	35/12	1475/985	89.5/88	0.88/0.85	48/17	50/18	7.0/6.2	2.0/2.1	375	255
		F	29/10	39/13.5	1470/980	89/88.5	0.89/0.86	54/19	56/20	6.2/5.5	1.8/1.9		
AMV 225M P	**4/6** [1)]	B	33/11	45/15	1475/985	90/89	0.89/0.85	60/21	63/22	7.0/6.8	2.0/2.4	583	315
		F	37/12	50/16	1475/985	90.5/89	0.90/0.87	66/22.5	69/23.5	6.2/6.0	1.8/2.0		
AMV 250M P	**4/6**	B	50/18	68/24	1470/985	91/90	0.90/0.85	89/34.5	93/36	8.5/8.5	2.8/3.2	1110	490
		F	55/20	74/27	1465/980	91/90	0.91/0.86	98/38	102/40	7.7/7.7	2.6/3.0		
AMV 280S V	**4/6**	B	63/22	84/29	1490/992	92.5/91	0.88/0.85	111/42	117/44	7.7/8.3	1.9/2.5	1200	580
		F	70/25	95/34	1485/990	92.5/91	0.89/0.86	123/47	129/49	7.0/7.5	1.7/2.3		
AMV 280M V	**4/6**	B	73/27	98/36	1490/992	92.5/91	0.87/0.85	131/50	137/53	7.7/8.3	1.9/2.5	1400	620
		F	80/30	109/40	1485/990	92/91	0.88/0.86	144/55	151/58	7.0/7.5	1.7/2.3		
AMV 315S ZE	**4/6**	B	90/31	121/42	1492/995	93/90.5	0.88/0.88	160/58	167/62	8.3/8.0	2.2/2.5	3100	790
		F	100/35	136/47	1490/993	93/90	0.88/0.88	176/65	184/69	7.5/7.2	2.0/2.3		
AMV 315M ZE	**4/6**	B	115/36	154/48	1492/995	93/90.5	0.88/0.87	200/67	209/71	8.3/8.0	2.2/2.5	3600	860
		F	130/40	174/54	1492/995	93/90	0.89/0.88	225/75	235/79	7.5/7.2	2.0/2.3		
AMV 315L ZE	**4/6**	B	135/43	180/58	1490/993	93.5/90	0.88/0.87	235/79	245/83	8.0/7.8	2.3/2.6	4300	990
		F	150/48	200/64	1488/993	93.5/90	0.89/0.88	260/88	270/92	7.2/7.0	2.1/2.4		

1) Same mounting dimensions 225S

Motors from frame size 132 upwards, with double marking

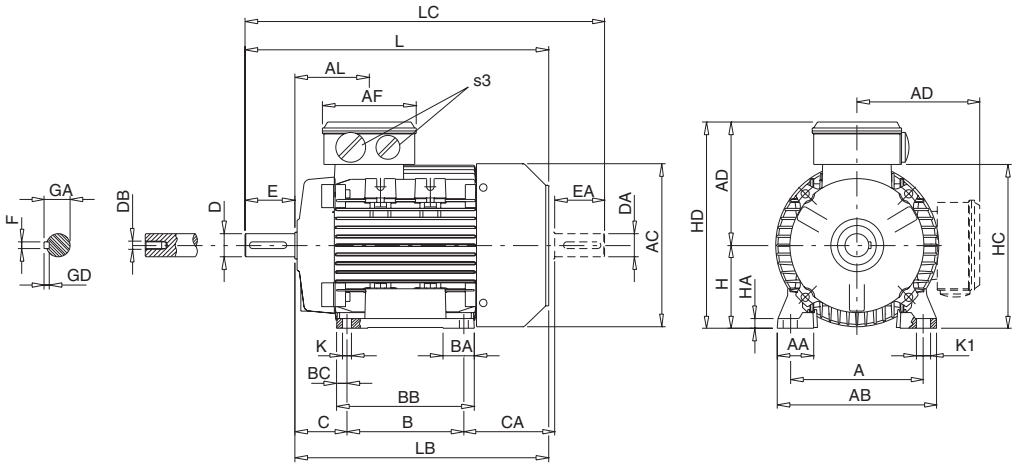
Pole-changing squirrel-cage motors for fan drives designed for range of rated voltage 380-420 V ± 5% - 50 Hz

For mains voltage to IEC 60038 400 V ± 10% - 50 Hz

Type		Temp. class	Rated output		Rated speed	Efficiency	Power factor	Rated current at		Direct-on-line starting		Moment of inertia	Weight
										Starting current ratio	Breakaway torque ratio		
			kW	HP	min^{-1}	η 100%	cos φ	400V	I_N 380-420V	I_A/I_N	M_A/M_N	J 10^{-3} kgm^2	kg
1000/750 min^{-1} (6/8 poles) - separate windings													
AMV 80Z AA	**6/8**	B	0.25/0.11	0.33/0.15	930/720	53/49	0.79/0.62	0.9/0.55	1.0/0.7	2.9/3.0	1.6/1.8	1.97	7.9
AMV 80Z BA	**6/8**	B	0.37/0.15	0.50/0.25	920/715	52/47	0.81/0.63	1.3/0.8	1.4/0.9	2.8/2.8	1.4/1.9	2.47	9.5
AMV 90L AA	**6/8**	B	0.55/0.22	0.75/0.30	960/740	65/47	0.62/0.51	2.0/1.4	2.1/1.5	3.9/2.9	2.5/2.1	4.78	16.2
AMV 90L BA	**6/8**	F	0.75/0.30	1.0/0.40	940/720	64/45.5	0.67/0.52	2.5/1.85	2.7/1.9	3.4/2.6	2.2/1.9	4.78	16.2
AMV 100L AA	**6/8**	B	1.1/0.45	1.5/0.60	950/710	70.6/58	0.71/0.67	3.1/1.7	3.3/1.8	4.3/2.8	2.0/1.3	9.43	22.0
AMV 112M AA	**6/8**	B	1.5/0.6	2.0/0.80	970/720	75.8/65	0.65/0.60	4.4/2.3	3.7/2.5	5.5/3.4	2.8/2.1	18.70	39.0
AMV 132S ZA	**6/8**	B	2.2/1	3/1.4	955/715	79/72	0.78/0.71	5.3/2.9	5.8/3.1	4.8/4.0	1.5/1.4	27.0	43
		F	2.4/1.1	3.2/1.5	950/710	78/71	0.79/0.72	5.8/3.2	6.3/3.4	4.4/3.6	1.3/1.2		
AMV 132M YA	**6/8**	B	3/1.3	4/1.7	955/715	80/73	0.78/0.72	7.2/3.8	7.8/4.0	4.8/4.0	1.5/1.4	34.0	49
		F	3.4/1.5	4.6/2	950/710	79/72	0.79/0.73	8.2/4.3	8.8/4.6	4.2/3.5	1.3/1.3		
AMV 132M ZA	**6/8**	B	4/1.8	5.5/2.4	955/715	82/74	0.78/0.74	9.2/4.8	9.7/5.1	5.3/4.2	1.7/1.5	40.0	54
		F	4.5/2	6/2.7	950/710	80/73	0.80/0.76	10.3/5.3	10.8/5.6	4.7/3.8	1.5/1.3		
AMV 160M YA	**6/8**	B	5.5/2.5	7.5/3.4	975/730	83/76	0.77/0.67	12.5/7	13/7.5	5.7/5.5	1.6/1.9	78.0	84
		F	6.2/2.8	8.3/3.8	970/725	82/75	0.78/0.68	13.5/7.8	14/8.3	5.3/4.9	1.4/1.7		
AMV 160M ZA	**6/8**	B	7/3.5	9.4/4.7	975/730	84/78	0.80/0.75	15/9	16/9.5	6.0/5.6	1.7/2.0	90.0	90
		F	7.8/3.9	10.5/5.2	970/725	83/77	0.81/0.76	16.5/10	17.5/10.8	5.5/5.0	1.5/1.8		
AMV 160L ZA	**6/8**	B	9/4.5	12/6	975/730	85/79	0.78/0.73	20/11	20.5/11.5	6.2/5.7	1.8/2.0	110.0	100
		F	10/5	13.5/6.7	970/725	84/78	0.79/0.74	22/12.2	23/12.8	5.6/5.1	1.6/1.8		
AMV 180L ZA	**6/8**	B	12/6	16/8	985/735	87/84	0.76/0.72	26/14.5	27.5/15	7.2/6.0	2.1/2.1	215.0	150
		F	13.5/6.7	18/9	980/730	86/83	0.77/0.73	29/16	30.5/16.7	6.5/5.4	1.9/1.9		
AMV 200L PG	**6/8**	B	17/8.5	23/11.5	980/735	89/85	0.80/0.74	35/19.5	36.5/20.5	5.6/5.6	1.9/2.3	285	220
		F	19/9.5	26/13	975/730	88/84	0.81/0.75	39/21.5	41/22.5	5.0/5.1	1.7/2.1		
AMV 200L RG	**6/8**	B	22/11	30/15	980/735	89.5/86	0.81/0.75	43/24.5	46/26	6.3/5.7	2.3/2.5	375	255
		F	24.5/12.5	33/16.5	975/730	89/85	0.82/0.76	48/28	50/29.5	5.6/5.0	2.1/2.3		
AMV 225M P	**6/8** 1)	B	26/13	35/17.5	985/740	90.5/87	0.80/0.74	52/28.5	55/30	6.6/6.2	2.2/2.3	583	315
		F	32/15	43/20	980/735	90/87	0.84/0.77	62/33	64/34	5.5/5.4	1.7/2.0		
AMV 250M P	**6/8**	B	38/19	52/26	985/735	92/90	0.87/0.81	69/38	72/40	8.0/7.5	2.7/3.2	1110	490
		F	42/21	56/28	980/730	91/89	0.88/0.82	76/42	79/44	7.3/6.8	2.5/2.9		
AMV 280S V	**6/8**	B	43/22	58/29	990/745	92/90	0.80/0.77	84/46	88/48	5.8/6.0	1.5/2.2	1200	580
		F	48/24	65/32.5	988/740	92/90	0.81/0.78	93/50	98/52	5.2/5.5	1.4/2.0		
AMV 280M V	**6/8**	B	54/27	72/36	990/745	92/90	0.80/0.77	104/57	110/60	5.8/6.1	1.5/2.2	1400	620
		F	60/30	80/40	988/740	92/90	0.81/0.78	115/63	121/66	5.2/5.5	1.4/2.0		
AMV 315S ZE	**6/8**	B	73/35	98/47	988/745	92.5/91	0.87/0.81	130/68	137/71	7.3/7.3	2.0/2.2	3100	790
		F	80/38	107/51	985/740	92/90	0.88/0.82	142/74	149/77	6.7/6.7	1.8/2.0		
AMV 315M ZE	**6/8**	B	85/40	114/54	988/745	93/92	0.87/0.81	150/77	158/81	7.5/7.4	2.1/2.3	3600	860
		F	94/44	126/59	985/740	92/91	0.88/0.82	165/85	173/89	6.8/6.7	1.9/2.1		
AMV 315L ZE	**6/8**	B	105/50	140/167	988/745	93.5/92	0.87/0.82	185/95	193/100	7.5/7.5	2.4/2.2	4300	990
		F	115/55	154/74	985/740	93/91.5	0.88/0.83	202/105	210/110	6.9/6.8	2.2/2.0		

1) Same mounting dimensions 225S

Motors from frame size 132 upwards, with double marking

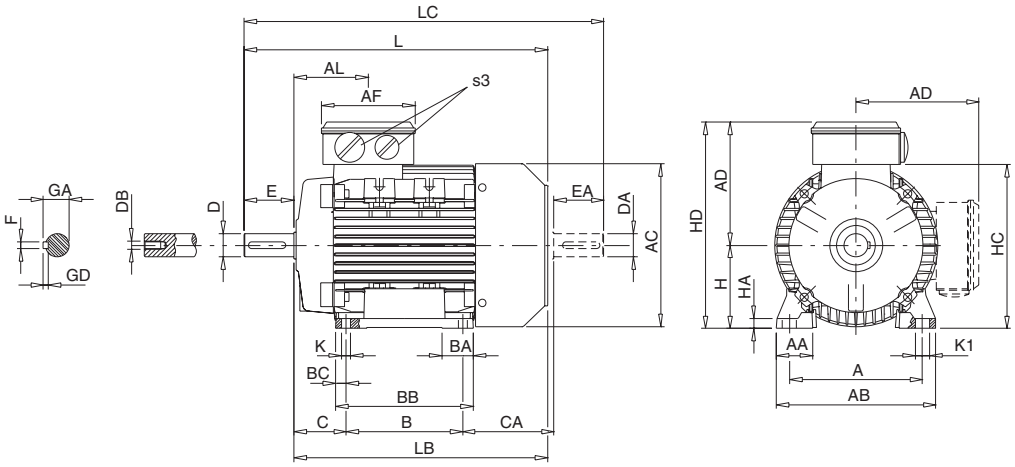


Aluminium frame

	IEC DIN	H h	A b	B a	C w_1	K[1)] s	AB f	BB e	BC	CA	AD[2)] g_4	HD[2)] m_1	AC g	HC	HA c	K_1
56Z AA, BA		56	90	71	36	6	109	90	9.5	65	98	154	112	110	8	12
63Z AA, BA, CA		63	100	80	40	7	126	105	12.5	72	103	166	125	125	8	12
71Z AA, BA, CA		71	112	90	45	7	144	109	9.5	83	112	183	142	142	9	17
80Z AA, BA, CA		80	125	100	50	9	153	125	12.5	89	129	209	160	162	9.5	14
90S AA, BA		90	140	100	56	10	170	150	12.5	116	138	228	180	181	11	15
90L CA, DA		90	140	125	56	10	170	150	12.5	88	138	228	180	181	11	15
100L AA, BA, CA		100	160	140	63	11	192	166	13	110	145	245	196	198	12	17
112M AA, BA, CA		112	190	140	70	10	220	175	17.5	126	161	273	225	226	15	19
132S AA, BA, YA, ZA		132	216	140	89	10	260	175	17.5	147.5	198	330	270	262	20	14
132M BA, CA, YA, ZA, RA		132	216	178	89	10	260	215	18.5	147.5	198	330	270	262	20	14
132M TA		132	216	178	89	10	260	215	18.5	197.5	198	330	270	262	20	14
160M XA, VA, ZA		160	254	210	108	12	292	250	20	192	246	406	335	324	20	14
160L RA, XA, ZA		160	254	254	108	12	292	294	20	192	246	406	335	324	20	14
180M RA, XA		180	279	241	121	12	330	324	22.5	256	266	446	366	360	22	18
180L RA, XA		180	279	279	121	12	330	324	22.5	218	266	446	366	360	22	18

	IEC DIN	L k	LB	LC k_1	AL	AF	BA m	AA n	D/DA d/d_1	E/EA l/l_1	F/FA u/u_1	GD	GA/GC t/t_1	DB [3)] d_6/d_7
56Z AA, BA		190	170	211	63	83	22	22	9	20	3	3	10.2	M4
63Z AA, BA, CA		213	190	238	66	83	26	26	11	23	4	4	12.5	M4
71Z AA, BA, CA		245	215	278	75	83	22	30	14	30	5	5	16	M5
80Z AA, BA, CA		272	232	319	79	116	28.5	34.5	19	40	6	6	21.5	M6
90S AA, BA		317	267	372	85	116	37/53	37	24	50	8	7	27	M8
90L CA, DA		317	267	372	85	116	37/53	37	24	50	8	7	27	M8
100L AA, BA, CA		366	306	433	91	116	38	44	28	60	8	7	31	M10
112M AA, BA, CA		388	328	456	91.5	116	46	48	28	60	8	7	31	M10
132S AA, BA, YA, ZA		449.5	369.5	536.5	134	133	55	57.5	38	80	10	8	41	M12
132M BA, CA, YA, ZA, RA		487.5	407.5	574.5	134	133	57.5	57.5	38	80	10	8	41	M12
132M TA		537.5	457.5	624.5	134	133	57.5	57.5	38	80	10	8	41	M12
160M XA, VA, ZA		613	503	730	156	149	60	64	42	110	12	8	45	M16
160L RA, XA, ZA		657	547	774	156	149	60	64	42	110	12	8	45	M16
180M RA, XA		712	602	838	178.5	180	93	66	48	110	14	9	51.5	M16
180L RA, XA		712	602	838	178.5	180	93	66	48	110	14	9	51.5	M16

1) Clearance hole for screw
2) Maximum dimension
3) Centering holes in shaft extensions to DIN 332 part 2

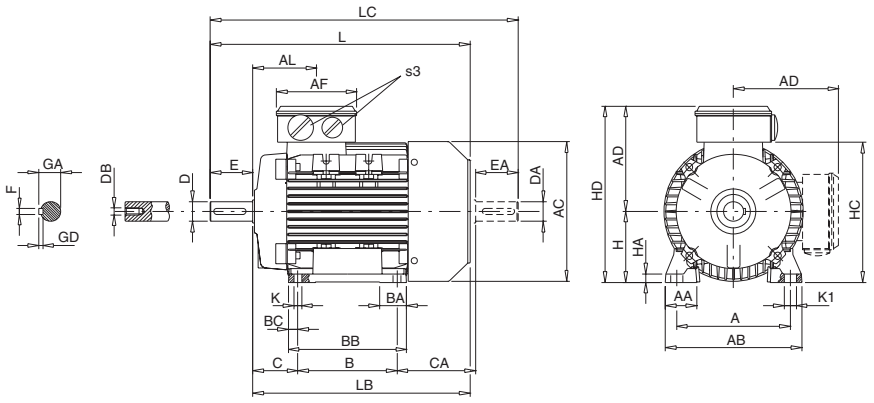


Cast iron frame

	IEC DIN	H h	A b	B a	C w_1	K[1)] s	AB f	BB e	BC	CA	AD[2)] g_4	HD[2)] m_1	AC g	HC	HA c	K_1
132S YG, ZG		132	216	140	89	10	260	175	17.5	185.5	201	333	270	262	20	14
132M YG, ZG, RG		132	216	178	89	10	260	215	18.5	147.5	201	333	270	262	20	14
132M TG		132	216	178	89	10	260	215	18.5	197.5	201	333	270	262	20	14
160M VG, XG, ZG		160	254	210	108	12	304	290	18	226	250	410	335	324	15	14
160L RG, XG, ZG		160	254	254	108	12	304	290	18	192	250	410	335	324	15	14
180M RG, XG		180	279	241	121	12	330	324	22.5	256	290	470	366	360	15	18
180L RG, XG, ZG		180	279	279	121	12	330	324	22.5	218	290	470	366	360	15	18
200L LG, NG, PG, RG, FG		200	318	305	133	16	380	360	22.5	237	341	541	405	400	18	_

	IEC DIN	L k	LB	LC k_1	AL [4)]	AF	BA m	AA n	D/DA d/d_1	E/EA l/l_1	F/FA u/u_1	GD	GA/GC t/t_1	DB [3)] d_6/d_7
132S YG, ZG		487.5	407.5	574.5	134	133	55	60	38	80	10	8	41	M12
132M YG, ZG, RG		487.5	407.5	574.5	134	133	57.5	60	38	80	10	8	41	M12
132M TG		547.5	457.5	624.5	134	133	57.5	60	38	80	10	8	41	M12
160M VG, XG, ZG		657	547	774	235	168	97	70	42	110	12	8	45	M16
160L RG, XG, ZG		657	547	774	235	168	97	70	42	110	12	8	45	M16
180M RG, XG		712	602	838	260.5	180	95	66	48	110	14	9	51.5	M16
180L RG, XG, ZG		712	602	838	260.5	180	95	66	48	110	14	9	51.5	M16
200L LG, NG, PG, RG, FG		779	669	895	185.5	265	90	79	55	110	16	10	59	M20

1) Clearance hole for screw
2) Maximum dimension
3) Centering holes in shaft extensions to DIN 332 part 2
4) Frame size 132 with terminal box on the left, AL = 222
Frame size 200 with terminal box on the left, AL = 385.5

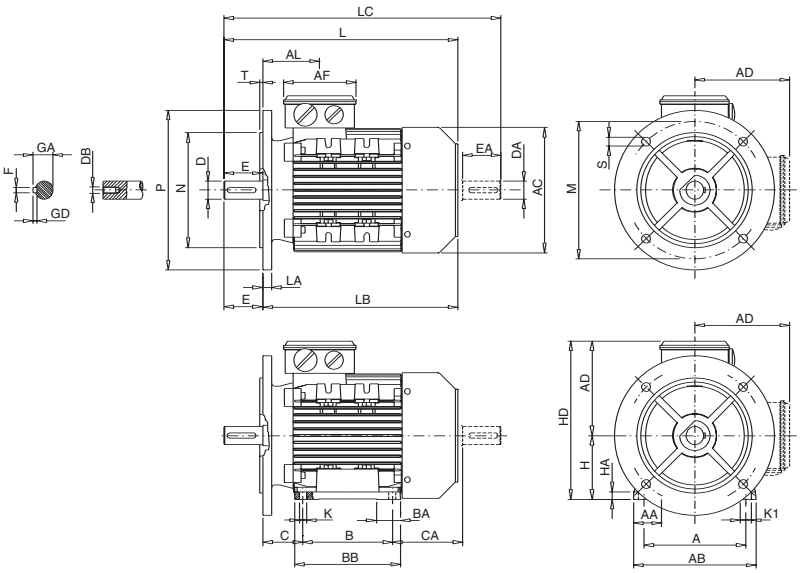


Cast iron frame

	No. of poles	H h	A b	B a	C w_1	K 1) s	AB f	BB e	BC	CA	AD 2) g_4	HD2) m_1	AC g	HC	HA c	K_1	L k
225S N P	2-4/2	225	356	286	149	16	420	375	32	318	360	585	463	450	22	16	857.5
	≥4	225	356	286	149	16	420	375	32	318	360	585	463	450	22	16	887.5
225M N, P	2-4/2	225	356	311	149	16	420	293	32	318	360	585	463	450	22	16	857.5
	≥4	225	356	311	149	16	420	293	32	318	360	585	463	450	22	16	887.5
250M K N, P	2-4/2	250	406	349	168	20	500	425	38	321	390	640	516	500	45	20	971.5
	≥4	250	406	349	168	20	500	425	38	321	390	640	516	500	45	20	971.5
280S T, V	2-4/2	280	457	368	190	20	560	450	41	325	423	703	506	564	50	20	1037
	≥4	280	457	368	190	20	560	450	41	325	423	703	506	564	50	20	1037
280M T, V	2-4/2	280	457	419	190	20	560	500	40.5	325	423	703	506	564	50	20	1088
	≥4	280	457	419	190	20	560	500	40.5	325	423	703	506	564	50	20	1088
315S YE	2-4/2	315	508	406	216	28	630	547	90	365	423	738	506	599	50	35	1117
	≥4	315	508	406	216	28	630	547	90	315	423	738	506	599	50	35	1097
315S ZE	2-4/2	315	508	406	216	28	630	547	45	342	515	830	620	660	55	35	1094
	≥4	315	508	406	216	28	630	547	45	342	515	830	620	660	55	35	1124
315M YE, ZE	2-4/2	315	508	457	216	28	630	547	45	291	515	830	620	660	55	35	1094
	≥4	315	508	457	216	28	630	547	45	291	515	830	620	660	55	35	1124
315L YE, ZE	2-4/2	315	508	508	216	28	630	598	45	360	515	830	620	660	55	35	1214
	≥4	315	508	508	216	28	630	598	45	360	515	830	620	660	55	35	1244

	No. of poles	LB	LC k1	AL	AF	BA m	AA n	D d	DA d1	E l	EA l1	F u	FA u1	GD	GA t	GC t1	DB 3) d6/d7
225S N P	2-4/2	747.5	973	304.5	265	95	90	55	55	110	110	16	16	11	59	59	M20
	≥4	747.5	1033	304.5	265	95	90	60	60	140	140	18	18	11	64	64	M20
225M N, P	2-4/2	747.5	973	304.5	265	95	90	55	55	110	110	16	16	10	59	59	M20
	≥4	747.5	1033	304.5	265	95	90	60	60	140	140	18	18	11	64	64	M20
250M K N, P	2-4/2	831.5	1118	342.5	265	120	135	60	60	140	140	18	18	11	64	64	M20
	≥4	831.5	1118	342.5	265	120	135	65	65	140	140	18	18	11	69	69	M20
280S T, V	2-4/2	897	1163	374	265	135	122	65	65	140	140	18	18	11	69	69	M20
	≥4	897	1163	374	265	135	122	75	75	140	140	20	20	12	79.5	79.5	M20
280M T, V	2-4/2	948	1214	399.5	265	135	122	65	65	140	140	18	18	11	69	69	M20
	≥4	948	1214	399.5	265	135	122	75	75	140	140	20	20	12	79.5	79.5	M20
315S YE	2-4/2	977	1267	399.5	265	135	122	65	60	140	140	18	18	11	69	64	M20
	≥4	927	1247	399.5	265	135	122	80	70	170	140	22	20	14	85	74.5	M20
315S ZE	2-4/2	954	1244	218	285	100	120	65	60	140	140	18	18	11	69	64	M20
	≥4	954	1274	218	285	100	120	80	70	170	140	22	20	14	85	74.5	M20
315M YE, ZE	2-4/2	954	1244	218	285	100	120	65	60	140	140	18	18	11	69	64	M20
	≥4	954	1274	218	285	100	120	80	70	170	140	22	20	14	85	74.5	M20
315L YE, ZE	2-4/2	1074	1364	218	285	100	120	65	60	140	140	18	18	11	69	64	M20
	≥4	1074	1394	218	285	100	120	80	70	170	140	22	20	14	85	74.5	M20

1) Clearance hole for screw
2) Maximum dimension
3) Centering holes in shaft extensions to DIN 332 part 2

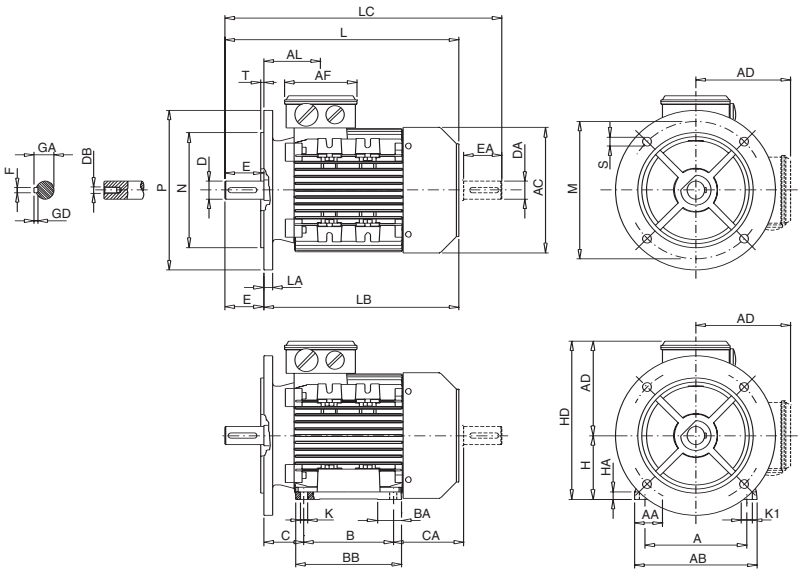


Aluminium frame

	IEC DIN	M e_1	N b_1	P a_1	T f_1	LA c_1	S[1] s_1	H h	A b	B a	C w_1	K s	CA	AD[2]	HD[2]	AC g
56Z AA, BA		100	80	120	2.5	5.5	M6	56	90	71	36	6	65	98	154	112
63Z AA, BA, CA		115	95	140	3	10	M8	63	100	80	40	7	72	103	166	125
71Z AA, BA, CA		130	110	160	3.5	10	M8	71	112	90	45	7	86	112	183	142
80Z AA, BA, CA		165	130	200	3.5	10	M10	80	125	100	50	9	89	129	209	160
90S AA, BA		165	130	200	3.5	12	M10	90	140	100	56	10	113	138	228	180
90L CA, DA		165	130	200	3.5	12	M10	90	140	125	56	10	88	138	228	180
100L AA, BA, CA		215	180	250	4	14	M12	100	160	140	63	11	110	145	245	196
112M AA, BA, CA		215	180	250	4	11	M12	112	190	140	70	10	126	161	273	225
132S AA, BA, YA, ZA		265	230	300	4	12	M12	132	216	140	89	10	147.5	198	330	270
132M BA, CA, YA, ZA, RA		265	230	300	4	12	M12	132	216	178	89	10	147.5	198	330	270
132M TA		265	230	300	4	12	M12	132	216	178	89	10	197.5	198	330	270
160M XA, VA, ZA		300	250	350	5	13	M16	160	254	210	108	12	192	246	406	335
160L RA, XA, ZA		300	250	350	5	13	M16	160	254	254	108	12	192	246	406	335
180M RA, XA		300	250	350	5	13	M16	180	279	241	121	12	256	266	446	366
180L RA, XA		300	250	350	5	13	M16	180	279	279	121	12	218	266	446	366

	BC	HA c	HC	K1	L k	LB	LC k1	AL	AF	D/DA d/d1	E/EA l/l1	F/FA u/u1	GD	GA/GC t,t1	DB3) d6/d7
56Z AA, BA	9.5	8	110	12	190	170	211	63	89	9	20	3	3	10.2	M4
63Z AA, BA, CA	12.5	8	125	12	213	190	238	66	89	11	23	4	4	12.5	M4
71Z AA, BA, CA	9.5	9	142	17	245	215	278	75	89	14	30	5	5	16	M5
80Z AA, BA, CA	12.5	9.5	162	14	272	232	319	79	116	19	40	6	6	21.5	M6
90S AA, BA	25	11	181	15	317	267	372	85	116	24	50	8	7	27	M8
90L CA, DA	12.5	11	181	15	317	267	372	85	116	24	50	8	7	27	M8
100L AA, BA, CA	13	12	198	17	366	306	433	91	116	28	60	8	7	31	M10
112M AA, BA, CA	17.5	15	226	19	388	328	456	91.5	116	28	60	8	7	31	M10
132S AA, BA, YA, ZA	17.5	20	262	14	449.5	369.5	536.5	134	133	38	80	10	8	41	M12
132M BA, CA, YA, ZA, RA	18.5	20	262	14	487.5	407.5	574.5	134	133	38	80	10	8	41	M12
132M TA	18.5	20	262	14	537.5	457.5	624.5	134	133	38	80	10	8	41	M12
160M XA, VA, ZA	20	20	324	14	613	503	730	156	149	42	110	12	8	45	M16
160L RA, XA, ZA	20	20	324	14	657	547	774	156	149	42	110	12	8	45	M16
180M RA, XA	22.5	22	360	18	712	602	838	178.5	180	48	110	14	9	51.5	M16
180L RA, XA	22.5	22	360	18	712	602	838	178.5	180	48	110	14	9	51.5	M16

1) Clearance hole for screw
2) Maximum dimension
3) Centering holes in shaft extensions to DIN 332 part 2

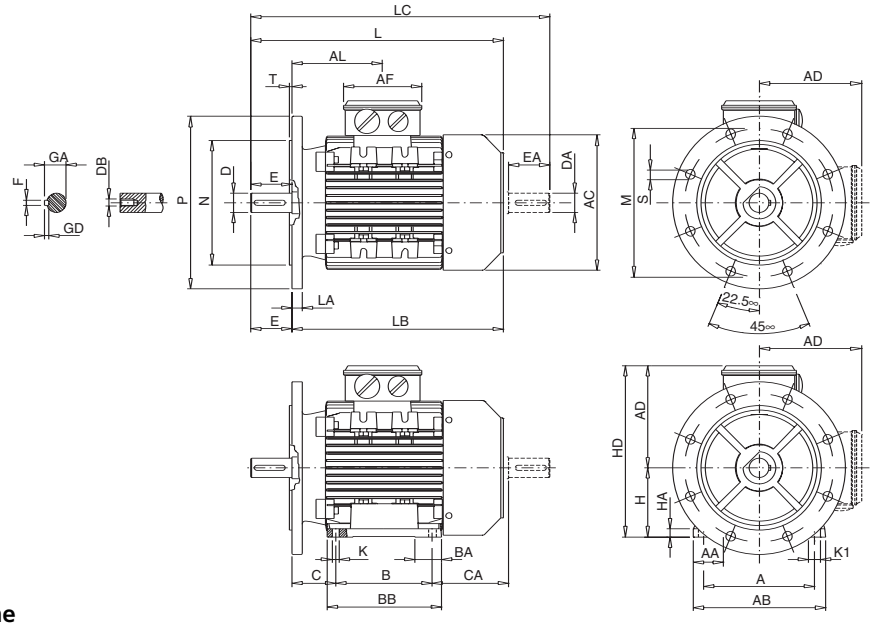


Cast iron frame

	IEC DIN	M e_1	N b_1	P a_1	T f_1	LA c_1	S[1)] s_1	H h	A b	B a	C w_1	K s	CA	AD[2)]	HD[2)]	AC g
132S YG, ZG		265	230	300	4	12	M12	132	216	140	89	10	185.5	201	333	270
132M YG, ZG, RG		265	230	300	4	12	M12	132	216	178	89	10	147.5	201	333	270
132M TG		265	230	300	4	12	M12	132	216	178	89	10	197.5	201	333	270
160M VG, XG, ZG		300	250	350	5	13	M16	160	254	210	108	12	226	250	410	335
160L RG, XG, ZG		300	250	350	5	13	M16	160	254	254	108	12	192	250	410	335
180M RG, XG		300	250	350	5	13	M16	180	279	241	121	12	256	290	470	366
180L RG, XG, ZG		300	250	350	5	13	M16	180	279	279	121	12	218	290	470	366
200L LG, NG, PG, RG, FG		350	300	400	5	15	M16	200	318	305	133	16	237	341	541	405

	BC	HA c	HC	K1	L k	LB	LC k1	AL	AF	D/DA d/d1	E/EA l/l1	F/FA u/u1	GD	GA/GC t,t1	DB3) d6/d7
132S YG, ZG	17.5	20	262	14	487.5	407.5	574.5	134	133	38	80	10	8	41	M12
132M YG, ZG, RG	18.5	20	262	14	487.5	407.5	574.5	134	133	38	80	10	8	41	M12
132M TG	18.5	20	262	14	537.5	457.5	624.5	134	133	38	80	10	8	41	M12
160M VG, XG, ZG	18	15	324	14	657	547	774	235	168	42	110	12	8	45	M16
160L RG, XG, ZG	18	15	324	14	657	547	774	235	168	42	110	12	8	45	M16
180M RG, XG	22.5	15	360	18	712	602	838	260.5	180	48	110	14	9	51.5	M16
180L RG, XG, ZG	22.5	15	360	18	712	602	838	260.5	180	48	110	14	9	51.5	M16
200L LG, NG, PG, RG, FG	27.5	18	400	_	779	669	895	185.5	265	55	110	16	9	59	M20

1) Clearance hole for screw
2) Maximum dimension
3) Centering holes in shaft extensions to DIN 332 part 2



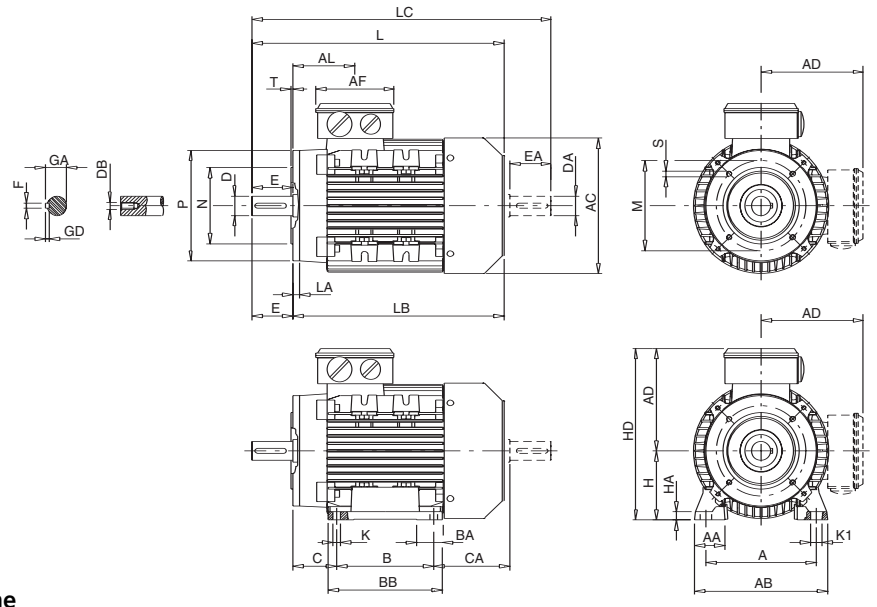
Cast iron frame

	No. of poles	M e_1	N b_1	P a_1	T f_1	LA c_1	S[1] s_1	H h	A b	B a	C w_1	K s	CA	HD[2] m_1	AC g	AD[2] g_4	HA c	K_1
225S N, P	2-4/2	400	350	450	5	16	M16	225	356	286	149	16	318	585	463	360	22	16
	≥4	400	350	450	5	16	M16	225	356	286	149	16	318	585	463	360	22	16
225M N, P	2-4/2	400	350	450	5	16	M16	225	356	311	149	16	293	585	463	360	22	16
	≥4	400	350	450	5	16	M16	225	356	311	149	16	293	585	463	360	22	16
250M K, N, P	2-4/2	500	450	550	5	18	M16	250	406	349	168	20	321	640	516	390	45	20
	≥4	500	450	550	5	18	M16	250	406	349	168	20	321	640	516	390	45	20
280S T, V	2-4/2	500	450	550	5	18	M16	280	457	368	190	20	325	703	514	423	50	20
	≥4	500	450	550	5	18	M16	280	457	368	190	20	325	703	514	423	50	20
280M T, V	2-4/2	500	450	550	5	18	M16	280	457	419	190	20	325	703	514	423	50	20
	≥4	500	450	550	5	18	M16	280	457	419	190	20	325	703	514	423	50	20
315S YE	2-4/2	600	550	660	6	22	M20	315	508	406	216	28	365	738	514	423	50	35
	≥4	600	550	660	6	22	M20	315	508	406	216	28	315	738	514	423	50	35
315S ZE	2-4/2	600	550	660	6	22	M20	315	508	406	216	28	342	830	620	515	55	35
	≥4	600	550	660	6	22	M20	315	508	406	216	28	342	830	620	515	55	35
315M YE, ZE	2-4/2	600	550	660	6	22	M20	315	508	457	216	28	291	830	620	515	55	35
	≥4	600	550	660	6	22	M20	315	508	457	216	28	291	830	620	515	55	35
315L YE, ZE *	2-4/2	600	550	660	6	22	M20	315	508	508	216	28	360	830	620	515	55	35
	≥4	600	550	660	6	22	M20	315	508	508	216	28	360	830	620	515	55	35

	No. of poles	L k	LB	LC k_1	AL	AF	BC	D d	DA d_1	E l	EA l_1	F u	FA u_1	GD	GA t	GC t_1	DB[3] d_6/d_7
225S N, P	2-4/2	857.5	747.5	973	304.5	265	32	55	55	110	110	16	16	11	59	59	M 20
	≥4	887.5	747.5	1033	304.5	265	32	60	60	140	140	18	18	11	64	64	M 20
225M N, P	2-4/2	857.5	747.5	973	304.5	265	32	55	55	110	110	16	16	10	59	59	M 20
	≥4	887.5	747.5	1033	304.5	265	32	60	60	140	140	18	18	11	64	64	M 20
250MK, P	2-4/2	971.5	831.5	1118	342.5	265	38	60	60	140	140	18	18	11	64	64	M 20
	≥4	971.5	831.5	1118	342.5	265	38	65	65	140	140	18	18	11	69	69	M 20
280S T, V	2-4/2	1037	897	1163	374	265	41	65	65	140	140	18	18	11	69	69	M 20
	≥4	1037	897	1163	374	265	41	75	75	140	140	20	20	12	79.5	79.5	M 20
280M T, V	2-4/2	1088	948	1214	399.5	265	40.5	65	65	140	140	18	18	11	69	69	M 20
	≥4	1088	948	1214	399.5	265	40.5	75	75	140	140	20	20	12	79.5	79.5	M 20
315S YE	2-4/2	1117	977	1267	399.5	265	90	65	60	140	140	18	18	11	69	64	M 20
	≥4	1097	927	1247	399.5	265	90	80	70	170	140	22	20	14	85	74.5	M 20
315S ZE	2-4/2	1094	954	1244	218	285	45	65	60	140	140	18	18	11	69	64	M 20
	≥4	1124	954	1274	218	285	45	80	70	170	140	22	20	14	85	74.5	M 20
315M YE, ZE	2-4/2	1094	954	1244	218	285	45	65	60	140	140	18	18	11	69	64	M 20
	≥4	1124	954	1274	218	285	45	80	70	170	140	22	20	14	85	74.5	M 20
315L YE, ZE *	2-4/2	1214	1074	1364	218	285	45	65	60	140	140	18	18	11	69	64	M 20
	≥4	1244	1074	1394	218	285	45	80	70	170	140	22	20	14	85	74.5	M 20

1) Clearance hole for screw
2) Maximum dimension
3) Centering holes in shaft extensions to DIN 332 part 2

* IM B5 on request

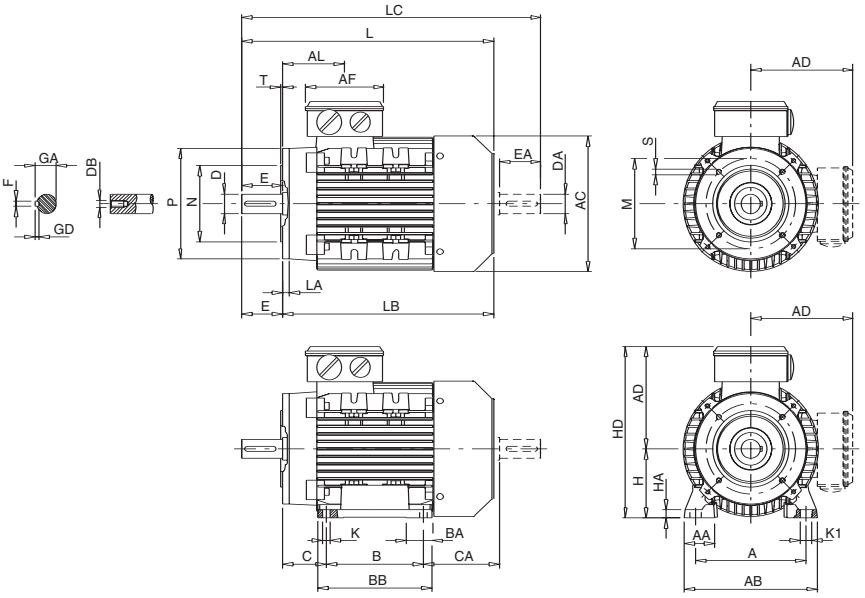


Aluminium frame

	Small flange						Large flange													
	P	N	LA	M	T	S	P	N	LA	M	T	S	L	LB	LC	AL	AF	D	DA	BC
	a_1	b_1	c_1	e_1	f_1	s_1	a_1	b_1	c_1	e_1	f_1	s_1	k		k_1			d	d_1	
56Z AA, BA	80	50		65	3	M5	105	70	8	85	2.5	M6	190	170	211	63	89	9	9	9.5
63Z AA, BA, CA	90	60		75	2.5	M5	120	80	8	100	2.5	M6	213	190	238	66	89	11	11	12.5
71Z AA, BA, CA	105	70		85	2.5	M6	140	95	8	115	2.5	M8	245	215	278	75	89	14	14	9.5
80Z AA, BA, CA	120	80	8	100	3	M6	160	110	8.5	130	3.5	M8	272	232	319	79	116	19	19	12.5
90S AA, BA	140	95	10	115	3	M8	160	110	9	130	3.5	M8	317	267	372	85	116	24	24	25
90L BA, CA, DA	140	95	10	115	3	M8	160	110	9	130	3.5	M8	317	267	372	85	116	24	24	12.5
100L AA, BA, CA	160	110	10	130	3.5	M8	200	130	12	165	3.5	M10	366	306	433	91	116	28	28	13
112M AA, BA, CA	160	110	10	130	3.5	M8	200	130	12	165	3.5	M10	388	328	456	91.5	116	28	28	17.5
132S AA, BA, YA, ZA	200	130	12	165	3.5	M10	250	180	12	215	4	M12	449.5	369.5	536.5	134	133	38	38	17.5
132M BA,CA,YA,ZA,RA	200	130	12	165	3.5	M10	250	180	12	215	4	M12	487.5	407.5	574.5	134	133	38	38	18.5
132M TA	200	130	12	165	3.5	M10	250	180	12	215	4	M12	537.5	457.5	624.5	134	133	38	38	18.5
160M XA, VA, ZA [4]	250	180	12	215	4	M12	300	230	12	265	5	M16	613	503	730	156	149	42	42	20
160L RA, XA, ZA [4]	250	180	12	215	4	M12	300	230	12	265	5	M16	657	547	774	156	149	42	42	20

	E	EA	F	FA	GD	GA	GC	DB[3]	H	A	B	C	K[1]	AB	BB	CA	AD[2]	HD[2]	AC	HC	HA	K_1
	l	l_1	u	u_1			t/t_1	d_6/d_7	h	b	a	w_1	s	f	e		g_4	m_1	g		c	
56Z AA, BA	20	20	3	3	3	10.2	10.2	M4	56	90	71	36	6	109	90	65	98	154	112	110	8	12
63Z AA, BA, CA	23	23	4	4	4	12.5	12.5	M4	63	100	80	40	7	126	105	72	103	166	125	125	8	12
71Z AA, BA, CA	30	30	5	5	5	16	16	M5	71	112	90	45	7	144	109	86	112	183	142	142	9	17
80Z AA, BA, CA	40	40	6	6	6	21.5	21.5	M6	80	125	100	50	9	153	125	89	129	209	160	9.5	14	14
90S AA, BA	50	50	8	8	7	27	27	M8	90	140	100	56	10	170	150	113	138	228	180	181	11	15
90L BA, CA, DA	50	50	8	8	7	27	27	M8	90	140	125	56	10	170	150	88	138	228	180	181	11	15
100L AA, BA, CA	60	60	8	8	7	31	31	M10	100	160	140	63	11	192	166	110	145	245	196	198	12	17
112M AA, BA, CA	60	60	8	8	7	31	31	M10	112	190	140	70	10	220	175	126	161	278	225	226	15	19
132S AA, BA, YA, ZA	80	80	10	10	8	41	41	M12	132	216	140	89	10	260	175	147.5	198	330	270	262	20	14
132M BA CA, YA, ZA, RA	80	80	10	10	8	41	41	M12	132	216	178	89	10	260	215	147.5	198	330	270	262	20	14
132M TA	80	80	10	10	8	41	41	M12	132	216	178	89	10	260	215	197.5	198	330	270	262	20	14
160M XA, VA, ZA [4]	110	110	12	12	8	45	45	M16	160	254	210	108	12	292	250	192	246	406	335	324	20	14
160L RA, XA, ZA [4]	110	110	12	12	8	45	45	M16	160	254	254	108	12	292	294	192	246	406	335	324	20	14

1) Clearance hole for screw
2) Maximum dimension
3) Centering holes in shaft extensions to DIN 332 part 2
4) Bearing drive end 6309 2Z C3



Cast iron frame

	Small flange						Large flange													
	P	N	LA	M	T	S	P	N	LA	M	T	S	L	LB	LC	AL	AF	D	DA	BC
	a_1	b_1	c_1	e_1	f_1	s_1	a_1	b_1	c_1	e_1	f_1	s_1	k		k_1			d	d_1	
132S YG, ZG	200	130	12	165	3.5	M10	250	180	12	215	4	M12	449.5	369.5	536.5	134	133	38	38	17.5
132M YG, ZG, RG	200	130	12	165	3.5	M10	250	180	12	215	4	M12	487.5	407.5	574.5	134	133	38	38	18.5
132M TG	200	130	12	165	3.5	M10	250	180	12	215	4	M12	537.5	457.5	624.5	134	133	38	38	18.5
160M VG, XG, ZG	250	180	12	215	4	M12	300	230	12	265	5	M16	613	503	730	235	168	42	42	18
160L RG, XG, ZG	250	180	12	215	4	M12	300	230	12	265	5	M16	657	547	774	235	168	42	42	18

	E	EA	F	FA	GD	GA	GC	DB[3]	H	A	B	C	K[1]	AB	BB	CA	AD[2]	HD[2]	AC	HC	HA	K[1]
	l	l_1	u	u_1			t/t_1	d_6/d_7	h	b	a	w_1	s	f	e		g_4	m_1	g		c	
132S YG, ZG	80	80	10	10	8	41	41	M12	132	216	140	89	10	260	175	185.5	201	333	270	262	20	14
132M YG, ZG, RG	80	80	10	10	8	41	41	M12	132	216	178	89	10	260	215	147.5	201	333	270	262	20	14
132M TG	80	80	10	10	8	41	41	M12	132	216	178	89	10	260	215	197.5	201	333	270	262	20	14
160M VG, XG, ZG	110	110	12	12	8	45	45	M16	160	254	210	108	12	304	290	226	250	410	335	324	15	14
160L RG, XG, ZG	110	110	12	12	8	45	45	M16	160	254	254	108	12	304	290	192	250	410	335	324	15	14

1) Clearance hole for screw
2) Maximum dimension
3) Centering holes in shaft extensions to DIN 332 part 2

Notes

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