CE

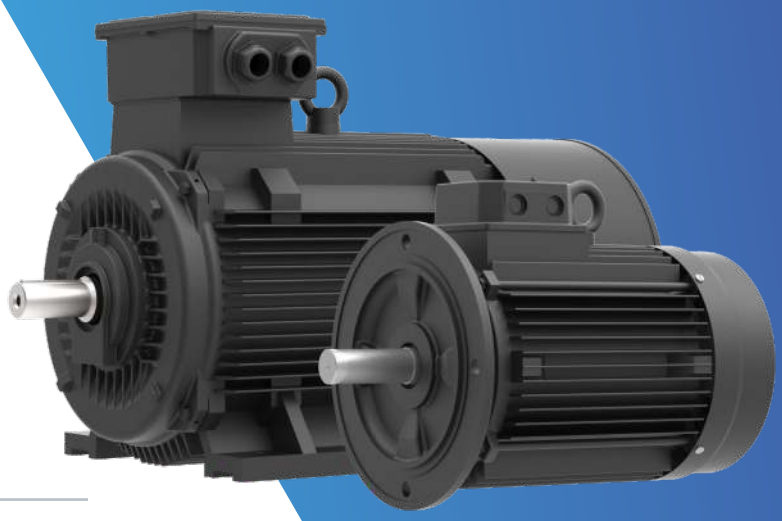
IE 2 / IE 3

GENERAL PUMPS

GMT Series

Energy-efficient
Cast Iron Three Phase
Induction Motors

60 Hz.



www.pumpsgp.com

Contents

Tel. : +34 96 1665200
e-mail: info@pumpsgp.com

Product Data

SPECIFICATIONS

- ❒ Motor type : AC three-phase squirrel cage induction motor
- ❒ Enclosure : TEFC
- ❒ Frame : 63 to 355L
- ❒ Mounting : Foot, Flange and Face
- ❒ Rated power : 0.37 kW to 315 kW (0.5 to 430 HP)
- ❒ Voltage ± variation : 230/380/460 V ± 10%
- ❒ Frequency ± variation : 60 Hz ± 5%
- ❒ Combined variation : 10% (Absolute sum)
- ❒ Rated speed : 3600, 1800, 1200 rpm (2 pole, 4 pole, 6 pole)
- ❒ Ambient temperature : +50°C
- ❒ Altitude : Should be lower than 1000 metres above sea level
- ❒ Relative humidity : Up to 100%
- ❒ Connection : Up to 2.2 kW-Star connection with 3 leads & above 2.2 kW-Delta connection with 6 leads
- ❒ Direction of rotation : Anticlockwise or clockwise as seen from the Driver end side
- ❒ Duty / Rating : S1 / Continuous
- ❒ Insulation class : Class 'F' and temperature rise limited to class 'B'
- ❒ Degree of protection : IP 55
- ❒ Cooling method : IC411 / Shaft mounted fan.

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APPLICATIONS

- ❒ Pumps
- ❒ Compressors
- ❒ Fans and blowers
- ❒ Flour mills, rolling mills, mixers
- ❒ Machine tools
- ❒ Textile and plastic machineries
- ❒ Printing, packaging and wood working machineries
- ❒ Agricultural, food processing machinery
- ❒ Material handling equipments
- ❒ Cranes, hoists and lifts
- ❒ Cooling towers.

FEATURES AND BENEFITS

- ❒ Motors are fitted with dynamically balanced aluminium die cast squirrel cage rotors.
- ❒ Motors are fitted with pre-lubricated antifriction ball bearings up to 132 frame.
- ❒ Motors are free from moisture and dust particles.
- ❒ Minimum electricity consumption because of special grade electrical steel used in an energy efficient optimized design.
- ❒ Balanced three-dimensional heat transfer principal due to special fins design of stator body.
- ❒ Minimum rotor losses due to use of electrolytic grade of aluminium.
- ❒ Minimum copper losses due to use of electrolytic grade of copper.
- ❒ Minimum friction losses.
- ❒ Low noise, smooth running motor.
- ❒ Reliable operation.
- ❒ Easy maintenance.
- ❒ Low payback period.

BENEFITS OF ENERGY EFFICIENT MOTORS

- ❒ Short payback period / lower operating cost due to their higher efficiency.
- ❒ Motors have lower power dissipation due to their higher efficiency.
- ❒ Motors have a longer life span due to their relatively low temperature rise.
- ❒ Motors have higher thermal margins, which helps avoid unnecessary safety margins in the design process.
- ❒ Motors save energy and reduce CO_2 emissions.

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STANDARDS FOR MOTORS

All motors are complying with following International standards:

International Standards	
IEC 60034-1	Rating and performance
IEC 60034-2-1	Methods for determining losses and efficiency
IEC 60034-5	Classification of degrees of protection
IEC 60034-6	Methods of cooling
IEC 60034-7	Symbols of construction and mounting arrangements
IEC 60034-8	Terminal markings and direction of rotation
IEC 60034-9	Noise limits
IEC 60072-1	Dimensions and output of electric machines
IEC 60034-14	Vibration limits
IEC 60034-30-1	Efficiency classes of line operated AC motors (IE code)

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INTERNATIONAL STANDARDS FOR MOTOR EFFICIENCY

The efficiency factor defines the efficiency of motors when transforming electrical energy into mechanical energy.

The International Electrotechnical Commission (IEC), in order to harmonize the energy consumption regulations aimed to reduce the CO_2 emissions and the impact of industrial operations on the environment, has established the standard IEC 60034-30:2008 which defines energy efficiency classes for low-voltage, three-phase, 50Hz and 60Hz squirrel cage induction motors.

In parallel IEC developed and issued a new standard for determining the motor efficiencies. The new standard IEC 60034-30 defines and harmonizes worldwide the efficiency classes IE1, IE2 and IE3 for low-voltage three-phase motors in the power range from 0.75 kW to 375 kW.

New international efficiency classes of low-voltage three-phase motors - IE = International Efficiency

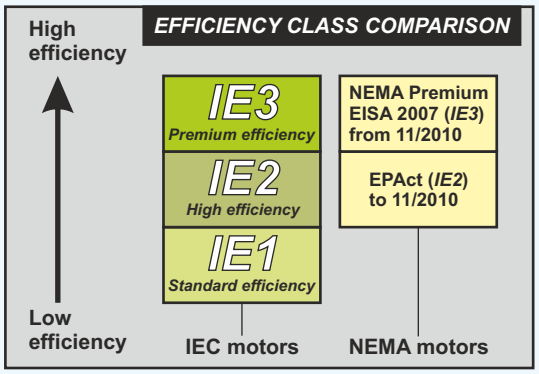
The new IEC 60034-30:2008 defines worldwide the following efficiency classes of LV three-phase motors, in the range from 0.75 to 375 kW.

IE1 = Standard Efficiency

IE2 = High Efficiency

IE3 = Premium Efficiency

(new efficiency class in Europe nowadays and identical to "NEMA Premium" in the USA for 60Hz).



From now motors can be offered and sold with the new classes IE1, IE2 and IE3.
In that case the efficiency has to be determined according to the new requirements given in the IEC 60034-2-1 standard.

According to the Commission Regulation (EC) No 640/2009 (introduced in July 2009) the required efficiency class of general-purpose motors (introduced to the market in Europe in future) will be as follows:

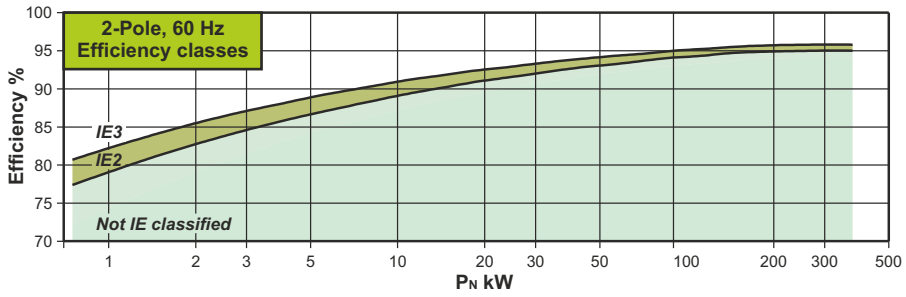
- **From 16 June 2011, motors placed for the first-time on the market shall have a minimum efficiency class of IE2.**
- **From 1 January 2015: motors with a rated output between 7.5 - 375 kW shall have a minimum efficiency class of IE3, or IE2 if they are operated/equipped with electronic speed control (VSD).**
- **From 1 January 2017: motors with a rated output between 0.75 - 375 kW shall have a minimum efficiency class of IE3, or IE2 if they are operated/equipped with electronic speed control (VSD).**

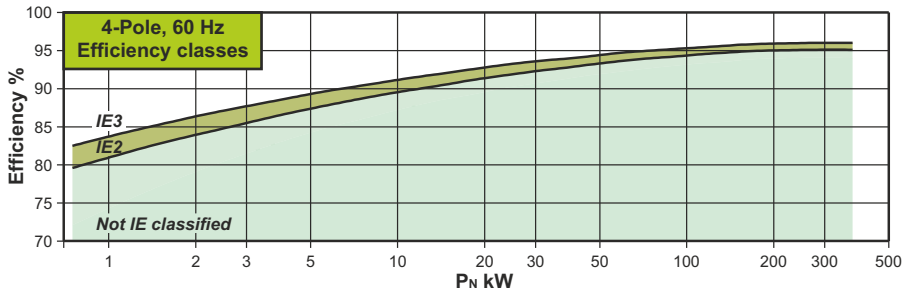
Electronic speed control is carried out using a frequency converter (VSD) that adjusts the speed of the motor - and therefore the torque produced - based on the energy needed.

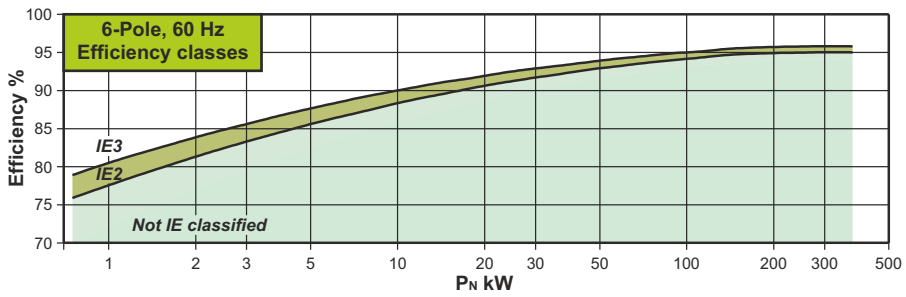
General Pumps has offered energy efficiency motors for several years now. These motors are also in compliance with the efficiency standards covered by CEMEP. We continuously carry out intensive research and development of the motors according to the new standards IEC 60034-30 and IEC 60034-2-1.

NOMINAL EFFICIENCY OF MOTORS & EFFICIENCY CLASS COMPARISON

Nominal efficiency (%) limits for class IE2 / IE3 60 Hz according to the IEC 60034-30							
P_N		2-Pole Eff. (%)		4-Pole Eff. (%)		6-Pole Eff. (%)	
kW	HP	*IE2*	*IE3*	*IE2*	*IE3*	*IE2*	*IE3*
0.18	0.25	64.0	65.6	68.0	69.5	55.0	67.5
0.37	0.5	72.0	73.4	72.0	78.2	64.0	75.3
0.55	0.75	74.0	76.8	75.5	81.1	68.0	81.7
0.75	1	75.5	77.0	78.0	83.5	73.0	82.5
1.1	1.5	82.5	84.0	84.0	86.5	85.5	87.5
1.5	2	84.0	85.5	84.0	86.5	86.5	88.5
2.2	3	85.5	86.5	87.5	89.5	87.5	89.5
3.7	5	87.5	88.5	87.5	89.5	87.5	89.5
5.5	7.5	88.5	89.5	89.5	91.7	89.5	91.0
7.5	10	89.5	90.2	89.5	91.7	89.5	91.0
11	15	90.2	91.0	91.0	92.4	90.2	91.7
15	20	90.2	91.0	91.0	93.0	90.2	91.7
18.5	25	91.0	91.7	92.4	93.6	91.7	93.0
22	30	91.0	91.7	92.4	93.6	91.7	93.0
30	40	91.7	92.4	93.0	94.1	93.0	94.1
37	50	92.4	93.0	93.0	94.5	93.0	94.1
45	60	93.0	93.6	93.6	95.0	93.6	94.5
55	75	93.0	93.6	94.1	95.4	93.6	94.5
75	100	93.6	94.1	94.5	95.4	94.1	95.0
90	125	94.5	95.0	94.5	95.4	94.1	95.0
110	150	94.5	95.0	95.0	95.8	950	95.8
150	200	95.0	95.4	95.0	96.2	95.0	95.8
185	250	95.4	95.8	95.0	96.2	95.0	95.8
220 to 335	300 to 450	95.4	95.8	95.4	96.2	95.0	95.8
375 to 1000	500 to 1350	95.4	95.8	95.8	96.2	95.0	95.8







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e-mail: info@pumpsgp.com

TOLERANCES

For industrial motors according to IEC 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:

- ❒ 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.
- ❒ 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.
- ❒ Where a tolerance is stated is only one direction, the value is not limited in the other direction.

Permissible deviation between real values & declared values according to the IEC 60034-1	
Power factor (cos φ)	-1/6(1-cos φ) Minimum 0.02 and maximum 0.07
Efficiency (η)	-0.15(1-η) for $P_N \leq 150$ kW -0.1(1-η) for $P_N > 150$ kW Where η is a decimal number
Slip (s)	±20% of the slip for $P_N \geq 1$ kW ±30% of the slip for $P_N < 1$ kW
Locked rotor current (I_L/I_N)	+20% (No lower limit)
Locked rotor torque (T_L/T_N)	-15% and +25% (+25% may be exceeded by agreement)
Breakdown torque (T_B/T_N)	-10%
Moment of inertia (J) [kgm²]	±10%

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Product Data

TYPE KEY

GMT	050	1	112	M	A	2

Type range
GMT = General Pumps Three-phase induction motor series

Motor output (HP)
025 = 0.25 hp
050 = 0.50 hp
075 = 0.75 hp
110 = 1.00 hp
115 = 1.50 hp
120 = 2.00 hp
130 = 3.00 hp
150 = 5.00 hp
175 = 7.50 hp
210 = 10.0 hp
212 = 12.5 hp
215 = 15.0 hp
220 = 20.0 hp
225 = 25.0 hp
230 = 30.0 hp
240 = 40.0 hp
250 = 50.0 hp
260 = 60.0 hp
275 = 75.0 hp
310 = 100 hp
312 = 120 hp
315 = 150 hp
318 = 180 hp
321 = 215 hp
327 = 270 hp
334 = 340 hp
343 = 430 hp

Number of poles
1 = 2 Pole 60 Hz.
3 = 4 Pole 60 Hz.
5 = 6 Pole 60 Hz.

Shaft centre height
063 = 63 mm
071 = 71 mm
080 = 80 mm
090 = 90 mm
100 = 100 mm
112 = 112 mm
132 = 132 mm
160 = 160 mm
180 = 180 mm
200 = 200 mm
225 = 225 mm
250 = 250 mm
280 = 280 mm
315 = 315 mm
355 = 355 mm

Frame length
Z =
S = Mechanical dimensions (short)
M = Mechanical dimensions (medium)
L = Mechanical dimensions (long)

Mounting arrangements
A = Mounting code IM B3
B = Mounting code IM B34
C = Mounting code IM B5
D = Mounting code IM B6
E = Mounting code IM B7
F = Mounting code IM B8
G = Mounting code IM B14
H = Mounting code IM B35
I = Mounting code IM V1
J = Mounting code IM V3
K = Mounting code IM V5
L = Mounting code IM V6
M = Mounting code IM V15
N = Mounting code IM V18
O = Mounting code IM V19
P = Mounting code IM V37

Efficiency class
2 = IE2 class motor
3 = IE3 motor

MATERIAL OF CONSTRUCTION

Component	Material
Stator frame	Cast iron
Front endshield	Cast iron
Rear endshield	Cast iron
Terminal box	Aluminum alloy / Cast iron
Terminal plate	Bakelite
Fan cover	Carbon steel
Fan	Reinforced polypropylene / Nylon
Electric rotor	Silicon steel / Carbon steel
Key	Carbon steel
Hardware	Carbon steel

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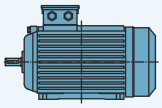
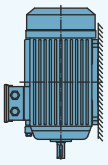
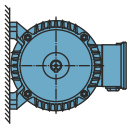
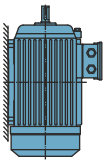
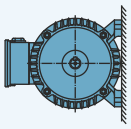
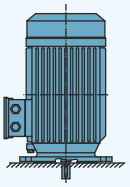
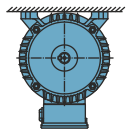
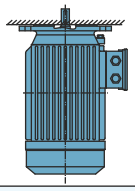
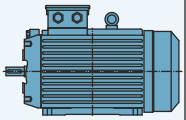
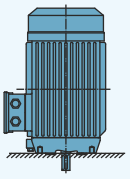
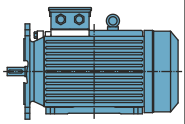
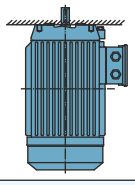
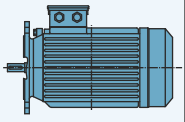
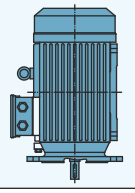
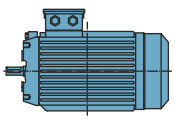
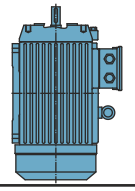
MOUNTING ARRANGEMENTS

Mounting arrangements for rotating electrical machines are designated according to the IEC 60034-7 standard. Our motors are available with the mounting arrangements as per details below, depending on design and frame size.

Horizontal shaft mounting					Vertical shaft mounting				
Mounting arrangement		Code I	Code II	Frame size	Mounting arrangement		Code I	Code II	Frame size
	Mounted by foot, foot down	IM B3	IM 1001	63 - 355		Mounted by foot, Driver end down	IM V5	IM 1011	63 - 160
	Mounted by foot, foot left (viewed from Driver-end)	IM B6	IM 1051	63 - 160		Mounted by foot, Driver end up	IM V6	IM 1031	63 - 160
	Mounted by foot, foot right (viewed from Driver-end)	IM B7	IM 1061	63 - 160		Mounted on Driver end side of flange type 'B', Driver end down	IM V1	IM 3011	63 - 355
	Mounted by foot, foot up	IM B8	IM 1071	63 - 160		Mounted on Driver end side of flange type 'B', Driver end up	IM V3	IM 3031	63 - 160
	Mounted by foot, foot down, with additional mounting on D-end side of flange type 'C'	IM B34	IM 2101	63 - 132		Mounted on Driver end side of flange type 'C', Driver end down	IM V18	IM 3611	63 - 132
	Mounted by foot, foot down, with additional mounting on D-end side of flange type 'B'	IM B35	IM 2001	63 - 355		Mounted on Driver end side of flange type 'C', Driver end up	IM V19	IM 3631	63 - 132
	Mounted on Driver end side of flange type 'B'	IM B5	IM 3001	63 - 355		Mounted by foot, with additional mounting on D-end side of flange, type 'B' D-end down	IM V15	IM 2011	63 - 160
	Mounted on Driver end side of flange type 'C'	IM B14	IM 3601	63 - 160		Mounted by foot, with additional mounting on D-end side of flange, type 'C' D-end up	IM V37	IM 2131	63 - 132

Tel. : +34 96 1665200
e-mail: info@pumpsgp.com

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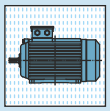
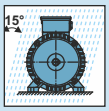
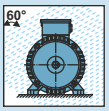
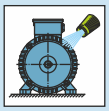
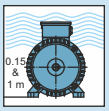
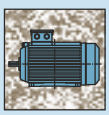
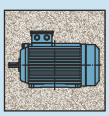
DEGREE OF PROTECTION (INGRESS PROTECTION - IP)

As per IEC 60034-5 standard, the Degree of protection of a rotating electrical machine is designated with the letters IP (Ingress Protection) followed by two characteristic numbers, with the following manner:

- ❒ First characteristic numeral: Describes to protection against access to hazardous parts and ingress of solids & foreign bodies.
- ❒ Second characteristic numeral: Describes to protection against ingress of water.
- ❒ All our motors shown in this catalog are IP 55.

			Second numeral & description								
			0	1	2	3	4	5	6	7	8
			Not protected	Protection against vertically falling drops of water	Protection against direct spray of water up to 15° from vertical	Protection against direct spray of water up to 60° from vertical	Protection against water splashed from all directions	Protection against low pressure jet of water from any directions	Protection against strong jet of water from any directions	Protection against immersion between 0.15 & 1 m	Protection against long period of immersion under pressure
First numeral & description											
0	Not protected										
1	Protection against solid foreign bodies > 50 mm (e.g: Inadvertent contact with hand)										
2	Protection against solid foreign bodies > 12 mm (e.g: Inadvertent contact with the fingers)			IP 21	IP 22	IP 23					
3	Protection against solid foreign bodies > 2.5 mm (e.g: Inadvertent contact with wires and tools)										
4	Protection against solid foreign bodies > 1 mm (e.g: Inadvertent contact with wires, bands)						IP 44				
5	Protection against dust (no harmful deposits of dust)						IP 54	IP 55	IP 56		
6	Totally protected against deposition of dust										

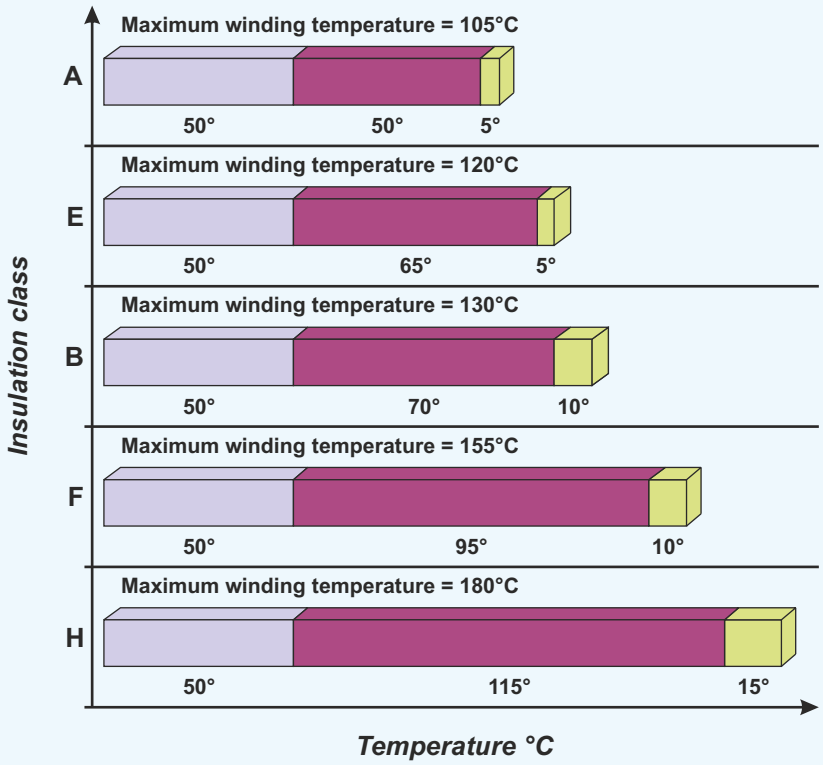
Tel. : +34 96 1665200
e-mail: info@pumpsgp.com

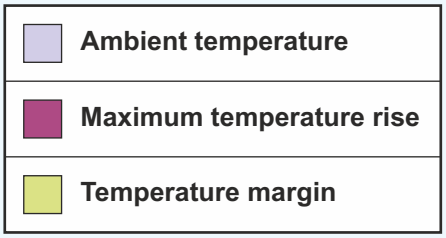
Product Data

INSULATION CLASS

Motors are manufactured with class 'F' insulation as a standard and temperature rise limited to class 'B'. This allows for about 25°C reserve thermal capacity in the motor. The reserve thermal capacity is what helps maintain the integrity of the insulation and lengthen motor life.

Temperature rise and maximum temperatures at the hottest points of the winding according to the temperature classes of IEC 60034-1.





Ins. class	Maximum winding temperature
A	105°C
E	120°C
B	130°C
F	155°C
H	180°C

Insulation class 'F' in an electric motor means that at ambient temperature of 50°C, the temperature rise of the winding may be max. 95°C with the additional temperature margin of 10°C (under specified measuring conditions in accordance with the IEC 60034-1 standard).

EFFECTS OF VARIATION OF VOLTAGE AND FREQUENCY

Effects of variation of voltage and frequency on the characteristics of motor

Characteristics	Voltage		Frequency	
	110%	90%	105%	95%
Torque				
Starting and maximum	Increase 21%	Decrease 19%	Decrease 10%	Increase 11%
Speed				
Synchronous	No change	No change	Increase 5%	Decrease 5%
Full load	Increase 1%	Decrease 1.5%	Increase 5%	Decrease 5%
Current				
No load	Increase 10-15%	Decrease 10-12%	Decrease 5-6%	Increase 5-6%
Starting	Increase 10-12%	Decrease 10-12%	Decrease 5-6%	Increase 5-6%
Full load	Decrease 7%	Increase 11%	Slight Decrease	Slight Increase
Temperature rise	Decrease 3-4%	Increase 6-7%	Slight Decrease	Slight Increase
Overload capacity	Increase 21%	Decrease 19%	Slight Decrease	Slight Increase
Magnetic noise	Slight Increase	Slight Decrease	Slight Decrease	Slight Increase
Efficiency				
Full load	Increase 0.5-1.0%	Decrease 2%	Slight Increase	Slight Decrease
Power factor	Decrease 3%	Increase 1%	Slight Increase	Slight Decrease

OVERLOAD

At operating temperature three-phase motors are capable of withstanding an overload for 15 second at 1.6 times the rated torque at rated voltage. This overload is according to the IEC 60034-1 standard and will not result in excessive heating.

Tel. : +34 96 1665200
e-mail: info@pumpsgp.com

Product Data

INSTALLATION CONDITIONS

The motors conform to degree of protection IP 55 as per IEC 60034-5.

The standard design for horizontal mounting is suitable for indoor and protected outdoor installation (temperature of coolant -20°C to +50°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.

INSTALLATION AT ALTITUDES OF MORE THAN 1000 M ABOVE SEA LEVEL

Conditions	Altitude of installation		
	2000 m	3000 m	4000 m
At 50°C ambient temperature and thermal class 'B', Rated output reduce to approx	92%	84%	76%
At 50°C ambient temperature and thermal class 'F', Rated output reduce 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

NUMBERS OF STARTS/HOUR

The permissible nos. 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.

Frame size	2 Pole	4 Pole	6 & 8 Pole
63 -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 - 355	4	8	12

Product Data

BEARING DETAILS & LUBRICATION

Frame size	Nos. of poles	Drive end bearing	Non-Drive end bearing	Regreasing interval [hours]
63	2	6201 ZZ-C3	6201 ZZ-C3	-
	4, 6, 8			-
71	2	6202 ZZ-C3	6202 ZZ-C3	-
	4, 6, 8			-
80	2	6204 ZZ-C3	6204 ZZ-C3	-
	4, 6, 8			-
90	2	6205 ZZ-C3	6205 ZZ-C3	-
	4, 6, 8			-
100	2	6206 ZZ-C3	6206 ZZ-C3	-
	4, 6, 8			-
112	2	6206 ZZ-C3	6206 ZZ-C3	-
	4, 6, 8			-
132	2, 4	6208 ZZ-C3	6208 ZZ-C3	-
	6, 8	6308-C3	6308-C3	8000
160	2, 4, 8	6309-C3	6209-C3	4000
	6	6310-C3	6309-C3	8000
180	2	6310-C3	6210-C3	3500
	4, 6, 8			8000
200	2	6312-C3	6212-C3	3500
	4, 6, 8			8000
225	2	6313-C3	6313-C3	3500
	4, 6, 8			8000
250	2	6315-C3	6215-C3	3000
	4, 6, 8			7000
280	2	6317-C3	6316-C3	3000
	4, 6, 8	6317-C3	6316-C3	5000
315	2	6317-C3	6317-C3	2000
	4, 6, 8	6319-C3	6319-C3	4000
355	2	6319-C3	6319-C3	2000
	4, 6, 8	6322-C3	6319-C3	3000

TERMINAL BOX

Terminal box is provided on top as a standard.

CABLE SIZE

Frame size	Maximum cable size		Cable entry size
	DOL starting	Star-Delta starting	*IE2 / IE3*
63	3C x 2.5 mm²	-	1 x 3/4"
71	3C x 2.5 mm²	-	1 x 3/4"
80	3C x 4 mm²	-	1 x 3/4"
90	3C x 4 mm²	-	2 x 3/4"
100	3C x 10 mm²	2 x 3C x 10 mm²	2 x 3/4"
112	3C x 10 mm²	2 x 3C x 10 mm²	2 x 3/4"
132	3C x 10 mm²	2 x 3C x 10 mm²	2 x 1"
160	3C x 35 mm²	2 x 3C x 25 mm²	2 x 1"
180	3C x 35 mm²	2 x 3C x 25 mm²	2 x M40 x 1.5
200	3C x 120 mm²	2 x 3C x 70 mm²	2 x M50 x 1.5
225	3C x 120 mm²	2 x 3C x 70 mm²	2 x M50 x 1.5
250	3C x 120 mm²	2 x 3C x 70 mm²	2 x M63 x 1.5
280	3C x 240 mm²	2 x 3C x 150 mm²	2 x M63 x 1.5
315	3C x 240 mm²	2 x 3C x 150 mm²	2 x M63 x 1.5
355	3C x 400 mm²	2 x 3C x 300 mm²	2 x M63 x 1.5

Tel. : +34 96 1665200
e-mail: info@pumpsgp.com

Product Data

NOISE LEVEL

As per IEC 60034-9 standard the permitted noise levels of electric machines are mention as per details below.

P_N		IE2 & IE3 NOISE LEVEL					
		2-Pole (3600 r/min)		4-Pole (1800 r/min)		6-Pole (1200 r/min)	
kW	HP	Measuring surface sound at 60 Hz Lpfa dB(A)	Sound pressure level at 60 Hz LWA dB(A)	Measuring surface sound at 60 Hz Lpfa dB(A)	Sound pressure level at 60 Hz LWA dB(A)	Measuring surface sound at 60 Hz Lpfa dB(A)	Sound pressure level at 60 Hz LWA dB(A)
0.75	1	56	67	46	57	45	57
1.1	1.5	57	68	48	60	45	57
1.5	2	61	73	48	60	49	61
2.2	3	61	73	52	64	53	65
3	4	63	75	52	64	53	65
3.7	5	65	75	53	65	55	67
5.5	7.5	68	80	59	71	55	67
7.5	10	68	80	59	71	57	69
11	15	72	84	62	72	57	69
15	20	73	86	62	73	58	70
18.5	25	73	86	64	76	58	70
22	30	74	87	64	76	61	73
30	40	77	91	64	76	62	74
37	50	77	91	64	76	62	74
45	60	77	91	65	78	63	75
55	75	80	94	66	79	64	76
75	100	80	94	69	82	68	80
90	120	80	94	69	82	68	80
110	150	81	95	77	90	73	83
132	180	81	95	77	90	73	83
160	215	85	99	82	95	78	90
200	270	85	99	82	95	78	90
250	340	88	102	84	97	78	90
315	430	88	102	84	97	-	-

VIBRATION LEVEL

The amplitude of vibration in electric motors are governed by IEC 60034-14, Mechanical vibration of rotating electrical machines with frame size 56 & large - methods of measurement and limits.

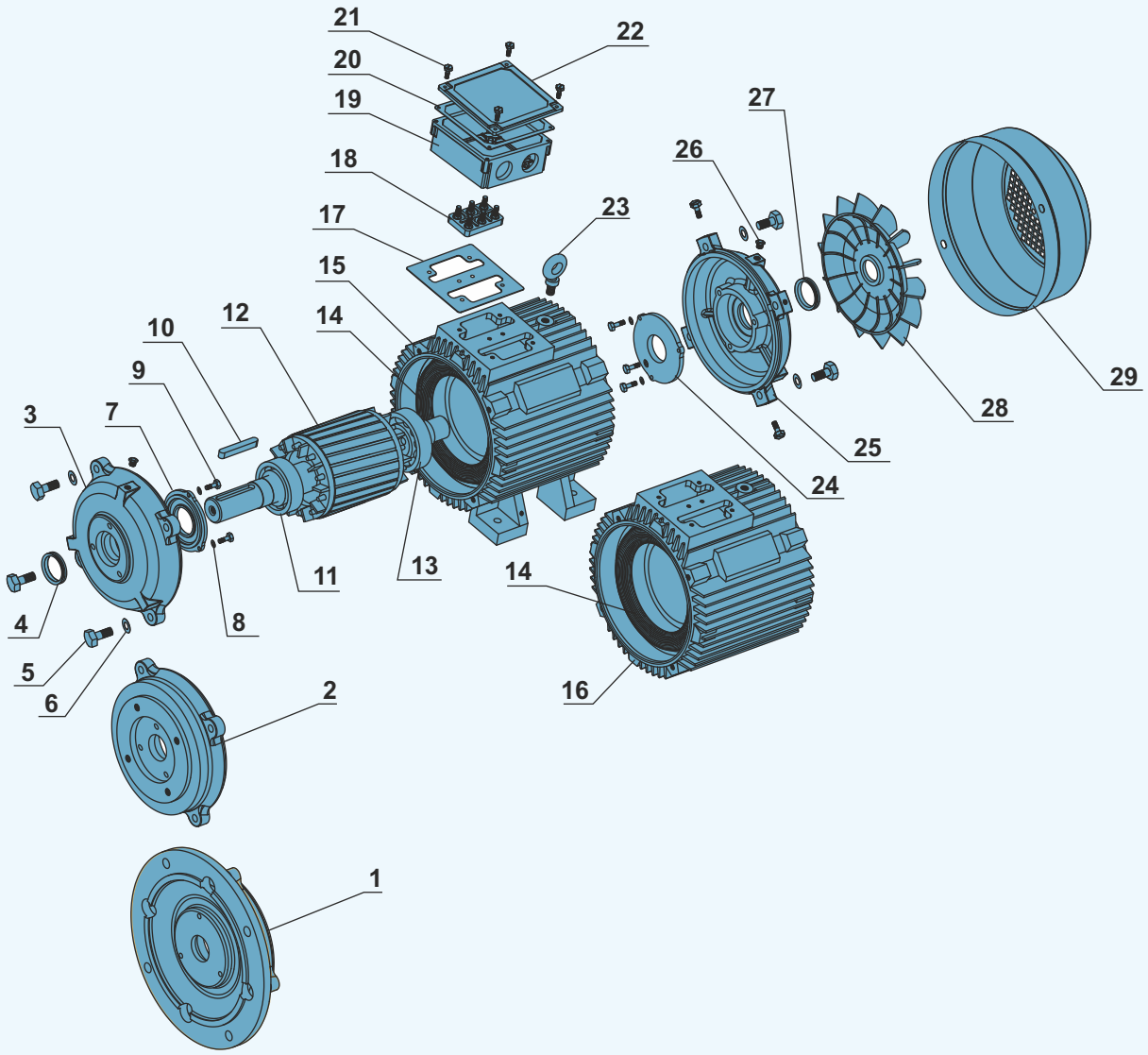
- ❒ Rotors are dynamically balanced with half key and the standard version meets the vibration levels of Grade A (without special vibration requirements) described in IEC 60034-14. As an option, motors can be supplied in conformance with vibration of Grade B.
- ❒ The RMS speed and vibration levels in mm/s of Grade A and B are shown in below table.

Vibration	Assembly	Vibration speed RMS (mm/s)		
		Shaft height $63 \leq H \leq 132$	Shaft height $132 < H \leq 280$	Shaft height $H > 280$
Grade A	Free suspension	1.6	2.2	2.8
Grade B	Free suspension	0.7	1.1	1.8

If the machine vibrates even after proper alignment on an amply size foundation, this could be cause by incorrect balanced pulley, coupling or similar, fitted to the shaft. Other causes could be weak foundation.

Product Data

EXPLODED VIEW AND SPARE PARTS DESCRIPTION



Pos.	Parts name	Pos.	Parts name
1	B5 flange	16	B4/B14 stator frame
2	B14 flange	17	Gasket
3	Front end shield	18	Terminal plate
4	V-seal	19	Terminal box base
5	Hex bolt	20	Gasket
6	Spring washer	21	Screw
7	Front bearing cover	22	Terminal box cover
8	Spring washer	23	Lifting bolt
9	Hex bolt	24	Rear bearing cover
10	Key	25	Rear end shield
11	Ball bearing (Drive end)	26	Grease nipple
12	Electric rotor	27	V-seal
13	Ball bearing (Non-drive end)	28	Fan
14	Stator stack	29	Fan cover
15	B3 stator frame		

Tel. : +34 96 1665200
e-mail: info@pumpsgp.com

Product Data

MOTOR PERFORMANCE DATA - 3600 RPM, 230/380/460V (2 POLE)

IE 2

HIGH EFFICIENCY

Rated output P_N		Frame size	Rated speed n [min^{-1}]	Efficiency η [%]	Power factor [cos φ]	Rated current [A]			DOL starting		Break down Torque / Rated Torque T_B/T_N	Moment of inertia J [kgm^2]	Gross weight [kg]
kW	HP					230V	380V	460V	Locked rotor current / Rated current I_L/I_N	Locked rotor Torque / Rated Torque T_L/T_N			
0.19	0.25	63	3310	68	0.7	0.950	0.503	0.475	5	3	3.1	0.00012	3.8
0.37	0.5	71	3420	73	0.77	1.65	0.928	0.826	6.8	2.7	2.7	0.00033	10
0.56	0.75	71	3420	76	0.8	2.28	1.31	1.14	6.8	2.7	2.7	0.00045	10.3
0.75	1	80	3400	79	0.84	2.84	1.68	1.42	6	2.9	3.1	0.00079	9
1.1	1.5	80	3410	82.5	0.81	4.14	2.41	2.07	7.2	3.7	3.7	0.00096	15.2
1.5	2	90S	3480	84	0.83	5.40	3.09	2.70	9.1	3.8	3.7	0.00205	18.5
2.2	3	90L	3490	85.5	0.78	8.28	4.5	4.14	9.9	4.2	4.4	0.00242	20.5
3.0	4	100L	3505	87.5	0.86	10.0	5.89	5.00	9	3.5	4	0.00672	32.1
4.1	5.5	112M	3495	87.5	0.84	13.7	7.73	6.83	9.5	3	4.2	0.00842	41.8
5.6	7.5	132S	3535	88.5	0.87	17.9	10.6	8.97	9.2	3	3.8	0.02430	65.8
7.5	10	132S	3535	89.5	0.85	24.8	14.3	12.4	9.4	3	3.9	0.02430	65.7
11	15	160M	3560	90.2	0.81	37.8	21.3	18.9	10.2	3.4	4.8	0.05295	117
15	20	160M	3550	90.2	0.83	50.2	28.7	25.1	8.9	2.9	4	0.05295	117
19	25	160L	3555	91	0.85	60.0	34.7	30.0	9.9	3.1	4.1	0.06471	139
22	30	180M	3555	91	0.85	71.4	40.1	35.7	9.5	2.8	3.7	0.11919	178
30	40	200L	3575	92.4	0.84	97.0	54	48.5	8.4	3.2	3.5	0.20630	251
37	50	200L	3570	92.4	0.85	118	68.6	59.1	8.5	3.8	3.4	0.22424	259
45	60	225S/M	3565	93	0.9	135	79.5	67.5	8.5	2.9	3.6	0.44846	399
56	75	250S/M	3565	93	0.91	163	95.9	81.6	8.9	2.8	3.6	0.55609	455
75	100	280S/M	3575	93.6	0.87	232	136	116	8.6	2.3	3.4	1.27083	716
93	125	280S/M	3575	94.5	0.88	272	159	136	8.8	2.5	3.5	1.41204	752
112	150	315S/M	3575	94.5	0.88	332	194	166	8.8	2.5	3.4	1.50617	830
131	175	315S/M	3575	95	0.89	392	235	196	8.8	2.5	3.3	1.74151	900
149	200	315S/M	3575	95	0.9	440	264	220	8.6	2.5	3.1	2.11806	990
187	250	315S/M	3575	95.4	0.88	554	325	277	9.4	2.9	3.9	2.11806	990
224	300	355M/L	3585	95.4	0.91	636	377	318	9.2	2.4	3.5	5.17105	1650
261	350	355M/L	3585	95.4	0.91	752	451	376	8.6	2.1	3	5.74561	1700

Tel. : +34 96 1665200
e-mail: info@pumpsgp.com

Product Data

MOTOR PERFORMANCE DATA - 1800 RPM, 230/380/460V (4 POLE)

IE 2

HIGH EFFICIENCY

Rated output P_N		Frame size	Rated speed n [min^{-1}]	Efficiency η [%]	Power factor [cos φ]	Rated current [A]			DOL starting		Break down Torque / Rated Torque T_B/T_N	Moment of inertia J [kgm^2]	Gross weight [kg]
kW	HP					230V	380V	460V	Locked rotor current / Rated current I_L/I_N	Locked rotor Torque / Rated Torque T_L/T_N			
0.18	0.25	63	1710	69	0.64	1.02	0.551	0.512	4.6	2.8	2.9	0.00056	7.6
0.37	0.5	71	1710	73	0.6	2.12	1.13	1.06	5.5	2.8	2.9	0.00079	10.9
0.55	0.75	80	1740	77	0.72	2.50	1.35	1.25	7.5	3.2	3.6	0.00242	9
0.75	1	80	1730	82.5	0.81	2.82	1.65	1.41	7.4	3.1	3.2	0.00380	18.1
1.1	1.5	90S	1745	84	0.76	4.32	2.59	2.16	7.6	2.9	3.5	0.00504	19.7
1.5	2	90L	1755	84	0.75	5.98	3.26	2.99	8.1	3.5	4	0.00672	23.8
2.2	3	100L	1745	87.5	0.71	8.88	5.02	4.44	8	4.9	5.4	0.01225	39.2
3.0	4	100L	1740	87.5	0.73	11.8	6.6	5.89	9.7	4.6	4.9	0.01225	38.8
4.0	5.5	112M	1755	89.5	0.76	14.4	8.4	7.19	7.6	2.3	3.1	0.01875	46.8
5.5	7.5	132M	1770	89.5	0.83	18.6	10.9	9.29	10	2.6	3.5	0.05427	40
5.5	7.5	132S	1770	89.5	0.83	18.6	10.9	9.29	10	2.6	3.5	0.05427	71.7
7.5	10	132M	1765	89.5	0.81	25.4	14.3	12.7	9.5	2.6	3.5	0.06590	76.3
11	15	160M	1765	91	0.76	40.0	21.6	20.0	7	3.2	3.2	0.10037	128
15	20	160L	1765	91	0.77	53.8	29.6	26.9	6.7	3	3	0.11542	131
18.5	25	180M	1770	92.4	0.79	63.6	35.9	31.8	8.5	3.4	3.2	0.19733	178
22	30	180L	1770	92.4	0.81	73.8	41.1	36.9	8.7	3.5	3.2	0.23321	198
30	40	200L	1780	93	0.79	102	57.1	51.2	7.8	2.8	2.8	0.33095	250
37	50	225S/M	1780	93	0.86	116	68	58.1	8.7	2.7	3	0.69987	370
45	60	225S/M	1780	93.6	0.89	136	80.6	67.8	8.3	3	3.2	0.83984	396
55	75	250S/M	1780	94.1	0.88	167	98.3	83.4	8.2	2.9	3.5	1.03930	469
75	100	280S/M	1785	94.5	0.87	228	136	114	8	2.7	2.8	2.16799	699
90	125	280S/M	1785	94.5	0.87	274	161	137	8.6	2.6	2.8	2.81036	796
110	150	280S/M	1785	95	0.87	334	197	167	8.6	2.6	2.7	3.21184	864
130	175	315S/M	1785	95	0.85	410	236	205	8.3	2.6	2.8	3.77391	1006
150	200	315S/M	1785	95	0.85	466	270	233	8.4	2.8	2.9	3.77391	1005
185	250	315S/M	1785	95.4	0.83	588	341	294	8.6	2.7	3	3.77391	993
220	300	355M/L	1790	95.4	0.87	666	390	333	8	2.3	2.6	6.85703	1620
260	350	355M/L	1790	95.4	0.87	786	472	393	7.9	2.4	2.6	8.12016	1643
300	400	355M/L	1790	95.4	0.88	898	544	449	7.5	2.3	2.4	9.92464	1837

Tel. : +34 96 1665200
e-mail: info@pumpsgp.com

Product Data

MOTOR PERFORMANCE DATA - 1200 RPM, 230/380/460V (6 POLE)

IE 2

HIGH EFFICIENCY

Rated output P_N		Frame size	Rated speed n [min^{-1}]	Efficiency η [%]	Power factor [cos φ]	Rated current [A]			DOL starting		Break down Torque / Rated Torque T_B/T_N	Moment of inertia J [kgm^2]	Gross weight [kg]
kW	HP					230V	380V	460V	Locked rotor current / Rated current I_L/I_N	Locked rotor Torque / Rated Torque T_L/T_N			
0.18	0.25	71	1100	61	0.48	1.54	0.787	0.772	3.5	2.8	2.8	0.00079	5.8
0.37	0.5	80	1135	64	0.68	2.14	1.16	1.07	5	2.9	3	0.00242	8.3
0.55	0.75	80	1135	68	0.64	3.18	1.5	1.59	5.2	3.3	3.2	0.00311	16.4
0.75	1	90L	1145	80	0.69	3.42	1.99	1.71	5.4	2.6	2.7	0.00560	24
0.75	1	90S	1145	80	0.69	3.42	1.99	1.71	5.4	2.6	2.7	0.00560	14.6
1.1	1.5	112M	1165	85.5	0.67	4.82	2.85	2.41	8	3.2	4	0.02056	31
1.5	2	112M	1160	86.5	0.71	6.14	3.77	3.07	6.9	2.5	3	0.02617	36
2.2	3	132S	1170	87.5	0.75	8.42	5.01	4.21	7	2.2	2.5	0.04264	45.4
3.0	4	132S	1175	87.5	0.63	13.7	7.36	6.83	8.1	2.7	3.4	0.05815	68.8
4.0	5.5	132M	1170	87.5	0.68	16.9	9.29	8.44	7.7	2.4	3.2	0.05815	71.2
5.5	7.5	160M	1170	89.5	0.81	19.0	11.5	9.52	6.8	2.3	2.9	0.10773	107
7.5	10	160M	1175	89.5	0.74	28.4	15.5	14.2	7	3	3.5	0.14364	119
11	15	160L	1175	90.2	0.71	43.2	22.8	21.6	7.5	3.4	3.8	0.17595	141
15	20	180L	1175	92	0.87	47.0	27.6	23.5	9	2.8	3.8	0.29648	191
18.5	25	200L	1180	91.7	0.8	63.4	35.6	31.7	6.6	2.4	2.4	0.37670	225
22	30	200L	1180	92.4	0.8	74.8	42.8	37.4	7	2.5	2.4	0.44846	250
30	40	225S/M	1185	93	0.8	101	57.7	50.6	8	3.1	3.5	0.98842	363
37	50	250S/M	1185	93	0.82	122	71.2	60.9	8	3.2	3.4	1.31790	446
45	60	280S/M	1190	94.1	0.82	146	86.5	73.2	7.2	2.2	2.6	2.29824	610
55	75	280S/M	1190	94.5	0.82	178	108	89.1	7	2.2	2.6	2.64298	655
75	100	315S/M	1190	95	0.85	234	142	117	6.4	2.1	2.2	3.44737	725
90	125	315S/M	1190	95	0.85	280	172	140	7	2.4	2.4	4.02193	841
110	150	315S/M	1185	95	0.8	364	207	182	7.6	3.1	3	5.28596	980
130	175	315S/M	1185	95	0.83	420	249	210	6.8	2.3	2.6	5.63070	1050
150	200	355M/L	1195	95	0.8	496	290	248	6.7	2.3	2.4	10.00785	1500
185	250	355M/L	1195	95	0.8	612	358	306	7	2.5	2.7	11.67582	1600
220	300	355M/L	1195	95	0.79	736	431	368	7.2	2.5	2.6	13.82036	1795
260	350	355M/L	1195	95	0.8	858	503	429	6.7	2.4	2.4	14.29693	1820
300	400	355M/L	1190	95	0.82	966	580	483	6	2	2	14.77349	1850
335	450	355M/L	1190	95	0.8	1090	645	545	6.2	2.1	2.1	15.48834	1900

Tel. : +34 96 1665200
e-mail: info@pumpsgp.com

Product Data

MOTOR PERFORMANCE DATA - 3600 RPM, 230/380/460V (2 POLE)

IE 3 PREMIUM EFFICIENCY

Rated output P_N		Frame size	Rated speed n [min^{-1}]	Efficiency η [%]	Power factor [cos φ]	Rated current [A]			DOL starting		Break down Torque / Rated Torque T_B/T_N	Moment of inertia J [kgm^2]	Gross weight [kg]
kW	HP					230V	380V	460V	Locked rotor current / Rated current I_L/I_N	Locked rotor Torque / Rated Torque T_L/T_N			
0.19	0.25	63	3415	68	0.74	0.898	0.5	0.449	6.3	4.4	4.4	0.00016	6.7
0.37	0.5	71	3440	73.4	0.82	1.54	0.876	0.772	7	3.1	3.3	0.00040	7.5
0.56	0.75	71	3415	76.8	0.84	2.14	1.22	1.07	7.3	3.7	3.9	0.00047	8.5
0.75	1	80	3470	81.5	0.79	2.92	1.7	1.46	8.6	4.9	4.5	0.00076	13.5
1.1	1.5	80	3450	84	0.81	4.06	2.37	2.03	8.4	5.3	5.2	0.00150	15
1.5	2	90S	3485	85.5	0.82	5.38	3.18	2.69	9.4	4.1	4.4	0.00200	18.5
2.2	3	90L	3480	86.5	0.83	7.70	4.52	3.85	9.1	4.3	4.6	0.00260	23.5
3.0	4	100L	3520	88.5	0.85	10.0	5.95	5.01	10.1	3.8	5	0.00640	32
4.1	5.5	112M	3510	88.5	0.85	13.3	7.83	6.67	8.6	2.8	4.4	0.00800	41
5.6	7.5	112M	3510	89.5	0.85	18.1	10.6	9.07	9.4	3.3	4.9	0.00945	40
5.6	7.5	132S	3545	89.5	0.86	17.9	10.5	8.97	9.6	3.2	4.3	0.02160	65
7.5	10	132S	3535	90.2	0.85	24.6	14.3	12.3	9	3.3	4	0.02520	69
9.3	12.5	132M	3535	91	0.87	29.2	17.1	14.6	9	3.1	3.9	0.03060	78
11	15	132M	3535	91	0.87	34.8	20.4	17.4	9.2	3.2	3.7	0.03060	78
11	15	160M	3550	91.7	0.84	35.8	20.8	17.9	8.7	3.1	4	0.04190	124
15	20	160M	3550	91.7	0.84	48.8	28.2	24.4	8.8	3.2	4.1	0.04721	131
19	25	160L	3550	92.4	0.84	59.8	34.3	29.9	8.9	3.3	4.4	0.05554	147
22	30	180M	3555	92.4	0.86	69.4	40.7	34.7	8.7	2.8	4.1	0.11919	182
30	40	200L	3570	93	0.86	94.2	55.3	47.1	8.7	3.6	3.3	0.18729	243
37	50	200L	3570	93.6	0.83	120	69.8	59.8	8.5	3.4	3.3	0.21190	249
45	60	225S/M	3565	94.1	0.9	133	80.1	66.7	7.8	2.4	3.4	0.44148	429
56	75	250S/M	3570	94.2	0.9	163	97.6	81.4	8.6	2.9	3.7	0.48879	520
75	100	250S/M	3570	94.5	0.91	218	133	109	8.3	2.8	3.5	0.52637	500
75	100	280S/M	3580	94.5	0.9	222	131	111	8.1	2.4	3.5	1.20673	766
93	125	280S/M	3581	95	0.9	264	159	132	8.6	2.6	3.3	1.34081	805
112	150	280S/M	3580	95	0.9	322	192	161	8.2	2.6	3.6	1.55525	819
112	150	315S/M	3585	95	0.89	326	193	163	9.3	2.5	3.7	2.11640	962
131	175	315S/M	3580	95.4	0.9	386	232	193	8.2	2.5	3.4	2.55689	1048
149	200	315S/M	3585	95.4	0.9	438	260	219	8.5	2.6	3	2.76838	1089
164	220	315S/M	3580	95.4	0.9	468	274	234	8.4	2.7	3.5	2.99285	1129
187	250	315S/M	3580	95.8	0.9	538	324	269	8.3	2.9	3.4	3.20097	1197
201	270	315L	3580	95.8	0.9	582	346	291	7.8	3	3.5	3.42429	1305
201	270	355M/L	3585	95.8	0.92	570	345	285	7.8	2.1	3.3	4.30930	1537
224	300	315L	3580	96.2	0.91	630	381	315	7.9	2.7	3.2	3.72206	1370
224	300	355M/L	3585	96.2	0.91	630	377	315	7.8	2.3	3.3	4.61102	1585
254	340	315L	3580	96.2	0.91	716	432	358	7.8	2.8	3.2	4.16870	1434
254	340	355M/L	3585	96.2	0.91	716	424	358	7.9	2.4	3.3	5.03995	1665
261	350	355M/L	3585	96.2	0.91	746	441	373	7.9	2.4	3.3	5.03995	1665
283	380	355M/L	3585	96.2	0.92	794	490	397	7.9	2.3	3	5.57611	1751
321	430	355M/L	3585	95.8	0.92	898	549	449	8.8	2.7	3	6.00505	1838

Tel. : +34 96 1665200
e-mail: info@pumpsgp.com

Product Data

MOTOR PERFORMANCE DATA - 1800 RPM, 230/380/460V (4 POLE)

IE 3

PREMIUM EFFICIENCY

Rated output P_N		Frame size	Rated speed n [min^{-1}]	Efficiency η [%]	Power factor [cos φ]	Rated current [A]			DOL starting		Break down Torque / Rated Torque T_B/T_N	Moment of inertia J [kgm^2]	Gross weight [kg]
kW	HP					230V	380V	460V	Locked rotor current / Rated current I_L/I_N	Locked rotor Torque / Rated Torque T_L/T_N			
0.19	0.25	63	1705	69.5	0.69	0.942	0.522	0.471	5.7	2.8	3.3	0.00061	7.2
0.37	0.5	71	1710	78.2	0.67	1.77	1.01	0.886	5.8	3.4	3.5	0.00082	9.5
0.56	0.75	80	1735	81.1	0.78	2.18	1.25	1.09	7.3	3.2	3.4	0.00255	12.5
0.75	1	90S	1760	84	0.74	3.02	1.75	1.51	8	2.8	3.6	0.00490	18.5
1.1	1.5	90S	1755	86.5	0.78	4.10	2.39	2.05	8.5	2.9	3.5	0.00550	19.5
1.5	2	90L	1755	86.5	0.78	5.58	3.21	2.79	8.3	3	4	0.00660	23
2.2	3	100L	1750	89.5	0.75	8.22	4.88	4.11	9	3.8	3.7	0.00900	33
2.2	3	112M	1760	89.5	0.79	7.82	4.6	3.91	7.7	2.2	3.4	0.01430	41
3.0	4	L100L	1740	89.5	0.78	10.8	6.42	5.39	9.5	4.4	4.1	0.01200	37.5
5.6	7.5	132S	1775	91.7	0.83	18.1	10.6	9.07	10.4	2.6	4.3	0.05284	68.8
7.5	10	132M	1770	91.7	0.83	24.8	14.4	12.4	10.5	2.7	4.3	0.06420	80.7
9.3	12.5	160M	1775	92.4	0.82	30.4	18	15.2	8.3	3	3.7	0.08030	109
11	15	160L	1775	92.4	0.82	36.4	21.1	18.2	8.3	3.1	3.8	0.10037	123
11	15	160M	1775	92.4	0.82	36.4	21.1	18.2	8.3	3.1	3.8	0.10037	139
15	20	160L	1775	93	0.81	50.0	29.2	25.0	8.3	3.3	4	0.12143	161
19	25	180M	1775	93.6	0.81	61.2	35.9	30.6	8.5	3.4	3.6	0.20013	187
22	30	180L	1775	93.6	0.82	72.0	42.1	36.0	9.5	3.8	3.9	0.22722	205
30	40	200L	1780	94.1	0.81	98.8	57.7	49.4	8.2	3	3.6	0.34685	259
37	50	200L	1780	94.5	0.81	121	71.3	60.7	8.3	3.6	3.6	0.39943	284
37	50	225S/M	1785	94.5	0.84	117	68.5	58.5	8.6	3.1	3.7	0.88216	423
45	60	225S/M	1780	95	0.85	140	83.9	69.9	8.2	3.2	3.7	0.95297	437
56	75	250S/M	1780	95.4	0.85	170	100	85.1	8.2	3.3	3.1	1.10928	519
75	100	250S/M	1780	95.4	0.86	230	136	115	8.2	3.2	3	1.21389	531
75	100	280S/M	1787	95.4	0.85	232	137	116	8.6	2.6	3	2.25382	764
93	125	280S/M	1785	95.4	0.85	278	164	139	8.1	2.7	3.4	2.55179	829
112	150	280S/M	1785	95.8	0.85	340	198	170	7.9	2.8	3	3.24774	884
112	150	315S/M	1790	95.8	0.85	340	200	170	8	3	3.2	2.47447	1010
131	175	315S/M	1790	96.2	0.85	406	239	203	8.7	3.1	3.4	2.93843	1095
149	200	315S/M	1790	96.2	0.86	456	273	228	7.8	2.8	2.8	4.43090	1224
164	220	315S/M	1790	96.2	0.85	492	287	246	8	3.2	3.2	3.23955	1152
187	250	315S/M	1790	96.2	0.85	568	332	284	7.9	3.2	3.1	3.46219	1300
201	270	315L	1792	96.2	0.85	614	358	307	8.1	3.4	3.1	3.93450	1332
201	270	315S/M	1790	96.2	0.85	614	358	307	7.8	3.1	3.1	3.69300	1332
201	270	355M/L	1792	96.2	0.85	614	368	307	7.9	2.7	3	7.00878	1495
224	300	315L	1790	96.2	0.85	676	398	338	7.9	3.1	2.8	6.85703	1430
224	300	355M/L	1790	96.2	0.84	684	402	342	7.9	2.7	3.2	7.51711	1554
254	340	315L	1790	96.2	0.85	768	451	384	8.9	3.5	3.4	8.38871	1527
254	340	355M/L	1790	96.2	0.85	768	456	384	7.9	2.8	3.1	8.59098	1621
261	350	315L	1790	96.2	0.85	768	469	384	7.9	3.5	3.4	8.38871	1527
261	350	355M/L	1790	96.2	0.85	798	475	399	7.8	2.8	3.1	8.59098	1621
283	380	355M/L	1790	96.2	0.85	860	505	430	7.9	2.9	3.2	9.66485	1695
321	430	355M/L	1790	96.5	0.83	988	575	494	8.8	3.1	3.5	10.71677	1772
358	480	355M/L	1790	96.5	0.85	1086	640	543	7.8	2.7	2.9	11.58609	1878

Tel. : +34 96 1665200
e-mail: info@pumpsgp.com

Product Data

MOTOR PERFORMANCE DATA - 1200 RPM, 230/380/460V (6 POLE)

IE 3

PREMIUM EFFICIENCY

Rated output P_N		Frame size	Rated speed n [min^{-1}]	Efficiency η [%]	Power factor [cos φ]	Rated current [A]			DOL starting		Break down Torque / Rated Torque T_B/T_N	Moment of inertia J [kgm^2]	Gross weight [kg]
kW	HP					230V	380V	460V	Locked rotor current / Rated current I_L/I_N	Locked rotor Torque / Rated Torque T_L/T_N			
0.19	0.25	71	1110	67.5	0.53	1.26	0.669	0.632	3.7	2.3	2.7	0.00093	11.5
0.37	0.5	80	1140	75.3	0.7	1.76	0.968	0.881	5.1	2.4	2.8	0.00253	12.5
0.56	0.75	90S	1165	81.7	0.67	2.52	1.46	1.26	6.4	2.6	3.4	0.00549	19
0.75	1	90L	1155	82.5	0.68	3.36	1.9	1.68	6.4	3	3.5	0.00658	25
1.5	2	L100L	1165	88.5	0.68	6.26	3.63	3.13	7.3	3	3	0.01755	38
2.2	3	132S	1175	89.5	0.7	8.82	5.19	4.41	6.9	1.8	3.1	0.04920	63
3.0	4	132S	1175	89.5	0.7	12.0	6.89	6.01	7.4	2.2	3.1	0.04530	61
4.1	5.5	132M	1165	89.5	0.71	15.8	9.21	7.90	7	1.9	3	0.05660	66
5.6	7.5	132M/L	1170	91	0.7	21.6	12.7	10.8	7.9	2.4	3.2	0.07550	80
5.6	7.5	160M	1180	91	0.79	19.2	11.5	9.60	7.2	2.4	3.1	0.13167	115
7.5	10	160M	1180	91	0.75	27.6	16	13.8	7.4	3	3.5	0.12209	122
9.3	12.5	160L	1181	91.7	0.78	32.2	18.8	16.1	8	3	3.4	0.14364	137
11	15	160L	1180	91.7	0.77	39.2	22.2	19.6	8.1	2.8	3.4	0.15800	143
15	20	180L	1180	91.7	0.83	49.4	29.3	24.7	9.2	3	3.9	0.32395	193
19	25	200L	1180	93	0.81	61.6	36.3	30.8	7.3	2.6	3.1	0.38611	223
22	30	200L	1180	93	0.8	74.2	42.9	37.1	7.3	2.8	3.3	0.45631	255
30	40	225S/M	1185	94.1	0.84	95.2	56.6	47.6	8.5	2.7	3.3	1.28804	401
37	50	250S/M	1187	94.1	0.84	118	69.7	58.8	7.8	2.7	2.8	1.42400	486
45	60	280S/M	1190	94.5	0.8	149	85.9	74.7	8.1	2.6	3.4	2.80126	678
56	75	280S/M	1190	94.5	0.81	180	106	90.2	7.5	2.6	3.3	3.24946	723
75	100	315S/M	1194	95	0.81	244	142	122	7.6	2.6	3.1	3.33837	962
93	125	315S/M	1194	95.4	0.81	292	170	146	7	2.6	3.1	3.99682	1048
112	150	315S/M	1190	95.8	0.81	356	207	178	7	2.5	2.7	4.44091	1106
131	175	315S/M	1190	95.8	0.81	428	248	214	8.1	2.9	3.2	5.10705	1190
149	200	315L	1190	95.8	0.82	480	282	240	7.3	2.8	3	11.13558	1365
149	200	315S/M	1190	95.8	0.82	480	282	240	7.3	2.8	3	5.77319	1365
164	220	315L	1190	95.8	0.81	518	301	259	7.4	3	3.2	11.13558	1448
164	220	355M/L	1195	95.8	0.78	538	310	269	7	2.4	2.9	10.18806	1594
187	250	355M/L	1195	95.8	0.78	622	362	311	7.1	2.5	2.9	11.11424	1666
201	270	355M/L	1195	95.8	0.79	664	387	332	7.2	2.4	2.8	12.04043	1739
224	300	355M/L	1195	95.8	0.78	740	424	370	7	2.6	2.9	13.40397	1854
254	340	355M/L	1195	95.8	0.78	840	482	420	7.5	2.6	2.8	15.02169	1970
261	350	355M/L	1195	95.8	0.78	874	501	437	7	2.6	2.8	15.02169	1970
283	380	355M/L	1195	96	0.78	938	538	469	7	2.4	2.7	15.02169	1970

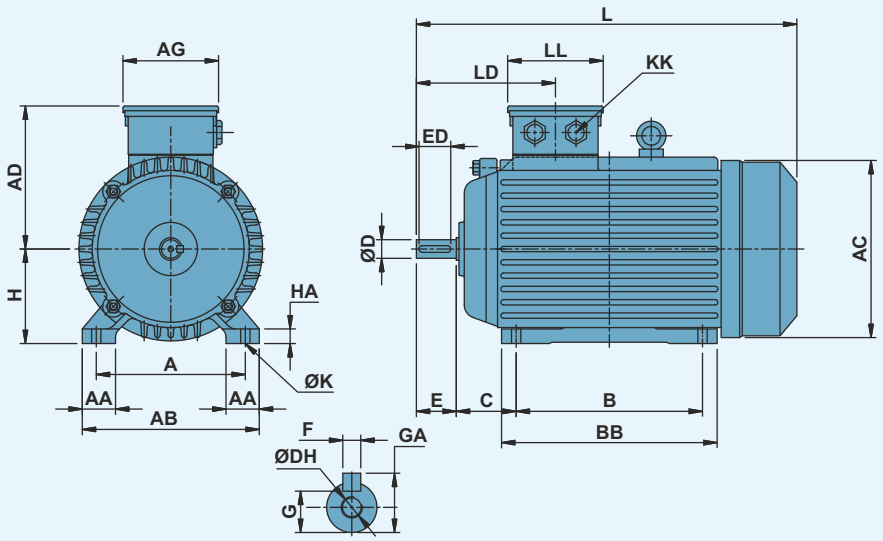
Tel. : +34 96 1665200
e-mail: info@pumpsgp.com

Product Data

FOOT MOUNTED (IM B3) MOTOR DIMENSIONAL DRAWING

IE 2 / IE3

HIGH / PREMIUM EFFICIENCY



Frame	Pole	A	AA	AB	AC	AD	AG	B	BB	C	D	DH	E	ED	F	G	GA	H	HA	K	KK	L	LD	LL
71	2, 4, 6, 8	112	25	133	144	110	85	90	112	45	14	M5	30	25	5	11	16	71	11	7	1x3/4"	246	120	85
80	2, 4, 6, 8	125	38	155	171	125	85	100	126	50	19	M6	40	34	6	15.5	21.5	80	10	10	1x3/4"	284	140	85
90S	2, 4, 6, 8	140	36	168	178	149	98	100	158	56	24	M8	50	42	8	20	27	90	13	10	2x3/4"	333	148	98
90L	2, 4, 6, 8	140	36	168	178	149	98	100	158	56	24	M8	50	42	8	20	27	90	13	10	2x3/4"	333	148	98
100L	2, 4, 6, 8	160	38	195	194	156	98	140	170	63	28	M10	60	52	8	24	31	100	14	12	2x3/4"	371	157	98
112M	2, 4, 6, 8	190	42	230	218	169	98	140	170	63	28	M10	60	52	8	24	31	100	14	12	2x3/4"	398	160	98
132S	2, 4, 6, 8	216	65	257	262	192	131	140	182	89	38	M12	80	68	10	33	41	132	18	12	2x1"	459	202	131
132M	2, 4, 6, 8	216	65	257	262	192	131	178	220	89	38	M12	80	68	10	33	41	132	18	12	2x1"	497	202	131
160M	2, 4, 6, 8	254	55	305	304	244	171	210	260	108	42	M16	110	96	12	37	45	160	19	15	2x1"	597	282	195
160L	2, 4, 6, 8	254	55	305	304	244	171	254	300	108	42	M16	110	96	12	37	45	160	19	15	2x1"	637	282	195
180M	2, 4, 6, 8	279	66	342	357	296	265	241	284	121	48	M16	110	96	14	42.5	51.5	180	27	15	2xM40x1.5	720	280	195
180L	2, 4, 6, 8	279	66	342	357	296	265	279	340	121	48	M16	110	96	14	42.5	51.5	180	27	15	2xM40x1.5	758	280	195
200L	2, 4, 6, 8	318	86	400	392	308	265	305	360	133	55	M20	110	96	16	49	59	200	30	19	2xM50x1.5	806	288	195
225S	4, 6, 8	356	85	450	425	330	265	286	370	149	60	M20	140	122	18	53	64	225	32	19	2xM50x1.5	856	325	195
225M	2	356	85	450	425	330	265	311	395	149	55	M20	110	96	16	49	59	225	32	19	2xM50x1.5	851	295	195
	4, 6, 8	356	85	450	425	330	265	311	395	149	60	M20	140	122	18	53	64	225	32	19	2xM50x1.5	881	325	195
250M	2	406	90	480	493	382	286	349	414	168	60	M20	140	122	18	53	64	250	24	24	2xM63x1.5	881	355	253
	4, 6, 8	406	90	480	493	382	286	349	414	168	65	M20	140	122	18	58	69	250	24	24	2xM63x1.5	881	355	253
280S	2	457	100	540	548	445	325	368	490	190	65	M20	140	122	18	58	69	280	42	24	2xM63x1.5	1025	362	240
	4, 6, 8	457	100	540	548	445	325	368	490	190	75	M20	140	122	20	67.5	79.5	280	42	24	2xM63x1.5	1025	362	240
280M	2	457	100	540	548	445	325	368	490	190	65	M20	140	122	18	58	69	280	42	24	2xM63x1.5	1025	362	240
	4, 6, 8	457	100	540	548	445	325	368	490	190	75	M20	140	122	20	67.5	79.5	280	42	24	2xM63x1.5	1025	362	240
315S	2	508	123	635	625	519	284	406	570	216	65	M20	140	122	18	58	69	315	43	28	2xM63x1.5	1182	394	397
	4, 6, 8	508	123	635	625	519	284	406	570	216	80	M20	170	150	22	71	85	315	43	28	2xM63x1.5	1212	424	397
315M	2	508	123	635	625	519	284	457	680	216	65	M20	140	122	18	58	69	315	43	28	2xM63x1.5	1292	394	397
	4, 6, 8	508	123	635	625	519	284	457	680	216	80	M20	170	150	22	71	85	315	43	28	2xM63x1.5	1322	424	397
315L	2	508	123	635	625	519	284	508	680	216	65	M20	140	122	18	58	69	315	43	28	2xM63x1.5	1292	424	397
	4, 6, 8	508	123	635	625	519	284	508	680	216	80	M20	170	150	22	71	85	315	43	28	2xM63x1.5	1322	424	397
355M	2	610	120	700	725	603	380	560	827	254	70	M20	140	122	20	62.5	74.5	355	45	35	2xM63x1.5	1514	397	330
	4, 6, 8	610	120	700	725	603	380	560	827	254	100	M24	210	185	25	81	105	355	45	35	2xM63x1.5	1584	467	330
355L	2	610	120	700	725	603	380	630	827	254	70	M20	140	122	20	62.5	74.5	355	45	35	2xM63x1.5	1514	397	330
	4, 6, 8	610	120	700	725	603	380	630	827	254	100	M24	210	185	25	81	105	355	45	35	2xM63x1.5	1584	467	330

Note: All dimensions in mm unless otherwise noted.

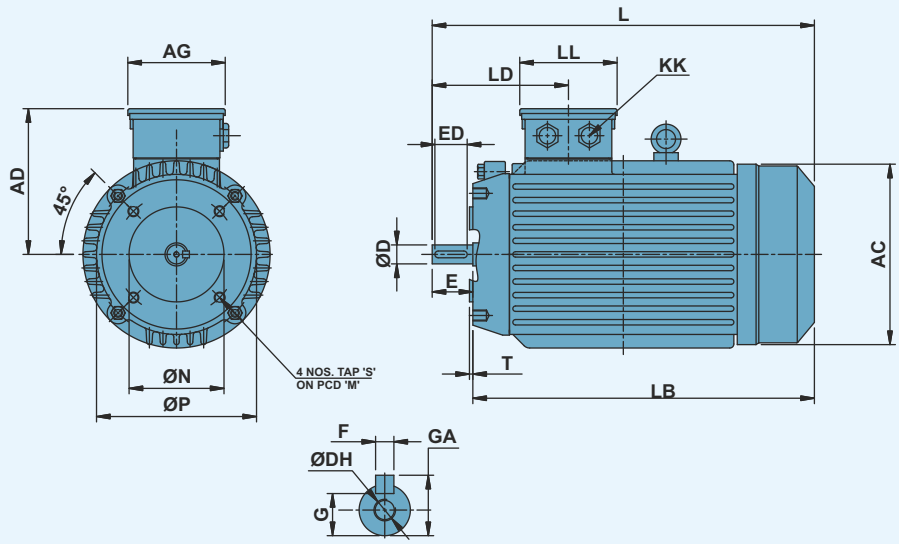
Tel. : +34 96 1665200
e-mail: info@pumpsgp.com

Product Data

"C" TYPE FLANGE MOUNTED (IM B14) MOTOR DIMENSIONAL DRAWING

IE 2 / IE3

HIGH / PREMIUM EFFICIENCY



Frame	Pole	AC	AD	AG	D	DH	E	ED	F	G	GA	KK	L	LB	LD	LL	M	N	P	S	T
71	2, 4, 6, 8	144	110	85	14	M5	30	25	5	11	16	1x3/4"	246	216	120	85	85	70	105	M6	2.5
80	2, 4, 6, 8	171	140	98	19	M6	40	34	6	15.5	21.5	2x3/4"	284	244	140	98	100	80	120	M6	3
90S	2, 4, 6, 8	178	149	98	24	M8	50	42	8	20	27	2x3/4"	333	284	169	98	115	95	140	M8	3
90L	2, 4, 6, 8	178	149	98	24	M8	50	42	8	20	27	2x3/4"	333	284	169	98	115	95	140	M8	3
100L	2, 4, 6, 8	194	156	98	28	M10	60	52	8	24	31	2x3/4"	371	311	157	98	130	110	160	M8	3.5
112M	2, 4, 6, 8	218	169	98	28	M10	60	52	8	24	31	2x3/4"	398	338	160	98	130	110	160	M8	3.5
132S	2, 4, 6, 8	262	192	131	38	M12	80	68	10	33	41	2x1"	459	378	202	131	165	130	200	M10	3.5
132M	2, 4, 6, 8	262	192	131	38	M12	80	68	10	33	41	2x1"	497	417	202	131	165	130	200	M10	3.5
160M	2, 4, 6, 8	304	244	171	42	M16	110	96	12	37	45	2x1"	597	486	282	195	215	180	250	M12	4
160L	2, 4, 6, 8	304	244	171	42	M16	110	96	12	37	45	2x1"	637	527	282	195	215	180	250	M12	4

Note: All dimensions in mm unless otherwise noted.

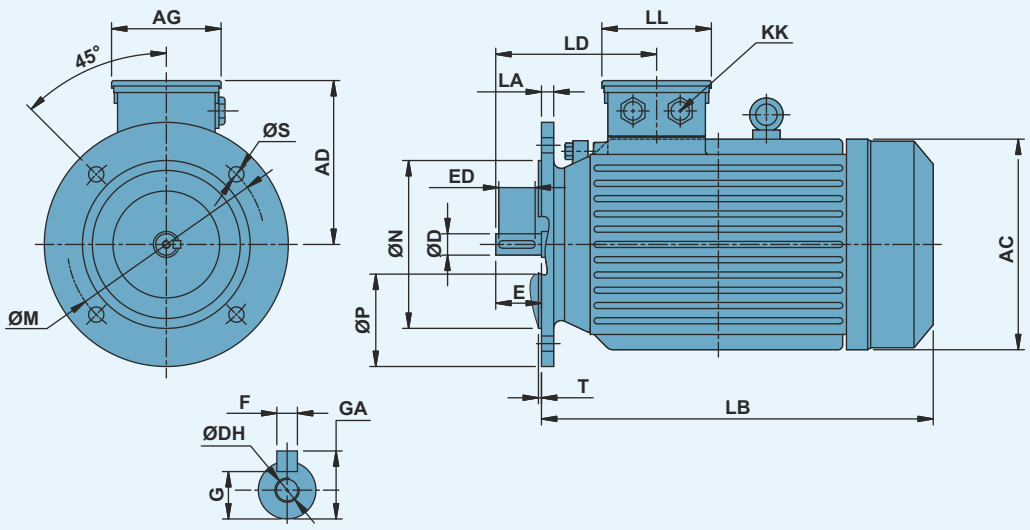
Tel. : +34 96 1665200
e-mail: info@pumpsgp.com

Product Data

"B" TYPE FLANGE MOUNTED (IM B5) MOTOR DIMENSIONAL DRAWING

IE 2 & IE3

HIGH / PREMIUM EFFICIENCY



Frame	Pole	AC	AD	AG	D	DH	E	ED	F	G	GA	KK	L	LA	LB	LD	LL	M	N	P	S	T
71	2, 4, 6, 8	144	110	85	14	M5	30	25	5	11	16	1x3/4"	246	9	216	120	85	130	110	160	10	3.5
80	2, 4, 6, 8	171	140	98	19	M6	40	34	6	15.5	21.5	2x3/4"	284	10	244	140	98	165	130	200	12	3.5
90S	2, 4, 6, 8	178	149	98	24	M8	50	42	8	20	27	2x3/4"	333	10	284	169	98	165	130	200	12	3.5
90L	2, 4, 6, 8	178	149	98	24	M8	50	42	8	20	27	2x3/4"	333	10	284	169	98	165	130	200	12	3.5
100L	2, 4, 6, 8	194	156	98	28	M10	60	52	8	24	31	2x3/4"	371	11	311	157	98	215	180	250	15	4
112M	2, 4, 6, 8	218	169	98	28	M10	60	52	8	24	31	2x3/4"	398	12	338	160	98	215	180	250	15	4
132S	2, 4, 6, 8	262	192	131	38	M12	80	68	10	33	41	2x1"	459	13	378	202	131	265	230	300	15	4
132M	2, 4, 6, 8	262	192	131	38	M12	80	68	10	33	41	2x1"	497	13	417	202	131	265	230	300	15	4
160M	2, 4, 6, 8	304	244	171	42	M16	110	96	12	37	45	2x1"	597	13	486	282	195	300	250	350	19	5
160L	2, 4, 6, 8	304	244	171	42	M16	110	96	12	37	45	2x1"	637	13	527	282	195	300	250	350	19	5
180M	2, 4, 6, 8	357	296	265	48	M16	110	96	14	42.5	51.5	2xM40x1.5	720	18	610	280	195	300	250	350	19	5
180L	2, 4, 6, 8	357	296	265	48	M16	110	96	14	42.5	51.5	2xM40x1.5	758	18	649	280	195	300	250	350	19	5
200L	2, 4, 6, 8	392	308	265	55	M20	110	96	16	49	59	2xM50x1.5	806	16	696	288	195	350	300	400	19	5
225S	4, 6, 8	425	330	265	60	M20	140	122	18	53	64	2xM50x1.5	856	17	716	325	195	400	350	450	19	5
225M	2	425	330	265	55	M20	110	96	16	49	59	2xM50x1.5	851	17	741	295	195	400	350	450	19	5
	4, 6, 8	425	330	265	60	M20	140	122	18	53	64	2xM50x1.5	881	17	741	325	195	400	350	450	19	5
250M	2	493	382	286	60	M20	140	122	18	53	64	2xM63x1.5	881	19	741	355	253	500	450	550	19	5
	4, 6, 8	493	382	286	65	M20	140	122	18	58	69	2xM63x1.5	881	19	741	355	253	500	450	550	19	5
280S	2	548	445	325	65	M20	140	122	18	58	69	2xM63x1.5	1025	19	885	362	240	500	450	550	19	5
	4, 6, 8	548	445	325	75	M20	140	122	20	67.5	79.5	2xM63x1.5	1025	19	885	362	240	500	450	550	19	5
280M	2	548	445	325	65	M20	140	122	18	58	69	2xM63x1.5	1025	19	885	362	240	500	450	550	19	5
	4, 6, 8	548	445	325	75	M20	140	122	20	67.5	79.5	2xM63x1.5	1025	19	885	362	240	500	450	550	19	5
315S	2	625	519	284	65	M20	140	122	18	58	69	2xM63x1.5	1182	24	1042	394	397	600	550	660	24	6
	4, 6, 8	625	519	284	65	M20	170	150	22	71	85	2xM63x1.5	1212	24	1042	424	397	600	550	660	24	6
315M	2	625	519	284	65	M20	140	122	18	58	69	2xM63x1.5	1292	24	1152	394	397	600	550	660	24	6
	4, 6, 8	625	519	284	65	M20	170	150	22	71	85	2xM63x1.5	1322	24	1152	424	397	600	550	660	24	6
315L	2	625	519	284	65	M20	140	122	18	58	69	2xM63x1.5	1292	24	1152	424	397	600	550	660	24	6
	4, 6, 8	625	519	284	65	M20	170	150	22	71	85	2xM63x1.5	1322	24	1152	424	397	600	550	660	24	6
355M	2	725	603	380	70	M20	140	122	20	62.5	74.5	2xM63x1.5	1514	25	1374	397	330	740	680	800	24	6
	4, 6, 8	725	603	380	100	M24	210	185	25	81	105	2xM63x1.5	1584	25	1374	467	330	740	680	800	24	6
355L	2	725	603	380	70	M20	140	122	20	62.5	74.5	2xM63x1.5	1514	25	1374	397	330	740	680	800	24	6
	4, 6, 8	725	603	380	100	M24	210	185	25	81	105	2xM63x1.5	1584	25	1374	467	330	740	680	800	24	6

Note: All dimensions in mm unless otherwise noted.

Tel. : +34 96 1665200
e-mail: info@pumpsgp.com

SHIPPING DIMENSIONS

IE 2 / IE 3 HIGH / PREMIUM EFFICIENCY

Frame size	Gross weight [kg]						Package dimensions [mm]	Gross volume [m³]
	IE 2			IE 3				
	2 pole	4 pole	6 pole	2 pole	4 pole	6 pole		
63	-	-	-	-	-	-	300 x 235 x 185	0.013
71	-	-	-	-	-	-	300 x 235 x 185	0.013
80	21	22	-	23	24	-	320 x 235 x 205	0.015
90S	26	27	27	29	30	30	390 x 270 x 245	0.026
90L	29	32	29	32	35	32	390 x 270 x 245	0.026
100L	55	61	54	61	67	59	510 x 380 x 380	0.074
112M	62	67	64	68	74	70	510 x 380 x 380	0.074
132S	101	98	96	111	108	106	660 x 435 x 460	0.132
132M	-	108	115	-	-	127	660 x 435 x 460	0.132
160M	161	162	175	177	178	193	750 x 535 x 430	0.173
160L	177	173	192	195	190	211	800 x 535 x 430	0.184
180M	248	247	-	260	259	-	965 x 610 x 660	0.389
180L	-	286	260	-	-	273	965 x 610 x 660	0.389
200L	328	337	318	344	354	334	1020 x 635 x 690	0.447
225S	-	383	-	-	-	-	1070 x 635 x 740	0.503
225M	421	413	390	442	434	410	1070 x 635 x 740	0.503
250M	515	528	512	541	554	538	1095 x 660 x 865	0.625
280S	655	645	628	688	677	659	1270 x 790 x 1020	1.020
280M	703	745	677	738	782	711	1270 x 790 x 1020	1.020
315S	1078	1080	1063	1132	1134	1116	1410 x 830 x 1140	1.334
315M	1139	1167	1143	1196	1225	1200	1410 x 830 x 1140	1.410
315L	1272	1355	1338	1336	1423	1405	1410 x 830 x 1140	1.438
355M	2088	1884	1782	2192	1978	1871	1740 x 950 x 1250	2.066
355L	2496	2090	1884	2621	2195	1978	1740 x 950 x 1250	2.066

Tel. : +34 96 1665200
e-mail: info@pumpsgp.com

GENERAL PUMPS

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CONTACT US

GENERAL PUMPS, S.L.U.

Pol. Ind. El Oliveral (U.E.7, Nave nº1) - Calle W 46394
Ribarroja del Turia - Valencia Spain

Tel. : +34 96 1665200 / Fax :+34 96 1665052

E-mail: info@pumpsgp.com

www.pumpsgp.com