

General Purpose 3-phase Induction Motors

Energy Efficient
Motors
series 3SIE

IE3



Comply with the new efficiency classes
for low-voltage three-phase motors

IEC 60034-30 standard
and EU Regulation 640/2009, 4/2014

Product Catalogue

General Purpose 3-phase Induction Motors

Certificates

Cantoni Motor SA
ISO 9001
Since September 30, 1999



Besel SA
ISO 9001
Since July 21, 1995



Celma Indukta SA
ISO 9001
Since April 1, 1993

ISO 14001
Since November 15, 1999



Emit SA
ISO 9001:2008
ISO 14001:2004
Since January 23, 2012



Cantoni® GROUP



since 1950



CELMA indukta

since 1920

since 1878



since 1921



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INTRODUCTION

New efficiency classes for the low-voltage three-phase motors (IE = International Efficiency).

Along with the international discussion on energy efficiency a worldwide harmonized energy efficiency standard classification system has been established for low-voltage three-phase asynchronous motors. For many years low-voltage three-phase motors in the European Union have been sold in three efficiency classes EFF3, EFF2 and EFF1. Aside from this, many different efficiency classification systems have been introduced and well-proven in many countries all over the world.

This was the reason for the International Electrotechnical Commission IEC to develop and publish an energy efficiency standard which replaces all previous national issues. In parallel IEC developed and issued a new standard for determining motor efficiency. The new standard IEC 60034-30-1 defines and harmonizes worldwide the efficiency classes IE1, IE2, IE3 and IE4 for low-voltage three-phase motors in the power range from 0.12 kW to 1000 kW (2p=2, 4, 6, 8)

IE1 = Standard Efficiency

IE2 = High Efficiency

IE3 = Premium Efficiency

According to IEC 60034-30-1 standard the efficiency has to be determined according to the new requirements given in the IEC 60034-2-1 standard.

According to the Comission Regulation (EC) No 640/2009 (introduced in July 2009) including Comission Regulation (EC) No 4/2014 the required efficiency class of general-purpose motors with 2p=2, 4, 6 (introduced to the market in the future) will be as follows:

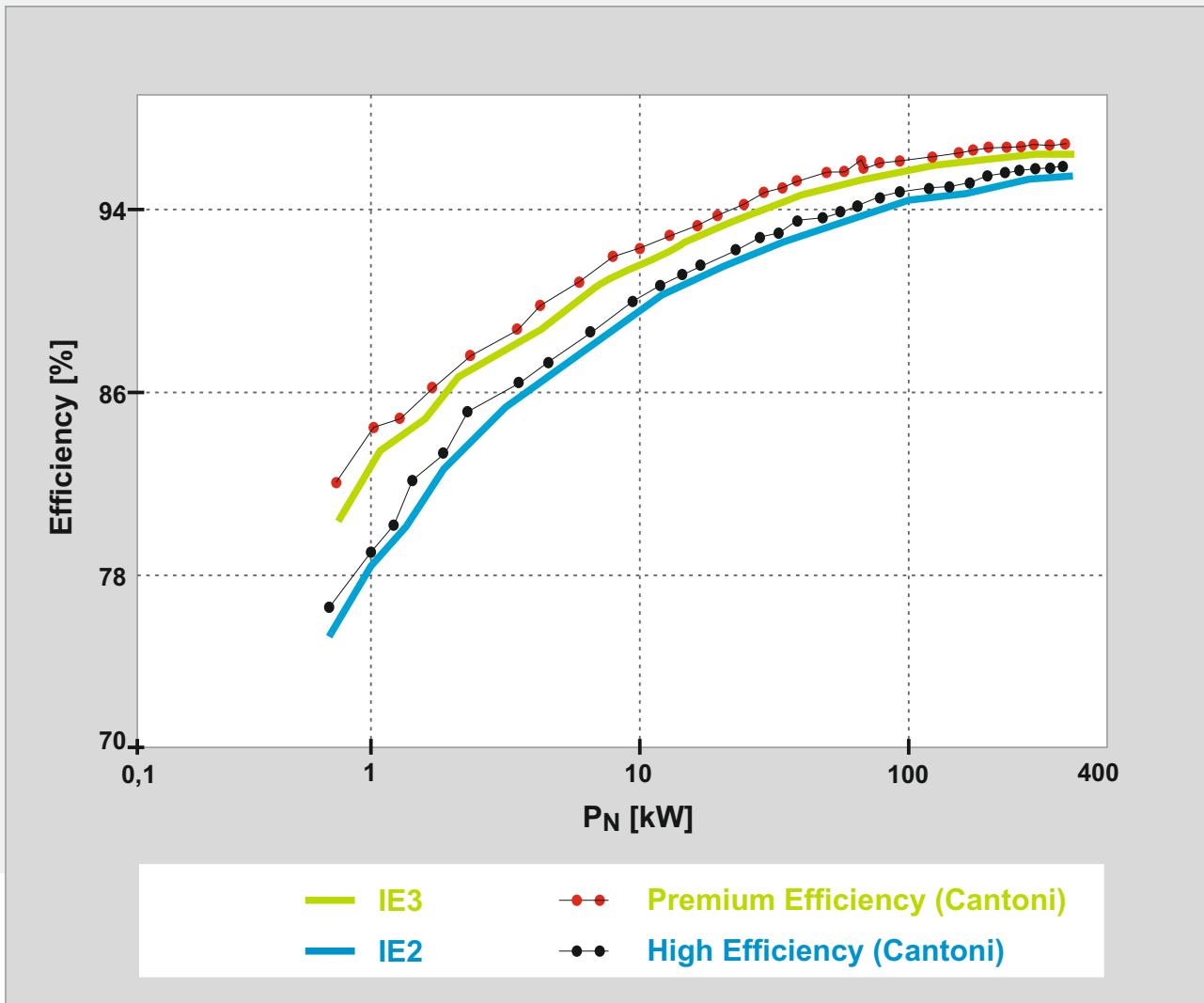
From 1 January 2017: motors with a rated output between 0.75 - 375 kW shall have a minimum efficiency class of IE3, or IE2 if they are operated/equipped with electronic speed control (VSD).

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.

EFFICIENCY OF MOTORS

The present catalogue describes the electric motors which belong to the efficiency class IE3 (Premium Efficiency) and motors excluded from the Regulations (EC) 640/2009 and 4/2014 (motors with $2p = 8, 10, 12$ and with rated output below 0.75kW and above 375kW).

Comparison between the efficiency of Cantoni Group motors (for example $2p=4$) and efficiency class IE2/IE3 requirements according to the IEC 60034-30-1.



The efficiency class system specified under IEC 60034-30-1 is valid for low voltage three phase squirrel cage induction motors with the following specifications:

- Rated voltage up to 1.000 V
- Rated output between 0.12 kW and 1000 kW
- Either 2, 4, 6 or 8 poles
- Rated on the basis of continuous duty (S1)
- Supplied directly from mains
- With ambient temperature within the range of $-30^{\circ}\text{C} \div +60^{\circ}\text{C}$
- With altitude up to 4000 m. a.s.l.

Motors with flanges, feet and/or shafts with mechanical dimensions different from IEC 60072-1 are also covered by this standard.

RATINGS - TOLERANCES

Permissible deviations between real values and catalogue values according to the IEC 60034-1:

Power factor cos φ	$\Delta \cos \varphi = -1/6 (1 - \cos \varphi_N)$
Efficiency η	$\Delta \eta = -15\% (100 - \eta_N)$ for $P_N \leq 150 \text{ kW}$ $\Delta \eta = -10\% (100 - \eta_N)$ for $P_N > 150 \text{ kW}$
Speed n	$\Delta n = \pm 20\% (n_s - n_N)$ for $P_N > 1 \text{ kW}$ $\Delta n = \pm 30\% (n_s - n_N)$ for $P_N \leq 1 \text{ kW}$
Locked rotor current I_L/I_N	$\Delta (I_L/I_N) = +20\% (I_L/I_N)$
Locked rotor torque T_L/T_N	$\min (T_L/T_N) = -15\% (T_L/T_N)$ $\max (T_L/T_N) = +25\% (T_L/T_N)$
Breakdown torque T_B/T_N	$\Delta (T_B/T_N) = -10\% (T_B/T_N)$
Moment of inertia J [kgm ²]	$\Delta J = \pm 10\% J$
Sound pressure level L_{pA} [dB]	$\Delta L_{pA} = +3 \text{ dB } /A$

STANDARDS

The electric motors are manufactured according to the international standards:

Rating and performance	IEC 60034-1
Methods for determining losses and efficiency	IEC 60034-2-1
Classification of degrees of protection	IEC 60034-5
Methods of cooling	IEC 60034-6
Symbols of construction and mounting arrangements	IEC 60034-7
Terminal markings and direction of rotation	IEC 60034-8
Noise limits	IEC 60034-9
Dimensions and output of electric machines	IEC 60072-1
Vibration limits	IEC 60034-14

New IEC standards regarding efficiency classes (IEC 60034-30-1) and efficiency measurements (IEC 60034-2-1)

The resulting efficiency values differ from those obtained under the previous IEC 60034-2:1996 testing standard.
It must be noted that the efficiency values are only comparable if they are obtained using the same measuring method.

EU Regulation 640/2009 and 4/2014 adapted on 6 January 2014

Commission Regulation 640/2009, adapted on 22 July 2009, specifies the requirements regarding the ecodesign of electric motors and the use of electronic speed control (VSD).

All the motors are manufactured according to Quality Assurance System consistent with ISO 9001.

The motors covered by the present catalogue comply with the regulations and standards effective in other countries, consistent with IEC standards.

All the motors described in the present catalogue are provided with CE mark.

IE1

IE2

IE3

ISO9001

IEC

CE

INSULATION CLASSIFICATION

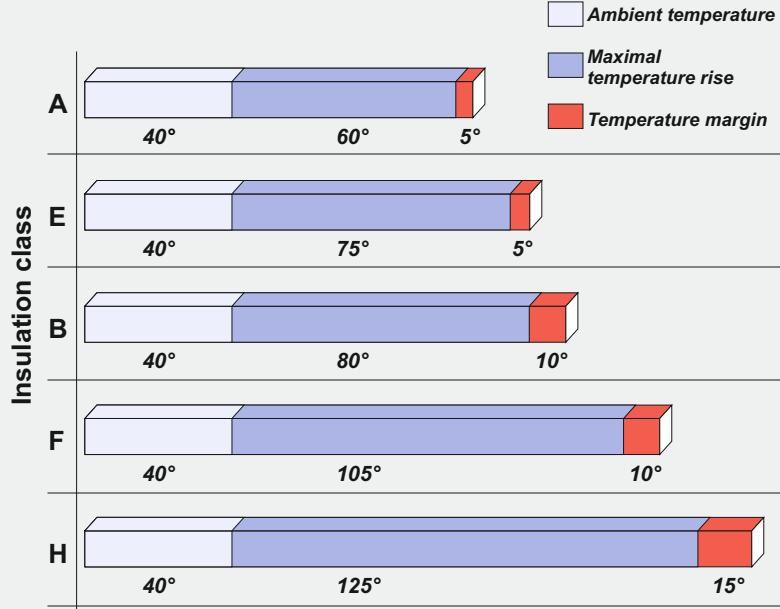
The insulation system of an electric motor is determined by a given insulation class on the basis of its thermal resistance. This thermal resistance should be guaranteed by the entire set of electric insulating materials used in the motor insulating system.

Thermal resistance classification is related to the temperature of the hotspot in the insulation occurring during rated operating conditions of the electric motor, allowing for the highest permissible rise in average temperature.

This rise should be selected so that at the highest permissible ambient temperature, the temperature of the hotspot in insulation will not exceed the value assigned to a given thermal resistance class.

Symbols of thermal resistance classes (permissible insulation temperatures at 40°C ambient temperature)

Symbol	Temperature [° C]
A	105
E	120
B	130
F	155
H	180



Insulation class F in an electric motor means that at ambient temperature of 40°C the temperature rise of the winding may be max. 105°C with the additional temperature margin of 10°C (under specified measuring conditions in accordance with the IEC 60034-1 standard).

Class F

The standard motors made by Cantoni Motor in their basic version have the insulation class F while the temperature rise is for class B. This means longer life for motors.

For special request we can deliver motors equipped with insulation class H.

Strengthened insulation system gives possibility to safe operation with frequency converters.

MOTOR FEET

Motors with frame size ≤ 132 have screwed feet.

Motors with frame size > 132 up to 315 have screwed feet or feet integrated with the motor housing.

Motors with frame size from 355 have feet integrated with the motor housing.

TERMINAL BOX

The terminal boxes of low voltage motors have threaded inlet holes designed for mounting cable glands.

The box contains a terminal board with marked terminals making possible connection of supply cables.

In addition, terminal boxes may be provided with additional terminals connected to the ends of thermal protection or anticondensation heater circuits and extra glands to connect these circuits.

Low voltage high-power motors contain terminal boxes with cable gland seals.

The circuits of thermal protection and anticondensation heaters are connected to separate terminal boxes.

Inside the boxes there are special clamps used to ground the supply cable armouring.

VIBRATION LEVEL AND NOISE LEVEL

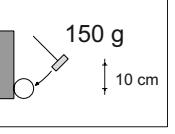
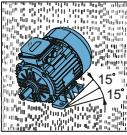
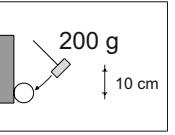
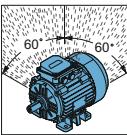
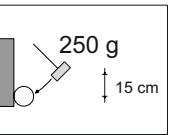
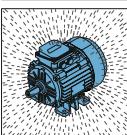
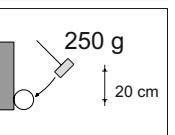
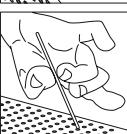
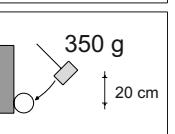
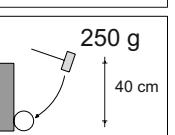
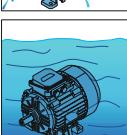
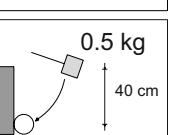
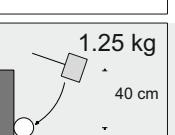
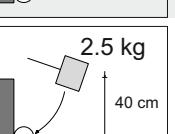
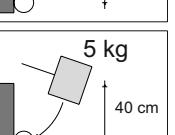
The rotor balancing method guarantees that a standard vibration level A is maintained in accordance with the IEC 60034-14 and a standard sound power level is maintained in accordance with the IEC 60034-9. On customer's demand the motors can be made with reduced vibration or noise level.

level A

General Purpose 3-phase Induction Motors
INTERNATIONAL PROTECTION MARKING IP

According to the IEC 60034-5 standard the electric motors are provided with IP code which determines the degree of protection (ensured by the housing) against penetration of solid matter and fluids.

IP55

PROTECTION AGAINST PENETRATION OF SOLID MATTER		PROTECTION AGAINST PENETRATION OF FLUIDS		IK MECHANICAL PROTECTION	
1st digit	DESCRIPTION	2nd digit	DESCRIPTION	3rd digit	DESCRIPTION
				00	No protection
0		Not protected		01	 Striking energy: 0.15 J
1		Protected against solid bodies larger than 50 mm		02	 Striking energy: 0.20 J
2		Protected against solid bodies larger than 12 mm		03	 Striking energy: 0.37 J
3		Protected against solid bodies larger than 2.5 mm		04	 Striking energy: 0.50 J
4		Protected against solid bodies larger than 1 mm		05	 Striking energy: 0.70 J
5		Protected against deposition of dust		06	 Striking energy: 1 J
6		Totally protected against deposition of dust		07	 Striking energy: 2 J
				08	 Striking energy: 5 J
				09	 Striking energy: 10 J
				10	 Striking energy: 20 J

All Cantoni Group standard motors are manufactured with IP 55 degree of protection according to the standard in force (IEC 60034-5). The following table lists its characteristics.

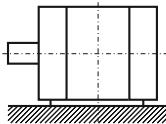
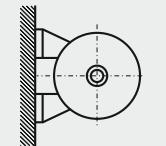
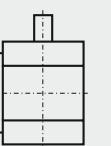
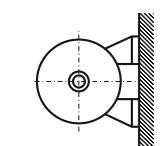
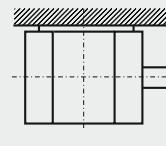
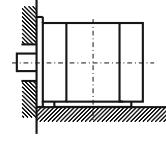
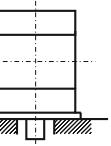
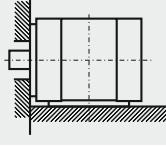
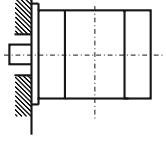
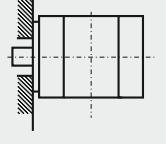
Each size 80 to 180 motor is equipped with seal rings (Simmerring or V-ring) on drive side and on non drive side. Labyrinth seals protect the motors from size 200 and above.

The terminal box is sealed with a gasket.

Motors with a higher degree of protection are available on request.

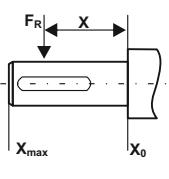
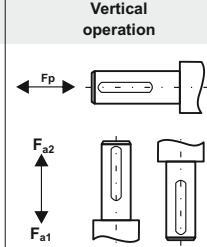
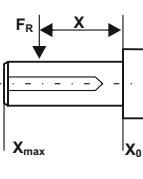
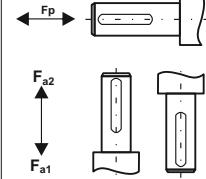
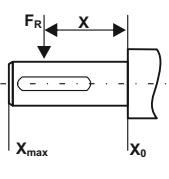
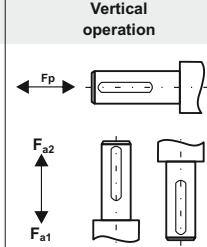
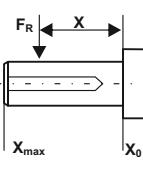
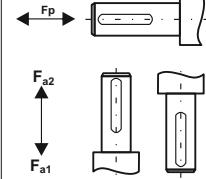
MOUNTING ARRANGEMENTS

According to the IEC 60034-7 standard

Horizontal shaft				Vertical shaft			
	Designation		Frame size		Designation		Frame size
	Code II	Code I			Code II	Code I	
	IM 1001	IM B3	56 ÷ 500		IM 1011	IM V5	56 ÷ 315 without 3SIE 315 M6B,C,D without SIE 315 M8C,D
	IM 1051	IM B6	56 ÷ 280		IM 1031	IM V6	56 ÷ 315 without 3SIE 315 M6B,C,D without SIE 315 M8C,D
	IM 1061	IM B7	56 ÷ 280		IM 2011 or IM 2111	IM V15	56 ÷ 355
	IM 1071	IM B8	56 ÷ 280		IM 2031 or IM 2131	IM V36	56 ÷ 355
	IM 2001	IM B35	56 ÷ 500		IM 3011	IM V1	56 ÷ 500
	IM 2101	IM B34	56 ÷ 132		IM 3031	IM V3	56 ÷ 280
	IM 3001	IM B5	56 ÷ 315 without 3SIEK 315 M6B,C,D without SIEK 315 M8C,D		IM 3611	IM V18	56 ÷ 180
	IM 3601	IM B14	56 ÷ 132		IM 3631	IM V19	56 ÷ 180

* Other mounting arrangements available on special request

General Purpose 3-phase Induction Motors
PERMISSIBLE LOADS ON THE SHAFT END

Frame size	Number of poles	Horizontal operation		Vertical operation		Frame size	Number of poles	Horizontal operation		Vertical operation			
													
		$F_R(x = 0)$ [kN]	$F_R(x = \text{max})$ [kN]	F_p [kN]	F_{a1} [kN]	F_{a2} [kN]	$F_R(x = 0)$ [kN]	$F_R(x = \text{max})$ [kN]	F_p [kN]	F_{a1} [kN]	F_{a2} [kN]		
Sh 56	2	0,20	0,16	0,04	0,03	0,05	3SIE 200 LA	2	2,91	2,44	2,24	1,72	2,92
Sh 56	4	0,25	0,20	0,05	0,04	0,06	3SIE 200 LB	2	2,85	2,39	2,23	1,67	2,93
Sh 56	6	0,25	0,20	0,06	0,05	0,07	3SIE 200 L	4	3,61	3,03	2,81	2,12	3,70
Sh 63	2	0,20	0,16	0,04	0,04	0,06	3SIE 200 LA	6	4,31	3,62	3,62	2,92	4,56
Sh 63	4	0,25	0,20	0,06	0,05	0,07	3SIE 200 LB	6	4,06	3,40	3,54	2,71	4,65
Sh 63	6	0,27	0,22	0,06	0,05	0,07	3SIE 225 S	4	4,18	3,40	3,19	2,42	4,16
Sh 63	8	0,27	0,22	0,07	0,06	0,08	3SIE 225 M	2	3,31	2,81	2,53	1,93	3,29
Sh 71	2	0,29	0,24	0,07	0,05	0,09	3SIE 225 M	4	3,97	3,23	3,13	2,26	4,24
Sh 71	4	0,36	0,30	0,09	0,07	0,11	3SIE 225 M	6	4,57	3,72	3,98	2,95	5,33
Sh 71	6	0,40	0,35	0,10	0,08	0,12	3SIE 250 M	2	4,09	3,39	3,11	2,33	4,13
Sh 71	8	0,40	0,35	0,11	0,09	0,13	3SIE 250 M	4	4,90	4,06	3,85	2,68	5,36
3SIE 80 (Sh)	2	0,33	0,27	0,09	0,06	0,12	3SIE 250 M	6	5,92	4,90	4,99	3,81	6,55
3SIE 80 (Sh)	4	0,44	0,37	0,12	0,09	0,15	3SIE 280 S	2	3,94	3,34	3,07	2,01	4,43
Sh 80	6	0,51	0,42	0,14	0,11	0,17	3SIE 280 S	4	6,69	5,67	5,01	3,65	6,77
Sh 80	8	0,51	0,42	0,17	0,15	0,20	3SIE 280 S	6	7,86	6,67	5,79	4,32	7,70
3SIE 90	2	0,79	0,66	0,64	0,44	0,84	3SIE 280 M	2	3,80	3,22	3,03	1,89	4,49
3SIE 90	4	1,00	0,83	0,80	0,65	1,05	3SIE 280 M	4	6,15	5,22	4,86	3,16	7,04
3SIE 90	6	1,15	0,95	0,90	0,77	1,17	3SIE 280 M	6	7,69	6,52	5,75	4,19	7,75
3SIE 100	2	1,11	0,89	0,90	0,61	1,17	3SIE 315 S	2	3,56	3,08	2,96	1,63	4,69
3SIE 100	4	1,39	1,12	1,12	0,90	1,46	3SIE 315 S	4	5,75	4,82	4,74	2,71	7,37
3SIE 100	6	1,60	1,29	1,26	1,08	1,64	3SIE 315 S	6	7,21	6,04	5,61	3,84	8,14
3SIE 112	2	1,56	1,22	1,23	0,84	1,60	3SIE 315 MA	2	3,07	2,65	2,82	1,23	4,89
3SIE 112	4	1,92	1,58	1,50	1,19	1,96	3SIE 315 MB	2	2,67	2,31	2,71	0,91	5,05
3SIE 112	6	2,20	1,80	1,69	1,26	2,20	3SIE 315 MA	4	5,40	4,52	4,64	2,41	7,53
3SIE 132	2	2,11	1,65	1,82	0,98	2,37	3SIE 315 MB	4	5,16	4,33	4,58	2,20	7,64
3SIE 132	4	2,67	2,08	2,31	1,36	3,00	3SIE 315 MA	6	6,75	5,66	5,48	3,22	8,40
3SIE 132	6	3,06	2,39	2,51	1,40	3,26	3SIE 315 MB	6	6,27	5,33	5,34	2,68	8,78
3SIE 160	2	2,43	1,88	1,97	1,00	2,56	3SIE 315 MC	2	2,84	2,48	2,71	0,63	5,37
3SIE 160	4	3,06	2,38	2,54	1,43	3,31	3SIE 315 MC	4	6,27	5,33	4,34	1,46	8,06
3SIE 160	6	3,54	2,81	2,83	1,80	3,68	3SIE 315 MC	6	7,57	6,44	5,08	1,87	9,23
3SIE 180	2	2,61	2,13	2,20	1,00	2,87	3SIE 315 MD	6	7,47	6,36	5,05	1,82	9,22
3SIE 180	4	3,30	2,68	2,83	1,37	3,68							
3SIE 180	6	3,78	3,07	3,17	1,93	4,12							

PERMISSIBLE LOADS ON THE SHAFT END for motors 2Sg (2p = 8 ÷ 12)

		$F_R(x = 0)$ [kN]	$F_R(x = \text{max})$ [kN]	F_p [kN]	F_{a1} [kN]	F_{a2} [kN]			$F_R(x = 0)$ [kN]	$F_R(x = \text{max})$ [kN]	F_p [kN]	F_{a1} [kN]	F_{a2} [kN]
		$F_R(x = 0)$ [kN]	$F_R(x = \text{max})$ [kN]	F_p [kN]	F_{a1} [kN]	F_{a2} [kN]			$F_R(x = 0)$ [kN]	$F_R(x = \text{max})$ [kN]	F_p [kN]	F_{a1} [kN]	F_{a2} [kN]
2Sg 200L	8	5,10	4,20	4,10	3,40	5,00	2Sg 280S8	8	8,30	6,90	6,60	5,20	8,50
2Sg 200LA	10	5,50	4,60	4,20	3,50	5,10	2Sg 280S10	10	9,30	7,70	6,70	5,40	8,40
2Sg 200LB	10	5,50	4,50	4,10	3,40	5,10	2Sg 280S12	12	9,80	8,10	7,00	5,70	8,70
2Sg 200L	12	5,90	4,90	4,40	3,70	5,40	2Sg 280M8	8	8,00	6,60	6,50	4,90	8,60
2Sg 225S	8	5,90	4,70	4,70	3,90	5,70	2Sg 280M10	10	8,80	7,30	6,50	5,20	8,20
2Sg 225S	10	6,50	5,10	4,70	4,00	5,60	2Sg 280M12	12	9,20	7,60	6,80	5,00	9,30
2Sg 225S	12	6,70	5,30	4,80	4,20	6,00	2Sg 315S8	8	8,40	7,00	7,00	5,00	9,60
2Sg 225M	8	5,70	4,60	4,60	3,70	5,80	2Sg 315S10	10	9,30	7,70	7,60	5,60	10,20
2Sg 225M	10	6,30	4,90	5,70	4,40	7,40	2Sg 315S12	12	9,80	8,10	8,00	5,90	10,80
2Sg 225M	12	6,70	5,30	4,90	3,90	6,20	2Sg 315M8A	8	8,20	6,80	6,90	4,80	9,70
2Sg 250M	8	6,90	5,60	5,60	4,30	7,20	2Sg 315M8B	8	7,70	6,40	6,80	4,30	10,00
2Sg 250M	10	7,50	6,20	5,70	4,40	7,40	2Sg 315M10	10	8,40	7,00	7,30	4,80	10,70
2Sg 250M	12	8,10	6,70	6,10	4,80	7,80	2Sg 315M12A	12	9,30	7,70	7,90	5,50	11,10
							2Sg 315M12B	12	9,10	7,60	7,80	5,30	11,20

VERSION WITH ROLLER BEARINGS for motors 355

Mechanical Size	Type of construction	No. of poles, 2p	D.E. bearing	N.D.E. bearing
3SIE 355 ML	IM1001 (B3)	4 ÷ 6	NU222 EM1C3	6222 C3
3SIE 355 H	IM1001 (B3)	4 ÷ 6	NU322 EM1C3	6322 C3

Horizontal mounting				
Motor type	Number of poles	Length of shaft extension E(mm)	Permissible radial forces	Permissible axial forces
			FX0	FXmax
3SIE 355 ML	4	210	22	18
	6	210	23	15
3SIE 355 H	4	210	27	17
	6	210	29	15

VERSION WITH ROLLER BEARINGS for motors SEE355 and Sh355-500

Mechanical Size	Type of construction	No. of poles, 2p	D.E. bearing	N.D.E. bearing
SEE 355	IM1001 (B3)	8	NU222 EM1C3	6222 C3
Sh 355..s	IM1001 (B3)	4 ÷ 8	NU322 EM1C3	6322 C3
Sh 400..s	IM1001 (B3)	4 ÷ 10	on request	on request
Sh 450..s	IM1001 (B3)	4 ÷ 12	on request	on request
Sh 500..s	IM1001 (B3)	4 ÷ 10	on request	on request

Horizontal mounting					Vertical operation	
Motor type	Number of poles	Length of shaft extension E(mm)	Permissible radial forces		Permissible axial forces	
			FX0	FXmax	FA	kN
SEE 355	8	210	24	14	6	on request
Sh 355..s	4	210	27	17	6	on request
	8	210	30	15	8	on request
Sh 400 Sh 450 Sh 500	4 ÷ 8		on request			

PERMISSIBLE LOADS ON THE SHAFT END

Value of radial force F_R acting on the shaft end for a given belt pulley diameter is calculated according to the following formula:

$$F_R = \frac{19600 \times P \times k}{D_k \times n} [N]$$

where:
 P - motor output [kW]
 D_k - belt pulley diameter [m]
 n - speed [rpm]
 k - belt tension factor:
 for V-belts k=2,2
 for flat belts k=3

Value of force F_R acting on any point of the shaft end (between points X=max and X=0) may be calculated according to the following formula:

$$F_R = F_{x0} - \frac{X}{E} \times (F_{x0} - F_{xmax}) [N]$$

where:
 F_{x0} - value of F_R force acting on the beginning of the shaft end
 F_{xmax} - value of F_R force acting on the end of the shaft end
 E - lenght of the shaft end

Other specifications dependent on the frame size:

Frame size	Degree of protection	Position of the terminal box	Number of terminals	Number of cable outlets	Optional rotation of the terminal box	Glands	Temperature sensors in winding	Bearing lubrication on the run	Thermal protection of bearings
56	IP 55	top	6	1	180°	M 20	on request	no	no
63	IP 55	top	6	1	180°	M 20	on request	no	no
71	IP 55	top	6	1	180°	M 20	on request	no	no
80	IP 55	top	6	1	180°	M 20	on request	no	no
90	IP 55	top	6	2	180°	M 20	on request	no	no
100	IP 55	top	6	2	180°	M 20	on request	no	no
112	IP 55	top	6	2	180°	M 25	on request	no	no
132	IP 55	top	6	2	180°	M 25	on request	no	no
160	IP 55	top	6	2	180°	M 40	on request	on request	on request
180	IP 55	top	6	2	180°	M 40	on request	on request	on request
200	IP 55	top *	6	2	4 × 90°	M 50	PTC	yes	on request
225	IP 55	top *	6	2	4 × 90°	M 50	PTC	yes	on request
250	IP 55	top *	6	2	4 × 90°	M 63	PTC	yes	on request
280	IP 55	top *	6	2	4 × 90°	M 63	PTC	yes	on request
315	IP 55	top *	6	2	4 × 90°	M 76	PTC	yes	on request
355ML	IP 55	top	6	2	4 × 90°	M 76	PTC Mark A	yes	on request
355H	IP 55	top	6	2	4 × 90°	M 90	Pt 100	yes	Pt 100
400	IP 55	top	6 (bars)	3	180°	3xφ55	Pt 100	yes	Pt 100
450	IP 55	top	3 (bars)	3	180°	3xφ55	Pt 100	yes	Pt 100
500	IP 55	top	3 (bars)	3	180°	3xφ55	Pt 100	yes	Pt 100

 * terminal box on right side for 2Sg motors series ($2p = 8 \div 12$)

BEARINGS

Frame size	Number of poles	Bearings	The bearings in basic version of motors for horizontal and vertical duty, excluding 3SIE 315 with $2p=2$.
Sh 56	2 ÷ 6	6201 2Z	
Sh 63	2 ÷ 8	6202 2Z	
Sh 71	2 ÷ 8	6203 2Z	
3SIE 80	2 ÷ 6	6204 2Z C3	
3SIE 90	2 ÷ 6	6205 2Z C3	
3SIE 100	2 ÷ 6	6206 2Z C3	
3SIE 112	2 ÷ 6	6306 2Z C3	
3SIE 132	2 ÷ 6	6308 2Z C3	
3SIE 160	2 ÷ 6	6309 2Z C3	
3SIE 180	2 ÷ 6	6311 2Z C3	
3SIE 200	2 ÷ 6	6312 C3	
3SIE 225	2 ÷ 6	6313 C3	
3SIE 250	2 ÷ 6	6315 C3	
3SIE 280	2	6315 C3	
3SIE 280	4 ÷ 6	6318 C3	
3SIE 315S,MA,MB	2	6315 C3	
3SIE 315MC	2	6316 C3	
3SIE 315S,MA,MB	4 ÷ 6	6318 C3	
3SIE 315MC,MD	4 ÷ 6	6320 C3/6318 C3	

BEARINGS for 2Sg ($2p = 8 \div 12$)

Frame size	Number of poles	Bearings
2Sg 200	8 ÷ 12	6312 C3
2Sg 225	8 ÷ 12	6313 C3
2Sg 250	8 ÷ 12	6315 C3
2Sg 280	8 ÷ 12	6317 C3
2Sg 315	8 ÷ 12	6318 C3

Frame Size	Type of construction	No. of poles, 2p	D.E. bearing	N.D.E. bearing	The bearings in basic version of motors for horizontal and vertical duty.
3SIE 355 ML	IM1001 (B3)	2	6217 C3	6217 C3	
3SIEL 355 ML	IM2001 (B35)	4 ÷ 6	6222 C3	6222 C3	
3SIEK 355 ML	IM3011 (V1)	4 ÷ 6	6322 C3	6322 C3	
3SIE 355 H	IM1001 (B3)	2	6217 C3	6217 C3	
3SIEL 355 H	IM2001 (B35)	4 ÷ 6	6322 C3	6322 C3	
3SIEK 355 H	IM3011 (V1)	4 ÷ 6	6322 C3	6322 C3	
Frame	Type of	No. of	D.E.	N.D.E.	
Size	construction	poles, 2p	bearing	bearing	
SEE 355	IM1001 (B3)	8	6222 C3	6222 C3	
SLEE 355	IM2001 (B35)	8	6222 C3	6222 C3	
SVEE 355	IM3011 (V1)	8	6322 C3	6322 C3	
Sh 355..s	IM1001 (B3)	2	6217 C3	6217 C3	
SLh 355..s	IM2001 (B35)	4 ÷ 8	6322 C3	6322 C3	
SVh 355..s	IM3001 (V1)	4 ÷ 8	6322 C3	6322 C3	
Sh 400..s	IM1001 (B3)	2			
SLh 400..s	IM2001 (B35)	4 ÷ 10			
SVh 400..s	IM3011 (V1)	4 ÷ 10			
Sh 450..s	IM1001 (B3)	4 ÷ 12			
SLh 450..s	IM2001 (B35)	4 ÷ 12			
SVh 450..s	IM3011 (V1)	4 ÷ 12			
Sh 500..s	IM1001 (B3)	4 ÷ 12			
SLh 500..s	IM2001 (B35)	4 ÷ 12			
SVh 500..s	IM3011 (V1)	4 ÷ 12			

HOUSING, END SHIELDS, FEET

Frame size [mm]	Motor housing	End shields	Feet
56	Aluminium	Aluminium	Aluminium - screwed
63	Aluminium	Aluminium	Aluminium - screwed
71	Aluminium	Aluminium	Aluminium - screwed
3SIE 80	Aluminium	Aluminium	Aluminium - screwed
3SIE 90	Aluminium	Aluminium	Aluminium - screwed
3 SIE100	Aluminium	Aluminium	Aluminium - screwed
3SIE 112	Aluminium	Cast iron	Aluminium - screwed
3SIE 132	Aluminium	Cast iron	Aluminium - screwed
3SIE 160	Cast iron	Cast iron	Cast iron - screwed or integrated
3SIE 180	Cast iron	Cast iron	Cast iron - screwed or integrated
3SIE 200	Cast iron	Cast iron	Cast iron - screwed or integrated
3SIE 225	Cast iron	Cast iron	Cast iron - screwed or integrated
3SIE 250	Cast iron	Cast iron	Cast iron - screwed or integrated
3SIE 280	Cast iron	Cast iron	Cast iron - screwed or integrated
3SIE 315	Cast iron	Cast iron	Cast iron - screwed or integrated
355	Cast iron	Cast iron	Cast iron - integrated
400	Cast iron	Cast iron	Cast iron - integrated
450	Cast iron	Cast iron	Cast iron - integrated
500	Cast iron	Cast iron	Cast iron - integrated

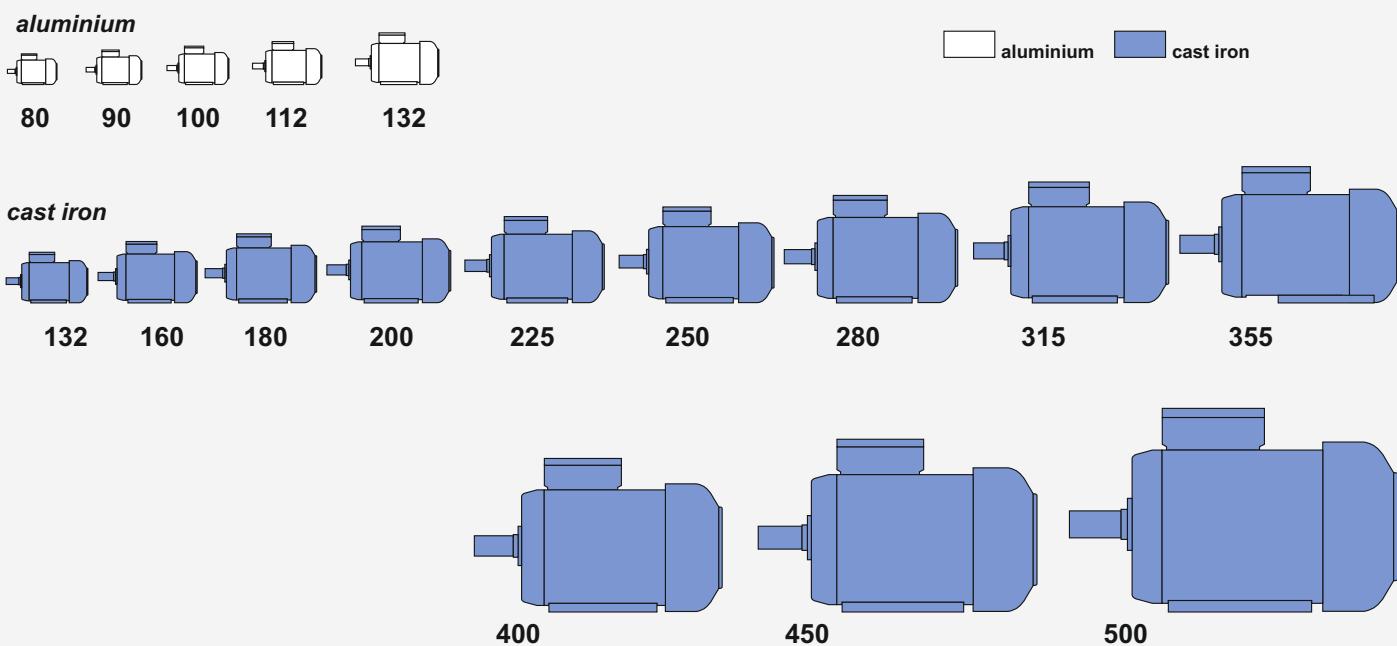
In motors series Sh, Sg of frame size 80, 90 and 100mm: on request end shields may be made of cast iron.

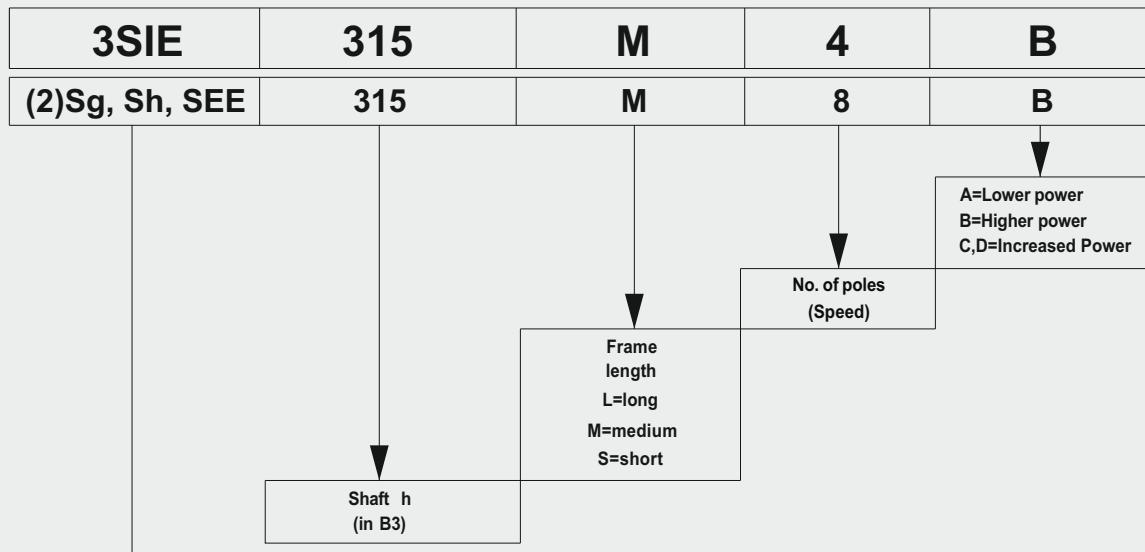
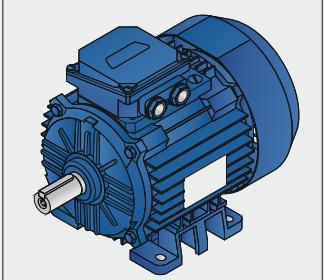
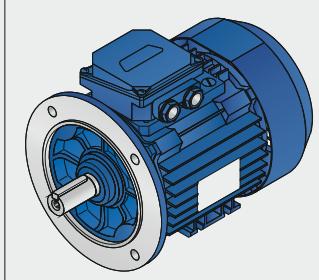
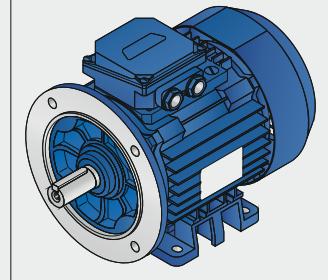
In motors series 3SIE of frame size 80, 90 and 100 mm: on request end shields may be made of cast iron.

In motors 3SIE of frame size 132, 160 and 180 mm - feet may be integrated with housing (motors with cast iron housing).

In motors 3SIE of frame size 132 mm - on request housing may be made of cast iron.

Motor housing



DESCRIPTION OF THE CATALOGUE VERSION**3SIE**
(2)Sg, Sh, SEE**3SIEK**
(2)SKg, SKh, SVEE, SVh**3SIEL**
(2)SLg, SLh, SLEE**ORDERING INFORMATION****Orders for motors should specify:**

- motor type designation,
- rated output,
- rated speed,
- operating duty,
- supply voltage and connection,
- frequency,
- mounting arrangements, end shield material,
- degree of protection,
- type of driven machine,
- other details regarding special requests,

and information concerning additional accessories e.g.

- thermal protection,
- anticondensation heaters,
- vibration sensors,
- etc.

When ordering high-power or special purpose motors one should also indicate:

- required direction of rotation,
- required degree of interior protection,
- method of start-up,
- method of coupling with the driven unit (gears, dimensions of belt pulleys, etc.),
- type of machine driven (nature of load), including the moment of inertia J or flywheel effect GD^2 brought to the motor shaft,
- other customer's specifications.

When ordering spare parts one should specify:

- full designation of the motor type including its serial number (provided on the nameplate) or catalogue number,
- degree of protection,
- mounting arrangement,
- name of part,
- number of pieces.

As part of our development program, we reserve the right to alter or amend any of the specifications without giving prior notice

General Purpose 3-phase Induction Motors

Totally Enclosed Motors IP 55

Item	Type	Rated output		Rated speed	Rated torque	Efficiency			Power factor	Full load current			Locked rotor torque	Locked rotor current	Breakdown torque	Moment of inertia	Weight (IMB3)
										2p=2			n _s =3000 rpm			f=50Hz	
		P _N	n _N	T _N	η _N	50% 75% 100%	cos φ _N	I _N at rated voltage [A]	T _L /T _N	I _L /I _N	T _B /T _N	J	I _L /I _N	T _B /T _N	[kgm ²]	[kg]	
1	Sh 56-2A	0,09	0,12	2820	0,30	45 52 62	0,63	0,60	0,35	0,35	2,5	3,4	2,7	0,000076	2,9		
2	Sh 56-2B	0,12	0,17	2800	0,41	50 58 65	0,73	0,70	0,40	0,40	2,0	3,0	2,0	0,000095	3,2		
3	Sh 63-2A	0,18	0,25	2760	0,62	60 63 65	0,80	0,85	0,50	0,50	2,1	3,4	2,1	0,000175	3,5		
4	Sh 63-2B	0,25	0,33	2780	0,85	66 69 72	0,78	1,1	0,65	0,65	2,4	4,3	2,5	0,000235	4,1		
5	Sh 71-2A	0,37	0,50	2800	1,26	67 69 71	0,77	1,75	1,0	1,0	2,2	4,4	2,2	0,000389	5,1		
6	Sh 71-2B	0,55	0,75	2790	1,88	69 72 75	0,85	2,35	1,35	1,35	2,0	4,0	2,1	0,000484	6,3		
7	3SIE 80-2A	0,75	1	2890	2,48	79,0 82,0 82,0	0,82	2,95	1,65	1,7	3,4	7,5	4,2	0,00100	9,5	IE3	
8	3SIE 80-2B	1,1	1,5	2890	3,63	82,0 83,0 83,0	0,77	4,3	2,2	2,5	5,1	9,0	4,7	0,00142	11,9	IE3	
9	3SIE 90S2	1,5	2	2925	4,9	82,7 84,4 84,2	0,85	5,3	3,2	3,0	2,4	7,3	3,5	0,0014	16,5	IE3	
10	3SIE 90L2	2,2	3	2910	7,2	85,4 86,5 85,9	0,86	7,5	4,5	4,3	2,7	8,0	4,0	0,0019	18,5	IE3	
11	3SIE 100L2	3	4	2915	9,8	86,9 87,7 87,1	0,85	10,2	6,2	5,8	3,1	8,5	4,1	0,0039	25,0	IE3	
12	3SIE 112M2	4	5,5	2925	13	88,7 89,0 88,1	0,89	12,8	7,8	7,4	2,3	8,4	3,2	0,0075	35,5	IE3	
13	3SIE 132S2A	5,5	7,5	2940	17,9	87,7 89,2 89,2	0,89	17,4	10,5	10,0	2,6	8,2	3,4	0,014	55,0	IE3	
14	3SIE 132S2B	7,5	10	2940	24,4	89,0 90,3 90,1	0,90	23,2	14,1	13,3	2,8	8,5	3,8	0,017	64,0	IE3	
15	3SIE 132M2	9,2	12,3	2935	29,9	90,4 91,0 90,7	0,88	28,9	17,5	16,6	3,2	9,7	3,8	0,020	88,0	IE3	
16	3SIE 132M2A	11	15	2925	35,9	90,8 91,4 91,2	0,89	34,1	20,6	19,6	2,6	8,1	3,8	0,021	95,0	IE3	
17	3SIE 160M2A	11	15	2945	35,7	90,3 91,4 91,2	0,90	33,6	20,4	19,2	2,1	7,9	3,0	0,048	123	IE3	
18	3SIE 160M2B	15	20	2945	48,6	89,8 91,9 91,9	0,90	45,5	27,6	26,2	2,4	8,0	3,4	0,059	132	IE3	
19	3SIE 160L2	18,5	25	2940	60,1	92,2 92,8 92,4	0,90	55,8	33,8	32,1	2,3	7,7	3,0	0,072	139	IE3	
20	3SIE 180M2	22	30	2955	71,1	91,1 92,4 92,7	0,90	66,2	40,1	38,1	3,2	9,2	3,7	0,095	190	IE3	
21	3SIE 200L2A	30	40	2965	97	93,1 93,7 93,5	0,90	89	54	51	2,4	7,0	2,8	0,19	275	IE3	
22	3SIE 200L2B	37	50	2955	120	93,5 93,8 93,7	0,90	110	67	63	2,2	6,3	2,6	0,20	295	IE3	
23	3SIE 225M2	45	60	2972	145	94,2 94,6 94,2	0,88	136	82	78	2,0	6,7	2,6	0,26	385	IE3	
24	3SIE 250M2	55	75	2969	177	94,5 94,8 94,5	0,91	161	97	92	2,2	6,9	2,9	0,42	495	IE3	
25	3SIE 280S2	75	100	2978	241	94,2 94,8 94,7	0,91	218	132	126	1,8	6,7	2,9	0,76	660	IE3	
26	3SIE 280M2	90	125	2979	289	94,5 95,1 95,0	0,91	261	158	150	1,8	7,3	3,1	0,95	690	IE3	
27	3SIE 315S2	110	150	2978	353	95,4 95,6 95,2	0,92	315	191	181	1,9	6,9	2,9	0,98	865	IE3	
28	3SIE 315M2A	132	175	2977	423	95,8 95,9 95,6	0,92	377	228	217	2,0	7,3	2,7	1,28	970	IE3	
29	3SIE 315M2B	160	220	2978	513	95,9 96,1 95,8	0,92	456	276	262	2,2	8,2	3,1	1,57	1118	IE3	
30	3SIE 315M2C	200	270	2980	641	95,9 96,1 95,8	0,93	-	341	324	2,3	8,1	3,1	1,74	1185	IE3	
31	3SIE 355 ML2A	250	335	2982	801	94,8 95,7 95,8	0,91	-	-	414	1,9	6,8	2,8	2,80	1620	IE3	
32	3SIE 355 ML2B	315	425	2982	1009	95,5 96,2 96,2	0,91	-	-	519	2,0	7,3	2,9	3,00	1700	IE3	
33	3SIE 355 H2D	355	475	2985	1136	95,2 96,0 96,2	0,91	-	-	585	1,8	7,5	2,8	4,90	2160	IE3	
34	3SIE 355 H2E	375	505	2985	1200	95,3 96,1 96,2	0,91	-	-	618	1,6	7,6	2,7	5,70	2220	IE3	
35	Sh 355H2Es	400	540	2985	1280	95,7 96,4 96,5	0,91	-	-	657	1,6	8,0	2,8	5,7	2200		
36	Sh 400H2Cs	450	610	2983	1441	95,6 96,4 96,5	0,91	-	-	740	1,3	6,6	2,6	6,7	2800		
37	Sh 400H2Ds	500	680	2985	1600	95,7 96,5 96,6	0,91	-	-	821	1,4	7,2	2,8	7,7	2880		
38	Sh 400H2Es	560	760	2989	1789	95,5 96,4 96,6	0,90	-	-	930	1,7	8,0	3,0	8,7	3100		
39	Sh 400H2Es	630	850	2985	2015	96,2 96,7 96,8	0,91	-	-	1033	1,5	7,9	2,8	8,7	3100		
40	Sh 450H2Bs	710	950	2990	2268	96,1 96,8 97,0	0,88	-	-	696 ²	0,6	6,2	2,7	17,2	4160		
41	Sh 450H2Cs	800	1080	2991	2254	96,2 96,9 97,1	0,88	-	-	783 ²	0,7	6,8	3,0	18,4	4380		
42	Sh 450H2Ds	900	1200	2990	2875	96,5 97,1 97,2	0,89	-	-	870 ²	0,7	6,6	2,8	19,0	4480		
43	Sh 500H2Bs	1000	1350	2992	3192	95,8 96,7 97,0	0,89	-	-	969 ²	1,4	9,0	3,4	35,9	6200		
44	Sh 500H2Cs	1120	1500	2992	3575	95,9 96,7 97,0	0,88	-	-	1098 ²	1,2	8,5	3,2	35,9	6200		
45	Sh 500H2Ds	1200	1609	2991	3832	96,0 96,8 97,0	0,90	-	-	1150 ²	1,4	7,9	2,9	35,9	6200		

2 - at rated voltage 690V

Totally Enclosed Motors IP 55

Item	Type	Rated output		Rated speed	Rated torque	Efficiency			Full load current			Locked rotor torque	Locked rotor current	Breakdown torque	Moment of Inertia	Weight (IMB3)	
		P _N [kW]	n _N [min ⁻¹]	T _N [Nm]	η _N [%] 50% 75% 100%			cos ϕ _N [-]	I _N at rated voltage [A] 230V 380V 400V	T _L /T _N [-]	I _L /I _N [-]	T _B /T _N [-]	J [kgm ²]	[kg]			
2p=4 n_s=1500 rpm f=50Hz																	
46	Sh 56-4A	0,06	0,08	1400	0,41	40,0	48,0	50,0	0,58	0,52	0,30	0,30	2,0	2,8	2,3	0,00015	2,6
47	Sh 56-4B	0,09	0,12	1380	0,62	54,0	58,0	60,0	0,61	0,60	0,35	0,35	2,0	2,4	2,1	0,00019	2,8
48	Sh 63-4A	0,12	0,17	1380	0,83	56,0	60,0	60,0	0,63	0,80	0,45	0,45	1,9	2,6	2,0	0,00024	3,5
49	Sh 63-4B	0,18	0,25	1380	1,26	60,0	63,0	65,0	0,65	1,1	0,65	0,65	2,0	2,6	2,0	0,00031	4,1
50	Sh 71-4A	0,25	0,33	1380	1,73	60,0	63,0	66,0	0,64	1,5	0,85	0,85	2,0	3,0	2,0	0,00061	5,1
51	Sh 71-4B	0,37	0,50	1370	2,6	64,0	67,0	70,0	0,68	2,2	125	1,25	2,1	3,1	2,1	0,00077	5,8
52	Sh 80-4A	0,55	0,75	1380	3,8	70,0	69,0	73,0	0,69	2,8	1,6	1,6	2,5	3,9	2,5	0,00158	7,5
IE3	53 3SIE 80-4B	0,75	1	1430	5,0	81,5	82,0	82,5	0,64	3,6	2,1	2,1	3,8	5,7	3,8	0,00265	11,6
IE3	54 3SIE 90S4	1,1	1,5	1450	7,2	81,8	84,0	84,1	0,77	4,3	2,6	2,5	2,3	7,2	3,5	0,0036	18,0
IE3	55 3SIE 90L4	1,5	2	1450	9,9	83,9	85,5	85,3	0,78	5,7	3,4	3,3	2,5	7,4	3,4	0,0040	21,0
IE3	56 3SIE 100L4A	2,2	3	1465	14,3	85,0	86,8	86,7	0,80	8,0	4,8	4,6	2,3	7,5	2,9	0,0076	27,5
IE3	57 3SIE 100L4B	3	4	1465	19,6	85,8	87,7	87,7	0,79	10,9	6,6	6,3	2,5	7,4	3,5	0,0086	31,0
IE3	58 3SIE 112M4	4	5,5	1455	26,3	88,5	89,0	88,6	0,80	14,2	8,6	8,1	2,1	7,0	3,0	0,0115	41,5
IE3	59 3SIE 132S4	5,5	7,5	1465	35,7	88,6	89,8	89,6	0,85	18,1	11,0	10,4	2,5	8,5	3,3	0,036	63,0
IE3	60 3SIE 132M4	7,5	10	1465	49,1	89,7	90,6	90,4	0,83	25,1	15,2	14,4	2,9	8,8	3,8	0,042	67,0
IE3	61 3SIE 132M4A	9,2	12,3	1460	60,2	91,0	91,5	91,0	0,83	30,6	18,5	17,6	3,1	9,0	4,1	0,050	90,0
IE3	62 3SIE 132M4B	11	15	1460	72,0	91,7	92,1	91,4	0,83	36,4	22,0	20,9	3,2	9,5	4,4	0,057	110
IE3	63 3SIE 160M4	11	15	1470	71,5	90,9	91,7	91,4	0,83	36,4	22,0	20,9	2,6	7,3	3,0	0,088	136
IE3	64 3SIE 160L4	15	20	1475	97,1	92,0	92,5	92,1	0,83	49,3	29,8	28,3	2,7	8,1	3,2	0,104	154
IE3	65 3SIE 180M4	18,5	25	1475	120,2	91,4	92,5	92,6	0,85	59,0	35,7	33,9	2,9	8,3	3,5	0,162	190
IE3	66 3SIE 180L4	22	30	1475	142,4	91,4	92,8	93,0	0,83	71,5	43,3	41,1	3,2	8,5	3,6	0,185	200
IE3	67 3SIE 200L4	30	40	1477	194	94,2	94,3	93,8	0,89	90	55	52	2,1	6,4	2,6	0,38	329
IE3	68 3SIE 225S4	37	50	1485	238	94,1	94,4	94,0	0,87	114	69	65	2,0	6,9	2,8	0,51	373
IE3	69 3SIE 225M4	45	60	1483	290	94,4	94,8	94,3	0,88	136	82	78	2,1	7,1	2,7	0,59	410
IE3	70 3SIE 250M4	55	75	1487	353	94,0	94,8	94,7	0,90	162	98	93	2,5	7,6	2,9	1,00	520
IE3	71 3SIE 280S4	75	100	1488	481	93,9	95,0	95,0	0,91	218	132	125	2,0	6,8	2,5	1,37	710
IE3	72 3SIE 280M4	90	125	1491	576	94,9	95,5	95,4	0,89	266	161	153	2,6	8,4	3,0	1,80	761
IE3	73 3SIE 315S4	110	150	1488	706	95,1	95,5	95,4	0,90	322	195	185	2,0	6,6	2,4	2,25	920
IE3	74 3SIE 315M4A	132	175	1489	847	95,6	95,9	95,6	0,91	381	231	219	2,3	7,9	2,8	2,59	1030
IE3	75 3SIE 315M4B	160	220	1490	1026	95,9	96,1	95,8	0,90	466	282	268	2,4	8,5	3,1	2,80	1130
IE3	76 3SIE 315M4C	200	270	1488	1284	95,8	96,2	96,2	0,90	-	351	333	2,4	8,1	2,9	3,46	1205
IE3	77 3SIE 355 ML4A	250	335	1489	1603	95,8	96,2	96,1	0,89	-	-	422	2,0	7,4	2,3	5,30	1700
IE3	78 3SIE 355 ML4B	315	425	1489	2020	96,0	96,4	96,3	0,90	-	-	525	2,3	7,5	2,5	6,40	1830
IE3	79 3SIE 355 H4D	355	475	1488	2278	96,1	96,5	96,3	0,88	-	-	605	1,7	6,4	2,2	7,80	2200
IE3	80 3SIE 355 H4E	375	505	1491	2402	95,9	96,3	96,3	0,88	-	-	639	1,9	7,5	2,4	9,10	2340
81	Sh 355H4Es	400	540	1489	2566	95,8	96,2	96,1	0,88	-	-	683	1,8	7,0	2,3	9,10	2320
82	Sh 400H4Cs	450	610	1490	2884	96,3	96,9	96,9	0,88	-	-	762	1,6	7,6	2,6	12,3	2920
83	Sh 400H4Ds	500	680	1491	3203	96,2	96,7	96,7	0,88	-	-	848	1,6	7,5	2,6	13,6	3100
84	Sh 400H4Es	560	760	1491	3587	96,4	95,8	96,8	0,87	-	-	960	1,7	7,6	2,6	15,0	3250
85	Sh 400H4Fs	630	850	1491	4035	96,5	96,9	96,9	0,87	-	-	1079	1,9	8,4	2,8	15,3	3440
86	Sh 450H4Bs	710	960	1492	4545	96,5	97,0	97,0	0,88	-	-	696 ²	1,6	7,0	2,5	27,1	4000
87	Sh 450H4Cs	800	1080	1494	5114	96,7	97,0	97,0	0,89	-	-	1493 ²	1,6	6,8	2,6	31,6	4400
88	Sh 450H4Ds	900	1210	1493	6757	96,6	97,0	97,0	0,88	-	-	882 ²	1,5	7,3	2,5	35,4	4620
89	Sh 450H4Es	1000	1350	1493	6397	96,7	97,2	97,2	0,89	-	-	967 ²	1,5	7,3	2,5	38,0	4700
90	Sh 500H4Cs	1120	1510	1495	7155	96,7	97,4	97,4	0,87	-	-	1106 ²	0,8	6,9	2,5	58,4	6100
91	Sh 500H4Ds	1250	1680	1495	7985	96,7	97,4	97,5	0,87	-	-	1233 ²	0,8	7,5	2,7	65,2	6600
92	Sh 500H4Es	1400	1880	1494	8949	96,9	97,5	97,5	0,88	-	-	1365 ²	0,7	6,4	2,4	66,5	6900

2 - at rated voltage 690V

General Purpose 3-phase Induction Motors

Totally Enclosed Motors IP 55

Item	Type	Rated output		Rated speed	Rated torque	Efficiency			Full load current			Locked rotor torque	Locked rotor current	Breakdown torque	Moment of inertia	Weight (IMB3)	
		P _N [kW]	n _N [min ⁻¹]			η _N [%]	50% 75% 100%	cos φ _N [-]	I _N at rated voltage [A] 230V 380V 400V	T _L /T _N [-]	I _L /I _N [-]						
2p=6 n_s=1000 rpm f=50Hz																	
93	Sh 56-6B	0,06	0,08	860	0,65	30	31	32	0,65	0,73	0,42	0,42	1,4	1,7	1,6	0,00019	2,8
94	Sh 63-6A	0,09	0,12	870	0,98	40	44	49	0,53	0,9	0,50	0,50	1,5	2,0	1,6	0,00024	3,5
95	Sh 63-6B	0,12	0,17	870	1,30	38	44	50	0,65	1,15	0,65	0,65	1,3	1,8	1,1	0,00031	4,1
96	Sh 71-6A	0,18	0,25	890	1,91	47	54	57	0,68	1,3	0,75	0,75	1,9	2,6	1,9	0,00074	4,8
97	Sh 71-6B	0,25	0,33	860	2,78	45	52	55	0,79	1,75	1,0	1,0	1,6	2,0	1,6	0,00095	5,6
98	Sh 80-6A	0,37	0,50	910	3,88	61	63	64	0,65	2,4	1,4	1,4	2,0	3,0	2,1	0,00169	7,4
99	Sh 80-6B	0,55	0,75	900	5,84	62	65	67	0,70	3,1	1,8	1,8	1,9	2,7	2,0	0,00207	8,6
100	3SIE 90S6	0,75	1	940	7,6	77,2	79,3	78,9	0,70	3,4	2,1	2,0	1,7	4,3	2,4	0,0032	16
101	3SIE 90L6	1,1	1,5	940	11,1	79,9	81,9	81,0	0,70	4,9	2,9	2,8	2,1	4,5	2,6	0,0090	19
102	3SIE 100L6	1,5	2	960	14,9	81,1	82,8	82,5	0,74	6,2	3,7	3,5	2,6	6,2	3,3	0,0100	23,5
103	3SIE 112M6	2,2	3	965	21,9	83,9	84,9	84,3	0,76	8,6	5,2	5,0	2,1	5,9	2,6	0,0177	34
104	3SIE 132S6	3	4	965	29,7	86,8	87,8	87,0	0,81	10,7	6,5	6,2	2,2	6,6	2,9	0,0440	54
105	3SIE 132M6A	4	5,5	965	39,8	89,1	89,2	88,0	0,81	14,1	8,5	8,1	2,3	6,6	3,0	0,0579	62
106	3SIE 132M6B	5,5	7,5	960	54,7	88,9	89,1	88,0	0,81	19,4	11,7	11,1	2,4	6,7	3,1	0,0637	66
107	3SIE 160M6	7,5	10	970	73,8	89,0	89,9	89,5	0,82	25,7	15,5	14,8	2,1	6,8	2,9	0,1020	134
108	3SIE 160L6	11	15	970	108,3	91,0	91,0	90,3	0,82	37,3	22,6	21,4	2,2	7,0	3,0	0,1230	146
109	3SIE 180L6	15	20	980	146,2	90,0	91,3	91,2	0,81	60,0	30,9	29,3	3,3	7,3	2,8	0,2760	198
110	3SIE 200L6A	18,5	25	988	179	91,3	92,0	91,7	0,81	63	38	36	2,0	5,8	2,4	0,50	285
111	3SIE 200L6B	22	30	987	213	91,7	92,2	92,2	0,82	73	44	42	2,0	5,7	2,1	0,64	309
112	3SIE 225M6	30	40	989	290	92,3	92,9	92,9	0,83	98	59	56	1,9	6,4	2,3	0,89	392
113	3SIE 250M6	37	50	991	356	92,2	93,4	93,3	0,82	121	73	70	2,0	6,7	2,6	1,23	440
114	3SIE 280S6	45	60	993	433	92,9	93,8	93,7	0,81	149	90	86	2,3	7,3	2,6	1,70	635
115	3SIE 280M6	55	75	992	529	93,8	94,4	94,1	0,82	179	108	103	2,3	6,8	2,6	1,90	695
116	3SIE 315S6	75	100	992	722	94,6	95,0	94,7	0,82	242	147	139	2,4	7,1	2,6	2,40	900
117	3SIE 315M6A	90	125	993	866	95,1	95,4	95,1	0,82	290	175	167	2,6	7,6	2,7	2,93	965
118	3SIE 315M6B	110	150	992	1059	95,2	95,6	95,2	0,82	354	214	203	2,8	7,5	2,8	3,46	1110
119	3SIE 315M6C	132	175	992	1271	95,4	95,8	95,4	0,83	-	253	241	2,5	7,0	2,5	4,21	1230
120	3SIE 315M6D	160	220	992	1540	95,2	95,7	95,6	0,78	-	-	310	3,3	8,0	2,7	4,36	1235
121	3SIE 355 ML6A	200	270	989	1931	95,4	95,9	95,8	0,86	-	-	350	2,0	7,1	2,3	7,20	1740
122	3SIE 355 ML6B	250	335	990	2412	95,6	96,0	95,8	0,86	-	-	438	2,1	7,2	2,4	8,60	1950
123	3SIE 355 H6C	315	430	992	3033	96,0	96,4	96,1	0,86	-	-	550	2,0	7,1	2,2	12,70	2390
124	3SIE 355 H6D	355	475	991	3421	95,9	96,3	96,1	0,86	-	-	620	1,9	7,0	2,3	13,60	2500
125	3SIE 355 H6E	375	505	991	3614	95,8	96,2	96,0	0,87	-	-	648	1,8	7,0	2,1	15,30	2620
126	Sh 355H6Es	400	540	992	3851	95,7	96,0	95,9	0,85	-	-	708	2,2	8,0	2,4	15,30	2600
127	Sh 400H6Cs	450	610	993	4328	95,8	96,3	96,0	0,83	-	-	815	1,5	7,5	2,5	19,4	3250
128	Sh 450H6As	500	680	994	4804	96,2	96,5	96,4	0,88	-	-	493 ²	1,2	6,7	2,6	36,5	3800
129	Sh 450H6Bs	560	760	994	5380	95,9	96,5	96,4	0,88	-	-	552 ²	1,2	6,8	2,6	40,6	4300
130	Sh 450H6Cs	630	850	994	6053	96,3	96,7	96,6	0,89	-	-	613 ²	1,3	7,0	2,6	45,0	4500
131	Sh 450H6Ds	710	960	994	6821	96,3	96,6	96,6	0,89	-	-	691 ²	1,4	7,4	2,6	50,0	4890
132	Sh 500H6As	800	1080	995	7678	96,5	96,9	96,8	0,86	-	-	804 ²	0,9	5,8	2,2	61,5	6200
133	Sh 500H6Bs	900	1210	995	8638	96,6	96,9	96,8	0,87	-	-	894 ²	1,0	6,0	2,2	71,0	6550
134	Sh 500H6Cs	1000	1350	995	9598	96,2	96,8	96,9	0,86	-	-	1004 ²	1,0	6,4	2,5	70,0	6700
135	Sh 500H6Ds	1120	1510	996	10739	96,1	96,8	97,0	0,85	-	-	1137 ²	1,1	7,0	2,6	80,0	7130
136	Sh 500H6Es	1250	1680	996	11985	96,2	96,9	97,0	0,85	-	-	1269 ²	1,1	7,1	2,6	84,9	7460
137	Sh 500H6Es	1300	1743	996	12465	96,3	96,9	97,0	0,85	-	-	1319 ²	1,1	6,9	2,5	84,9	7460

2 - at rated voltage 690V

Totally Enclosed Motors IP 55

Item	Type	Rated output		Rated speed	Rated torque	Efficiency			Power factor	Full load current		Locked rotor torque	Locked rotor current	Breakdown torque	Moment of inertia	Weight (IMB3)	
		P _N [kW]	n _N [min ⁻¹]			n _N [%] at % of full load	cos φ _N	I _N at rated voltage [A] _{230V} [A] _{380V} [A] _{400V}		T _L /T _N [-]	I _L /I _N [-]						
		2p=8 n_s=750 rpm f=50Hz															
138	Sh 63-8A	0,04	0,05	670	0,61	20	25	30	0,56	0,9	0,5	0,5	1,9	1,3	1,7	0,00024	3,5
139	Sh 63-8B	0,06	0,08	660	0,87	20	24	28	0,48	1,1	0,65	0,65	1,4	1,4	1,4	0,000307	4,1
140	Sh 71-8A	0,09	0,12	680	1,27	25	31	35	0,5	1,3	0,75	0,75	2,2	1,6	2,2	0,000736	4,7
141	Sh 71-8B	0,12	0,17	670	1,71	40	45	47	0,63	1,25	0,7	0,7	1,7	1,9	1,8	0,000946	5,6
142	Sh 80-8A	0,18	0,25	680	2,53	43	51	53	0,57	1,55	0,9	0,9	1,8	2,3	2,0	0,001693	7,5
143	Sh 80-8B	0,25	0,33	680	3,51	52	55	57	0,6	2,1	1,2	1,2	1,7	2,5	1,7	0,00207	8,9
144	Sh 90S-8	0,37	0,5	695	5,08	54,2	60,8	63,4	0,59	2,5	1,5	1,4	1,7	3,0	2,3	0,0021	13,4
145	Sh 90L-8	0,55	0,75	675	7,78	60,4	65,3	65	0,64	3,3	2	1,9	1,7	2,8	1,9	0,0024	15,3
146	Sg 100L-8A	0,75	1	710	10,1	65,9	70,5	71,1	0,66	4	2,4	2,3	1,5	3,5	1,9	0,009	23,6
147	Sg 100L-8B	1,1	1,5	705	14,9	67,6	71,8	72,2	0,65	5,9	3,6	3,4	1,6	3,6	1,9	0,01	26,3
148	Sg 112M-8	1,5	2	720	19,9	72,5	76,2	76,8	0,71	6,9	4,2	4,0	1,9	4,6	2,3	0,0192	53
149	Sg 132S-8	2,2	3	710	29,6	75,4	78,2	78	0,74	9,6	5,8	5,5	2,0	4,7	2,4	0,033	53
150	Sg 132M-8	3	4	710	40,4	78,5	80,7	80	0,74	12,7	7,7	7,3	2,3	5,0	3,0	0,044	65
151	Sg 160M-8A	4	5,5	705	54,2	81,5	82,7	81,5	0,76	16,2	9,8	9,3	2,2	5,0	2,7	0,06	85
152	Sg 160M-8B	5,5	7,5	710	74	82,1	83,7	83	0,75	22,2	13,4	12,8	2,7	5,5	3,0	0,077	95
153	Sg 160L-8	7,5	10	705	102	84,5	85,5	84,5	0,78	28,6	17,3	16,4	2,7	5,8	3,0	0,102	115
154	Sg 180L-8	11	15	730	144	87,7	89,2	89	0,76	40,8	24,7	23,5	2,0	5,5	2,4	0,213	165
155	2Sg 200L8	15	20	733	195	88,8	90	89,5	0,83	51	30,5	29,1	2,2	5,5	2,1	0,45	255
156	2Sg 225S8	18,5	25	735	240	88,8	90	89,5	0,81	64	39	37	2,0	5,6	2,0	0,58	280
157	2Sg 225M8	22	30	735	286	90,0	90,8	90,4	0,80	76	46	44	2,0	5,2	1,8	0,68	315
158	2Sg 250M8	30	40	738	388	91,0	92	91,5	0,84	98	59	56	2,5	6,3	2,1	1,27	430
159	2Sg 280S8	37	50	737	479	92,0	93,1	92,8	0,83	121	73	69	2,0	5,3	1,8	1,47	535
160	2Sg 280M8	45	60	737	583	92,0	92,8	92,5	0,84	145	88	84	2,1	5,4	2,0	1,8	590
161	2Sg 315S8	55	75	735	715	92,0	93,0	92,7	0,81	184	111	106	2,0	5,3	1,9	2,16	720
162	2Sg 315M8A	75	100	737	972	92,5	93,5	93,2	0,82	246	149	142	2,5	6,2	1,9	2,29	750
163	2Sg 315M8B	90	125	737	1166	92,5	93,5	93,2	0,82	296	179	170	2,4	6,5	1,9	2,86	840
164	SIE 315M8C ¹	110	150	737	1425	92,3	93,1	93,3	0,79	375	227	215	2,3	5,4	2,2	3,46	1105
165	SIE 315M8D ¹	132	175	734	1717	92,7	93,3	93,2	0,81	439	266	252	2,3	5,4	2,2	3,69	1136
166	SEE 355ML8A	160	220	739	2068	95,1	95,5	95,0	0,80	-	-	304	1,6	5,8	2,0	7,0	1680
167	SEE 355ML8B	200	270	740	2581	95,1	95,5	95,0	0,79	-	-	385	1,8	6,2	2,1	8,3	1750
168	Sh 355H8Ds	250	340	742	3218	95,3	95,8	95,4	0,78	-	-	485	1,3	6,0	2,0	12,9	2440
169	Sh 355H8Es	315	430	742	4054	95,1	95,5	95,3	0,78	-	-	612	1,3	6,0	2,0	16,0	2590
170	Sh 400H8Ds	355	480	742	4569	95,1	95,6	95,6	0,77	-	-	696	1,2	5,8	2,0	18,8	3200
171	Sh 400H8Es	400	540	742	5148	95,1	95,7	95,7	0,77	-	-	783	1,2	5,9	2,0	21,0	3350
172	Sh 450H8Bs	450	610	746	5761	95,2	96,0	96,1	0,78	-	-	502 ²	1,0	5,8	2,1	41,6	4400
173	Sh 450H8Cs	500	680	746	6401	95,3	96,1	96,2	0,78	-	-	558 ²	1,0	5,8	2,1	46,0	4600
174	Sh 450H8Ds	560	760	746	7169	95,4	96,2	96,3	0,78	-	-	624 ²	1,0	5,7	2,1	49,0	4770
175	Sh 450H8Es	630	850	746	8065	95,6	96,2	96,3	0,79	-	-	693 ²	1,0	5,6	2,0	53,8	4980
176	Sh 500H8Bs	710	960	746	9089	95,8	96,4	96,5	0,81	-	-	760 ²	1,0	6,0	2,4	92,4	6680
177	Sh 500H8Cs	800	1080	746	10241	95,8	96,4	96,5	0,80	-	-	867 ²	1,1	6,3	2,5	95,8	6800
178	Sh 500H8Ds	900	1210	746	11522	95,8	96,5	96,6	0,80	-	-	975 ²	1,0	6,0	2,4	108	7240
179	Sh 500H8Es	1000	1350	746	12802	95,8	96,6	96,6	0,80	-	-	1083 ²	1,1	6,5	2,5	118	7570

1 - with insulation class H

2 - at rated voltage 690V

Item	Type	Rated output		Rated speed	Rated torque	Efficiency			Power factor	Full load current			Locked rotor torque	Locked rotor current	Breakdown torque	Moment of inertia	Weight (MB3)
		P _N [kW]	n _N [HP]			T _N [Nm]	n _N [%] at % of full load	cos φ _N		I _N at rated voltage [A]230V	[A]380V	[A]400V					
2p=10 n_s=600 rpm f=50Hz																	
180	Sh 90S-10	0,25	0,34	560	4,3	44,9	51,3	55,6	0,51	2,2	1,3	1,3	1,8	2,2	2,0	0,0028	17
181	Sh 90L-10	0,37	0,50	565	6,3	50,7	58,9	63,4	0,56	2,6	1,6	1,5	1,9	2,3	2,15	0,0030	20
182	Sg 100L-10A	0,55	0,75	570	9,2	39,8	49,2	55,0	0,44	5,7	3,5	3,3	2,7	3,1	2,7	0,009	24
183	Sg 100L-10B	0,75	1,0	560	12,8	44,6	54,1	56,8	0,54	6,1	3,7	3,5	2,0	3,0	2,1	0,01	24,5
184	Sg 112M-10	0,75	1,0	550	13,0	42,6	52,1	71,3	0,65	4,1	2,5	2,3	2,5	3,1	2,5	0,0177	33
185	Sg 112M-10A	1,1	1,5	560	18,7	69,2	72,6	72,2	0,64	6,0	3,4	3,4	1,3	3,3	1,8	0,0180	32
186	Sg 132S-10	1,1	1,5	565	18,6	53,4	68,2	77	0,65	5,5	3,3	3,2	1,2	3,5	1,6	0,025	52
187	Sg 132S-10A	1,5	2,0	565	25,4	53,2	69,8	74	0,60	8,5	5,1	4,9	1,3	3,7	2,4	0,032	66
188	Sg 132S-10B	2,2	3,0	560	37,5	43,1	62,9	75	0,58	12,7	7,7	7,3	1,4	3,9	2,5	0,04	72
189	Sg 160L-10	5,5	7,5	575	91,4	76,1	79,9	80,9	0,56	30,5	18,4	17,5	1,9	4,8	2,6	0,096	125
190	Sg 180L-10	7,5	10,0	585	122	81,9	85,1	86	0,58	37,7	22,8	21,7	2,3	5,1	2,4	0,22	164
191	2Sg 200L10A	7,5	10	580	123	82,5	84	85	0,68	32,5	19,7	18,7	1,7	3,5	2,1	0,4	240
192	2Sg 200L10B	11	15	590	178	84,7	86,7	87,5	0,68	46,5	28,1	26,7	3,2	5,9	2,4	0,47	255
193	2Sg 225S10	13	18	592	210	87,5	89,3	90,5	0,67	54	32,5	31	1,8	3,8	2	0,6	280
194	2Sg 225M10	15	20	590	243	86	88	89	0,67	63	38	36,5	2,8	5,4	2	0,76	315
195	2Sg 225M10z	18,5	25	590	299	84,3	87,1	87,7	0,64	83	50	47,5	2,8	5,5	2,1	0,76	325
196	2Sg 250M10	22	30	592	355	87,5	89,6	90	0,70	88	53	50	3	5,8	2	1,27	430
197	2Sg 280S10A	30	40	586	489	85,3	87,3	88,8	0,71	119	72	69	2	4,5	1,7	1,35	525
198	2Sg 280S10B	37	50	583	606	87	90	91	0,75	136	82	78	1,9	4,5	1,5	1,61	565
199	2Sg 280M10	45	60	587	732	88	90,5	91,6	0,76	162	98	93	2	4,5	1,6	2,03	630
200	Sg 315S10	45	60	588	731	91,5	91,5	92,1	0,71	173	105	99	2	4,1	2	2,16	720
201	2Sg 315S10z	55	75	583	901	88	90,5	91,5	0,75	201	122	116	1,7	4,7	1,9	2,86	840
202	2Sg 315M10	75	100	583	1229	88	90,5	91,5	0,75	274	166	158	1,8	4,9	1,5	3,01	895
203	Sg 355S10A	90	125	592	1453	93,1	94,1	94,0	0,81	-	-	176	1,4	5,7	2,2	8,2	1250
204	Sg 355S10B	110	150	592	1774	93,8	94,6	94,4	0,79	-	-	213	1,4	5,8	2,4	10,3	1390
205	Sg 355M10A	132	175	592	2129	93,9	94,6	94,4	0,80	-	-	253	1,8	6,1	2,3	12,7	1620
206	Sg 355M10B	160	220	592	2581	93,7	94,7	94,7	0,83	-	-	294	1,8	6,3	2,4	14,1	1730
207	Sh 400H10As	200	270	594	3216	94,4	95,1	95,0	0,82	-	-	371	1,0	5,4	2,5	25,6	3010
208	Sh 400H10Bs	250	340	593	4019	94,6	95,2	95,1	0,82	-	-	463	1,1	5,6	2,4	28,5	3170
209	Sh 400H10Cs	315	430	593	5064	95,1	95,5	95,4	0,82	-	-	581	1,1	5,7	2,4	32,2	3350
210	Sh 450H10As	355	480	594	5708	94,9	95,6	95,5	0,81	-	-	384 ²	1,0	6,0	2,3	53,9	4130
211	Sh 450H10Bs	400	540	594	6431	94,9	95,6	95,6	0,81	-	-	432 ²	1,1	6,4	2,3	58,3	4300
212	Sh 500H10As	450	610	594	7235	95,0	95,7	95,6	0,81	-	-	486 ²	1,4	6,3	2,1	74,1	5420
213	Sh 500H10Bs	500	680	594	8039	95,1	95,8	95,7	0,82	-	-	533 ²	1,5	6,6	2,2	85,5	5700
214	Sh 500H10Cs	560	760	593	9019	95,4	95,9	95,8	0,82	-	-	597 ²	1,3	6,2	2,0	94,2	5950
215	Sh 500H10Ds	630	850	594	10129	95,3	95,8	95,8	0,82	-	-	671 ²	1,7	6,9	2,2	108	6400

2 - at rated voltage 690V