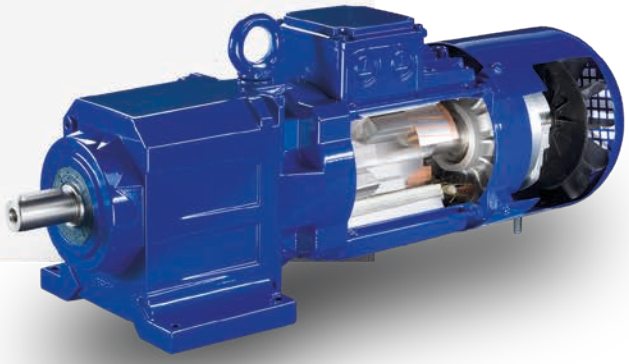
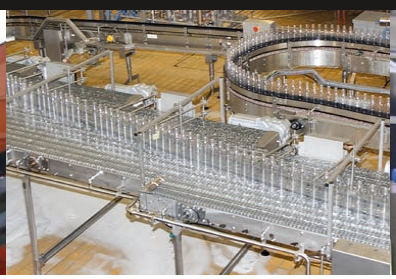
B2000 - Energy Saving Geared Motor Platform

Future proof investment



Bauer Gear Motor®
Altra Industrial Motion






Bauer Gear Motor

Electric motors account for around 50 per cent of the European Union's industrial energy demands. This corresponded to CO_2 emissions of around 578 million tonnes in 2020. By expanding the use of efficient motors under the regulation, an additional 40 million tonnes of CO2 will be saved annually, reducing the annual energy bill of EU households and industry by around EUR 20 billion by 2030.

Bauer Gear Motor welcomes the EU Directive

EU Directive 2009/125/EC (Ecodesign requirements for energy-related products) defines the conditions for these savings. The EU member states have given their support to the new rules for reducing the energy demands of industrial motors. Regulation (EU) 2019/1781 sets ecodesign requirements for electric motors and variable speed drives pursuant to Directive 2009/125/EC.

The ordinance sets out two stages:

From 1 July 2021, motors must comply as a minimum with MEPS (Minimum Efficiency Performance Standards) energy efficiency class IE2 (High Efficiency) in the power range ≥ 0.12 to < 0.75kW and IE3 (Premium Efficiency) for motors with rated power of ≥ 0.75 kW. From 1 July 2023, single-phase motors and Ex eb motors with increased safety must comply as a minimum with energy efficiency class IE2 (High Efficiency) for motors with rated power of ≥ 0.12 kW.

Company policy

We are also seeing our efforts in the field of ecodesign paying off. As Bauer Gear Motor pursues its objectives, it is also seeking to minimise both its consumption of raw materials and energy and its impact on the environment, while using resources efficiently. Bauer Gear Motor fully supports the Directive, especially as most of our developments take energy saving on board.

What does the EU directive mean?

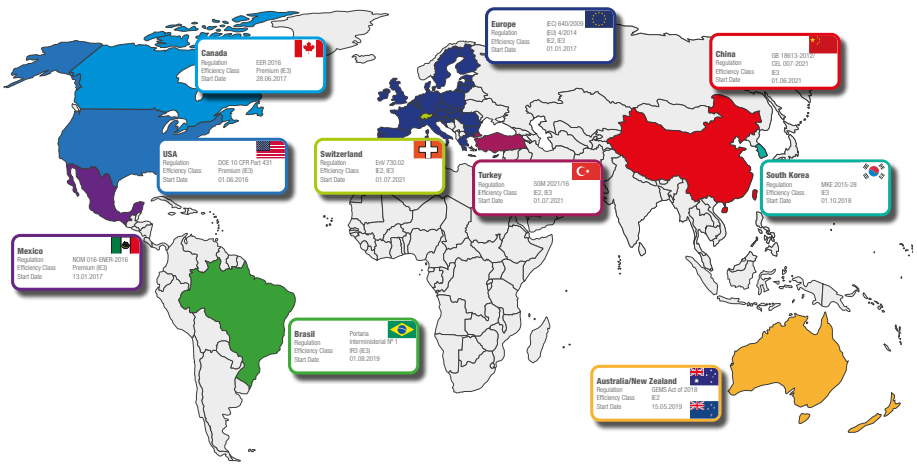
IEC 60034-30-1 is a global standard for energy-saving motors. The IEC 60034-30-1 standard is gradually being incorporated into national legislation worldwide as a basis for setting the minimum requirements for energy efficiency levels of electric motors. Electric motors account for approximately 1,470 TWh of the EU's total energy demands in 2020. Using energy-efficient motors would save around EUR 20 billion, reducing total cost of ownership (TCO) and global warming. Bauer Gear Motor PMSM drives already comply with the requirements of IE4 and IE5, as set out in the new technical specifications of IEC TS 60034-30-2.

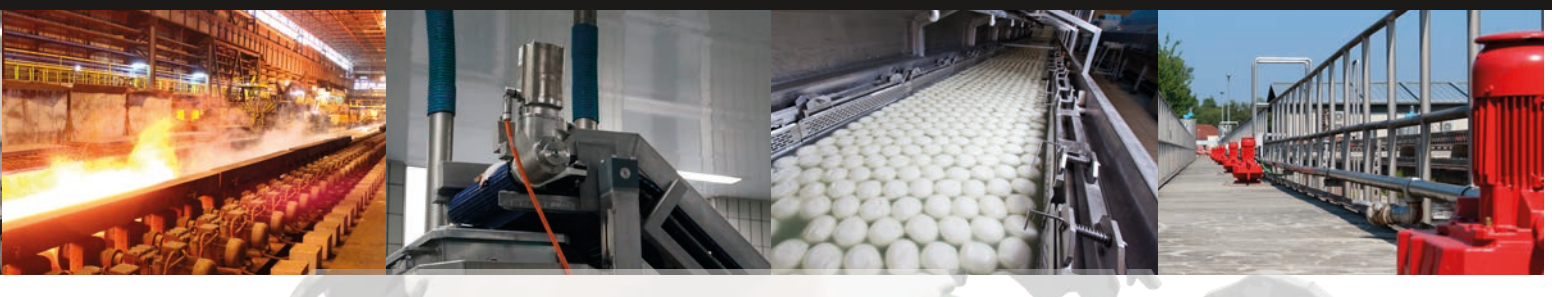
New IE (International Energy Efficiency) efficiency classes

were introduced at the beginning of 2009:

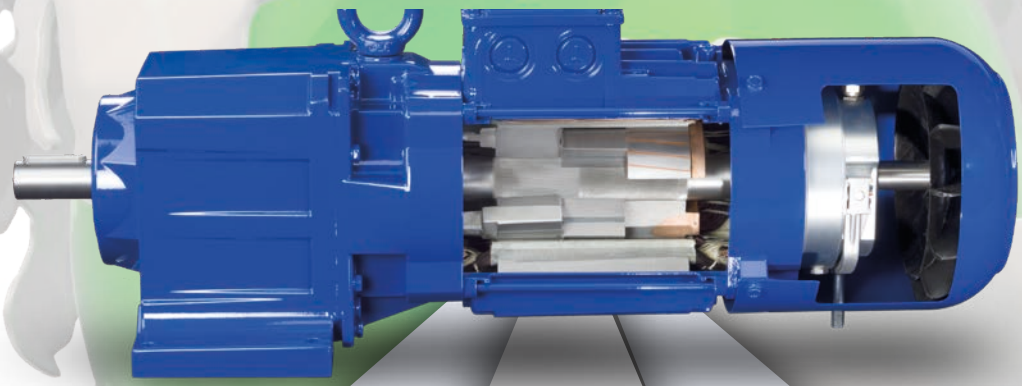
IE1 = Standard Efficiency
IE2 = High Efficiency
IE3 = Premium Efficiency
IE4 = Super Premium Efficiency
IE5

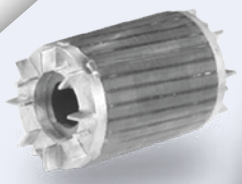
Worldwide Energy Efficiency Requirements





Comparison of the Motor Technologies





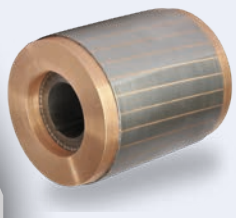
Aluminium

Reference Losses 100%

Permanent Magnet

No voltage induction in the rotor

- No heat losses in the rotor
- Rotor losses reduced by 100%
- Total losses reduced by approximately 25%
- Total efficiency increased by more than 10%
- Partial load efficiency increased by more than 30%
- Synchronous speed
- High starting torque

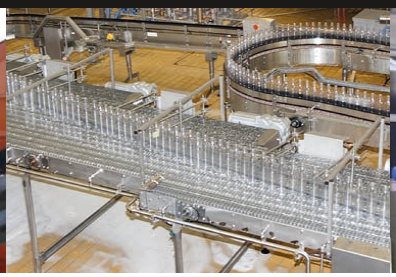


Copper

Higher electrical conductability of copper

- Rotor resistance reduces by 40%
- Heat losses in rotor reduced by 40%
- Total losses reduced by 10...15%
- Total efficiency increased by 1…2%






Investment security for the future

The Bauer Gear Motor range of motors offers trend-setting technologies for energy-efficient drives and for motor designs tailored to specific applications. The latter option enables highly efficient drive solutions without requiring additional space.

η	Advantages	Your benefits
Without	• Motor design according to duty • Small installation volume and minimum weight • Higher motor powers	• Economical • Small installation space • Efficient motor utilisation • Smaller motor frame size • Tailored to customer application
IE1	• Standard efficiency in continuous operation • Small installation volume and minimum weight	• Economical • Small installation space • Can be used universally in other EU countries
IE2	• Higher efficiency in continuous operation • Higher start-up torque	• Economical • Small installation space • Up to 34% more energy savings compared to IE1 • Lower rated motor power than IE1 for dynamic load applications • Short amortisation period
IE3	• Premium efficiency in continuous operation • Higher start-up torque	• Up to 18% more energy savings compared to IE2 • Already meets the minimum efficiency requirement of 2021/2023 today
IE4	• Super premium efficiency for variable speed operation • Speed control with very high efficiency • Small installation volume and minimum weight • Considerably better efficiency than IE3 motors, even under partial load conditions • High torque and power density • High overload capacity	• Up to 28% more energy savings compared to IE3 • Short amortisation period • Small installation space • Compact drive unit • More torque with same size motor frame • Requires smaller installation space with same power • Reduced number of variants thanks to higher efficiency over the entire torque range • Design security thanks to spare drive unit capacity • Technology leader • Already meets the efficiency requirements of future standards
IE5	• Speed control with highest possible efficiency • Small installation volume and minimal weight • Significantly better efficiency than IE3 motors, even in the partial load range • High torque and power density • High overload capacity	• Up to 59% more energy savings compared to IE3 • Short amortisation period • Small installation space • Compact drive unit • More torque with same size motor frame • Requires smaller installation space with same power • Reduced number of variants thanks to higher efficiency over the entire torque range • Design security thanks to spare drive unit capacity • Technology leader • Already meets the efficiency requirements of future standards

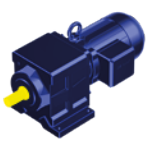
Short ROI (Return on Invest) times

Three different rotor technologies, which can be configured according to the required efficiency classes, ensure highly efficient drive solutions without requiring additional space. Bauer energy saving gear motors fully exploit the energy saving potential of the drive technology in modular and in application-specific standards. Using efficient gear variants optimises the saving potential as a gear motor unit still further and considerably speeds up the ROI.

P_N [kW]	IE1 [ASM]	IE2 [ASM]	IE3 [ASM]	IE4 [ASM]
0,03	D04LA4			
0,04	D04LA4			
0,06	D04LA4			
	D06LA4			
0,09	D04LA4			
	D06LA4			
0,11	D04LA4			
0,12	DSE04LA4	DHE05LA4	DPE05LA4	
		DHE06LA4	DPE06LA4	
0,18	DSE05LA4	DHE05LA4	DPE07LA4	
		DHE06LA4		
0,25	DSE06LA4	DHE07LA4	DPE08MA4	
0,37	DSE07LA4	DHE08MA4	DPE08LA4	
0,55	DSE08MA4	DHE08LA4	DPE08XA4	DPE08XB4
0,75	DSE08LA4	DHE08XA4	DPE08XB4	DPE09XA4
			DPE09LA4	
1,1	DSE08XA4	DHE09LA4	DPE09XA4	DPE09XB4
			DPE09XB4	
1,5	DSE09LA4	DHE09XA4	DPE09XB4	DPE09XB4C
2,2	DSE09XA4	DHE09XA4C	DPE09XB4C	DPE11LA4
			DPE11MA4	
			DPE11LB4	
3	DSE11SA4	DHE11MA4	DPE11LA4	DPE11LB4
			DPE11LB4	
4	DSE11MA4	DHE11LA4	DPE11LB4	DPE11LB4C
			DPE13MA4	
5,5	DSE11LA4	DHE11LA4C	DPE11LB4C	
			DPE13LA4	
			DPE13XA4	
7,5	DSE13MA4	DHE13LA4	DPE13XA4	
9,5	DSE13LA4	DHE16MB4	DPE16LB4	
11	DSE16MB4	DHE16LB4	DPE16LB4	
15	DSE16LB4	DHE16XB4	DPE16XB4	
18,5	DSE16XB4	DHE18LB4	DPE18LB4	
22	DSE18LB4	DHE18XB4	DPE18XB4	
30	DSE18XB4		DPE20XA4	
37			DPE22MA4	

P_N [kW]	IE1 [PMSM]	IE2 [PMSM]	IE3 [PMSM]	IE4 [PMSM]	IE5 [PMSM]
0,12				S4E04SA4-1	
0,157		SHE04SA4-1			
0,2					S5E04SA4-1
					S5E06MA4
0,25				S4E06MA4	S5E04SA4-1
0,315				S4E04SA4-1	
0,37	SSE06MA4			S4E06LA4	
0,4					S5E06MA4
0,55	SSE06LA4				S5E06MA4
0,75			SPE06MA4		S5E06LA4
0,78				S4E08MA4	
1,1			SPE08LA4	S4E06LA4	
1,55	SSE08LA4			S4E09SA4	S5E08MA4
2,2		SHE09SA4		S4E08MA4	S5E08LA4
					S5E09XA4
3				S4E11SA6	
3,1			SPE08LA4		
			SPE09XA4		
4			SPE11SA6	S4E09SA4	
4,2					S5E11MA6
5,5				S4E11SA6	S5E09XA4
				S4E11MA6	S5E11LA6
6,3					S5E09XA4
7,5			SPE11LA6	S4E11SA6	S5E11MA6
9,5					S5E11MA6
					S5E11LA6
11				S4E11MA6	S5E11LA6
15					S5E11LA6

Helical geared motor
BG-Series

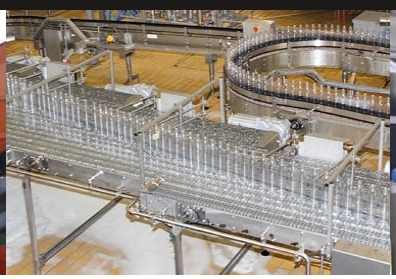


Shaft mounted geared motor
BF-Series

Bevel geared motor
BK-Series

Torque range: 20 - 18500 Nm - Power range: 0,03 kW - 75 kW






Target Orientated Decision Making

Purchasing

20%

Visible Costs

Control the Visible Costs

When considering total investment costs, the pure purchasing price of components is only a fraction of the total costs. We speak here about the budgeted costs which are, amongst others, administrative costs, transport and delivery, goods incoming, customs and even up to and including costs for returns.

Storage
Quality
Energy
Production
Logistics
Sales
Finance
Reliability
Maintenance
Spare Parts
Commissioning
Disposal

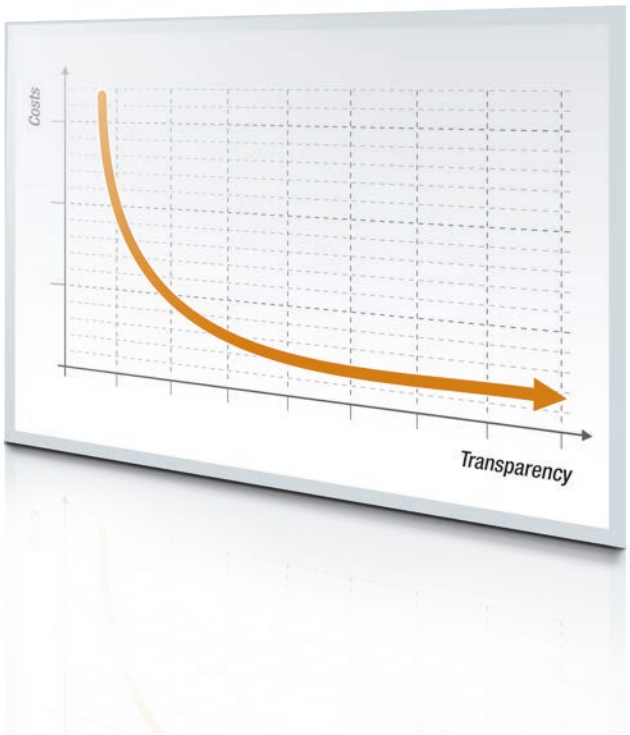
80%

Hidden Costs

Reduce the Hidden Costs

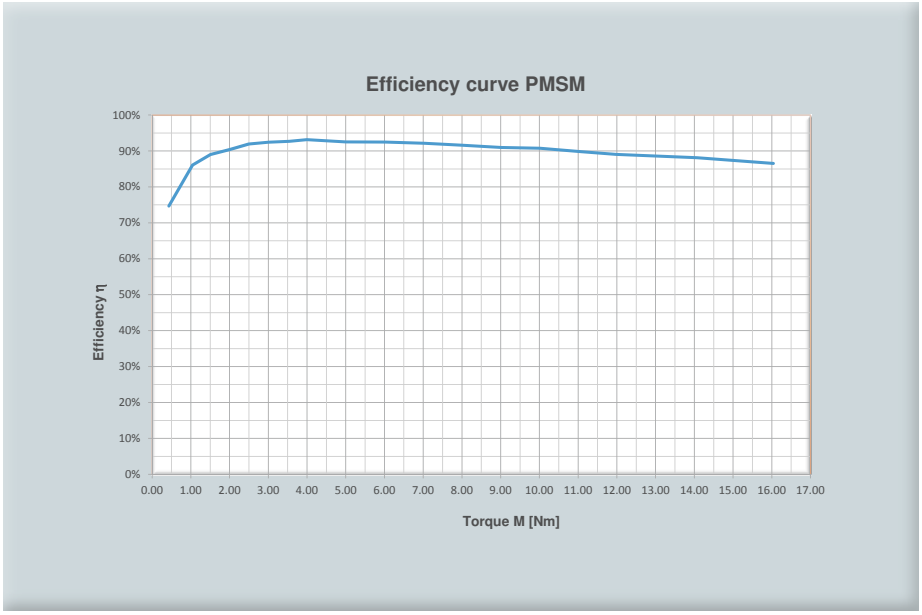
The majority are the so called „hidden costs“. These follow-up costs are influenced strongly dependent on the drive technology used. The sum of costing factors such as energy efficiency, servicing, stocking, maintenance, cleaning, downtime and spare parts, named here only as an example of the total costs, show the large variety of „hidden costs“.

BauerTCO

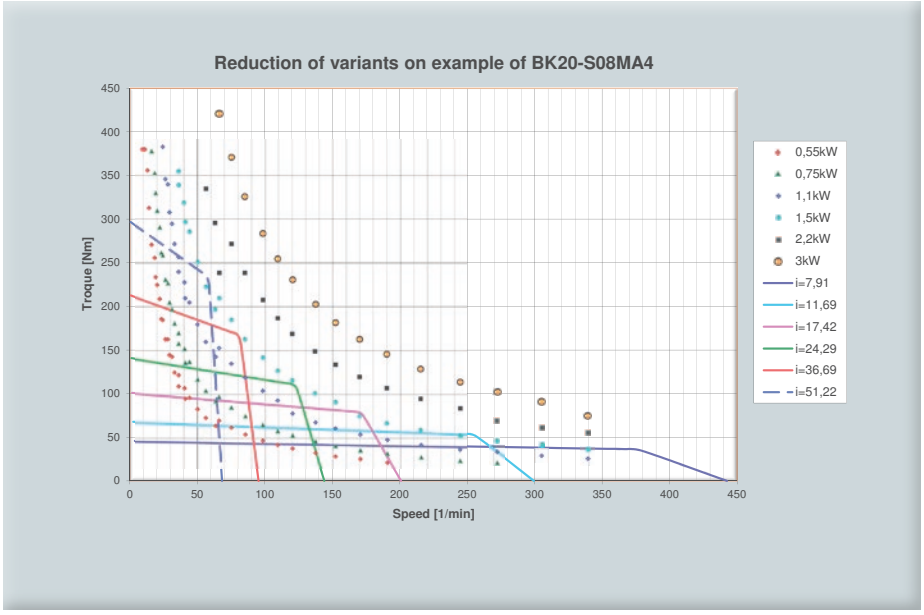


Advanced TCO assessment

Improvement of the working capital by . . .



. . . reduction of variants



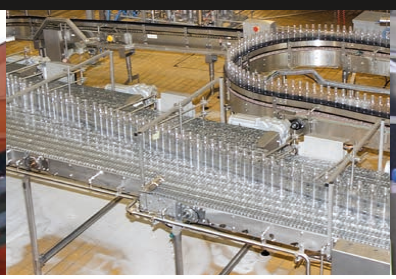
Correctly exploiting the energy savings potential opens up methods and resources for taking full advantage of the cost and variant optimisation opportunities that exist within the framework of the TCO assessment.

The highly efficient motor technologies have the considerable advantage that they demonstrate a constant level of efficiency with the correct control under very wide-ranging partial load conditions. In particular, a permanent magnet synchronous motor under partial load conditions with a load factor of up to 1:5 demonstrates a constant, and using current technology, highest level of efficiency of IE5 according to IEC TS 60034-30-2.

This offers for gear motors with the highest energy savings, the possibility of significantly reducing the variety of different asynchronous motors in the field.

The development of energy saving motors helps therefore not only to lower CO_2 emissions but also offers users the benefit of drastically reducing the complexity of the variants used as well as costs in relation to storage, logistics, servicing and repairs.






Permanent Magnet Synchronous Motors PMSM

The stator of a permanent magnet synchronous motor has the same structure as the stator of a three-phase asynchronous induction motor (ASM), with three separate phase windings. However, a PMSM has a rotor with embedded permanent magnets made from the rare-earth material, instead of the squirrel-cage rotor found in induction motors.

These permanent magnets and the resulting constant magnetic field eliminate the need for inducing a magnetic field in the rotor in order to produce torque, and they eliminate the need for a speed difference (slip) between the rotating fields of the stator and the rotor, which is required in an induction motor. The rotor rotates synchronously with the rotating field of the stator.

A synchronous motor cannot start up by itself when connected to the mains, due to the inertia of the rotor and the high speed of the rotating stator field. Magnetic coupling between the two components is not possible under these conditions. Consequently, the rotor must be brought up to the speed of the rotating field. A frequency converter allows this to be done by increasing the speed of the rotating field in a controlled manner while maintaining magnetic coupling between the stator and the rotor.

Synchronous motors run at constant speed independent of the load. The torque of a synchronous motor is proportional to the current. The input current necessary for the required torque is determined from the rotor position and the motor data on the following page. This requires a field-oriented frequency converter with a suitable algorithm for controlling synchronous motors.

PM synchronous motors have considerably higher power density and much better efficiency than induction motors. For geared motors, this yields higher system efficiency with minimal installation volume. PMSM drives can produce higher torques with the same installation volume, which may allow a smaller motor size to be used in some applications.

Your benefit:

- Small installation volume and minimal weight
- Extremely high efficiency under rated operating conditions
- Considerably better efficiency than induction motors, even under partial load conditions
- High torque density and power density
- High overload capacity
- Lower life-cycle costs
- Clear operating cost saving potential (resulting in a smaller CO2 footprint)
- Short payback time
- Futureproof Investment

Motor technologies IE1• IE2 • IE3 • IE4 • IE5

IE-Class \ kW	0,12	0,18	0,25	0,37	0,55	0,75	1,1	1,5	2,2	3	4	5,5	7,5	9,5	11	15	18,5	22	30	37
IE1 Asynchronous	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
IE2 Asynchronous	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
IE3 Asynchronous	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
IE4 Asynchronous					●	●	●	●	●	●	●	◐	◐	◐	◐	◐	◐	◐		
IE3 PMSM						●	●			●	●		●							
IE4 PMSM	●		●	●		●	●	●	●	●	●	●	●		●					
IE5 PMSM		●	●	●	●	●		●	●		●	●	●	●	●	●				

Technical data

All motors: converter supply voltage 380 to 500 V

Motor data sheet: S09SA4 (example)		
Rated power P_N	1.55	kW
Rated torque M_n	10	Nm
Rated current I_n	3	A
Motor poles 2p	4	
Rated speed n_n	1500	rpm
Rated frequency	50	Hz
Motor efficiency η	88.2	%
Motor connection	Y	
Phase-to-phase resistance U–V R_{20}	9.9	ohm
Winding resistance Rs_{20}	4.95	ohm
D-axis inductance L_d	64.1	mH
Q-axis inductance L_q	110	mH
Reverse EMF constant k_e	208	V / 1000 rpm
Torque constant k_t	3.3	Nm/A
Peak torque $M_{max\ (60s)}$	20	Nm
Peak current $I_{max\ (60s)}$	6.4	A
Moment of inertia	0.00245	kgm²
Connection voltage inverter min.	380	V

Reverse EMF constant ke:

The reverse EMF is the voltage induced in the rotor by the magnetic field of the stator. It depends on the rotational speed of the rotor.

Torque constant kt:

Ratio of motor torque to motor current in amperes [A].

D-axis inductance Ld:

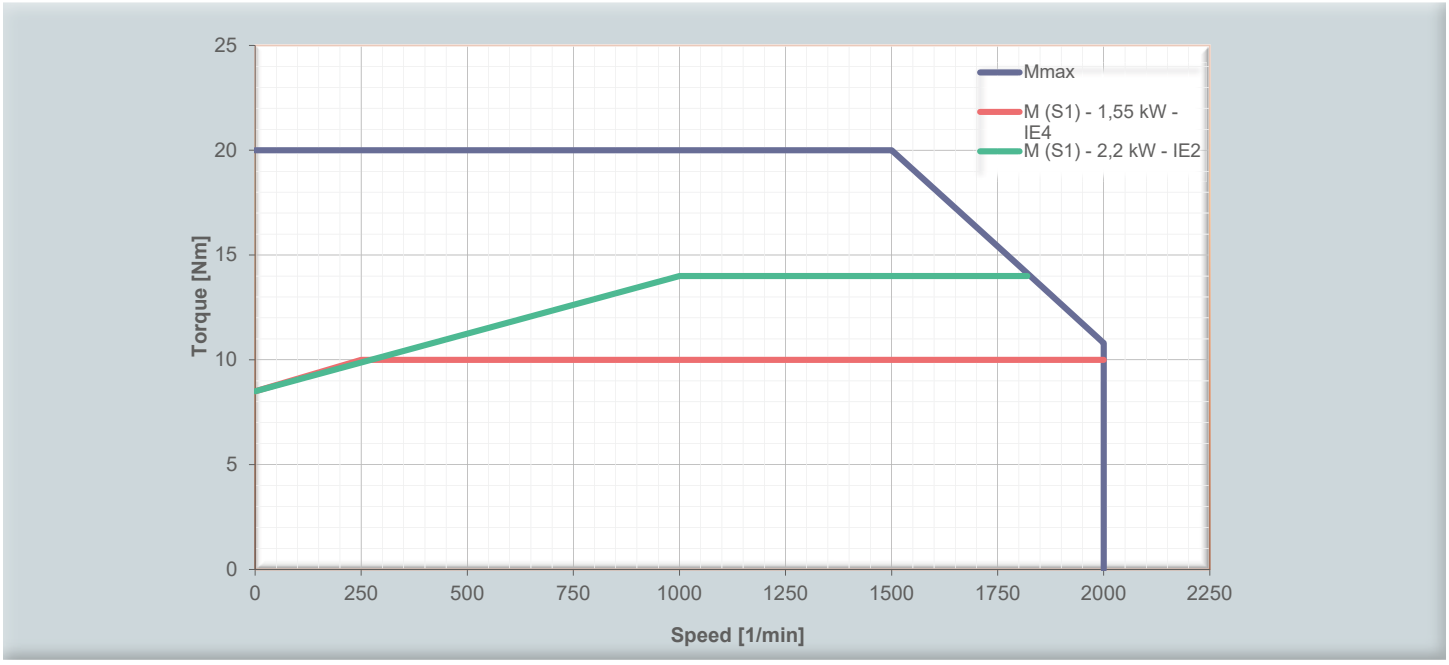
The inductance in the direction of current component id, which generates the magnetic flux.

Q-axis inductance Lq:

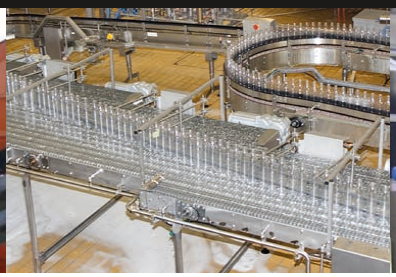
The inductance in the direction of current component iq, which generates the torque.

Inductance

A measure of the ability of an electrical conductor to produce a magnetic field.








Technical Data S04 — Standard

Motor Data (ventilated)							S..04SA4
Rated power P_n	kW		0.12	0.157	0.2	0.25	0.315
Rated torque M_n	Nm		0.76	1	0.65	0.8	1
Rated current I_n	A		0.41	0.54	0.52	0.64	0.8
Motor poles 2p			4	4	4	4	4
Rated speed n_n	1/min		1500	1500	3000	3000	3000
Rated frequency	Hz		50	50	100	100	100
Motor efficiency η	%		IE4-67.4	IE2-61.4	IE5-80.3	IE5-78.5	IE4-74.5
Motor connection			Y	Y	Y	Y	Y
Phase-to-phase resistance U-V R_{20}	Ohm		154.4	154.4	70.6	70.6	70.6
Winding resistance Rs_{20}	Ohm		77.2	77.2	35.3	35.3	35.3
D-axis inductance D L_d	mH		268	268	120	120	120
D-axis inductance Q L_q	mH		412	412	185	185	185
Reverse EMF constant k_e	V/1000 1/min		120	120	80	80	80
Torque constant k_t	Nm/A		1.85	1.85	1.25	1.25	1.25
Peak torque $M_{max\ (60s)}$	Nm		1.6	1.6	1.6	1.6	1.6
Peak current $I_{max\ (60s)}$	A		0.86	0.86	1.3	1.3	1.3
Moment of inertia	kgm²		0.00014				
Data Inverter Duty							
Speed [1/min]			Torque [Nm]				
150			0.76	0.76	0.65	0.76	0.76
500			0.76	0.85	0.65	0.8	0.85
1000			0.76	1	0.65	0.8	0.8
1500 to 1800			0.76	1	-	-	--
3000 to 3600			-	-	0.65	0.8	1

Motor Data (non-ventilated)							S..U04SA4
Rated power P_n	kW			0.12	0.12	0.18	0.2
Rated torque M_n	Nm			0.76	0.38	0.58	0.65
Rated current I_n	A			0.42	0.33	0.49	0.54
Motor poles 2p				4	4	4	4
Rated speed n_n	1/min			1500	3000	3000	3000
Rated frequency	Hz			50	100	100	100
Motor efficiency η	%			IE3-66.0	IE5-82.2	IE5-80.0	IE5-79.1
Motor connection				Y	Y	Y	Y
Phase-to-phase resistance U-V R_{20}	Ohm			154.4	70.6	70.6	70.6
Winding resistance Rs_{20}	Ohm			77.2	35.3	35.3	35.3
D-axis inductance D L_d	mH			268	120	120	120
D-axis inductance Q L_q	mH			412	185	185	185
Reverse EMF constant k_e	V/1000 1/min			120	80	80	80
Torque constant k_t	Nm/A			1.85	1.2	1.2	1.2
Peak torque $M_{max\ (60s)}$	Nm			1.2	1	1	1
Peak current $I_{max\ (60s)}$	A			0.67	0.85	0.85	0.85
Moment of inertia	kgm²			0.00014			
Data Inverter Duty							
Speed [1/min]				Torque [Nm]			
150				0.76	0.38	0.58	0.65
500				0.76	0.38	0.58	0.65
1000				0.76	0.38	0.58	0.65
1500 to 1800				0.76	-	-	-
3000 to 3600				-	0.38	0.58	0.65

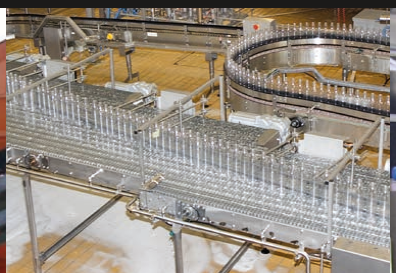
Technical Data S06

Standard

Motor Data (ventilated)							S..06MA4
Rated power P_n	kW	0.2	0.25	0.37	0.4	0.55	0.75
Rated torque M_n	Nm	1.3	1.6	2.4	1.3	1.75	2.4
Rated current I_n	A	0.55	0.67	1	1	1.35	1.85
Motor poles 2p		4	4	4	4	4	4
Rated speed n_n	1/min	1500	1500	1500	3000	3000	3000
Rated frequency	Hz	50	50	50	100	100	100
Motor efficiency η	%	IE5-79.6	IE4-76.6	IE1-66.1	IE5-86.2	IE5-84.0	IE3-78.6
Motor connection		Y	Y	Y	Y	Y	Y
Phase-to-phase resistance U-V R_{20}	Ohm	79	79	79	24.6	24.6	24.6
Winding resistance Rs_{20}	Ohm	39.5	39.5	39.5	12.3	12.3	12.3
D-axis inductance D L_d	mH	171	171	171	52.3	52.3	52.3
D-axis inductance Q L_q	mH	271	271	271	83.3	83.3	83.3
Reverse EMF constant k_e	V/1000 1/min	152	152	152	84	84	84
Torque constant k_t	Nm/A	2.4	2.4	2.4	1.3	1.3	1.3
Peak torque $M_{max\ (60s)}$	Nm	3.8	3.8	3.8	3.8	3.8	3.8
Peak current $I_{max\ (60s)}$	A	1.6	1.6	1.6	3	3	3
Moment of inertia	kgm²	0.0002					
Data Inverter Duty							
Speed [1/min]		Torque [Nm]					
150		1.3	1.6	1.8	1.3	1.75	1.8
500		1.3	1.6	2	1.3	1.75	2
1000		1.3	1.6	2.2	1.3	1.75	2.2
1500 to 1800		1.3	1.6	2.4	-	-	-
3000 to 3600		-	-	-	1.3	1.75	2.4

Motor Data (non-ventilated)							S..U06MA4
Rated power Pn	kW	0.18	0.2	0.25	0.25	0.37	0.4
Rated torque Mn	Nm	1.15	1.3	1.6	0.8	1.2	1.3
Rated current In	A	0.49	0.55	0.68	0.63	0.93	1
Motor poles 2p		4	4	4	4	4	4
Rated current nn	1/min	1500	1500	1500	3000	3000	3000
Rated frequency	Hz	50	50	50	100	100	100
Motor efficiency η	%	IE5-80.8	IE5-79.1	IE4-75.5	IE5-87.8	IE5-86.6	IE5-86.3
Motor connection		Y	Y	Y	Y	Y	Y
Phasenwiderstand U-V R20	Ohm	79	79	79	24.6	24.6	24.6
Phase-to-phase resistance U-V Rs20	Ohm	39.5	39.5	39.5	12.3	12.3	12.3
D-axis inductance D Ld	mH	171	171	171	52.3	52.3	52.3
D-axis inductance Q Lq	mH	271	271	271	83.3	83.3	83.3
Reverse EMF constant ke	V/1000 1/min	152	152	152	84	84	84
Torque constant kt	Nm/A	2.35	2.35	2.35	1.3	1.3	1.3
Peak torque Mmax (60s)	Nm	2.6	2.6	2.6	2.8	2.8	2.8
Peak current Imax (60s)	A	1.1	1.1	1.1	2.2	2.2	2.2
Moment of inertia	kgm²	0.0002					
Data Inverter Duty							
Speed [1/min]		Torque [Nm]					
150		1.15	1.3	1.6	0.8	1.2	1.3
500		1.15	1.3	1.6	0.8	1.2	1.3
1000		1.15	1.3	1.6	0.8	1.2	1.3
1500 to 1800		1.18	1.3	1.6	-	-	-
3000 to 3600		-	-	-	0.8	1.2	1.3






Technical Data S06 — Standard

Motor Data (ventilated)							S..06LA4
Rated power P_n	kW		0.37	0.4	0.55	0.75	1.1
Rated torque M_n	Nm		2.4	2.6	3.5	2.4	3.5
Rated current I_n	A		1.03	1.12	1.5	1.9	2.8
Motor poles 2p			4	4	4	4	4
Rated speed n_n	1/min		1500	1500	1500	3000	3000
Rated frequency	Hz		50	50	50	100	100
Motor efficiency η	%		IE4-81.0	IE4-79.8	IE1-74.1	IE5-88.3	IE4-84.0
Motor connection			Y	Y	Y	Y	Y
Phase-to-phase resistance U-V R_{20}	Ohm		37.2	37.2	37.2	11.5	11.5
Winding resistance Rs_{20}	Ohm		18.6	18.6	18.6	5.75	5.75
D-axis inductance D L_d	mH		99.5	99.5	99.5	29.4	29.4
D-axis inductance Q L_q	mH		133	133	133	40.1	40.1
Reverse EMF constant k_e	V/1000 1/min		148	148	148	80.3	80.3
Torque constant k_t	Nm/A		2.3	2.3	2.3	1.25	1.25
Peak torque $M_{max\ (60s)}$	Nm		5.6	5.6	5.6	5.6	5.6
Peak current $I_{max\ (60s)}$	A		2.4	2.4	2.4	4.5	4.5
Moment of inertia	kgm^2		0.0002				
Data Inverter Duty							
Speed [1/min]			Torque [Nm]				
150			2.4	2.5	2.5	2.4	2.5
500			2.4	2.6	2.9	2.4	2.9
1000			2.4	2.6	3.5	2.4	3.5
1500 to 1800			2.4	2.6	3.5	-	3.5
3000 to 3600			-	-	-	2.4	3.5

Motor data (non ventilated)							S..U06LA4
Rated power P_n	kW				0.25	0.37	0.55
Rated torque M_n	Nm				1.6	2.4	1.75
Rated current I_n	A				0.7	1.05	1.45
Motor poles 2p					4	4	4
Rated speed n_n	1/min				1500	1500	3000
Rated frequency	Hz				50	50	100
Motor efficiency η	%				IE5-85.5	IE4-80.0	IE5-87.9
Motor connection					Y	Y	Y
Phase-to-phase resistance U-V R_{20}	Ohm				37.2	37.2	11.5
Winding resistance Rs_{20}	Ohm				18.6	18.6	5.75
D-axis inductance D L_d	mH				99.5	99.5	29.4
D-axis inductance Q L_q	mH				133	133	40.1
Reverse EMF constant k_e	V/1000 1/min				148	148	80.3
Torque constant k_t	Nm/A				2.3	2.3	1.2
Peak torque $M_{max\ (60s)}$	Nm				3.8	3.8	3.8
Peak current $I_{max\ (60s)}$	A				1.7	1.7	3.2
Moment of inertia	kgm^2				0.0002		
Data Inverter Duty							
Speed [1/min]					Torque [Nm]		
150					1.6	2.4	1.75
500					1.6	2.4	1.75
1000					1.6	2.4	1.75
1500 to 1800					1.6	2.4	-
3000 to 3600					-	-	1.75

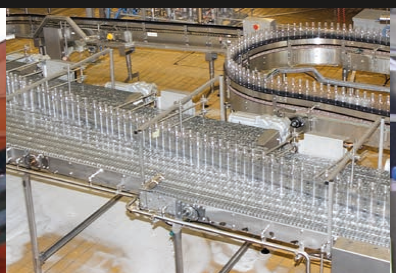
Technical Data S08

Standard

Motor Data (ventilated)							S..08MA4
Rated power P_n	kW		0.78	1.18	1.65	1.55	2.2
Rated torque M_n	Nm		5	5	7	5	7
Rated current I_n	A		1.8	3.1	4.3	3.5	4.8
Motor poles 2p			4	4	4	4	4
Rated speed n_n	1/min		1500	2250	2250	3000	3000
Rated frequency	Hz		50	75	75	1000	100
Motor efficiency η	%		IE4-85.7	IE5-87.9	IE3-83.8	IE5-91.2	IE4-88.8
Motor connection			Y	D	D	Y	Y
Phase-to-phase resistance U-V R_{20}	Ohm		18.7	6.23	6.23	4.73	4.73
Winding resistance Rs_{20}	Ohm		9.35	9.35	9.35	2.36	2.36
D-axis inductance D L_d	mH		97	34	34	24.7	24.7
D-axis inductance Q L_q	mH		170	57	57	43.5	43.5
Reverse EMF constant k_e	V/1000 1/min		180	103	103	90	90
Torque constant k_t	Nm/A		2.8	1.6	1.6	1.45	1.45
Peak torque $M_{max\ (60s)}$	Nm		10	10	10	10	10
Peak current $I_{max\ (60s)}$	A		3.7	6.4	6.4	7.5	7.5
Moment of inertia	kgm²		0.00115				
Data Inverter Duty							
Speed [1/min]			Torque [Nm]				
150			5	5	5	5	5
500			5	5	5.9	5	5.9
1000			5	5	7	5	7
1500 to 1800			5	5	7	5	7
2250 to 2600			-	5	7	5	7
3000 to 3600			-	-	-	5	7

Motor Data (non-ventilated)							S..U08MA4
Rated power P_n	kW				0.55	0.82	1.1
Rated torque M_n	Nm				3.5	3.5	3.5
Rated current I_n	A				1.28	2.25	2.55
Motor poles 2p					4	4	4
Rated speed n_n	1/min				1500	2250	3000
Rated frequency	Hz				50	75	100
Motor efficiency η	%				IE5-87.2	IE5-88.4	IE5-90.8
Motor connection					Y	D	Y
Phase-to-phase resistance U-V R_{20}	Ohm				18.7	6.23	4.73
Winding resistance Rs_{20}	Ohm				9.35	9.35	2.36
D-axis inductance D L_d	mH				97	34	24.7
D-axis inductance Q L_q	mH				170	57	43.5
Reverse EMF constant k_e	V/1000 1/min				180	103	90
Torque constant k_t	Nm/A				2.7	1.4	1.4
Peak torque $M_{max\ (60s)}$	Nm				10	10	10
Peak current $I_{max\ (60s)}$	A				3.7	6.4	7.5
Moment of inertia	kgm²				0.00115		
Data Inverter Duty							
Speed [1/min]					Torque [Nm]		
150					3.5	3.5	3.5
500					3.5	3.5	3.5
1000					3.5	3.5	3.5
1500 to 1800					3.5	3.5	3.5
2250 to 2600					-	3.5	3.5
3000 to 3600					-	-	3.5






Technical Data S08 — Standard

Motor Data (ventilated)							S..08LA4
Rated power P_n	kW	1.1	1.55	1.65	2.35	2.2	3.1
Rated torque M_n	Nm	7	10	7	10	7	10
Rated current I_n	A	2.6	3.6	4.7	6.6	5.2	7.4
Motor poles 2p		4	4	4	4	4	4
Rated speed n_n	1/min	1500	1500	2250	2250	3000	3000
Rated frequency	Hz	50	50	75	75	100	100
Motor efficiency η	%	IE3 - 85.4	IE1-80.5	IE4-85.9	IE1-81.4	IE5-89.2	IE3-86.9
Motor connection		Y	Y	D	D	Y	Y
Phase-to-phase resistance U-V R_{20}	Ohm	11	11	3.67	3.67	2.82	2.82
Winding resistance Rs_{20}	Ohm	5.5	5.5	5.5	5.5	1.41	1.41
D-axis inductance D L_d	mH	70	70	24	24	16.8	16.8
D-axis inductance Q L_q	mH	117	117	39	39	29.6	29.6
Reverse EMF constant k_e	V/1000 1/min	171	171	99	99	87	87
Torque constant k_t	Nm/A	2.75	2.8	1.5	1.5	1.35	1.35
Peak torque $M_{max\ (60s)}$	Nm	15	15	14	14	15	15
Peak current $I_{max\ (60s)}$	A	5.6	5.6	9.5	9.5	11.2	11.2
Moment of inertia	kgm²	0.0015					
Data Inverter Duty							
Speed [1/min]		Torque [Nm]					
150		6.5	6.5	6.5	6.5	6.5	6.5
500		7	8	7	8	7	8
1000		7	10	7	10	7	10
1500 to 1800		7	10	7	10	7	10
2250 to 2600		-	-	7	10	7	10
3000 to 3600		-	-	-	-	7	10

Motor Data (non-ventilated)							S..U08LA4
Rated power P_n	kW				0.78	1.18	1.55
Rated torque M_n	Nm				5	5	5
Rated current I_n	A				1.9	3.6	3.9
Motor poles 2p					4	4	4
Rated speed n_n	1/min				1500	2250	3000
Rated frequency	Hz				50	75	100
Motor efficiency η	%				IE5-86.9	IE5-86.5	IE5-88.9
Motor connection					Y	D	Y
Phase-to-phase resistance U-V R_{20}	Ohm				11	3.67	2.82
Winding resistance Rs_{20}	Ohm				5.5	5.5	1.41
D-axis inductance D L_d	mH				70	24	16.8
D-axis inductance Q L_q	mH				117	39	29.6
Reverse EMF constant k_e	V/1000 1/min				171	99	87
Torque constant k_t	Nm/A				2.6	1.4	1.3
Peak torque $M_{max\ (60s)}$	Nm				15	14	15
Peak current $I_{max\ (60s)}$	A				5.6	9.5	11.2
Moment of inertia	kgm²				0.0015		
Data Inverter Duty							
Speed [1/min]					Torque [Nm]		
150					5	5	5
500					5	5	5
1000					5	5	5
1500 to 1800					5	5	5
2250 to 2600					-	5	5
3000 to 3600					-	-	5

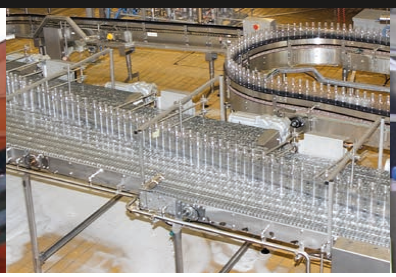
Technical Data S09

Standard

Motor Data (ventilated)							S..09SA4
Rated power P_n	kW		1.55	2.2	2.35	3	4
Rated torque M_n	Nm		10	14	10	13	13
Rated current I_n	A		3	4.3	5.3	6.9	8
Motor poles 2p			4	4	4	4	4
Rated speed n_n	1/min		1500	1500	2250	2250	3000
Rated frequency	Hz		50	50	75	75	100
Motor efficiency η	%		IE4 - 88.2	IE2 - 83.9	IE5 - 89.3	IE3 - 86.8	IE4 - 89.7
Motor connection			Y	Y	D	D	Y
Phase-to-phase resistance U-V R_{20}	Ohm		9.9	9.9	3.3	3.3	2.42
Winding resistance Rs_{20}	Ohm		4.95	4.95	4.95	4.95	1.21
D-axis inductance D L_d	mH		64.1	64.1	21.4	21.4	15.5
D-axis inductance Q L_q	mH		110	110	36.6	36.6	27.6
Reverse EMF constant k_e	V/1000 1/min		208	208	120	120	103
Torque constant k_t	Nm/A		3.3	3.3	1.9	1.9	1.63
Peak torque $M_{max\ (60s)}$	Nm		20	20	20	20	20
Peak current $I_{max\ (60s)}$	A		6.4	6.4	11	11	12.5
Moment of inertia	kgm²		0.00245				
Data Inverter Duty							
Speed [1/min]			Torque [Nm]				
150			8.5	8.5	8.5	8.5	8.5
500			10	10	10	10	10
1000			10	14	10	13	13
1500 to 1800			10	14	10	13	13
2250 to 2600			-	-	10	13	13
3000* to 3600**			-	-	-	-	13

Motor Data (non-ventilated)							S..U09SA4
Rated power P_n	kW				1.1	1.65	2.2
Rated torque M_n	Nm				7	7	7
Rated current I_n	A				2.2	3.75	4.45
Motor poles 2p					4	4	4
Rated speed n_n	1/min				1500	2250	3000
Rated frequency	Hz				50	75	100
Motor efficiency η	%				IE5 - 90.8	IE5 - 91.3	IE5 - 91.9
Motor connection					Y	D	Y
Phase-to-phase resistance U-V R_{20}	Ohm				9.9	3.3	2.42
Winding resistance Rs_{20}	Ohm				4.95	4.95	1.21
D-axis inductance D L_d	mH				64.1	21.4	15.5
D-axis inductance Q L_q	mH				110	36.6	27.6
Reverse EMF constant k_e	V/1000 1/min				208	1120	103
Torque constant k_t	Nm/A				3.2	1.85	1.6
Peak torque $M_{max\ (60s)}$	Nm				20	20	20
Peak current $I_{max\ (60s)}$	A				6.4	11	12.5
Moment of inertia	kgm²				0.00245		
Data Inverter Duty							
Speed [1/min]					Torque [Nm]		
150					7	7	7
500					7	7	7
1000					7	7	7
1500 to 1800					7	7	7
2250 to 2600					-	7	7
3000 to 3600					-	-	7






Technical Data S09

Standard

Motor Data (ventilated)							S..09XA4
Rated power P_n	kW		2.2	3.1	4.1	5.5	6.3
Rated torque M_n	Nm		14	20	17.5	17.5	20
Rated current I_n	A		4.2	5.9	9.2	10.5	12
Motor poles 2p			4	4	4	4	4
Rated speed n_n	1/min		1500	1500	2250	3000	3000
Rated frequency	Hz		50	50	75	100	100
Motor efficiency η	%		IE5 - 90.3	IE3 - 88	IE4 - 89.4	IE5 – 92.5	IE5 - 92
Motor connection			Y	Y	D	Y	Y
Phase-to-phase resistance U-V R_{20}	Ohm		5.25	5.25	1.75	1.31	1.31
Winding resistance Rs_{20}	Ohm		2.63	2.63	2.63	0.66	0.66
D-axis inductance D L_d	mH		41.2	41.2	13.8	12.7	12.7
D-axis inductance Q L_q	mH		70.1	70.1	24.4	17.9	17.9
Reverse EMF constant k_e	V/1000 1/min		209	209	120	102	102
Torque constant k_t	Nm/A		3.35	3.35	1.9	1.67	1.67
Peak torque $M_{max\ (60s)}$	Nm		31	31	29	30	30
Peak current $I_{max\ (60s)}$	A		10	10	16	20	20
Moment of inertia	kgm^2		0.0038				
Data Inverter Duty							
Speed [1/min]			Torque [Nm]				
150			13	13	13	13	12.5
500			14	16	16	16	15.7
1000			14	20	17.5	17.5	20
1500 to 1800			14	20	17.5	17.5	20
2250 to 2600			-	-	17.5	17.5	20
3000* to 3600**			-	-	-	17.5	20 / **17.5

Motor Data (non-ventilated)							S..U09XA4
Rated power P_n	kW				1.55	2.35	3.1
Rated torque M_n	Nm				10	10	10
Rated current I_n	A				3.1	5.5	6.3
Motor poles 2p					4	4	4
Rated speed n_n	1/min				1500	2250	3000
Rated frequency	Hz				50	75	100
Motor efficiency η	%				IE5 - 89.9	IE5 - 90.6	IE5 - 92.8
Motor connection					Y	D	Y
Phase-to-phase resistance U-V R_{20}	Ohm				5.25	1.75	1.31
Winding resistance Rs_{20}	Ohm				2.63	2.63	0.66
D-axis inductance D L_d	mH				41.2	13.8	12.7
D-axis inductance Q L_q	mH				70.1	24.4	17.9
Reverse EMF constant k_e	V/1000 1/min				209	120	102
Torque constant k_t	Nm/A				3.2	1.8	1.6
Peak torque $M_{max\ (60s)}$	Nm				30	30	30
Peak current $I_{max\ (60s)}$	A				10	16	20
Moment of inertia	kgm^2				0.0038		
Data Inverter Duty							
Speed [1/min]					Torque [Nm]		
150					10	10	10
500					10	10	10
1000					10	10	10
1500 to 1800					10	10	10
2250 to 2600					-	10	10
3000* to 3600**					-	-	10

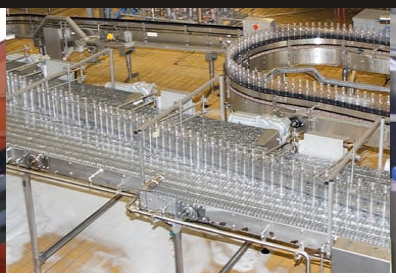
Technical Data S11

Standard

Motor Data (ventilated)							S..11SA6
Rated power P_n	kW			3	4	5.5	7.5
Rated torque M_n	Nm			19	25.5	17.5	24
Rated current I_n	A			5.9	8	11	15.2
Motor poles 2p				6	6	6	6
Rated speed n_n	1/min			1500	1500	3000	3000
Rated frequency	Hz			75	75	150	150
Motor efficiency η	%			IE4 - 90.1	IE3-87.7	IE4-91.2	IE4-90.8
Motor connection				Y	Y	Y	Y
Phase-to-phase resistance U-V R_{20}	Ohm			3.52	3.52	0.89	0.89
Winding resistance Rs_{20}	Ohm			1.76	1.76	0.447	0.447
D-axis inductance D L_d	mH			20	20	5	5
D-axis inductance Q L_q	mH			30	30	7.7	7.7
Reverse EMF constant k_e	V/1000 1/min			210	210	106	106
Torque constant k_t	Nm/A			3.2	3.2	1.55	1.55
Peak torque $M_{max\ (60s)}$	Nm			35	35	40	40
Peak current $I_{max\ (60s)}$	A			11	11	25	25
Moment of inertia	kgm^2			0,012			
Data Inverter Duty							
Speed [1/min]				Torque [Nm]			
150				19	19	17.5	19
500				19	22	17.5	21.5
1000				19	25.5	17.5	24
1500 to 1800				19	25.5	-	-
2250 to 2600				-	-	-	-
3000* to 3600**				-	-	17.5	24

Motor Data (non-ventilated)							S..U11SA6
Rated power P_n	kW				2.2	3.1	4
Rated torque M_n	Nm				14	10	12.75
Rated current I_n	A				4.4	6.6	8.4
Motor poles 2p					6	6	6
Rated speed n_n	1/min				1500	3000	3000
Rated frequency	Hz				75	150	150
Motor efficiency η	%				IE5 – 91.3	IE5-91.5	IE5 – 91.9
Motor connection					Y	Y	Y
Phase-to-phase resistance U-V R_{20}	Ohm				3.52	0.89	0.89
Winding resistance Rs_{20}	Ohm				1.76	0.447	0.447
D-axis inductance D L_d	mH				20	5	5
D-axis inductance Q L_q	mH				30	7.7	7.7
Reverse EMF constant k_e	V/1000 1/min				210	106	106
Torque constant k_t	Nm/A				3.1	1.52	1.52
Peak torque $M_{max\ (60s)}$	Nm				40	40	40
Peak current $I_{max\ (60s)}$	A				13	25	25
Moment of inertia	kgm^2				0.012		
Data Inverter Duty							
Speed [1/min]					Torque [Nm]		
150					14	10	12.75
500					14	10	12.75
1000					14	10	12.75
1500 to 1800					14	10	12.75
2250 to 2600					-	-	-
3000 to 3600					-	10	12.75






Technical Data S11

Standard

Motor Data (ventilated)							S..11MA6
Rated power P_n	kW		4.2	5.5	7.5	9.5	11
Rated torque M_n	Nm		26.5	35	24	30	35
Rated current I_n	A		8.3	11	15.4	19.3	22.5
Motor poles 2p			6	6	6	6	6
Rated speed n_n	1/min		1500	1500	3000	3000	3000
Rated frequency	Hz		75	75	150	150	150
Motor efficiency η	%		IE5-92.5	IE4-90.8	IE5-93.2	IE5-93.2	IE4-93.1
Motor connection			Y	Y	Y	Y	Y
Phase-to-phase resistance U-V R_{20}	Ohm		1.78	1.78	0.43	0.43	0.43
Winding resistance Rs_{20}	Ohm		0.892	0.892	0.217	0.217	0.217
D-axis inductance D L_d	mH		12	12	3	3	3
D-axis inductance Q L_q	mH		18.4	18.4	4.6	4.6	4.6
Reverse EMF constant k_e	V/1000 1/min		206	206	104	104	104
Torque constant k_t	Nm/A		3.15	3.15	1.55	1.55	1.55
Peak torque $M_{max\ (60s)}$	Nm		55	55	55	55	55
Peak current $I_{max\ (60s)}$	A		17	17	35	35	35
Moment of inertia	kgm²		0.0175				
Data Inverter Duty							
Speed [1/min]			Torque [Nm]				
150			26.5	26.5	24	26.5	26.5
500			26.5	30	24	30	30
1000			26.5	35	24	30	35
1500 to 1800			26.5	35	-	-	-
2250 to 2600			-	-	-	-	-
3000 to 3600**			-	-	24	30	35

Motor Data (non-ventilated)							S..U11MA6
Rated power P_n	kW				3.1	4	5.5
Rated torque M_n	Nm				20	13	17.5
Rated current I_n	A				6.4	8.6	11.5
Motor poles 2p					6	6	6
Rated speed n_n	1/min				1500	3000	3000
Rated frequency	Hz				75	150	150
Motor efficiency η	%				IE5 – 93.3	IE5-92.5	IE5 – 93.3
Motor connection					Y	Y	Y
Phase-to-phase resistance U-V R_{20}	Ohm				1.78	0.43	0.43
Winding resistance Rs_{20}	Ohm				0.892	0.217	0.217
D-axis inductance D L_d	mH				12	3	3
D-axis inductance Q L_q	mH				18.4	4.6	4.6
Reverse EMF constant k_e	V/1000 1/min				206	104	104
Torque constant k_t	Nm/A				3.1	1.52	1.52
Peak torque $M_{max\ (60s)}$	Nm				55	55	55
Peak current $I_{max\ (60s)}$	A				17	35	35
Moment of inertia	kgm²				0.0175		
Data Inverter Duty							
Speed [1/min]					Torque [Nm]		
150					20	13	17.5
500					20	13	17.5
1000					20	13	17.5
1500 to 1800					20	-	-
2250 to 2600					-	-	-
3000 to 3600					-	13	17.5

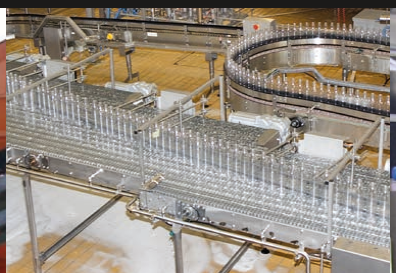
Technical Data S11

Standard

Motor Data (ventilated)							S..11LA6
Rated power P_n	kW		5.5	7.5	9.5	11	15
Rated torque M_n	Nm		35	48	30	35	48
Rated current I_n	A		10.8	14.7	18.5	21.5	30
Motor poles 2p			6	6	6	6	6
Rated speed n_n	1/min		1500	1500	3000	3000	3000
Rated frequency	Hz		75	75	150	150	150
Motor efficiency η	%		IE5-93.2	IE3 – 91.4	IE5 – 93.8	IE5 – 94.1	IE5 – 93.8
Motor connection			Y	Y	Y	Y	Y
Phase-to-phase resistance U-V R_{20}	Ohm		1.21	1.21	0.3	0.3	0.3
Winding resistance Rs_{20}	Ohm		0.605	0.605	0.15	0.15	0.15
D-axis inductance D L_d	mH		9.3	9.3	2.4	2.4	2.4
D-axis inductance Q L_q	mH		13.9	13.9	3.5	3.5	3.5
Reverse EMF constant k_e	V/1000 1/min		210	210	105	105	105
Torque constant k_t	Nm/A		3.25	3.25	1.6	1.6	1.6
Peak torque $M_{max\ (60s)}$	Nm		75	75	75	75	75
Peak current $I_{max\ (60s)}$	A		23	23	48	48	48
Moment of inertia	kgm²		0.0215				
Data Inverter Duty							
Speed [1/min]			Torque [Nm]				
150			35	35	30	35	35
500			35	40	30	35	40
1000			35	48	30	35	48
1500 to 1800			35	48	-	-	-
2250 to 2600			-	-	-	-	-
3000* to 3600**			-	-	30	35	48 / **40

Motor Data (non-ventilated)							S..U11LA6
Rated power P_n	kW				4	5.5	7.5
Rated torque M_n	Nm				25.5	17.5	23.9
Rated current I_n	A				8.1	11.5	15.7
Motor poles 2p					6	6	6
Rated speed n_n	1/min				1500	3000	3000
Rated frequency	Hz				75	150	150
Motor efficiency η	%				IE5 – 93.2	IE5-91.9	IE5 – 93.3
Motor connection					Y	Y	Y
Phase-to-phase resistance U-V R_{20}	Ohm				1.21	0.3	0.3
Winding resistance Rs_{20}	Ohm				0.605	0.15	0.15
D-axis inductance D L_d	mH				9.3	2.4	2.4
D-axis inductance Q L_q	mH				13.9	3.5	3.5
Reverse EMF constant k_e	V/1000 1/min				210	105	105
Torque constant k_t	Nm/A				3.1	1.52	1.52
Peak torque $M_{max\ (60s)}$	Nm				75	75	75
Peak current $I_{max\ (60s)}$	A				23	48	48
Moment of inertia	kgm²				0.0215		
Data Inverter Duty							
Speed [1/min]					Torque [Nm]		
150					25.5	17.5	23.9
500					25.5	17.5	23.9
1000					25.5	17.5	23.9
1500 to 1800					25.5	-	-
2250 to 2600					-	-	-
3000 to 3600					-	17.5	23.9






Technical Data S..08

Aseptic Design

Motor data				S..A08MB4
Rated power P_n	kW		0.55	0.78
Rated torque M_n	Nm		3.5	2.5
Rated current I_n	A		1.3	1.85
Motor poles 2p			4	4
Rated speed n_n	1/min		1500	3000
Rated frequency	Hz		50	100
Motor efficiency η	%		IE5-86.5	IE5-90.2
Motor connection			Y	Y
Phase-to-phase resistance U-V R_{20}	Ohm		18.7	4.73
Winding resistance Rs_{20}	Ohm		9.35	2.36
D-axis inductance D L_d	mH		97	24.7
D-axis inductance Q L_q	mH		170	43.5
Reverse EMF constant k_e	V/1000 1/min		180	90
Torque constant k_t	Nm/A		2.7	1.35
Peak torque $M_{max\ (60s)}$	Nm		10	10
Peak current $I_{max\ (60s)}$	A		3.7	7.5
Moment of inertia	kgm²		0.00115	
Data Inverter Duty				
Speed [1/min]			Torque [Nm]	
150			3.5	2.5
500			3.5	2.5
1000			3.5	2.5
1500 to 1800			3.5	-
2250 to 2600			-	-
3000 to 3600			-	2.5

Motor data				S..A08LB4 \08LB4
Rated power P_n	kW	0.78	1.1	1.5
Rated torque M_n	Nm	5	3.5	4.8
Rated current I_n	A	1.85	2.6	3.55
Motor poles 2p		4	4	4
Rated speed n_n	1/min	1500	3000	3000
Rated frequency	Hz	50	100	100
Motor efficiency η	%	IE5-88.4	IE5-92.3	IE5-91.8
Motor connection		Y	Y	Y
Phase-to-phase resistance U-V R_{20}	Ohm	11	2.82	2.82
Winding resistance Rs_{20}	Ohm	5.5	1.41	1.41
D-axis inductance D L_d	mH	70	16.8	16.8
D-axis inductance Q L_q	mH	117	29.6	29.6
Reverse EMF constant k_e	V/1000 1/min	171	87	87
Torque constant k_t	Nm/A	2.7	1.36	1.35
Peak torque $M_{max\ (60s)}$	Nm	15	15	15
Peak current $I_{max\ (60s)}$	A	5.6	11.5	11.5
Moment of inertia	kgm²	0.0015		
Data Inverter Duty				
Speed [1/min]		Torque [Nm]		
150		5	3.5	4.8
500		5	3.5	4.8
1000		5	3.5	4.8
1500 to 1800		5	-	-
2250 to 2600		-	-	-
3000 to 3600		-	3.5	3.5

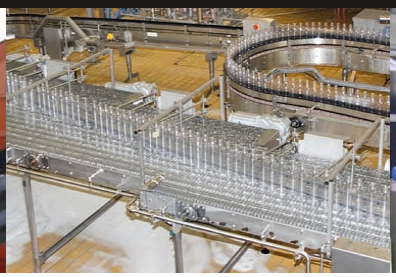
Technical Data S..09

Aseptic Design

Motor data				S..A09SB4
Rated power P_n	kW		1.1	1.55
Rated torque M_n	Nm		7	5
Rated current I_n	A		2.2	3.3
Motor poles 2p			4	4
Rated speed n_n	1/min		1500	3000
Rated frequency	Hz		50	100
Motor efficiency η	%		IE5 - 89.2	IE5 - 90.7
Motor connection			Y	Y
Phase-to-phase resistance U-V R_{20}	Ohm		9.9	2.42
Winding resistance Rs_{20}	Ohm		4.95	1.21
D-axis inductance D L_d	mH		64.1	15.5
D-axis inductance Q L_q	mH		110	27.6
Reverse EMF constant k_e	V/1000 1/min		208	103
Torque constant k_t	Nm/A		3.2	1.5
Peak torque $M_{max\ (60s)}$	Nm		20	20
Peak current $I_{max\ (60s)}$	A		6.4	12.5
Moment of inertia	kgm^2		0.00245	
Data Inverter Duty				
Speed [1/min]			Torque [Nm]	
150			7	5
500			7	5
1000			7	5
1500 to 1800			7	-
2250 to 2600			-	-
3000 to 3600			-	5

Motor data				S..A09XB4
Rated power P_n	kW	1.55	2.2	3
Rated torque M_n	Nm	10	7	9.55
Rated current I_n	A	3.1	4.5	6.1
Motor poles 2p		4	4	4
Rated speed n_n	1/min	1500	3000	3000
Rated frequency	Hz	50	100	100
Motor efficiency η	%	IE5 - 91.0	IE5 - 92.9	IE5 - 92.5
Motor connection		Y	Y	Y
Phase-to-phase resistance U-V R_{20}	Ohm	5.25	1.31	1.31
Winding resistance Rs_{20}	Ohm	2.63	0.66	0.66
D-axis inductance D L_d	mH	41.2	12.7	12.7
D-axis inductance Q L_q	mH	70.1	17.9	17.9
Reverse EMF constant k_e	V/1000 1/min	209	102	102
Torque constant k_t	Nm/A	3.2	1.56	1.56
Peak torque $M_{max\ (60s)}$	Nm	30	30	30
Peak current $I_{max\ (60s)}$	A	10	20	20
Moment of inertia	kgm^2	0.0038		
Data Inverter Duty				
Speed [1/min]		Torque [Nm]		
150		10	7	9.5
500		10	7	9.5
1000		10	7	9.5
1500 to 1800		10	-	-
2250 to 2600		-	-	-
3000* to 3600		-	7	9.55*






Technical Data S08MA4

Stainless steel

Motor data							S..08MA4
Rated power P_n	kW	0.25	0.37	0.55	0.37	0.55	0.75
Rated torque M_n	Nm	1.6	2.4	3.5	1.2	1.75	2.4
Rated current I_n	A	0.56	0.86	1.3	0.9	1.32	1.8
Motor poles 2p		4	4	4	4	4	4
Rated speed n_n	1/min	1500	1500	1500	3000	3000	3000
Rated frequency	Hz	50	50	50	100	100	100
Motor efficiency η	%	IE5-88.2	IE5-88.0	IE5-85.5	IE5-87.5	IE5-89.7	IE5-90.5
Motor connection		Y	Y	Y	Y	Y	Y
Phase-to-phase resistance U-V R_{20}	Ohm	18.7	18.7	18.7	4.73	4.73	4.73
Winding resistance Rs_{20}	Ohm	9.35	9.35	9.35	2.36	2.36	2.36
D-axis inductance D L_d	mH	97	97	97	24.7	24.7	24.7
D-axis inductance Q L_q	mH	170	170	170	43.5	43.5	43.5
Reverse EMF constant k_e	V/1000 1/min	180	180	180	90	90	90
Torque constant k_t	Nm/A	2.8	2.8	2.8	1.33	1.33	1.33
Peak torque $M_{max\ (60s)}$	Nm	5.6	5.6	5.6	3.8	3.8	3.8
Peak current $I_{max\ (60s)}$	A	2.1	2.1	2.1	2.9	2.9	2.9
Moment of inertia	kgm²	0.00115					
Data Inverter Duty							
Speed [1/min]		Torque [Nm]					
150		1.6	2.4	3.5	1.2	1.75	2.4
500		1.6	2.4	3.5	1.2	1.75	2.4
1000		1.6	2.4	3.5	1.2	1.75	2.4
1500 to 1800		1.6	2.4	3.5	1.2	1.75	2.4
3000		-	-	-	1.2	1.75	2.4

Technical Data S09SA4

Stainless steel

Motor data							S..09SA4
Rated power P_n	kW		0.37	0.55	0.75	0.75	1.1
Rated torque M_n	Nm		2.4	3.5	4.8	2.4	3.5
Rated current I_n	A		0.75	1.1	1.5	1.6	2.3
Motor poles 2p			4	4	4		4
Rated speed n_n	1/min		1500	1500	1500	3000	3000
Rated frequency	Hz		50	50	50	100	100
Motor efficiency η	%		IE5 - 89.2	IE5 - 90.3	IE5 - 90.5	IE5 - 89.3	IE5 - 91.3
Motor connection			Y	Y	Y	Y	Y
Phase-to-phase resistance U-V R_{20}	Ohm		9.9	9.9	9.9	2.42	2.42
Winding resistance Rs_{20}	Ohm		4.95	4.95	4.95	1.21	1.21
D-axis inductance D L_d	mH		64.1	64.1	64.1	15.5	15.5
D-axis inductance Q L_q	mH		110	110	110	27.6	27.6
Reverse EMF constant k_e	V/1000 1/min		208	208	208	103	103
Torque constant k_t	Nm/A		3.2	3.2	3.2	1.5	1.5
Peak torque $M_{max\ (60s)}$	Nm		7.7	7.7	7.7	7.7	7.7
Peak current $I_{max\ (60s)}$	A		2.4	2.4	2.4	5.1	5.1
Moment of inertia	kgm²		0.002	-	-	-	-
Daten Inverter Duty							
Speed[1/min]			Torque [Nm]				
150			2.4	3.5	4.8	2.4	3.5
500			2.4	3.5	4.8	2.4	3.5
1000			2.4	3.5	4.8	2.4	3.5
1500 to 1800			2.4	3.5	4.8	2.4	3.5
3000			-	-	-	2.4	3.5




Technical Data S09XA4

Stainless steel

Motor data				S..09XA4
Rated power P_n	kW	0.55	0.75	1.1
Rated torque M_n	Nm	3.5	4.8	7
Rated current I_n	A	1.1	1.6	2.3
Motor poles 2p		4	4	4
Rated speed n_n	1/min	1500	1500	1500
Rated frequency	Hz	50	50	50
Motor efficiency η	%	IE5 - 89.9	IE5 - 91.2	IE5 - 91.4
Motor connection		Y	Y	Y
Phase-to-phase resistance U-V R_{20}	Ohm	5.25	5.25	5.25
Winding resistance Rs_{20}	Ohm	2.63	2.63	2.63
D-axis inductance D L_d	mH	41.2	41.2	41.2
D-axis inductance Q L_q	mH	70.1	70.1	70.1
Reverse EMF constant k_e	V/1000 1/min	209	209	209
Torque constant k_t	Nm/A	3.2	3.2	3.2
Peak torque $M_{max\ (60s)}$	Nm	11.2	11.2	11.2
Peak current $I_{max\ (60s)}$	A	3.7	3.7	3.7
Moment of inertia	kgm^2	0.0038		
Data Inverter Duty				
Speed [1/min]		Torque [Nm]		
150		3.5	4.8	7
500		3.5	4.8	7
1000		3.5	4.8	7
1500 to 1800		3.5	4.8	7

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