



**Super Premium
Efficiency
Gear Motors
for Explosion
Hazardous Areas**

η
up to
IE5



 **Bauer Gear Motor**[®]
Altra Industrial Motion

Boosting energy efficiency with variable speed drives

EU Regulation 640/2009/EC exempts motors for use in explosion hazardous areas from the minimum efficiency requirements for placing new products on the market, because explosion protection takes precedence over the energy savings that can be achieved with motors. This does not mean that there is no potential for energy savings with the electric motors used in the chemical industry. This is why the VIK pamphlet „VIK Recommendation 1: Three-Phase Induction Motors – Technical Requirements“ recommends the use of efficiency class IE2 (High Efficiency) for motors with explosion protection types Ex d and Ex nA and efficiency class IE1 (Standard Efficiency) for motors with explosion protection type Ex e.

For many years, only encapsulated motors (type Ex d) could be used for variable speed operation in explosion hazardous areas. With the launch of motors with explosion protection type Ex e for use next to the inverter, customers now have a economical alternative to encapsulated motors when procuring motors for use in explosion hazardous areas. Variable speed drives create opportunities for major energy savings. For applications in

explosion hazardous areas as well as other areas, retrofitting frequency inverters in existing plants and achieving higher energy savings by using highly efficient motors are both attractive options. Most currently available variable-speed three-phase induction motors with explosion protection type Ex e are only available in standard efficiency class IE1. This means that potential energy savings are only partially utilised.

For the **first time ever**, the S series of permanent magnet synchronous geared motors (PMSM) from **Bauer Gear Motor GmbH** offers variable-speed motors in **efficiency class up to IE5** for use in explosion hazardous areas.

Bauer Gear Motor GmbH helps amongst others the chemical industry to fully exploit potential energy savings with high efficiency motors up to IE5, even at the highest level.

Motor Data

Type	Design									
	1500 1/min					3000 1/min				
	Speed	Power	Torque	Current	η Class	Speed	Power	Torque	Current	η Class
1/min	kW	Nm	A		1/min	kW	Nm	A		
S..08MA4	150	0,08	5	1,9		150	0,08	5	3,7	
	500	0,29	5,6	2,1		500	0,29	5,6	4,1	
	1000	0,68	6,5	2,3		1000	0,7	6,5	4,7	
	1500	1	6,5	2,3	IE3	3000	2	6,5	4,7	IE5
	1800	1,2	6,5	2,3		3600	2,5	6,5	4,7	
S..08LA4	150	0,1	6,5	2,5		150	0,1	6,5	5,2	
	500	0,42	8,0	3,0		500	0,42	8,0	5,9	
	1000	1	9,55	3,5		1000	1	9,55	7,0	
	1500	1,5	9,55	3,5	IE2	3000	3	9,55	7,0	IE4
	1800	1,8	9,55	3,5		3600	3,6	9,55	7,0	
S..09SA4	150	0,13	8	2,5		150	0,13	8	5,2	
	500	0,53	10	3,2		500	0,53	10	6,4	
	1000	1,36	13	4,0		1000	1,36	13	8,25	
	1500	2	13	4,0	IE3	3000	4	13	8,25	IE4
	1800	2,2	11,5	4,0		3600	4,15	11	7,3	
S..09XA4	150	0,2	13	4,0		150	0,196	12,5	8,0	
	500	0,84	16	5,0		500	0,84	15,7	9,9	
	1000	2,1	20	6,3		1000	2,1	20	12,5	
	1500	3,1	20	6,3	IE3	3000	6,3	20	12,5	IE5
	1800	3,6	19	6,3		3600	5,5	14,5	9,2	
S..11SA6	150	0,28	18	5,6		150	0,28	18	12	
	500	1	20	6,2		500	1	20	13,3	
	1000	2,4	22,5	7,0		1000	2,4	22,5	15	
	1500	3,5	22,5	7,0	IE3	3000	7,1	22,5	15	IE4
	1800	6,1	22,5	7,0		3600	8,5	22,5	15	
S..11MA6	150	0,42	26,5	8,5		150	0,42	26,5	17	
	500	1,6	30	9,5		500	1,6	30	19,3	
	1000	3,7	35	11		1000	3,7	35	22,5	
	1500	5,5	35	11	IE4	3000	11	35	22,5	IE4
	1800	6,5	35	11		3600	12,9	34,3	22,5	
S..11LA6	150	0,51	32,5	9,8		150	0,5	32,5	20	
	500	2	39,4	12		500	2,1	39,4	24	
	1000	5	48	14,7		1000	5	48	30	
	1500	7,5	48	14,7	IE3	3000	15	48	30	IE5
	1800	9	47,5	14,7		3600	15	40	25,8	

PMSM S-series up to IE5 for explosion hazardous areas

Design torque M_N :

5 Nm – 48 Nm

Rated power P_N :

0,75 kW – 15 kW

Protection type

Increased Safety – Zone 1

⊕ II 2 G Ex e IIC T1 - T3 Gb

S.XE.08MA4

S.XE.08LA4

S.XE.09SA4

S.XE.09XA4

S.XE.11SA6

S.XE.11MA6

S.XE.11LA6

Dust explosion protection - Zone 21

⊕ II 2 D Ex tb IIIC T 160°C ... 120° Db

S.XC.08MA4

S.XC.08LA4

S.XC.09SA4

S.XC.09XA4

S.XC.11SA6

S.XC.11MA6

S.XC.11LA6



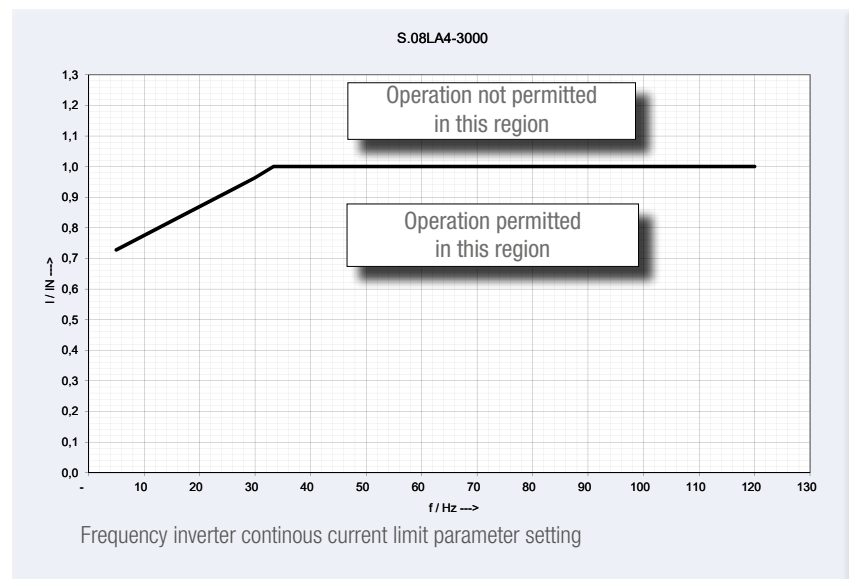
Inverter Settings

Minimum clock frequency:	3 kHz
Short-term current limit:	160% x I_N
Maximum overload time:	60 s
Minimum frequency:	5 Hz
Maximum frequency:	up to 180 Hz, depending on motor design
Permissible operating time below f_{min} :	60 s (in open loop mode)

All other settings must be selected according to the requirements of the drive. The maximum overload time and the permissible operating time below f_{min} are based on an interval of 10 minutes. Non-standard operating conditions are available on request.

Frequency-dependent current limit

The continuous current limit of the frequency inverter must be set in accordance with the current versus frequency diagram (motor type example below S..08LA4-3000 rpm).



Investment security for the future

Electric motors account for around 50% of industrial energy demand in the Union. The use of energy-efficient motors would save around €20 billion each year within Europe up until 2030. Bauer Gear Motor GmbH pursues its goals with minimum consumption of raw materials and energy, the lowest possible environmental impact, and efficient utilisation of resources. This philosophy is reflected in our product strategy, and we want to share it with our customers in

... what we offer

- More than 90 years of experience in drive technology
- Advice from gear motor specialists
- A high level of engineering expertise for custom drive solutions
- A high level of application expertise
- Global availability
- Exceptional flexibility
- A broad product spectrum
 - Pioneering technologies for energy-efficient drives
 - Standard Efficiency (IE1) and Premium Efficiency (IE3) with standard induction motor technology
 - IE5 – the highest efficiency class technologically possible – with permanent magnet synchronous motors (PMSM)
- Sector-specific solutions as standard

... for your benefits

- A partner on your side:
 - that speaks your language
 - that understands you
 - that gives top priority to customer satisfaction
- More added value by using:
 - The Bauer brand, with
 - a good reputation worldwide
 - sturdy and durable drives
 - a high enclosure protection rating of IP65 as standard lying above the market standard
 - extremely high quality awareness
 - Products that are tailored to your applications and give you the benefit of:
 - our expertise as drive manufacturers for over 90 years
 - our knowledge of the industry
 - Higher flexibility
 - adaptation of standard drives to your needs
 - fast time to market for product launch with custom drive solutions (SSD)
- Expert advice for fully exploiting potential energy savings
- Acquiring technology leadership by using motors up to IE5
- Achieving investment security by complying with statutory provisions for energy efficiency extending beyond 2023

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Die Marken der Altra Motion

Kupplungen

Ameridrives
www.ameridrives.com

Bibby Turboflex
www.bibbyturboflex.com

Guardian Couplings
www.guardiancouplings.com

Huco
www.huco.com

Lamiflex Couplings
www.lamiflexcouplings.com

Stromag
www.stromag.com

TB Wood's
www.tbwoods.com

Lineare Systeme

Thomson
www.thomsonlinear.com

Getriebe-Nocken-Endschalter

Stromag
www.stromag.com

Technisierte Lageraggregate

Kilian
www.kilianbearings.com

Elektrische Kupplungen und Bremsen

Matrix
www.matrix-international.com

Stromag
www.stromag.com

Warner Electric
www.warnerelectric.com

Riemenantriebe

TB Wood's
www.tbwoods.com

Hoch belastbare Kupplungen und Bremsen

Twiflex
www.twiflex.com

Stromag
www.stromag.com

Svendborg Brakes
www.svendborg-brakes.com

Wichita Clutch
www.wichitaclutch.com

Getriebe und Sonderkomponenten

Bauer Gear Motor
www.bauergears.com

Boston Gear
www.bostongear.com

Delevan
www.delevan.com

Delroyd Worm Gear
www.delroyd.com

Nuttall Gear
www.nuttallgear.com

Motorbremssysteme

Jacobs Vehicle Systems
www.jacobsvehiclesystems.com

Präzisionsmotoren und Automation

Kollmorgen
www.kollmorgen.com

Miniaturmotoren

Portescap
www.portescap.com

Freilaufkupplungen

Formsprag Clutch
www.formsprag.com

Marland Clutch
www.marland.com

Stieber
www.stieberclutch.com

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