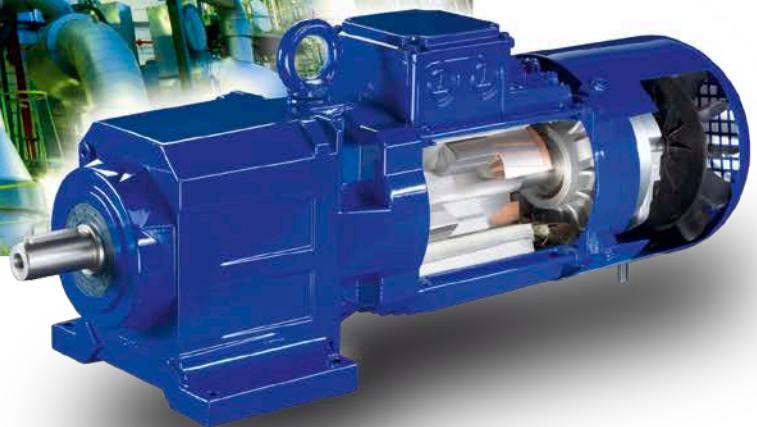




**World's First
Super Premium
Efficiency
Gear Motors for
Explosion
Hazardous Areas**



 **Bauer**[®]
Gear Motor

An Altra Industrial Motion Company

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 IE4*** for use in explosion hazardous areas. This is the highest energy efficiency that can be achieved with the current state of motor technology.

Bauer Gear Motor GmbH helps amongst others the chemical industry fully exploit potential energy savings with high efficiency IE4 motors, even at the highest level.

Motor data

Type	Design							
	1500 1/min				3000 1/min			
	Speed 1/min	Power kW	Torque Nm	Current A	Speed 1/min	Power kW	Torque Nm	Current 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	3000	2	6,5	4,7
	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	3000	3	9,55	7,0
	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	3000	4	13	8,25
	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	3000	6,3	20	12,5
	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	3000	7,1	22,5	15
	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	3000	11	35	22,5
	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	3000	15	48	30
	1800	9	47,5	14,7	3600	15	40	25,8

PMSM S-series in IE4* 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 IIC 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



* The data corresponds to the characteristic curve of the motor, lower efficiency classes as IE4 can occur at the rated point.

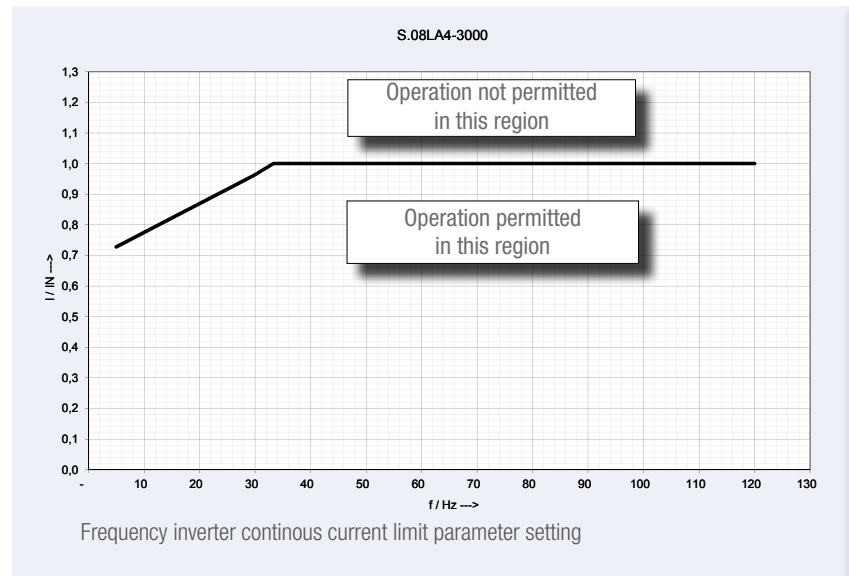
Inverter Settings

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

Electrically driven machinery accounts for around 70 % of overall energy demand for industrial consumption. Energy savings of 135 billion kilowatt-hours per year would be possible within Europe with the use of modern drive systems.

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

- 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
 - Super Premium Efficiency (IE4) – the highest efficiency class technologically possible – with permanent magnet synchronous motors (PMSMs)
- 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 85 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 IE4 motors
- Achieving investment security by complying with statutory provisions for energy efficiency extending beyond 2017

Couplings

Ameridrives Couplings

Mill Spindles, Ameriflex, Ameridisc
Erie, PA - USA
1-814-480-5000

Gear Couplings
San Marcos, TX - USA
1-800-458-0887

Bibby Turboflex

Disc, Gear, Grid Couplings, Overload Clutches
Dewsbury, England
+44 (0) 1924 460801

Boksburg, South Africa
+27 (0) 11 918 4270

TB Wood's

Elastomeric Couplings
Chambersburg, PA - USA
1-888-829-6637 – Press #5

For application assistance:
1-888-829-6637 – Press #7

General Purpose Disc Couplings
San Marcos, TX - USA
1-888-449-9439

Ameridrives Power Transmission

Universal Joints, Drive Shafts, Mill Gear Couplings
Green Bay, WI - USA
1-920-593-2444

Huco Dynatork

Precision Couplings and Air Motors
Hertford, England
+44 (0) 1992 501900

Chambersburg, PA - USA
1-888-829-6637

Lamiflex Couplings

Flexible Couplings, Bearing Isolators, and Coupling Guards
São Paulo, SP - Brasil
+55 (11) 5679-6533

Guardian Couplings

Flywheel, Jaw, Shear, Gear, Grid, Disc and Engine Couplings
Michigan City, IN - USA
1-219-874-5248

Engineered Bearing Assemblies

Kilian Manufacturing

Engineered Bearing Assemblies
Syracuse, NY - USA
1-315-432-0700

Electromagnetic Clutches and Brakes

Warner Electric

Electromagnetic Clutches and Brakes
New Hartford, CT - USA
1-800-825-6544

For application assistance:
1-800-825-9050

Saint Barthélemy d'Anjou, France
+33 (0) 2 41 21 24 24

Precision Electric Coils and Electromagnetic Clutches and Brakes

Columbia City, IN - USA
1-260-244-6183

Matrix International

Electromagnetic Clutches and Brakes, Pressure Operated Clutches and Brakes

Brechin, Scotland
+44 (0) 1356 602000
New Hartford, CT - USA
1-800-825-6544

Inertia Dynamics

Spring Set Brakes; Power On and Wrap Spring Clutch/Brakes
New Hartford, CT - USA
1-800-800-6445

Overrunning Clutches

Formsprag Clutch

Overrunning Clutches and Holdbacks
Warren, MI - USA
1-800-348-0881 – Press #1

For application assistance:
1-800-348-0881 – Press #2

Marland Clutch

Roller Ramp and Sprag Type Overrunning Clutches and Backstops
South Beloit, IL - USA
1-800-216-3515

Stieber Clutch

Overrunning Clutches and Holdbacks
Heidelberg, Germany
+49 (0) 6221 30 47 0

Belted Drives and Sheaves

TB Wood's

Belted Drives
Chambersburg, PA - USA
1-888-829-6637 – Press #5

For application assistance:
1-888-829-6637 – Press #7

Heavy Duty Clutches and Brakes

Wichita Clutch

Pneumatic Clutches and Brakes
Wichita Falls, TX - USA
1-800-964-3262
Bedford, England
+44 (0) 1234 350311

Twiflex Limited

Caliper Brakes and Thrusters
Twickenham, England
+44 (0) 20 8894 1161

Industrial Clutch

Pneumatic and Oil Immersed Clutches and Brakes
Waukesha, WI - USA
1-262-547-3357

Svendborg Brakes

Industrial Brakes and Brake Systems
Vejstrup, Denmark
+45 63 255 255

Gearing

Boston Gear

Enclosed and Open Gearing, Electrical and Mechanical P.T. Components
Charlotte, NC - USA
1-800-825-6544

For application assistance:
1-800-816-5608

Bauer Gear Motor

Geared Motors
Esslingen, Germany
+49 (711) 3518-0
Somerset, NJ - USA
1-732-469-8770

Nuttall Gear and Delroyd Worm Gear

Worm Gear and Helical Speed Reducers
Niagara Falls, NY - USA
1-716-298-4100

Linear Products

Warner Linear

Linear Actuators
Belvidere, IL - USA
1-800-825-6544
For application assistance:
1-800-825-9050

Saint Barthélemy d'Anjou, France
+33 (0) 2 41 21 24 24

Bauer Gear Motor

Bauer Gear Motor GmbH

Eberhard-Bauer-Straße 37
73734 Esslingen - Germany
+49 711 3518 0
+49 711 3518 381 (Fax)

Bauer Gear Motor Slovakia s.r.o.

Tovarenská 49
953 01 Zlate Moravce - Slovakia
+421 37 6926100
+421 37 6926181 (Fax)

Bauer Gear Motor Limited

Nat Lane Business Park
Winsford, Cheshire
CW7 3BS - United Kingdom
+44 1606 868600
+44 1606 868603 (Fax)

Bauer Gear Motor LLC

31 Schoolhouse Rd.
Somerset NJ 08873-1212 - USA
+1 732 469 8770
+1 732 469 8773 (Fax)

Altra Industrial Motion (Shenzhen) Co., Ltd.

18 Huan Zhen Road Dabo
Industrial Zone - BoGoang Village
ShaJing Town - BaoAn District
Guangdong Province
518104 Shenzhen City - China
+86 755 27246308
+86 755 27246017 (Fax)

Altra Industrial Motion 000

Volokolamskoye sh., 142, bldg 6
Business Center „Irbis“
125464 Moscow - Russia
+7 495 6420468
+7 495 6420469 (Fax)

Customer Centre Finland

01510 Vantaa
+358 207 189700

Customer Centre France-Benelux

Brussel (Anderlecht)
+32 2 5295941

Customer Centre Italy

Grisignano di Zocco (VI)
+39 0444 414392

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www.bauergears.com

Eberhard-Bauer-Straße 37
73734 Esslingen - Germany
Tel.: +49 711 3518-0
Fax: +49 711 3518-381

