

Encoders and angle measurement

Flexible, robust, precise

Product overview – Edition 2016



Partnership.
Precise.
Pioneering.

Visibly better: Baumer sensors.

The Baumer Group is leading at the international level in the development and production of sensors, shaft encoders, measuring instruments as well as components for automatic image processing. As an owner-managed family business, we employ about 2300 workers worldwide in 37 subsidiaries and 19 countries. With marked customer orientation, consistently high quality and vast innovation potential worldwide, Baumer develops specific solutions for many industries and applications.

Our standards – your benefits.

- Passion coupled with expertise – both have made us a sensor pioneer and technology leader
- Our range of services is hard to beat – we have the right product, developed by our own team, for every task
- Inspiring through innovation – a challenge Baumer employees take on every day
- Reliability, precision and quality – our customers' requirements are what drives us
- Partnership from the start – together with our customers we develop suitable solutions
- Always a step ahead – thanks to our production depth, our flexibility and our delivery reliability
- Available worldwide – Baumer is present across the globe





Baumer sensors – precise, compact and reliable

Baumer offers a broad portfolio of standard products based on a multitude of sensor technologies. Our customers benefit from the comprehensive consultation and reliable service we provide around the world. In close collaboration with them we develop specific solutions with distinct advantages in cost and performance. Our customers benefit from our international development teams, the considerable diversity of our production facilities and optimized business processes, which guarantee maximum flexibility and promptness in the implementation of customer requirements.



Learn more.
Detailed technical information, data sheets, tutorials and the Baumer product finder can be found at:
www.baumer.com



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Flexible,
robust and
precise.



OptoPulse® – the new benchmark for encoders:
EIL580-SC with clamping flange and
M23 connector

Incremental encoders



Incredibly versatile.

From cost-efficient standard products on to high-resolution variants with 320 000 pulses per revolution: In our portfolio you always will encounter the matching incremental encoder. Our passion for sensors lays the groundwork for innovative products available in different designs and variants – with robust magnetic or precise optical sensing, optional HTL, TTL or sine signals and with all common mechanical interfaces.

The product portfolio comprises particularly compact designs of mere 24 mm in diameter on to large hollow shaft diameters up to 85 mm. Configurable encoders allow for maximum flexibility in a wide range of applications. In doing so, they contribute towards cutting down on costs in maintenance and inventory.



Service

OptoPulse® – quickly available and reliable delivery times.

OptoPulse® sets new benchmarks also in ways of delivery. Many stock items are supplied within 24 hours - one working day. More standard items up to the quantity of 10 are available within 5 working days thanks to optimum process harmonization.

Incremental encoders

Size 24...40 mm

Precise optical sensing.

Max. 2048 pulses per revolution.

- Solid shaft, blind or through hollow shaft
- Ideal where space is tight



Features	■ Size 24 mm ■ Solid shaft with synchro flange	■ Size 24 mm ■ Blind hollow shaft	■ Size 30 mm ■ Solid shaft with synchro flange	■ Size 40 mm ■ Blind hollow or through hollow shaft
Product family	ITD 01 B14	ITD 01 A4	BDK 16	BHK 16
Sensing method	Optical			
Size (housing)	ø24 mm		ø30 mm	ø40 mm
Voltage supply	5 VDC ±5 %, 8...30 VDC		5 VDC ±10 %, 10...30 VDC	
Output stage				
- TTL/RS422	■	■	■	■
- HTL/push-pull	■	■	■	■
Output signals	A 90° B, N + inverted			
Shaft type				
- Solid shaft	ø4 mm	—	ø5 mm	—
- Blind hollow shaft	—	ø4 mm	—	ø12 mm
- Through hollow shaft	—	—	—	ø6 mm
Connection				
- Flange connector M9	—	—	Radial	
- Cable	Radial / axial	Radial	Radial / axial	Radial
Pulses per revolution	30...1024		10...2048	
Operating temperature	-20...+85 °C			
Protection	IP 54		IP 42, IP 65	
Operating speed	≤18 000 rpm	≤10 000 rpm	≤12 000 rpm (IP 42) ≤6000 rpm (IP 65)	≤12 000 rpm
Max. shaft load	≤5 N axial, ≤8 N radial	—	≤10 N axial, ≤10 N radial	—

Incremental encoders

Size 24...40 mm

Robust magnetic sensing.
Max. 1024 pulses per revolution.

- Solid shaft or blind hollow shaft
- Ideal where space is tight

EcoMag



Features	■ Size 30 mm ■ Solid shaft with synchro flange	■ Size 30 mm ■ Solid shaft with synchro flange ■ High protection IP 67	■ Size 40 mm ■ Blind hollow shaft
Product family	BRIV30 - <i>EcoMag</i>	BRIV30 R - <i>EcoMag</i>	BRIH40 - <i>EcoMag</i>
Sensing method	Magnetic		
Size (housing)	ø30 mm	ø30 mm	ø40 mm
Voltage supply	5 VDC ±10 %, 20...28 VDC		
Output stage			
- TTL/RS422	■	■	■
- HTL/push-pull	■	■	■
Output signals	A 90° B, N + inverted		
Shaft type			
- Solid shaft	ø5 mm	ø6 mm, ø8 mm	—
- Blind hollow shaft	—	—	ø6 mm, ø12 mm
Connection			
- Flange connector M9	Radial	Radial / axial	Radial
- Cable	Radial / axial	Radial / axial	Radial
Pulses per revolution	2...1024		
Operating temperature	-20...+65 °C -20...+85 °C (5 VDC)	-40...+65 °C -40...+85 °C (5 VDC)	-20...+65 °C -20...+85 °C (5 VDC)
Protection	IP 65	IP 67	IP 65
Operating speed	≤6000 rpm		
Max. shaft load	≤10 N axial, ≤10 N radial	≤30 N axial, ≤50 N radial	—

EcoMag

EcoMag – robust incremental encoders with resilient magnetic sensing.

Incremental encoders

Size 58 mm

Precise optical sensing.

Max. 5000 pulses per revolution.

- Solid shaft, blind or through hollow shaft
- Robust all-metal housing



OptoPulse® – the new benchmark for encoders

OptoPulse®



Features	■ Solid shaft with clamping flange ■ Solid shaft with synchro flange ■ Blind hollow shaft ■ Through hollow shaft			
Product family	EIL580-SC - <i>OptoPulse®</i>	EIL580-SY - <i>OptoPulse®</i>	EIL580-B - <i>OptoPulse®</i>	EIL580-T - <i>OptoPulse®</i>
Sensing method	Optical			
Size (housing)	ø58 mm			
Voltage supply	5 VDC ±5 %, 8...30 VDC, 4.75...30 VDC			
Output stage				
- TTL/RS422	■	■	■	■
- HTL/push-pull	■	■	■	■
Output signals	A 90° B, N + inverted			
Shaft type				
- Solid shaft	ø10 mm	ø6 mm	—	—
- Blind hollow shaft	—	—	ø8...15 mm	—
- Through hollow shaft	—	—	—	ø8...15 mm
Connection				
- Flange connector M12, M23	Radial / axial			Radial
- Cable	Radial / axial / tangential			Radial / tangential
Pulses per revolution	100...5000			
Operating temperature	-40...+85 °C (option: +100 °C)			
Protection	IP 65, IP 67			
Operating speed	≤12 000 rpm (IP 65) ≤6000 rpm (IP 67)	≤8000 rpm (IP 65) ≤6000 rpm (IP 67)	≤6000 rpm (IP 65) ≤3000 rpm (IP 67)	
Max. shaft load	≤40 N axial, ≤80 N radial		—	—
Option	Square flange, programmable		Isolated hollow shaft, hybrid bearings, programmable	

OptoPulse®

The innovative optical sensing method utilized by *OptoPulse®* incremental encoders ensures ultra-high accuracy and consistently high signal quality throughout the entire temperature range. The heart of this technology is a monolithic OptoASIC with high integration density particularly conceived for high-precision encoders. Thanks to the limited number of discrete components, reliability in the application is decisively improved when it comes to shocks and vibrations.

Incremental encoders

Size 58 mm

Robust magnetic sensing.

Max. 2048 pulses per revolution.

- Solid shaft, blind or through hollow shaft
- Robust all-metal housing

EcoMag



Features	■ Solid shaft with clamping flange	■ Solid shaft with synchro flange	■ Blind hollow shaft	■ Through hollow shaft
Product family	BRIV 58K - <i>EcoMag</i>	BRIV 58S - <i>EcoMag</i>	BRIH 58S - <i>EcoMag</i>	BRID 58S - <i>EcoMag</i>
Sensing method	Magnetic			
Size (housing)	ø58 mm			
Voltage supply	5 VDC ±10 %, 10...30 VDC			
Output stage				
- TTL/RS422	■	■	■	■
- HTL/push-pull	■	■	■	■
Output signals	A 90° B, N + inverted			
Shaft type				
- Solid shaft	ø10 mm	ø6 mm	—	—
- Blind hollow shaft	—	—	ø12 mm	—
- Through hollow shaft	—	—	—	ø12 mm
Connection				
- Flange connector M12, M23	Radial			
- Cable	Radial			
Pulses per revolution	64...2048			
Operating temperature	-20...+85 °C			
Protection	IP 42, IP 65			
Operating speed	≤12 000 rpm (IP 42), ≤6000 rpm (IP 65)			
Max. shaft load	≤40 N axial, ≤60 N radial		—	—



ShaftLock

The *ShaftLock* locking collar prevents the large high-quality bearing pack from any misalignment by high axial shaft loads during operation or at installation. The *ShaftLock* technology ensures maximum precision and improved service life, keeps code disc and sensing unit safe from damage and avoids cost-intensive downtime.

Incremental encoders

Size 58 mm

Precise optical sensing.

Max. 320 000 pulses per revolution.

- Solid shaft with clamping or synchro flange
- Robust all-metal housing



Features	■ Solid shaft with clamping or synchro flange		■ Solid shaft with clamping or synchro flange		■ Solid shaft with clamping flange ■ Max. 320 000 pulses per revolution	■ Solid shaft with synchro flange ■ Max. 320 000 pulses per revolution
Product family	GI355	GI356	G0355	G0356	BDH HighRes	BDT HighRes
Sensing method	Optical					
Size (housing)	ø58 mm					
Voltage supply	5 VDC ±10 %, 4.75...30 VDC, 10...30 VDC				5 VDC ±10 %, 10...30 VDC	
Output stage						
- TTL/RS422	■		■		■	■
- HTL/push-pull	■		■		■	■
Output signals	A 90° B, N + inverted					
Shaft type						
- Solid shaft	ø10 mm	ø6 mm	ø10 mm	ø6 mm	ø10 mm	ø6 mm
Flange	Clamping flange	Synchro flange	Clamping flange	Synchro flange	Clamping flange	Synchro flange
Connection						
- Flange connector M23	Radial / axial				Radial	
- Cable	Radial / axial				Radial	
Pulses per revolution	5...6000		6000...80 000		7200...320 000	
Operating temperature	-20...+85 °C (-20...+100 °C)				-20...+85 °C	
Protection	IP 54, IP 65				IP 42, IP 65	
Operating speed	≤10 000 rpm				≤6000 rpm	
Max. shaft load	≤20 N axial, ≤40 N radial				≤40 N axial, ≤60 N radial	≤10 N axial, ≤20 N radial
Options	With SIL2 certification: GI357		—		—	—

Incremental encoders

Size 58 mm

Precise optical sensing.
Max. 320 000 pulses per revolution.

- Blind hollow or through hollow shaft
- Robust all-metal housing

HighRes – max. 320 000
pulses per revolution



Features	■ Through hollow shaft	■ Through hollow shaft ■ Tangential cable outlet	■ Blind hollow shaft ■ Max. 320 000 pulses per revolution	■ Through hollow shaft ■ Max. 320 000 pulses per revolution
Product family	G0333	ITD21H00	BHF HighRes	BHG HighRes
Sensing method	Optical			
Size (housing)	ø58 mm			
Voltage supply	5 VDC ±10 %, 4.75...30 VDC, 10...30 VDC		5 VDC ±10 %, 10...30 VDC	
Output stage				
- TTL/RS422	■	■	■	■
- HTL/push-pull	■	■	■	■
Output signals	A 90° B, N + inverted			
Shaft type				
- Blind hollow shaft	—	—	ø12 mm	—
- Through hollow shaft	ø12...14 mm	ø10...14 mm	—	ø12 mm
Connection				
- Flange connector M23	Radial / axial	—	Radial	
- Cable	Radial	Tangential	Radial	
Pulses per revolution	6000...80 000	100...80 000	4096...320 000	
Operating temperature	-25...+85 °C	-30...+100 °C	-20...+85 °C	
Protection	IP 54	IP 54, IP 65	IP 42, IP 65	
Operating speed	≤6000 rpm			
Options	Stainless steel variant GE333	Operating temperature -30...+120 °C	—	—

Incremental encoders

Large hollow shaft 20...27 mm

Precise optical sensing.
Max. 80 000 pulses per revolution.

- Blind hollow or through hollow shaft
- Easy installation

HighRes – max. 80 000
pulses per revolution



Features	■ Through hollow shaft ■ Torque support ■ Max. 2048 pulses per revolution	■ Through hollow shaft ■ Max. 10 000 pulses per revolution	■ Blind hollow or through hollow shaft ■ Max. 16 384 pulses per revolution	■ Through hollow shaft ■ Protection up to IP 67 ■ Max. 80 000 pulses per revolution ■ Isolated shaft	
Product family	ITD 40	ITD 41	G110H	G110S	HS35F
Sensing method	Optical				
Size (housing)	ø80 mm		ø75 mm		ø3.15" (ø80 mm)
Voltage supply	5 VDC ±5 %, 8...30 VDC		5 VDC ±10 % 4.75...30 VDC		4.75...30 VDC
Output stage					
- TTL/RS422	■	■	■	■	
- HTL/push-pull	■	■	■	■	
Output signals	A 90° B, N + inverted				
Shaft type					
- Blind hollow shaft	—	—	—	ø20 mm, ø25 mm	—
- Through hollow shaft	ø17...27 mm	ø17...30 mm	ø20, ø25 or ø25.4 mm	—	ø0.375...1" (ø9.525...25.4 mm)
Connection					
- Flange connector M23	—	—	Radial		—
- Flange connector MIL	—	—	—		Radial
- Cable	Radial				
Pulses per revolution	200...2048	2000...10 000	1024...16 384		1024...80 000
Operating temperature	-20...+70 °C, -20...+100 °C		-20...+85 °C		-40...+100 °C (-40...+212 °F)
Protection	IP 65		IP 54		IP 65, IP 67
Operating speed	≤5000 rpm, ≤3000 rpm (>70 °C)		≤3800 rpm		≤5000 rpm (IP 65) ≤3000 rpm (IP 67)
Options	Torque support with electric isolation Stainless steel variant		—		—

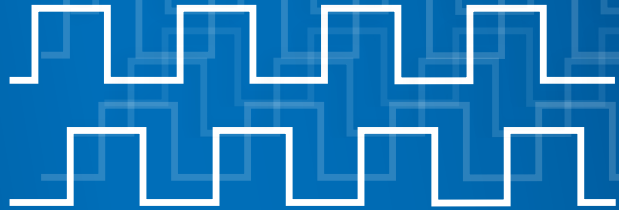
Incremental encoders

Large hollow shaft 30...85 mm

Precise optical sensing.

Max. 4096 pulses per revolution.

- Through hollow shaft
- Easy installation



Features	■ Through hollow shaft max. ø50 mm ■ Very flat design ■ Clamping at B side	■ Through hollow shaft max. ø65 mm ■ Clamping at B side	■ Through hollow shaft max. ø85 mm ■ Bearingless
Product family	ITD 61	ITD 70	ITD 75
Sensing method	Optical		
Size (housing)	ø120 mm	ø150 mm	
Voltage supply	4.75...30 VDC	5 VDC ±5 %, 8...30 VDC	
Output stage			
- TTL/RS422	■	■	■
- HTL/push-pull	■	■	■
Output signals	A 90° B, N + inverted		
Shaft type			
- Through hollow shaft	ø30...50 mm	ø38...65 mm	ø60...85 mm
Connection			
- Flange connector M23	—	Radial	—
- Cable	Radial		
Pulses per revolution	1024...4096	1000...2500	
Operating temperature	-20...+85 °C	-20...+70 °C	
Protection	IP 54		
Operating speed	≤4000 rpm (+70 °C) ≤3000 rpm (+85 °C)	≤3000 rpm	
Options	Stainless steel variant Cable with connector	Cable with connector	

Incremental encoders

Programmable

Precise optical sensing.

Max. 320 000 pulses per revolution.

- Configurable by programming software, switch or external programming tool
- Solid shaft, blind or through hollow shaft
- Configurable electric interface level (TTL or HTL)



Features	■ Solid shaft max. ø6 mm	■ Through hollow shaft max. ø12 mm ■ Max. 320 000 pulses per revolution	■ Blind hollow shaft max. ø12 mm ■ Max. 320 000 pulses per revolution	■ Through hollow shaft max. ø14 mm ■ Detachable cable
Product family	BNIV	BHG HighRes	BHF HighRes	ITD2PH00
Configurable parameters	Pulses per revolution			Pulses per revolution, output stage HTL or TTL, zero pulse, signal sequence
Configuration	HEX switch	Programming software, programming tool		
Sensing method	Optical			
Size (housing)	ø40 mm			
Voltage supply	4.75...30 VDC	5 VDC ±10 %, 10...30 VDC		4.75...30 VDC
Output stage				
- TTL/RS422	■	■	■	—
- HTL/push-pull	■	■	■	■
Output signals	A 90° B, N + inverted			
Shaft type				
- Solid shaft	ø6 mm	—	—	—
- Blind hollow shaft	—	—	ø12 mm	—
- Through hollow shaft	—	ø12 mm	—	ø10 mm, ø12 mm, ø14 mm
Connection				
- Flange connector M12	Radial	—	Radial	—
- Flange connector M23	—	Radial	—	—
- Cable	Radial			Tangential
Pulses per revolution	100...25 000	4096...320 000		1...65536
Operating temperature	-20...+85 °C			-30...+100 °C
Protection	IP 64	IP 42, IP 65		IP 65
Operating speed	≤3000 rpm	≤6000 rpm		
Max. shaft load	≤10 N axial, ≤40 N radial	—	—	—

Incremental encoders

Programmable

Maximum flexibility by versatile configuration options.

HighRes – max. 320 000 pulses per revolution



Features	■ Through hollow shaft max. ø25.4 mm	■ Solid shaft with clamping flange max. ø10 mm or synchro flange max. ø6 mm		■ Blind or through hollow shaft max. ø15 mm	
Product family	HS35P	EIL580P-SC	EIL580P-SY	EIL580P-B	EIL580P-T
Configurable parameters	Pulses per revolution, output stage HTL or TTL, zero pulse	Pulses per revolution, output stage HTL or TTL, zero pulse, signal sequence			
Configuration	Programming software, programming tool				
Sensing method	Optical				
Size (housing)	ø3.15" (ø80 mm)	ø58 mm			
Voltage supply	4.75...30 VDC				
Output stage					
- TTL/RS422	■	■	■	■	■
- HTL/push-pull	■	■	■	■	■
Output signals	A 90° B, N + inverted	A 90° B, R + inverted			
Shaft type					
- Solid shaft	—	ø10 mm	ø6 mm	—	—
- Blind hollow shaft	—	—	—	ø8...15 mm	—
- Through hollow shaft	ø0.375...1" (ø9.525...25.4 mm)	—	—	—	ø8...15 mm
Connection					
- Flange connector M23	—	Radial / axial			Radial
- Flange connector MIL	Radial	—		—	
- Cable	Radial	Radial / axial / tangential			Radial / tangential
Pulses per revolution	1...8192	1...65536			
Operating temperature	-40...+100 °C (-40...+212 °F)	-40...+100 °C			
Protection	IP 65, IP 67				
Operating speed	≤5000 rpm	≤12 000 rpm (IP 65) ≤6000 rpm (IP 67)		≤8000 rpm (IP 65), ≤6000 rpm (IP 67)	≤6000 rpm (IP 65), ≤3000 rpm (IP 67)
Max. shaft load	—	≤40 N axial, ≤80 N radial		—	—
Option	—	Isolated hollow shaft, flange variant, connector variant			

Incremental encoders

Sine/Cosine



Precise optical sensing.
Highest signal quality.

- Size $\varnothing 58...80$ mm
- Maximum speed 12 000 rpm
- Robust all-metal housing



Features	Solid shaft with synchro flange	Blind hollow shaft max. ø12 mm	Through hollow shaft	Blind hollow shaft max. ø10 mm Inside flexible coupling
Product family	BDT Sine	BHF Sine	BHG Sine	BHT Sine
Sensing method	Optical			
Size (housing)	ø58 mm			
Voltage supply	5 VDC ±5 %			
Output stage	SinCos 1 Vpp			
Shaft type				
- Solid shaft	ø6 mm	—	—	—
- Blind hollow shaft	—	ø12 mm	—	ø9.52 mm, ø10 mm
- Through hollow shaft	—	—	ø12 mm	—
Connection				
- Flange connector M12	—	Radial		
- Flange connector M23	Radial / axial	Radial		
- Cable	Radial / axial	Radial		
Sine waves per revolution	1000...5000			
Operating temperature	-20...+85 °C			
Protection	IP 42, IP 65			IP 65
Operating speed	≤12 000 rpm (IP 42), ≤6000 rpm (IP 65)			≤6000 rpm
Max. shaft load	≤10 N axial, ≤20 N radial	—	—	—

Incremental encoders

Sine/Cosine

Precise optical sensing.
Highest signal quality.

- Size ø58...80 mm
- Maximum speed 12 000 rpm
- Robust all-metal housing



Features	■ Through hollow shaft ■ Tangential cable outlet	■ Through hollow shaft ■ Inch size ■ Protection up to IP 67	■ Through hollow shaft
Product family	ITD22H00	HS355	ITD 42 A4 Y79
Sensing method	Optical / <i>LowHarmonics</i>		
Size (housing)	ø58 mm	ø3.15" (ø80 mm)	ø80 mm
Voltage supply	5 VDC ±10 %	4.75...30 VDC	5 VDC ±10 %, 8...30 VDC
Output stage	SinCos 1 Vpp		
Shaft type			
- Through hollow shaft	ø10 mm, ø12 mm, ø14 mm	ø0.375...1" (ø9.525...25.4 mm)	ø20...27 mm
Connection			
- Flange connector MIL	—	Radial	—
- Cable	Tangential	Radial	Radial
Sine waves per revolution	1024...2048	1024...5000	1024...2048
Operating temperature	-30...+100 °C	-40...+100 °C (-40...+212 °F)	-20...+85 °C
Protection	IP 65	IP 65, IP 67	IP 65
Operating speed	≤6000 rpm	≤5000 rpm (IP 65) ≤3000 rpm (IP 67)	≤5000 rpm

LowHarmonics

LowHarmonics is leading cutting-edge technology by generating sine signals with negligible harmonic content. Sine encoders with *LowHarmonics* ensure improved control quality, less drive heating and higher energy efficiency.

Incremental encoders

Inch size

Precise optical sensing.
Max. 80 000 pulses per revolution.

- Solid shaft, blind or through hollow shaft
- Robust all-metal housing
- Protection up to IP 67



Features	■ Solid shaft with square flange ■ Inch size ■ Max. 6000 pulses per revolution	■ Solid shaft with square flange ■ Inch size ■ Max. 5000 pulses per revolution	■ Blind or through hollow shaft ■ Max. 5000 pulses per revolution	■ Through hollow shaft ■ Inch size ■ Max. 80 000 pulses per revolution ■ Isolated shaft	
Product family	G25	EIL580-SQ - <i>OptoPulse</i> ®	EIL580-B	EIL580-T	HS35
Sensing method	Optical				
Size (housing)	2.5 x 2.5" (63.5 x 63.5 mm)	2.5 x 2.5" (63.5 x 63.5 mm)	2.28" (ø58 mm)		ø3.15" (ø80 mm)
Voltage supply	5 VDC ±10 % 4.75...30 VDC	5 VDC ±5 % 8...30 VDC 4.75...30 VDC	5 VDC ±5 % 8...30 VDC 4.75...30 VDC		4.75...30 VDC
Output stage					
- TTL/RS422	■	■	■		■
- HTL/push-pull	■	■	■		■
Output signals	A, B, Z + inverted	A 90° B, R + inverted			A 90° B, N + inverted
Shaft type					
- Solid shaft	ø0.375" (ø9.52 mm)	ø10 mm	—		—
- Blind hollow shaft	—	—	ø0.315-0.591" (ø8...15 mm)		—
- Through hollow shaft	—	—	—	ø0.315-0.591" (ø8...15 mm)	ø0.375...1" (ø9.525...25.4 mm)
Connection					
- Flange connector MIL	Radial	—	—		Radial
- Flange connector M12, M23	—	Radial / axial	Radial / axial	Radial	—
- Cable	Radial	Radial / axial / tangential	Radial / axial / tangential	Radial / tangential	—
Pulses per revolution	5...6000	100...5000			1024...80 000
Sine waves per revolution	—	—	—		1024...5000
Operating temperature	-30...+100 °C (5 VDC) -30...+85 °C (24 VDC)	-40...+85 °C (optional +100 °C)			-40...+100 °C (-40...+212 °F)
Protection	IP 54 (without shaft seal) IP 67 (with shaft seal)	IP 65, IP 67			IP 54, IP 65, IP 67
Operating speed	≤10 000 rpm (IP 54) ≤6000 rpm (IP 67)	≤8000 rpm (IP 65) ≤6000 rpm (IP 67)			≤5000 rpm
Max. shaft load	≤80 lbs (350 N) axial/radial ≤100 lbs (450 N) axial or ≤150 lbs (670 N) radial	—	—		—
Options	—	Programmable	Programmable Isolated hollow shaft		Function monitoring EMS Programmable

Incremental encoders

Other designs



Solid shaft with EURO flange B10.
Measuring wheel encoder for length measurement.

- More product variants or customer-specific designs on request.



Features	■ Solid shaft with EURO flange B10 ■ Max. 5000 pulses per revolutions	■ Solid shaft with EURO flange B10 ■ Max. 2048 pulses per revolution	■ Solid shaft with EURO flange B10 ■ Max. 6000 pulses per revolution	■ Measuring wheel encoder comprising encoder, tether arm and measuring wheel ■ Contact pressure fully adjustable
Product family	EIL580-S1 - <i>OptoPulse®</i>	ITD 40 B10	ITD 41 B10	MA20
Configurable parameters	—	—	—	16 pre-defined resolutions
Configuration	—	—	—	HEX switch
Sensing method	Optical			
Size (housing)	ø58 mm	ø82 mm		ø40 mm (encoder)
Voltage supply	5 VDC ±5 % 8...30 VDC 4.75...30 VDC	5 VDC ±5 % 8...30 VDC		4.75...30 VDC
Output stage				
- TTL/RS422	■	—	—	—
- HTL/push-pull	■	■	■	■
Output signals	A 90° B, R + inverted	A 90° B, N + inverted		A 90° B
Shaft type				
- Solid shaft	ø11 mm			ø6 mm
Connection				
- Flange connector M12	Radial	—	—	Radial
- Flange connector M23	Radial	—	—	—
- Cable	Radial			
Pulses per revolution	100...5000	200...2048	1000...6000	100...25 000
Operating temperature	-40...+85 °C (optional +100 °C)	-20...+70 °C (-20...+100 °C)		-20...+85 °C
Protection	IP 65, IP 67	IP 65		IP 64
Operating speed	≤12 000 rpm (IP 65) ≤6000 rpm (IP 67)	≤12 000 rpm	≤6000 rpm	≤3000 rpm
Max. shaft load	≤40 N axial, ≤80 N radial	≤40 N axial, ≤60 N radial		—
Options	—	Seawater resistant Cable with connector		Measuring wheels available with different rubber surface

Absolute flexibility.



Absolute encoders in Ø58 mm size:
EAL580 with clamping flange

Absolute encoders



All current interfaces, device-integrated or by modular bus covers.

With Baumer, you will always encounter the absolute encoder that is just right for your requirements – with conventional point-to-point interface or realtime EtherNet, with precise optical or robust magnetic sensing, from compact $\varnothing 30$ mm size on to large hollow shafts of $\varnothing 50$ mm. The products are optimized for maximum performance and hence predestined for demanding applications where they measurably contribute towards increased productivity.

Reliable quality and flexible delivery times for any interface or mechanical product variant: This involves qualified and committed people, intelligent technologies and the latest production methods.



Sensing technologies

Optical or magnetic sensing

Optical encoders ensure ultimate precision and maximum magnetic field immunity in parallel.

They allow for resolutions up to 18 bits per turn at an accuracy as high as $\pm 0.01^\circ$. Magnetic encoders of the *MAGRES* series are particularly robust and always provide reliable operation even under heavy shocks and vibrations or where there is dew and condensation.

Absolute encoders

Robust magnetic sensing

Size 30 mm.

Integrated interface.

- Solid shaft and blind hollow shaft
- Compact housing where space is tight

MAGRES



Features	■ Solid shaft max. ø8 mm		■ Solid shaft max. ø8 mm ■ High resistance against shocks and vibrations		■ Blind hollow shaft max. ø6 mm Multiturn		■ Solid shaft max. ø6 mm
Product family	BMMV 30	BMSV 30	BMMV 30R	BMSV 30R	BMMH 30	BMSH 30	EAM280
Interface							
- SSI	■		■		■		–
- Analog / redundant	–		–		–		■ / –
- CANopen® / redundant	■ / –		■ / –		■ / –		– / ■
Function principle							
	Multiturn	Singleturn	Multiturn	Singleturn	Multiturn	Singleturn	Singleturn
Sensing method	Magnetic						
Size (housing)	ø30 mm						ø28.6 mm
Voltage supply	10...30 VDC						10...30 VDC (CANopen®) 12...30 VDC (Analog) 5 VDC ±5 % (Analog)
Shaft type							
- Solid shaft	ø5 mm, ø6 mm, ø8 mm				–		ø6 mm
- Blind hollow shaft	–				ø4 mm, ø6 mm		–
Connection							
- Flange connector M12	Radial, axial						Radial
- Cable	Radial, axial						Radial
Resolution ¹⁾	≤30 bit	≤12 bit	≤30 bit	≤12 bit	≤30 bit	≤12 bit	≤12 bit (Analog) ≤14 bit (CANopen®)
Steps per turn	≤4096/12 bit						4096/12 bit (Analog) 16384/14 bit (CANopen®)
Number of turn	≤262144/18 bit –		≤262144/18 bit –		≤262144/18 bit –		–
Absolute accuracy	±1°						±1.8°
Operating temperature	-20...+85 °C		-40...+65 °C		-20...+85 °C		-40...+85 °C
Protection	IP 65		IP 67		IP 65		
Operating speed	≤6000 rpm						≤800 rpm
Max. shaft load	≤10 N axial, ≤10 N radial		≤30 N axial, ≤50 N radial		–		≤25 N axial, ≤25 N radial

MAGRES

The MAGRES absolute encoders operate on both magnetic singleturn and multiturn sensing – entirely non-contact and with high resolutions up to 12 bit singleturn.

Absolute encoders

Robust magnetic sensing

Size 42 mm.

Integrated interface.

- Solid shaft and blind hollow shaft
- Compact housing where space is tight



MAGRES



Features	■ Solid shaft max. ø10 mm		■ Blind hollow shaft ø12 mm	
Product family	BMMV 42	BMSV 42	BMMH 42	BMSH 42
Interface				
- SSI	■		■	
- CANopen®	■		■	
- DeviceNet	■		■	
Function principle				
	Multiturn	Singleturn	Multiturn	Singleturn
Sensing method	Magnetic			
Size (housing)	ø42 mm			
Voltage supply	10...30 VDC			
Shaft type				
- Solid shaft	ø6 mm, ø10 mm		—	
- Blind hollow shaft	—		ø12 mm	
Connection				
- Flange connector M12	Radial			
- Cable	Radial			
Resolution ¹⁾	≤30 bit	≤12 bit	≤30 bit	≤12 bit
Steps per turn	≤4096/12 bit			
Number of turn	≤262 144/18 bit —		≤262 144/18 bit —	
Absolute accuracy	±1°			
Operating temperature	-20...+85 °C			
Protection	IP 65			
Operating speed	≤6000 rpm			
Max. shaft load	≤10 N axial, ≤25 N radial		—	

1) depending on interface

Absolute encoders

Robust magnetic sensing

Size 58 mm.

Integrated interface and modular bus covers.

- Solid shaft and blind hollow shaft



MAGRES



Features	■ Solid shaft with clamping or synchro flange ■ Integrated interface		■ Blind hollow shaft ■ Integrated interface		■ Solid shaft with clamping or synchro flange ■ Modular bus cover		■ Blind hollow shaft ■ Modular bus cover	
Product family	BMMV 58	BMSV 58	BMMH 58	BMSH 58	BMMV 58 flexible	BMSV 58 flexible	BMMH 58 flexible	BMSH 58 flexible

Interface

- SSI	■		■		—		—	
- Analog / redundant	■ / ■		■ / ■		— / —		— / —	
- CANopen® / redundant	■ / ■		■ / ■		■ / —		■ / —	
- DeviceNet	■		■		■		■	
- Profibus-DP	—		—		■		■	
- SAEJ1939	—		—		■		■	
- EtherCAT / PoE	—		—		■		■	
- EtherNet/IP	—		—		■		■	
- Powerlink	—		—		■		■	
- Profinet	—		—		■		■	

Function principle	Multiturn	Singleturn	Multiturn	Singleturn	Multiturn	Singleturn	Multiturn	Singleturn
Sensing method	Magnetic							
Size (housing)	ø58 mm							
Voltage supply	10...30 VDC, 8...30 VDC (analog)				10...30 VDC			
Shaft type								
- Solid shaft	ø6 mm, ø10 mm		–		ø6 mm, ø10 mm		–	
- Blind hollow shaft	–		ø15 mm (ø12 mm analog)		–		ø12 mm	
Connection	Flange connector M12, M23, SUB-D or cable (depending on product and variant)							
Resolution ¹⁾	≤30 bit	≤12 bit	≤30 bit	≤12 bit	≤30 bit	≤12 bit	≤30 bit	≤12 bit
Steps per turn	≤4096/12 bit							
Number of turn	≤262144/18 bit –		≤262144/18 bit –		≤262144/18 bit –		≤262144/18 bit –	
Absolute accuracy	±1°							
Operating temperature	-40...+85 °C							
Protection	IP 65, IP 67							
Operating speed	≤6000 rpm							
Max. shaft load	≤40 N axial, ≤80 N radial		–		≤40 N axial, ≤80 N radial		–	

Absolute encoders

Robust magnetic sensing

Size 58 mm.

Integrated interface and modular bus covers.

- Solid shaft with clamping flange
- Operating temperature down to -40 °C
- Hermetically sealed, compliance up to IP 69K
- Stainless steel design



MAGRES
hermetic



Features	■ Solid shaft with clamping flange ■ Multiturn ■ Hermetically sealed ■ Integrated interfaces	■ Solid shaft with clamping flange ■ Multiturn ■ Hermetically sealed ■ Modular bus cover
Product family	BMMV 58 - MAGRES hermetic	BMMV 58 flexible - MAGRES hermetic

Interface		
- SSI	■	—
- CANopen®	■	■
- DeviceNet	—	■ 2)
- Profibus-DP	■	■
- SAEJ1939	—	■
- EtherCAT/PoE	—	■ 2)
- EtherNet/IP	—	■
- Powerlink	—	■ 2)
- Profinet	—	■

Function principle	Multiturn	Multiturn
Sensing method	Magnetic	
Size (housing)	ø58 mm	
Voltage supply	10...30 VDC	
Shaft type		
- Solid shaft	ø10 mm	
Connection	Flange connector M12	
Resolution ¹⁾	≤29 bit	≤30 bit
Steps per turn	≤4096/12 bit ≤8192/13 bit (Profibus)	≤4096/12 bit
Number of turn	≤65536/16 bit (Profibus) ≤262144/18 bit	≤65536/16 bit ≤262144/18 bit (CANopen®)
Absolute accuracy	±1°	
Operating temperature	-40...+85 °C	
Protection	IP 68, IP 69 K	
Operating speed	≤6000 rpm	
Max. shaft load	≤120 N axial, ≤280 N radial	

1) depending on interface
2) on request

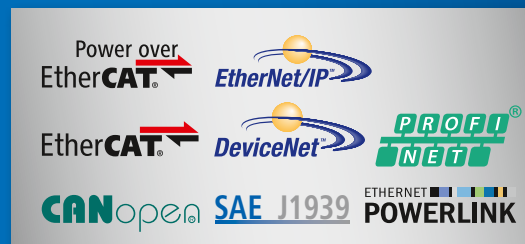
Absolute encoders

Precise optical sensing

Size 58 mm.

Integrated interface.

- Resolution up to 14 bit per turn
- High accuracy up to $\pm 0.025^\circ$
- Operating temperature down to -40°C
- Additional incremental signals



Features	■ Solid shaft with clamping flange		■ Solid shaft with synchro flange		■ Blind hollow shaft		■ Through hollow shaft	
Interface	Product family							
- SSI or (SSI / incremental)	GM400	GA240	GM401	GA241	GXM2S	GXA2S	GOM2H	G0A2H
- RS485	GXM7W	GXA7W	GXM7W	GXA7W	GXM7S	—	—	—
- Analog	—	—	—	ATD 2A B14	—	—	ATD 2A A4	ATD2AH00
- Parallel	GXP1W	GA240	GXP1W	GA241	—	—	—	—
- CANopen®	GXP5W	GXU5W	GXP5W	GXU5W	GXP5S	—	G0P5H	—
- DeviceNet	GXP8W	—	GXP8W	—	—	—	—	—
- Profinet	EAL580-SC		EAL580-SY		EAL580-B		EAL580-T	
Function principle	Multiturn	Singleturn	Multiturn	Singleturn	Multiturn	Singleturn	Multiturn	Singleturn
Sensing method	Optical							
Size (housing)	ø58 mm							
Voltage supply	10...30 VDC							
Shaft type								
- Solid shaft	ø10 mm		ø6 mm		—		—	
- Blind hollow shaft	—		—		ø12-14 mm		—	
- Through hollow shaft	—		—		—		ø12-14 mm	
Connection	Flange connector M12, M23, M27, D-SUB or cable (depending on product and variant)							
Resolution ¹⁾	≤29 bit	≤13 bit	≤29 bit	≤13 bit	≤29 bit	≤13 bit	≤29 bit	≤13 bit
Steps per turn	≤8192/13 bit							
Number of turn	≤65536/16 bit —		≤65536/16 bit —		≤65536/16 bit —		≤65536/16 bit —	
Absolute accuracy	±0.025°							
Protection	IP 65				IP 54			
Operating temperature	-40...+85 °C (depending on product and variant)							
Operating speed	≤6000 rpm							
Max. shaft load	≤20 N axial, ≤40 N radial				—			
Options	Operating temperature -40...+85 °C Stainless steel, Offshore		Operating temperature -40...+85 °C		Operating temperature -40...+85 °C		Operating temperature -40...+85 °C Protection IP 65	

Absolute encoders

Precise optical sensing

Size 58 mm.
Integrated interface.

- High resolution up to 18 bit per turn
- High accuracy $\pm 0.01^\circ$
- Operating temperature max. -40°C
- Additional incremental signals

HighRes – up to 18 bit
singleturn resolution



New



New



Features	■ Solid shaft with clamping flange ■ High resolution		■ Solid shaft with synchro flange ■ High resolution		■ Blind hollow shaft ■ High resolution		■ Through hollow shaft ■ High resolution	
Interface	Product family							
- SSI or (SSI / incremental)	GBM2W	GBA2W	GBM2W	GBA2W	GBM2S	GBA2S	GBM2H	GBA2H
- RS485	GBM7W ²⁾	—	GBM7W ²⁾	—	GBM7S ²⁾	—	—	—
- CANopen®	GBP5W	GBU5W	GBP5W	GBU5W	GBP5S	—	GBP5H	—
- EtherCAT / PoE	ATD 2B B14	—	ATD 2B B14	—	ATD 2B A4	—	ATD 4B A4	—
- BiSS C	GBPAW	GBUAW	GBPAW	GBUAW	GBPAS	GBUAS	GBPAH	GBUAH
- Profinet	EAL580-SC		EAL580-SY		EAL580-B		EAL580-T	
Function principle	Multiturn	Singleturn	Multiturn	Singleturn	Multiturn	Singleturn	Multiturn	Singleturn
Sensing method	Optical							
Size (housing)	ø58 mm							
Voltage supply	10...30 VDC							
Shaft type								
- Solid shaft	ø10 mm		ø6 mm		—		—	
- Blind hollow shaft	—		—		ø12-14 mm		—	
- Through hollow shaft	—		—		—		ø12-14 mm	
Connection	Flange connector M12, M23, D-SUB or cable (depending on product and variant)							
Resolution ¹⁾	≤32 bit	≤18 bit	≤32 bit	≤18 bit	≤32 bit	≤18 bit	≤32 bit	≤18 bit
Steps per turn	≤262144/18 bit							
Number of turn	≤16384/14 bit —		≤16384/14 bit —		≤16384/14 bit —		≤16384/14 bit —	
Absolute accuracy	±0.01°							
Protection	IP 65				IP 54 (IP 65 optional)		IP 54	
Operating temperature	-40...+85 °C (depending on product and variant)							
Operating speed	≤6000 rpm							
Max. shaft load	≤20 N axial, ≤40 N radial				—			
Options	Operating temperature -40...+85 °C							

1) depending on interface
2) on request

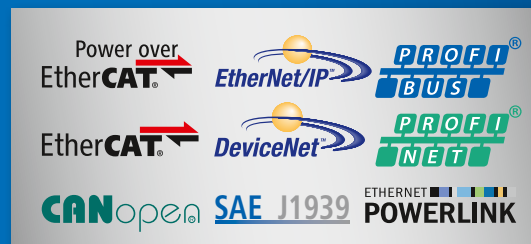
Absolute encoders

Precise optical sensing

Size 58 mm.

Modular bus cover.

- Resolution up to 14 bit per turn
- High accuracy $\pm 0.025^\circ$
- Operating temperature down to -40°C
- Additional incremental signals



Features	■ Solid shaft with clamping flange		■ Solid shaft with synchro flange		■ Blind hollow shaft		■ Through hollow shaft	
Product family	GXMMW	GXAMW	GXMMW	GXAMW	GXMMS	GXAMS	G0MMH	G0AMH

Interface

- SSI	■	■	■	■	■	■	■	■
- CANopen®	■	■	■	■	■	■	■	■
- DeviceNet	■	■	■	■	■	■	■	■
- Profibus-DP	■	■	■	■	■	■	■	■
- SAEJ1939	■	■	■	■	■	■	■	■
- EtherCAT / PoE	■	■	■	■	■	■	■	■
- EtherNet/IP	■	■	■	■	■	■	■	■
- Powerlink	■	■	■	■	■	■	■	■
- Profinet	■	■	■	■	■	■	■	■

Function principle	Multiturn	Singleturn	Multiturn	Singleturn	Multiturn	Singleturn	Multiturn	Singleturn
Sensing method	Optical							
Size (housing)	ø58 mm							
Voltage supply	10...30 VDC							
Shaft type								
- Solid shaft	ø10 mm		ø6 mm		—		—	
- Blind hollow shaft	—		—		ø12-14 mm		—	
- Through hollow shaft	—		—		—		ø12-14 mm	
Connection	Bus cover with M12 or cable gland (depending on product and variant)							
Resolution	≤29 bit	≤13 bit	≤29 bit	≤13 bit	≤29 bit	≤13 bit	≤29 bit	≤13 bit
Steps per turn	≤8192/13 bit							
Number of turn	≤65536/16 bit —		≤65536/16 bit —		≤65536/16 bit —		≤65536/16 bit —	
Absolute accuracy	±0.025°							
Protection	IP 54, IP 65						IP 54	
Operating speed	≤6000 rpm							
Operating temperature	-25...+85 °C							
Max. shaft load	≤20 N axial, ≤40 N radial				—		—	
Options	Incremental outputs Stainless steel variant Operating temperature -40...+85 °C						Protection IP 69K Stainless steel variant Operating temperature -40...+85 °C	

Absolute encoders

Precise optical sensing

Size 58 mm.
Modular bus cover.

- High resolution up to 18 bit per turn
- High accuracy $\pm 0.01^\circ$
- Operating temperature down to -40°C
- Additional incremental signals



HighRes – up to 18 bit
singleturn resolution



Features	■ Solid shaft with clamping flange ■ High resolution		■ Solid shaft with synchro flange ■ High resolution		■ Blind hollow shaft ■ High resolution		■ Through hollow shaft ■ High resolution	
Product family	GBMMW	GBAMW	GBMMW	GBAMW	GBMMS	GBAMS	GBMMH	GBAMH

Interface				
- SSI	■	■	■	—
- CANopen®	■	■	■	■
- DeviceNet	■	■	■	■
- Profibus-DP	■	■	■	■
- SAEJ1939	■	■	■	—
- EtherCAT / PoE	■	■	■	—
- EtherNet/IP	■	■	■	■
- Powerlink	■	■	■	—
- Profinet	■	■	■	■

Function principle	Multiturn	Singleturn	Multiturn	Singleturn	Multiturn	Singleturn	Multiturn	Singleturn
Sensing method	Optical							
Size (housing)	ø58 mm							
Voltage supply	10...30 VDC							
Shaft type								
- Solid shaft	ø10 mm		ø6 mm		—		—	
- Blind hollow shaft	—		—		ø12-14 mm		—	
- Through hollow shaft	—		—		—		ø12-14 mm	
Connection	Bus cover with M12 or cable gland (depending on product and variant)							
Resolution	≤31 bit	≤18 bit	≤31 bit	≤18 bit	≤31 bit	≤18 bit	≤31 bit	≤18 bit
Steps per turn	≤262144/18 bit		≤262144/18 Bit		≤262144/18 Bit		≤262144/18 Bit	
Number of turn	≤8192/13 bit	—	≤8192/13 bit	—	≤8192/13 bit	—	≤8192/13 bit	—
Absolute accuracy	±0.01°							
Protection	IP 54, IP 65						IP 54	
Operating speed	≤6000 rpm							
Operating temperature	-25...+85 °C							
Max. shaft load	≤20 N axial, ≤40 N radial				—		—	
Options	Incremental outputs Operating temperature -40...+85 °C						Protection IP 69K Stainless steel variant Operating temperature -40...+85 °C	

Absolute encoders

Large hollow shafts 20...50.8 mm

Precise optical sensing.
SSI interface.

- Shallow installation depth
- Easy installation
- Wide range of accessories



SSI



Features	■ Through hollow shaft max. ø25.4 mm ■ Integrated interface SSI	■ Through hollow shaft max. ø50.8 mm ■ Integrated interface SSI	■ Through hollow shaft max. ø27 mm ■ Integrated interface SSI and optional incremental signals
Product family	G1M2H	G2M2H	ATD 4S A4
Interface			
- SSI / SSI/incremental	■ / –	■ / –	■ / ■
Function principle			
	Multiturn		Singleturn / Multiturn
Sensing method			
	Optical		
Size (housing)	ø90 mm	ø116 mm	ø80 mm
Voltage supply			
	10...30 VDC		
Shaft type			
- Through hollow shaft	ø25.4 mm	ø50.8 mm	ø20...27 mm
Connection			
- Flange connector M23	Radial		
- Cable	–	–	Radial
Resolution			
	≤25 bit		
Steps per turn			
	≤8192/13 bit		
Number of turn			
	≤4096/12 bit		
Absolute accuracy			
	±0.025°		±0.02°
Operating temperature			
	-25...+85 °C		-20...+85 °C
Protection			
	IP 54		IP 65
Operating speed			
	≤3800 rpm	≤2000 rpm	≤5000 rpm
Options			
	Operating temperature -40...+85 °C Protection IP 65		Incremental signals: HTL, TTL, or sine Resolution: Steps per turn max. 15 bit Number of turn max. 24 bit

Absolute encoders

Large hollow shaft 20...50.8 mm

Precise optical sensing.
Realtime EtherNet and fieldbus.

- Shallow installation depth
- Easy installation
- Wide range of accessories



Features	■ Through hollow shaft max. ø25.4 mm ■ Modular bus cover	■ Through hollow shaft max. ø50.8 mm ■ Modular bus cover	■ Through hollow shaft max. ø27 mm ■ Integrated interface EtherCAT
Product family	G1MMH	G2MMH	ATD 4B A4 Y11
Interface			
- CANopen®	■	■	—
- DeviceNet	■	■	—
- Profibus-DP	■	■	—
- EtherCAT	—	—	■
Function principle			
Function principle	Multiturn		
Sensing method			
Sensing method	Optical		
Size (housing)	ø90 mm	ø116 mm	ø80 mm
Voltage supply			
Voltage supply	10...30 VDC		
Shaft type			
- Through hollow shaft	ø25.4 mm	ø50.8 mm	ø20...27 mm
Connection			
Connection	Bus cover with M12 or cable gland (depending on product and variant)		
Resolution			
Resolution	≤29 bit		
Steps per turn			
Steps per turn	≤8192/13 bit		≤131072/17 bit
Number of turn			
Number of turn	≤65536/16 bit		
Absolute accuracy			
Absolute accuracy	±0.025°		±0.02°
Operating temperature			
Operating temperature	-25...+85 °C		-20...+85 °C
Protection			
Protection	IP 54		IP 65
Operating speed			
Operating speed	≤3800 rpm	≤2000 rpm	≤5000 rpm
Configurable parameters			
Configurable parameters	Steps per turn Number of turn Rotational direction Preset		Steps per turn Number of turn Rotational direction Operating modes
Options			
Options	Operating temperature -40...+85 °C Protection IP 65		—

Tough where it's rough.
Precise during
operation.



Incremental encoder
HOG 10 with blind
hollow shaft



HeavyDuty encoders, speed switches, tachogenerators and combinations.

For decades, Baumer HeavyDuty encoders have been proving unrivalled reliability under most adverse conditions. Whether at gantry cranes, vertical lift bridges, steel plants or windpower stations – these encoders are extremely robust, failsafe and durable. Product combinations merging several sensing methods or twin encoders can take over specific tasks and safety functions. In drive applications where besides the speed information additional control signals are required, HeavyDuty product combinations of encoders, tachogenerators and speed switches will

provide you with the decisive impulse thanks to their integrated additional functions.

Durable and reliable thanks to proven HeavyDuty technology.

- Solid aluminium or stainless steel housing
- Dual bearings
- HeavyDuty connection technology
- Isolated against shaft currents
- Explosion protection against gases and dust
- Protected against sea and tropical climate

HÜBNER
BERLIN
A Baumer Brand

Baumer Hübner

Hübner Berlin, now Baumer Hübner, is the Baumer Group competence center for HeavyDuty sensors particularly conceived for drive engineering. We have been world-leading in this industry for more than 50 years, setting new benchmarks for reliable encoders, tachogenerators and speed switches in HeavyDuty technology. Our unrivalled resilient products are optimized to match your individual application and merge longtime branch expertise with cutting-edge technology. For dependable operation you can always rely on.

HeavyDuty

Incremental encoders

Size 58...120 mm.

Solid shaft from $\varnothing 6...11$ mm.

- Precision signals in drive engineering
- Robust electrical and mechanical design
- Synchro or EURO flange B10
- Redundant sensing
- Integrated function monitoring EMS



Features	■ Solid shaft with synchro flange	■ Solid shaft with EURO flange B10 ■ Shallow installation depth <70 mm	■ Solid shaft with EURO flange B10 ■ Concentrated on the essential – pure functionality	■ Solid shaft with EURO flange B10 ■ Max. 5000 pulses per revolution ■ Corrosion-proof compliant to C4
Product family	OG 71	OG 9	POG 86E	POG 86
Sensing method	Optical			
Size (housing)	ø58 mm	ø115 mm		
Voltage supply	5 VDC ±5 %, 9...26 VDC	5 VDC ±5 %, 9...26 VDC, 9...30 VDC	5 VDC ±5 %, 9...30 VDC	
Output stage				
- TTL/RS422	■	■	■	■
- HTL/push-pull	■	—	—	—
- HTL-P (Power Linedriver)	—	■	■	■
- LWL (fiber-optic interface)	With fiber-optic transducer (Outdoor-Box)			
Output signals	K1, K2, K0 + inverted			
Shaft type				
- Solid shaft	ø6 mm	ø11 mm		
Flange	Synchro flange	EURO flange B10		
Connection	Terminals	Terminal box		
Pulses per revolution	100...1024	1...1250	512...2500	500...5000
Operating temperature	-20...+85 °C	-30...+100 °C	-40...+100 °C	
Protection	IP 66	IP 55	IP 56	
Operating speed	≤10 000 rpm	≤12 000 rpm		
Max. shaft load	≤30 N axial, ≤40 N radial	≤250 N axial, ≤450 N radial		
Explosion protection	Ex II 3G IIC / 3D IIIC (ATEX)			
Options	—	Redundant output	—	Function monitoring EMS Redundant sensing Centrifugal switch (FSL)

HTL/TTL

To ensure optimum HTL or TTL signal quality via RS422 even at extended cable length we deploy short circuit proof power drivers with max. 300 mA peak current. This allows for direct TTL signal supply in extended transmission length of more than 500 m and yet extremely compact housings. The high-current power drivers HTL-P are fully compatible to HTL/push-pull and allow for long-distance lines up to 350 m.

HeavyDuty

Incremental encoders

Unrivalled longevity and reliability thanks to proven HeavyDuty technology.

- Solid aluminium or stainless steel housing
- Dual bearings
- Explosion protection against gases and dust
- HeavyDuty connection technology
- Isolated against shaft currents
- Protected against sea and tropical climate



Features	■ Solid shaft with EURO flange B10 ■ Max. 5000 pulses per revolution ■ High protection IP 66	■ Solid shaft with EURO flange B10 ■ Seawater resistant (C5M)	■ Solid shaft with EURO flange B10 ■ Max. 10000 pulses per revolution	■ Solid shaft with EURO flange B10 ■ IECEx certification
Product family	POG 10	POG 11	POG 90	EEx OG 9
Sensing method	Optical			
Size (housing)	ø115 mm			ø120 mm
Voltage supply	5 VDC ±5 %, 9...30 VDC			
Output stage				
- TTL/RS422	■	■	■	■
- HTL-P (Power Linedriver)	■	■	■	■
- LWL (fiber-optic interface)	With fiber-optic transducer (Outdoor-Box)			
Output signals	K1, K2, K0 + inverted			
Shaft type				
- Solid shaft	ø11 mm			
Flange	EURO flange B10			
Connection	Terminal box, rotatable			
Pulses per revolution	300...5000		1024...10000	25...5000
Operating temperature	-40...+100 °C -50...+100 °C (option)		-20...+85 °C	-40...+55 °C (<500 pulses) -50...+55 °C (<500-2500 pul.) -25...+55 °C (>3072 pulses)
Protection	IP 66	IP 67	IP 66	IP 56
Operating speed	≤12 000 rpm			
Max. shaft load	≤300 N axial, ≤450 N radial			≤200 N axial, ≤350 N radial
Explosion protection	Ex II 3G IIC / 3D IIIC (ATEX)			Ex II 2G IIC (ATEX/IECEx)
Options	Function monitoring EMS Redundant sensing Housing foot B3		Function monitoring EMS Redundant sensing	

EURO flange B10

EURO flange B10 is the world-wide mounting standard for HeavyDuty shaft encoders.

HeavyDuty

Incremental encoders

Size 60...105 mm.

Hollow shaft $\varnothing 8...26$ mm or cone shaft $\varnothing 17$ mm.

- Precision signals in drive engineering
- Robust electrical and mechanical design
- Redundant sensing
- Integrated function monitoring EMS



Features	■ Blind hollow shaft ■ High shock and vibration resistance	■ Cone shaft or through hollow shaft	■ Cone shaft or blind hollow shaft ■ Rotatable terminal box ■ Concentrated on the essential – pure functionality	■ Cone shaft or blind hollow shaft ■ Rotatable terminal box
Product family	HOG 71	HOG 75	HOG 86E	HOG 86
Sensing method	Optical			
Size (housing)	$\varnothing 60$ mm	$\varnothing 75$ mm	$\varnothing 99$ mm	$\varnothing 99$ mm
Voltage supply	5 VDC $\pm 5\%$, 9...26 VDC			
Output stage				
- TTL/RS422	■	■	■	■
- HTL/push-pull	■	–	–	–
- HTL-P (Power Linedriver)	–	■	■	■
- LWL (fiber-optic interface)	With fiber-optic transducer (Outdoor-Box)			
Output signals	K1, K2, K0 + inverted			
Shaft type				
- Cone shaft 1:10	–	$\varnothing 17$ mm		
- Blind hollow shaft	$\varnothing 8...12$ mm	–	$\varnothing 12...16$ mm	
- Through hollow shaft	–	$\varnothing 12...26$ mm	–	–
Connection	Terminals		Terminal box, rotatable, flange connector M23	Terminal box, rotatable, flange connector M23 or cable
Pulses per revolution	64...2048	250...2500	512...2500	500...5000
Operating temperature	-20...+85 °C	-30...+85 °C	-40...+100 °C	
Protection	IP 66	IP 65	IP 66	
Operating speed	$\leq 10\,000$ rpm	$\leq 12\,000$ rpm		
Max. shaft load	≤ 30 N axial, ≤ 40 N radial	≤ 30 N axial, ≤ 40 N radial	≤ 350 N axial, ≤ 450 N radial	≤ 30 N axial, ≤ 40 N radial
Explosion protection	Ex II 3G IIC / 3D IIIC (ATEX)			
Options	–	Hybrid bearings	–	Function monitoring EMS, hybrid bearings, redundant sensing

Redundant sensing

Encoders with two sensing units for redundant signal acquisition ensure ever-present availability in demanding applications.

HeavyDuty

Incremental encoders

50 years of HeavyDuty expertise brought into being encoder platform HOG 86, a complete product family with outstanding flexibility in selection and mounting options.



Features	■ Cone shaft or blind hollow shaft ■ 5000 pulses per revolution ■ Hybrid bearings as standard		
Product family	HOG 10	HOG 11	HOG 100
Sensing method	Optical		
Size (housing)	ø105 mm		
Voltage supply	5 VDC ±5 %, 9...30 VDC		5 VDC ±5 %, 9...26 VDC, 9...30 VDC
Output stage			
- TTL/RS422	■	■	■
- HTL/push-pull	—	—	—
- HTL-P (Power Linedriver)	■	■	■
- LWL (fiber-optic interface)	With fiber-optic transducer (Outdoor-Box)		
Output signals	K1, K2, K0 + inverted		
Shaft type			
- Cone shaft 1:10	ø17 mm		
- Through hollow shaft	ø12...20 mm		
Connection	Terminal box axial, radial		
Pulses per revolution	300...5000		1024...10 000
Operating temperature	-40...+100 °C (-50...+100 °C option)		-30...+85 °C
Protection	IP 66	IP 67	IP 66
Operating speed	≤12000 rpm		
Max. shaft load	≤450 N axial, ≤600 N radial		
Explosion protection	Ex II 3G IIC / 3D IIIC (ATEX)		
Options	Function monitoring EMS Redundant sensing	Function monitoring EMS Redundant sensing DNV certification	Function monitoring EMS Redundant sensing

EMS

Enhanced Monitoring System EMS in incremental encoders monitors all crucial encoder functionalities throughout the encoder's entire speed range. EMS will signal connection errors and speed up commissioning. During operation, EMS facilitates error tracking and prevents cost-intensive downtime.

HeavyDuty

Incremental encoders

Size 130...165 mm.

Hollow shaft $\varnothing 16...75$ mm.

- Precise optical encoders for large drive shafts
- Through hollow shaft
- Outstanding high mechanical reserve capacity
- For use in permanently oily-wet environments
- Hybrid bearings as standard



Features	■ Through hollow shaft ■ Seawater resistant (C5M) ■ Integrated lightning protection ■ Axial torque plate	■ Through hollow shaft max. ø38 mm	■ Through hollow shaft ■ Rotatable terminal box ■ Operating speed max. 6000 rpm ■ Max. 5000 pulses per revolution	■ Through hollow shaft with keyway ■ Seawater resistant (C5M) ■ Protection IP 67 ■ Max. 8192 pulses per revolution
Product family	HOG 131	HOG 16	HOG 163	HOG 165
Sensing method	Optical			
Size (housing)	ø130 mm	ø158 mm	ø158 mm	ø165 mm
Voltage supply	5 VDC ±5 %, 9...30 VDC			
Output stage				
- TTL/RS422	■	■	■	■
- HTL-P (Power Linedriver)	■	■	■	■
- LWL (fiber-optic interface)	With fiber-optic transducer (Outdoor-Box)			
Output signals	K1, K2, K0 + inverted			
Shaft type				
- Through hollow shaft	ø16...36 mm	ø20...38 mm	ø38...75 mm	ø20...38 mm
Connection	Terminal box	Terminal box, rotatable		
Pulses per revolution	2048...3072	250...2500	250...5000	1024...8192
Operating temperature	-40...+100 °C	-20...+85 °C	-30...+85 °C	-30...+100 °C
Protection	IP 56	IP 66	IP 56	IP 67
Operating speed	≤6000 rpm			
Max. shaft load	≤300 N axial, ≤500 N radial	≤450 N axial, ≤600 N radial	≤300 N axial, ≤500 N radial	≤500 N axial, ≤650 N radial
Explosion protection	Ex II 3G IIC / 3D IIIC (ATEX)			
Options	Redundant sensing			Redundant sensing Long torque arm Stainless steel housing

Hybrid bearings

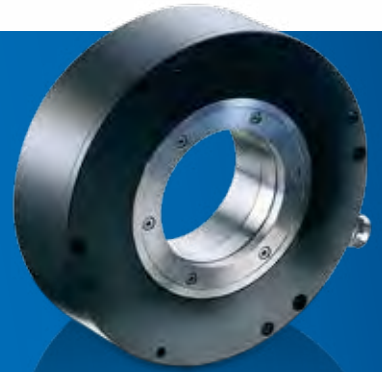
Hybrid bearings consist of a steel race hosting high-strength ceramic balls. Hybrid bearings enable 5 times the service life of conventional steel bearings. In parallel, hybrid bearings provide high-voltage proof isolation of the encoder shaft.

HeavyDuty Incremental encoders

Size 227...287 mm.

Hollow shaft ø80...150 mm.

- Precise optical encoders for large drive shafts
- Through hollow shaft
- Outstanding high mechanical reserve capacity
- Insulated shaft



Features	■ Through hollow shaft max. ø115 mm ■ Rotatable terminal box ■ Robust light-metal housing	■ Through hollow shaft max. ø150 mm ■ Plug-in electronics for quick exchange, no need to uninstall ■ With crane eye for easy handling
Product family	HOG 220	HOG 28
Sensing method	Optical	
Size (housing)	ø227 mm	ø287 mm
Voltage supply	5 VDC ±10 %, 9...26 VDC	
Output stage		
- TTL/RS422	■	■
- HTL/Gegentakt	—	—
- HTL-P (Power Linedriver)	■	■
- LWL (fiber-optic)	With fiber-optic transducer (Outdoor-Box)	
Output signals	K1, K2, K0 + inverted	
Shaft type		
- Through hollow shaft	ø80...115 mm	ø120...150 mm
Connection	Terminal box radial, rotatable	Terminal box radial, rotatable, mating connector M23
Pulses per revolution	1024	1024...2048
Operating temperature	-30...+85 °C	
Protection	IP 54	IP 56
Operating speed	≤3800 rpm	≤3600 rpm
Max. shaft load	≤450 N axial, ≤700 N radial	≤550 N axial, ≤800 N radial
Explosion protection	Ex II 3G IIC / 3D IIIC (ATEX)	
Options	Isolated hollow shaft Redundant sensing	Redundant sensing

Corrosion protection

For onshore or offshore applications in a high-corrosive environment, Baumer provides sensors with long-term protection by durable coating compliant to categories C4 or C5M according to EN ISO 12944. External salt spray tests proved these products corrosion-proof and standard compliant. Non-coated products of the HeavyDuty class fulfil C4 requirements even in their standard variant, whereas stainless steel designs or nickel-plated sensors provide C5M protection.

Incremental encoders – Sine/Cosine

Size 58...115 mm.

Solid shaft $\varnothing 6...11$ mm, hollow shaft $\varnothing 12...26$ mm or cone shaft $\varnothing 17$ mm.

- Precise optical sensing
- Extremely high signal quality



Features	■ Solid shaft with synchro flange	■ Solid shaft with EURO flange B10 ■ Max 5000 sine waves per revolution	■ Blind hollow shaft max. $\varnothing 14$ mm ■ High resistance against shocks and vibrations ■ Patented expansion anchor for fan guard assembly	■ Cone shaft or through hollow shaft max. $\varnothing 26$ mm ■ Hybrid bearings as standard
Product family	OGS 71	POGS 90	HOGS 71	HOGS 75
Sensing method	Optical			
Size (housing)	$\varnothing 58$ mm	$\varnothing 115$ mm	$\varnothing 60$ mm	$\varnothing 75$ mm
Voltage supply	5 VDC $\pm 10\%$, 9...30 VDC			
Output stage				
- SinCos 1 Vpp	■	■	■	■
Output signals	K1, K2, K0 + inverted			
Shaft type				
- Solid shaft	$\varnothing 6$ mm	$\varnothing 11$ mm	—	—
- Cone shaft 1:10	—	—	—	$\varnothing 17$ mm
- Blind hollow shaft	—	—	$\varnothing 12...14$ mm	—
- Through hollow shaft	—	—	—	$\varnothing 14...26$ mm
Flange	Synchro flange	EURO flange B10	—	—
Connection	Connecting terminal in the housing	Terminal box, rotatable	Connecting terminal in the housing	
Sine waves per revolution	1024...5000	720...5000	1024...5000	1024...2048
Operating temperature	-20...+85 °C			-20...+70 °C
Protection	IP 66			IP 56
Operating speed	$\leq 10\,000$ rpm			
Max. shaft load	≤ 30 N axial, ≤ 40 N radial	≤ 250 N axial, ≤ 350 N radial	≤ 30 N axial, ≤ 40 N radial	≤ 80 N axial, ≤ 150 N radial ≤ 170 N axial, ≤ 250 N radial (cone shaft)
Explosion protection	Ex II 3G IIC / 3D IIIC (ATEX)			
Options	—	Dual shaft	—	Cable outlet

HeavyDuty

Incremental encoders – Sine/Cosine

Size 105...168 mm.

Solid shaft $\varnothing 12...75$ mm or cone shaft $\varnothing 17$ mm.

- Precise optical sensing
- Extremely high signal quality



Features	■ Cone shaft or blind hollow shaft max. ø20 mm	■ Through hollow shaft max. ø75 mm	■ Through hollow shaft max. ø70 mm ■ Axial torque plate ■ Clamping set
Product family	HOGS 100	HOGS 14	HOGS 151
Sensing method	Optical		
Size (housing)	ø105 mm	ø158 mm	ø168 mm
Voltage supply	5 VDC ±10 %, 9...30 VDC		
Output stage			
- SinCos 1 Vpp	■	■	■
Output signals	K1, K2, K0 + inverted		A+, B+, R+, A-, B-, R-
Shaft type			
- Cone shaft 1:10	ø17 mm	—	—
- Blind hollow shaft	ø12...20 mm	—	—
- Through hollow shaft	—	ø40...75 mm	ø60...70 mm
Connection	Terminal box, rotatable		Round connector, cable
Sine waves per revolution	720...5000	1024...5000	
Operating temperature	-20...+85 °C		
Protection	IP 54	IP 55	IP 54
Operating speed	≤10 000 rpm	≤6300 rpm	
Max. shaft load	≤450 N axial, ≤600 N radial	≤150 N axial, ≤200 N radial	≤350 N axial, ≤500 N radial
Explosion protection	Ex II 3G IIC / 3D IIIC (ATEX)		

LowHarmonics

LowHarmonics is leading cutting-edge technology by generating sine signals with negligible harmonic content. Sine encoders with *LowHarmonics* ensure improved control quality, less drive heating and higher energy efficiency.

HeavyDuty

Absolute encoders

Size 60...160 mm.

Solid shaft, hollow shaft or cone shaft.

- EURO flange B10
- Operating temperature bis +100 °C
- Power-autonomous *MicroGen* revolution counter
- Extremely robust thanks to bearings at both shaft ends
- Additional incremental signals with zero pulse



New



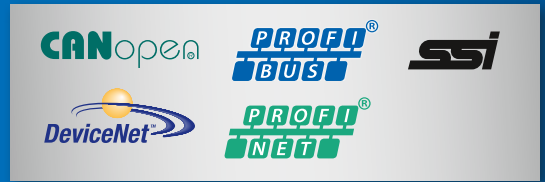
New

Features	■ Solid shaft with synchro flange	■ Solid shaft with EURO flange B10 ■ Axial bus cover	■ Solid shaft with EURO flange B10 ■ Corrosion & seawater proof ■ Double-sided mounting	■ Cone shaft, blind or through hollow shaft ■ Corrosion & seawater proof ■ Double-sided mounting
Product family	AMG 71	AMG 81	PMG 10	HMG 10
Interface				
- SSI	■	■	■	■
- CANopen®	—	■	■	■
- Profibus-DP	—	■	■	■
- Profinet	—	—	■	■
- EtherCAT	—	—	■	■
Function principle	Singleturn / Multiturn			
Sensing method	Optical		Magnetic	
Size (housing)	ø60 mm	ø115 mm	ø115 mm	ø105 mm
Voltage supply	7...30 VDC	9...30 VDC		
Shaft type				
- Solid shaft	ø6 mm	ø11 mm	ø11 mm	—
- Cone shaft 1:10	—	—	—	ø17 mm
- Blind hollow shaft	—	—	—	ø12...20 mm
- Through hollow shaft	—	—	—	ø12...20 mm
Flange	Synchro flange	EURO flange B10	EURO flange B10	—
Connection	Terminal cover with cable gland	Axial bus cover Mating connector M23	Bus cover Terminal box Mating connector M12 or M23	
Resolution	≤29 bit		≤40 Bit	
Steps per turn	≤8192/13 bit		≤1 048 576/20 bit	
Number of turn	≤4096/12 Bit ≤65 536/16 Bit		≤1 048 576/20 bit	
Protection	IP 66	IP 55	IP 66, IP 67	
Operating temperature	-20...+85 °C		-40...+100 °C	
Operating speed	≤5000 U/min	≤3500 U/min	≤12000 rpm	
Max. shaft load	≤50 N axial, ≤120 N radial	≤50 N axial, ≤60 N radial	≤450 N axial, ≤650 N radial	
Explosion protection	Ex II 3G IIC / 3D IIIC (ATEX)			
Options	SinCos signal Additional incremental signals	Additional incremental signals	Integrated speed switch Additional incremental signals	

HeavyDuty

Absolute encoders

Robust mechanics and innovative technology – our absolute HeavyDuty encoders are ultra-reliable and durable in parallel excel with unique *MicroGen* technology. *MicroGen* is completely wear-free and this way opens up new application potential.



Features	■ Through hollow shaft ■ Corrosion & seawater proof ■ Isolated bearings ■ Axial torque plate
Product family	HMG 161
Interface	
- SSI	■
- CANopen®	■
- DeviceNet	■
- Profibus-DP	■
Sensing method	Optical
Size (housing)	ø160 mm
Voltage supply	9...30 VDC
Shaft type	
- Through hollow shaft	ø38...70 mm
Connection	Bus cover Terminal box
Resolution	≤29 bit
Steps per turn	≤8192/13 bit
Number of turn	≤65 536/16 bit
Protection	IP 66
Operating temperature	-20...+85 °C
Operating speed	≤5000 rpm
Max. shaft load	≤350 N axial, ≤500 N radial
Explosion protection	Ex II 3G IIC / 3D IIIC (ATEX)
Options	Additional incremental signals

MicroGen

Patented revolution counter *MicroGen* is the heartbeat in the next generation of gearless absolute multiturn encoders without battery. *MicroGen* uses the motion of the encoder shaft for autonomous energy generation. *MicroGen* excels with outstanding robustness and a simplified design, is free from wear and immune to magnetic fields throughout a wide temperature range.

HeavyDuty

Speed switches

Mechanical and electronic speed switches.

- Mechanical centrifugal switches without auxiliary power supply
- Electronic speed switch, energy-autonomous by tacho principle
- Electronic speed switches, up to three outputs
- Solid shaft
- EURO flange B10



Features	■ Mechanical centrifugal switch ■ Operating temperature max. +130 °C	■ Electronic speed switch ■ Max. 6000 rpm	■ Electronic speed switch ■ 3 outputs	■ Electronic speed switch
Product family	FS 90	ES 90	ES 93	ES 100
Voltage supply	–	–	–	–
Switching outputs	1 output, speed-controlled	1 output, speed-controlled	3 outputs, speed-controlled	1 output, speed-controlled
Output switching capacity	≤6 A / 230 VAC ≤1 A / 125 VDC	≤6 A / 250 VAC ≤1 A / 48 VDC	–	≤6 A / 250 VAC ≤1 A / 48 VDC
Minimum switching current	50 mA	100 mA	40 mA	100 mA
Size (housing)	ø115 mm			
Shaft type				
- Solid shaft	ø11 mm			
Flange	EURO flange B10			
Connection	Terminal box			
Operating temperature	-30...+130 °C	-20...+85 °C		
Protection	IP 55			
Operating speed (n)	≤1.25 x ns	≤6000 rpm	≤5000 rpm	≤500 rpm
Switching speed range (ns) ¹	850...4900 rpm	650...6000 rpm	200...5000 rpm	110...500 rpm
Max. shaft load	≤150 N axial, ≤250 N radial			
Options	Product combination with encoder or tachogenerator			

1) Any selected switching speed as a permanent factory setting

Digital speed switch as stand-alone product.

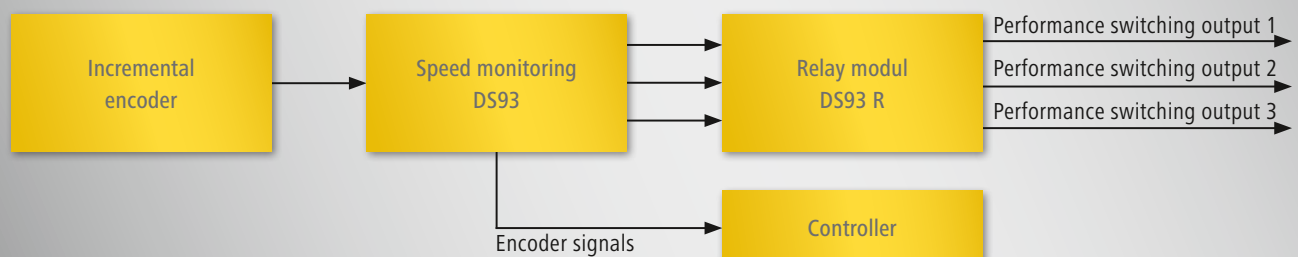
- HTL/TTL signal evaluation
- Integrated speed display
- Robust housing for surface mount



Features	■ Configurable speed monitoring ■ Outdoor housing ■ With speed display	■ Relay modul for DS 93 and encoder with DSL-R ■ High switching performance ■ DIN rail mount
Product family	DS 93	DS 93 R
Voltage supply	15...26 VDC	—
Switching outputs	3 outputs, speed-controlled	3 floating relay change-over contacts
Output switching capacity	High: 12 V, Low: 0 V ≤40 mA	≤6 A at 250 VAC or ≤1 A at 48 VC each output
Size (housing)	122 x 122 x 80 mm	50 x 75 x 55 mm
Connection	Terminals with cable gland	
Operating temperature	-20...+70 °C	-20...+50 °C
Protection	IP 65	IP 20
Switching speed range (ns)	≤20 000 rpm	≤20 000 rpm
Options	Relay module with three floating relay contacts	—

SAFETY

Besides the encoder itself, mechanical or electronic *SAFETY* speed switches can perform decisive safety-relevant functions at excess or insufficient speed. For applications in the field of functional safety, Baumer offers sensors approved by the German Technical Inspection Agency (TÜV). The portfolio is subject to continuous expansion.



HeavyDuty

Speed switches

Incremental encoders
with digital speed switch.

- Encoder-integrated for a space-saving solution
- Fully configurable switch on/off speed
- Up to three switching outputs



Features	■ Blind hollow shaft ■ 2 switching outputs	■ Blind hollow shaft ■ 3 switching outputs	■ Through hollow shaft ■ 2 switching outputs	■ Through hollow shaft ■ 3 switching outputs
Product family	HOG 10+DSL.E	HOG 10+DSL.R	HOG 165+DSL.E	HOG 165+DSL.R
Sensing method	Optical			
Size (housing)	ø105 mm		ø165 mm	
Voltage supply	9...30 VDC	15...30 VDC	9...30 VDC	15...30 VDC
Output stage				
- TTL/RS422	■	■	■	■
- HTL-P (Power Linedriver)	■	■	■	■
Output signals	K1, K2, K0 + inverted			
Shaft type				
- Blind hollow shaft	ø16 mm		—	—
- Through hollow shaft	—	—	ø25 mm	
Connection	Terminal box			
Pulses per revolution	512...2500		512...4096	
Operating temperature	-30...+85 °C			
Protection	IP 66		IP 67	
Operating speed (n)	≤6000 rpm			
Switching speed range (ns)	3...6000 rpm			
Max. shaft load	≤250 N axial, ≤450 N radial		≤150 N axial, ≤200 N radial	
Switching outputs	2 relay outputs, each with its individual attack value, 1 relay output as control output	3 transistor outputs, each with its individual attack value	2 relay outputs, each with its individual attack value, 1 relay output as control output	3 transistor outputs, each with its individual attack value
Output switching capacity	≤0.25 A at 230 VAC/VDC at each output	High: 12 V, Low: 0 V ≤20 mA	≤0.25 A at 230 VAC/VDC at each output	High: 12 V, Low: 0 V ≤20 mA
Explosion protection	Ex II 3G IIC / 3D IIIC (ATEX)			
Options	—	Relay module DS 93 R with three floating relay contacts	—	Relay module DS 93 R with three floating relay contacts

Incremental encoders with digital speed switch.

- Encoder-integrated for a space-saving solution
- Fully configurable switch on/off speed
- Up to three switching outputs

Configurable by
PC software



Features	■ Solid shaft with EURO flange B10 ■ 2 switching outputs	■ Solid shaft with EURO flange B10 ■ 3 switching outputs
Product family	POG 10+DSL.E	POG 10+DSL.R
Sensing method	Optical	
Size (housing)	ø120 mm	
Voltage supply	15...26 VDC	
Output stage		
- TTL/RS422	■	■
- HTL-P (Power Linedriver)	■	■
Output signals	K1, K2, K0 + inverted	
Shaft type		
- Solid shaft	ø11 mm	
Flange	EURO flange B10	
Connection	Terminal box	
Pulses per revolution	512...2500	
Operating temperature	-30...+85 °C	
Protection	IP 66	
Operating speed (n)	≤6000 rpm	
Switching speed range (ns)	3...6000 rpm	
Max. shaft load	≤300 N axial, ≤450 N radial	
Switching outputs	2 relay outputs, each with its individual attack value, 1 relay output as control output	3 transistor outputs, each with its individual attack value
Output switching capacity	≤0.25 A at 230 VAC/VDC at each output	High: 12 V, Low: 0 V ≤40 mA
Explosion protection	Ex II 3G IIC / 3D IIIC (ATEX)	
Options	—	Relay module DS 93 R with three floating relay contacts

HeavyDuty

Speed switches

Incremental encoders with digital speed switch.

- Encoder-integrated for a space-saving solution
- Fully configurable switch on/off speed
- Operating temperature -40...+100 °C
- Additional incremental signals with zero pulse
- Corrosion & seawater proof



				
	New	New	New	New
Features	■ Solid shaft with EURO flange B10 ■ 1 transistor output	■ Solid shaft with EURO flange B10 ■ 1 relay output	■ Cone shaft or blind hollow shaft ■ 1 transistor output	■ Cone shaft or blind hollow shaft ■ 1 relay output
Product family	PMG 10+DSL	PMG 10+DSL	HMG 10+DSL	HMG 10+DSL.R
Interface				
- SSI	■	■	■	■
- CANopen®	■	■	■	■
- DeviceNet	■	■	■	■
- Profibus-DP	■	■	■	■
- EtherCAT	■	■	■	■
- Profinet	■	■	■	■
Function principle				
Function principle	Singleturn / Multiturn			
Sensing method				
Sensing method	Magnetic			
Size (housing)				
Size (housing)	ø115 mm		ø105 mm	
Voltage supply				
Voltage supply	9...30 VDC			
Shaft type				
- Solid shaft	ø11 mm		—	—
- Cone shaft 1:10	—	—	ø17 mm	
- Blind hollow shaft	—	—	ø12...20 mm	
Flange				
Flange	EURO flange B10		—	—
Connection				
Connection	Bus cover, terminal box, mating connector M12 or mating connector M23			
Resolution				
Resolution	≤40 bit			
Steps per turn				
Steps per turn	≤1 048 576/20 bit			
Number of turn				
Number of turn	≤1 048 576/20 bit			
Protection				
Protection	IP 66, IP 67			
Operating temperature				
Operating temperature	-40...+100 °C			
Operating speed (n)				
Operating speed (n)	≤12000 rpm			
Switching speed range (ns)				
Switching speed range (ns)	2...12000 rpm			
Max. shaft load				
Max. shaft load	≤450 N axial, ≤650 N radial		—	—
Switching outputs				
Switching outputs	1 transistor output, each with its individual attack value	1 relay output, each with its individual attack value	1 transistor output, each with its individual attack value	1 relay output, each with its individual attack value
Output switching capacity				
Output switching capacity	≤50 mA at 30 VDC	≤100 mA at 60 VDC	High: 12 V, Low: 0 V ≤20 mA	≤0.25 A at 230 VAC/VDC at each output
Explosion protection				
Explosion protection	Ex II 3G IIC / 3D IIIC (ATEX)			
Options				
Options	Relay module DS 93 R with three floating relay contacts	—	Relay module DS 93 R with three floating relay contacts Additional incremental signals	Additional incremental signals

HeavyDuty

Speed switches



HeavyDuty

Tachogenerators

Solid shaft with EURO flange B10 or flange B10.

Idle voltage up to 200 mV/rpm.

- Ultimate lifetime thanks to *LongLife* commutator with embedded silver track
- Real-time acquisition of speed and rotational direction
- Operating temperature max. +130 °C



Features	■ Solid shaft with EURO flange B10		■ Solid shaft with flange B10, ø85 mm ■ Redundant output (TDPZ)		■ Solid shaft with EURO flange B10 ■ Redundant output (TDPZ)		■ Solid shaft with EURO flange B10 ■ Redundant output (TDPZ)	
Product family	GTF 7.08	GTF 7.16	TDP 0.09	TDPZ 0.09	TDP 0.2	TDPZ 0.2	TDP 13	TDPZ 13
Voltage supply	No							
Size (housing)	ø115 mm		ø85 mm		ø115 mm		ø120...175 mm	
Shaft type								
- Solid shaft	ø11 mm		ø6 mm		ø7...14 mm		ø14...18 mm	
Flange	EURO flange B10		Flange B10		EURO flange B10		Flange B10	
Idle voltage	10...60 mV per rpm		10...60 mV per rpm		10...150 mV per rpm	20...100 mV per rpm	10...200 mV per rpm	
Performance								
- Speed ≥5000 rpm	0.3 W	0.6 W	—	—	—	—	—	—
- Speed ≥3000 rpm	—	—	1.2 W	2 x 0.3 W	12 W	2 x 0.3 W	—	—
- Speed ≥2000 rpm	—	—	—	—	—	—	40 W	2 x 0.2 W
Rotor moment of inertia	0.4 kgcm²	0.6 kgcm²	0.25 kgcm²	0.29 kgcm²	1.1 kgcm²	1.2 kgcm²	0.4 kgcm²	0.2 kgcm²
Connection	Screw terminals		Terminal box					
Operating temperature	-30...+130 °C							
Protection	IP 56				IP 55			
Operating speed	≤9000 rpm		≤10 000 rpm		≤10 000 rpm		≤6000 rpm	
Max. shaft load	≤150 N axial, ≤250 N radial		≤40 N axial, ≤60 N radial		≤60 N axial, ≤80 N radial		≤80 N axial, ≤100 N radial	
Options	—		—		Sea/tropical climate protection Dual shaft Protection IP 56		—	

HeavyDuty Tachogenerators

Analog tachogenerators by Baumer stand out by ultra-accurate conversion of tacho voltage throughout the entire speed range. *LongLife* transmission technology contributes a major share.



Features	■ Solid shaft with EURO flange B10 ■ Ex-approved	■ Solid shaft with flange B10 ■ Redundant output (TDPZ)
Product family	EEx GP 0.2	TG74
Voltage supply	No	
Size (housing)	ø126 mm	
Shaft type		
- Solid shaft	ø11 mm	ø14 mm
Flange	EURO flange B10	Flange B10
Idle voltage	20...150 mV per rpm	
Performance		
- Speed ≥ 5000 rpm	12 W	
Rotor moment of inertia	1.15 kgcm ²	
Connection	Screw terminals	
Operating temperature	-20...+55 °C	
Protection	IP 54	
Operating speed	2800...8000 rpm	
Max. shaft load	≤ 60 N axial, ≤ 80 N radial	
Explosion protection	ATEX II 2G Ex de IIC T6 Gb	—



LongLife

LongLife technology in HeavyDuty tachogenerators is based on a commutator-embedded silver track which reduces wear virtually to zero. *LongLife* tachogenerators combine very high signal quality for optimum dynamic control with outstanding resilience and unrivalled longevity.

HeavyDuty

Tachogenerators

Bearingless hollow shaft or cone shaft designs.

Idle voltage up to 60 mV per rpm.

- Ultimate longevity thanks to *LongLife* commutator with embedded silver track
- Operating temperature up to +130 °C
- Very high accuracy throughout the entire speed range



Features	■ Tachogenerator ■ Bearingless ■ Blind hollow shaft	■ Tachogenerator ■ Bearingless ■ Blind hollow shaft	■ Tachogenerator ■ Bearingless ■ Blind hollow shaft	■ Tachogenerator ■ Bearingless ■ Blind hollow shaft		
Product family	GT 5	GT 7.08	GT 7.16	GT 9	GTB 9.06	GTB 9.16
Voltage supply	No					
Size (housing)	ø52 mm	ø85 mm		ø89 mm	ø95 mm	
Shaft type						
- Cone shaft 1:10	—	—		ø17 mm	ø17 mm	
- Blind hollow shaft	ø8...12 mm	ø12...16 mm		ø7...14 mm	ø12...16 mm	
Idle voltage	7...10 mV per rpm	10...60 mV per rpm		10...20 mV per rpm	10...20 mV per rpm	16...60 mV per rpm
Performance						
- Speed ≥5000 rpm	0.075 W	0.3 W	0.6 W	0.3 W	0.3 W	
Rotor moment of inertia	0.05 kgcm²	0.4 kgcm²	0.55 kgcm²	0.95 kgcm²	0.95 kgcm²	
Connection	Plug-in terminals	Screw terminals		Plug-in terminals	Connector	
Operating temperature	-30...+130 °C					
Protection	IP 20	IP 55		IP 20	IP 68	
Operating speed	≤10 000 rpm	≤9000 rpm				
Options	—	Protection IP 44 with Protective cover		Protection IP 44 with Protective cover	—	

HeavyDuty

Tachogenerators & Resolver

Resolvers.

Resolvers are the classical feedback systems for harsh environments and also very robust against mechanical impact.

- Encoder-compatible
- Operating temperature up to +100 °C
- Precision analog signals



Features	■ Tachogenerator ■ Bearingless ■ Blind hollow shaft	■ Tachogenerator ■ Blind hollow shaft	■ Resolver ■ Solid shaft with synchro flange	■ Resolver ■ Blind hollow shaft	
Product family	GTR 9	KTD 3	KTD 4	RTD 1 B14 Y1	RTD 4 A4 Y2
Voltage supply/frequency	No			7 Vms / 10 kHz	7 Vms / 10 kHz
Size (housing)	ø95 mm	ø100 mm	ø86 mm	ø58 mm	ø80 mm
Shaft type					
- Solid shaft	—	—		ø6 mm	—
- Blind hollow shaft	ø16 mm	ø14 mm	ø10...16 mm	—	ø10...16 mm
Idle voltage	20...60 mV per rpm	20...60 mV per rpm	10...60 mV per rpm	—	—
Performance					
- Speed ≥5000 rpm	0.9 W	—		—	—
Rotor moment of inertia	1.95 kgcm²	600-900 kgcm²	600 kgcm²	≤0.01 Nm (+20 °C)	≤0.015 Nm (+20 °C)
Connection	Connector	Screw terminals	Cable, radial	Connector M23	Connector M23
Operating temperature	-30...+130 °C	-25...+100 °C	-15...+100 °C	-20...+100 °C	-40...+100 °C
Protection	IP 56	IP 54		IP 65	IP 65
Operating speed	≤9000 rpm	≤6000 rpm		≤10 000 rpm	≤8000 rpm
Options	—	—	Operating temperature -30 °C	—	—

HeavyDuty Combinations

Incremental twin encoders.
Solid, blind hollow or cone shaft.

- Two encoders on a common shaft
- Every encoder with optional redundant sensing
- Integrated function monitoring EMS



Features	■ Solid shaft with EURO flange B10 ■ Maximum speed 12 000 rpm	■ Solid shaft with EURO flange B10 ■ Seawater resistant (C5M) - POG 11 G	■ Cone shaft or blind hollow shaft ■ Seawater resistant (C5M) - HOG 11 G		
Product family	POG 86 G	POG 10 G	POG 11 G	HOG 10 G	HOG 11 G
Sensing method	Optical				
Size (housing)	ø115 mm	ø115 mm		ø105 mm	
Voltage supply	5 VDC ±5 %, 9...30 VDC				
Output stage					
- TTL/RS422	■	■		■	
- HTL-P (Power Linedriver)	■	■		■	
Shaft type					
- Solid shaft	ø11 mm	ø11 mm		—	
- Cone shaft	—	—		ø17 mm	
- Blind hollow shaft	—	—		ø16...20 mm	
Flange	EURO flange B10	EURO flange B10		—	
Connection	Terminal box				
Pulses per revolution	300...5000	300...5000		300...5000	
Operating temperature	-40...+100 °C -25...+100 °C (>3072 ppr)				
Protection	IP 56	IP 66	IP 67	IP 66	IP 67
Operating speed	≤12 000 rpm	≤6000 rpm		≤6000 rpm	
Max. shaft load	≤250 N axial, ≤350 N radial	≤300 N axial, ≤450 N radial		≤450 N axial, ≤600 N radial	
Explosion protection	Ex II 3G IIC / 3D IIIC (ATEX)				
Options	Function monitoring EMS	Function monitoring EMS Redundant sensing system, two terminal boxes each encoder			

1 + 1 = 1

1 + 1 = 1 translates into HeavyDuty product combinations where HeavyDuty encoders, tachogenerators and speed switches are combined into a robust unit. Hence, besides speed feedback, the application may involve more signals for drive regulation. In parallel, HeavyDuty combinations provide different output signals and sharing a common shaft to save space, they excel with ultimate reliability and longevity.

Tachogenerator.

With speed switch or incremental encoder.

- Energy-autonomous speed switch
- Electronic speed switch ESL with 1 or 3 switching outputs
- Mechanical centrifugal switch FSL with one switching output



Features	■ Tachogenerator with integrated mechanical centrifugal switch ■ Solid shaft with flange B10	■ Tachogenerator with integrated mechanical centrifugal switch ■ Solid shaft with EURO flange B10	■ Tachogenerator with electronic speed switch ■ Solid shaft with EURO flange B10	■ Tachogenerator with encoder ■ Solid shaft with EURO flange B10		
Product family	TDP 0.09+FSL	TDP 0,2+FSL	TDPZ 0,2+FSL	DP 0,2+ESL	TDPZ 0,2+ESL	TDP 0,2+OG9
Sensing method	Optical					
Size (housing)	ø85 mm	ø115 mm				
With centrifugal switch	■	■	—		—	
With speed switch	—	—	■		—	
Voltage supply	No	No	12 VDC ±10 % (only TDP 0.2 +ESL 93)		5 VDC ±5 % 8...30 VDC	
Idle voltage	10...60 mV per rpm	10...150 mV per rpm	0...100 mV per rpm	10...150 mV per rpm	20...100 mV per rpm	10...150 mV per rpm
Performance (Speed >3000 rpm)	1.2 W	12 W	2 x 3 W	12 W	2 x 3 W	12 W
Shaft type						
- Solid shaft	ø6 mm	ø7...14 mm		ø7...14 mm		ø11 mm
Flange	Flange B10	EURO flange B10				
Connection	Terminal box					
Operating temperature	-30...+130 °C	-30...+130 °C		-25...+85 °C		-30...+100 °C -25...+100 °C (>3072 ppr)
Protection	IP 56	IP 55		IP 55		IP 56
Operating speed (n)	≤1.25 x ns	≤1.25 x ns		≤6000 rpm		≤10 000 rpm
Switching speed range (ns) ¹	850...4900 rpm	850...4900 rpm		200...600 rpm		—
Max. shaft load	≤40 N axial, ≤60 N radial	≤60 N axial, ≤80 N radial				
Switching outputs (speed-controlled)	1 output	1 output		1 or 3 outputs		—
Output circuit	Normally open / Normally closed	Normally open / Normally closed		Transistor outputs: High: 12 V, Low: 0 V ≤40 mA		—
Options	—	Redundant output (TDPZ)		Redundant output (TDPZ)		—

1) Any selected switching speed as a permanent factory setting

HeavyDuty Combinations

Incremental encoders with speed switch.
Solid shaft $\varnothing 11$ mm.

- Energy-autonomous speed switch
- Electronic speed switch ESL with one or three switching outputs
- Mechanical centrifugal switch FSL with one switching output



Features	■ Solid shaft with EURO flange B10		■ Solid shaft with EURO flange B10 ■ Special sealing against ingress of solids		■ Solid shaft with EURO flange B10 ■ Seawater resistant (C5M) ■ For use in salty, oily-wet environments	
Product family	POG 86+FSL	POG 86+ESL	POG 10+FSL	POG 10+ESL	POG 11+FSL	POG 11+ESL
Sensing method	Optical					
Size (housing)	ø115 mm					
With centrifugal switch	■	—	■	—	■	—
With speed switch	—	■	—	■	—	■
Voltage supply	5 VDC ±5 %, 9...30 VDC					
Output stage						
- TTL/RS422	■		■		■	
- HTL-P (Power Linedriver)	■		■		■	
Output signals	K1, K2, K0 + inverted					
Shaft type						
- Solid shaft	ø11 mm					
Flange	EURO flange B10					
Connection	Terminal box					
Pulses per revolution	500...5000		300...5000			
Operating temperature	-30...+100 °C	-25...+85 °C	-40...+100 °C	-25...+85 °C	-40...+100 °C	-25...+85 °C
Protection	IP 56		IP 66		IP 67	
Operating speed	≤6000 rpm					
Switching speed range (ns) ¹⁾	850...4900 rpm (FSL), 200...6000 rpm (ESL)					
Max. shaft load	≤300 N axial, ≤450 N radial					
Switching outputs (speed-controlled)	1 output	1 or 3 outputs	1 output	1 or 3 outputs	1 output	1 or 3 outputs
Output circuit	Norm. open/ Norm. closed	Transistor outputs	Norm. open/ Norm. closed	Transistor outputs	Norm. open/ Norm. closed	Transistor outputs
Options	Function monitoring EMS		Function monitoring EMS Redundant sensing			

1) Any selected switching speed as a permanent factory setting

Incremental encoders with speed switch. Solid or cone shaft.

- Energy-autonomous speed switch
- Electronic speed switch ESL with one or three switching outputs
- Mechanical centrifugal switch FSL with one switching output



Features	■ Cone shaft or blind hollow shaft	■ Cone shaft or blind hollow shaft ■ Special sealing against ingress of solids	■ Solid shaft with EURO flange B10 ■ Seawater resistant (C5M) ■ For use in salty, oily-wet environments		
Product family	HOG 86+FSL	HOG 10+FSL	HOG 10+ESL	HOG 11+FSL	HOG 11+ESL
Sensing method	Optical				
Size (housing)	ø99 mm	ø105 mm			
With centrifugal switch	■	■	—	■	—
With speed switch	—	—	■	—	■
Voltage supply	5 VDC ±5 %, 9...30 VDC				
Output stage					
- TTL/RS422	■	■		■	
- HTL-P (Power Linedriver)	■	■		■	
Output signals	K1, K2, K0 + inverted				
Shaft type					
- Cone shaft 1:10	ø17 mm				
- Blind hollow shaft	ø16 mm	ø16...20 mm			
Connection	Terminal box				
Pulses per revolution	500...5000	300...5000			
Operating temperature	-40...+100 °C	-40...+100 °C	-20...+85 °C	-40...+100 °C	-20...+85 °C
Protection	IP 56	IP 66		IP 67	
Operating speed	≤6000 rpm				
Switching speed range (ns) ¹⁾	850...4900 rpm	850...4900 rpm (FSL) 200...6000 rpm (ESL)		850...4900 rpm (FSL) 200...6000 rpm (ESL)	
Max. shaft load	≤350 N axial, ≤450 N radial	≤450 N axial, ≤600 N radial			
Switching outputs (speed-controlled)	1 output	1 output	1 or 3 outputs	1 output	1 or 3 outputs
Output circuit	Norm. open/ Norm. closed	Norm. open/ Norm. closed	Transistor outputs	Norm. open/ Norm. closed	Transistor outputs
Options	Function monitoring EMS Redundant sensing				

Durable and space-saving.



Bearingless absolute encoder:
MHAD 50

Bearingless encoders



Non-contact, wear-free and compact.

Bearingless encoders by Baumer operate on the non-contact method, most utilize magnetic sensing and virtually all are free from wear. No dust, dirt or condensation will impair their reliable operation. They even withstand harmful fibres dominating any environment in the textile industry. Our bearingless encoders are particularly resistant to shocks and vibrations with a virtually unlimited service life.

Forgoing any mechanical components prone to wear, these encoders master also highspeed applications. The portfolio comprises incremental encoders with square wave and sinusoidal signals as well as absolute product variants with most common interfaces.

Fit into the smallest gap

Their extremely shallow installation depth, sometimes less than 20 mm, makes bearingless encoders with ring magnet and sensor an ideal solution where installation space is very limited – whether on shafts with 6 or 600 mm diameter. The narrow ring magnet and the lean sensor head even allow for attachment to the A-end of the shaft, for example between gearing and the machine part to be driven.

Bearingless encoders

Incremental

Hollow shaft max. $\varnothing 150$ mm.
Max. 8192 pulses per revolution.

- Square wave and sine signals
- High protection on to IP 67
- Compact designs



Features	■ Through hollow shaft max. ø43.5 mm ■ Max. 1024 pulses per revolution	■ Through hollow shaft max. ø43.5 mm ■ Max. 4096 pulses per revolution ■ Sensor housing made of zinc die cast	■ Through hollow shaft max. ø45 mm ■ Max. 50 pulses per revolution	■ Through hollow shaft max. ø28 mm ■ Max. 2048 pulses per revolution	
Product family	MDFK 08	MIR 10	ITD 67	ITD49H00	ITD49H00 Sine
Sensing method	Magnetic				
Magnetic wheel diameter	ø30.5...56 mm	ø30.5...56 mm	ø72 mm	ø40 mm	
Dimensions (sensing head)	15 x 8.5 x 45.5 mm	10 x 15 x 45.5 mm	20 x 11 x 75 mm	12 x 16 x 48 mm	
Voltage supply	8...30 VDC 5 VDC ±5 %	10...30 VDC 5 VDC ±5 %	8...26 VDC	5 VDC ±5 % 8...26 VDC	5 VDC ±10 %
Output stage					
- TTL/RS422	■	■	—	■	—
- HTL/push-pull	■	■	■	■	—
- SinCos 1 Vpp	—	—	—	—	■
Output signals	A 90° B, N + inverted	A 90° B, N + inverted	A, B	A 90° B, N / A 90° B, N + inv.	
Output frequency	≤250 kHz	≤350 kHz	≤160 kHz	≤300 kHz (TTL) ≤160 kHz (HTL)	≤180 kHz
Shaft type					
- Through hollow shaft	ø6...43.5 mm	ø6...43.5 mm	ø10...45 mm	ø9...28 mm	
Connection					
- Cable	Radial				
Pulses per revolution	256...1024	320...4096	20, 50	64...2048	—
Sine waves per revolution	—	—	—	—	64
Operating temperature	-25...+85 °C	-40...+85 °C	-20...+85 °C	-40...+100 °C	
Protection	IP 67	IP 66, IP 67	IP 67	IP 67	
Operating speed	≤20 000 rpm	≤20 000 rpm	≤10 000 rpm	≤30 000 rpm	
Options	—	—	Redundant variant	Cable with connector Several installation options	

Bearingless encoders

Incremental

Bearingless encoders by Baumer operate on non-contact sensing technology and are virtually wearfree. They withstand shocks and vibrations and are predestined for applications where space is tight.



Features	■ Through hollow shaft max. ø65 mm ■ Max. 4095 pulses per revolution		■ Through hollow shaft max. ø150 mm ■ Max. 8192 pulses per revolution	
Product family	ITD69H00	ITD69H00 Sine	ITD89H00	ITD89H00 Sine
Sensing method	Magnetic			
Magnetic wheel diameter	ø81 mm		ø162 mm	
Dimensions (sensing head)	12 x 16 x 48 mm			
Voltage supply	5 VDC ±5 % 8...26 VDC	5 VDC ±10 %	5 VDC ±5 % 8...26 VDC	5 VDC ±10 %
Output stage				
- TTL/RS422	■	—	■	—
- HTL/push-pull	■	—	■	—
- SinCos 1 Vpp	—	■	—	■
Output signals	A 90° B, N / A 90° B, N + inverted			
Output frequency	≤300 kHz (TTL) ≤160 kHz (HTL)	≤180 kHz	≤300 kHz (TTL) ≤160 kHz (HTL)	≤180 kHz
Shaft type				
- Through hollow shaft	ø40...65 mm		ø70...ø150 mm	
Connection				
- Cable	Radial			
Pulses per revolution	128...4096	—	256...8192	—
Sine waves per revolution	—	128	—	246
Operating temperature	-40...+100 °C			
Protection	IP 67			
Operating speed	≤15 000 rpm		≤7500 rpm	
Options	Cable with connector Several installation options			

Bearingless encoders

Incremental

Hollow shaft max. $\varnothing 740$ mm.
Max. 32 768 pulses per revolution.

- Square wave and SinCos signals
- Optional with DNV certification
- Wear-free
- Wide axial backlash ± 3 mm
- For any shaft the matching installation principle



HDmag



Features	■ Through hollow shaft $\varnothing 16...80$ mm ■ Installation depth ≤ 30 mm ■ Stainless steel wheel			
Product family	MHGE 100	MHGE 200	MHGE 400	MHGE 800
Sensing method	Magnetic			
Magnetic wheel diameter	$\varnothing 99.9$ mm	$\varnothing 201.7$ mm	$\varnothing 405.4$ mm	$\varnothing 813$ mm
Dimensions (sensing head)	100 x 40 x 65 mm			
Voltage supply	Rectangular: 4.75...30 VDC, Sine: 5 VDC			
Output stage				
- TTL/RS422	■	■	■	■
- HTL/push-pull	■	■	■	■
- SinCos 1 Vpp	■	■	■	■
Output signals	A+, B+, R+ , A-, B-, R-			
Output frequency	≤ 300 kHz			
Shaft type				
- Through hollow shaft	$\varnothing 16...80$ mm	$\varnothing 50...180$ mm	$\varnothing 70...340$ mm	$\varnothing 650...740$ mm
Connection				
- Flange connector M23	Radial			
Pulses per revolution	64...4096	128...8192	256...16 384	512...32 768
Sine waves per revolution	64	128	256	512
Operating temperature	$-40...+100$ °C			
Protection	IP 66, IP 67			
Operating speed	≤ 8000 rpm	≤ 4000 rpm	≤ 2000 rpm	≤ 100 rpm
Options	DNV certification			

Bearingless encoders

Incremental

Hollow shaft max. $\varnothing 340$ mm.
Max. 524288 pulses per revolution.

- Square wave and SinCos signals
- Particularly high resolution
- Wear-free
- Wide axial backlash ± 3 mm
- For any shaft the matching installation principle
- Outstanding signal quality thanks to FPGA signal processing



Features	■ Through hollow shaft $\varnothing 16...80$ mm ■ Installation depth ≤ 35 mm ■ Stainless steel wheel		
Product family	MHGP 100	MHGP 200	MHGP 400
Sensing method	Magnetic		
Magnetic wheel diameter	$\varnothing 99.9$ mm	$\varnothing 201.7$ mm	$\varnothing 405.4$ mm
Dimensions (sensing head)	120 x 30 x 90 mm		
Voltage supply	4.5...30 VDC		
Output stage			
- TTL/RS422	■	■	■
- HTL/push-pull	■	■	■
- SinCos 1 Vpp	■	■	■
Output signals	A+, B+, R+, A-, B-, R-		
Output frequency	≤ 2 MHz		
Shaft type			
- Through hollow shaft	$\varnothing 16...80$ mm	$\varnothing 50...180$ mm	$\varnothing 70...340$ mm
Connection			
- Flange connector M23	Radial		
Pulses per revolution	64...131 072	128...262 144	256...524 288
Sine waves per revolution	8192	16384	32768
Operating temperature	$-20...+85$ °C		
Protection	IP 66, IP 67		
Operating speed	≤ 8000 rpm	≤ 4000 rpm	≤ 2000 rpm

HDmag

The bearingless *HDmag* encoders operate on high-resolution sensing of a precision magnetic measure combined with digital signal processing in real time. *HDmag* encoders are available as incremental and absolute variants, provide outstanding high resolution and fit virtually any shaft diameter.

Bearingless encoders

Incremental & quasi-absolute

Hollow shaft $\varnothing 3183$ mm.

Max. 131 762 pulses per revolution.

- Square wave, sine and SSI interface
- Position and speed signals via SSI
- Any shaft diameter as standard
- Wear-free
- Wide axial backlash ± 5 mm
- Radial air gap up to 3 mm



*HDmag
flex*



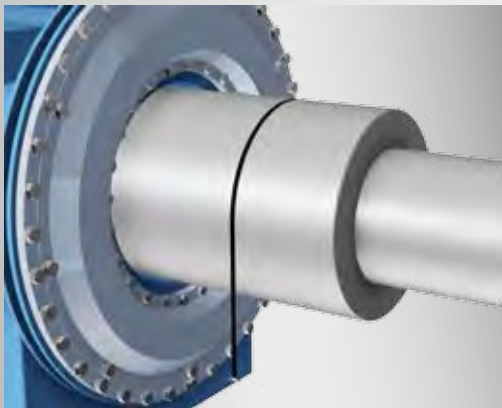
Features	■ Magnetic belt encoder ■ Incremental ■ Max. 131072 pulses per revolution	■ Magnetic belt encoder ■ Quasi-absolute ■ Max. resolution 24 bit singleturn
Product family	MIR 3000F	MQR 3000F
Sensing method	Magnetic	
Dimensions (sensing head)	165 x 25 x 93 mm	
Voltage supply	4.75...30 VDC	
Output stage		
- TTL/RS422	■	■
- HTL/push-pull	■	■
- SinCos 1 Vpp	■	■
- SSI	—	Linedriver RS485
Output signals	A+, B+, R+, A-, B-, R-	0...24 bit singleturn 0...24 bit speedsignal
Shaft type		
- Magnetic belt	$\varnothing 300...3183$ mm	
Connection	Flange connector M23	
Pulses per revolution	512...131 072	1024...4096
Sine waves per revolution	512...16 384	1024...4096
Operating temperature	$-40...+85$ °C	
Protection sensing head	IP 66, IP 67	
Operating speed	≤ 1850 rpm	
Options	Corrosion protected for offshore use	Corrosion protected for offshore use Additional incremental signals

HDmag flex

HDmag flex magnetic belt encoders operate on the proven HDmag technology. The sensor head will fit any shaft diameter thanks to both sensing elements being permanently aligned at the factory. The magnetic measure is buckled on the shaft like a belt. HDmag flex magnetic belt encoders provide: short lead times and easy installation, absolute robustness and reliability, precise position and speed feedback, high signal resolution

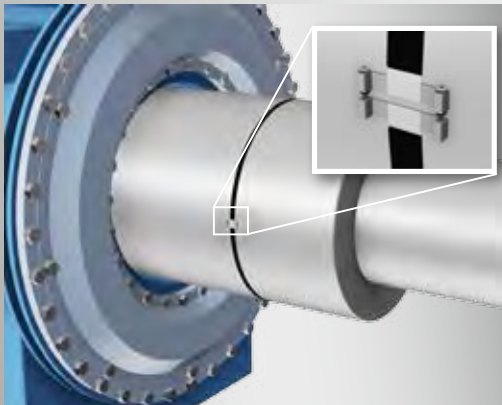
Bearingless encoders

Incremental & quasi-absolute



Installed in no time at all.

The adjustable magnetic strap is buckled like a belt on the drive or generator shaft and thus allows to work with even the largest diameters.



The lock is welded securely to the magnetic belt for maximum tractive force, holding the belt securely on the shaft.



The sensing head allows for very high resolutions and large mechanical backlash.

Bearingless encoders

Absolute

Hollow shaft max. $\varnothing 340$ mm.

Singleturn variants.

- SSI and CANopen® interface
- Additional square wave and sine signals
- Wide axial backlash ± 3 mm
- For any shaft the matching installation principle



HDmag



Features	■ Wearfree encoder ■ Through hollow shaft ø30 mm	■ Wearfree encoder ■ Through hollow shaft ø16...80 mm	■ Wearfree encoder ■ Through hollow shaft ø50...180 mm	■ Wearfree encoder ■ Through hollow shaft ø70...340 mm
Product family	MHAD 50	MHAP 100	MHAP 200	MHAP 400
Interface				
- SSI	■	■	■	■
- CANopen®	■	—	—	—
Function principle	Singleturn			
Sensing method	Magnetic			
Magnetic wheel diameter	ø50 mm	ø101.3 mm	ø203.1 mm	ø406.8 mm
Dimensions (sensing head)	55 x 36 x 20 mm	120 x 30 x 90 mm	120 x 30 x 78 mm	120 x 30 x 78 mm
Voltage supply	4.5...30 VDC			
Output stage				
- TTL/RS422	■	■	■	■
- HTL/push-pull	■	■	■	■
- SinCos 1 Vpp	—	■	■	■
Output signals	A+, B+, A-, B-			
Shaft type				
- Through hollow shaft	ø30 mm	ø16...80 mm	ø50...180 mm	ø70...340 mm
Connection				
- Flange connector M12	Radial	—	—	—
- Flange connector M23	—	Radial	—	—
- Cable	Radial	—	—	—
Resolution	≤65536 / 16 bit	≤131072 / 17 bit		
Absolute accuracy	±0.3° (-40...+85 °C) ±0.25° (+20 °C)	—	—	—
Pulses per revolution	1024...8192	1...131 072	1...262 144	1...524 288
Sine waves per revolution	—	1...8192	1...16 384	1...32 768
Operating temperature	-40...+85 °C	-20...+85 °C		
Protection	IP 67	IP 66, IP 67		
Operating speed	≤6000 rpm	≤8000 rpm	≤4000 rpm	≤2000 rpm

Bearingless encoders

Absolute

Compact kit design ø30...58 mm.
Singleturn and multiturn variants.

- All common fieldbus & EtherNet interfaces
- Integrated interface or modular bus covers
- Hollow shaft ø12 mm
- SSI and parallel interface

MAGRES



Features	■ Encoder kit – size ø30 mm ■ Integrated interfaces		■ Encoder kit – size ø55 mm ■ Integrated interfaces		■ Encoder kit – size ø58 mm ■ Integrated interfaces		■ Encoder kit – size ø58 mm ■ Modular bus cover	
Product family	BMMK 30 - MAGRES	BMSK 30 - MAGRES	BMMK 55 - MAGRES	BMSK 55 - MAGRES	BMMK 58 - MAGRES	BMSK 58 - MAGRES	BMMK 58 flexible	BMSK 58 flexible
Interface								
- SSI	■		■		■		–	
- Parallel	–		–		–		■	
- CANopen®	■		■		■		■	
- DeviceNet	–		–		–		■	
- Profibus-DP	–		–		–		■	
- SAEJ1939	–		–		–		■	
- EtherCAT/PoE	–		–		–		■	
- EtherNet/IP	–		–		–		■	
- Powerlink	–		–		–		■	
- Profinet	–		–		–		■	
Function principle	Multiturn	Singleturn	Multiturn	Singleturn	Multiturn	Singleturn	Multiturn	Singleturn
Sensing method	Magnetic							
Size (housing)	ø30 mm		ø55 mm		ø58 mm			
Voltage supply	5 VDC ±10 %, 10...30 VDC						10...30 VDC	
Shaft type								
- Ring magnet bore	ø5...8 mm		ø6 mm		ø12 mm		ø12 mm	
Connection								
- Flange connector M9	Radial, axial		–		–		–	
- Flange connector M12	–		Radial		Radial, axial		–	
- Cable	Radial, axial		Radial		Radial, axial		–	
- Bus cover	–		–		–		Radial	
Resolution	≤25 bit	≤10 bit	≤30 bit	≤12 bit	≤30 bit	≤12 bit	≤30 bit	≤12 bit
Steps per turn	≤1024/10 bit		≤4096/12 bit					
Number of turn	≤32768/15 bit	–	≤262144/18 bit	–	≤262144/18 bit	–	≤262144/18 bit	–
Absolute accuracy	±1°							
Operating temperature	-20...+85 °C							
Protection	IP 67		IP 69K		IP 67			
Operating speed	≤6000 rpm							

Magnetic rotary encoders

Absolute

Miniature designs down to 20 mm.
Angular range through 360°.

- Linearized analog output signals
- Max. resolution 0.09°
- With magnet rotor



Features	■ Sensor housing M18x1 ■ Linear angular range 270° ■ Output signal 4...20 mA	■ Sensor housing M18x1 ■ Linear angular range 360° linear ■ Output signal 0...4.3 VDC	■ Sensor housing rectangular ■ Linear angular range 270° ■ Output signal 4...20 mA	■ Sensor housing rectangular ■ Linear angular range 360° ■ Output signal 0...4.3 VDC
Product family	MDRM 18 (I-Type270°)	MDRM 18 (U-Type360°)	MDFM 20 (I-Type270°)	MDFM 20 (U-Type360°)
Sensor housing	Cylindrical threaded		Rectangular	
Dimensions (sensing head)	18 mm		20 x 30 x 8 mm	
Sensing distance	5 mm (with magnet rotor MSFS)		4 mm (with magnet rotor MSFS)	
Output circuit	Current output	Voltage output	Current output	Voltage output
Output signal	4...20 mA	0...4.3 VDC	4...20 mA	0...4.3 VDC
Angular range	270° linear	360° linear	270° linear	360° linear
Resolution	1.41°		0.09°	
Response time	<2 ms		<4 ms	
Connection	Cable 2 m Mating connector M12		Cable 2 m Mating connector M8	Cable 2 m Mating connector M12
Voltage supply	15...30 VDC	4.7...7.5 VDC	15...30 VDC	4.7...7.5 VDC
Operating temperature	-40...+85 °C			
Protection	IP 67			

Linear bearingless encoders

Incremental

Size 10 mm.

Unlimited measuring range.

- Square wave output signals
- Max. resolution 0.02 mm
- With magnetic belt



Features	■ Linear measuring system ■ Output signals A 90° B with index pulse ■ Output circuit push-pull or RS422
Product family	MIL10
Size (sensing head)	Rectangular
Dimensions (sensing head)	10 x 15 x 45.5 mm
Sensing distance	0.1...0.6 mm
Interpolation	Factor 20, 50, 100
Movement speed	<5 m/s (resolution 5 µm) <10 m/s (resolution 10 µm) <25 m/s (resolution 25 µm)
Output circuit	HTL/Push-pull TTL/RS422
Output signal	A 90° B
Resolution	5 µm (factor 4 evaluation) 10 µm (factor 4 evaluation) 25 µm (factor 4 evaluation)
System-Accuracy	±(0.02 mm +0.04 mm x magnetic belt length)
Connection	- Cable 2 m - Cable 0.3 m with connector M12
Voltage supply	10...30 VDC, 5 VDC ±5 %
Operating temperature	-40...+85 °C
Protection	IP 66, IP 67

Linear measurement made easy.



Absolute cable transducer BMMS K50
with max. 5 m measuring length.

Cable transducers



Easy attachment – reliable results.

Baumer cable transducers are the easiest and most reliable solution to acquire linear distance and position. Linear measurement covers virtually the entire range up to 50 meters. Particularly conceived for industrial applications, the high-quality cable-pulls are extremely durable. They always provide reliable measuring results and allow for both

system integration and retrofit. Cable-pulls go together with virtually any encoder. You have the choice – the cable-pull with optimum measuring length used in combination with the matching incremental encoder or absolute interface.

Redundant variants

MAGRES BMMS redundant encoders utilize two robust magnetic sensing systems. Each provides an individual output signal to ensure ultimate signal availability. An integrated monitoring system compares these two values and will output an error message in the event of failure. The monitoring system will relieve the master control, simultaneously cutting down on cabling effort and cost.

Cable transducers

Absolute

Size up to 120 mm.

Max. measuring length 7.5 m.

- Cable-pulls with absolute multiturn encoder
- Analog, CANopen® and SSI
- Compact housing



Features	■ Measuring length max. 3.4 m ■ Absolute encoders	■ Measuring length max. 5 m ■ Absolute encoders	■ Measuring length max. 7.5 m ■ Absolute encoders	■ Measuring length max. 4.7 m ■ Absolute encoders
Product family	BMMS K34	BMMS K50	BMMS M75	GCA5
Interface				
- SSI	■	■	■	–
- Analog / redundant	■ / ■	■ / ■	■ / ■	■ / ■
- CANopen® / redundant	■ / ■	■ / ■	■ / ■	– / ■
Sensing method	Magnetic			
Size	88 x 88 x 66 mm	88 x 88 x 66 mm	120 x 120 x 70 mm	104 x 104 x 65 mm
Voltage supply	8...30 VDC			8...30 VDC (Analog) 10...30 VDC (CANopen®)
Connection				
- Flange connector M12	Radial			
- Cable	Radial			
Measuring length	3400 mm	5000 mm	7500 mm	4700 mm
Resolution				
- SSI, CANopen®	0.1 mm/step			
- Analog	12 bit			
Linearity	±0.6 %	±0.5 %	±0.2 %	±1 %
Operating temperature	-40...+85 °C			
Protection (encoder)	IP 65 (encoder)			IP 67 (housing) IP 54 (cable outlet)
Materials	Cable-pull housing: plastic Encoder: Aluminium Cable: Stainless steel with coating			Housing: plastic Cable: Stainless steel with coating

Cable transducers

Absolute & incremental

Size up to 200 mm.

Max. measuring length 50 m.

- Utmost flexibility in the combination of encoder and cable-pull
- High operational reliability and longlife
- Highest resolution and linearity



Features	■ Measuring length 2.1 m ■ Absolute or incremental encoder		■ Measuring length 3 m ■ Absolute or incremental encoder		■ Measuring length 5...15 m ■ Absolute or incremental encoder		■ Measuring length 30...50 m ■ Absolute or incremental encoder	
Product family	GCI2	GCA2	GCI4	GCA4	GCI15	GCA15	GCI50	GCA50
Interface								
- SSI	—	■	—	■	—	■	—	■
- BiSS-C	—	■	—	■	—	■	—	■
- CANopen® / SAEJ1939	—	■ / ■	—	■ / ■	—	■ / ■	—	■ / ■
- DeviceNet	—	■	—	■	—	■	—	■
- Profibus-DP	—	■	—	■	—	■	—	■
- EtherCAT / PoE	—	■	—	■	—	■	—	■
- EtherNet/IP	—	■	—	■	—	■	—	■
- Powerlink	—	■	—	■	—	■	—	■
- Profinet	—	■	—	■	—	■	—	■
Function principle	Incremental	Absolute	Incremental	Absolute	Incremental	Absolute	Incremental	Absolute
Sensing method	Optical							
Size	60 x 60 mm		96 x 96 x 56 mm		115 x 115 x 82.5 - 180.5 mm		200 x 200 x 268 - 333.5 mm	
Voltage supply	5 VDC 4.75...30 VDC	10...30 VDC	5 VDC 4.75...30 VDC	10...30 VDC	5 VDC 4.75...30 VDC	10...30 VDC	5 VDC 4.75...30 VDC	10...30 VDC
Output stage								
- TTL/RS422	■	—	■	—	■	—	■	—
- HTL/push-pull	■	—	■	—	■	—	■	—
Connection								
- Flange connector M12, M23	Radial, axial							
- Cable	Radial, axial							
- Bus cover	Radial							
Measuring length	2100 mm		3000 mm		5000...15 000 mm		30 000...50 000 mm	
Pulses per revolution	≤80 000	—	≤80 000	—	≤80 000	—	≤80 000	—
Resolution	—	≤36 bit	—	≤36 bit	—	≤36 bit	—	≤36 bit
Linearity	±0.01 %		±0.02 % (3...7.5 m), ±0.01 % (10...50 m)					
Operating temperature	-20...+85 °C							
Protection (encoder)	IP 65							
Materials	Cable-pull housing: plastic Encoder: Aluminium Cable: Stainless steel with coating		Cable-pull housing: Aluminium Encoder: Aluminium Cable: Stainless steel with coating					
Options	Operating temperature -40...+85 °C							

Solutions for every scenario.



Absolute encoder / ATEX
X 700 with bus cover

For very special applications



SIL, Ex, stainless steel and offshore encoders Signal processing

Whether in hazardous areas, extremely corrosive environments or for demanding functional safety requirements – we are your strong partner.

Baumer is competent in all fields of application, for example offshore oil rigs or wind turbines. This expertise is confirmed by relevant certifications of compliance to SIL, ATEX, IECEx, DNV and UL standards approved by recognized testing institutes.

Certifications

Ever-extending IECEx certification of our explosion-protected HeavyDuty incremental encoders ensures compliance to most demanding international safety directives. Hence, the encoders are approved for use throughout all 30 countries supporting the IECEx standard. International certification provides particular benefit to OEMs when exporting their machines and systems.

For very special applications

Explosion-proof incremental encoders

Explosion protection Ex II 2D / 2G or Ex II 3D.
With ATEX and IECEx certification.

- Size 63...160 mm
- Square wave and sine signals



Features	■ Solid shaft with EURO flange B10 ■ ATEX-/IECEEx certification ■ SinCos signal with <i>LowHarmonics</i>		■ Through hollow shaft ■ ATEX-/IECEEx approval	■ Solid shaft with clamping or synchro flange ■ Blind or through hollow shaft ■ ATEX-/IECEEx approval	■ Solid shaft with clamping flange ■ Stainless steel housing ■ ATEX certification
Product family	EEx OG 9	EEx OG 9 S	EEx HOG 161	Ex EIL580 - <i>OptoPulse</i> ®	X 700 - incremental
Sensing method	Optical				
Size (housing)	ø120 mm	ø115 mm	ø160 mm	ø58 mm	ø70 mm
Voltage supply	5 VDC ±5 % 9...26 VDC 9...30 VDC	5 VDC ±5 % 9...30 VDC	5 VDC ±5 % 9...26 VDC 9...30 VDC	5 VDC ±5 % 8...30 VDC 4.75...30 VDC	4.75...30 VDC
Output stage					
- TTL/RS422	■	—	■	■	■
- HTL/push-pull	■	—	■	■	■
- SinCos 1 Vpp	—	■	—	—	—
Output signals	K1, K2, K0 + inverted			A 90° B, N + inverted	
Shaft type					
- Solid shaft	ø11 mm		—	ø6 mm, ø10 mm	ø10 mm
- Blind hollow shaft	—		—	ø8...15 mm	—
- Through hollow shaft	—		ø30...70 mm	ø8...15 mm	—
Flange	EURO flange B10		—	Clamping/synchro flange	Clamping flange
Connection					
- Terminal box	Radial			—	—
- Flange connector M12, M23	—			Radial / axial	—
- Cable	—		—	Radial / axial / tangential	Axial
Pulses per revolution	1...5000	—	250...5000	100...5000	5...5000
Sine waves per revolution	—	1024...2048	—	—	—
Operating temperature	-20...+55 °C		-20...+58 °C (IP 56) -20...+66 °C (IP 54)	-40...+85 °C	-25...+70 °C
Protection	IP 56		IP 54, IP 56	IP 65, IP 67	IP 67
Operating speed	≤5600 rpm		≤5600 rpm	≤12 000 rpm (IP 65) ≤6000 rpm (IP 67)	≤6000 rpm
Max. shaft load	≤450 N axial, ≤650 N radial		≤450 N axial, ≤650 N radial	≤40 N axial, ≤80 N radial	≤60 N axial, ≤50 N radial
Explosion protection	Ex II 2G (ATEX/IECEEx)		Ex II 2G (ATEX/IECEEx)	Ex II 3D (ATEX)	Ex II 2D/2G (ATEX)
Options	Cable gland M20x1.5	—	Cable gland M20x1.5	—	—

For very special applications

Explosion-proof absolute encoders

Explosion protection Ex II 2D / 2G.
With ATEX certification.

- Size 70 mm
- SSI, CANopen®, RS485, Profibus-DP



Features	■ Solid shaft with clamping flange ■ Stainless steel housing ■ ATEX certification		■ Solid shaft with clamping flange ■ Stainless steel housing ■ ATEX certification		■ Solid shaft with clamping flange ■ Stainless steel housing ■ ATEX certification		■ Solid shaft with clamping flange ■ Stainless steel housing ■ ATEX certification	
Product family	X 700 - SSI		X 700 - RS485		X 700 - CANopen®		X 700 - Profibus-DP	
Interface								
- SSI	■		—		—		—	
- RS485	—		■		—		—	
- CANopen®	—		—		■		—	
- Profibus-DP	—		—		—		■	
Function principle	Multiturn	Singleturn	Multiturn	Singleturn	Multiturn	Singleturn	Multiturn	Singleturn
Sensing method	Optical							
Size (housing)	ø70 mm							
Voltage supply	10...30 VDC							
Shaft type								
- Solid shaft	ø10 mm							
Flange	Clamping flange							
Connection								
- Cable gland	Axial				Bus cover, radial			
Resolution	≤25 bit	≤14 bit	≤25 bit	≤14 bit	≤25 bit	≤14 bit	≤25 bit	≤14 bit
Steps per turn	≤8192/13 bit	≤16384/14 bit	≤8192/13 bit	≤16384/14 bit	≤8192/13 bit	≤16384/14 bit	≤8192/13 bit	≤16384/14 bit
Number of turn	≤4096/12 bit	—	≤4096/12 bit	—	≤4096/12 bit	—	≤4096/12 bit	—
Absolute accuracy	±0.025°							
Operating temperature	-25...+60 °C							
Protection	IP 67							
Operating speed	≤6000 rpm							
Max. shaft load	≤60 N axial, ≤50 N radial							
Explosion protection	Ex II 2D/2G (ATEX)							

For very special applications

Redundant absolute encoders

Two sensing systems.

For maximum application availability.

- Size 50...120 mm
- SSI, CANopen®, analog



Features	■ Absolute encoders ■ Solid shaft with clamping or synchro flange ■ Blind hollow shaft		■ Cable-pull encoders ■ Measuring length 3.4...7.5 m		■ Absolute encoders ■ Solid shaft with clamping flange ■ SSI / integrated resolver	■ Bearingless encoders with two sensor heads ■ Through hollow shaft ø30 mm
Product family	BMMV 58 BMSV 58	BMMH 58 BMSH 58	BMMS K34 BMMS K50	BMMS M75	ATD 2S B14 Y24	MHAD 50 - <i>HDmag</i>

Interface

- Analog redundant	■	■	—	—
- SSI redundant	—	—	—	■
- SSI + Resolver	—	—	■	—
- CANopen® redundant	■	■	—	■
Function principle	Multiturn or singleturn	Multiturn	Multiturn or singleturn	Singleturn
Sensing method	Magnetic			
Size (housing)	ø58 mm	ø58 mm (encoder)	ø58 mm	ø55 x 36 x 20 mm
Voltage supply	8...30 VDC	8...30 VDC	10...30 VDC	4.5...30 VDC

Output stage

- Analog	0...10 V / 0.5...4.5 V / 4...20 mA	0...10 V / 0.5...4.5 V / 4...20 mA	—	—
- Absolute	CANopen®	CANopen®	SSI-Daten: Linedriver RS485	SSI-Daten: Linedriver RS485 CANopen®: CAN-Bus, LV (3.3 V)
- Resolver	—	—	Pole pairs 1 = 2 poles	—

Shaft type

- Solid shaft	ø6 / ø10 mm	—	—	ø10 mm
- Blind hollow shaft	—	ø12 mm	—	—
- Through hollow shaft	—	—	—	ø30 mm

Connection

- Flange connector M12	Radial	Radial	—	Radial
- Flange connector M23	—	—	Radial	—
- Cable	Radial	Radial	—	Radial
Resolution	≤30 bit	—	≤24 bit	≤16 bit
Steps per turn	≤4096/12 bit	—	4096/12 bit	≤65 536/16 bit
Number of turn	≤262 144/18 bit	—	4096/12 bit	—
Absolute accuracy	±1°	0.1 mm/step	—	±0.3° (-40...+85 °C) ±0.25° (+20 °C)
Operating temperature	-20...+65 °C	-40...+65 °C	-30...+85 °C	-40...+85 °C
Protection	IP 65	—	—	IP 67
Operating speed	≤6000 rpm	—	≤5000 rpm	≤6000 rpm
Max. shaft load	≤40 N axial ≤60 N radial	—	≤40 N axial ≤60 N radial	—

For very special applications

SIL encoders incremental and absolute

With SIL2 and SIL3 certification.

For quick implementation of your system concepts.

- Size 58...105 mm
- Square wave and sine signals

PL
SIL



Functional Safety



Features	■ Sine encoders ■ Through hollow shaft ■ SIL2/SIL3 approval	■ Incremental encoders ■ Solid shaft with clamping or synchro flange ■ SIL2 approval	■ Sine encoders ■ Cone shaft ■ Blind hollow shaft ■ PLd/SIL2 approval	■ Absolute encoder SSI ■ Solid shaft ø10 mm ■ Adjustable incremental tracks ■ PLd/SIL2 approval
Product family	ITD22H00 SIL	GI357	HOGS 100S	GBA2W
Function principle	—	—	—	Singleturn
Sensing method	Optical			
Size (housing)	ø58 mm	ø58 mm	ø105 mm	ø58 mm
Voltage supply	5 VDC ±10 %	24 VDC +20/-50 %	5 VDC ±10 % 7...30 VDC	24 VDC ±10 %
Output stage				
- TTL/RS422	—	■	—	—
- HTL/push-pull	—	■	—	■
- SinCos 1 Vpp	■	—	■	—
Output signals	A, B, N	A 90° B + inverted	K1 (A+), K2 (B+), K0 (R+) + inverted	A 90° B + inverted SSI absolute
Shaft type				
- Cone shaft 1:10	—	—	ø17 mm	—
- Solid shaft	—	ø6 mm / ø10 mm	—	ø10 mm
- Blind hollow shaft	—	—	ø16 mm	—
- Through hollow shaft	ø10, ø12, ø14 mm	—	—	—
Flange	—	Clamping or synchro flange	—	Clamping flange
Connection				
- Terminal box	—	—	Radial	—
- Flange connector M12, M23	—	Radial, axial	—	Radial
- Cable	Tangential	—	—	—
Resolution	—	—	—	8192/13 bit / 65536/16 bit
Pulses per revolution	—	5...5000	—	4096
Sine waves per revolution	1024, 2048	—	1024...5000	—
Operating temperature	-30...+100 °C	-25...+85 °C	-25...+85 °C	-20...+85 °C
Protection	IP 65	IP 54 (without shaft seal) IP 65 (with shaft seal)	IP 66	IP 67
Operating speed	≤6000 rpm	≤10000 rpm	≤10000 rpm	≤3000 rpm
Max. shaft load	—	≤20 N axial, ≤40 N radial	≤250 N axial, ≤400 N radial	≤20 N axial, ≤40 N radial
Approval	SIL2 or SIL3 compliant in redundant use	SIL2 compliant to IEC 61508	PLd/SIL2 approval	PLd/SIL2 approval (incremental)

For very special applications

Stainless steel incremental encoders



V2A and V4A.
Max. 10 000 pulses per revolution.
■ Size 58...89 mm
■ Square wave and sine signals



Features	■ Through hollow shaft ■ Pulses per revolution 5...6000		■ Solid shaft with clamping flange ■ Pulses per revolution 5...6000		■ Blind hollow shaft ■ Pulses per revolution 200...6000		■ Blind hollow shaft ■ Pulses per revolution max. 10 000 ■ Sine waves per revolution 1024...2048	
Product family	GE333	GE355	GF355	ITD21 A4 Y65	ITD 40 A4	ITD 42 A4 Y141		
Sensing method	Optical							
Size (housing)	ø58 mm					ø89 mm		
Voltage supply	5 VDC ±10 %, 4.75...30 VDC, 10...30 VDC				5 VDC ±5 %, 8...30 VDC			
Output stage								
- TTL/RS422	■	■		■	■		—	
- HTL/push-pull	■	■		■	■		—	
- SinCos 1 Vpp	—	—		—	—	■		
Output signals	A 90° B, N + inverted					A, B, N + inv.	A, B, N	
Shaft type								
- Solid shaft	—	ø10 mm		—	—	—	—	
- Blind hollow shaft	—	—		—	—	ø20...27 mm	—	
- Through hollow shaft	ø12 mm	—		ø10...14 mm	—	ø20...27 mm		
Connection								
- Cable	Radial	Radial / axial		Radial	Radial			
Pulses per revolution	5...6000	5...6000		200...6000	2000...10000 —			
Sine waves per revolution	—	—		—	— 1024...2048			
Operating temperature	-25...+100 °C (5 VDC) -25...+85 °C (24 VDC)	-25...+85 °C		-20...+85 °C	-20...+70 °C -20...+85 °C			
Protection	IP 65	IP 67		IP 66	IP 67			
Operating speed	≤6000 rpm	≤10 000 rpm		≤3000 rpm	≤2500 rpm			
Max. shaft load	—	≤20 N axial, ≤40 N radial			—			
Material	Stainless steel: 1.4305	Stainless steel: 1.4305	Stainless steel: 1.4404	Stainless steel: 1.4305	Stainless steel: 1.4305	Stainless steel: 1.4305	Stainless steel	
Options	—	—		Cable with connector	Cable with connector			

For very special applications

Stainless steel absolute encoders

V2A and V4A.

- Size 58 mm
- SSI, fieldbus, real time EtherNet



MAGRES
hermetic



Features	■ Solid shaft with clamping flange ■ Integrated interfaces		■ Solid shaft with clamping or synchro flange ■ Through hollow shaft ■ Modular bus cover		■ Solid shaft with clamping flange ■ Hermetically sealed ■ Integrated interfaces		■ Solid shaft with clamping flange ■ Hermetically sealed ■ Modular bus cover	
Product family	GE244	GE404	GEMMW	GEMMH	BMMV 58 - MAGRES hermetic		BMMV 58 flexible - MAGRES hermetic	

Interface

- SSI	■	—	—	■	—
- CANopen®	—	■	■	■	■
- DeviceNet	—	■	■	—	■ 1)
- Profibus-DP	—	■	■	■	■
- SAEJ1939	—	■ 1)	■ 1)	—	■
- EtherCAT/PoE	—	■ 1)	■ 1)	—	■ 1)
- EtherNet/IP	—	■ 1)	■ 1)	—	■
- Powerlink	—	■ 1)	■ 1)	—	■ 1)
- Profinet	—	■ 1)	■ 1)	—	■

Function principle	Singleturn	Multiturn	Multiturn	Multiturn	Multiturn
Sensing method	Optical			Magnetic	
Size (housing)	ø58 mm				
Voltage supply	10...30 VDC				
Shaft type					
- Solid shaft	ø10 mm		ø6, ø10 mm	—	ø10 mm
- Through hollow shaft	—		—	ø12...14 mm	—
Connection	M23 radial		Bus cover cable gland		Bus cover M12
Resolution	14 bit	26 bit	29 bit	≤29 bit	≤30 bit
Steps per turn	≤16384/14 bit	≤4096/12 bit	≤8192/13 bit	≤8192/13 bit	≤4096/12 bit
Number of turn	—	≤16384/14 bit	≤65 536/16 bit	≤65 536/16 bit	≤262 144/18 bit
Absolute accuracy	±0.025°			±1°	
Operating temperature	-25...+85 °C			-40...+85 °C	
Protection	IP 67			IP 68, IP 69 K	
Operating speed	≤6000 rpm				
Max. shaft load	≤20 N axial ≤40 N radial		≤20 N axial ≤40 N radial	—	≤120 N axial (combined), ≤280 N radial (combined) ≤270 N axial (single load)
Material	Stainless steel: 1.4305 / 1.4404		Stainless steel: 1.4305		

1) on request

For very special applications

Offshore incremental encoders

For use in C5M environments.

- Size ø58...800 mm
- Square wave and sine signals



Features	■ Solid shaft with clamping or synchro flange		■ Cone shaft or blind hollow shaft ■ High protection IP 67		■ Through hollow shaft		■ Through hollow shaft ■ Bearingless encoders ■ Pulses per revolution 64...32 768	
Product family	GI355-C	GI356-C	HOG 11		HOG 131		MHGE 100 - HDmag	MHGE 800 - HDmag
Sensing method	Optical					Magnetic		
Size (housing)	ø58 mm		ø105 mm		ø130 mm		100 x 40 x 65 mm	
Size (magnetic wheel)							ø99.9...813 mm	
Voltage supply	5 VDC ±10 % 4.75...30 VDC 10...30 VDC		5 VDC ±5 % 9...30 VDC		5 VDC ±5 % 9...26 VDC 9...30 VDC		Rectangular: 4.75...30 VDC Sine: 5 VDC	
Output stage								
- TTL/RS422	■		■		■		■	
- HTL/push-pull	■		—		—		—	
- HTL-P (Power Linedriver)	—		■		■		■	
- SinCos 1 Vpp	—		—		—		■	
Output signals	A 90° B, N + inverted		K1, K2, K0 + inverted		K1, K2, K0 + inverted		A+, B+, R+ , A-, B-, R-	
Output frequency	≤150 kHz		≤120 kHz		≤120 kHz		≤300 kHz	
- Solid shaft	ø10 mm	ø6 mm	—		—		—	
- Cone shaft 1:10	—		ø17 mm		—		—	
- Blind hollow shaft	—		ø12...20 mm		—		—	
- Through hollow shaft	—		—		ø16...36 mm		ø16...80 mm	ø650...740 mm
Flange	Clamping flange	Synchro flange	—		—		—	
Connection								
- Flange connector M23	Radial / axial		—		—		Radial	
- Cable	Radial / axial		—		—		—	
- Terminal box	—		Radial		Radial		—	
Pulses per revolution	5...6000		300...2500		2048...3072		64...4096	512...32 768
Sine waves per revolution	—		—		—		64	512
Operating temperature	-25...+85 °C (-25...+100 °C)		-30...+85 °C		-40...+100 °C		-40...+100 °C	
Protection	IP 54, IP 65		IP 67		IP 56		IP 67 (sensor head)	
Operating speed	≤10 000 rpm		≤6000 rpm		≤6000 rpm		≤8000 rpm	≤1000 rpm
Max. shaft load	≤20 N axial, ≤40 N radial		≤250 N axial, ≤400 N radial		≤300 N axial, ≤500 N radial		—	
Explosion protection	—		Ex II 3G IIC / 3D IIIC (ATEX)		Ex II 3G IIC / 3D IIIC (ATEX)		—	
Corrosion protection	For C5M environments compliant to ISO 12944-2		Corrosion and seawater proof					
Options	With SIL2 certification: GI357		DNV certification		—		DNV certification	

For very special applications

Offshore absolute encoders

For use in C5M environments.

- Size ø58...122 mm
- SSI, fieldbus, real time EtherNet



New

Features	■ Solid shaft with clamping or synchro flange		■ Through hollow shaft		■ Solid shaft with clamping or synchro flange	■ Cone, solid, blind or through hollow shaft ■ Double-sided mounting	
Product family	GM400-C	GM401-C	GOM2H-C	G0A2H-C	GXMMW ¹⁾	PMG 10	HMG 10

Interface

- SSI / SSI with incremental	■ / ■	■ / ■	■ / ■	■ / ■	■ / ■
- CANopen®	—	—	■	■	■
- DeviceNet	—	—	■	—	—
- Profibus-DP	—	—	■	■	■
- EtherCAT	—	—	■	■	■
- Profinet	—	—	■	■	■

Function principle	Multiturn		Multiturn	Singleturn	Multiturn	Multiturn / Singleturn	
Sensing method	Optical						
Size (housing)	ø58 mm		ø58 mm		ø58 mm	ø115 mm	ø105 mm
Voltage supply	10...30 VDC		10...30 VDC		10...30 VDC	9...30 VDC	
Shaft type							
- Solid shaft	ø10 mm	ø6 mm	—		ø6 mm, ø10 mm	ø11 mm	—
- Cone shaft 1:10	—		—		—	—	ø17 mm
- Blind hollow shaft	—		—		—	—	ø12...20 mm
- Through hollow shaft	—		ø12-14 mm		—	—	ø12...20 mm
Flange	Clamping flange	Synchro flange	—		Clamping flange, synchro flange	EURO flange B10	—
Connection	Flange connector M23 cable		Flange connector M23 cable		Bus cover with M12 or cable gland	Bus cover, terminal box, connector M12 or M23	
Resolution	≤30 bit		≤26 bit	≤14 bit	≤28 bit	≤40 Bit	
Steps per turn	≤16384/14 bit		≤16384/14 bit	≤16384/14 bit	≤8192/13 bit	≤1 048 576/20 Bit	
Number of turn	≤65536/16 bit		≤4096/12 bit	—	≤65536/16 bit	≤1 048 576/20 Bit	
Absolute accuracy	±0.025°		±0.025°		±0.025°	—	
Protection	IP 54, IP 65		IP 54 (IP 65 optional)		IP 54, IP 65	IP 66, IP 67	
Operating temperature	-25...+85 °C		-25...+85 °C		-25...+85 °C	-40...+100 °C	
Operating speed	≤6000 rpm		≤6000 rpm		≤6000 rpm	≤12000 rpm	
Max. shaft load	≤20 N axial, ≤40 N radial		—		≤20 N axial, ≤40 N radial	≤450 N axial, ≤650 N radial	
Corrosion protection	For C5M environments compliant to ISO 12944-2				Corrosion and seawater proof		
Options	Additional incremental signals						

1) on request

For very special applications

Signal processing

Digital converters.

- Level conversion and potential separation
- For extended signal transmission length
- TTL, HTL and SinCos



Features	■ Conversion TTL to TTL ■ Signal regeneration	■ Conversion HTL to TTL ■ Signal regeneration	■ Conversion TTL to HTL ■ Signal regeneration	■ Conversion HTL to HTL ■ Signal regeneration
Product family	HEAG 151	HEAG 152	HEAG 153	HEAG 154
Size	DIN rail housing 50 x 75 x 55 mm			
Voltage supply	5 VDC ±5%		9...26 VDC	
Inputs				
- Number	1	1	1	1
- TTL/RS422	■	—	■	—
- HTL/push-pull	—	■	—	■
Outputs				
- Number	1	1	1	1
- TTL/RS422	■	■	—	—
- HTL/push-pull	—	—	■	■
Input signals	K1, K2, K0 + inverted			
Output signals	K1, K2, K0 + inverted			
Output circuit	Optocoupler			
Connection	Screw terminals			
Consumption	≤5 mA			
Input frequency	200 kHz	120 kHz	200 kHz	120 kHz
Operating temperature	-20...+50 °C			
Protection	IP 20			

For very special applications

Signal processing

Precision interpolators and signal converter.

- Enhanced resolution and signal interpolation
- Up to three signal outputs
- TTL, HTL and SinCos



Features	■ Precision interpolator ■ Splitter for signal conversion SinCos to TTL/HTL ■ Additional signal interpolation	■ Precision sine multiplier ■ Converter SinCos to multiple SinCos	■ Precision interpolator ■ Precision splitter ■ Converter SinCos to multiple SinCos ■ Additional HTL or TTL signal interpolation
Product family	HEAG 158	HEAG 159	HEAG 160
Size	Surface mount housing 122 x 122 x 80 mm		
Voltage supply	10...30 VDC	5 VDC ±5%, 10...30 VDC	
Inputs			
- Number	2	2	2
- TTL/RS422	—	—	—
- HTL/push-pull	—	—	—
- SinCos 1 Vpp	■	■	■
Outputs			
- Number	3	2	4
- TTL/RS422	■	—	■
- HTL/push-pull	■	—	■
- SinCos 1 Vpp	—	■	■
- Error output	■	—	■
Input signals	A+, A-, B+, B-, R+, R-		
Output signals	A+, A-, B+, B-, R+, R-		
Connection	Mating 3-pin connector M23		
Consumption	≤150 mA (15 VDC)	≤500 mA (5 VDC), ≤300 mA (10...30 VDC)	
Input frequency	400 kHz		
Operating temperature	0...+50 °C		
Protection	IP 65		
Options	A+, A-, B+, B-, R+, R-, Error		

For very special applications

Signal processing

Fiber-optic transmitter.

- Interference-resistant fiber-optic transmitter
- For long-distance transmission and EMC-critical environments
- TTL and HTL



Features	■ Signal conversion TTL to LWL ■ For EMC-critical environments	■ Signal conversion HTL to LWL ■ For EMC-critical environments	■ Signal conversion LWL to TTL ■ For EMC-critical environments	■ Signal conversion LWL to HTL ■ For EMC-critical environments
Product family	HEAG 171	HEAG 172	HEAG 173	HEAG 174
Size	Surface mount housing 122 x 122 x 80 mm		DIN rail housing 50 x 75 x 55 mm	
Voltage supply	5 VDC ±5%, 9...26 VDC	9...26 VDC	5 VDC ±5%	10...30 VDC
Inputs				
- Number	4	4	3	3
- TTL/RS422	■	—	—	—
- HTL/push-pull	—	■	—	—
- LWL	—	—	■	■
Outputs				
- Number	4	4	3	3
- TTL/RS422	—	—	■	—
- HTL/push-pull	—	—	—	■
- LWL	■	■	—	—
Input signals	K1, K2, K3, K4 + inverted		LWL 1, 2, 3	
Output signals	LWL 1, 2, 3, 4		K1, K2, K3 + inverted	
Connection				
- Screw terminals	—	—	■	■
- Cable gland M16	■	■	—	—
- Cable gland M20	■	■	—	—
Max. load current	200 mA		60 mA	
Operating temperature	-20...+70 °C		-20...+50 °C	
Protection	IP 65		IP 20	

For very special applications

Signal processing

Fiber-optic transmitter.

- Interference-resistant fiber-optic transmitter
- For long-distance transmission and EMC-critical environments
- TTL and HTL



Features	■ Signal conversion TTL to LWL ■ For EMC-critical environments	■ Signal conversion HTL to LWL ■ For EMC-critical environments
Product family	HEAG 175	HEAG 176
Size	DIN rail housing 50 x 75 x 55 mm	
Voltage supply	5 VDC ±5%, 9...26 VDC	9...26 VDC
Inputs		
- Number	3	3
- TTL/RS422	■	—
- HTL/push-pull	—	■
- LWL	—	—
Outputs		
- Number	3	3
- TTL/RS422	—	—
- HTL/push-pull	—	—
- LWL	■	■
Input signals	K1, K2, K3 + inverted	
Output signals	LWL 1, 2, 3	
Connection		
- Screw terminals	■	■
- Cable gland M16	—	—
- Cable gland M20	—	—
Max. load current	75 mA	
Operating temperature	-20...+50 °C	
Protection	IP 20	

A secure hold
during tilt and
vibration.



Inclination sensor GIM500.

Inclination & acceleration sensors



Absolute precise and robust.

Baumer inclination sensors of the GIM series detect the inclination angle towards the horizontal line at machines and machine equipment. Typical applications are construction or agricultural vehicles in mobile automation. As particular construction benefit, an accessible rotary shaft during installation is not required. To meet the ever-growing requirements in mobile automation, the Baumer GIM inclination sensors provide versatile interface options such as CANopen®, SAEJ1939 or analog current and voltage outputs. Besides the very robust mechanical design, GIM500 excels with outstanding electromagnetic capability and E1 type approval compliant to automotive directive 2006/28/EG.

Baumer acceleration sensors of the GAM900 series supply the master control with precise acceleration information via CANopen® or analog interface. SIL2/PLD-certified acceleration sensor GAM900S acts as a two-in one device replacing conventional sensorics for monitoring shock and vibration, for example in wind turbines: acceleration sensors to detect vibration in three-axis direction and mechanical limit switches with relay contact as link in the safety chain. Thanks to SIL2/PLD-certified limit monitoring, GAM900S will simplify the equipment's safety assessment and implementation of machine directive 2006/42/EG including „vibration monitoring“ as safety function requirement.

MEMS technology

Baumer inclination and acceleration sensors are working with sensor elements based on MEMS technology (micro electro mechanical system). Compared with conventional technologies, the MEMS sensor elements excel with their compact design, high cost efficiency and ultimate durability under harsh conditions. The MEMS sensor elements used by Baumer have been specially qualified for the use in harsh industrial environments, and their long-term availability is ensured.

Inclination sensors

Application-specific scaling

One and two-dimensional.
Compact design.

- Analog, CANopen®, Profibus-DP and SAEJ1939
- Robust metal or plastic housing
- MEMS technology
- E1-certification



Features	■ Sensing range: one-dimensional 360° two-dimensional $\pm 5^\circ / \pm 15^\circ / \pm 30^\circ / \pm 60^\circ$	■ Sensing range: one-dimensional 360° two-dimensional $\pm 5^\circ / \pm 15^\circ / \pm 30^\circ / \pm 60^\circ$	■ Sensing range: one-dimensional 360° two-dimensional up to $\pm 60^\circ$	■ Sensing range: one-dimensional 360° two-dimensional $\pm 15^\circ / \pm 30^\circ / \pm 60^\circ$
Product family	GIM150	GIM200	GIM500	GNAMG
Interface				
- Analog / redundant	■	■ / ■	—	—
- CANopen® / SAEJ1939	— / —	— / —	■ / ■	■ / —
- Profibus-DP	—	—	—	■
- Switching output	—	■	—	—
Sensing method	MEMS	MEMS	MEMS	MEMS
Size (housing)	33.7 x 33.7 x 7 mm	84 x 72 x 35 mm	48 x 24 x 52 mm	99 x 60 x 5 mm
Voltage supply	5 VDC	8...30 VDC	8...36 VDC	10...30 VDC
Connection	Cable	Flange connector M12	Cable Flange connector M12	Cable gland Flange connector M12
Resolution	0.02°	0.02°	0.025°	0.1°
Accuracy				
- Sensing range 360°	$\pm 3.6^\circ$	$\pm 3.6^\circ$	$\pm 0.1^\circ$	$\pm 0.2^\circ$
- Sensing range $\pm 15^\circ$	± 0.15	± 0.15	$\pm 0.1^\circ$	$\pm 0.1^\circ$
- Sensing range $\pm 30^\circ$	$\pm 0.3^\circ$	$\pm 0.3^\circ$	$\pm 0.1^\circ$	$\pm 0.2^\circ$
- Sensing range $\pm 60^\circ$	$\pm 0.6^\circ$	$\pm 0.6^\circ$	$\pm 0.1^\circ$	$\pm 0.2^\circ$
Operating temperature	-20...+70 °C	-40...+85 °C	-40...+85 °C	-25...+85 °C
Protection	IP 66 (flange connector M12) IP 67 (cable gland)	IP 67	IP 69k	IP 66 (flange connector M12) IP 67 (cable gland)
Options	—	—	Seawater resistant Deutsch connector Max. $\pm 90^\circ$, two-dimensional	Stainless steel Operating temperature -40...+85 °C

Measuring inclination even in harsh environments

Inclination sensors detect the angle of inclination towards the horizontal line at machines and equipment. Acting as electronic water scale, they are ideal for measuring inclination angles, particularly where rotation shafts are difficult to access. Baumer inclination sensors significantly contribute towards improved safety, for example at cranes. The robust and saltwater-proof, IP 69K-rated aluminium die cast and plastic housing makes them ideal for industrial use in a rough ambience.

Acceleration sensors

Measuring precision and safety

Vibration and shock detection in three-axis direction.

- Redundant diversified sensing
- Offshore capable
- Analog and CANopen®
- Individually configurable filters



Features	■ Up to two relay outputs for limit monitoring ■ 3 axes detection, MEMS based	■ Safe limit monitoring by relay output ■ Redundante 3 axes detection, MEMS based ■ SIL2/PLd approval
Product family	GAM900	GAM900S
Interface		
- Analog	■	■
- CANopen®	■	■
Sensing method	MEMS	2 x MEMS
Size (housing)	55 x 30 x 90 mm	
Voltage supply	10...30 VDC	
Connection	Flange connector 1x or 2x M12	
Frequency bands	6 (configurable)	4 (configurable)
Resolution	<4 mg	
Accuracy 3σ (with band pass filtering)	=35 mg (range ±1000 mg) =10 mg (range ±250 mg)	=60 mg (range ±1000 mg) =15 mg (range ±250 mg)
Measuring range	±2 g	
Operating temperature	-40...+85 °C	
Protection	IP 67	
Material	Aluminium or glass-fiber reinforced plastic	
Optionen	Filter up to 150 Hz	



Functional
Safety
Type
Approved

www.tuv.com
ID 0600000000



Functional safety with certificate

The EC type-examination of the acceleration sensor GAM900S by the notified body TÜV Rheinland certifies the compliance with the increased requirements of the conformity assessment procedure according to the Machinery Directive. Further SIL2/PLd certified encoders complete the Baumer portfolio and simplify safety certification of the installation.

Accessories



Mounting accessories for hollow shaft encoders

Matching accessories for hollow shaft mount

- Stator couplings for ultra-precise mount with maximum installation flexibility
- Safe and easy anti-torsion spring washers and pins
- Torque supports for industry and HeavyDuty variants



Mounting accessories for solid shaft encoders

Matching accessories for solid shaft mount

- Shaft couplings to link drive shaft and encoder shaft
- Mounting clamp to secure encoder flange
- Adaptor flange and mounting angle for quick and safe encoder mount
- Flange adaptor, for example to change a clamping flange into a synchro flange



Programming and diagnostic tools

For encoder commissioning and configuration

- Signal processing for interpolation, conversion, regenerating and as a switching relay, HTL, TTL, SinCos and fiber-optic
- Programming tools with GSD-/EDS-/XML files as well as instruction manuals, USB adaptor and PC software
- Testing equipment for incremental encoders for consistent monitoring of encoder data
- PC software for display and evaluation

Encoders and angular sensors

Several mechanical and electric interface concepts as well as increasingly demanding applications call for appropriate accessories. With Baumer you will always encounter the matching mounting accessories like torque supports, spring washers, connectors and cables.

Deployed in conjunction with incremental encoders, measuring wheels perform the task of length measurement or speed monitoring. Learn more at: www.baumer.com



Varied connectors and cables

Matching all encoders and angular sensors

- Mating connector M12, M23, MIL and other standards
- Mating connector pre-assembled or for self-assembly
- Different cables, non-assembled



Small and large measuring wheels

Measuring wheels – for any surface the optimum grip

- Wheel material and surface profile depending on the application
- Circumference 20 or 50 cm
- For shaft diameters from 4 to 12 mm



Motor earthing units with hollow shaft

To discharge parasitic shaft currents

- For use in potentially explosive areas
- Hollow shafts from $\varnothing 20$ to $\varnothing 42$ mm

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HOG 10+DSL.R	46	ITD89H00 Sine	61	TDP 13	50
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Worldwide presence
and supreme competence
in consulting, sales
and service.

Baumer – the strong partner.

We at Baumer are close to our customers, understand their needs and provide the best solution. Worldwide customer service for Baumer starts with on-the-spot personal discussions and qualified consultation. Our application engineers speak your language and strive from the start, through an interactive problem analysis, to offer comprehensive and user-compatible solutions.

We are close to you across the globe.

The worldwide Baumer sales organizations guarantee short delivery times and readiness to supply. Many of our customers are directly linked via our electronic order system with the JIT logistics process.

A worldwide network coupled with the most modern communication techniques enable us to deliver information quickly and transparently to decision makers in all Baumer locations.

Closeness to the customer for Baumer means being available for your needs anywhere and at any time.



Worldwide presence.



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Represented by:

Incremental encoders

Size 24...58 mm

Size (ø)	Precise optical sensing	Robust magnetic sensing	Solid shaft	Blind hollow shaft	Through hollow shaft	TTL/RS422	HTL/push-pull	Pulses per revolution	Product family	Page
24 mm	■	■	■	■	■	■	■	≤ 5000	ITD 01 B14	6
24 mm	■	■	■	■	■	■	■	> 5000	ITD 01 A4	6
30 mm	■	■	■	■	■	■	■	≤ 5000	BDK 16	6
40 mm	■	■	■	■	■	■	■	> 5000	BHK 16	6
30 mm	■	■	■	■	■	■	■	≤ 5000	BRIV 30	7
30 mm	■	■	■	■	■	■	■	> 5000	BRIV 30 R	7
40 mm	■	■	■	■	■	■	■	≤ 5000	BRIH 40	7
58 mm	■	■	■	■	■	■	■	≤ 5000	EIL580-SC	8
58 mm	■	■	■	■	■	■	■	> 5000	EIL580-SY	8
58 mm	■	■	■	■	■	■	■	≤ 5000	EIL580-B	8
58 mm	■	■	■	■	■	■	■	> 5000	EIL580-T	8
58 mm	■	■	■	■	■	■	■	≤ 5000	BRIV 58K	9
58 mm	■	■	■	■	■	■	■	> 5000	BRIV 58S	9
58 mm	■	■	■	■	■	■	■	≤ 5000	BRIH 58S	9
58 mm	■	■	■	■	■	■	■	> 5000	BRID 58S	9
58 mm	■	■	■	■	■	■	■	≤ 5000	GI355 / GI356	10
58 mm	■	■	■	■	■	■	■	> 5000	G0355 / G0356	10
58 mm	■	■	■	■	■	■	■	≤ 5000	BDH - HighRes	10
58 mm	■	■	■	■	■	■	■	> 5000	BDT - HighRes	10
58 mm	■	■	■	■	■	■	■	≤ 5000	G0333	11
58 mm	■	■	■	■	■	■	■	> 5000	ITD21H00	11
58 mm	■	■	■	■	■	■	■	≤ 5000	BHF - HighRes	11
58 mm	■	■	■	■	■	■	■	> 5000	BHG - HighRes	11



Large hollow shaft

Hollow shaft (ø max.)	Blind hollow shaft	Through hollow shaft	TTL/RS422	HTL/push-pull	Pulses per revolution	Product family	Page
25 mm	■	■	■	■	≤ 5000	ITD 40	12
27 mm	■	■	■	■	> 5000	ITD 41	12
25.4 mm	■	■	■	■	≤ 5000	G110H	12
25 mm	■	■	■	■	> 5000	G110S	12
25.4 mm	■	■	■	■	≤ 5000	HS35F	12
50 mm	■	■	■	■	≤ 5000	ITD 61	13
65 mm	■	■	■	■	> 5000	ITD 70	13
85 mm	■	■	■	■	≤ 5000	ITD 75	13



Programmable

Size (ø)	Solid shaft	Blind hollow shaft	Through hollow shaft	Configurable parameters	Pulses per revolution	Output signal level	Zero pulse	TTL/RS422	HTL/push-pull	Pulses per revolution	Product family	Page
40 mm	■	■	■	■	■	■	■	■	■	≤ 5000	BNIV	14
58 mm	■	■	■	■	■	■	■	■	■	> 5000	BHG HighRes	14
58 mm	■	■	■	■	■	■	■	■	■	≤ 5000	BHF HighRes	14
58 mm	■	■	■	■	■	■	■	■	■	> 5000	ITD2PH00	14
80 mm	■	■	■	■	■	■	■	■	■	≤ 5000	HS35P	15
58 mm	■	■	■	■	■	■	■	■	■	> 5000	EIL580P	15



Incremental encoders

Sine/Cosine 1 Vpp

Size (ø)	Solid shaft	Blind hollow shaft	Through hollow shaft	Sine waves per revolution	Option: S12	Product family	Page
58 mm	■			■	■	BDT Sine	16
58 mm		■		■	■	BHF Sine	16
58 mm			■	■	■	BHG Sine	16
58 mm		■		■	■	BHT Sine	16
58 mm			■	■	■	ITD22H00	17
80 mm			■		■	HS35S	17
80 mm			■		■	ITD 42 A4 Y79	17



BDT Sine



BHF/BHG Sine



BHT Sine



ITD22H00



HS35S



ITD 42 A4 Y79

Absolute encoders

Robust magnetic sensing

Size (ø)	Solid shaft	Blind hollow shaft	Singleturn	Multiturn	Integrated interface	Modular bus cover	SSI	Analog redundant	CANopen	DeviceNet	Profibus-DP	SAE1939	EtherCAT/IOE / EtherNet/IP	Profinet/Powerlink	Product family	Page
30 mm	■			■	■		■		■						BMMV 30	22
30 mm	■		■		■		■		■						BMSV 30	22
30 mm	■			■	■		■		■						BMMV 30R	22
30 mm	■		■		■		■		■						BMSV 30R	22
30 mm		■		■	■		■		■						BMMH 30	22
30 mm		■	■		■		■		■						BMSH 30	22
28 mm	■			■			■		■						EAM280	22
42 mm	■			■	■		■		■	■					BMMV 42	23
42 mm	■		■		■		■		■	■					BMSV 42	23
42 mm		■		■	■		■		■	■					BMMH 42	23
42 mm		■	■		■		■		■	■					BMSH 42	23
58 mm	■			■	■		■	■	■	■					BMMV 58	24
58 mm	■		■		■		■	■	■	■					BMSV 58	24
58 mm		■		■	■		■	■	■	■					BMMH 58	24
58 mm		■	■		■		■	■	■	■					BMSH 58	24
58 mm	■			■	■		■	■	■	■	■	■	■	■	BMMV 58 flexible	24
58 mm	■		■		■		■	■	■	■	■	■	■	■	BMSV 58 flexible	24
58 mm		■		■	■		■	■	■	■	■	■	■	■	BMMH 58 flexible	24
58 mm		■	■		■		■	■	■	■	■	■	■	■	BMSH 58 flexible	24
58 mm	■			■	■		■	■	■	■					BMMV 58 hermetic	25
58 mm	■			■	■		■	■	■	■	■	■	■	■	BMMV 58 hermetic flexible	25



BMSV/BMMV 30
BMSV/BMMV 30R



BMSH/BMMH 30



EAM280



BMSV/BMMV 42



BMSH/BMMH 42



BMSV/BMMV 58



BMSH/BMMH 58



BMSV/BMMV 58
flexible



BMSH/BMMH 58
flexible



BMMV 58 hermetic



BMMV 58
hermetic flexible

Inch size & other designs

Size (ø)	Inch size	EURO flange B10	Measuring wheel encoder	Solid shaft	Blind hollow shaft	Through hollow shaft	TTL/RS422	HTL/push-pull	Product family	Page
2.5"	■			■			■	■	G25	18
2.5"	■			■			■	■	EIL580-SQ	18
2.28"	■				■		■	■	EIL580-B	18
2.28"	■				■		■	■	EIL580-T	18
3.15"	■				■		■	■	HS35	18
58 mm		■		■			■	■	EIL580-S1	19
82 mm		■		■				■	ITD 40 B10	19
82 mm		■		■				■	ITD 41 B10	19
40 mm			■					■	MA20	19



G25



EIL580-SQ



EIL580-B



EIL580-T



HS35



EIL580-S1



ITD 40 B10
ITD 41 B10



MA20

Absolute encoders

Precise optical sensing – integrated interface – resolution up to 16 bit

Size (ø)	Solid shaft	Blind hollow shaft	Through hollow shaft	Multiturn	Singleturn	SSI / SSI + Incremental	RS485	Analog	Parallel	CANopen*	DeviceNet	Profinet	Product family	Page
58 mm	■	■	■	■							■		EAL580	26
58 mm	■		■		■								GM400 / GM401	26
58 mm	■			■	■			■					GA240 / GA241	26
58 mm		■		■	■								GXM2S	26
58 mm		■		■	■								GXA2S	26
58 mm			■	■	■								GOM2H	26
58 mm			■	■	■								G0A2H	26
58 mm	■			■		■							GXM7W	26
58 mm	■				■	■							GXA7W	26
58 mm		■		■		■							GXM7S	26
58 mm	■				■		■						ATD 2A B14	26
58 mm			■	■			■						ATD2AH00	26
58 mm			■	■			■						ATD 2A A4	26
58 mm	■			■				■					GXP1W	26
58 mm			■	■					■				G0P5H	26
58 mm	■			■					■				GXP5W	26
58 mm	■				■					■			GXU5W	26
58 mm		■		■					■				GXP5S	26
58 mm	■			■							■		GXP8W	26



EAL580
GM400 / GA240
GXA7W / GXM7W
GXP1W
GXP5W / GXU5W
GXP8W



EAL580
GM401 / GA241
GXA7W / GXM7W
GXP1W
GXP5W / GXU5W
GXP8W



EAL580
GXM2S
GXA2S
GXM7S
GXP5S



EAL580
GOM2H
G0A2H
G0P5H



ATD2AH00
ATD 2A A4

Precise optical sensing – modular bus cover

Size (ø)	Solid shaft	Blind hollow shaft	Through hollow shaft	Multiturn	Singleturn	Resolution 18 bit per turn	SSI	CANopen*	Profinet-DP	SAE11939	EtherCAT / PoE	Profinet / EtherNet/IP	Powerlink	Product family	Page
58 mm	■		■			■	■	■	■	■	■	■	■	GXMMW	28
58 mm	■			■		■	■	■	■	■	■	■	■	GXAMW	28
58 mm		■		■		■	■	■	■	■	■	■	■	GXMMS	28
58 mm		■		■		■	■	■	■	■	■	■	■	GXAMS	28
58 mm			■	■			■	■			■			G0MMH	28
58 mm			■	■			■	■			■			G0AMH	28
58 mm	■			■	■	■	■	■	■	■	■	■	■	GBMMW	29
58 mm	■				■	■	■	■	■	■	■	■	■	GBAMW	29
58 mm		■		■		■	■	■	■	■	■	■	■	GBMMS	29
58 mm		■			■	■	■	■	■	■	■	■	■	GBAMS	29
58 mm			■	■			■	■			■			GBMMH	29
58 mm			■	■			■	■			■			GBAMH	29



GXAMW/GXMMW
GBAMW/GBMMW



GXAMW/GXMMW
GBAMW/GBMMW



GXAMS/GXMMS
GBAMS/GBMMS



G0AMH/G0MMH
GBAMH/GBMMH

Precise optical sensing – integrated interface – resolution up to 18 bit

Size (ø)	Solid shaft	Blind hollow shaft	Through hollow shaft	Multiturn	Singleturn	SSI / SSI + Incremental	RS485	CANopen*	EtherCAT / PoE	BiSS C	Profinet	Product family	Page
58 mm	■	■	■	■	■						■	EAL580	27
58 mm	■			■	■							GBM2W	27
58 mm	■				■							GBA2W	27
58 mm		■		■	■							GBM2S	27
58 mm		■			■							GBA2S	27
58 mm			■	■	■							GBM2H	27
58 mm			■		■	■						GBA2H	27
58 mm	■			■		■						GBM7W	27
58 mm		■				■						GBM7S	27
58 mm	■			■			■					GBP5W	27
58 mm	■				■		■					GBU5W	27
58 mm		■		■			■					GBP5S	27
58 mm			■	■			■					GBP5H	27
58 mm		■		■				■				ATD 2B A4	27
58 mm			■	■				■				ATD 4B A4	27
58 mm	■			■					■			GBPAW	27
58 mm	■				■				■			GBUAW	27
58 mm		■		■					■			GBPAS	27
58 mm		■			■				■			GBUAS	27
58 mm			■	■					■			GBPAH	27
58 mm			■		■				■			GBUAH	27



EAL580
GBM2W / GBA2W
GBM7W
GBP5W / GBU5W
GBPAW / GBUAW



EAL580
GBM2W / GBA2W
GBM7W
GBP5W / GBU5W
GBPAW / GBUAW



EAL580
GBM2S / GBA2S
GBM7S
GBP5S
GBPAS / GBUAS



EAL580
GBM2H
GBA2H
GBP5H
GBPAH / GBUAH



ATD 4B A4

Precise optical sensing – large hollow shaft

Hollow shaft (ø max.)	Multiturn	Singleturn	Resolution 18 bit per turn	Integrated interface	Modular bus cover	SSI	CANopen*	Profinet-DP	EtherCAT	Product family	Page
25.4 mm	■		■		■					G1M2H	30
50.8 mm	■		■		■					G2M2H	30
27 mm	■	■		■						ATD 4S A4	30
25.4 mm	■			■		■	■	■		G1MMH	31
50.8 mm	■			■		■	■	■		G2MMH	31
27 mm	■		■	■					■	ATD 4B A4 Y11	31



G1M2H



G2M2H



ATD 4S A4



G1MMH



G2MMH



ATD 4B A4 Y11

HeavyDuty

Incremental encoders – TTL/HTL

Size (ø)	Shaft (ø max.)	Solid shaft	Hollow shaft	TTL/RS-422	HTL push-pull	HTL-p/Power Line driver	LWL	EURO flange B10	Terminal box	Redundant sensing	EMS	Ex II 3G/3D (ATEX)	Ex II 2G (ATEX/IECEx)	Product family	Page
58 mm	6 mm	■	■	■							■	OG 71		OG 71	34
115 mm	11 mm	■	■	■	■	■	■	■	■	■	■	OG 9		OG 9	34
115 mm	11 mm	■	■	■	■	■	■	■	■	■	■	POG 86E		POG 86E	34
115 mm	11 mm	■	■	■	■	■	■	■	■	■	■	POG 86		POG 86	34
115 mm	11 mm	■	■	■	■	■	■	■	■	■	■	POG 10		POG 10	35
115 mm	11 mm	■	■	■	■	■	■	■	■	■	■	POG 11		POG 11	35
115 mm	11 mm	■	■	■	■	■	■	■	■	■	■	POG 90		POG 90	35
120 mm	11 mm	■	■	■	■	■	■	■	■	■	■	EEx OG 9		EEx OG 9	35
60 mm	14 mm		■	■	■						■	HOG 71		HOG 71	36
75 mm	26 mm		■	■	■						■	HOG 75		HOG 75	36
99 mm	16 mm		■	■	■			■	■	■	■	HOG 86E		HOG 86E	36
99 mm	16 mm		■	■	■			■	■	■	■	HOG 86		HOG 86	36
105 mm	20 mm		■	■	■	■		■	■	■	■	HOG 10		HOG 10	37
105 mm	20 mm		■	■	■	■		■	■	■	■	HOG 11		HOG 11	37
105 mm	20 mm		■	■	■			■	■	■	■	HOG 100		HOG 100	37
130 mm	36 mm		■	■	■	■		■	■	■	■	HOG 131		HOG 131	38
158 mm	38 mm		■	■	■	■		■	■	■	■	HOG 16		HOG 16	38
158 mm	75 mm		■	■	■	■		■	■	■	■	HOG 163		HOG 163	38
165 mm	25 mm		■	■	■	■		■	■	■	■	HOG 165		HOG 165	38
227 mm	115 mm		■	■	■	■		■	■	■	■	HOG 220		HOG 220	39
227 mm	150 mm		■	■	■	■		■	■	■	■	HOG 28		HOG 28	39



Incremental encoders – Sine/Cosine 1 Vpp

Size (ø)	Shaft (ø max.)	Solid shaft	Hollow shaft	EURO flange B10	Terminal box	Ex II 3G/3D (ATEX)	Product family	Page
58 mm	6 mm	■			■		OGS 71	40
115 mm	11 mm	■	■	■			POGS 90	40
60 mm	14 mm		■		■		HOGS 71	40
75 mm	26 mm		■		■		HOGS 75	40
105 mm	20 mm		■	■	■		HOGS 100	41
158 mm	75 mm		■	■	■		HOGS 14	41
168 mm	70 mm		■		■		HOGS 151	41



Absolute encoders

Size (ø)	Solid shaft	Hollow shaft	SSI	CANopen	DeviceNet	Profibus-DP	EtherCAT	Profinet	EURO flange B10	Terminal box	Redundant sensing	Ex II 3G/3D (ATEX)	Product family	Page
60 mm	■	■								■			AMG 71	42
115 mm	■	■	■		■			■		■			AMG 81	42
122 mm	■	■	■		■	■	■	■	■	■	■		PMG 10	42
122 mm		■	■	■	■	■	■		■	■	■		HMG 10	42
160 mm		■	■	■	■				■		■		HMG 161	43



HeavyDuty

Speed switches

Incremental encoders with digital speed switches

Size	Mechanical	Electronic	Digital/progr.	Solid shaft	Switching outputs	EURO flange B10	Terminal box	Surface mount	Product family	Page
ø115 mm	■		■	1	■	■			FS 90	44
ø115 mm		■	■	1	■	■			ES 90	44
ø115 mm		■	■	3	■	■			ES 93	44
ø115 mm		■	■	1	■	■			ES 100	44
122 mm			■	3			■		DS 93	45
122 mm			■	3			■		DS 93 R	45



FS 90



ES 90
ES 93



ES 100



DS 93



DS 93 R

Size (ø)	Digital/progr.	Solid shaft	Hollow shaft	TTL/RS422	HTL/push-pull	Switching outputs	EURO flange B10	Terminal box	Ex II 3G/3D (ATEX)	Product family	Page
105 mm	■		■	■	■	2		■	■	HOG 10 + DSL.E	46
105 mm	■		■	■	■	3		■	■	HOG 10 + DSL.R	46
165 mm	■		■	■	■	2		■	■	HOG 165 + DSL.E	46
165 mm	■		■	■	■	3		■	■	HOG 165 + DSL.R	46
120 mm	■	■		■	■	2	■	■	■	POG 10 + DSL.E	47
120 mm	■	■		■	■	3	■	■	■	POG 10 + DSL.R	47



HOG 10 + DSL.E
HOG 10 + DSL.R



HOG 165 + DSL.E
HOG 165 + DSL.R



POG 10 + DSL.E
POG 10 + DSL.R

Absolute encoders with digital speed switches

Size (ø)	Solid shaft	Hollow shaft	SSI	CANopen	DeviceNet	Profibus-DP	EtherCAT	Profinet	EURO flange B10	Ex II 3G/3D (ATEX)	Product family	Page
122 mm	■		■	■	■	■	■	■	■		PMG 10 + DSL	48
122 mm	■		■	■	■	■	■	■	■		PMG 10 + DSL R	48
122 mm		■	■	■	■	■	■			■	HMG 10 + DSL	48
122 mm		■	■	■	■	■	■			■	HMG 10 + DSL R	48



PMG 10 + DSL



PMG 10 + DSL R



HMG 10 + DSL



HMG 10 + DSL R

Tachogenerators & Resolver

Size (ø)	Solid shaft	Hollow shaft	EURO flange B10	B10-Flansch	Terminal box	Bearingless	Product family	Page
115 mm	■		■				GTF 7.08	50
115 mm	■		■				GTF 7.16	50
85 mm	■			■	■		TDP 0,09	50
85 mm	■			■	■		TDPZ 0,09	50
115 mm	■		■				TDP 0,2	50
115 mm	■		■				TDPZ 0,2	50
175 mm	■			■	■		TDP 13	50
175 mm	■			■	■		TDPZ 13	50
126 mm	■		■				EEx GP 0,2	51
126 mm	■			■			TG 74	51



GTF 7.08
GTF 7.16



TDP 0,09
TDPZ 0,09



TDP 0,2
TDPZ 0,2



TDP 13
TDPZ 13



EEx GP 0,2



TG 74

Size (ø)	Solid shaft	Hollow shaft	Resolver	Bearingless	Product family	Page
52 mm		■		■	GT 5	52
85 mm		■		■	GT 7.08	52
85 mm		■		■	GT 7.16	52
89 mm		■		■	GT 9	52
95 mm		■		■	GTB 9.06	52
95 mm		■		■	GTB 9.16	52
95 mm		■		■	GTR 9	53
86 mm		■			KTD 4	53
100 mm		■			KTD 3	53
58 mm	■		■		RTD 1 B14 Y1	53
80 mm		■	■		RTD 4 A4 Y2	53



GT 5



GT 7.08
GT 7.16



GT 9



GTB 9.06
GTB 9.16



GTR 9



KTD 3
KTD 4



RTD 1 B14 Y1



RTD 4 A4 Y2

HeavyDuty

Combinations – incremental twin encoders

Size (ø)	Solid shaft	Hollow shaft	TTL/RS422	HTL/push-pull	EURO flange B10	Terminal box	Redundant sensing	Ex II 3G/3D (ATEX)	Product family	Page
115 mm									POG 86 G	54
115 mm									POG 10 G	54
115 mm									POG 11 G	54
105 mm									HOG 10 G	54
105 mm									HOG 11 G	54



POG 86 G



POG 10 G
POG 11 G



HOG 10 G
HOG 11 G

Combinations – tachogenerators with speed switch or incremental encoder

Size (ø)	Centrifugal switch (FSL)	Speed switches (ESL)	Incremental encoder	Solid shaft	EURO flange B10	Terminal box	Product family	Page
85 mm							TDP 0.09 + FSL	55
115 mm							TDP 0.2 + FSL	55
115 mm							TDPZ 0.2 + FSL	55
115 mm							TDP 0.2 + ESL	55
115 mm							TDPZ 0.2 + ESL	55
115 mm							TDP 0.2 + OG9	55



TDP 0,09 + FSL



TDP 0,2 + FSL
TDPZ 0,2 + FSL



TDP 0,2 + ESL
TDPZ 0,2 + ESL



TDP 0,2 + OG9

Combinations – incremental and absolute encoders with speed switches

Size (ø)	Incremental	Absolute	Mechanical (FSL)	Electronic (ESL)	Solid shaft	Blind hollow shaft	TTL/RS422	HTL/push-pull	SSI	CANopen® / DeviceNet	Profibus-DP	Product family	Page
115 mm												POG 86 + FSL	56
115 mm												POG 86 + ESL	56
115 mm												POG 10 + FSL	56
115 mm												POG 10 + ESL	56
115 mm												POG 11 + FSL	56
115 mm												POG 11 + ESL	56
99 mm												HOG 86 + FSL	57
105 mm												HOG 10 + FSL	57
105 mm												HOG 10 + ESL	57
105 mm												HOG 11 + FSL	57
105 mm												HOG 11 + ESL	57



POG 86 +FSL/ESL



POG 10 +FSL/ESL



POG 11 +FSL/ESL



HOG 86 +FSL



HOG 10 +FSL/ESL



HOG 11 +FSL/ESL

Bearingless encoders

Incremental & quasi-absolute

	Hollow shaft (o max.)	Incremental	Quasi-absolute	TTL/RS422	HTL/push-pull	HTL-PI	Power Line driver	SinCos 1 Vpp	Highspeed-proof	DNV certification	Product family	Page
47.8 mm	■		■	■							MDFK 08	60
47.8 mm	■		■	■							MIR 10	60
45 mm	■			■							ITD 67	60
28 mm	■		■	■							ITD49H00	60
28 mm	■					■					ITD49H00 Sine	60
65 mm	■		■	■							ITD69H00	61
65 mm	■					■					ITD69H00 Sine	61
140 mm	■		■	■							ITD89H00	61
140 mm	■					■					ITD89H00 Sine	61
80 mm	■		■	■		■				■	MHGE 100	62
180 mm	■		■	■		■				■	MHGE 200	62
340 mm	■		■	■		■				■	MHGE 400	62
740 mm	■		■	■		■				■	MHGE 800	62
80 mm	■		■	■		■					MHGP 100	63
180 mm	■		■	■		■					MHGP 200	63
340 mm	■		■	■		■					MHGP 400	63
3183 mm	■		■		■	■					MIR 3000F	64
3183 mm		■	■		■	■					MQR 3000F	64



Bearingless encoders

Absolute

	Hollow shaft (o max.)	Absolute Singleturn	Absolute Multiturn	SSI	Parallel	CANopen*	DeviceNet	Profibus-DP / SAE11939	EtherCAT / PoE / EtherNet/IP	Powerlink / Profinet	TTL/RS422	HTL/push-pull	SinCos 1 Vpp	Product family	Page
30 mm	■		■								■	■		MHAD 50	66
80 mm	■		■								■	■	■	MHAP 100	66
180 mm	■		■								■	■	■	MHAP 200	66
340 mm	■		■								■	■	■	MHAP 400	66
8 mm	■		■											BMSK 30	67
8 mm		■	■											BMMK 30	67
6 mm	■		■		■									BMSK 55	67
6 mm		■	■		■									BMMK 55	67
12 mm	■		■	■	■									BMSK 58	67
12 mm		■	■		■									BMMK 58	67
12 mm	■				■	■	■	■	■					BMSK 58 flexible	67
12 mm		■			■	■	■	■	■					BMMK 58 flexible	67



Magnetic rotary encoders

Absolute

Sensor housing M18x1					Product family	Page
Sensor housing rectangular						
Angular range 360°					Product family	Page
Current output						
Voltage output					Product family	Page
■			■	■	MDRM 18 (I-Type270°)	68
■		■		■	MDRM 18 (U-Type360°)	68
	■		■	■	MDFM 20 (I-Type270°)	68
	■	■		■	MDFM 20 (U-Type360°)	68



MDRM 18



MDFM 20

Linear bearingless encoders

Incremental

Size	TTL/RS422	HTL/push-pull	Product family	Page
10 mm	■	■	MIL10	69



MIL10

Cable transducers

Absolute & incremental

Size	Measuring length	Incremental	Absolute	SSI	Analog/redundant	CANopen*	DeviceNet	Profibus-DP	SAE11939	EtherCAT/PoE	EtherNet/IP	Powerlink	Profinet	TTL/RS422	HTL/push-pull	Product family	Page
88 mm	3.4 m	■	■	■	■											BMMS K34	72
88 mm	5 m	■	■	■	■											BMMS K50	72
120 mm	7.5 m	■	■	■	■											BMMS M75	72
120 mm	7.5 m	■	■	■	■											GCA5	72
58 mm	2.1 m	■	■		■	■	■	■	■	■	■					GCA2	73
96 mm	3 m	■	■		■	■	■	■	■	■	■					GCA4	73
115 mm	15 m	■	■		■	■	■	■	■	■	■					GCA15	73
200 mm	50 m	■	■		■	■	■	■	■	■	■					GCA50	73
58 mm	2.1 m	■										■	■			GCI2	73
96 mm	3 m	■										■	■			GCI4	73
115 mm	15 m	■										■	■			GCI15	73
200 mm	50 m	■										■	■			GCI50	73



BMMS K34
BMMS K50



BMMS M75



GCA5



GCA2
GCI2



GCA4
GCI4



GCA15
GCI15



GCA50
GCI50

Explosion-proof encoders

Size (ø)	Ex II 2G (ATEX/IECEx)	Ex II 2D/2G (ATEX)	Ex II 3D (ATEX)	Incremental	Absolute	Solid shaft	Hollow shaft	TTL/RS422	HTL/push-pull	SinCos 1 Vpp	SSI	RS485	CANopen*	Profibus-DP	Product family	Page
120 mm	■	■	■	■	■		■	■							EEx OG9	76
115 mm	■	■	■	■	■				■						EEx OG9 S	76
160 mm	■	■	■	■	■		■	■							EEx HOG 161	76
58 mm		■	■	■	■	■	■	■							Ex EIL580	76
70 mm		■	■	■	■		■	■							X 700 - incremental	76
70 mm		■	■	■	■					■					X 700 SSI	77
70 mm		■	■	■	■						■				X 700 RS485	77
70 mm		■	■	■	■							■			X 700 CANopen*	77
70 mm		■	■	■	■								■		X 700 Profibus-DP	77



EEx OG 9
EEx OG 9 S



EEx HOG 161



Ex EIL580



X 700 - incremental
X 700 SSI
X 700 RS485



X 700 CANopen*
X 700 Profibus-DP

Redundant encoders

Absolute

Size (ø)	Solid shaft	Hollow shaft	Cable-pull encoder	Bearingless encoder	Analog redundant	SSI redundant	SSI + Resolver	CANopen redundant	Product family	Page
58 mm	■			■			■		BMSV 58	78
58 mm	■			■			■		BMMV 58	78
58 mm		■		■			■		BMSH 58	78
58 mm		■		■			■		BMMH 58	78
58 mm			■	■			■		BMMS K34	78
58 mm			■	■			■		BMMS M50	78
58 mm			■	■			■		BMMS M75	78
58 mm	■					■			ATD 2S B14 Y24	78
55 mm				■	■		■		MHAD 50	78



BMSV 58
BMMV 58



BMSH 58
BMMH 58



BMMS K34
BMMS M50
BMMS M75



ATD 2S B14 Y24



MHAD 50

SIL encoders

Incremental & absolute

Size (ø)	SIL3 (compliant in redundant use)	SIL2	Solid shaft	Hollow shaft	TTL/RS422	HTL/push-pull	SinCos 1 Vpp	Absolute SSI	Product family	Page
58 mm	■			■			■		ITD22H00 SIL	79
58 mm		■	■		■	■	■		GI357	79
58 mm		■		■	■	■	■		HOGS 100S	79
105 mm		■	■			■		■	GBA2W	79



ITD22H00 SIL



GI357



HOGS 100S



GBA2W

Stainless steel encoders

Incremental

Size (ø)	Stainless steel 1.4305	Stainless steel 1.4404	Solid shaft	Hollow shaft	TTL/RS422	HTL/ Push-pull	SinCos 1 Vss	Product family	Page
58 mm	■			■	■	■		GE333	80
58 mm	■		■		■	■		GE355	80
58 mm		■	■		■	■		GF355	80
68 mm	■			■	■	■		ITD21 A4 Y65	80
89 mm	■			■	■	■		ITD 40 A4	80
89 mm	■			■			■	ITD 42 A4 Y141	80



GE333



GE355
GF355



ITD21 A4 Y65



ITD 40 A4
ITD 42 A4 Y141

Absolute

Size (ø)	Stainless Steel 1.4305	Stainless Steel 1.4404	Solid shaft	SSI	CANopen*	Devicenet	Profibus-DP / SAE1539	EtherCAT / PoE / EtherNet/IP	Powerlink / Profinet	Product family	Page
58 mm		■	■	■	■					GE244	81
58 mm	■			■	■					GE404	81
58 mm	■			■		■	■			GEMMW	81
58 mm	■			■		■	■			GEMMH	81
58 mm	■			■	■	■				BMMV 58 hermetic	81
58 mm	■			■		■	■	■	■	BMMV 58 hermetic flexible	81



GE244
GE404



GEMMW



BMMV 58
hermetic



BMMV 58
hermetic flexible

Offshore encoders

Size (ø)	Incremental	Absolute Singleturn	Absolute Multiturn	Solid shaft	Hollow shaft	TTL/RS422	HTL/push-pull	SinCos 1Vpp	SSI / SSI + Incremental	CANopen*	DeviceNet	EtherCAT	Profinet	Profibus-DP	Product family	Page
58 mm	■			■		■									GI355-C	82
58 mm	■			■		■									GI356-C	82
105 mm	■				■	■		■							HOG 11	82
130 mm	■				■	■		■							HOG 131	82
100 mm	■				■	■		■	■						MHGE 100	82
813 mm	■				■	■		■	■						MHGE 800	82
58 mm	■		■	■						■					GM400-C	83
58 mm	■		■	■						■					GM401-C	83
58 mm	■	■			■					■					G0M2H-C	83
58 mm	■		■	■						■					G0A2H-C	83
58 mm	■		■	■						■	■	■	■	■	GXMMW	83
105 mm	■	■	■		■					■	■		■	■	HMG 10	83
115 mm	■	■	■	■						■	■		■	■	PMG 10	83



Signal Processing

Size	Digital converter	Precision interpolator	Fiber-optic transmitter	Product family	Page
50 mm	■			HEAG 151	84
50 mm	■			HEAG 152	84
50 mm	■			HEAG 153	84
50 mm	■			HEAG 154	84
122 mm		■		HEAG 158	85
122 mm		■		HEAG 159	85
122 mm		■		HEAG 160	85
122 mm			■	HEAG 171	86
122 mm			■	HEAG 172	86
50 mm			■	HEAG 173	86
50 mm			■	HEAG 174	86
50 mm			■	HEAG 175	87
50 mm			■	HEAG 176	87



Inclination sensors

Size	Sensing range 1-dim. / 360°	Sensing range 2-dim. / ±15°	CANopen*	Profibus-DP	SAE J1939	Analog	Switching output	Product family	Page
33.7 mm	■	■				■		GIM150	90
48 mm	■	■	■			■		GIM500	90
84 mm	■	■				■	■	GIM200	90
99 mm	■	■	■	■				GNAMG	90



Acceleration sensors

Size	Redundant	SIL2/PLd approval	Analog	CANopen*	Product family	Page
55 mm			■	■	GAM900	91
55 mm	■	■	■	■	GAM900S	91

