

Baumer Tachogenerators and Resolvers





Tachogenerators Baumer are an electric devices that measure the shaft rotation frequency and convert it into an electrical signal.

The German company produces several categories of such equipment. All series are products that can operate in heavy duty conditions.

The devices use Longlife technology, which consists of a silver track integrated in the commutator. This feature allows equipment almost completely to avoid wear. The technology significantly increases the life of the device and its reliability in harsh environments. Special seals are located in both sides of sensor`s body.

The company Baumer hubner produces the following types of tachogenerators:

- Solid shaft
- Bearingless
- Hollow shaft



To find out stock ability and delivery time to your region, please contact our manager.



info@eltra-trade.com



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Tough where it's rough. Precise in 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, reliable 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
- Bearings at both shaft ends
- HeavyDuty connection technology
- Isolated against shaft currents
- Explosion protection against gases and dust
- Protected against sea and tropical climate

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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 encoders incremental

Size up to $\varnothing 120$ mm / solid shaft

Synchro flange or
EURO flange B10.

- Precision speed signals for drive engineering
- Robust electrical and mechanical designs
- Redundant sensing / twin encoders
- Second shaft end for centrifugal / speed switches
- Integrated function monitoring EMS



Features	<ul style="list-style-type: none"> ■ Solid shaft with EURO flange B10 ■ Housing uncoated 	<ul style="list-style-type: none"> ■ Solid shaft with EURO flange B10 ■ Corrosion protection C4 	<ul style="list-style-type: none"> ■ Solid shaft with EURO flange B10 ■ Shallow installation depth <70 mm 	<ul style="list-style-type: none"> ■ Solid shaft with EURO flange B10 ■ Pulses per revolution up to 5000
Product family	POG 86E	POG 86	OG 9	POG 9
Sensing method	Optical			
Size (housing)	$\varnothing 115$ 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				
- Solid shaft	$\varnothing 11$ mm			
Flange	EURO flange B10			
Connection	Terminal box			
Pulses per revolution	512...2500	500...5000	1...1250	300...5000
Operating temperature	-40...+100 °C		-30...+100 °C	
Protection	IP 56		IP 55	
Operating speed	$\leq 12\,000$ rpm			
Max. shaft load	≤ 250 N axial, ≤ 450 N radial			
Explosion protection	Ex II 3G IIC / 3D IIIC (ATEX)			
Options	Corrosion protection C4	Function monitoring EMS Second shaft end Centrifugal switch (FSL)	–	Function monitoring EMS Second shaft end Speed switches (FSL, ESL) Twin encoder POG 9 G

Powerful output drivers

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 encoders incremental

Size up to ø120 mm / solid shaft

Unrivalled longevity and reliability thanks to proven HeavyDuty technology.

- Solid aluminium or stainless steel housings
- Bearings at both shaft ends
- EX-protection for gas and dust
- HeavyDuty connection technology
- Insulation against shaft currents
- Protection against seawater and tropical conditions

Learn more:
www.baumer.com/HD-incremental



Features	<ul style="list-style-type: none"> ■ Solid shaft with EURO flange B10 ■ Pulses per revolution up to 10000 	<ul style="list-style-type: none"> ■ Solid shaft with EURO flange B10 ■ Pulses per revolution up to 5000 ■ High protection IP 66 	<ul style="list-style-type: none"> ■ Solid shaft with EURO flange B10 ■ Corrosion protection CX (C5-M) 	<ul style="list-style-type: none"> ■ Solid shaft with EURO flange B10 ■ IECEx certification
Product family	POG 90	POG 10	POG 11	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	1024...10000	300...5000	25...5000	
Operating temperature	-20...+85 °C	-40...+100 °C -50...+100 °C (option)	-40...+55 °C (<500 ppr) -50...+55 °C (<500-2500 ppr) -25...+55 °C (>3072 ppr)	
Protection	IP 66	IP 66	IP 67	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 IIIIC (ATEX)			Ex II 2G IIC (ATEX/IECEx)
Options	Second shaft end Centrifugal switch (FSL) Speed switch (ESL) Housing foot B3	Function monitoring EMS Redundant (POG 10M) Housing foot B3	Function monitoring EMS Redundant (POG 11M) Housing foot B3	–



EURO flange B10

EURO flange B10 is the global mounting standard for HeavyDuty shaft encoders.

HeavyDuty encoders incremental

Size up to $\varnothing 105$ mm / hollow shaft

Blind hollow, through hollow or cone shaft.

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



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Features	<ul style="list-style-type: none"> ■ Blind hollow shaft ■ High shock and vibration resistance 	<ul style="list-style-type: none"> ■ Cone shaft or blind hollow shaft ■ Rotatable terminal box 	<ul style="list-style-type: none"> ■ Cone shaft or blind hollow shaft ■ Rotatable terminal box ■ Corrosion protection C4
Product family	HOG 71	HOG 86E	HOG 86
Sensing method	Optical		
Size (housing)	$\varnothing 60$ 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	
Connection	Terminals	Terminal box rotatable, flange connector M23	Terminal box rotatable, flange connector M23 or cable
Pulses per revolution	64...2048	512...2500	500...5000
Operating temperature	-20...+85 °C	-40...+100 °C	
Protection	IP 66		
Operating speed	$\leq 10\,000$ rpm		
Max. shaft load	≤ 30 N axial, ≤ 40 N radial	≤ 350 N axial, ≤ 450 N radial	≤ 350 N axial, ≤ 450 N radial
Explosion protection	Ex II 3G IIC / 3D IIIC (ATEX)		
Options	–	Corrosion protection C4	Function monitoring EMS Hybrid bearings Redundant (HOG 86M)

Redundant sensing

Devices with redundant, i.e. double sensing support demanding applications, e.g. where high availability and functional safety are required. Our qualified and experienced experts would be glad to support you in the design of your safety-relevant application and its certification by the notified body.

HeavyDuty encoders incremental

Size up to $\varnothing 105$ mm / hollow shaft

With the HOG 86, HOG9 and HOG10 series from Hübner Berlin, you have a unique product portfolio at your disposal that combines more than 60 years of experience of the world market leader and the latest technologies to unrivalled robust and durable products.

Learn more:
www.baumer.com/HD-incremental



Features	<ul style="list-style-type: none"> ■ Cone shaft or blind hollow shaft ■ Pulses per revolution up to 5000 	<ul style="list-style-type: none"> ■ Cone shaft or blind hollow shaft ■ Pulses per revolution up to 5000 ■ Hybrid bearings as standard ■ Corrosion protection CX (C5-M) 	<ul style="list-style-type: none"> ■ Cone shaft or blind hollow shaft ■ Corrosion protection CX (C5-M) ■ Hybrid bearings as standard ■ Protection class IP 67 	<ul style="list-style-type: none"> ■ Cone shaft or blind hollow shaft ■ Pulses per revolution up to 10 000 ■ Hybrid bearings as standard
Product family	HOG 9	HOG 10	HOG 11	HOG 100
Sensing method	Optical			
Size (housing)	$\varnothing 97$ mm	$\varnothing 105$ 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	$\varnothing 17$ mm			
- Through hollow shaft	$\varnothing 12...16$ mm	$\varnothing 12...20$ mm		
Connection	Flange connector M23		Terminal box axial, radial	
Pulses per revolution	300...5000			1024...10 000
Operating temperature	-30...+100 °C		-40...+100 °C (-50...+100 °C option)	
Protection	IP 56	IP 66	IP 67	IP 66
Operating speed	$\leq 10\,000$ rpm		$\leq 12\,000$ rpm	
Max. shaft load	≤ 400 N axial, ≤ 500 N radial		≤ 450 N axial, ≤ 600 N radial	
Explosion protection	Ex II 3G IIC / 3D IIIC (ATEX)			
Options	—	Function monitoring EMS Redundant (HOG 10M)	Function monitoring EMS Redundant (HOG 11M) DNV certificate	Centrifugal switch (FSL) Speed switch (ESL) Redundant (HOG 100M)

Enhanced Monitoring System 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 encoders incremental

Large hollow shaft

Through hollow shaft up to $\varnothing 75$ mm.

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



Features	<ul style="list-style-type: none"> ■ Through hollow shaft ■ Corrosion protection CX (C5-M) ■ Integrated lightning protection ■ Axial torque plate 	<ul style="list-style-type: none"> ■ Through hollow shaft up to $\varnothing 38$ mm 	<ul style="list-style-type: none"> ■ Through hollow shaft ■ Rotatable terminal box ■ Operating speed up to 6000 rpm ■ Pulses per revolution up to 5000 	<ul style="list-style-type: none"> ■ Blind hollow shaft with keyway ■ Corrosion protection CX (C5-M) ■ Protection IP 67 ■ Pulses per revolution up to 8192
Product family	HOG 131	HOG 16	HOG 163	HOG 165
Sensing method	Optical			
Size (housing)	$\varnothing 130$ mm	$\varnothing 158$ mm	$\varnothing 158$ mm	$\varnothing 165$ mm
Voltage supply	5 VDC $\pm 5\%$, 9...30 VDC			
Output stage				
- TTL/RS422	■	■	■	■
- HTL-P (Power Linedriver)	■	■	■	■
- LWL (fiber-optic)	With fiber-optic transducer (Outdoor-Box)			
Output signals	K1, K2, K0 + inverted			
Shaft type				
- Through hollow shaft	$\varnothing 16...36$ mm	$\varnothing 20...38$ mm	$\varnothing 38...75$ mm	–
- Blind hollow shaft	–	–	–	$\varnothing 20...38$ 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 IIC (ATEX)			
Options	Redundant (HOG 131M)	Redundant (HOG 16M)	Redundant (HOG 163M)	Redundant (HOG 165M) Through hollow shaft Long torque arm Surface protection in harsh environments

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 encoders incremental

Large hollow shaft

Through hollow shaft up to $\varnothing 150$ mm.

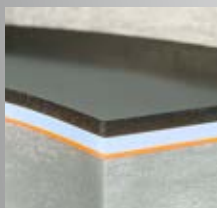
- Precise optical encoders for large drive shafts
- Outstanding high mechanical reserve capacity
- Isolated shaft

Learn more:

www.baumer.com/HD-incremental



Features	<ul style="list-style-type: none"> ■ Through hollow shaft up to $\varnothing 115$ mm ■ Rotatable terminal box ■ Robust light-metal housing ■ Pulses per revolution up to 2048 	<ul style="list-style-type: none"> ■ Through hollow shaft up to $\varnothing 115$ mm ■ Rotatable terminal box ■ Robust light-metal housing ■ Pulses per revolution up to 4000 	<ul style="list-style-type: none"> ■ Through hollow shaft up to $\varnothing 150$ mm ■ Plug-in electronics for quick exchange, no need to uninstall ■ With crane eye for easy handling
Product family	HOG 220	HOG 22	HOG 28
Sensing method	Optical		
Size (housing)	$\varnothing 227$ mm		$\varnothing 287$ mm
Voltage supply	5 VDC $\pm 5\%$, 9...30 VDC		5 VDC $\pm 5\%$, 9...26 VDC
Output stage			
- TTL/RS422	■	■	■
- HTL-P (Power Linedriver)	■	■	■
- LWL (fiber-optic)	With fiber-optic transducer (Outdoor-Box)		
Output signals	K1, K2, K0 + inverted		
Shaft type			
- Through hollow shaft	$\varnothing 80...115$ mm	$\varnothing 120...150$ mm	
Connection	Terminal box radial rotatable		Terminal box radial rotatable, mating connector M23
Pulses per revolution	1024, 2048	720...4000	1024...2048
Operating temperature	-30...+85 °C		
Protection	IP 56	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	Redundant (HOG 220M) Isolated hollow shaft	Redundant (HOG 22M) Protection IP 56	Redundant (HOG 28M)



Outstanding corrosion protection

Thanks to optimized material selection and highly resistant coatings, Baumer encoders and sensors are ideally suited for corrosive environments, for example for permanent outdoor use at sea or in mobile automation. Their corrosion protection is determined by complex salt spray tests and usually corresponds to the highest corrosivity category C5-M (from 2018 CX) based on the EN ISO 12944 standard.

HeavyDuty encoders incremental

Sine/Cosine

Solid shaft with EURO flange B10.
Blind hollow shaft.

- Precise optical sensing
- Extremely high signal quality



Features	<ul style="list-style-type: none"> ■ Solid shaft with EURO flange B10 ■ Sine periods per revolution up to 5000 	<ul style="list-style-type: none"> ■ Blind hollow shaft up to $\varnothing 14$ mm ■ High resistance against shocks and vibrations ■ Patented expansion anchor for fan guard assembly
Product family	POGS 90	HOGS 71
Sensing method	Optical	
Size (housing)	$\varnothing 115$ mm	$\varnothing 60$ mm
Voltage supply	5 VDC ± 10 %, 9...30 VDC	
Output stage	<ul style="list-style-type: none"> ■ - SinCos 1 Vpp 	
Output signals	K1, K2, K0 + inverted	
Shaft type	<ul style="list-style-type: none"> - Solid shaft - Cone shaft 1:10 - Blind hollow shaft - Through hollow shaft 	
Flange	EURO flange B10	–
Connection	Terminal box, rotatable	Connecting terminals in the housing
Sine periods per revolution	720...5000	1024...5000
Operating temperature	-20...+85 °C	
Protection	IP 66	
Operating speed	$\leq 10\,000$ rpm	
Max. shaft load	≤ 250 N axial, ≤ 350 N radial	≤ 30 N axial, ≤ 40 N radial
Explosion protection	Ex II 3G IIC / 3D IIIC (ATEX)	
Options	Second shaft end	–

HeavyDuty encoders incremental Sine/Cosine

Blind hollow, through hollow
or cone shaft.

- Precise optical sensing
- Extremely high signal quality

Learn more:
www.baumer.com/HD-incremental



Features	<ul style="list-style-type: none"> ■ Cone shaft or blind hollow shaft up to $\varnothing 20$ mm 	<ul style="list-style-type: none"> ■ Through hollow shaft up to $\varnothing 75$ mm 	<ul style="list-style-type: none"> ■ Through hollow shaft up to $\varnothing 70$ mm ■ Axial torque plate ■ Clamping set
Product family	HOGS 100	HOGS 14	HOGS 151
Sensing method	Optical		
Size (housing)	$\varnothing 105$ mm	$\varnothing 158$ mm	$\varnothing 168$ 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	$\varnothing 17$ mm	–	–
- Blind hollow shaft	$\varnothing 12...20$ mm	–	–
- Through hollow shaft	–	$\varnothing 40...75$ mm	$\varnothing 60...70$ mm
Connection	Terminal box, rotatable		Round connector, cable
Sine periods per revolution	1024...5000		
Operating temperature	$-20...+85$ °C		
Protection	IP 66	IP 55	IP 54
Operating speed	$\leq 10\,000$ 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)		
Options	Second shaft end Centrifugal switch (FSL) Speed switch (ESL) Redundant (HOGS 100M)	–	–

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 encoders absolute

Size up to $\varnothing 115$ mm

Solid shaft with EURO flange B10.
Hollow shaft or cone shaft.

- Extremely robust design with bearings at both shaft ends
- Highly robust, magnetic singleturn scanning
- Energy self-sufficient *MicroGen* revolution counter
- Additional incremental signals with zero pulse
- Integrated speed switch optional



Programmable via
Wifi adaptor



Features	<ul style="list-style-type: none"> ■ Solid shaft with EURO flange B10 ■ Corrosion & seawater proof ■ Double-sided mounting 	<ul style="list-style-type: none"> ■ Solid shaft with EURO flange B10 ■ Corrosion & seawater proof ■ Double-sided mounting ■ Programmable 	<ul style="list-style-type: none"> ■ Cone shaft or hollow shaft ■ Corrosion & seawater proof ■ Double-sided mounting 	<ul style="list-style-type: none"> ■ Cone shaft or hollow shaft ■ Corrosion & seawater proof ■ Double-sided mounting ■ Programmable
Product family	PMG 10	PMG 10P	HMG 10	HMG 10P

Interface

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

Function principle	Multiturn	Singleturn	Multiturn	Singleturn	Multiturn	Singleturn	Multiturn	Singleturn
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Programmable	–	–	■	■	–	–	■	■
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Sensing method	Magnetic							
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Size (housing)	$\varnothing 115$ mm				$\varnothing 105$ mm			
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Voltage supply	9...30 VDC							
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Shaft type

- Solid shaft	$\varnothing 11$ mm	–							
- Cone shaft 1:10	–	$\varnothing 17$ mm							
- Hollow shaft	–	$\varnothing 12...20$ mm				$\varnothing 12...20$ mm			

Connection	Bus cover, terminal box, mating connector M12 or M23							
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Steps per turn	$\leq 1\ 048\ 576/20$ bits							
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Number of turns	$\leq 1\ 048\ 576/20$ bits	–	$\leq 1\ 048\ 576/20$ bits	–	$\leq 1\ 048\ 576/20$ bits	–	$\leq 1\ 048\ 576/20$ bits	–
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Protection	IP 66, IP 67							
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Operating temperature	-40...+85 °C (SSI: -40...+95 °C)							
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Operating speed	≤ 12000 rpm							
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Max. shaft load	≤ 450 N axial, ≤ 650 N radial							
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Explosion protection	Ex II 3G IIC / 3D IIC (ATEX)							
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Options	Additional incremental signals with zero pulse Integrated speed switch WLAN adapter for easy programming							
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HeavyDuty encoders absolute

Large hollow shaft

Through hollow shaft up to $\varnothing 70$ mm.

- Extremely robust design with bearings at both shaft ends
- Energy self-sufficient *MicroGen* revolution counter
- Additional incremental signals with zero pulse



Learn more:
www.baumer.com/HD-absolute



Features	<ul style="list-style-type: none"> ■ Through hollow shaft ■ Corrosion & seawater proof ■ Isolated bearings ■ Axial torque plate
Product family	HMG 161
Interface	
- SSI	■
- CANopen® / DeviceNet	■ / ■
- Profibus-DP / Profinet	■ / –
- EtherCAT / EtherNet/IP	– / –
Function principle	Multiturn Singleturn
Programmable	–
Sensing method	Optical
Size (housing)	$\varnothing 160$ mm
Voltage supply	9...30 VDC
Shaft type	
- Cone shaft 1:10	–
- Blind hollow shaft	–
- Through hollow shaft	$\varnothing 38...70$ mm
Connection	Bus cover, terminal box
Steps per turn	$\leq 8192/13$ bits
Number of turns	$\leq 65536/$ – 16 bits
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 IIC (ATEX)
Options	Additional incremental signals

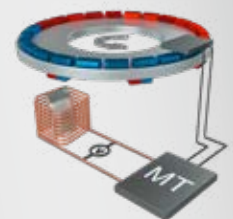
Programming / monitoring

With the compact programming Wifi adapter, you can intuitively parameterise your HeavyDuty encoder using a PC, tablet or smartphone – even if it is already installed in the system. The monitoring function clearly visualises the current encoder signals, for example during commissioning.



MicroGen

The patented *MicroGen* revolution counter is the heart of the HeavyDuty absolute encoders. *MicroGen* operates without battery or gears, generating energy straight from the encoder shaft movement. *MicroGen* has been standing the test of time for more than 10 years in tough HeavyDuty applications. Characterized by the principle's simplicity, the encoders are immune against magnetic fields, and combine wear-free operation over a large temperature range with leading edge robustness.



HeavyDuty speed switches / monitors

Mechanical / electronic

Mechanical centrifugal switches or electronic speed switches.

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



Features	<ul style="list-style-type: none"> ■ Mechanical centrifugal switch ■ Operating temperature max. +130 °C 	<ul style="list-style-type: none"> ■ Electronic speed switch ■ Speed up to 6000 rpm 	<ul style="list-style-type: none"> ■ Electronic speed switch ■ 3 outputs 	<ul style="list-style-type: none"> ■ 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			
- 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

HeavyDuty speed switches / monitors

Digital / Stand-alone

Stand-alone product for outdoor and switchboard.

- Configurable of HTL/TTL, PNP and SinCos signals
- Configurable switching thresholds
- Integrated speed display
- Standard component or safety component certified up to SIL3 / PLe

Learn more:

www.baumer.com/HD-speed



Features	<ul style="list-style-type: none"> ■ Configurable speed monitoring ■ Outdoor housing ■ With speed display 	<ul style="list-style-type: none"> ■ Relay modul for DS 93 and encoder with DSL-R ■ High switching performance ■ DIN rail mount 	<ul style="list-style-type: none"> ■ Safe speed monitors with SIL3/PLe certification ■ For non-certified incremental encoders / proximity switches ■ Inputs SinCos, TTL, HTL, PNP 	<ul style="list-style-type: none"> ■ Safe speed monitors with SIL3/PLe certification ■ For SIL-certified SinCos encoders ■ Inputs SinCos
Product family	DS 93	DS 93 R	GMM230S, GMM236S	GMM240S, GMM246S
Voltage supply	15...26 VDC	–	18...30 VDC	
Switching outputs	3 outputs, speed-controlled	3 potential-free relay contacts with changeover contact	1 relay-, 1 analog- and 4 control outputs HTL	
Output switching capacity	High: 12 V, Low: 0 V ≤40 mA	≤6 A at 250 VAC or ≤1 A at 48 VC each output	Relay 5...36 V (5 mA...5 A) Analog 4...20 mA (≤270 Ω) HTL (≤30 mA each output)	
Size (housing)	122 x 122 x 80 mm	50 x 75 x 55 mm	50 x 100 x 165 mm	
Connection	Terminals with cable gland		Screw terminal and connector D-SUB	
Operating temperature	-20...+70 °C	-20...+50 °C	-20...+55 °C	
Protection	IP 65	IP 20	IP 20	
Switching speed range (ns)	≤20 000 rpm	≤20 000 rpm	–	
Options	Relay module with 3 potential-free relay contacts (DS 93R)	–	Splitter output SinCos and RS422 Programming unit	

SAFETY

Mechanical centrifugal switches and electronic speed switches are ideally suited for the simple and fast implementation of safety functions when exceeding or falling below the speed of drives, machines and systems.

The following device types flexibly support the diverse requirements of safety architectures in OEM and retrofit applications:

- Speed switches
- Rotary encoder/speed switch combination
- Rotary encoder with integrated speed switch
- Stand-alone devices for encoder signal evaluation

In the design of your safety-relevant application and its certification by the notified body, our qualified and experienced experts would be glad to support you.

HeavyDuty speed switches / monitors

Digital / encoder-integrated

Incremental encoders
with digital speed switch.

- Blind or through hollow shaft
- Space-saving integration into encoder housing
- User-configurable on/off switching speeds
- Up to three switching outputs

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Features	<ul style="list-style-type: none"> ■ Blind hollow shaft ■ 2 switching outputs 	<ul style="list-style-type: none"> ■ Blind hollow shaft ■ 3 switching outputs 	<ul style="list-style-type: none"> ■ Through hollow shaft ■ 2 switching outputs 	<ul style="list-style-type: none"> ■ 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 with 3 potential-free relay contacts (DS 93R)	–	Relay module with 3 potential-free relay contacts (DS 93R)

HeavyDuty speed switches / monitors

Digital / encoder-integrated

Incremental encoders with digital speed switch.

- Solid shaft with EURO flange B10
- Space-saving integration into encoder housing
- User-configurable on/off switching speeds
- Up to three switching outputs

Configurable by
PC software

Learn more:
www.baumer.com/HD-speed



Features	<ul style="list-style-type: none"> ■ Solid shaft with EURO flange B10 ■ 2 switching outputs 	<ul style="list-style-type: none"> ■ 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 with 3 potential-free relay contacts (DS 93R)

HeavyDuty speed switches / monitors

Digital / encoder-integrated

Absolute encoders with digital speed switch.

- Space-saving integration into encoder housing
- User-configurable on/off switching speeds
- Operating temperature -40...+95 °C
- Additional incremental signals with zero pulse
- Corrosion protection CX

EtherCAT

CANopen

EtherNet/IP

DeviceNet

PROFI
BUS

PROFI
NET

SSI

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Features	<ul style="list-style-type: none"> ■ Solid shaft with EURO flange B10 ■ 1 transistor output 	<ul style="list-style-type: none"> ■ Solid shaft with EURO flange B10 ■ 1 transistor output ■ Programmable 	<ul style="list-style-type: none"> ■ Cone shaft or blind hollow shaft ■ 1 transistor output 	<ul style="list-style-type: none"> ■ Cone shaft or blind hollow shaft ■ 1 transistor output ■ Programmable
Product family	PMG 10D	PMG 10PD	HMG 10D	HMG 10PD

Interface

- SSI	■	■	■	■
- HTL/TTL	■	■	■	■
- CANopen® / DeviceNet	■/■	■/■	■/■	■/■
- Profibus-DP / Profinet	■/■	■/■	■/■	■/■
- EtherCAT / EtherNet/IP	■/■	■/■	■/■	■/■

Function principle	Singleturn / Multiturn			
Sensing method	Magnetic			
Size (housing)	ø115 mm		ø105 mm	
Voltage supply	9...30 VDC			
Shaft type				
- Solid shaft	ø11 mm		-	
- Cone shaft 1:10	-		ø17 mm	
- Blind hollow shaft	-		ø12...20 mm	
- Through hollow shaft	-		ø12...20 mm	
Flange	EURO flange B10		-	
Connection	Bus cover, terminal box, mating connector M12 or M23			
Steps per turn	≤1 048 576/20 bits			
Number of turns	≤1 048 576/20 bits			
Protection	IP 66, IP 67			
Operating temperature	-40...+85 °C (SSI: -40...+95 °C)			
Operating speed (n)	≤12000 rpm			
Switching speed range (ns)	2...12000 rpm			
Max. shaft load	≤450 N axial, ≤650 N radial		-	
Switching outputs	1 transistor output, each with its attack value	1 transistor output speed controlled	1 transistor output, each with its attack value	1 transistor output speed controlled
Output switching capacity	≤100 mA with 30 VDC	≤100 mA with 30 VDC	≤100 mA with 30 VDC	≤100 mA with 30 VDC
Explosion protection	Ex II 3G IIC / 3D IIC (ATEX)			
Options	Additional incremental signals with zero pulse Relay output	Additional incremental signals with zero pulse Relay module with 3 potential-free relay contacts (DS 93R) WiFi adaptor for programming	Additional incremental signals with zero pulse Relay output	Additional incremental signals with zero pulse Relay module with 3 potential-free relay contacts (DS 93R) WiFi adaptor for programming

HeavyDuty speed switches / monitors

Digital / encoder-integrated

Flexible variety.
Individual configuration.

- Pulses per revolution
- Speed switching limits
- Switching characteristics / hysteresis
- SSI settings of absolute value

Programmable via
Wifi adaptor

Learn more:
www.baumer.com/HD-speed

Intelligent HeavyDuty encoders

Intelligent HeavyDuty encoders with integrated speed switch provide positions as well as signals for speed detection and speed limitation in harsh environments.

Advantages

- Fast integration into your application
- Flexible parameterization and convenient monitoring of current signals
- Smartphone, tablet and PC directly connectable via WLAN programming adaptor
- Integrated web server for access without software installation



HeavyDuty tachogenerators

Tachogenerators

Solid shaft with EURO 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 up to +130 °C



Features	■ Solid shaft with EURO flange B10		■ Solid shaft with EURO flange B10, ø85 mm ■ Double tachometer with redundant output (TDPZ)		■ Solid shaft with EURO flange B10 ■ Double tachometer with redundant output (TDPZ)		■ Solid shaft with EURO flange B10 ■ Double tachometer with 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							
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 kgcm ²	0.6 kgcm ²	0.25 kgcm ²	0.29 kgcm ²	1.1 kgcm ²	1.2 kgcm ²	0.4 kgcm ²	0.2 kgcm ²
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 Second shaft end Protection IP 56		–	



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

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.

Learn more:
www.baumer.com/HD-tacho

HeavyDuty tachogenerators

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	<ul style="list-style-type: none"> ■ Tachogenerator ■ Bearingless ■ Blind hollow shaft 	<ul style="list-style-type: none"> ■ Tachogenerator ■ Bearingless ■ Blind hollow shaft 	<ul style="list-style-type: none"> ■ Tachogenerator ■ Bearingless ■ Blind hollow shaft 	<ul style="list-style-type: none"> ■ 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 kgcm ²	0.4 kgcm ² 0.55 kgcm ²	0.95 kgcm ²	0.95 kgcm ²
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

Tachogenerators

Learn more:
www.baumer.com/HD-tacho



Features	<ul style="list-style-type: none"> ■ Tachogenerator ■ Bearingless ■ Blind hollow shaft 	<ul style="list-style-type: none"> ■ Tachogenerator ■ Blind hollow shaft 	
Product family	GTR 9	KTD 3	KTD 4
Voltage supply/frequency	No		
Size (housing)	ø95 mm	ø100 mm	ø86 mm
Shaft type			
- Solid shaft	–	–	
- Blind hollow shaft	ø16 mm	ø14 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 kgcm ²	600-900 kgcm ²	600 kgcm ²
Connection	Connector	Screw terminals	Cable, radial
Operating temperature	-30...+130 °C	-25...+100 °C	-15...+100 °C
Protection	IP 56	IP 54	
Operating speed	≤ 9000 rpm	≤ 6000 rpm	
Options	–	–	Operating temperature -30 °C

HeavyDuty combinations

Incremental twin encoders

Two encoders on a common shaft.
Solid, blind hollow or cone shaft.

- Every encoder with optional redundant sensing
- Integrated function monitoring EMS

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Features	<ul style="list-style-type: none"> ■ Solid shaft with EURO flange B10 ■ Speed up to 12 000 rpm 	<ul style="list-style-type: none"> ■ Solid shaft with EURO flange B10 ■ Corrosion protection CX (C5-M) 	<ul style="list-style-type: none"> ■ Cone shaft or blind hollow shaft ■ Speed up to 10 000 rpm 	<ul style="list-style-type: none"> ■ Cone shaft or blind hollow shaft ■ Corrosion protection CX (C5-M)
Product family	POG 86 G POG 9 G	POG 10 G POG 11 G	HOG 9 G	HOG 10 G HOG 11 G
Sensing method	Optical			
Size (housing)	ø115 mm	ø115 mm	ø97 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	ø17 mm
- Blind hollow shaft	–	–	ø16 mm	ø16...20 mm
Flange	EURO flange B10	EURO flange B10	–	–
Connection	Terminal box		Flange connector M23	Terminal box
Pulses per revolution	300...5000	300...5000	300...5000	300...5000
Operating temperature	-40...+100 °C, -25...+100 °C (>3072 ppr)			
Protection	IP 56	IP 66 IP 67	IP 56	IP 66 IP 67
Operating speed	≤12 000 rpm	≤6000 rpm	≤10 000 rpm	≤6000 rpm
Max. shaft load	≤250 N axial, ≤350 N radial	≤300 N axial, ≤450 N radial	≤400 N axial, ≤500 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 and two terminal boxes per encoder	Function monitoring EMS	Function monitoring EMS Redundant sensing and two terminal boxes per encoder

Combinations 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.

HeavyDuty combinations

Tachogenerators

With mechanical centrifugal switch, electronic 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

Learn more:

www.baumer.com/HD-combi



Features	<ul style="list-style-type: none"> ■ Tacho generator with integrated mechanical centrifugal switch ■ Solid shaft with EURO flange B10 	<ul style="list-style-type: none"> ■ Tacho generator with integrated mechanical centrifugal switch ■ Solid shaft with EURO flange B10 	<ul style="list-style-type: none"> ■ Tacho generator with electronic speed switch ■ Solid shaft with EURO flange B10 	<ul style="list-style-type: none"> ■ Tacho generator with encoder ■ Solid shaft with EURO flange B10
Product family	TDP 0,09+FSL	TDP 0,2+FSL TDPZ 0,2+FSL	TDP 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
Performance (Speed >3000 rpm)	1.2 W	12 W	2 x 3 W	12 W
Shaft type				
- Solid shaft	ø6 mm	ø7...14 mm	ø7...14 mm	ø11 mm
Flange	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			
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

Mechanical centrifugal switch
or electronic speed switch.

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



Features	<ul style="list-style-type: none"> ■ Solid shaft with EURO flange B10 ■ Pulses per revolution 500...5000 	<ul style="list-style-type: none"> ■ Solid shaft with EURO flange B10 ■ Pulses per revolution 300...5000 	<ul style="list-style-type: none"> ■ Solid shaft with EURO flange B10 ■ Special sealing against ingress of solids 	<ul style="list-style-type: none"> ■ Solid shaft with EURO flange B10 ■ Corrosion protection CX (C5-M) ■ For use in salty, oily-wet environments 	
Product family	POG 86+FSL	POG 9+FSL POG 9+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	-30...+100 °C -20...+85 °C	-40...+100 °C -25...+85 °C	-40...+100 °C -25...+85 °C	
Protection	IP 56	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 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		Function monitoring EMS Redundant sensing		

1) Any selected switching speed as a permanent factory setting

HeavyDuty combinations

Incremental encoders with speed switch

Mechanical centrifugal switch
or electronic speed switch.

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

Learn more:

www.baumer.com/HD-combi



Features	<ul style="list-style-type: none"> ■ Cone shaft or blind hollow shaft 	<ul style="list-style-type: none"> ■ Cone shaft or blind hollow shaft ■ Special sealing against ingress of solids 	<ul style="list-style-type: none"> ■ Cone shaft or blind hollow shaft ■ Corrosion protection CX (C5-M) ■ 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, some designs merely 10 mm, make 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 up to $\varnothing 150$ mm.
Up to 8192 pulses per revolution.

- Square wave and SinCos signals
- Wear-free operation
- Small mounting depth for easy integration
- Immunity against dust, dirt, fibres and fluids



Features	<ul style="list-style-type: none"> ■ Through hollow shaft up to $\varnothing 43.5$ mm ■ Up to 1024 ppr 	<ul style="list-style-type: none"> ■ Through hollow shaft up to $\varnothing 43.5$ mm ■ Up to 4096 ppr ■ Metal die cast housing 	<ul style="list-style-type: none"> ■ Through hollow shaft up to $\varnothing 45$ mm ■ Up to 50 ppr 	<ul style="list-style-type: none"> ■ Through hollow shaft up to $\varnothing 28$ mm ■ Up to 2048 ppr
Product family	MDFK 08	MIR 10	ITD 67	ITD49H ITD49H Sine
Sensing method	Magnetic			
Magnetic wheel diameter	$\varnothing 30.5 \dots 56$ mm	$\varnothing 30.5 \dots 56$ mm	$\varnothing 72$ mm	$\varnothing 40$ mm
Mount magnetic wheel	Radial screw connection			Hot shrinking, stick, radial screw connection
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 % 5 VDC ± 10 % 8...26 VDC
Output stage				
- TTL/RS422	■	■	–	■ –
- HTL/push-pull	■	■	■	■ –
- SinCos 1 Vpp	–	–	–	– ■
Output signals	A 90° B, R + inverted	A 90° B, R + inverted	A, B	A 90° B, R / A 90° B, R + inv.
Output frequency	≤ 250 kHz	≤ 350 kHz	≤ 160 kHz	≤ 300 kHz (TTL) ≤ 180 kHz ≤ 160 kHz (HTL)
Shaft type				
- Through hollow shaft	$\varnothing 6 \dots 43.5$ mm	$\varnothing 6 \dots 43.5$ mm	$\varnothing 10 \dots 45$ mm	$\varnothing 9 \dots 28$ mm
Connection				
- Cable	Radial			
Pulses per revolution	256...1024	320...4096	20, 50	64...2048 –
Sine periods 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	$\leq 20\,000$ rpm	$\leq 20\,000$ rpm	$\leq 10\,000$ rpm	$\leq 30\,000$ rpm
Options	Cable with pre-assembled connector Several mounting options Magnetic shields Redundant sensing of a magnetic wheel with two sensing heads			

Bearingless encoders

Incremental

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

Learn more:
www.baumer.com/bearingless



Features	<ul style="list-style-type: none"> Through hollow shaft up to $\varnothing 65$ mm Up to 4095 ppr 	<ul style="list-style-type: none"> Through hollow shaft up to $\varnothing 150$ mm Up to 8192 ppr 		
Product family	ITD69H	ITD69H Sine	ITD89H	ITD89H Sine
Sensing method	Magnetic			
Magnetic wheel diameter	$\varnothing 81$ mm		$\varnothing 162$ mm	
Mount magnetic wheel	Hot shrinking, stick, radial screw connection			
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, R / A 90° B, R + inverted			
Output frequency	≤ 300 kHz (TTL) ≤ 160 kHz (HTL)	≤ 180 kHz	≤ 300 kHz (TTL) ≤ 160 kHz (HTL)	≤ 180 kHz
Shaft type				
- Through hollow shaft	$\varnothing 40$...65 mm		$\varnothing 70$...150 mm	
Connection				
- Cable	Radial			
Pulses per revolution	128...4096	—	256...8192	—
Sine periods per revolution	—	128	—	246
Operating temperature	-40...+100 °C			
Protection	IP 67			
Operating speed	$\leq 15\,000$ rpm		$\leq 7\,500$ rpm	
Options	Cable with pre-assembled connector Several mounting options Magnetic shields Redundant sensing of a magnetic wheel with two sensing heads			

Redundant sensing

To increase the availability and safety of your application, redundant sensing of one magnetic pole wheel with two sensing heads can be applied.

In the design of your safety-relevant application and its certification by the notified body, our qualified and experienced experts would be glad to support you.

Bearingless encoders

Incremental

Hollow shaft up to $\varnothing 740$ mm.
Up to 32 768 pulses per revolution.

- Square wave and SinCos signals
- Wear-free operation
- Wide axial tolerance ± 3 mm
- Pole wheel fixation by screwing, gluing or shrinking



Features	<ul style="list-style-type: none"> ■ Through hollow shaft $\varnothing 16 \dots 80$ mm ■ Installation depth ≤ 30 mm ■ Stainless steel wheel 	<ul style="list-style-type: none"> ■ Through hollow shaft $\varnothing 50 \dots 180$ mm ■ Installation depth ≤ 30 mm ■ Stainless steel wheel 	<ul style="list-style-type: none"> ■ Through hollow shaft $\varnothing 70 \dots 340$ mm ■ Installation depth ≤ 30 mm ■ Stainless steel wheel 	<ul style="list-style-type: none"> ■ Through hollow shaft $\varnothing 650 \dots 740$ mm ■ Installation depth ≤ 30 mm
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 90° B, R + inverted			
Output frequency	≤ 300 kHz			
Shaft type				
- Through hollow shaft	$\varnothing 16 \dots 80$ mm	$\varnothing 50 \dots 180$ mm	$\varnothing 70 \dots 340$ mm	$\varnothing 650 \dots 740$ mm
Connection				
- Flange connector M23	Radial			
Pulses per revolution	64...4096	128...8192	256...16 384	512...32 768
Sine periods per revolution	64	128	256	512
Operating temperature	$-40 \dots +100$ °C			
Protection	IP 66, IP 67			
Operating speed	≤ 8000 rpm	≤ 4000 rpm	≤ 2000 rpm	≤ 1000 rpm
Options	DNV certificate			DNV certificate Stainless steel wheel

HDmag

Bearingless *HDmag* encoders are based on the high-resolution scanning of a precision magnetic wheel combined with digital real-time signal processing. *HDmag* encoders are available as incremental and absolute variants, provide outstanding high resolution and fit virtually any shaft diameter.

Bearingless encoders

Incremental

Hollow shaft up to $\varnothing 340$ mm.
Up to 524288 pulses per revolution.

- Square wave and SinCos signals
- Wear-free operation
- Wide axial tolerance ± 3 mm
- Pole wheel fixation by screwing, gluing or shrinking
- Superb signal quality thanks to FPGA signal processing



Learn more:
www.baumer.com/bearingless



Features	<ul style="list-style-type: none"> ■ Through hollow shaft $\varnothing 16 \dots 80$ mm ■ Installation depth ≤ 35 mm ■ Stainless steel wheel 	<ul style="list-style-type: none"> ■ Through hollow shaft $\varnothing 50 \dots 180$ mm ■ Installation depth ≤ 35 mm ■ Stainless steel wheel 	<ul style="list-style-type: none"> ■ Through hollow shaft $\varnothing 70 \dots 340$ 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 90° B, R + inverted		
Output frequency	≤ 2 MHz		
Shaft type			
- Through hollow shaft	$\varnothing 16 \dots 80$ mm	$\varnothing 50 \dots 180$ mm	$\varnothing 70 \dots 340$ mm
Connection			
- Flange connector M23	Radial		
Pulses per revolution	64...131 072	128...262 144	256...524 288
Sine periods per revolution	8192	16384	32768
Operating temperature	$-20 \dots +85$ °C		
Protection	IP 66, IP 67		
Operating speed	≤ 8000 rpm	≤ 4000 rpm	≤ 2000 rpm

Bearingless encoders

Absolute

Compact kit design $\varnothing 36$ mm and $\varnothing 58$ mm.
Singleturn and multiturn variants.

- Analog, SSI, fieldbus and realtime Ethernet interface
- Touchless, wear-free operation
- Immune against dust, dirt, fibres and fluids
- Wide axial tolerance for magnet rotor
- Robust R-series for demanding applications



Features	<ul style="list-style-type: none"> ■ Encoder kit – size $\varnothing 36$ mm 	<ul style="list-style-type: none"> ■ Encoder kit – size $\varnothing 36$ mm ■ E1 compliant design ■ Corrosion protection CX (C5-M) ■ ISO 13849 compliant firmware 	<ul style="list-style-type: none"> ■ Encoder kit – size $\varnothing 58$ mm 	<ul style="list-style-type: none"> ■ Encoder kit – size $\varnothing 58$ mm ■ E1 compliant design ■ Corrosion protection CX (C5-M) ■ ISO 13849 compliant firmware
Product family	EAM360 Kit	EAM360R Kit	EAM580 Kit	EAM580R Kit

Interface

- SSI	■	–	■	–
- Analog	–	■	–	■
- CANopen®	■	■	■	■
- SAE J1939	–	■	–	■
- Profinet	–	–	■	–
- EtherCAT	–	–	■	–
- EtherNet/IP	–	–	■	–

Function principle	Singleturn / Multiturn			
Sensing method	Magnetic			
Size (housing)	$\varnothing 36$ mm		$\varnothing 58$ mm	
Voltage supply	4.5 ... 30 VDC (CANopen, SAE J1939, SSI) 8 ... 30 VDC / 14 ... 30 VDC (Analog - type-specific) 10 ... 30 VDC (Ethernet)			
Shaft type	–			
- Ring magnet bore	$\varnothing 6$ mm, $\varnothing 8$ mm, $\varnothing 12$ mm			
Connection	–			
- Flange connector M12	Radial			
- Flange connector M23	–	–	Radial	–
- Cable	Radial (0.14 mm ²)	Radial (0.5 mm ²)	Radial (0.14 mm ²)	Radial (0.5 mm ²)
Steps per turn	≤65536/16 bits			
Number of turns	≤262 144/18 bits			
Operating temperature	-40...+85 °C			
Protection	IP 67			
Operating speed	≤6000 rpm			
Options	Additional incremental signals (SSI, CANopen®)	Cable with DEUTSCH connector	Additional incremental signals (SSI, CANopen®)	Cable with DEUTSCH connector

Bearingless encoders Absolute

Compact kit design $\varnothing 50$ mm and $\varnothing 55$ mm.
Singleturn variants.

- Analog, SSI and CANopen redundant interface
- Touchless, wear-free operation
- Immune against dust, dirt, fibres and fluids
- Small mounting depth down to 10 mm

Learn more:
www.baumer.com/bearingless



Features	<ul style="list-style-type: none"> ■ Encoder kit – size $\varnothing 50$ mm ■ Integrated interfaces ■ Singleturn 	<ul style="list-style-type: none"> ■ Encoder kit – size $\varnothing 55$ mm ■ Integrated interfaces ■ Singleturn
Product family	EAM500	BMSK 55
Interface		
- SSI	–	■
- Analog	■	–
- CANopen® / redundant	■ / ■	– / –
Function principle	Singleturn	
Sensing method	Magnetic	
Size (housing)	$\varnothing 50$ mm	$\varnothing 55$ mm
Voltage supply	10...30 VDC (CANopen®) 12...30 VDC (Analog) 5 VDC ± 5 % (Analog)	10...30 VDC (on request) 5 VDC ± 10 %
Shaft type		
- Bore of magnet rotor	$\varnothing 5...8$ mm	
Connection		
- Cable	Radial	
Steps per turn	$\leq 4096/12$ bits (Analog) $\leq 16384/14$ bits (CANopen®)	$\leq 4096/12$ bits
Absolute accuracy	$\pm 1.8^\circ$	$\pm 1^\circ$
Operating temperature	$-40...+85$ °C	$-20...+85$ °C
Protection	IP 67	
Operating speed	≤ 800 rpm	≤ 6000 rpm

Bearingless encoders

Absolute

Hollow shaft up to $\varnothing 340$ mm.
Singleturn variants.

- SSI and CANopen® interface
- Additional square wave and SinCos signals
- Wide axial tolerance ± 3 mm
- Touchless, wear-free operation
- Immune against dust, dirt, fibres and fluids



HDmag



Features	<ul style="list-style-type: none"> ■ Wear-free encoder ■ Through hollow shaft $\varnothing 30$ mm 	<ul style="list-style-type: none"> ■ Wear-free encoder ■ Through hollow shaft $\varnothing 16...80$ mm ■ Stainless steel wheel 	<ul style="list-style-type: none"> ■ Wear-free encoder ■ Through hollow shaft $\varnothing 50...180$ mm ■ Stainless steel wheel 	<ul style="list-style-type: none"> ■ Wear-free encoder ■ Through hollow shaft $\varnothing 70...340$ mm ■ Stainless steel wheel
Product family	MHAD 50	MHAP 100	MHAP 200	MHAP 400
Interface				
- SSI	■	■	■	■
- CANopen®	■	–	–	–
Function principle	Singleturn			
Sensing method	Magnetic			
Magnetic wheel diameter	$\varnothing 50$ mm	$\varnothing 101.3$ mm	$\varnothing 203.1$ mm	$\varnothing 406.8$ 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 90° B + inverted			
Shaft type				
- Through hollow shaft	$\varnothing 30$ mm	$\varnothing 16...80$ mm	$\varnothing 50...180$ mm	$\varnothing 70...340$ mm
Connection				
- Flange connector M12	Radial	–	–	–
- Flange connector M23	–	Radial	–	–
- Cable	Radial	–	–	–
Total resolution	$\leq 65\,536 / 16$ bits	$\leq 131\,072 / 17$ bits		
Absolute accuracy	$\pm 0.3^\circ (-40...+85^\circ\text{C})$ $\pm 0.25^\circ (+20^\circ\text{C})$	–	–	–
Pulses per revolution	1024...8192	1...131 072	1...262 144	1...524 288
Sine periods per revolution	–	1...8192	1...16 384	1...32 768
Operating temperature	$-40...+85^\circ\text{C}$	$-20...+85^\circ\text{C}$		
Protection	IP 67	IP 66, IP 67		
Operating speed	≤ 6000 rpm	≤ 8000 rpm	≤ 4000 rpm	≤ 2000 rpm

Bearingless encoders

For large shaft diameters

Hollow shaft $\varnothing 3183$ mm.
Up to 131 072 pulses per revolution.

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



Learn more:
www.baumer.com/bearingless

HDmag flex



Features	<ul style="list-style-type: none"> ■ Magnetic belt encoder with adapter wheel ■ Incremental ■ Pulses per revolution up to 131 072 ■ For shaft $\varnothing 90...300$ mm 	<ul style="list-style-type: none"> ■ Magnetic belt encoder ■ Incremental ■ Pulses per revolution up to 131 072 ■ For shaft $\varnothing 300...3183$ mm 	<ul style="list-style-type: none"> ■ Magnetic belt encoder with adapter wheel ■ Quasi-absolute ■ Resolution up to 24 bits singleturn ■ For shaft $\varnothing 90...300$ mm 	<ul style="list-style-type: none"> ■ Magnetic belt encoder ■ Quasi-absolute ■ Resolution up to 24 bits singleturn ■ For shaft $\varnothing 300...3183$ mm
Product family	MIR 350F	MIR 3000F	MQR 350F	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 90° B, R + inverted		0...24 bits singleturn 0...24 bits speed signal	
Shaft type				
- Magnetic belt	$\varnothing 90...300$ mm	$\varnothing 300...3183$ mm	$\varnothing 90...300$ mm	$\varnothing 300...3183$ mm
Connection	Flange connector M23			
Pulses per revolution	512...131 072		1024...4096	
Sine periods per revolution	512...16 384		1024...4096	
Operating temperature	-40...+85 °C			
Protection sensing head	IP 67	IP 66, IP 67	IP 67	IP 66, IP 67
Operating speed	≤ 2000 rpm	≤ 1850 rpm	≤ 2000 rpm	≤ 1850 rpm
Options	–	–	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 in the factory. The magnetic scale is buckled on the shaft like a belt. *HDmag flex* magnetic belt encoders are characterized by short lead times, easy installation with wide axial and radial tolerances, outstanding robustness and reliability for precise position and speed feedback with ultimate resolution.

Bearingless encoders

Analog magnetic rotary encoders

Cylindrical design.

Angular range 120...360°.

- Linearized analog output signals
- Resolution up to 0.09°
- With magnet rotor
- Absolute sensing



Features	<ul style="list-style-type: none"> ■ Linear angular range 120° ■ Output signal 4...20 mA 	<ul style="list-style-type: none"> ■ Linear angular range 270° ■ Output signal 4...20 mA 	<ul style="list-style-type: none"> ■ Linear angular range 160° ■ Output signal 0.5...4.5 VDC / 1...9 VDC 	<ul style="list-style-type: none"> ■ Linear angular range 360° ■ Output signal 0...4.3 VDC / 0...5 VDC
Product family	MDRM 18	MDRM 18 MDRM 18	MDRM 18	MDRM 18 MDRM 18
Sensor housing	Cylindrical threaded			
Angular range	120° linear	270° linear		360° linear
Resolution	0.09	0.09° 1.41°	0.09°	0.09° 1.41°
Sensing distance max.	5 mm (with magnet rotor MSFS)	5 mm (with magnet rotor MSFS) 4 mm (with magnet rotor MSFS)	5 mm (with magnet rotor MSFS)	5 mm (with magnet rotor MSFS) 4 mm (with magnet rotor MSFS)
Output circuit	Current output		Voltage output	
Output signal	4...20 mA		0.5...4.5 VDC 1...9 VDC	0...4.3 VDC 0...5 VDC
Response time	<2 ms			
Dimensions (sensing head)	18 mm			
Connection	Cable 2 m Mating connector M12	Cable 2 m Connector M12	Cable 2 m Mating connector M8	Cable 2 m Connector M12
Voltage supply	15...30 VDC		5 VDC 12...28 VDC	4.7...7.5 VDC 4.75...5.25 VDC
Operating temperature	-40...+85 °C			
Protection	IP 67			

Functional principle

The heart of a magnetic angle sensor is the integrated dual differential Hall element which builds an electrical parameter related to the flux direction of an exterior magnetic field. This magnetic field rotating about the element's center axis generates two sinusoids shifted by 90° which are utilized to detect the rotation angle for output as an absolute value. The integrated electronics evaluates the sinusoids into a linear voltage or current signal. The absolute detection principle ensures output of the correct rotation angle even after power failure.

Bearingless encoders

Analog magnetic rotary encoders

Rectangular design.
Angular range 270...360°.

- Linearized analog output signals
- Resolution up to 0.09°
- With magnet rotor
- Absolute sensing

Learn more:
www.baumer.com/bearingless



Features	<ul style="list-style-type: none"> ■ Linear angular range 270° ■ Output signal 4...20 mA ■ Resolution 0.09° 	<ul style="list-style-type: none"> ■ Linear angular range 270° ■ Output signal 4...20 mA ■ Resolution 1.41° 	<ul style="list-style-type: none"> ■ Linear angular range 360° ■ Output signal 0...4.3 VDC ■ Resolution 0.09° 	<ul style="list-style-type: none"> ■ Linear angular range 360° ■ Output signal 0...5 VDC ■ Resolution 1.41°
Product family	MDFM 20	MDFM 20	MDFM 20	MDFM 20
Sensor housing	Rectangular			
Angular range	270° linear		360° linear	
Resolution	0.09°	1.41°	0.09°	1.41°
Sensing distance max.	5 mm (with magnet rotor MSFS)	4 mm (with magnet rotor MSFS)	5 mm (with magnet rotor MSFS)	4 mm (with magnet rotor MSFS)
Output circuit	Current output		Voltage output	
Output signal	4...20 mA		0...4.3 VDC	0...5 VDC
Response time	<4 ms			
Dimensions (sensing head)	20 x 30 x 8 mm			
Connection	Cable 2 m Mating connector M8			
Voltage supply	15...30 VDC		4.7...7.5 VDC	4.75...5.25 VDC
Operating temperature	-40...+85 °C			
Protection	IP 67			



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