

Product overview. Motion Control.  
Encoders, tachogenerators,  
resolvers, inclination sensors.



Edition 2011

## Welcome to the world of encoders



Precise angle measurement, intelligent positioning - Baumer serves as your competent and reliable partner for detection of rotational and linear movements. Our standard portfolio comprises a large variety of flexible solutions, from miniature encoders to intelligent positioning drives with different readout principles, mounting possibilities and electrical interfaces. Baumer offers the optimum solution for your application. If required, we realize fast individual adaptations. We are your innovative technology expert at any time.

For detailed information about our extensive product range and to learn more about Baumer innovations, please visit our website:

[www.baumer.com/motion](http://www.baumer.com/motion)

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# Motion Control



## Industries

- Automotive Assembly
- Chemical, Petrochemical
- Drive Technology
- Electronic Production
- Food, Beverage, Semi-luxury Goods
- Graphical Machinery
- Handling and Robotics
- Injection Molding, Die Casting
- Escalator / Elevator
- Machine Tools
- Medical Industry
- Pharmaceutical, Bio Technology
- Semiconductor Industry
- Textile Machinery
- Transportation
- Water, Energy, Mining
- Warehouse and Logistics
- Wind Power Plants
- Wood Machinery



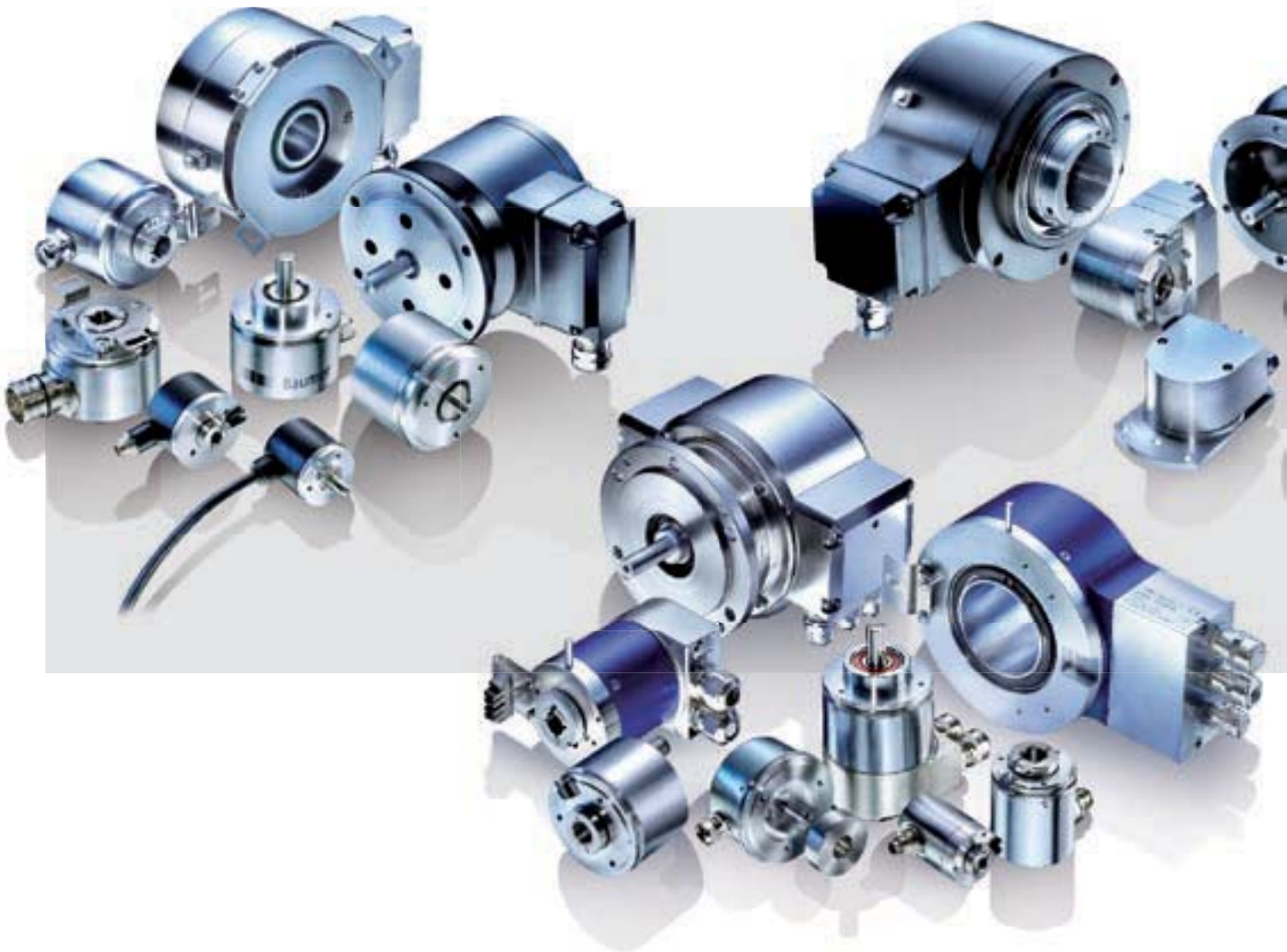
## Baumer sets benchmarks

Our aim is always to be a step ahead of competition and to set innovative benchmarks. Quality has tradition at Baumer. High exactness and reliability characterize the sophisticated products and solutions devised for our customers. With an optimal market presence, many solutions result from the close collaboration and individual consultation of our customers at source. The mastery of the processes is the basis for consistent high quality, reliability, flexibility and economy. To continuously improve our business processes we combine lean management methods with Six Sigma. Our claim:

- High degree of innovation
- Wide variety of products
- Outstanding application expertise
- Individual collaboration and partnership with the customers
- Comprehensive consultation and outstanding service worldwide



Widest range of innovative and precise solutions for positioning, speed and angle measurement.



#### Customer-specific solutions

No product portfolio is versatile enough to offer the perfect solution for any application. Quite often requirements take new ways and the yet existing solutions on the market do not satisfy all demands to the desired extent. This is the reason why our R&D department is in close contact and collaboration with our customers. Searching for the optimized solution for specialised requirements, innovative specialists are creating new customer-specific configurations - from specific mechanical designs up to brandnew systems. An innovative solution can also help you to be the decisive step ahead of the competition.

We would be happy to advise you!





## Motion Control

The expert know-how in position sensing that has been compiled for decades created a multitude of practice-oriented innovations and continuous improvements. They conquer new domains boosting completely new solutions in factory automation, from incremental encoders to absolute configurations that ensure a reliable and precise operation even under water. In this context, high precision, ever-growing demands on sturdiness, varied designs and mounting options, different operating principles as well as the impressive variety of fieldbus interfaces play an important role.

- Incremental encoders
- Sine encoders
- Absolute encoders
- Tachogenerators
- Ex encoders
- Encoders without bearing
- Speed switches
- Resolvers
- Inclination sensors



# Applications

## Speed and acceleration control

Nearly no domain in mechanical plant engineering where drive technology does not take over important control functions. Thanks to high resolutions and short data cycles, Baumer encoders guarantee reliable realtime measured values.

- Drive and conveyor technology
- Lift construction
- Processing machines
- Handling and robotics



## Precise position sensing

Times have changed. Obsolete complicated cabling connecting control cabinets with encoders is nowadays often replaced by fieldbus systems.

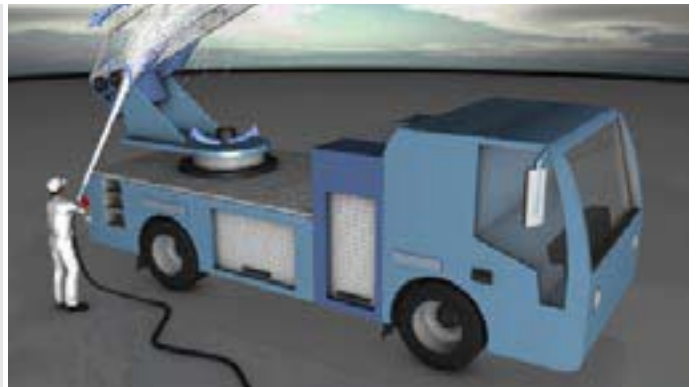
- Mounting and handling
- Metal sheet processing
- Profile milling machines
- Machinery for plastics and semiconductor industry



## Robust and shockproof

The wide temperature range and especially high protection standards provided by Baumer encoders are well-proven in mobile use. Immunity against shocks and vibrations goes without saying.

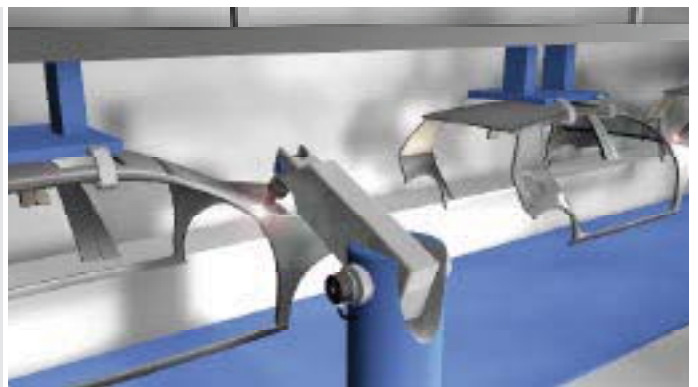
- Mobile conveyor plants (concrete pumps)
- Agricultural machinery, tractors and ambulance vehicles
- Construction site machinery as excavators and cranes
- Conveyor bridges in port facilities



## Production process control

In many domains of automotive, from car body lacquering to final assembly, Baumer encoders take over important tasks - for example in transport chains in the lacquering process as well as positioning of lifting tables at assembly lines.

- Automotive industry
- Presses and punches
- Feed control in lacquering facilities
- Foil, cable and cloth winding machines



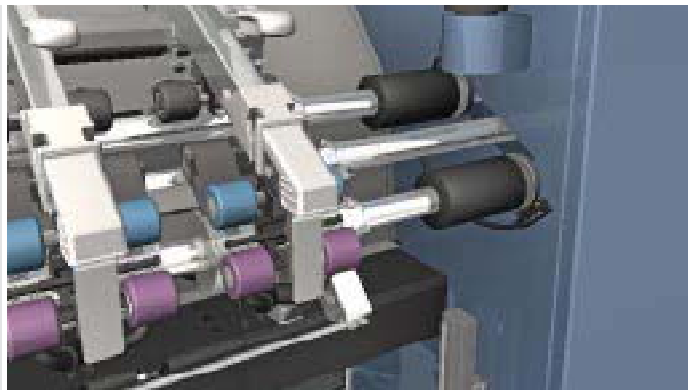


## A simple way of sensing linear and rotary movements

Non-contact sensing systems are easy to mount and most often satisfy requirements on precision.

They can be utilized without problems also in a dusty and humid environment.

- Wood processing machines
- Spindle positioning at profile milling machines
- Graphical machinery (printing machines)
- Environment plant engineering and textile machinery



## Precise angular sensing

For optimal alignment of wind power plants towards the wind direction, absolute encoders reliably provide the actual position even under roughest conditions. Also here, for many years manufacturers in drive technology have been relying on Baumer encoders.

- Wind power plants
- Conveying systems in day-mining
- Ship construction
- Gear test stands



## Reliable and versatile

Baumer encoders are utilized in numerous domains. Very robust and up to strong impacts, they provide an excellent axial runout and reliable operation even under extreme temperatures and ambient conditions.

- Packaging machines
- Blister and carton box packaging
- Labelling machines
- Foil-winding machines



## Absolutely robust

Reliability under extreme conditions - like embarking and disembarking container ships - that's the point. No matter if the focus is on rapidness or robustness - like in many other applications Baumer encoders are the suitable solution.

- High racks
- Chipboard production plants
- Warehouse and logistics
- Metal sheet processing machines



# Incremental encoders








					
Model	ITD 01 A 4 Y 1	ITD 01 B14	BHK	BDK	
Features	<ul style="list-style-type: none"> <li>-Mini encoder with end shaft <math>\varnothing 4</math> mm</li> <li>-Resolution max. 1024 ppr</li> <li>-Optical sensing</li> <li>-Outer diameter <math>\varnothing 24</math> mm</li> </ul>	<ul style="list-style-type: none"> <li>-Mini encoder with shaft <math>\varnothing 4</math> mm</li> <li>-Resolution max. 1024 ppr</li> <li>-Optical sensing</li> <li>-Outer diameter <math>\varnothing 24</math> mm</li> </ul>	<ul style="list-style-type: none"> <li>-Mini encoder with end shaft or hollow shaft</li> <li>-Optical sensing</li> <li>-Resolution max. 2048 ppr</li> <li>-Housing <math>\varnothing 40</math> mm</li> </ul>	<ul style="list-style-type: none"> <li>-Mini encoder with shaft <math>\varnothing 5</math> mm</li> <li>-Optical sensing</li> <li>-Resolution max. 2048 ppr</li> <li>-Housing <math>\varnothing 30</math> mm</li> </ul>	
Voltage supply	5 VDC $\pm 5$ % 8...30 VDC	5 VDC $\pm 5$ % 8...30 VDC	5 VDC $\pm 10$ % 10...30 VDC	5 VDC $\pm 10$ % 10...30 VDC	
Resolution (steps/turn)	30...1024	30...1024	10...2048	10...2048	
Output frequency	$\leq 100$ kHz	$\leq 100$ kHz	$\leq 100$ kHz	$\leq 100$ kHz	
Operating temperature	-20...+85 °C	-20...+85 °C	-20...+85 °C	-20...+85 °C	
Housing	$\varnothing 24$ mm	$\varnothing 24$ mm	$\varnothing 40$ mm	$\varnothing 30$ mm	
Shaft diameter	$\varnothing 4$ mm end shaft	$\varnothing 4$ mm	$\varnothing 6$ mm hollow shaft / $\varnothing 12$ mm end shaft	$\varnothing 5$ mm	
Operating speed	$\leq 10000$ rpm	$\leq 18000$ rpm	$\leq 12000$ rpm	$\leq 12000$ rpm	
E-connection	Cable 1 m	Cable 1 m	Connector or cable	Connector or cable	

# Incremental encoders





## Incremental encoders

- Compact configurations
- Shaft  $\varnothing 4$  mm and  $\varnothing 5$  mm
- End shaft  $\varnothing 8$ -16 mm
- Hollow shaft  $\varnothing 6$ -15 mm
- Optical and magnetic sensing
- Resolution max. 2048 pulses
- Rotation speed max. 12000 rpm
- Protection max. IP 66

				
ITD 27 A 4 Y27	ITD 27 A 4 Y15	GI341, GI342 - <i>incretivo</i>	ITD 20 A 4	BRIH, BRID - <i>EcoMag</i>
- Encoder with end shaft $\varnothing 10$ -16 mm - Resolution max. 32 ppr - Magnetic sensing - Mounting on shaft by headless pins	- Encoder with hollow shaft $\varnothing 9$ -14 mm - Resolution max. 32 ppr - Magnetic sensing - HTL output signals	- Encoder with end or hollow shaft $\varnothing 10$ -15 mm - Resolution max. 2048 ppr - Optical sensing - Flange and housing made of high-tech plastics	- Encoder with end shaft max. $\varnothing 14$ mm - Resolution max. 1024 ppr - Optical sensing - Mounting by torque support	- Encoder with end or hollow shaft $\varnothing 12$ mm - Magnetic sensing - Resolution max. 2048 ppr - High resistance to shock and vibrations
8...24 VDC	8...24 VDC	5 VDC $\pm 10$ % 4.75...30 VDC	5 VDC $\pm 5$ % 8...30 VDC	5 VDC $\pm 10$ % 10...30 VDC
1...32	1...32	5...2048	50...1024	64...2048
-	-	$\leq 150$ kHz	$\leq 120$ kHz	$\leq 320$ kHz
-20...+85 °C	-20...+85 °C	-20...+80 °C	-20...+70 °C -20...+100 °C	-20...+85 °C
$\varnothing 58$ mm	$\varnothing 58$ mm	$\varnothing 58$ mm	$\varnothing 58$ mm	$\varnothing 58$ mm
$\varnothing 10$ -16 mm end shaft	$\varnothing 9$ -14 mm hollow shaft	$\varnothing 10$ -15 mm hollow shaft / end shaft	$\varnothing 8$ -14 mm end shaft	$\varnothing 12$ mm hollow shaft / end shaft
$\leq 12000$ rpm	$\leq 6000$ rpm	$\leq 6000$ rpm	$\leq 8000$ rpm	$\leq 12000$ rpm
Cable 1 m	Cable 1 m	Cable 1 m	Cable 1 m	Connector or cable

# Incremental encoders








					
Model	BHF, BHG	TIL	ITD 21 A 4 Y109	BDH, BDT	
Features	<ul style="list-style-type: none"> <li>- Encoder with end or hollow shaft <math>\varnothing 12</math> mm</li> <li>- Optical sensing</li> <li>- Resolution max. 10000 ppr</li> <li>- Small profile depth</li> </ul>	<ul style="list-style-type: none"> <li>- Encoder with hollow shaft <math>\varnothing 10</math>-16 mm</li> <li>- Resolution max. 2048 ppr</li> <li>- Optical sensing</li> <li>- Mounting by torque support</li> </ul>	<ul style="list-style-type: none"> <li>- Encoder with end shaft <math>\varnothing 10</math>-14 mm</li> <li>- Resolution max. 6000 ppr</li> <li>- Optical sensing</li> <li>- Anodised</li> </ul>	<ul style="list-style-type: none"> <li>- Encoder with shaft <math>\varnothing 10</math> mm or <math>\varnothing 6</math> mm</li> <li>- Optical sensing</li> <li>- Resolution max. 10000 ppr</li> <li>- Clamping or synchro flange</li> </ul>	
Voltage supply	5 VDC $\pm 10$ % 10...30 VDC 4.5...30 VDC	5 VDC $\pm 5$ % 8...26 VDC	5 VDC $\pm 5$ % 8...30 VDC	5 VDC $\pm 10$ % 10...30 VDC 4.5...30 VDC	
Resolution (steps/turn)	10...10000	100...2048	100...6000	10...10000	
Output frequency	$\leq 750$ kHz	$\leq 120$ kHz	$\leq 300$ kHz (TTL) $\leq 160$ kHz (HTL)	$\leq 300$ kHz $\leq 750$ kHz	
Operating temperature	-20...+85 °C	-20...+70 °C	0...+70 °C	-20...+85 °C	
Housing	$\varnothing 58$ mm	60 x 72 mm	$\varnothing 68$ mm	$\varnothing 55$ mm $\varnothing 58$ mm	
Shaft diameter	$\varnothing 12$ mm hollow shaft / end shaft	$\varnothing 10$ -16 mm hollow shaft	$\varnothing 10$ -14 mm end shaft	$\varnothing 6$ mm / $\varnothing 10$ mm	
Operating speed	$\leq 12000$ rpm	$\leq 6000$ rpm	$\leq 5000$ rpm	$\leq 12000$ rpm	
E-connection	Connector or cable	Cable 1 m	Cable 1 m	Connector or cable	

# Incremental encoders

## Incremental encoders

- Industrial standard encoder
- Hollow shaft max.  $\varnothing 27$  mm
- Shaft  $\varnothing 6$  mm,  $\varnothing 10$  mm and  $\varnothing 9.52$  mm (inch)
- Optical and magnetic sensing
- Clamping and synchro flange
- Square flange
- Resolution max. 16384 pulses
- Rotation speed max. 12000 rpm
- Protection max. IP 65

				
<b>BRIV 58K, BRIV 58S - EcoMag</b>	<b>GI355, GI356</b>	<b>GI352</b>	<b>G110H, G110S</b>	<b>ITD 40 A 4 Y79</b>
- Encoder with shaft $\varnothing 10$ mm or $\varnothing 6$ mm - Magnetic sensing - Resolution max. 2048 ppr - High resistance to shock and vibrations	- Encoder with shaft $\varnothing 10$ mm or $\varnothing 6$ mm - Resolution max. 6000 ppr - Optical sensing - Clamping or synchro flange	- Encoder with inch dimensions - Resolution max. 6000 ppr - Optical sensing - Shaft $\varnothing 9.52$ mm	- Encoder with end or hollow shaft max. $\varnothing 25.4$ mm - Resolution max. 16384 ppr - Optical sensing - Robust design	- Encoder with hollow shaft $\varnothing 20$ -27 mm - Resolution max. 2048 ppr - Optical sensing - Mounting by torque support
5 VDC $\pm 10$ % 10...30 VDC	5 VDC $\pm 10$ % 4.75...30 VDC	5 VDC $\pm 10$ % 4.75...30 VDC	5 VDC $\pm 10$ % 4.75...30 VDC	5 VDC $\pm 5$ % 8...30 VDC
64...2048	5...6000	5...6000	5...16384	100...2048
$\leq 320$ kHz	$\leq 150$ kHz	$\leq 150$ kHz	$\leq 150$ kHz	$\leq 120$ kHz
-20...+85 °C	-25...+100 °C (5 VDC) -25...+85 °C (24 VDC)	-25...+100 °C (5 VDC) -25...+85 °C (24 VDC)	-25...+85 °C (24 VDC)	-20...+70 °C -20...+100 °C
$\varnothing 58$ mm	$\varnothing 58$ mm	$\varnothing 58$ mm	$\varnothing 75$ mm	$\varnothing 80$ mm
$\varnothing 6$ mm / $\varnothing 10$ mm	$\varnothing 6$ mm / $\varnothing 10$ mm	$\varnothing 9.52$ mm	$\varnothing 25$ mm hollow shaft / end shaft	$\varnothing 20$ -27 mm hollow shaft
$\leq 12000$ rpm	$\leq 10000$ rpm	$\leq 10000$ rpm	$\leq 3800$ rpm	$\leq 5000$ rpm
Connector or cable	Connector or cable	Connector	Connector	Cable 1 m

# Incremental encoders




					
Model	ITD 41 A 4 Y22	ITD 41 A 4 Y141	HOG 71	HOG 9	
Features	<ul style="list-style-type: none"> <li>-Encoder with hollow shaft <math>\varnothing 17-27</math> mm</li> <li>-Resolution max. 10000 ppr</li> <li>-Optical sensing</li> <li>-Through-hollow shaft</li> </ul>	<ul style="list-style-type: none"> <li>-Encoder with end shaft <math>\varnothing 20-27</math> mm</li> <li>-Resolution max. 10000 ppr</li> <li>-Optical sensing</li> <li>-NIRO design</li> </ul>	<ul style="list-style-type: none"> <li>-Encoder with end shaft <math>\varnothing 12-14</math> mm</li> <li>-Optical sensing</li> <li>-Compact, robust die-cast housing</li> <li>-Inside connecting terminals</li> </ul>	<ul style="list-style-type: none"> <li>-Encoder with end shaft <math>\varnothing 12-16</math> mm or cone shaft <math>\varnothing 17</math> mm (1:10)</li> <li>-Optical sensing</li> <li>-Compact, robust die-cast housing</li> <li>-Metal connector</li> </ul>	
Voltage supply	5 VDC $\pm 5$ % 8...30 VDC	5 VDC $\pm 5$ % 8...30 VDC	5 VDC $\pm 5$ % 9...26 VDC	5 VDC $\pm 5$ % 9...26 VDC 9...30 VDC	
Resolution (steps/turn)	2000...10000	2000...10000	64...2048	1...2500	
Output frequency	$\leq 300$ kHz (TTL) $\leq 160$ kHz (HTL)	$\leq 300$ kHz (TTL) $\leq 160$ kHz (HTL)	$\leq 120$ kHz	$\leq 120$ kHz	
Operating temperature	0...+70 °C 0...+100 °C	0...+70 °C	-20...+85 °C	-30...+100 °C	
Housing	$\varnothing 80$ mm	$\varnothing 89$ mm	$\varnothing 60$ mm	$\varnothing 97$ mm	
Shaft diameter	$\varnothing 17-27$ mm hollow shaft	$\varnothing 20-27$ mm end shaft	$\varnothing 12-14$ mm end shaft	$\varnothing 12-16$ mm end shaft / $\varnothing 17$ mm cone shaft	
Operating speed	$\leq 5000$ rpm	$\leq 2500$ rpm	$\leq 10000$ rpm	$\leq 10000$ rpm	
E-connection	Cable 1 m	Cable 1 m	Terminal box	Terminal connector	

# Incremental encoders

## Incremental encoders

- Industrial standard encoder
- Hollow shaft max.  $\varnothing 115$  mm
- End shaft max.  $\varnothing 27$  mm
- Optical sensing
- Specialized housing designs
- Resolution max. 10000 pulses
- Rotation speed max. 10000 rpm
- High protection max. IP 67

				
HOG 10, HOG 10 + FSL	HOG 131	ITD 70 A 4 Y 9	HOG 16, HOG 163	HOG 220
- Encoder with end shaft max. $\varnothing 20$ mm - Optical sensing - Logic level TTL with regulator UB 9...26 VDC - Logic level HTL with power drivers	- Encoder with hollow shaft $\varnothing 16-36$ mm - Optical sensing - Shaft especially sealed for offshore applications - Housing with special surface protection	- Encoder with hollow shaft max. $\varnothing 65$ mm - Resolution max. 2500 ppr - Optical sensing - Mounting by torque support	- Encoder with hollow shaft $\varnothing 20-75$ mm - Optical sensing - Robust light-metal housing - Logic level TTL with regulator UB 9...26 VDC	- Encoder with hollow shaft $\varnothing 80-115$ mm - Optical sensing - Robust light-metal housing - Logic level TTL with regulator UB 9...26 VDC
5 VDC $\pm 5$ % 9...26 VDC 9...30 VDC	5 VDC $\pm 5$ % 9...26 VDC 9...30 VDC	5 VDC $\pm 5$ % 8...30 VDC	5 VDC $\pm 5$ % 9...26 VDC 9...30 VDC	5 VDC $\pm 5$ % 9...26 VDC 9...30 VDC
1...2500	1024...3072	1000...2500	250...2500 250...5000	1024
$\leq 120$ kHz	$\leq 120$ kHz	$\leq 120$ kHz	$\leq 120$ kHz	$\leq 120$ kHz
-40...+100 °C -50...+100 °C (optional)	-40...+100 °C	-20...+70 °C	-30...+85 °C -20...+100 °C	-30...+85 °C
$\varnothing 105$ mm	$\varnothing 130$ mm	$\varnothing 150$ mm	$\varnothing 158$ mm	$\varnothing 227$ mm
$\varnothing 12-20$ mm end shaft / $\varnothing 17$ mm cone shaft	$\varnothing 16-36$ mm hollow shaft	$\varnothing 40-65$ mm hollow shaft	$\varnothing 20-75$ mm hollow shaft	$\varnothing 80-115$ mm hollow shaft
$\leq 6000$ rpm	$\leq 6000$ rpm	$\leq 3000$ rpm	$\leq 6000$ rpm	$\leq 3800$ rpm
Terminal box	Terminal box	Connector M23 type 2, 12-pin	Terminal box	Terminal box

# Incremental encoders



					
Model	ITD 21 B10 Y 2	OG 9	POG 9	POG 90	
Features	<ul style="list-style-type: none"> <li>- Encoder with shaft <math>\varnothing 10-12</math> mm</li> <li>- Resolution max. 6000 ppr</li> <li>- Optical sensing</li> <li>- Centering alignment <math>\varnothing 70</math> mm, mounting screw hole circle <math>\varnothing 77</math> mm</li> </ul>	<ul style="list-style-type: none"> <li>- Encoder with shaft <math>\varnothing 11</math> mm</li> <li>- Optical sensing</li> <li>- Euro-flange B10</li> <li>- Logic level TTL with regulator UB 9...26 VDC</li> </ul>	<ul style="list-style-type: none"> <li>- Encoder with shaft <math>\varnothing 11</math> mm</li> <li>- Optical sensing</li> <li>- Euro-flange B10</li> <li>- Logic level TTL with regulator UB 9...26 VDC</li> </ul>	<ul style="list-style-type: none"> <li>- Encoder with shaft <math>\varnothing 11</math> mm</li> <li>- Resolution max. 10000 ppr</li> <li>- Optical sensing</li> <li>- Logic level TTL with regulator UB 5 VDC / 9...26 VDC</li> </ul>	
Voltage supply	5 VDC $\pm 5$ % 8...30 VDC	5 VDC $\pm 5$ % 9...26 VDC 9...30 VDC	5 VDC $\pm 5$ % 9...26 VDC 9...30 VDC	5 VDC $\pm 5$ % 9...30 VDC	
Resolution (steps/turn)	1000...6000	1...1250	1...2500	1024...10000	
Output frequency	$\leq 300$ kHz (TTL) $\leq 160$ kHz (HTL)	$\leq 120$ kHz	$\leq 120$ kHz	$\leq 250$ kHz	
Operating temperature	0...+70 °C 0...+100 °C	-30...+100 °C	-30...+100 °C	-20...+85 °C	
Housing	$\varnothing 58$ mm	$\varnothing 115$ mm	$\varnothing 115$ mm	$\varnothing 115$ mm	
Shaft diameter	$\varnothing 10-12$ mm	$\varnothing 11$ mm	$\varnothing 11$ mm	$\varnothing 11$ mm	
Operating speed	$\leq 12000$ rpm	$\leq 12000$ rpm	$\leq 12000$ rpm	$\leq 10000$ rpm	
E-connection	Cable 1 m	Terminal box	Terminal box	Terminal box	



## Incremental encoders

- HeavyDuty solutions
- Centering flange
- Euro-flange B10
- Shaft max.  $\varnothing 12$  mm
- Optical sensing
- Resolution max. 10000 pulses
- Rotation speed max. 12000 rpm
- Big terminal box, pivotable through  $180^\circ$
- Protection max. IP 66



POG 10, POG 10 + FSL

- Encoder with shaft  $\varnothing 11$  mm
- Optical sensing
- High protection IP 66
- Big terminal box, pivotable through  $180^\circ$

5 VDC  $\pm 5\%$   
 9...26 VDC  
 9...30 VDC

1...2500

$\leq 120$  kHz

-40...+100 °C  
 -50...+100 °C (optional)

$\varnothing 115$  mm





$\varnothing 11$  mm

$\leq 12000$  rpm

Terminal box


# Sine encoders



					
Model	ITD 22 A 4 Y36	HOGS 71	ITD 42 A 4 Y79	HOGS 100	
Features	<ul style="list-style-type: none"> <li>-Encoder with end shaft <math>\varnothing</math>10-14 mm</li> <li>-Resolution max. 5000 ppr</li> <li>-Sine output signals 1 Vpp</li> <li>-Mounting by torque support</li> </ul>	<ul style="list-style-type: none"> <li>-Encoder with end shaft <math>\varnothing</math>12-14 mm</li> <li>-Resolution max. 5000 ppr</li> <li>-Sine output signals 1 Vpp</li> <li>-Low harmonic content (patented LowHarmonics technology)</li> </ul>	<ul style="list-style-type: none"> <li>-Encoder with hollow shaft <math>\varnothing</math>20-27 mm</li> <li>-Resolution max. 2048 ppr</li> <li>-Sine output signals 1 Vpp</li> <li>-Mounting by torque support</li> </ul>	<ul style="list-style-type: none"> <li>-Encoder with end shaft max. <math>\varnothing</math>20 mm or cone shaft <math>\varnothing</math>17 mm (1:10)</li> <li>-Resolution max. 5000 ppr</li> <li>-Low harmonic content (patented LowHarmonics technology)</li> <li>-Top-quality sine signals</li> </ul>	
Voltage supply	5 VDC $\pm$ 10 % 8...26 VDC	5 VDC $\pm$ 10 % 9...30 VDC	5 VDC $\pm$ 10 % 8...26 VDC	5 VDC $\pm$ 10 % 9...30 VDC	
Resolution (steps/turn)	1024...5000	1024...5000	1024...2048	720...5000	
Output signals	A, B, N	A 90° B, C + inverted	A, B, N	K1 90° K2, K0 + inverted	
Operating temperature	-20...+85 °C	-20...+85 °C	-20...+85 °C	-20...+85 °C	
Housing	$\varnothing$ 58 mm	$\varnothing$ 60 mm	$\varnothing$ 80 mm	$\varnothing$ 105 mm	
Shaft diameter	$\varnothing$ 10-14 mm end shaft	$\varnothing$ 12-14 mm end shaft	$\varnothing$ 20-27 mm hollow shaft	$\varnothing$ 12-20 mm end shaft / $\varnothing$ 17 mm cone shaft	
Operating speed	$\leq$ 8000 rpm	$\leq$ 10000 rpm	$\leq$ 5000 rpm	$\leq$ 10000 rpm	
E-connection	Cable 1 m	Terminal box	Cable 1 m	Terminal box	

## Sine encoders

- Sine output 1 Vpp
- End shaft  $\varnothing$ 10-20 mm
- Hollow shaft  $\varnothing$ 20-27 mm
- Cone shaft  $\varnothing$ 17 mm
- Shaft  $\varnothing$ 6 and  $\varnothing$ 11 mm
- Optical sensing
- Resolution max. 5000 pulses
- LowHarmonics technique
- A 90° B and inverted signals
- Protection max. IP 66





				
OGS 71	POGS 90			
- Encoder with shaft $\varnothing$ 6 mm - Resolution max. 5000 ppr - Sine output signals 1 Vpp - Low harmonic content (patented LowHarmonics technology)	- Encoder with shaft $\varnothing$ 11 mm - Resolution max. 5000 ppr - Low harmonic content (patented LowHarmonics technology) - Sine output signals 1 Vpp			
5 VDC $\pm$ 10 % 9...30 VDC	5 VDC $\pm$ 10 % 9...30 VDC			
1024...5000	720...5000			
A 90° B, C + inverted	K1 90° K2, K0 + inverted			
-20...+85 °C	-20...+85 °C			
$\varnothing$ 60 mm	$\varnothing$ 115 mm			
$\varnothing$ 6 mm	$\varnothing$ 11 mm			
$\leq$ 10000 rpm	$\leq$ 10000 rpm			
Terminal box	Terminal box			

# Absolute encoders - parallel



## Absolute encoders - parallel

- End shaft and shaft encoders
- Clamping and synchro flange
- Optical and magnetic sensing
- Resolution: singleturn max. 13 bit
- Resolution: multiturn 12 bit
- High resistance to shock and vibrations
- Cable or connector output





				
Model	BMSH 58 parallel - <i>MAGRES</i>	BMSV 58 parallel - <i>MAGRES</i>	GA240, GA241 - parallel	GXP1W - parallel
Features	- Encoder singleturn / parallel - Magnetic sensing - Resolution: 12 bit - High resistance to shock and vibrations	- Encoder singleturn / parallel - Magnetic sensing - Resolution: 12 bit - High resistance to shock and vibrations	- Encoder singleturn / parallel - Optical sensing - Resolution: 13 bit - Clamping or synchro flange	- Encoder multiturn / parallel - Optical sensing - Resolution: singleturn 12 bit, multiturn 12 bit - Clamping or synchro flange
Voltage supply	10...30 VDC	10...30 VDC	10...30 VDC	10...30 VDC
Total resolution	12 bit	12 bit	13 bit	24 bit
Interface	12 parallel outputs	12 parallel outputs	13 parallel outputs	24 parallel outputs
Operating temperature	-20...+85 °C	-20...+85 °C	-25...+85 °C -40...+85 °C (optional)	-25...+70 °C
Housing	ø58 mm	ø58 mm	ø58 mm	ø58 mm
Shaft diameter	ø12 mm end shaft	ø6 mm / ø10 mm	ø6 mm / ø10 mm	ø6 mm / ø10 mm
Operating speed	≤12000 rpm	≤12000 rpm	≤10000 rpm	≤10000 rpm
E-connection	Cable	Cable	Connector or cable	Connector D-SUB, 37-pin, 1 m cable

# Absolute encoders - SSI







## Absolute encoders - SSI

- Hollow or end shaft encoders
- Singleturn and multiturn encoders
- Optical and magnetic sensing
- Resolution: singleturn 12-15 bit
- Resolution: multiturn 12-24 bit
- High resistance to shock and vibrations
- Programmable functions
- Optional: incremental signals

				
Model	BMSH 58, BMMH 58 SSI - <i>MAGRES</i>	GXM2S - SSI	G0M2H - SSI	ATD 4S A 4 Y10
Features	- Encoder single- or multiturn / SSI - Magnetic sensing - Resolution: singleturn 12 bit, multiturn 13 bit - High resistance to shock and vibrations	- Encoder multiturn / SSI - Optical sensing - Resolution: singleturn 14 bit, multiturn 12 bit - End shaft $\varnothing$ 12 mm / $\varnothing$ 14 mm	- Encoder multiturn / SSI - Optical sensing - Resolution: singleturn 14 bit, multiturn 12 bit - Hollow shaft max. $\varnothing$ 14 mm	- Encoder single- or multiturn / SSI - Optical sensing - Resolution: singleturn 15 bit, multiturn 24 bit - Hollow shaft $\varnothing$ 20-27 mm
Voltage supply	5 VDC $\pm$ 10 % 10...30 VDC	10...30 VDC	10...30 VDC	10...30 VDC
Total resolution	25 bit	26 bit	26 bit	39 bit
Interface	SSI	SSI Incremental A 90° B (optional)	SSI Incremental A 90° B (optional)	SSI
Operating temperature	-20...+85 °C	-25...+85 °C -40...+85 °C (optional)	-25...+85 °C -40...+85 °C (optional)	-20...+85 °C
Housing	$\varnothing$ 58 mm	$\varnothing$ 58 mm	$\varnothing$ 58 mm	$\varnothing$ 80 mm
Shaft diameter	$\varnothing$ 12 mm end shaft	$\varnothing$ 12-14 mm end shaft	$\varnothing$ 12-14 mm hollow shaft	$\varnothing$ 20-27 mm hollow shaft
Operating speed	$\leq$ 12000 rpm	$\leq$ 6000 rpm	$\leq$ 6000 rpm	$\leq$ 5000 rpm
E-connection	Connector or cable	Connector, 12-pin	Connector, 12-pin	Connector M23 type 2, 12-pin resp. 17-pin





# Absolute encoders - SSI



					
Model	G1S2B - SSI	BMSV 30, BMMV 30 SSI - <i>MAGRES</i>	BMSV 42, BMMV 42 SSI - <i>MAGRES</i>	BMSV 58, BMMV 58 SSI - <i>MAGRES</i>	
Features	-Encoder multiturn / 2 x SSI -Optical sensing -Resolution: singleturn 13 bit, multiturn 12 bit -For safety-relevant applications according SIL3	-Mini encoder single- or multiturn / SSI -Magnetic sensing -Resolution: singleturn 10 bit, multiturn 15 bit -Housing ø30 mm	-Mini encoder single- or multiturn / SSI -Magnetic sensing -Resolution: singleturn 12 bit, multiturn 13 bit -Housing ø42 mm	-Encoder single- or multiturn / SSI -Magnetic sensing -Resolution: singleturn 12 bit, multiturn 13 bit -High resistance to shock and vibrations	
Voltage supply	10...30 VDC	5 VDC ±10 % 10...30 VDC	5 VDC ±10 % 10...30 VDC	5 VDC ±10 % 10...30 VDC	
Total resolution	25 bit	25 bit	25 bit	25 bit	
Interface	SSI Incremental A, B + inverted	SSI	SSI	SSI	
Operating temperature	-25...+85 °C -40...+85 °C (optional)	-20...+85 °C	-20...+85 °C	-20...+85 °C	
Housing	ø90 mm	ø30 mm	ø42 mm	ø58 mm	
Shaft diameter	ø20 mm hollow shaft	ø5-8 mm	ø6 mm / ø10 mm	ø6 mm / ø10 mm	
Operating speed	≤3800 rpm	≤6000 rpm	≤12000 rpm	≤12000 rpm	
E-connection	Connector, 16-pin	Connector or cable	Connector or cable	Connector or cable	





## Absolute encoders - SSI

- Shaft and hollow shaft encoders
- Singleturn and multiturn encoders
- Optical and magnetic sensing
- Resolution: singleturn 10-18 bit
- Resolution: multiturn 12-16 bit
- High resistance to shock and vibrations
- Electronic setting of zero point
- Optional: incremental signals
- Protection max. IP 66

				
GA240, GA241 - SSI	GM400, GM401 - SSI	GBM2W - SSI	AMG 71	
- Encoder singleturn / SSI - Optical sensing - Resolution: 14 bit - Clamping or synchro flange	- Encoder multiturn / SSI - Optical sensing - Resolution: singleturn 14 bit, multiturn 12 bit - Clamping or synchro flange	- Encoder multiturn / SSI - Optical sensing - Resolution: singleturn 18 bit, multiturn 16 bit - Clamping or synchro flange	- Encoder multiturn / SSI - Optical sensing - Resolution: singleturn 13 bit, multiturn 12 bit / 16 bit - Multiturn: sensing principle without gears and battery	
10...30 VDC	10...30 VDC	10...30 VDC	7...30 VDC	
14 bit	26 bit	34 bit	29 bit	
SSI Incremental A 90° B (optional)	SSI Incremental A 90° B (optional)	SSI Incremental A 90° B (optional)	SSI	
-25...+85 °C -40...+85 °C (optional)	-25...+85 °C -40...+85 °C (optional)	-25...+85 °C -40...+85 °C (optional)	-20...+85 °C	
ø58 mm	ø58 mm	ø58 mm	ø60 mm	
ø6 mm / ø10 mm	ø6 mm / ø10 mm	ø6 mm / ø10 mm	ø6 mm	
≤10000 rpm	≤10000 rpm	≤10000 rpm	≤5000 rpm	
Connector or cable	Connector or cable	Connector or cable	Terminal box	

# Absolute encoders - bus interfaces








					
Model	BMSH 42, BMMH 42 CANopen - <i>MAGRES</i>	BMSH 58, BMMH 58 CANopen - <i>MAGRES</i>	GXP5S - CANopen	G0P5H - CANopen	
Features	- Mini encoder single- or multiturn / CANopen - Magnetic sensing - Resolution: singleturn 12 bit, multiturn 18 bit - Housing ø42 mm	- Encoder single- or multiturn / CANopen - Magnetic sensing - Resolution: singleturn 12 bit, multiturn 18 bit - Integrated fieldbus interface	- Encoder multiturn / CANopen - Optical sensing - Resolution: singleturn 13 bit, multiturn 16 bit - End shaft ø12 mm / ø14 mm	- Encoder multiturn / CANopen - Optical sensing - Resolution: singleturn 13 bit, multiturn 16 bit - Hollow shaft max. ø14 mm	
Voltage supply	10...30 VDC	10...30 VDC	10...30 VDC	10...30 VDC	
Total resolution	30 bit	30 bit	29 bit	29 bit	
Interface	CANopen	CANopen	CANopen	CANopen	
Operating temperature	-20...+85 °C	-20...+85 °C	-25...+85 °C -40...+85 °C (optional)	-25...+85 °C -40...+85 °C (optional)	
Housing	ø42 mm	ø58 mm	ø58 mm	ø58 mm	
Shaft diameter	ø12 mm end shaft	ø12 mm end shaft	ø12-14 mm end shaft	ø12-14 mm hollow shaft	
Protection DIN EN 60529	IP 42 IP 65	IP 65	IP 54	IP 54	
E-connection	Connector or cable	Connector or cable	Connector	Connector	



# Absolute encoders - bus interfaces





## Absolute encoders - bus interfaces

- CANopen and DeviceNet
- End shaft and hollow shaft encoders
- Shaft encoders with clamping and synchro flange
- Singleturn and multiturn encoders
- Optical and magnetic sensing
- Resolution: singleturn 12-13 bit
- Resolution: multiturn 16-18 bit
- High resistance to shock and vibrations
- Electronic setting of zero point

				
<b>BMSV 42, BMMV 42</b> CANopen - <i>MAGRES</i>	<b>BMSV 58, BMMV 58</b> CANopen - <i>MAGRES</i>	<b>GXP5W</b> - CANopen	<b>BMSH 42, BMMH 42</b> DeviceNet - <i>MAGRES</i>	<b>BMSH 58, BMMH 58</b> DeviceNet - <i>MAGRES</i>
- Mini encoder single- or multiturn / CANopen - Magnetic sensing - Resolution: singleturn 12 bit, multiturn 16 bit - Housing $\varnothing 42$ mm	- Encoder single- or multiturn / CANopen - Magnetic sensing - Resolution: singleturn 12 bit, multiturn 18 bit - Integrated fieldbus interface	- Encoder multiturn / CANopen - Optical sensing - Resolution: singleturn 13 bit, multiturn 16 bit - Clamping or synchro flange	- Mini encoder single- or multiturn / DeviceNet - Magnetic sensing - Resolution: singleturn 12 bit, multiturn 16 bit - Housing $\varnothing 42$ mm	- Encoder single- or multiturn / DeviceNet - Magnetic sensing - Resolution: singleturn 12 bit, multiturn 16 bit - Integrated fieldbus interface
10...30 VDC	10...30 VDC	10...30 VDC	10...30 VDC	10...30 VDC
28 bit	30 bit	29 bit	28 bit	28 bit
CANopen	CANopen	CANopen	DeviceNet	DeviceNet
-20...+85 °C	-20...+85 °C	-25...+85 °C -40...+85 °C (optional)	-20...+85 °C	-20...+85 °C
$\varnothing 42$ mm	$\varnothing 58$ mm	$\varnothing 58$ mm	$\varnothing 42$ mm	$\varnothing 58$ mm
$\varnothing 6$ mm / $\varnothing 10$ mm	$\varnothing 6$ mm / $\varnothing 10$ mm	$\varnothing 6$ mm / $\varnothing 10$ mm	$\varnothing 12$ mm end shaft	$\varnothing 12$ mm end shaft
IP 65	IP 65	IP 54 IP 65	IP 65	IP 65
Connector or cable	Connector or cable	Connector	Connector or cable	Connector or cable

# Absolute encoders - bus interfaces








					
Model	BMSV 42, BMMV 42 DeviceNet - <i>MAGRES</i>	BMSV 58, BMMV 58 DeviceNet - <i>MAGRES</i>	GXP8W - DeviceNet	BMMH 58 Profibus-DP - <i>MAGRES</i>	
Features	-Mini encoder single- or multiturn / DeviceNet  -Magnetic sensing  -Resolution: singleturn 12 bit, multiturn 16 bit  -Housing ø42 mm	-Encoder single- or multiturn / DeviceNet  -Magnetic sensing  -Resolution: singleturn 12 bit, multiturn 16 bit  -Integrated fieldbus interface	-Encoder multiturn / DeviceNet  -Optical sensing  -Resolution: singleturn 13 bit, multiturn 16 bit  -Clamping or synchro flange	-Encoder multiturn / Profibus-DP  -Magnetic sensing  -Resolution: singleturn 13 bit, multiturn 16 bit  -Integrated fieldbus interface	
Voltage supply	10...30 VDC	10...30 VDC	10...30 VDC	10...30 VDC	
Total resolution	28 bit	28 bit	29 bit	29 bit	
Interface	DeviceNet	DeviceNet	DeviceNet	Profibus-DPV0	
Operating temperature	-20...+85 °C	-20...+85 °C	-25...+85 °C -40...+85 °C (optional)	-20...+85 °C	
Housing	ø42 mm	ø58 mm	ø58 mm	ø58 mm	
Shaft diameter	ø6 mm / ø10 mm	ø6 mm / ø10 mm	ø6 mm / ø10 mm	ø12 mm end shaft	
Protection DIN EN 60529	IP 65	IP 65	IP 54 IP 65	IP 65	
E-connection	Connector or cable	Connector or cable	Connector	Male/female connector M12, connector M8	

# Absolute encoders - bus interfaces





## Absolute encoders - bus interfaces

- CANopen, DeviceNet, Profibus, SSI, EtherCAT, RS485
- Hollow shaft, end shaft and cone shaft
- Shaft encoders with clamping and synchro flange
- Singleturn and multiturn encoders
- Optical and magnetic sensing
- Resolution: singleturn 12-15 bit
- Resolution: multiturn 12-16 bit
- High resistance to shock and vibrations
- Electronic setting of zero point

				
<b>BMMV 58 Profibus-DP - MAGRES</b>	<b>HMG 11, HMG 11 + FSL</b>	<b>AMG 11, AMG 11 + FSL</b>	<b>ATD 4B A 4 Y11</b>	<b>GXM7S - RS485, GXM7W - RS485</b>
- Encoder multiturn / Profibus-DP - Magnetic sensing - Resolution: singleturn 13 bit, multiturn 16 bit - Integrated fieldbus interface	- Encoder multiturn / SSI / Profibus / CANopen - Optical sensing - Resolution: singleturn 13 bit, multiturn 12 bit / 16 bit - Hollow shaft, end shaft or cone shaft ø16-20 mm	- Encoder multiturn / SSI / Profibus / CANopen - Optical sensing - Resolution: singleturn 13 bit, multiturn 12 bit / 16 bit - EURO-flange B10 / shaft ø11 mm	- Encoder single- or multiturn / EtherCAT - Optical sensing - Resolution: singleturn 15 bit, multiturn 16 bit - Hollow shaft ø20-27 mm	- Encoder multiturn / RS485 - Optical sensing - Resolution: singleturn 13 bit, multiturn 12 bit - End shaft ø12 mm / ø14 mm - Clamping flange or synchro flange
10...30 VDC	9...30 VDC	9...30 VDC	10...30 VDC	10...30 VDC
29 bit	29 bit	29 bit	31 bit	25 bit
Profibus-DPV0	SSI Profibus-DPV0 CANopen	SSI Profibus-DPV0 CANopen	EtherCAT	RS485
-20...+85 °C	-20...+85 °C	-20...+85 °C	-20...+85 °C	-25...+85 °C -40...+85 °C (optional)
ø58 mm	ø122 mm	ø122 mm	ø80 mm	ø58 mm
ø6 mm / ø10 mm	ø16-20 mm hollow, end or cone shaft	ø11 mm	ø20-27 mm hollow shaft	ø12-14 mm end shaft ø6 mm / ø10 mm
IP 65	IP 67	IP 67	IP 65	IP 54 IP 65
Male/female connector M12, connector M8	Terminal box/ bus cover	Terminal box/ bus cover	Male M12, A-coded, female M12, D-coded	Connector or cable

# Absolute encoders - modular bus covers








				
Model	BMSH 58, BMMH 58 flexible - <i>MAGRES</i>	GXAMS, GXMMS - <i>multivo</i>	GBAMS, GBMMS - <i>multivoPlus</i>	G0AMH, G0MMH - <i>multivo</i>
Features	<ul style="list-style-type: none"> <li>- Encoder single- or multiturn / bus cover</li> <li>- Magnetic sensing</li> <li>- Resolution: singleturn 12 bit, multiturn 18 bit</li> <li>- Modular fieldbus interfaces</li> </ul>	<ul style="list-style-type: none"> <li>- Encoder single- or multiturn / bus cover</li> <li>- Optical sensing</li> <li>- Resolution: singleturn 13 bit, multiturn 16 bit</li> <li>- End shaft <math>\varnothing</math>12 mm / <math>\varnothing</math>14 mm</li> </ul>	<ul style="list-style-type: none"> <li>- Encoder single- or multiturn / bus cover</li> <li>- Optical sensing</li> <li>- High total resolution max. 31 bit</li> <li>- End shaft <math>\varnothing</math>12 mm / <math>\varnothing</math>14 mm</li> </ul>	<ul style="list-style-type: none"> <li>- Encoder single- or multiturn / bus cover</li> <li>- Optical sensing</li> <li>- Resolution: singleturn 13 bit, multiturn 16 bit</li> <li>- Hollow shaft max. <math>\varnothing</math>14 mm</li> </ul>
Voltage supply	10...30 VDC	10...30 VDC	10...30 VDC	10...30 VDC
Total resolution	30 bit	29 bit	31 bit	29 bit
Interface	Profibus-DPV0 / V2 CANopen DeviceNet EtherCAT	Profibus-DPV0 / V2 CANopen DeviceNet EtherCAT Fiber-optic bus SSI	Profibus-DPV0 / V2 CANopen DeviceNet EtherCAT Fiber-optic bus SSI	Profibus-DPV0 CANopen DeviceNet
Operating temperature	-20...+85 °C	-25...+85 °C -40...+85 °C (optional)	-25...+85 °C -40...+85 °C (optional)	-25...+85 °C -40...+85 °C (optional)
Housing	$\varnothing$ 58 mm	$\varnothing$ 58 mm	$\varnothing$ 58 mm	$\varnothing$ 58 mm
Shaft diameter	$\varnothing$ 12 mm end shaft	$\varnothing$ 12-14 mm end shaft	$\varnothing$ 12-14 mm end shaft	$\varnothing$ 12-14 mm hollow shaft
Protection DIN EN 60529	IP 65	IP 54	IP 54	IP 54

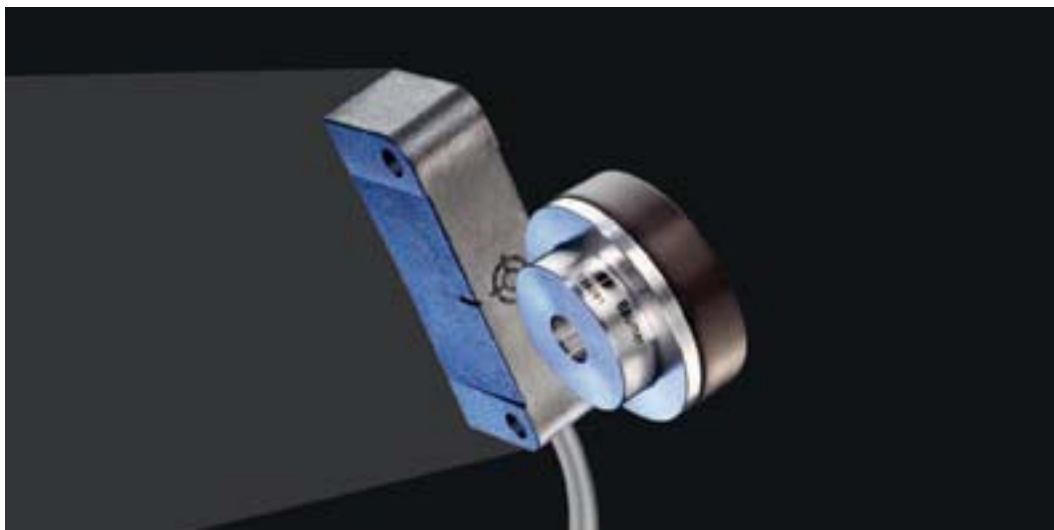
# Absolute encoders - modular bus covers





## Absolute encoders - modular bus covers

- Modular bus interfaces
- CANopen, DeviceNet, Profibus, EtherCAT, fiber-optic, SSI
- End shaft and hollow shaft encoders
- Shaft encoders with clamping and synchro flange
- Optical and magnetic sensing
- Resolution: singleturn 12-18 bit
- Resolution: multiturn 16-18 bit
- High resistance to shock and vibrations

				
<b>G1MMH, G2MMH - multivo</b>	<b>GBAMH, GBMMH - multivoPlus</b>	<b>BMSV 58, BMMV 58 flexible - MAGRES</b>	<b>GXAMW, GXMMW - multivo</b>	<b>GBAMW, GBMMW - multivoPlus</b>
- Encoder multiturn / bus cover - Optical sensing - Resolution: singleturn 13 bit, multiturn 16 bit - Hollow shaft of 1" and 2" diameter	- Encoder single- or multiturn / bus cover - Optical sensing - High total resolution max. 31 bit - Hollow shaft max. ø14 mm	- Encoder single- or multiturn / bus cover - Magnetic sensing - Resolution: singleturn 12 bit, multiturn 18 bit - Modular fieldbus interfaces	- Encoder single- or multiturn / bus cover - Optical sensing - Resolution: singleturn 13 bit, multiturn 16 bit - Clamping or synchro flange	- Encoder single- or multiturn / bus cover - Optical sensing - High total resolution max. 31 bit - Clamping or synchro flange
10...30 VDC	10...30 VDC	10...30 VDC	10...30 VDC	10...30 VDC
29 bit	31 bit	30 bit	29 bit	31 bit
Profibus-DPV0 CANopen DeviceNet	Profibus-DPV0 CANopen DeviceNet	Profibus-DPV0 / V2 CANopen DeviceNet EtherCAT	Profibus-DPV0 / V2 CANopen DeviceNet EtherCAT Fiber-optic bus SSI	Profibus-DPV0 / V2 CANopen DeviceNet EtherCAT Fiber-optic bus SSI
-25...+85 °C -40...+85 °C (optional)	-25...+85 °C -40...+85 °C (optional)	-20...+85 °C	-25...+85 °C -40...+85 °C (optional)	-25...+85 °C -40...+85 °C (optional)
ø90 mm ø116 mm	ø58 mm	ø58 mm	ø58 mm	ø58 mm
ø25.4 / ø50.8 mm hollow shaft	ø12-14 mm hollow shaft	ø6 mm / ø10 mm	ø6 mm / ø10 mm	ø6 mm / ø10 mm
IP 54	IP 54	IP 65	IP 54 IP 65	IP 54 IP 65

# Encoders without bearing




					
Model	MEFK 10 - EcoSpin	MDFK 08	MDFK 10	ITD 67 A 4 Y 9	
Features	<ul style="list-style-type: none"> <li>-Magnetic sensor with rotor</li> <li>-Resolution max. 2880 steps</li> <li>-Output signals A 90° B</li> <li>-Output circuit: push-pull</li> <li>-Non-contact, wear-free sensing system</li> </ul>	<ul style="list-style-type: none"> <li>-Magnetic sensor with rotor</li> <li>-Resolution max. 4096 steps</li> <li>-Output signals A 90° B or A 90° B +N</li> <li>-Output circuits: push-pull and RS422</li> <li>-Non-contact, wear-free sensing system</li> </ul>	<ul style="list-style-type: none"> <li>-Magnetic sensor with rotor</li> <li>-Resolution max. 16384 steps</li> <li>-Output signals A 90° B or A 90° B +N</li> <li>-Output circuits: push-pull and RS422</li> <li>-Non-contact, wear-free sensing system</li> </ul>	<ul style="list-style-type: none"> <li>-Magnetic sensor with rotor</li> <li>-Magnetic sensing</li> <li>-Resolution 20 and 50 pulses</li> <li>-Output circuits: HTL</li> <li>-Without own bearings</li> </ul>	
Voltage supply	8...28 VDC	8...30 VDC 5 VDC ±5 %	8...30 VDC 5 VDC ±5 %	8...24 VDC	
Output signals	A 90° B	A 90° B A 90° B, N A 90° B + inverted A 90° B, N + inverted	A 90° B, N A 90° B, N + inverted	A, B	
System accuracy	±0.8 °	±0.5 °	±0.5 °	-	
Jitter	≤20 %	≤15 %	≤15 %	-	
Angular range	-	-	-	-	
Housing	Rectangular 10 mm	Rectangular 8.5 mm	Rectangular 10 mm	-	
Protection DIN EN 60529	IP 67	IP 67	IP 67	IP 66	

# Encoders without bearing





## Encoders without bearing

- Wear-free systems
- For rotary and linear applications
- Dust and dirt tolerant
- 2- and 3-channel variants with zero pulse
- High resolution
- Absolute position sensing through 360° rotation angle
- High protection max. IP 67

				
ITD 69 A 4 Y 5	MDRM 18, MDFM 20 - A270 / C270	MDRM 18, MDFM 20 - A360 / C360	MLFK 10	
<ul style="list-style-type: none"> <li>-Magnetic sensor with rotor</li> <li>-Magnetic sensing</li> <li>-Resolution max. 2048 ppr</li> <li>-Output circuits HTL, TTL or sine 1 V<sub>ss</sub></li> <li>-Without own bearings</li> </ul>	<ul style="list-style-type: none"> <li>-Magnetic sensor with rotor</li> <li>-Measuring range 270° linear</li> <li>-Resolution 1.41° (A270) 0.09° (C270)</li> <li>-Output signals 4...20 mA</li> <li>-Non-contact, wear-free sensing system</li> </ul>	<ul style="list-style-type: none"> <li>-Magnetic sensor with rotor</li> <li>-Measuring range 360° linear</li> <li>-Resolution 1.41° (A360) 0.09° (C360)</li> <li>-Output signals 0...5 V, 0...4.3 V</li> <li>-Non-contact, wear-free sensing system</li> </ul>	<ul style="list-style-type: none"> <li>-System for linear motion feedback</li> <li>-Resolution max. 0.005 mm</li> <li>-Output signals A 90° B and A 90° B + inverted</li> <li>-Output circuits: push-pull and RS422</li> <li>-Non-contact, wear-free sensing system</li> </ul>	
5 VDC ±5 % 8...26 VDC 5 VDC ±10 %	15...30 VDC	5 VDC ±5 %	8...30 VDC 5 VDC ±5 %	
A 90° B, N A 90° B, N + inverted	4...20 mA	0...5 V, non-regulated 0...4.3 V, regulated	A 90° B A 90° B + inverted	
-	±0.6 %, (A270) ±0.25 % (C270)	±0.6 %, (A360) ±0.25 % (C360)	±0.04 mm	
-	-	-	-	
-	270 ° linear	360 ° linear	-	
16 x 48 mm	Rectangular 20 mm Cylindrical M18	Rectangular 20 mm Cylindrical M18	Rectangular 10 mm	
IP 66	IP 67	IP 67	IP 67	

# Tachogenerators



					
Model	GT 5	GT 9	GTB 9	GTR 9	
Features	<ul style="list-style-type: none"> <li>-High response speed</li> <li>-Open circuit voltage 7...10 mV per rpm</li> <li>-End shaft <math>\varnothing</math>8-12 mm</li> <li>-Top signal quality over the total rotational speed range by patented Longlife technique</li> </ul>	<ul style="list-style-type: none"> <li>-High response speed</li> <li>-Open circuit voltage 10...20 mV per rpm</li> <li>-End shaft <math>\varnothing</math>12-16 mm or cone shaft <math>\varnothing</math>17 mm (1:10)</li> <li>-Top signal quality over the total rotational speed range by patented Longlife technique</li> </ul>	<ul style="list-style-type: none"> <li>-High response speed</li> <li>-Open circuit voltage 10...20 mV per rpm</li> <li>-End shaft <math>\varnothing</math>12-16 mm or cone shaft <math>\varnothing</math>17 mm (1:10)</li> <li>-Top signal quality over the total rotational speed range by patented Longlife technique</li> </ul>	<ul style="list-style-type: none"> <li>-High response speed</li> <li>-Open circuit voltage 20...60 mV per rpm</li> <li>-End shaft <math>\varnothing</math>16 mm</li> <li>-Top signal quality over the total rotational speed range by patented Longlife technique</li> </ul>	
Linearity tolerance	$\leq 0.15$ %	$\leq 0.15$ %	$\leq 0.15$ %	$\leq 0.15$ %	
Temperature coefficient	$\pm 0.05$ %/K (idle)	$\pm 0.05$ %/K (idle)	$\pm 0.05$ %/K (idle)	$\pm 0.05$ %/K (idle), optional: 0.005 %/K	
Open-circuit voltage	7...10 mV per rpm	10...20 mV per rpm	10...20 mV per rpm	20...60 mV per rpm	
Shaft diameter	$\varnothing$ 8-12 mm end shaft	$\varnothing$ 12-16 mm end shaft / $\varnothing$ 17 mm cone shaft	$\varnothing$ 12-16 mm end shaft / $\varnothing$ 17 mm cone shaft	$\varnothing$ 16 mm end shaft	
Operating temperature	-30...+130 °C	-30...+130 °C	-30...+130 °C	-30...+130 °C	
Protection DIN EN 60529	IP 00 IP 54	IP 00 IP 44	IP 68	IP 56	
E-connection	Plug-in terminals	Plug-in terminals	Connector	Connector	



# Tachogenerators


## Tachogenerators

- Patented LongLife technique
- Housings ø52 mm, bearingless configuration
- End shaft ø8-16 mm without bearing
- Shaft ø6-18 mm with bearing
- Cone shaft ø17 mm
- Housing with bearing
- Temperature-resistant -30...+130 °C
- High resistance to shock and vibrations
- High protection max. IP 68

				
KTD 2-... B14	TDP 0,09	TDP 0,2	GMP 1,0	TDP 13
<ul style="list-style-type: none"> <li>-High response speed</li> <li>-Open circuit voltage 7...15 mV per rpm</li> <li>-Shaft ø6 mm with synchro flange</li> <li>-Wide rotation speed range</li> </ul>	<ul style="list-style-type: none"> <li>-High response speed</li> <li>-Open circuit voltage 10...60 mV per rpm</li> <li>-Shaft ø6 mm with flange</li> <li>-Top signal quality over the total rotational speed range by patented Longlife technique</li> </ul>	<ul style="list-style-type: none"> <li>-High response speed</li> <li>-Open circuit voltage 10...150 mV per rpm</li> <li>-Shaft ø7-14 mm with flange</li> <li>-Top signal quality over the total rotational speed range by patented Longlife technique</li> </ul>	<ul style="list-style-type: none"> <li>-High response speed</li> <li>-Open circuit voltage 40...175 mV per rpm</li> <li>-Shaft ø12-14 mm</li> <li>-Top signal quality over the total rotational speed range by patented Longlife technique</li> </ul>	<ul style="list-style-type: none"> <li>-High response speed</li> <li>-Open circuit voltage 20...200 mV per rpm</li> <li>-Shaft ø14-18 mm with flange</li> <li>-Top signal quality over the total rotational speed range by patented Longlife technique</li> </ul>
≤0.2 %	≤0.15 %	≤0.15 %	≤0.5 %	≤0.15 %
±0.2 %/10 K (-10...+100 °C)	±0.05 %/K (idle)	±0.05 %/K (idle)	±0.05 %/K (idle)	±0.05 %/K (idle)
7...15 mV per rpm	10...60 mV per rpm	10...150 mV per rpm	40...175 mV per rpm	20...200 mV per rpm
ø6 mm	ø6 mm	ø7-14 mm	ø12-14 mm	ø14-18 mm
-20...+100 °C	-30...+130 °C	-30...+130 °C	-30...+130 °C	-30...+130 °C
IP 55	IP 56	IP 55	IP 55	IP 55
Screw connection, 2-pin	Terminal box	Terminal box	Terminal box	Terminal box

# Ex/stainless steel encoders



					
Model	EEx HOG 161 - incremental	EEx OG 9 - incremental	X 700 - incremental	X 700 - SSI	
Features	<ul style="list-style-type: none"> <li>-Encoder incremental / ATEX</li> <li>-Optical sensing</li> <li>-Ex-approved by ATEX II 2G Ex de IIC T6</li> <li>-Hollow shaft <math>\varnothing</math>30-70 mm</li> </ul>	<ul style="list-style-type: none"> <li>-Encoder incremental / ATEX</li> <li>-Optical sensing</li> <li>-Ex-approved by ATEX II 2G Ex de IIC T6</li> <li>-Shaft <math>\varnothing</math>11 mm</li> </ul>	<ul style="list-style-type: none"> <li>-Encoder incremental / ATEX</li> <li>-Optical sensing</li> <li>-Resolution max. 5000 ppr</li> <li>-Clamping flange / shaft <math>\varnothing</math>10 mm</li> </ul>	<ul style="list-style-type: none"> <li>-Encoder single- or multiturn / SSI / ATEX</li> <li>-Optical sensing</li> <li>-Resolution: singleturn 14 bit, multiturn 12 bit</li> <li>-Clamping flange / shaft <math>\varnothing</math>10 mm</li> </ul>	
Voltage supply	5 VDC $\pm$ 5 % 9...26 VDC 9...30 VDC	5 VDC $\pm$ 5 % 9...26 VDC 9...30 VDC	4.75...30 VDC	10...30 VDC	
Resolution (steps/turn)	250...2500	1...5000	5...5000	-	
Total resolution	-	-	-	26 bit	
Operating temperature	-20...+65 °C (T5) -20...+70 °C (T6)	-20...+55 °C	-25...+70 °C	-25...+60 °C	
Housing	$\varnothing$ 160 mm	$\varnothing$ 120 mm	$\varnothing$ 70 mm	$\varnothing$ 70 mm	
Shaft diameter	$\varnothing$ 30-70 mm hollow shaft	$\varnothing$ 11 mm	$\varnothing$ 10 mm	$\varnothing$ 10 mm	
Operating speed	$\leq$ 5600 rpm	$\leq$ 7000 rpm	$\leq$ 6000 rpm	$\leq$ 6000 rpm	
E-connection	Terminal box	Terminal box	Cable 2 m (other length upon request)	Cable 2 m (other length upon request)	
Protection DIN EN 60529	IP 54 (T6) IP 56 (T5)	IP 56	IP 67	IP 67	

# Ex/stainless steel encoders

## Ex/stainless steel encoders

- Ex-approved by ATEX
- Stainless steel housing
- Incremental and absolute encoders
- Optical and magnetic sensing
- SSI, CANopen and modular bus cover
- Incremental resolution max. 5000 pulses
- Total resolution max. 30 bit
- High resistance to shock and vibrations
- High protection max. IP 68 or IP 69k



				
X 700 - CANopen	BMMV 58 SSI - <i>MAGRES hermetic</i>	GE400, GE401 - SSI	GEMMW - <i>multivo</i>	BMMV 58 flexible - <i>MAGRES hermetic</i>
- Encoder multiturn / CANopen / ATEX - Optical sensing - Resolution: singleturn 13 bit, multiturn 16 bit - Clamping flange / shaft $\varnothing 10$ mm	- Encoder multiturn / SSI - Magnetic sensing, hermetically sealed - Resolution: singleturn 12 bit, multiturn 13 bit - High resistance to shock and vibrations	- Encoder multiturn / SSI - Stainless steel design - Optical sensing - Resolution: singleturn 14 bit, multiturn 12 bit	- Encoder multiturn / bus cover - Stainless steel design - Optical sensing - Resolution: singleturn 13 bit, multiturn 16 bit	- Encoder multiturn / bus cover - Magnetic sensing, hermetically sealed - Resolution: singleturn 12 bit, multiturn 18 bit - Modular fieldbus interfaces
10...30 VDC	5 VDC $\pm 10$ % 10...30 VDC	10...30 VDC	10...30 VDC	10...30 VDC
-	-	-	-	-
29 bit	25 bit	26 bit	29 bit	30 bit
-25...+60 °C	-40...+85 °C	-25...+85 °C -40...+85 °C (optional)	-25...+85 °C -40...+85 °C (optional)	-40...+85 °C
$\varnothing 70$ mm	$\varnothing 58$ mm	$\varnothing 58$ mm	$\varnothing 58$ mm	$\varnothing 58$ mm
$\varnothing 10$ mm	$\varnothing 10$ mm	$\varnothing 6$ mm / $\varnothing 10$ mm	$\varnothing 10$ mm	$\varnothing 10$ mm
$\leq 6000$ rpm	$\leq 6000$ rpm	$\leq 10000$ rpm	$\leq 10000$ rpm	$\leq 12000$ rpm
Cable 2 m (other length upon request)	Connector or cable	Connector	Bus cover	Bus cover
IP 67	IP 68 IP 69K	IP 67	IP 67	IP 68 IP 69K

# Resolvers



## Resolvers

- Shaft  $\varnothing$ 6 mm
- Hollow shaft  $\varnothing$ 10-16 mm
- Extremely robust mechanics
- Rotation speed max. 10000 rpm
- Temperature-resistant max. +100 °C
- High resistance to shock and vibrations
- Protection IP 65


				
Model	RTD 1 B14 Y 1	RTD 4 A 4 Y 2		
Features	<ul style="list-style-type: none"> <li>- Robust resolver with shaft <math>\varnothing</math>6 mm</li> <li>- Rotation speed max. 10000 rpm</li> <li>- Centering alignment <math>\varnothing</math>50 mm</li> <li>- Mounting hole circle <math>\varnothing</math>68 mm</li> </ul>	<ul style="list-style-type: none"> <li>- Robust resolver with end shaft <math>\varnothing</math>10-16 mm</li> <li>- Rotation speed max. 8000 rpm</li> <li>- High resistance against shocks and vibrations</li> <li>- Wide operating temperature range</li> </ul>		
Primary element	Rotor	Rotor		
Number of pole pairs	1 = 2-pin	1 = 2-pin		
Input voltage	7 Vrms	7 Vrms		
Input frequency	10 kHz	10 kHz		
Shaft diameter	$\varnothing$ 6 mm	$\varnothing$ 10-16 mm end shaft		
Operating temperature	-20...+100 °C	-20...+100 °C		
Protection DIN EN 60529	IP 65	IP 65		
E-connection	Connector M23 type 2, 12-pin	Connector M23 type 2, 12-pin		

# Inclination sensors



## Inclination sensors

- Measuring range two-dimensional: 15°, 30°, 60°
- Measuring range one-dimensional: 360°
- CANopen or Profibus interface
- Temperature-resistant max. +85 °C
- High resistance to shock and vibrations
- Protection IP 66
- Optional: housing of stainless steel

				
Model	GNAMG			
Features	<ul style="list-style-type: none"> <li>- Inclination sensor / CANopen / Profibus</li> <li>- Measuring range two-dimensional: 15°, 30° and 60°</li> <li>- Measuring range one-dimensional: 360°</li> <li>- Resolution: 0.001° to 1°</li> <li>- Precision: ±0.1° to 0.5°</li> </ul>			
Voltage supply	10...30 VDC			
Measuring range	15°, 30°, 60° (two-dimensional) 360° (one-dimensional)			
Interface	CANopen Profibus-DPV0			
Housing	Mounting plate with bus cover			
Operating temperature	-25...+85 °C -40...+85 °C (optional)			
Protection DIN EN 60529	IP 66			
E-connection	Cable gland or connector M12			

# Worldwide presence

We at Baumer like to be close to customers; we listen to them and, understanding their needs, 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. 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.

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