

# Magnetic Absolute Encoder WDGA

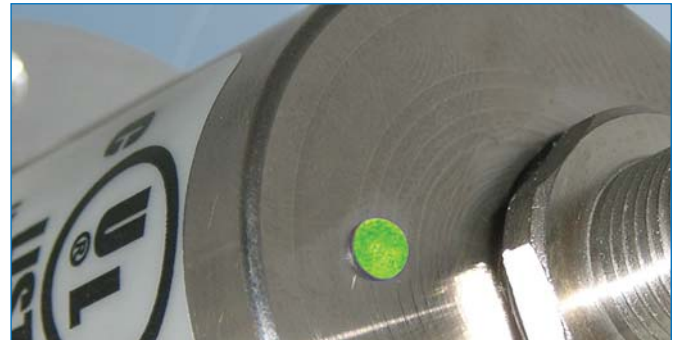
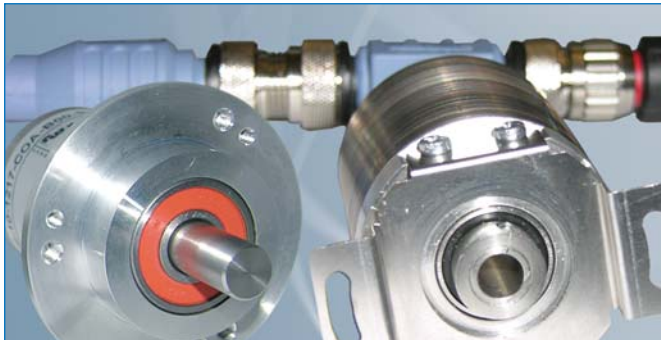


**EnDra**<sup>®</sup>  
Technologie

- CANopen in a 36 mm housing
- Single-/Multiturn (12/40 Bit)
- Ground-breaking Technology with 32 Bit processor
- Very high shaft loading, IP67
- EnDra<sup>®</sup> Technology:  
No gears, no battery

**CANopen**<sup>®</sup>

# Absolute encoder WDGA, solid and hollow shaft ... magnetic, autonomous - thanks to EnDra®



The singleturn and multiturn absolute rotary encoders, series WDGA, possess new, outstanding qualities thanks to their patented EnDra® technology:

- Free of wear – no gears
- Environmentally friendly – no battery
- High energy efficiency – low power consumption

[www.wachendorff-automation.com/wdga](http://www.wachendorff-automation.com/wdga)

With their high resolution of 12 Bit singleturn and 12 Bit + 18 Bit multiturn, they are ideal for those applications, where high measuring accuracy as well as mechanical ruggedness is important. The interface provides the evaluation electronics with the complete position value, consisting of the combination of the singleturn position with the corresponding multiturn position based on the number of revolutions. The resolution of the singleturn position is 12 Bit (4096 steps per revolution). The multiturn can handle up to 40 bits, depending on requirements.

In practice, in the CAN profile, 32 bits are processed. Higher resolutions are transmitted via High Precision Objects.

Despite its extremely high resolution, the maintenance-free encoder has need of neither gears nor back-up battery. This guarantees a long service-life for the mechanics as well as helping protect the environment.

With its exceptionally high shaft loads of up to 220 N radial and 120 N axial, it will work reliably and accurately for years to come.

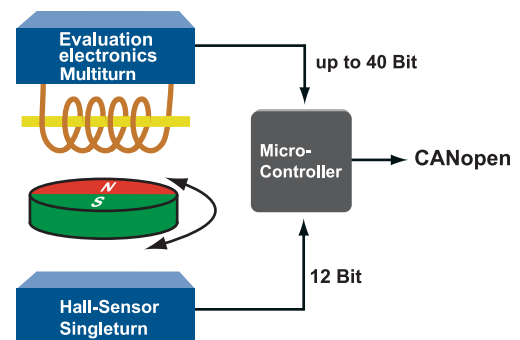


### Quick in operation: 100 % CANopen

The WDGA absolute encoders are equipped with a two-colour LED (red/green). Thanks to the differentiated change in colour and the varying blinking frequencies of the LED, important status signalling can be read off directly. The WDGA absolute encoders can thus be integrated quickly and easily into the existing CANbus topology.

### Operating principle of the EnDra® technology for the multiturn:

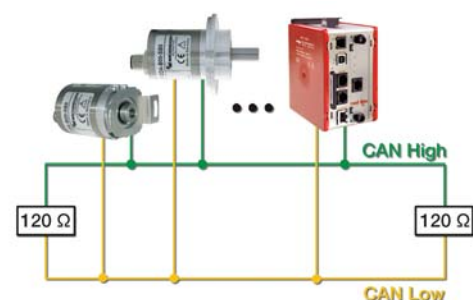
The Wachendorff WDGA encoders do not require mechanical gears to detect the number of revolutions and the direction of rotation. Instead the revolutions are determined by means of an energy wire (EnDra®): a permanent magnet accumulates in the wire so much energy that for a defined position the information "Revolution" and "Direction of Rotation" is transmitted to the evaluation electronics. An external energy feed, for example by means of a battery, is not required for this. The result is that this patented system is able to work fully autonomously.



The following examples serve to make the enormous capabilities of the WDGA absolute encoders even clearer:

- Using a measuring wheel with a circumference of 500 mm it is possible to make an absolute measurement of the total circumference of the earth, approx. 40,076 km, with a resolution of around 120 µm.
- If you run our WDGA absolute encoder 24 hours a day, 7 days a week, at its max. speed of 12,000 rpm, it will only reach its final value after around 11 years.

**And all of this absolutely autonomously.**



# Encoder WDGA absolute CANopen magnetic, EnDra®



## Specifications:

### Mechanical Data

Housing:	ferrous chrome-plated, magnetic screening		
Shaft/hollow bore (blind):	stainless steel, not magnetic		
Flange:	Aluminium		
Bearing type:	2 precision ball bearings		
Shaft encoder:	<b>WDGA 36A</b>	<b>WDGA 58A</b>	<b>WDGA 58B</b>
Flange:	synchro	synchro	clamping
Shaft Ø:	6 mm	6 mm	10 mm
Length:	11.5 mm	12 mm	20 mm
Operating speed max.:	12,000 rpm	8,000 rpm	8,000 rpm
Permissible shaft loading:			
max. $F_r$	80 N	125 N	220 N
max. $F_a$	50 N	70 N	120 N
Starting torque: (at ambient temperature)	< 0,3 Ncm	< 1 Ncm	< 1 Ncm
Service life:			
at 100 % rated shaft load	1 x 10 <sup>9</sup> revs.	1 x 10 <sup>9</sup> revs.	1 x 10 <sup>9</sup> revs.
at 40 % rated shaft load	1 x 10 <sup>10</sup> revs.	1 x 10 <sup>10</sup> revs.	1 x 10 <sup>10</sup> revs.
at 20 % rated shaft load	1 x 10 <sup>11</sup> revs.	1 x 10 <sup>11</sup> revs.	1 x 10 <sup>11</sup> revs.
Hollow shaft encoder:	<b>WDGA 36E</b>		
Flange:	hollow bore		
Shaft Ø:	6 mm		
Insertion depth min./max.:	8 mm/17 mm		
Operating speed max.:	12,000 rpm		
Permissible shaft loading:			
max. $F_r$	80 N		
max. $F_a$	50 N		
Starting torque: (at ambient temperature)	< 0,3 Ncm		
Service life:			
at 100 % rated shaft load	1,4 x 10 <sup>8</sup> revs.		
at 40 % rated shaft load	2,0 x 10 <sup>9</sup> revs.		
at 20 % rated shaft load	1,7 x 10 <sup>10</sup> revs.		
<b>Sensor data</b>			
Singleturn technology:	innovative hall sensor technology		
Singleturn resolution:	4.096 steps/360° (12 Bit)		
Singleturn precision:	<1.5°		
intern cycle time:	≤ 600 µs		
Multiturn Technology:	patented system with no battery and no gears		
Multiturn resolution:	up to 262.144 revolutions (18 Bit) with high precision value up to 40 Bit		

### Environmental data

Operating temperature: - 40 °C up to + 80 °C  
 Storage temperature: - 40 °C up to + 100 °C  
 Protection class (EN 60529): IP67, shaft sealed to IP65

ESD (DIN EN 61000-4-2): 8 kV  
 Burst (DIN EN 61000-4-4): 2 kV  
 includes EMC: DIN EN 61000-6-2  
 DIN EN 61000-6-4

- EnDra®: maintenance-free and environmentally friendly
- CANopen, Single- and Multiturn
- Communication Profile according to CiA 301
- Device Profile for encoder CiA 406 V3.2 class C2
- Single-/Multiturn (12 Bit / 40 Bit)
- Forward-looking technology with 32 Bit processor
- 2-colour-LED as indicator for operating condition and error message appropriate CiA 303-3
- High shaft load up to 220 N radial, 120 N axial

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Vibration:	50 m/s <sup>2</sup> (10-2000 Hz)
(DIN EN 60068-2-6)	
Shock:	1000 m/s <sup>2</sup> (6 ms)
(DIN EN 60068-2-27)	
Design:	appropriate DIN VDE 0160

### Interface

Protocol:	<b>CAN</b> CANopen
	- Communication profil CiA 301
	- Device Profile for encoder CiA 406 V3.2 class C2
Node number:	0 up to 127 (default 127)
Baud rate:	10 kBaud up to 1 MBaud with automatic bit rate detection

The standard settings as well as any customization in the software can be changed via LSS (CiA 305) and the SDO protocol, e. g. PDOs, Scaling, Heartbeat, Node-ID, Baud rate, etc.

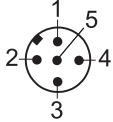
### Programmable CAN transmission modes

- **Synchronous mode:** when a synchronisation telegram (SYNC) is received from another bus node, PDOs are transmitted independently.
- **Asynchronous mode:** a PDO message is triggered by an internal event. (e.g. change of measured valued, internal timer, etc.)

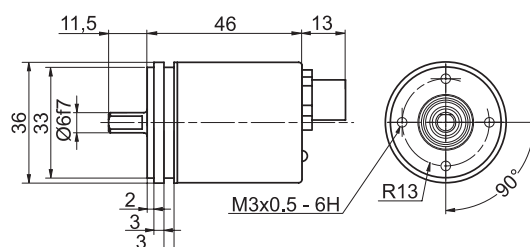
### Electrical Data:

Supply voltage:	10 VDC up to 30 VDC max. 50 mA
Power consumption:	max. 0,5 W

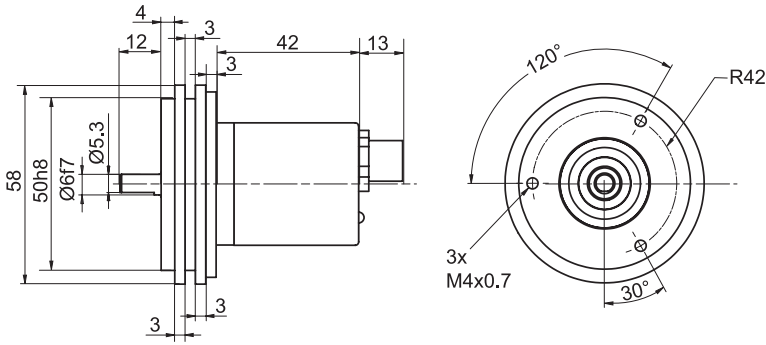
### Electrical connections, axial, M12x1

Definition	connector pin (connector-encoder)	Sensor connector pin assignment 5-pin
$U_B$	2	
Ground (GND)	3	
CAN <sub>High</sub>	4	
CAN <sub>Low</sub>	5	
CAN <sub>GND</sub> / shield	1	

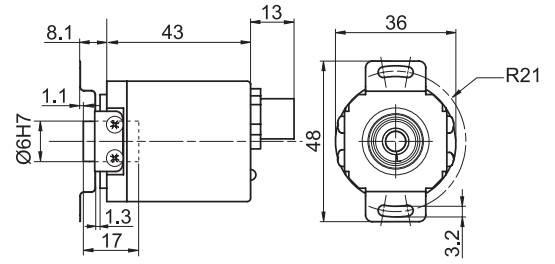
### Synchro flange WDGA 36A



**Synchro flange WDGA 58A**

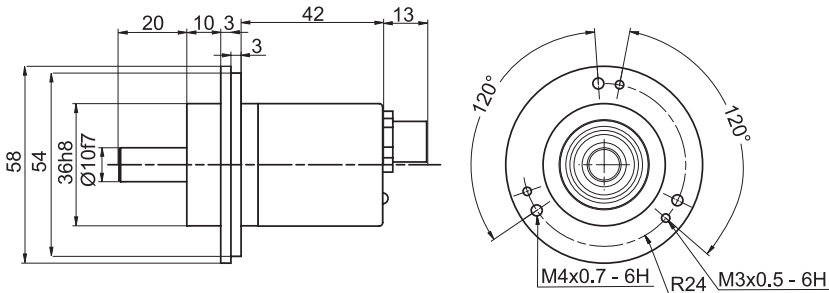


**Hollow bore (blind) WDGA 36E**



All dimensional specifications in mm.

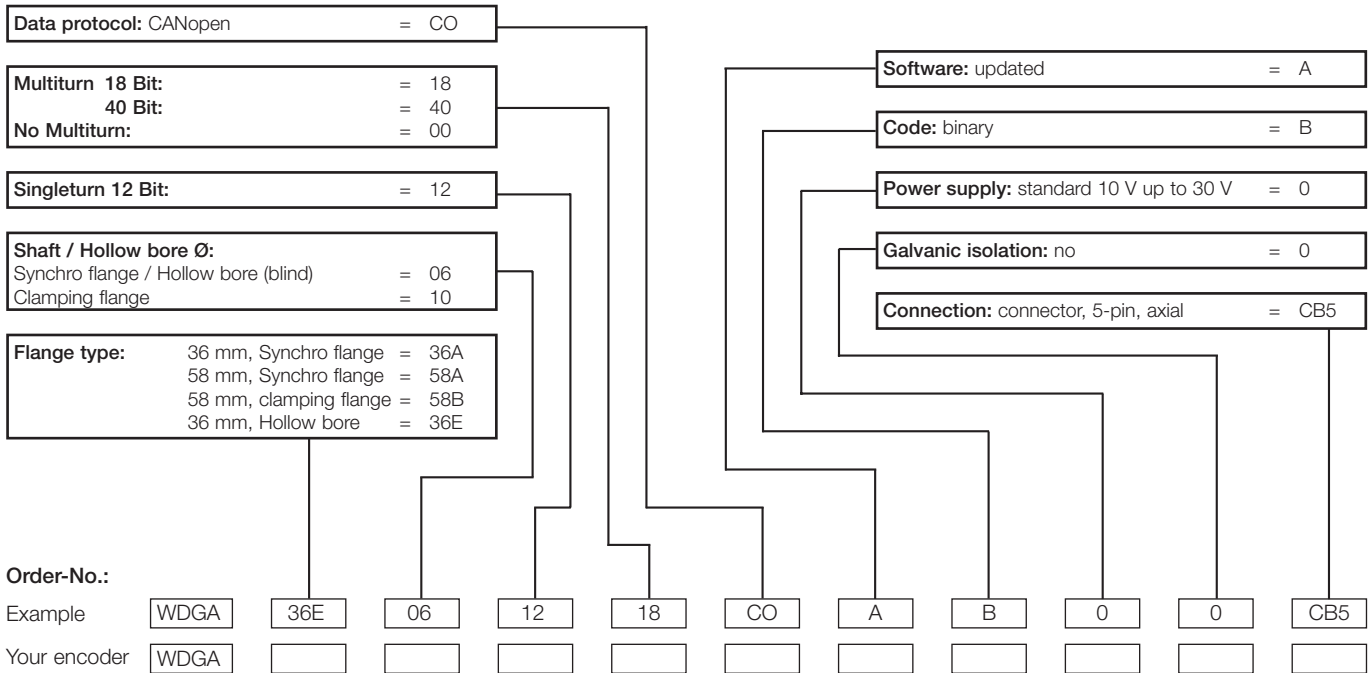
**Clamping flange WDGA 58B**



Suitable accessories for encoders WDGA absolute CANopen can be found on our website:

[www.wachendorff-automation.com/wdgaacc](http://www.wachendorff-automation.com/wdgaacc)

**Ordering information:**



**Any Questions?** Just call Patrick Steiner +49 (0) 67 22/9965-523, send him an E-Mail at [pst@wachendorff.de](mailto:pst@wachendorff.de), or call your local distributor:

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