Magnetic Absolute Encoder WDGA
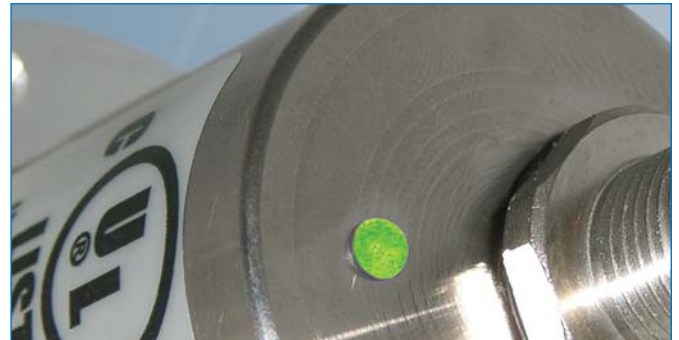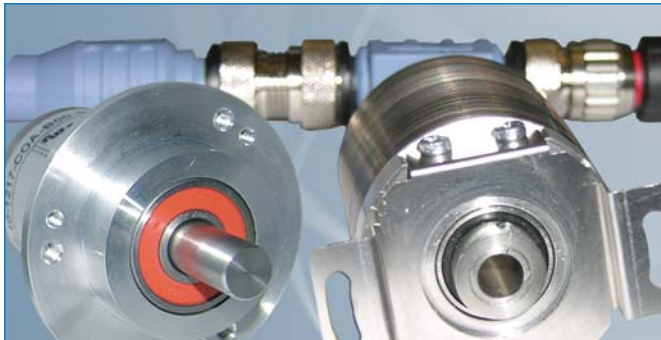
- **CANopen in a 36 mm housing**

- **Single-/Multiturn (12/40 Bit)**

- **Ground-breaking Technology with 32 Bit processor**

- **Very high shaft loading, IP67**

- **EnDra® Technology: No gears, no battery**

CANopen®

EnDra®
Technologie

Industrially RUGGED

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

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:
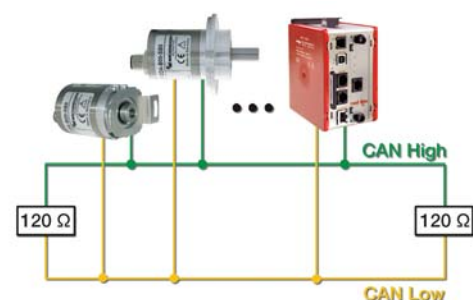The Wachendorff WDGA encoders do not require mechanical gears to detect the number of revolutions and the direction of rotation. Instead the revolutions are determined by means of an energy wire (EnDra)®: a permanent magnet accumulates in the wire so much energy that for a defined position the information "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.
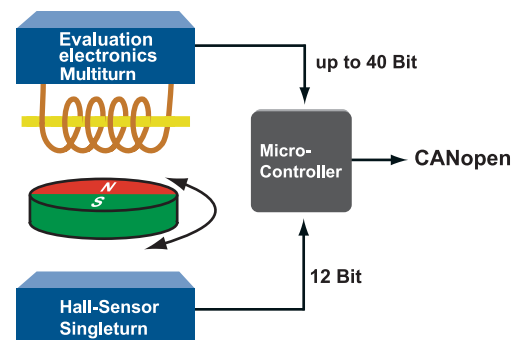
The following examples serve to make the enormous capabilities of the WDGA absolute encoders even clearer:

- 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®

- 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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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:	WDGA 36A	WDGA 58A	WDGA 58B
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:	< 0,3 Ncm	< 1 Ncm	< 1 Ncm
(at ambient temperature)			
Service life:			
at 100 % rated shaft load	1×10^9 revs.	1×10^9 revs.	1×10^9 revs.
at 40 % rated shaft load	1×10^{10} revs.	1×10^{10} revs.	1×10^{10} revs.
at 20 % rated shaft load	1×10^{11} revs.	1×10^{11} revs.	1×10^{11} revs.

Hollow shaft encoder:	WDGA 36E
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:	< 0,3 Ncm
(at ambient temperature)	
Service life:	
at 100 % rated shaft load	$1,4 \times 10^8$ revs.
at 40 % rated shaft load	$2,0 \times 10^9$ revs.
at 20 % rated shaft load	$1,7 \times 10^{10}$ revs.

Sensor data
Singleturn technology:	innovative hall sensor technology
Singleturn resolution:	4.096 steps/360° (12 Bit)
Singleturn precision:	<0.35°
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

Vibration: (DIN EN 60068-2-6)	50 m/s² (10-2000 Hz)
Shock: (DIN EN 60068-2-27)	1000 m/s² (6 ms)
Design:	appropriate DIN VDE 0160

Interface	**CAN**
Protocol:	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, Scaleing, Heartbeat, Node-ID, Baud rate, etc.
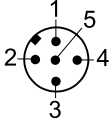
Programmable CAN transmission modes
- **Sychronous mode:** when a synchronisation telegram (SYNC) is received from another bus node, PDOs are transmitted independently.
- **Asynchronous mode:** a PDO message is triggered by an internal event. (e.g. change of measured valued, internal timer, etc.)
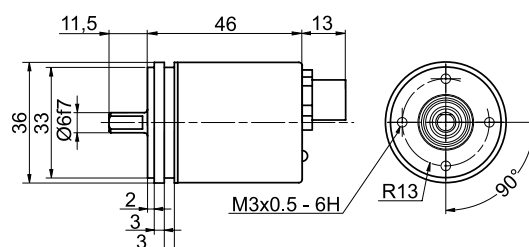
Electrical Data:
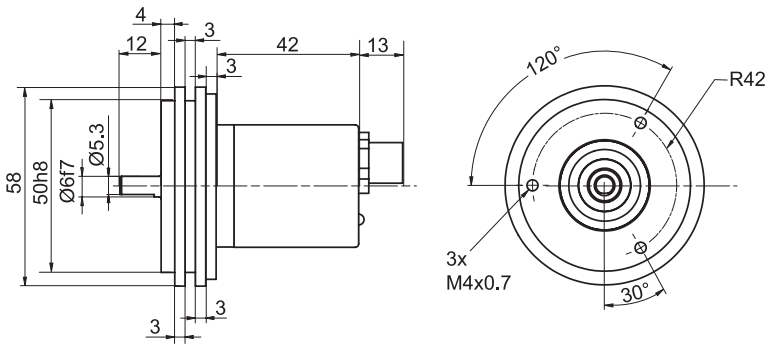|	
Supply voltage:	10 VDC up to 30 VDC max. 50 mA
Power consumption:	max. 0,5 W

Electrical connections, axial, M12x1

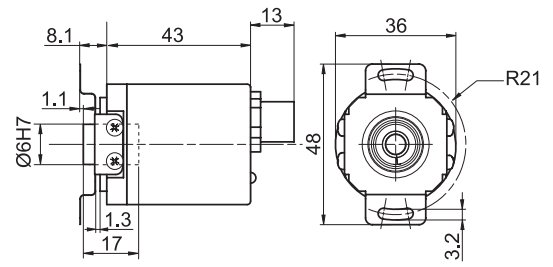| Definition	connector pin (connector-encoder)	Sensor connector pin assignment 5-pin
U_B	2	
Ground (GND)	3	
CAN_{High}	4	
CAN_{Low}	5	
CAN_{GND} / shield	1	

Synchro flange WDGA 36A

Synchro flange WDGA 58A

3x
M4x0.7

Hollow bore (blind) WDGA 36E

All dimensional specifications in mm.

Clamping flange WDGA 58B

M4x0.7 - 6H   R24   M3x0.5 - 6H
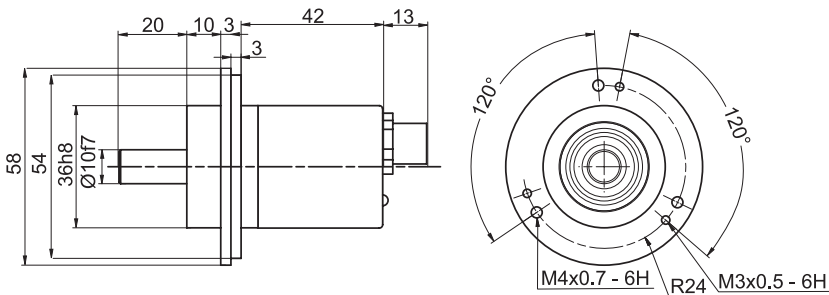
Suitable accessories for encoders WDGA absolute CANopen can be found on or website:
www.wachendorff-automation.com/wdgaacc

Ordering information:

Data protocol: CANopen	=	CO

Multiturn 18 Bit:	=	18
40 Bit:	=	40
No Multiturn:	=	00

Singleturn 12 Bit:	=	12

Shaft / Hollow bore Ø:		
Synchro flange / Hollow bore (blind)	=	06
Clamping flange	=	10

Flange type:	36 mm, Synchro flange =	36A
	58 mm, Synchro flange =	58A
	58 mm, clamping flange =	58B
	36 mm, Hollow bore =	36E

Software: updated	=	A

Code: binary	=	B

Power supply: standard 10 V up to 30 V	=	0

Galvanic isolation: no	=	0

Connection: connector, 5-pin, axial	=	CB5

Order-No.:

Example	WDGA	36E	06	12	18	CO	A	B	0	0	CB5
Your encoder	WDGA										

Any Questions? Just call Patrick Steiner +49 (0) 67 22 / 99 65-523, send him an E-Mail at pst@wachendorff.de, or call your local distributor:

Please contact your local distributor: