

# Absolute Encoders WDGA SSI

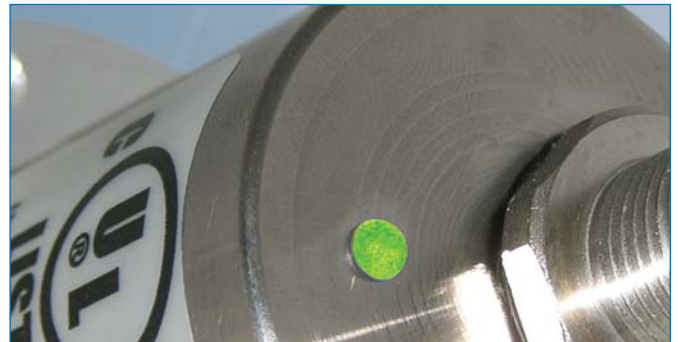
- SSI in a 36 mm / 58 mm housing
- Single-/Multiturn (14/40 bit)
- Ground-breaking technology with 32 Bit processor
- Very high shaft loading, IP67
- EnDra<sup>®</sup>-Technology: no gears, no battery



**SSI**  
Synchronous Serial Interface

**EnDra<sup>®</sup>**  
Technology

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



The singleturn and multiturn absolute 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
- Very compact construction

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

With their high resolution of 14 bit singleturn and 14 bit + 40 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 14 bit (16384 steps per revolution). The multiturn can handle up to 40 bits, depending on requirements.

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 and helps to 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.

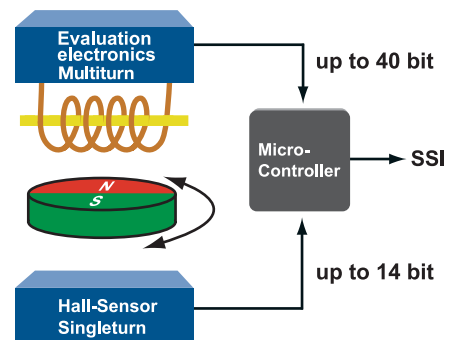


### Quick in operation:

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 application.

### 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. The revolutions are determined by means of an energy wire (EnDra®) instead: in the wire a permanent magnet accumulates enough energy, that the information "Revolution" and "Direction of Rotation" for a defined position is transmitted to the evaluation electronics. An external energy feed, for example using a battery, is not required. The result is that this patented system is able to work fully autonomously.



The following examples conduce 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 not reach its final value until around 11 years.

**And all of this absolutely autonomously.**

# Encoders WDGA absolute SSI magnetic with EnDra®



## Specifications:

### Mechanical data

Housing: steel case chrome-plated, magnetic shielding  
 Shaft/hollow bore (blind): stainless steel  
 Flange: Aluminium  
 Bearing type: 2 precision ball bearings

	WDGA 36A	WDGA 58A	WDGA 58B
Shaft encoders:	WDGA 36A	WDGA 58A	WDGA 58B
Flange:	synchro	synchro	clamping
Shaft Ø:	6 mm	6/10 mm	6/10 mm
Length of shaft:	11.5 mm	12/20 mm	12/20 mm
Operating speed max.:	12,000 rpm	8000 rpm	8000 rpm
Permissible shaft loading: max. $F_r$	80 N	125/220 N	125/220 N
max. $F_a$	50 N	120 N	120 N
Starting torque: (at ambient temperature)	< 0,3 Ncm	< 1 Ncm	< 1 Ncm
Service life:			
at 100 % rated shaft load	$1.4 \times 10^8$ revs.	$1 \times 10^9$ revs.	$1 \times 10^9$ revs.
at 40 % rated shaft load	$2.0 \times 10^9$ revs.	$1 \times 10^{10}$ revs.	$1 \times 10^{10}$ revs.
at 20 % rated shaft load	$1.7 \times 10^{11}$ revs.	$1 \times 10^{11}$ revs.	$1 \times 10^{11}$ revs.

	WDGA 36E
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: (at ambient temperature)	< 0,3 Ncm
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: up to 16,384 steps/360° (14 bit)  
 Singleturn accuracy: < ± 0.35°  
 Singleturn-repeat accuracy: < ± 0,20°  
 Intern cycle time: ≤ 600 µs  
 Multiturn technology: patented based EnDra® technology no battery and no gear  
 Multiturn resolution: up to 40 bit

### Ambient data

Operating temperature: - 40 °C up to + 80 °C  
 Storage temperature: - 40 °C up to + 100 °C  
 Protection class (EN 60529): IP67, shaft sealed IP65  
 cable outlet K1: IP40

### Environmental data

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 61000-6-3

- EnDra® multiturn technology: maintenance-free and environmentally friendly
- SSI, Gray or binary code
- Single-/Multiturn (14 bit/40 bit)
- Forward-looking technology with 32 bit processor
- 2-colour-LED as indicator for operating condition and error message
- High shaft load up to 220 N radial, 120 N axial

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

Vibration: 50 m/s<sup>2</sup> (10 Hz up to 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

Clock input:  
 Clock frequency:

Data output:  
 Output code:  
 SSI output:  
 Parity bit:  
 Error bit:  
 Turn on time:  
 Pos. direction of counting: (View)  
 Set to zero:

### SSI

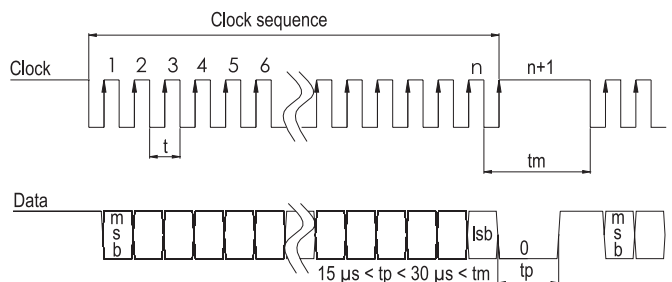
via opto-coupler  
 100 kHz up to 500 kHz  
 up to 2 MHz on request  
 RS485/RS422 compatible  
 Gray or binary code  
 Angular-/position value  
 optional (even/odd)  
 optional  
 <1.5 s  
 DIR = GND ⇔ cw  
 DIR = +Ub ⇔ ccw  
 Preset = apply +Ub for 2 s

### Electrical data

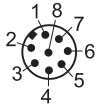
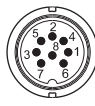
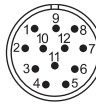
Supply voltage: 10 VDC up to 30 VDC;  
 4.75 VDC up to 5.5 VDC  
 max. 80 mA  
 max. 0.8 W

Power consumption: max. 0.8 W

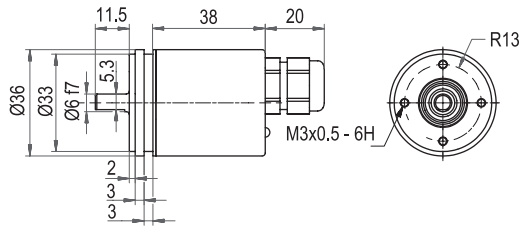
### Protocol SSI



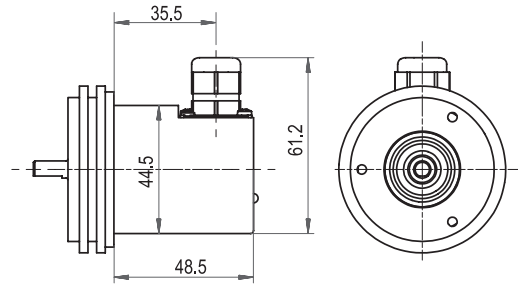
### Connection configuration for encoder WDGA SSI:

				
Connector/cable	M12 x1	M16	M23	cable outlet
Description	CB8 axial, CC8 radial, 8-pin	CH8 radial 8-pin	C5 radial, 12-pin	K1, radial L2, axial L3, radial
GND	1	2	12	wh
Plus U+	2	1	11	bn
SSI CLK+	3	6	2	gn
SSI CLK-	4	5	1	ye
SSI DATA+	5	4	3	gy
SSI DATA-	6	3	4	pk
PRESET	7	8	9	bu
DIR	8	7	8	rd
Shield	housing	housing	housing	housing K1: n. c.

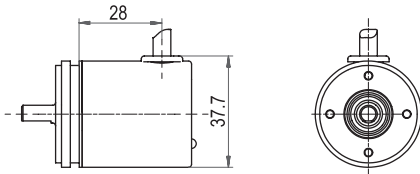
**WDGA 36A: Cable outlet, L2:**



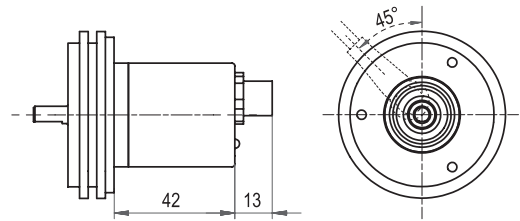
**Cable outlet, L3:**



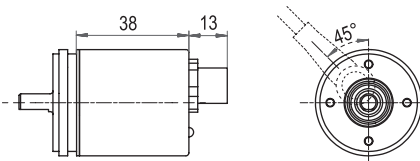
**Cable outlet, K1:**



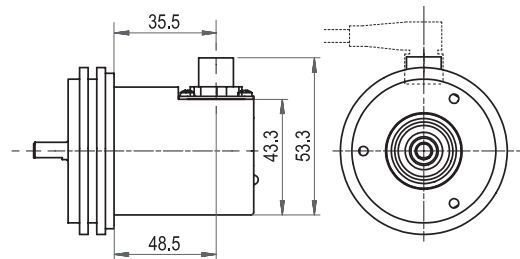
**Connector, M12 x 1, 8-pin, CB8:**



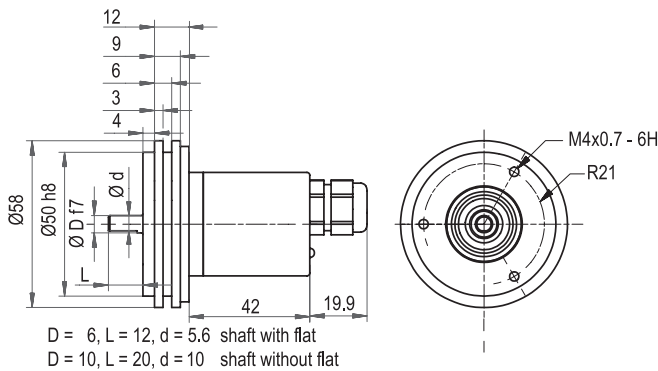
**Connector, M12 x 1, 8-pin, CB8:**



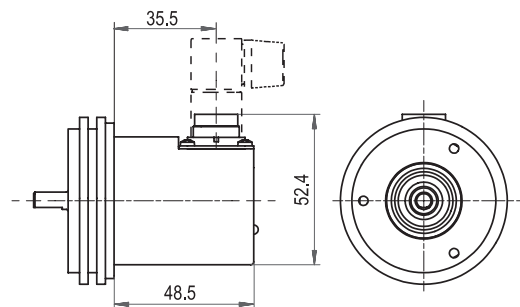
**Connector, M12 x 1, 8-pin, CC8:**



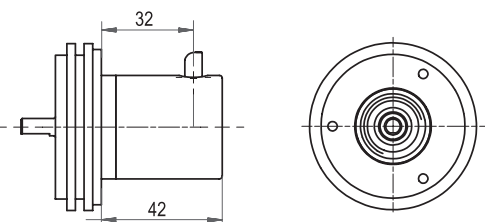
**WDGA 58A: Cable outlet, L2:**



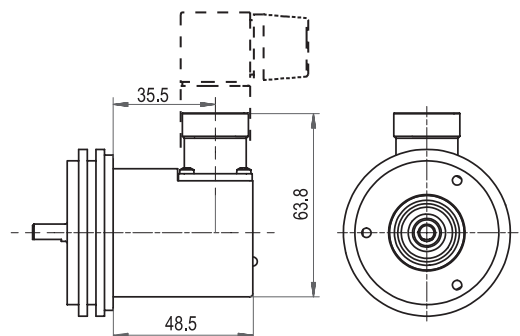
**Connector, M16, 8-pin, CH8:**



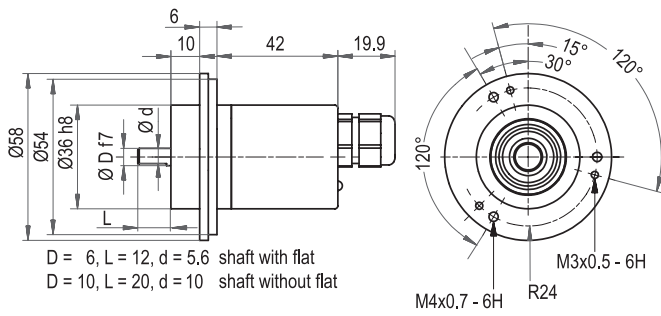
**Cable outlet, K1:**



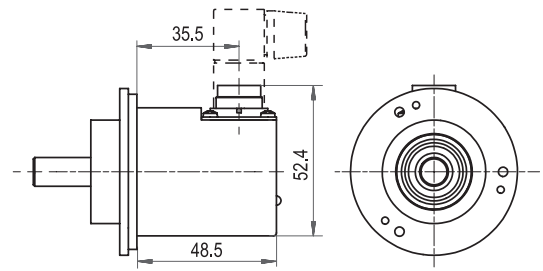
**Connector, M23, 12-pin, C5:**



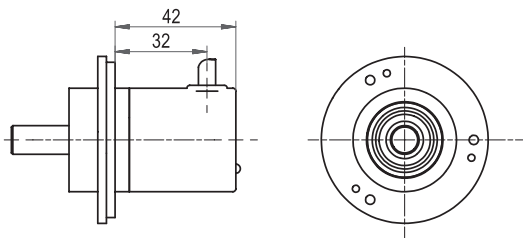
**WDGA 58B: Cable outlet, L2:**



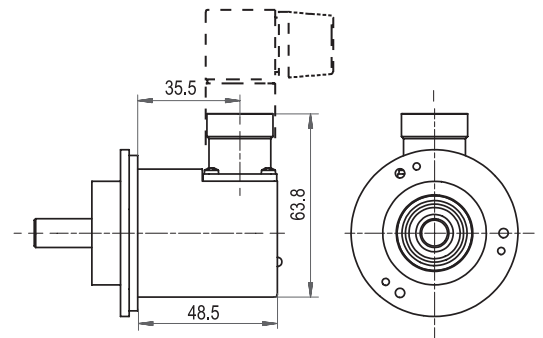
**Connector, M16, 8-pin, CH8:**



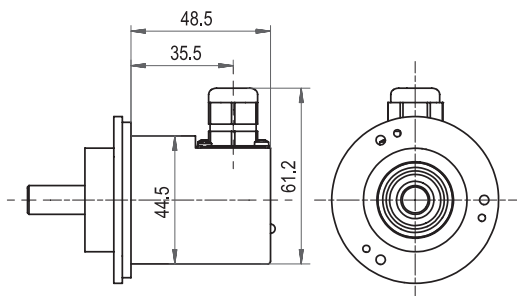
**Cable outlet, K1:**



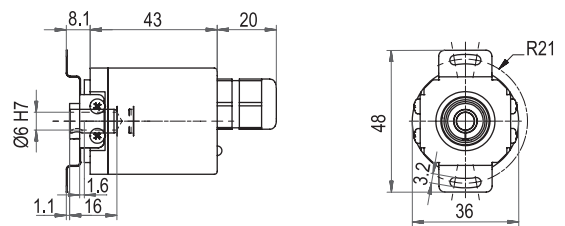
**Connector, M23, 12-pin, C5:**



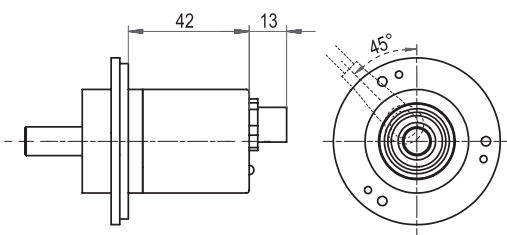
**Cable outlet, L3:**



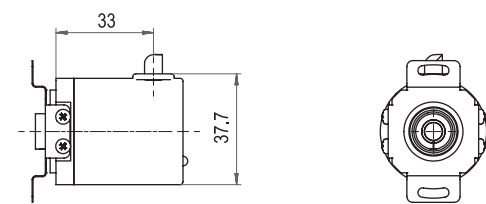
**WDGA 36E: Cable outlet, L2:**



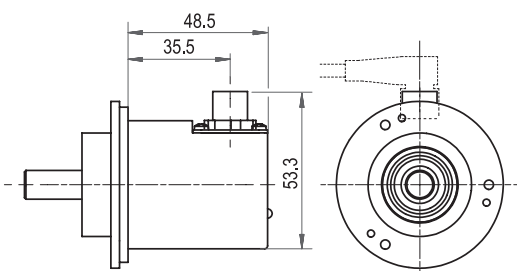
**Connector, M12 x 1, 8-pin, CB8:**



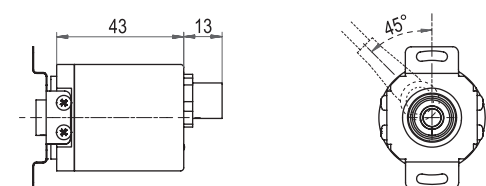
**Cable outlet, L1:**



**Connector, M12 x 1, 8-pin, CC8:**

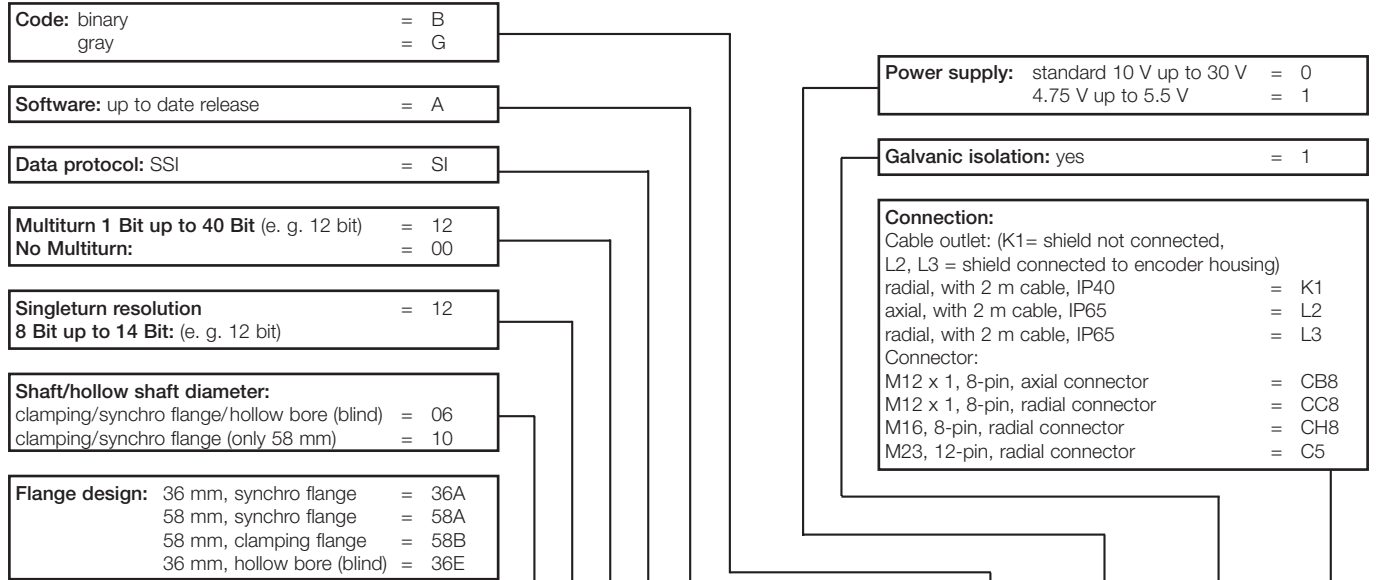


**Connector, M12 x 1, 8-pin, CB8:**



Suitable accessories for encoders WDGA absolute SSI can be found on our website: [www.wachendorff-automation.com/acc](http://www.wachendorff-automation.com/acc)

**Ordering information:**



**Order-No.:**

Example	WDGA	58B	10	12	12	SI	A	B	0	1	CB8
Your encoder	WDGA										

Specifications without engagement, subject to errors and modifications.

**Any Questions?** Just call Mr. Patrick Steiner +49 (0) 67 22 / 99 65-523, send him an e-mail to [pst@wachendorff.de](mailto:pst@wachendorff.de) or visit our homepage: [www.wachendorff-automation.com/wdgassi](http://www.wachendorff-automation.com/wdgassi)



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