



# Online Data Sheet

## Encoder WDG 100H

[www.wachendorff-automation.com/wdg100h](http://www.wachendorff-automation.com/wdg100h)

### Wachendorff Automation

#### ... systems and encoders

- Complete systems
- Industrial rugged encoders to suit your application
- Standard range and customer versions
- Maximum permissible loads
- 48-hour express production
- Made in Germany
- Worldwide distributor network

# Encoder WDG 100H (optical)



- Rugged and extremely thin thru-bore encoder for extension on power motors
- Thru-Bore, bore size max. 45 mm
- Full connection protection with 10 VDC up to 30 VDC
- Easy mounting
- Meets protection class IP54
- Up to 20,480 PPR
- Optional: -40 °C up to +80 °C  
Protection to IP55 all around

[www.wachendorff-automation.com/wdg100h](http://www.wachendorff-automation.com/wdg100h)

Resolution	
Pulses per revolution PPR	up to 20480 PPR

Mechanical Data	
Housing	
Flange	hollow shaft (through-bored)
Flange material	aluminum
Housing cap	aluminum, powder coated
Torque supports	incl. 1 torque support WDGDS10001
- 1. Spring plate compensation	axial: ±0.8 mm, radial: ±0.2 mm
Housing	Ø 100 mm

Shaft(s)	
Shaft material	stainless steel
Starting torque	approx. 1.5 Ncm at ambient temperature
Fixing	2 x M4, DIN 913; Starting torque: 2,5 Nm

Shaft	Ø 25 mm
Shaft length	L: 42 mm
Insertion depth min.	52 mm
Max. Permissible shaft loading radial	200 N
Max. Permissible shaft loading axial	100 N

Shaft	Ø 25.4 mm, Ø 1"
Shaft length	L: 42 mm, L: 1.65 in
Insertion depth min.	52 mm
Max. Permissible shaft loading radial	200 N, 20.39 kp
Max. Permissible shaft loading axial	100 N, 10.197 kp

Shaft	Ø 28 mm
Shaft length	L: 42 mm
Insertion depth min.	52 mm
Max. Permissible shaft loading radial	200 N
Max. Permissible shaft loading axial	100 N

Shaft	Ø 30 mm
Shaft length	L: 42 mm
Insertion depth min.	52 mm

Max. Permissible shaft loading radial	200 N
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Max. Permissible shaft loading axial	100 N
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Shaft	Ø 32 mm
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Shaft length	L: 42 mm
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Insertion depth min.	52 mm
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Max. Permissible shaft loading radial	200 N
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Max. Permissible shaft loading axial	100 N
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Shaft	Ø 36 mm
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Shaft length	L: 42 mm
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Insertion depth min.	52 mm
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Max. Permissible shaft loading radial	200 N
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Max. Permissible shaft loading axial	100 N
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Shaft	Ø 38 mm
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Shaft length	L: 42 mm
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Insertion depth min.	52 mm
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Max. Permissible shaft loading radial	200 N
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Max. Permissible shaft loading axial	100 N
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Shaft	Ø 40 mm
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Shaft length	L: 42 mm
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Insertion depth min.	52 mm
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Max. Permissible shaft loading radial	200 N
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Max. Permissible shaft loading axial	100 N
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Shaft	Ø 42 mm
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Shaft length	L: 42 mm
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Insertion depth min.	52 mm
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Max. Permissible shaft loading radial	200 N
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Max. Permissible shaft loading axial	100 N
--------------------------------------	-------

Shaft	Ø 45 mm
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Shaft length	L: 42 mm
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Insertion depth min.	52 mm
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Max. Permissible shaft loading radial	200 N
Max. Permissible shaft loading axial	100 N

### Bearings

Bearings type	2 precision ball bearings
Nominal service life	3 x 10 <sup>10</sup> revs. at 100 % rated shaft load 1 x 10 <sup>11</sup> revs. at 40 % rated shaft load 1 x 10 <sup>12</sup> revs. at 20 % rated shaft load
Max. operating speed	3500 rpm

### Machinery Directive: basic data safety integrity level

MTTF <sub>d</sub>	200 a
Mission time (TM)	25 a
Nominal service life (L10h)	1 x 10 <sup>12</sup> revs. at 20 % rated shaft load and 3500 rpm
Diagnostic coverage (DC)	0 %

### Electrical Data

Power supply/Current consumption	4,75 VDC up to 5,5 VDC: typ. 100 mA
Power supply/Current consumption	5 VDC up to 30 VDC: typ. 70 mA
Power supply/Current consumption	10 VDC up to 30 VDC: typ. 100 mA
Output circuit	TTL TTL, RS422 compatible, inv. HTL HTL, inv. 1 Vpp sin/cos
Pulse frequency	TTL 5000 ppr: max. 200 kHz HTL 5000 ppr: max. 200 kHz TTL more than 1200 ppr: max. 2 MHz HTL more than 1200 ppr: max. 600 kHz 1 Vpp sin/cos: max. 100 kHz
Channels	AB ABN and inverted signals
Load	max. 40 mA / channel @ 1 Vpp sin/cos: min. 120 Ohm
Circuit protection	circuit type H24 and R24 only

### Accuracy

Phase offset	90° ± max. 7.5 % of the period duration
pulse-/pause-ratio	5000 ppr: 50 % ± max. 7 % Output circuits F24, P24, F05, P05, 645: 50 % ± max. 10 %

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

### Duty information

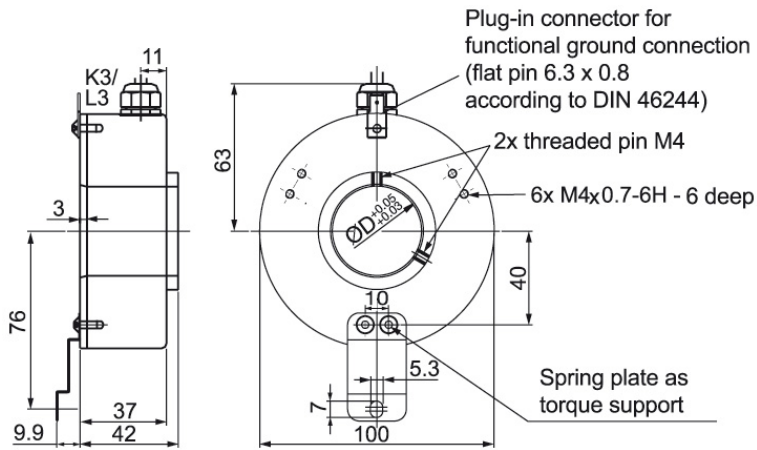
Customs tariff number:	90318020
Country of origin:	Germany

General Data	
Weight	approx. 720 g
Connections	cable or connector, radial
Protection rating (EN 60529)	IP54
Operating temperature	-20 °C up to +80 °C 1 Vpp: -10 °C up to +70 °C
Storage temperature	-30 °C up to +80 °C

### More Information

General technical data and safety instructions  
<http://www.wachendorff-automation.com/gtd>  
 Options  
<http://www.wachendorff-automation.com/acc>

**Cable connection K3, L3 with 2 m cable**



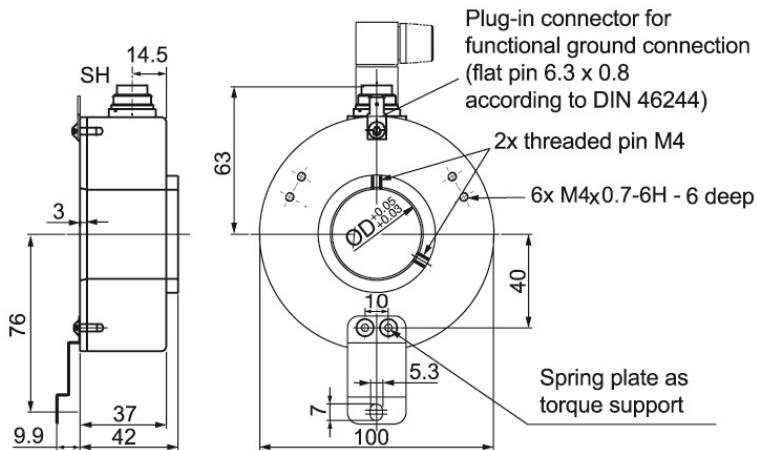
**Description**

**ABN inv. poss.**

<b>K3</b>	radial, shield not connected	•
<b>L3</b>	radial, shield connected to encoder housing	•

Assignments				
	<b>K3, L3</b>	<b>K3, L3</b>	<b>L3</b>	<b>L3</b>
<b>Circuit</b>	F05, H05, F24, H24, H30	P05, R05, P24, R24, 245, 645, R30	SIN	SIF
<b>GND</b>	WH	WH	WH	WH
<b>(+) Vcc</b>	BN	BN	BN	BN
<b>A</b>	GN	GN	GN	GN
<b>B</b>	YE	YE	GY	GY
<b>N</b>	GY	GY	BK	BK
<b>Light reserve warning</b>	-	-	-	RD
<b>A inv.</b>	-	RD	YE	YE
<b>B inv.</b>	-	BK, (BU at ACA)	PK	PK
<b>N inv.</b>	-	VT	VT	VT
<b>Shield</b>	flex	flex	flex	flex

**Connector (M16x0.75) SH, 5-, 6-, 8-, 12-pin**



**Description**

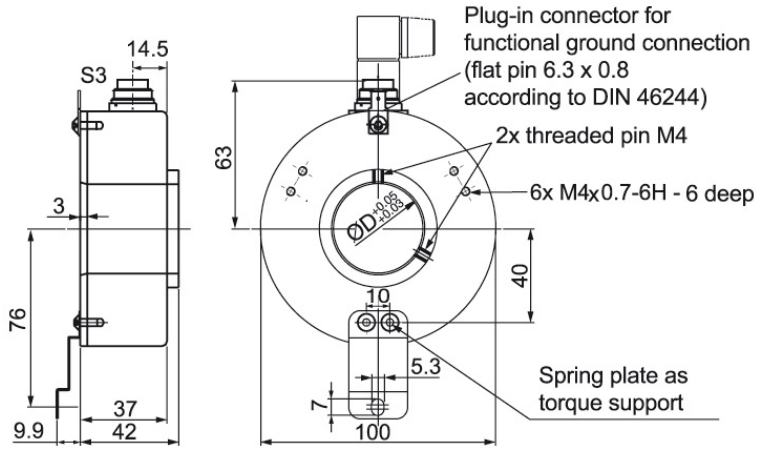
**ABN inv. poss.**

<b>SH5</b>	radial, 5-pin, Connector connected to encoder housing	-
<b>SH6</b>	radial, 6-pin, Connector connected to encoder housing	-
<b>SH8</b>	radial, 8-pin, Connector connected to encoder housing	•
<b>SH12</b>	radial, 12-pin, Connector connected to encoder housing	•

**Assignments**

	<b>SH5</b>	<b>SH6</b>	<b>SH8</b>	<b>SH8</b>	<b>SH8</b>	<b>SH12</b>	<b>SH12</b>	<b>SH12</b>
	<b>5-pin</b>	<b>6-pin</b>	<b>8-pin</b>	<b>8-pin</b>	<b>8-pin</b>	<b>12-pin</b>	<b>12-pin</b>	<b>12-pin</b>
<b>Circuit</b>	F05, H05, F24, H24, H30	F05, H05, F24, H24, H30	F05, H05, F24, H24, H30	P05, R05, P24, R24, R30, 245, 645	SIN	P05, R05, P24, R24, 245, 645, R30	F05, H05, F24, H24, H30	SIN
<b>GND</b>	1	6	1	1	1	K, L	K, L	K, L
<b>(+) Vcc</b>	2	1	2	2	2	M, B	M, B	M, B
<b>A</b>	3	2	3	3	3	E	E	E
<b>B</b>	4	4	4	4	4	H	H	H
<b>N</b>	5	3	5	5	5	C	C	C
<b>Light reserve warning</b>	-	-	-	-	-	-	-	-
<b>A inv.</b>	-	-	-	6	6	F	-	F
<b>B inv.</b>	-	-	-	7	7	A	-	A
<b>N inv.</b>	-	-	-	8	8	D	-	D
<b>n. c.</b>	-	5	6, 7, 8	-	-	G, J	A, D, F, G, J	G, J
<b>Shield</b>	-	-	-	-	-	-	-	-

**Connector (M16x0.75) S3, 7-pin**




**Description**

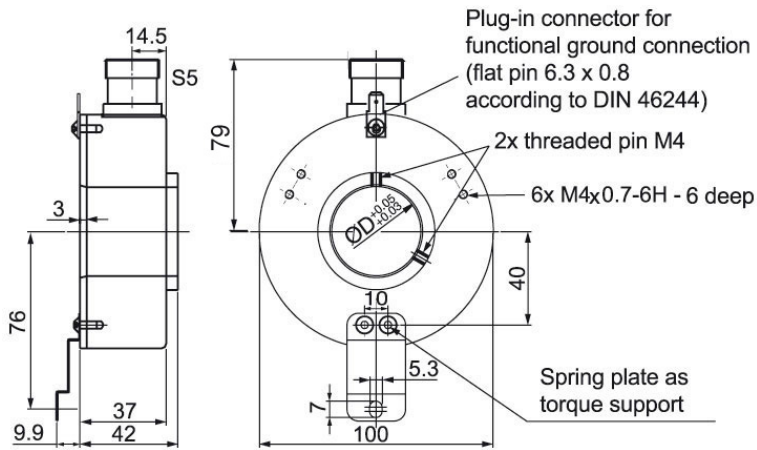
**ABN inv. poss.**

**S3** radial, 7-pin, Connector connected to encoder housing

-

Assignments	
	S3
	7-pin
	
<b>Circuit</b>	F05, H05, F24, H24, H30
<b>GND</b>	1
<b>(+) Vcc</b>	2
<b>A</b>	3
<b>B</b>	4
<b>N</b>	5
<b>Light reserve warning</b>	-
<b>A inv.</b>	-
<b>B inv.</b>	-
<b>N inv.</b>	-
<b>n. c.</b>	6, 7
<b>Shield</b>	-

**Connector (M23) S5, 12-pin**

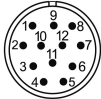





**Description**

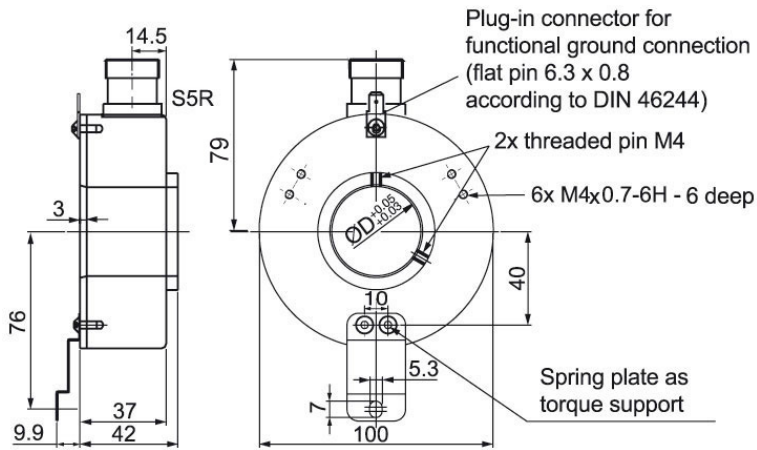
ABN inv. poss.

S5 radial, 12-pin, Connector connected to encoder housing

•

Assignments				
	S5	S5	S5	S5
	12-pin	12-pin	12-pin	12-pin
				
<b>Circuit</b>	F05, H05, F24, H24, H30	P05, R05, P24, R24, 245, 645, R30	SIN	SIF
<b>GND</b>	10	10	10	10
<b>(+) Vcc</b>	12	12	12	12
<b>A</b>	5	5	5	5
<b>B</b>	8	8	8	8
<b>N</b>	3	3	3	3
<b>Light reserve warning</b>	-	-	-	7
<b>A inv.</b>	-	6	6	6
<b>B inv.</b>	-	1	1	1
<b>N inv.</b>	-	4	4	4
<b>n. c.</b>	1, 2, 4, 6, 7, 9, 11	2, 7, 9, 11	2, 7, 9, 11	2, 9, 11
<b>Shield</b>	-	-	-	-

**Connector (M23) S5R, 12-pin (clockwise)**

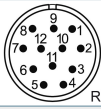
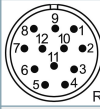
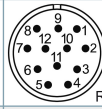
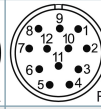


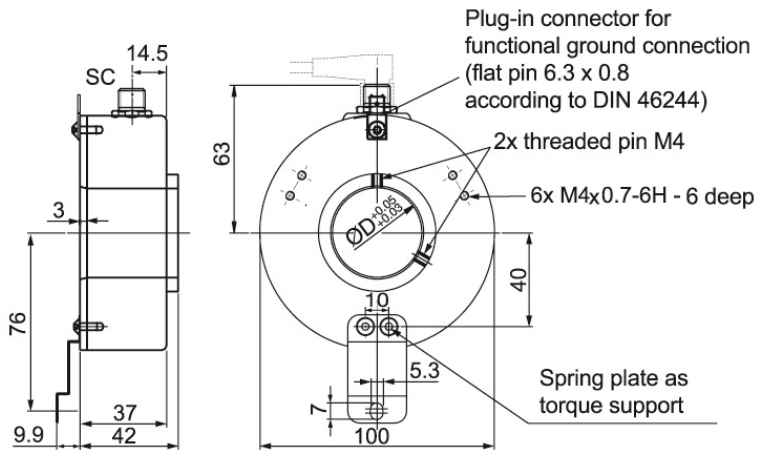
**Description**

ABN inv. poss.

S5R radial, 12-pin, Connector connected to encoder housing








•

Assignments				
	S5R	S5R	S5R	S5R
	12-pin	12-pin	12-pin	12-pin
				
<b>Circuit</b>	F05, H05, F24, H24, H30	P05, R05, P24, R24, 245, 645, R30	SIN	SIF
<b>GND</b>	10	10	10	10
<b>(+) Vcc</b>	12	12	12	12
<b>A</b>	5	5	5	5
<b>B</b>	8	8	8	8
<b>N</b>	3	3	3	3
<b>Light reserve warning</b>	-	-	-	7
<b>A inv.</b>	-	6	6	6
<b>B inv.</b>	-	1	1	1
<b>N inv.</b>	-	4	4	4
<b>n. c.</b>	1, 2, 4, 6, 7, 9, 11	2, 7, 9, 11	2, 7, 9, 11	2, 9, 11
<b>Shield</b>	-	-	-	-

**Sensor-connector (M12x1) SC, 4-, 5-, 8-, 12-pin**

**Description**
**ABN inv. poss.**

<b>SC4</b>	radial, 4-pin, Connector connected to encoder housing	-
<b>SC5</b>	radial, 5-pin, Connector connected to encoder housing	-
<b>SC8</b>	radial, 8-pin, Connector connected to encoder housing	•
<b>SC12</b>	radial, 12-pin, Connector connected to encoder housing	•

**Assignments**

	<b>SC4</b>	<b>SC5</b>	<b>SC8</b>	<b>SC8</b>	<b>SC8</b>	<b>SC12</b>	<b>SC12</b>
	<b>4-pin</b>	<b>5-pin</b>	<b>8-pin</b>	<b>8-pin</b>	<b>8-pin</b>	<b>12-pin</b>	<b>12-pin</b>
							
<b>Circuit</b>	F05, H05, F24, H24, H30	F05, H05, F24, H24, H30	F05, H05, F24, H24, H30	P05, R05, P24, R24, R30, 245, 645	SIN	F05, H05, F24, H24, H30	P05, R05, P24, R24, 245, 645, R30
<b>GND</b>	3	3	1	1	1	3	3
<b>(+) Vcc</b>	1	1	2	2	2	1	1
<b>A</b>	2	4	3	3	3	4	4
<b>B</b>	4	2	4	4	5	6	6
<b>N</b>	-	5	5	5	7	8	8
<b>Light reserve warning</b>	-	-	-	-	-	-	-
<b>A inv.</b>	-	-	-	6	4	-	9
<b>B inv.</b>	-	-	-	7	6	-	7
<b>N inv.</b>	-	-	-	8	8	-	10
<b>n. c.</b>	-	-	6, 7, 8	-	-	2, 5, 7, 9, 10, 11, 12	2, 5, 11, 12
<b>Shield</b>	-	-	-	-	-	-	-

## Options

### Low temperature

The encoder WDG 100H with the output circuit types F24, H24, P24, R24, F05, H05, P05, R05, 245, 645 is also available with the extended temperature range -40 °C up to +80 °C (measured at the flange).

### Order key

**ACA**

### IP55 all around (not 1 Vpp Sin/Cos)

The encoder WDG 100H can be supplied in a full IP55 version.

### Order key

**ACP**

Max. RPM: 1500 rpm

Permitted Shaft-Loading, axial: 100 N, 12.237 kp

Permitted Shaft-Loading, radial: 120 N, 22.434 kp

Max. PPR: 20480 ppr

Starting-torque: approx. 5 Ncm at ambient temperature, approx. 1.416 in-ozf at ambient temperature

### Cable length

The encoder WDG 100H can be supplied with more than 2 m cable. The maximum cable length depends on the supply voltage and the frequency; see [www.wachendorff-automation.com/atd](http://www.wachendorff-automation.com/atd)

### Order key

**XXX = Decimeter**

Please extend the standard order code with a three figure number, specifying the cable length in decimetres.

Example: 5 m cable = 050

Example Order No.	Type				Your encoder
WDG 100H	WDG 100H				WDG 100H
	<b>Bore size</b>				
25	25; 1Z= Ø 25.4 mm, Ø 1"; 28; 30; 32; 36; 38; 40; 42; 45				
	<b>Pulses per revolution PPR:</b>				
1024	512, 1024, 2048, 2500, 3600, 4096, 4500, 5000, 8192, 10240, 16384, 20480 1 Vpp Sin/Cos only 1024, 2048 Other PPRs on request				
	<b>Channels:</b>				
ABN	AB, ABN				
	<b>Output circuit</b>				
H24	<b>Resolution PPR</b>	<b>Power supply VDC</b>	<b>Output circuit</b>	<b>Light reserve warning</b>	<b>Order key</b>
	up to 2500	5 - 30	HTL (TTL at 5 VDC)	-	H30
		5 - 30	HTL, inv. (TTL/RS422 comp. at 5 VDC)	-	R30
	up to 5000	4.75 - 5.5	TTL	-	H05
		4.75 - 5.5	TTL, RS422 comp., inverted	-	R05
		10 - 30	HTL	-	H24
		10 - 30	HTL inverted	-	R24
	8192 up to 20480	10 - 30	TTL, RS422 comp., inverted	-	245
		4.75 - 5.5	TTL	-	F05
		4.75 - 5.5	TTL, RS422 comp., inverted	-	P05
		10 - 30	HTL	-	F24
	1024, 2048	10 - 30	HTL inverted	-	P24
		10 - 30	TTL, RS422 comp., inverted	-	645
		4.75 - 5.5	1 Vpp sin/cos	•	SIF
		4.75 - 5.5	1 Vpp sin/cos	-	SIN
		<b>Electrical connections</b>			
K3	<b>Description</b>			<b>ABN inv. poss.</b>	<b>Order key</b>
	<b>Cable: length (2 m standard, WDG 58T: 1 m)</b>				
	radial, shield not connected			•	K3
	radial, shield connected to encoder housing			•	L3
	<b>Connector: (shield connected to encoder housing)</b>				
	connector, M16x0.75, 5-pin, radial			-	SH5
	connector, M16x0.75, 6-pin, radial			-	SH6
	connector, M16x0.75, 8-pin, radial			•	SH8
	connector, M16x0.75, 12-pin, radial			•	SH12
	connector, M16x0.75, 7-pin, radial			-	S3
	connector, M23, 12-pin, radial			•	S5
	connector, clockwise pin count, M23, 12-pin, radial			•	S5R
	sensor-connector, M12x1, 4-pin, radial			-	SC4
	sensor-connector, M12x1, 5-pin, radial			-	SC5
	sensor-connector, M12x1, 8-pin, radial			•	SC8
	sensor-connector, M12x1, 12-pin, radial			•	SC12
	<b>Options</b>				
	<b>Description</b>			<b>Order key</b>	
	Low temperature			ACA	
	IP55			ACP	
	Without option			Empty	
	Cable length			XXX = Decimeter	

<b>Example Order No.=</b>	WDG 100H	25	1024	ABN	H24	K3		WDG 100H						<b>Your encoder</b>
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For further information please contact our local distributor.  
Here you find a list of our distributors worldwide.  
<https://www.wachendorff-automation.com/contact-sales-en/>



Wachendorff Automation GmbH & Co. KG  
Industriestrasse 7 • 65366 Geisenheim  
Germany

Phone: +49 67 22 / 99 65 25  
E-Mail: [wdg@wachendorff.de](mailto:wdg@wachendorff.de)  
[www.wachendorff-automation.de](http://www.wachendorff-automation.de)

