



# Online Data sheet

## Encoder WDG 40S

[www.wachendorff-automation.com/wdg40sm](http://www.wachendorff-automation.com/wdg40sm)

### **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 40S (magnetic)



- Robust and economical encoder with small dimensions
- Easy screw mounting
- Protection to IP67, shaft sealed to IP65
- Optional: Protection to IP67 all around  
-40 °C up to +80 °C

[www.wachendorff-automation.com/wdg40sm](http://www.wachendorff-automation.com/wdg40sm)

Resolution	
Pulses per revolution PPR	up to 1024 PPR

### Mechanical Data

Housing	
Flange	screw flange
Starting torque nut	max. 10 Nm
Flange material	aluminum, incl. nut M20 x 1.5
Housing cap	aluminum, powder coated
Housing	Ø 40 mm

Shaft(s)	
Shaft material	stainless steel
Starting torque	approx. 0.2 Ncm at ambient temperature

Shaft	Ø 6 mm
Shaft length	L: 13 mm
Max. Permissible shaft loading radial	80 N
Max. Permissible shaft loading axial	50 N

Bearings	
Bearings type	2 precision ball bearings
Nominale service life	1 x 10 <sup>9</sup> revs. at 100 % rated shaft load 1 x 10 <sup>10</sup> revs. at 40 % rated shaft load 1 x 10 <sup>11</sup> revs. at 20 % rated shaft load
Max. operating speed	12000 rpm

### Machinery Directive: basic data safety integrity level

MTTF <sub>d</sub>	200 a
Mission time (TM)	25 a
Nominale service life (L10h)	1 x 10 <sup>11</sup> revs. at 20 % rated shaft load and 12000 rpm
Diagnostic coverage (DC)	0 %

### Electrical Data

Power supply/Current consumption	5 VDC up to 30 VDC: typ. 40 mA
Output circuit	HTL (TTL at 5 VDC) HTL, inv. (TTL/RS422 comp. at 5 VDC)
Pulse frequency	1024 ppr: max. 200 kHz

Channels	AB ABN and inverted signals
Load	max. 40 mA / channel
Circuit protection	no

### Accuracy

Phase offset	90° ± max. 25% of the period duration
pulse-/pause-ratio	at 1 ppr up to 128 ppr: 50 % ± max. 7 % 129 ppr - 256 ppr: 50 % ± max. 9 % 257 ppr - 512 ppr: 50 % ± max. 13 % 513 ppr - 1024 ppr: 50 % ± max. 18 %

### 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

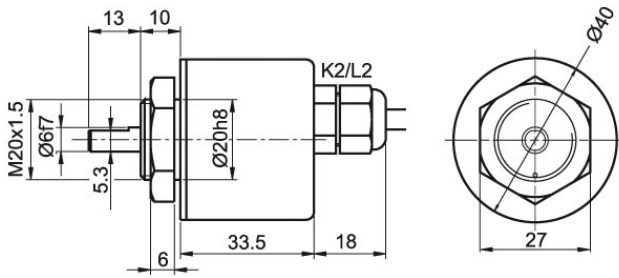
### General Data

Weight	approx. 90 g
Connections	cable or connector outlet
Protection rating (EN 60529)	Housing: IP65, IP67; shaft sealed: IP65; cable outlet K1: IP40
Operating temperature	-20 °C up to +80 °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>

## Cabel connection K2, L2 with 2 m cable

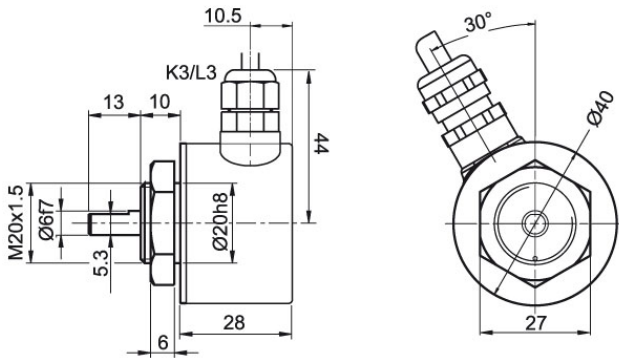


### Description

Description	ABN inv. poss.
<b>K2</b> axial, shield not connected	•
<b>L2</b> axial, shield connected to encoder housing	•

Assignments		
	K2, L2	K2, L2
<b>Circuit</b>	N35	M35
<b>GND</b>	WH	WH
<b>(+) Vcc</b>	BN	BN
<b>A</b>	GN	GN
<b>B</b>	YE	YE
<b>N</b>	GY	GY
<b>Light reserve warning</b>	-	-
<b>A inv.</b>	-	RD
<b>B inv.</b>	-	BK
<b>N inv.</b>	-	VT
<b>Shield</b>	flex	flex

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



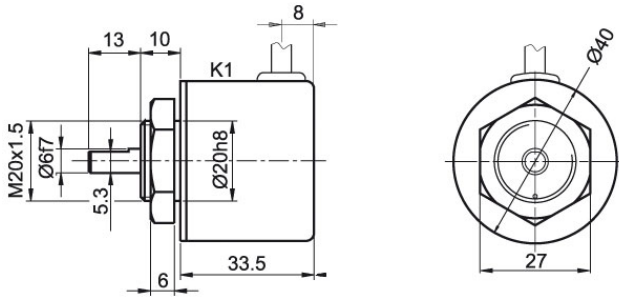
**Description**

**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>Circuit</b>	N35	M35
<b>GND</b>	WH	WH
<b>(+) Vcc</b>	BN	BN
<b>A</b>	GN	GN
<b>B</b>	YE	YE
<b>N</b>	GY	GY
<b>Light reserve warning</b>	-	-
<b>A inv.</b>	-	RD
<b>B inv.</b>	-	BK
<b>N inv.</b>	-	VT
<b>Shield</b>	flex	flex

**Cable connection K1 (IP40) with 2 m cable**



**Description**

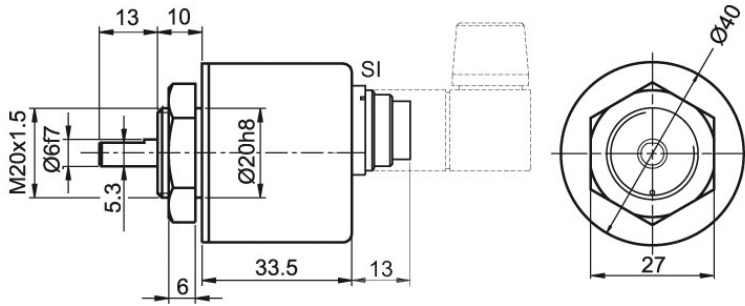
**ABN inv. poss.**

**K1** radial, shield not connected (IP40)

•

Assignments		
	<b>K1</b>	<b>K1</b>
<b>Circuit</b>	N35	M35
<b>GND</b>	WH	WH
<b>(+) Vcc</b>	BN	BN
<b>A</b>	GN	GN
<b>B</b>	YE	YE
<b>N</b>	GY	GY
<b>Light reserve warning</b>	-	-
<b>A inv.</b>	-	RD
<b>B inv.</b>	-	BK
<b>N inv.</b>	-	VT
<b>Shield</b>	flex	flex

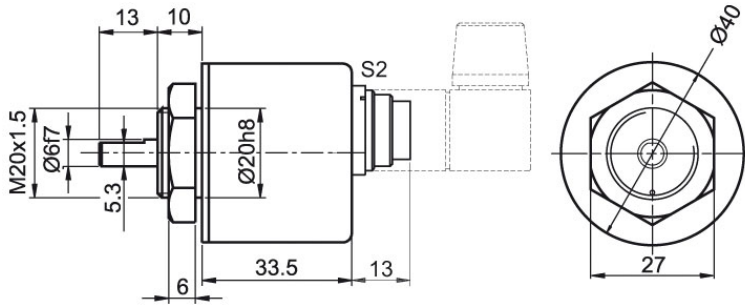
**Connector (M16x0.75) SI, 5-, 6-, 8-, 12-pin**



Description	ABN inv. poss.
<b>SI5</b> axial, 5-pin, Connector connected to encoder housing	-
<b>SI6</b> axial, 6-pin, Connector connected to encoder housing	-
<b>SI8</b> axial, 8-pin, Connector connected to encoder housing	•
<b>SI12</b> axial, 12-pin, Connector connected to encoder housing	•

Assignments	SI5 5-pin	SI6 6-pin	SI8 8-pin	SI8 8-pin	SI12 12-pin	SI12 12-pin
<b>Circuit</b>	N35	N35	N35	M35	N35	M35
<b>GND</b>	1	6	1	1	K, L	K, L
<b>(+) Vcc</b>	2	1	2	2	M, B	M, B
<b>A</b>	3	2	3	3	E	E
<b>B</b>	4	4	4	4	H	H
<b>N</b>	5	3	5	5	C	C
<b>Light reserve warning</b>	-	-	-	-	-	-
<b>A inv.</b>	-	-	-	6	-	F
<b>B inv.</b>	-	-	-	7	-	A
<b>N inv.</b>	-	-	-	8	-	D
<b>n. c.</b>	-	5	6, 7, 8	-	A, D, F, G, J	G, J
<b>Shield</b>	-	-	-	-	-	-

**Connector (M16x0.75) S2, 7-pin**



**Description**

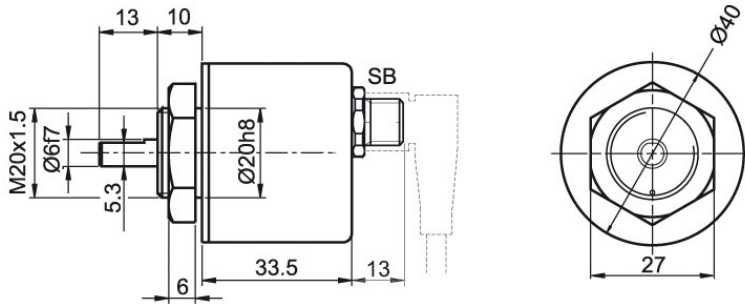
**ABN inv. poss.**

**S2** axial, 7-pin, Connector connected to encoder housing

-

Assignments	
	<b>S2</b>
	<b>7-pin</b>
<b>Circuit</b>	N35
<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>	-

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



Description	ABN inv. poss.
<b>SB4</b> axial, 4-pin, Connector connected to encoder housing	-
<b>SB5</b> axial, 5-pin, Connector connected to encoder housing	-
<b>SB8</b> axial, 8-pin, Connector connected to encoder housing	•
<b>SB12</b> axial, 12-pin, Connector connected to encoder housing	•

Assignments	SB4 4-pin	SB5 5-pin	SB8 8-pin	SB8 8-pin	SB12 12-pin	SB12 12-pin
<b>Circuit</b>	N35	N35	N35	M35	N35	M35
<b>GND</b>	3	3	1	1	3	3
<b>(+) Vcc</b>	1	1	2	2	1	1
<b>A</b>	2	4	3	3	4	4
<b>B</b>	4	2	4	4	6	6
<b>N</b>	-	5	5	5	8	8
<b>Light reserve warning</b>	-	-	-	-	-	-
<b>A inv.</b>	-	-	-	6	-	9
<b>B inv.</b>	-	-	-	7	-	7
<b>N inv.</b>	-	-	-	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-friction bearings

The encoder WDG 40S is also available as a particularly smooth-running low-friction encoder. The starting torque is thereby changed to 0.1 Ncm and the protection class at the shaft input to IP50.

### Order key

**AAC**

### IP67 all around

The encoder WDG 40S can be supplied in a full IP67 version.

### Order key

**AAO**

Max. RPM: 3500 rpm

Permitted Shaft-Loading, axial: 30 N

Permitted Shaft-Loading, radial: 45 N

Max. PPR: 1024 ppr

Starting-torque: approx. 1.2 Ncm at ambient temperature

### Low temperature

The encoder WDG 40S with the output circuit types M35, N35 is also available with the extended temperature range -40 °C up to +80 °C (measured at the flange).

### Order key

**ACA**

### Cable length

The encoder WDG 40S 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)

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

Example: 5 m cable = 050

### Order key

**XXX = Decimeter**

Example Order No.	Type					Your encoder	
WDG 40S	WDG 40S					WDG 40S	
<b>Pulses per revolution PPR:</b>							
1024	1-1024 Other PPRs on request						
<b>Channels:</b>							
ABN	AB, ABN bis 1024 I/U						
<b>Output circuit</b>							
N35	<b>Resolution PPR</b>	<b>Power supply VDC</b>	<b>Output circuit</b>	<b>Light reserve warning</b>	<b>Order key</b>		
	up to 1024	5 - 30	HTL, inv. (TTL/RS422 comp. at 5 VDC)	-	M35		
		5 - 30	HTL (TTL at 5 VDC)	-	N35		
<b>Electrical connections</b>							
K2	<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 (IP40)			•	K1		
	axial, shield not connected			•	K2		
	axial, shield connected to encoder housing			•	L2		
	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, axial			-	SI5		
	connector, M16x0.75, 6-pin, axial			-	SI6		
	connector, M16x0.75, 8-pin, axial			•	SI8		
	connector, M16x0.75, 12-pin, axial			•	SI12		
	connector, M16x0.75, 7-pin, axial			-	S2		
	sensor-connector, M12x1, 4-pin, axial			-	SB4		
	sensor-connector, M12x1, 5-pin, axial			-	SB5		
sensor-connector, M12x1, 8-pin, axial			•	SB8			
sensor-connector, M12x1, 12-pin, axial			•	SB12			
<b>Options</b>							
	<b>Description</b>			<b>Order key</b>			
	Low-friction bearings			AAC			
	IP67			AAO			
	Low temperature			ACA			
	Without option			Empty			
	Cable length			XXX = Decimeter			

<b>Example Order No.=</b>	WDG 40S	1024	ABN	N35	K2		WDG 40S					<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

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)

