



Online Data sheet

Encoder WDG 40E

www.wachendorff-automation.com/wdg40e

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 40E



Illustration similar



- Robust hollow bore (blind) encoder with small dimensions
- Full connection protection with 10 VDC up to 30 VDC
- With light reserve warning
- Optional: -40 °C up to +80 °C [-40 °F up to +176 °F]

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Resolution

Pulses per revolution PPR up to 2500 PPR

Mechanical Data

Flange	hollow shaft (blind-bored)
Flange material	aluminum
Housing material	aluminum, powder coated
- 1. Spring plate compensation	axial: ± 0.8 mm [0.0315"], radial: ± 0.2 mm [0.0079"]
- Max. operating speed	12000 rpm up to max. protection rating +60 °C
Flange diameter	$\varnothing$ 40 mm [$\varnothing$ 1.575"]

Shaft(s)

Shaft material	stainless steel
Starting torque	approx. 0.2 Ncm [0.283 in-ozf] at ambient temperature
Shaft	$\varnothing$ 6 mm [$\varnothing$ 0.236"]
Shaft length	L: 15 mm [0.591"]
Insertion depth min.	17 mm [0.669"]
Insertion depth max.	20 mm [0.787"]
Max. Permissible shaft loading radial	100 N [10.197 kp]
Max. Permissible shaft loading axial	50 N [5.098 kp]

Bearings

Bearings type	2 precision ball bearings
Nominale service life	1.4 x 10 ⁸ revs. at 100 % rated shaft load 2 x 10 ⁹ revs. at 40 % rated shaft load 1.7 x 10 ¹⁰ revs. at 20 % rated shaft load
Max. operating speed	12000 rpm

Machinery Directive: basic data safety integrity level

MTTF _d	200 a
Mission time (TM)	25 a
Nominale service life (L10h)	1.7 x 10 ¹⁰ revs. at 20 % rated shaft load and 12000 rpm
Diagnostic coverage (DC)	0 %

Electrical Data

Power supply/Current consumption	4,75 VDC up to 5,5 VDC: typ. 70 mA
Power supply/Current consumption	10 VDC up to 30 VDC: typ. 70 mA
Operating principle	optical

Output circuit	TTL, RS422 compatible, inv. HTL
Pulse frequency	TTL $\leq$ 2500 ppr: max. 200 kHz HTL $\leq$ 2500 ppr: max. 200 kHz
Channels	AB ABN and inverted signals
Load	max. 40 mA / channel
Circuit protection	circuit type H24 and R24 only

Accuracy

Phase offset	90° $\pm$ max. 7.5 % of the period duration
pulse-/pause-ratio	50 % $\pm$ max. 7 %

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 ² (10 Hz up to 2000 Hz)
Shock: (DIN EN 60068-2-27)	1000 m/s ² (6 ms)
Electrical Safety:	according DIN VDE 0160

Duty information

Customs tariff number:	90318020
Country of origin:	Germany

General Data

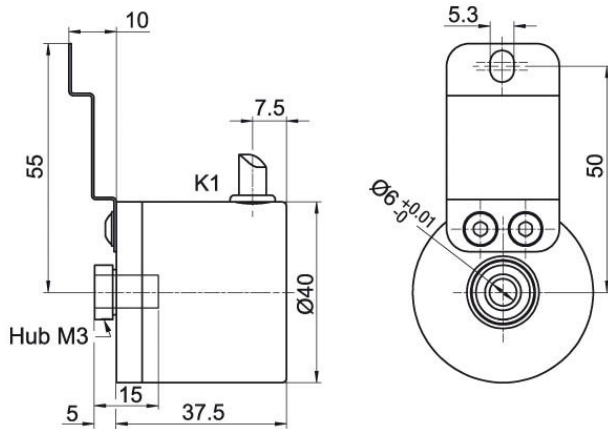
Weight	approx. 100 g [3.527 oz]
Connections	cable or connector outlet
Protection rating (EN 60529)	Housing: IP65, IP67; shaft sealed: IP65; cable outlet K1: IP40
Operating temperature	-20 °C up to +80 °C [-4 °F up to +176 °F]
Storage temperature	-30 °C up to +80 °C [-22 °F up to 176 °F]

More Information

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

Options
<http://www.wachendorff-automation.com/acc>

Cable connection K1 (IP40) with 2 m cable



Description

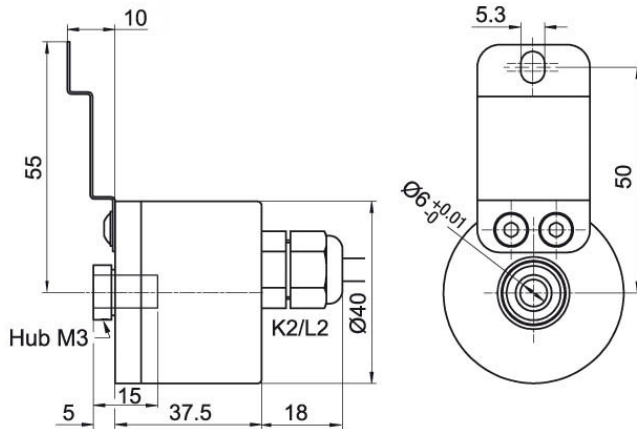
ABN inv. poss.

K1 radial, shield not connected (IP40)

•

Assignments		
	K1	K1
Circuit	H05, H24	R05, R24
GND	WH	WH
(+) Vcc	BN	BN
A	GN	GN
B	YE	YE
N	GY	GY
-	-	-
A inv.	-	RD
B inv.	-	BK
N inv.	-	VT
Shield	flex	flex

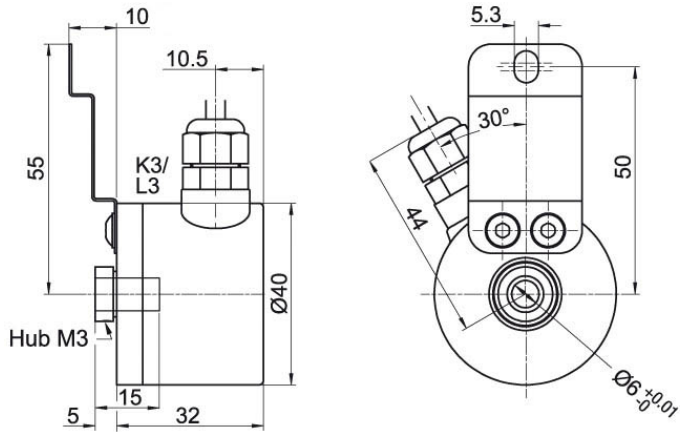
Cable connection K2, L2 with 2 m cable



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

Assignments		
	K2, L2	K2, L2
Circuit	H05, H24	R05, R24
GND	WH	WH
(+) Vcc	BN	BN
A	GN	GN
B	YE	YE
N	GY	GY
-	-	-
A inv.	-	RD
B inv.	-	BK
N inv.	-	VT
Shield	flex	flex

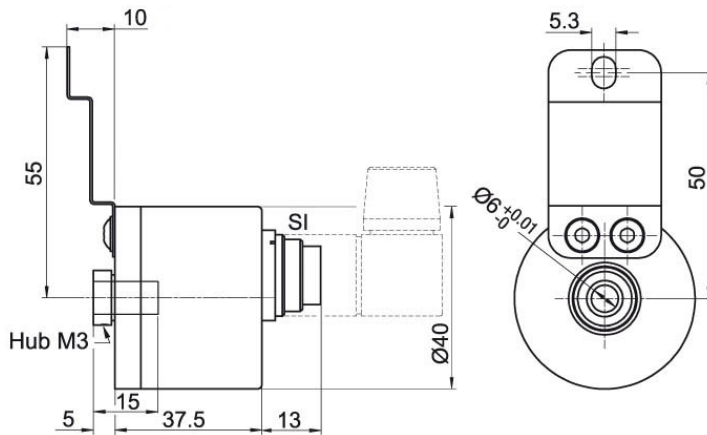
Cable connection K3, L3 with 2 m cable



Description	ABN inv. poss.
K3 radial, shield not connected	•
L3 radial, shield connected to encoder housing	•

Assignments		
	K3, L3	K3, L3
Circuit	H05, H24	R05, R24
GND	WH	WH
(+) Vcc	BN	BN
A	GN	GN
B	YE	YE
N	GY	GY
-	-	-
A inv.	-	RD
B inv.	-	BK
N inv.	-	VT
Shield	flex	flex

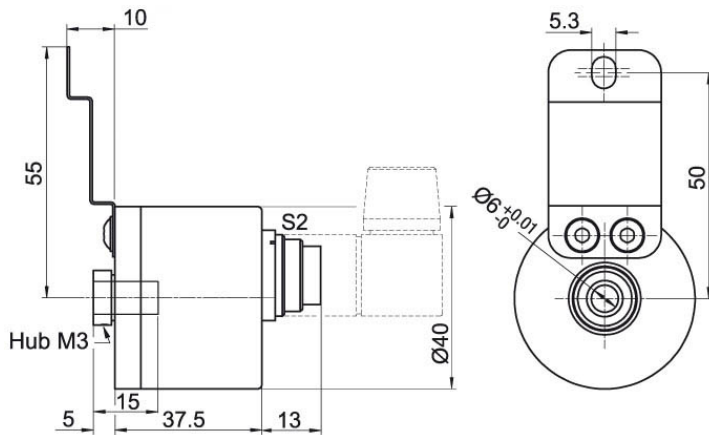
Connector (M16x0.75) SI, 5-, 6-, 8-, 12-pin



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

Assignments				
	SI5	SI6	SI8	SI12
	5-pin	6-pin	8-pin	12-pin
Circuit	H05, H24	H05, H24	R05, R24	R05, R24
GND	1	6	1	K, L
(+) Vcc	2	1	2	M, B
A	3	2	3	E
B	4	4	4	H
N	5	3	5	C
-	-	-	-	-
A inv.	-	-	6	F
B inv.	-	-	7	A
N inv.	-	-	8	D
n. c.	-	5	-	G, J
Shield	-	-	-	-

Connector (M16x0.75) S2, 7-pin



Description

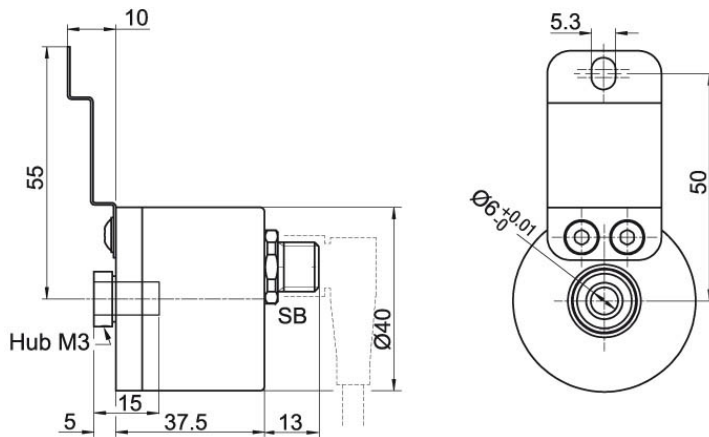
ABN inv. poss.

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

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Assignments	
	S2
	7-pin
Circuit	H05, H24
GND	1
(+) Vcc	2
A	3
B	4
N	5
-	-
A inv.	-
B inv.	-
N inv.	-
n. c.	6, 7
Shield	-

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



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

Assignments				
	SB4	SB5	SB8	SB12
	4-pin	5-pin	8-pin	12-pin
Circuit	H05, H24	H05, H24	R05, R24	R05, R24
GND	3	3	1	3
(+) Vcc	1	1	2	1
A	2	4	3	4
B	4	2	4	6
N	-	5	5	8
-	-	-	-	-
A inv.	-	-	6	9
B inv.	-	-	7	7
N inv.	-	-	8	10
n. c.	-	-	-	2, 5, 11, 12
Shield	-	-	-	-

Options

Low-friction bearings

The encoder WDG 40E is also available as a particularly smooth-running low-friction encoder. The starting torque is thereby changed to $\leq 0.1 \text{ Ncm}$ [0.141 in-ozf] and the protection class at the shaft input to IP50.

Order key

AAC

Low temperature

The encoder WDG 40E with the output circuit types H24, R24 is also available with the extended temperature range $-40 \text{ }^{\circ}\text{C}$ up to $+80 \text{ }^{\circ}\text{C}$ [$-40 \text{ }^{\circ}\text{F}$ up to $+176 \text{ }^{\circ}\text{F}$] (measured at the flange).

Order key

ACA

Cable length

The encoder WDG 40E can be supplied with more than 2 m cable. The maximum cable length depends on the supply voltage and the frequency; see <https://www.wachendorff-automation.com/download-gtd-incremental-encoders/>

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

Example: 5 m cable = 050

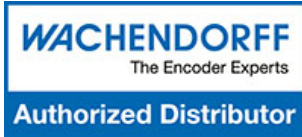
Order key

XXX = Decimeter

Example Order No.	Type						Your encoder
WDG 40E	WDG 40E						WDG 40E
		Bore size					
06	06						
		Pulses per revolution PPR:					
1024	4, 10, 20, 25, 28, 30, 36, 40, 50, 60, 90, 100, 128, 150, 200, 250, 314, 360, 400, 500, 600, 720, 1000, 1024, 1080, 1250, 1500, 1800, 2000, 2048, 2500 Other PPRs on request						
		Channels:					
ABN	AB, ABN bis 2048 I/U						
		Output circuit					
H24	Resolution PPR	Power supply VDC	Output circuit	-	Order key		
	up to 2500	4.75 - 5.5	TTL	-	H05		
		4.75 - 5.5	TTL, RS422 comp., inverted	-	R05		
		10 - 30	HTL	-	H24		
		10 - 30	HTL inverted	-	R24		
		Electrical connections					
K1	Description		ABN inv. poss.	Order key			
	Cable: length (2 m standard, WDG 58T: 1 m)						
	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			
	Connector: (shield connected to encoder housing)						
	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			
		Options					
	Description		Order key				
	Low-friction bearings		AAC				
	Low temperature		ACA				
	Without option		Empty				
	Cable length		XXX = Decimeter				

Example Order No. =	WDG 40E	06	1024	ABN	H24	K1	
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WDG 40E							Your encoder
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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/>

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