



Online Data Sheet

Encoder WDG 100I

www.wachendorff-automation.com/wdg100i

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 100I (optical)



- Rugged and extremely thin thru-bore encoder for extension on power motors
- Thru-Bore, bore size max. 42 mm
- Balanced stainless steel clamping ring for smooth running
- Insulating sleeve to protect the bearings from currents
- 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/wdg100i

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 WDGDS10012
- 1. Spring plate compensation	axial: ±0.8 mm, radial: ±0.2 mm
Housing	Ø 100 mm

Shaft(s)

Shaft material	stainless steel, (insulation sleeve: POM-C)
Starting torque	approx. 1.5 Ncm at ambient temperature
Fixing	clamping screw M4 with hexagon socket

Shaft	Ø 25 mm
Advice	with insulating sleeve
Shaft length	L: 48.8 mm
Insertion depth min.	29 mm
Max. Permissible shaft loading radial	200 N
Max. Permissible shaft loading axial	100 N

Shaft	Ø 30 mm
Advice	with insulating sleeve
Shaft length	L: 48.8 mm
Insertion depth min.	29 mm
Max. Permissible shaft loading radial	200 N
Max. Permissible shaft loading axial	100 N

Shaft	Ø 32 mm
Advice	with insulating sleeve
Shaft length	L: 48.8 mm
Insertion depth min.	29 mm
Max. Permissible shaft loading radial	200 N
Max. Permissible shaft loading axial	100 N

Shaft	Ø 38 mm
Advice	with insulating sleeve
Shaft length	L: 48.8 mm
Insertion depth min.	29 mm
Max. Permissible shaft loading radial	200 N
Max. Permissible shaft loading axial	100 N

Shaft	Ø 40 mm
Advice	with insulating sleeve
Shaft length	L: 48.8 mm
Insertion depth min.	29 mm
Max. Permissible shaft loading radial	200 N
Max. Permissible shaft loading axial	100 N

Shaft	Ø 42 mm
Advice	with insulating sleeve
Shaft length	L: 48.8 mm
Insertion depth min.	29 mm
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 ¹⁰ revs. at 100 % rated shaft load 1 x 10 ¹¹ revs. at 40 % rated shaft load 1 x 10 ¹² revs. at 20 % rated shaft load
Max. operating speed	3500 rpm

Machinery Directive: basic data safety integrity level

MTTF _d	200 a
Mission time (TM)	25 a
Nominal service life (L10h)	1 x 10 ¹² 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
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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
Electric strength (DIN EN 60243-2)	Insulating sleeve: 500 V

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

Duty information

Customs tariff number:	90318020
Country of origin:	Germany

General Data

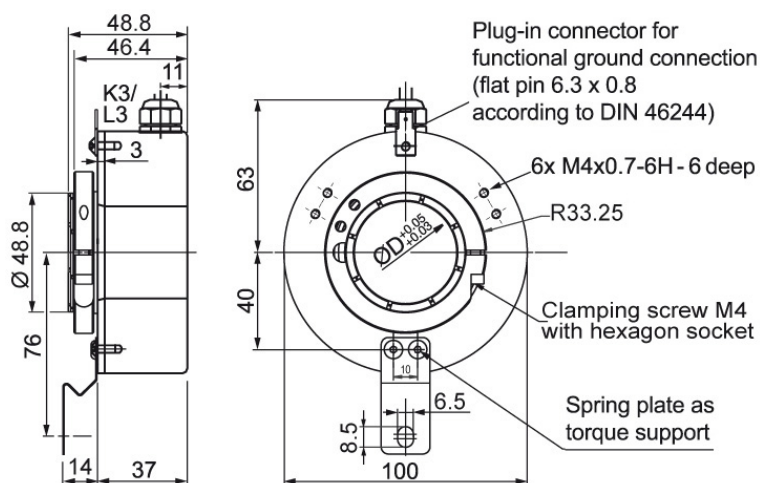
Weight	approx. 900 g
Connections	cable or connector, radial
Protection rating (EN 60529)	IP54
Operating temperature	-20 °C up to +80 °C 1 Vpp: -10 °C up to +70 °C
Storage temperature	-30 °C up to +80 °C

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



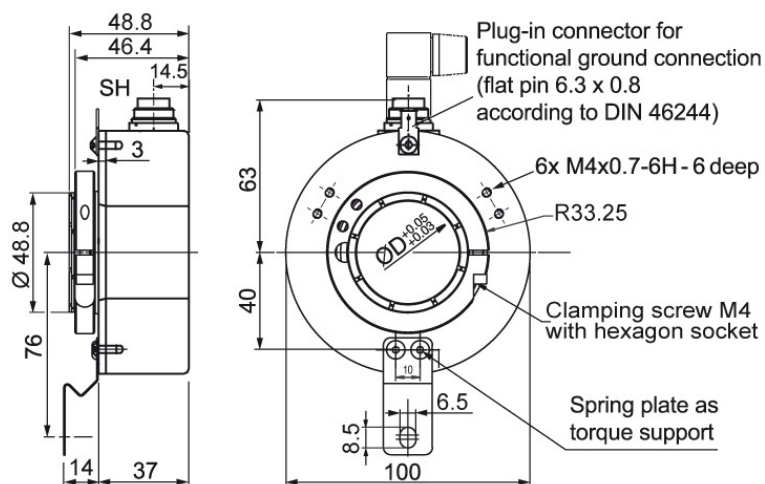
Description

ABN inv. poss.

K3	radial, shield not connected	•
L3	radial, shield connected to encoder housing	•

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

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



Description

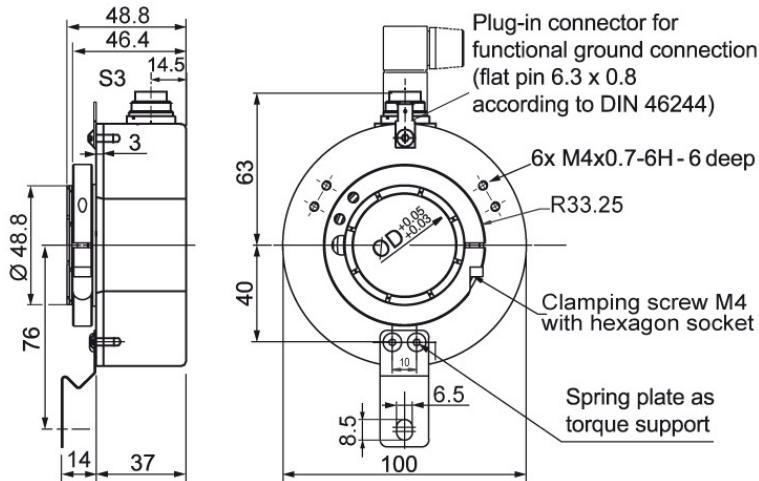
ABN inv. poss.

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

Assignments

	SH5	SH6	SH8	SH8	SH8	SH12	SH12	SH12
	5-pin	6-pin	8-pin	8-pin	8-pin	12-pin	12-pin	12-pin
Circuit	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
GND	1	6	1	1	1	K, L	K, L	K, L
(+) Vcc	2	1	2	2	2	M, B	M, B	M, B
A	3	2	3	3	3	E	E	E
B	4	4	4	4	4	H	H	H
N	5	3	5	5	5	C	C	C
Light reserve warning	-	-	-	-	-	-	-	-
A inv.	-	-	-	6	6	F	-	F
B inv.	-	-	-	7	7	A	-	A
N inv.	-	-	-	8	8	D	-	D
n. c.	-	5	6, 7, 8	-	-	G, J	A, D, F, G, J	G, J
Shield	-	-	-	-	-	-	-	-

Connector (M16x0.75) S3, 7-pin



Description

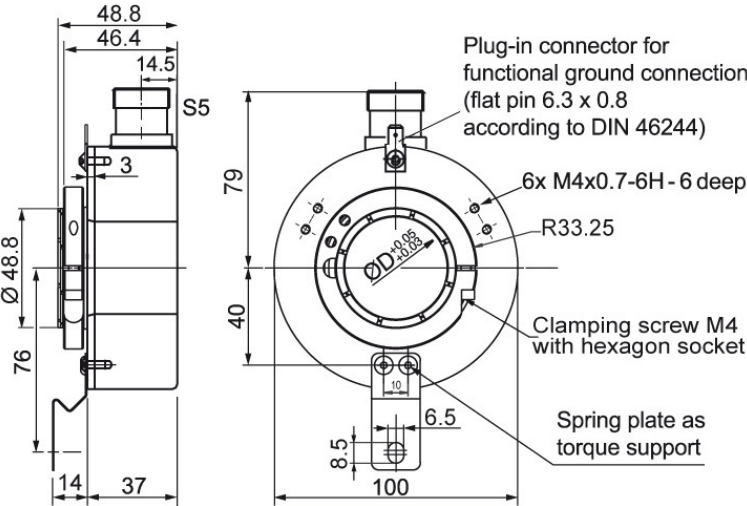
ABN inv. poss.

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

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

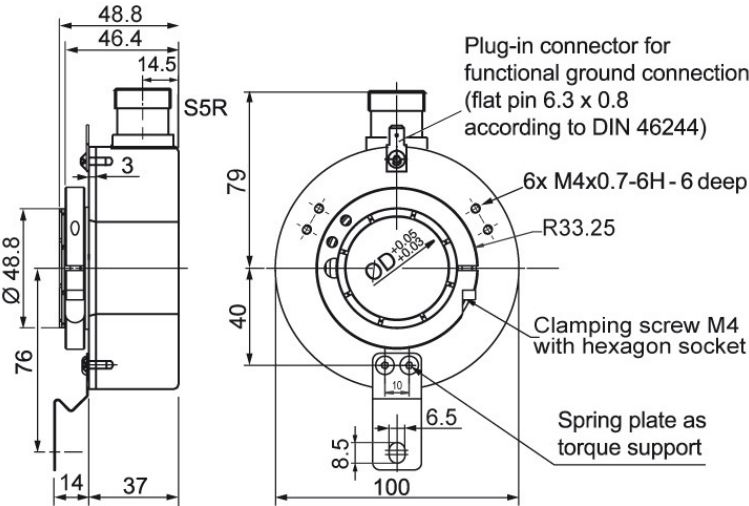
Connector (M23) S5, 12-pin



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

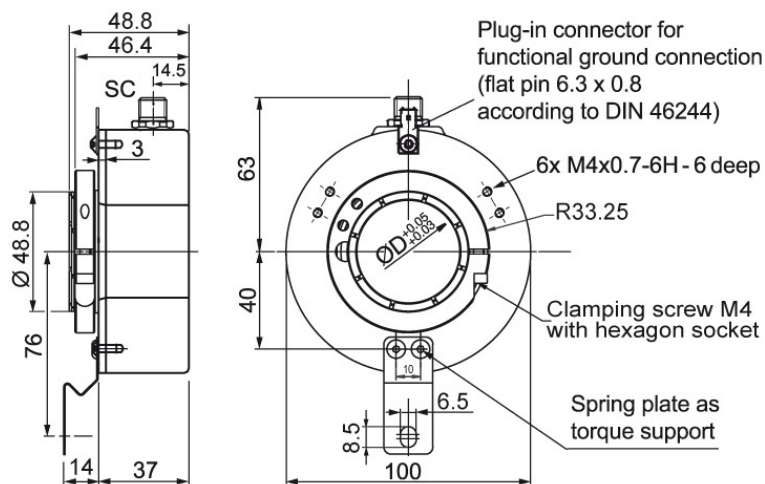
Connector (M23) S5R, 12-pin (clockwise)



Description	ABN inv. poss.
S5R radial, 12-pin, Connector connected to encoder housing	•

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

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



Description

ABN inv. poss.

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

Assignments

	SC4 4-pin	SC5 5-pin	SC8 8-pin	SC8 8-pin	SC8 8-pin	SC12 12-pin	SC12 12-pin
Circuit	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
GND	3	3	1	1	1	3	3
(+) Vcc	1	1	2	2	2	1	1
A	2	4	3	3	3	4	4
B	4	2	4	4	5	6	6
N	-	5	5	5	7	8	8
Light reserve warning	-	-	-	-	-	-	-
A inv.	-	-	-	6	4	-	9
B inv.	-	-	-	7	6	-	7
N inv.	-	-	-	8	8	-	10
n. c.	-	-	6, 7, 8	-	-	2, 5, 7, 9, 10, 11, 12	2, 5, 11, 12
Shield	-	-	-	-	-	-	-

Options

Low temperature

The encoder WDG 100I 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 100I 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 100I 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

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 100I	WDG 100I						WDG 100I
		Bore size					
38	25; 30; 32; 38; 40; 42						
		Pulses per revolution PPR:					
512	512, 1024, 2048, 2500, 3600, 4096, 5000, 4500, 8192, 10240, 16384, 20480						
		Channels:					
AB	AB, ABN						
		Output circuit					
H30	Resolution PPR	Power supply VDC	Output circuit	Light reserve warning	Order key		
	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		
		10 - 30	TTL, RS422 comp., inverted	-	245		
		10 - 30	TTL, RS422 comp., inverted	-	245		
	8192 up to 20480	4.75 - 5.5	TTL	-	F05		
		4.75 - 5.5	TTL, RS422 comp., inverted	-	P05		
		10 - 30	HTL	-	F24		
		10 - 30	HTL inverted	-	P24		
		10 - 30	TTL, RS422 comp., inverted	-	645		
	1024, 2048	4.75 - 5.5	1 Vpp sin/cos	•	SIF		
		4.75 - 5.5	1 Vpp sin/cos	-	SIN		
		Electrical connections					
K3	Description	ABN inv. poss.			Order key		
	Cable: length (2 m standard, WDG 58T: 1 m)						
	radial, shield not connected	•			K3		
	radial, shield connected to encoder housing	•			L3		
	Connector: (shield connected to encoder housing)						
	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		
		Options					
	Description	Order key					
	Low temperature	ACA					
	IP55	ACP					
	Cable length	Cable lenght					
	Without option	Empty					

Example Order No. =	WDG 100I	38	512	AB	H30	K3		WDG 100I								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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