



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



Illustration similar



- 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 [-40 °F up to +176 °F]
Protection to IP55 all around

www.wachendorff-automation.com/wdg100i

Resolution	
Pulses per revolution PPR	up to 20480 PPR
Mechanical Data	
Flange	hollow shaft (through-bored)
Flange material	aluminum
Housing material	aluminum, powder coated
Torque supports	incl. 1 torque support WDGDS10012
- 1. Spring plate compensation	axial: ±0.8 mm [0.0315"], radial: ±0.2 mm [0.0079"]
Flange diameter	Ø 100 mm [Ø 3.543"]
Shaft(s)	
Shaft material	stainless steel, (insulation sleeve: POM-C)
Starting torque	approx. 1.5 Ncm [2.124 in-ozf] at ambient temperature
Fixing	clamping screw M4 with hexagon socket
Shaft	Ø 25 mm [Ø 0.984"]
Advice	with insulating sleeve
Shaft length	L: 48.8 mm [1.921"]
Insertion depth min.	29 mm [1.142"]
Max. Permissible shaft loading radial	200 N [20.394 kp]
Max. Permissible shaft loading axial	100 N [10.197 kp]
Shaft	Ø 25.4 mm [Ø 1"] Ordern No: 1Z
Advice	with insulating sleeve
Shaft length	L: 48.8 mm [1.921"]
Insertion depth min.	29 mm [1.142"]
Max. Permissible shaft loading radial	200 N [20.394 kp]
Max. Permissible shaft loading axial	100 N [10.197 kp]
Shaft	Ø 30 mm [Ø 1.181"]
Advice	with insulating sleeve
Shaft length	L: 48.8 mm [1.921"]
Insertion depth min.	29 mm [1.142"]
Max. Permissible shaft loading radial	200 N [20.394 kp]
Max. Permissible shaft loading axial	100 N [10.197 kp]
Shaft	Ø 32 mm [Ø 1.26"]
Advice	with insulating sleeve

Shaft length	L: 48.8 mm [1.921"]
Insertion depth min.	29 mm [1.142"]
Max. Permissible shaft loading radial	200 N [20.394 kp]
Max. Permissible shaft loading axial	100 N [10.197 kp]
Shaft	Ø 38 mm [Ø 1.496"]
Advice	with insulating sleeve
Shaft length	L: 48.8 mm [1.921"]
Insertion depth min.	29 mm [1.142"]
Max. Permissible shaft loading radial	200 N [20.394 kp]
Max. Permissible shaft loading axial	100 N [10.197 kp]
Shaft	Ø 40 mm [Ø 1.575"]
Advice	with insulating sleeve
Shaft length	L: 48.8 mm [1.921"]
Insertion depth min.	29 mm [1.142"]
Max. Permissible shaft loading radial	200 N [20.394 kp]
Max. Permissible shaft loading axial	100 N [10.197 kp]
Shaft	Ø 42 mm [Ø 1.654"]
Advice	with insulating sleeve
Shaft length	L: 48.8 mm [1.921"]
Insertion depth min.	29 mm [1.142"]
Max. Permissible shaft loading radial	200 N [20.394 kp]
Max. Permissible shaft loading axial	100 N [10.197 kp]
Bearings	
Bearings type	2 precision ball bearings
Nominale 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
Nominale 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. 70 mA (100 mA only F05, P05)
Power supply/Current consumption	5 VDC up to 30 VDC: typ. 70 mA
Power supply/Current consumption	10 VDC up to 30 VDC: typ. 70 mA (100 mA only F24, P24, 645)
Operating principle	optical
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)
Electrical Safety:	according DIN VDE 0160

Duty information

Customs tariff number:	90318020
Country of origin:	Germany

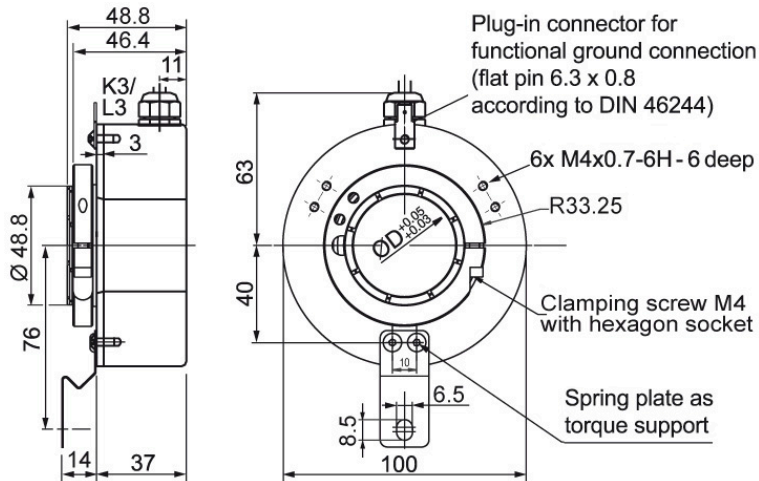
General Data

Weight	approx. 900 g [31.746 oz]
Connections	cable or connector, radial
Protection rating (EN 60529)	IP54
Operating temperature	-20 °C up to +80 °C [-4 °F up to +176 °F] 1 Vpp: -10 °C up to +70 °C [+14 °F up to +158 °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>

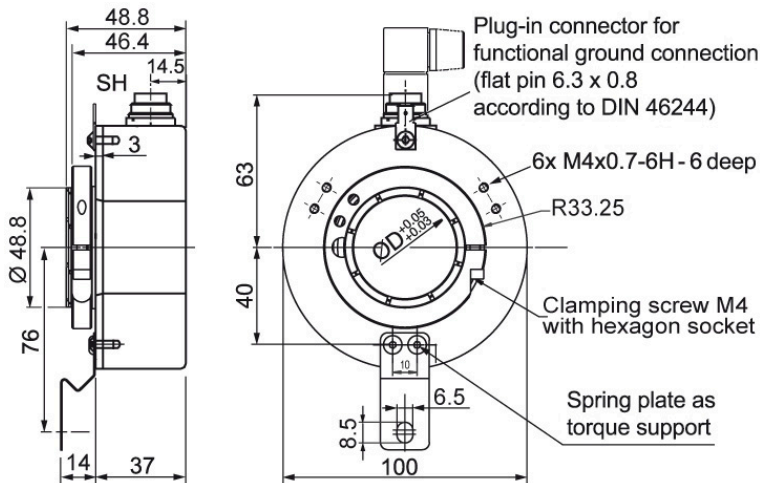
Cable connection K3, L3 with 2 m cable



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

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

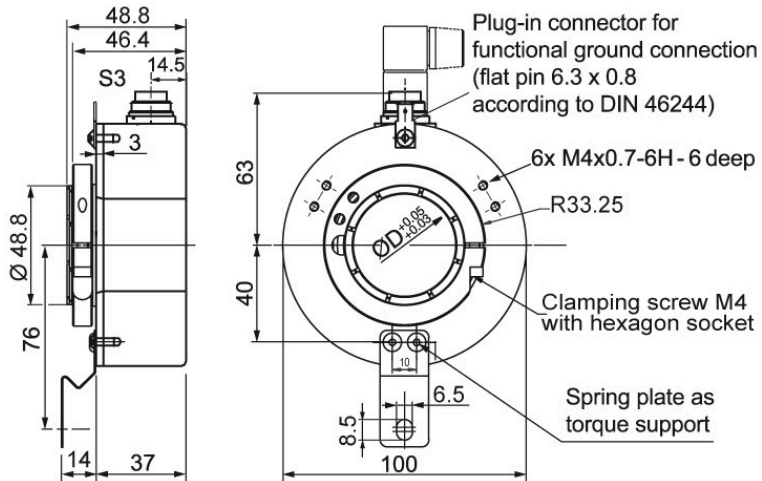
Connector (M16x0.75) SH, 5-, 6-, 8-, 12-pin



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

Connector (M16x0.75) S3, 7-pin



Description

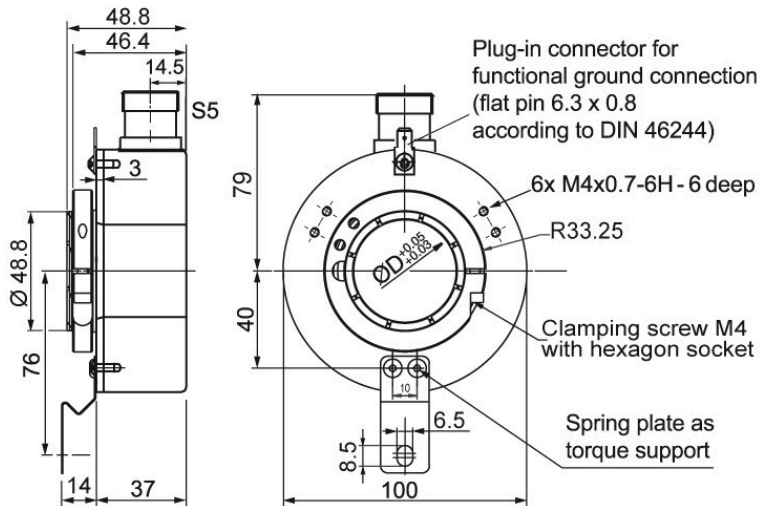
ABN inv. poss.

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

-

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

Connector (M23) S5, 12-pin



Description

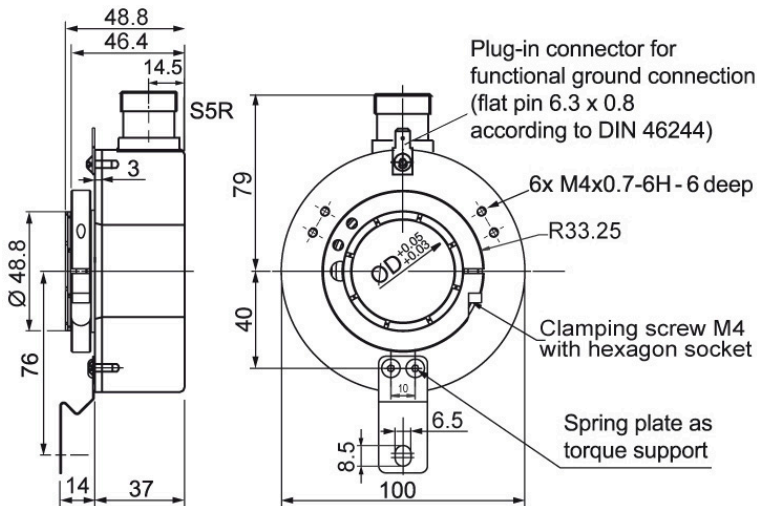
ABN inv. poss.

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

•

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

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



Description

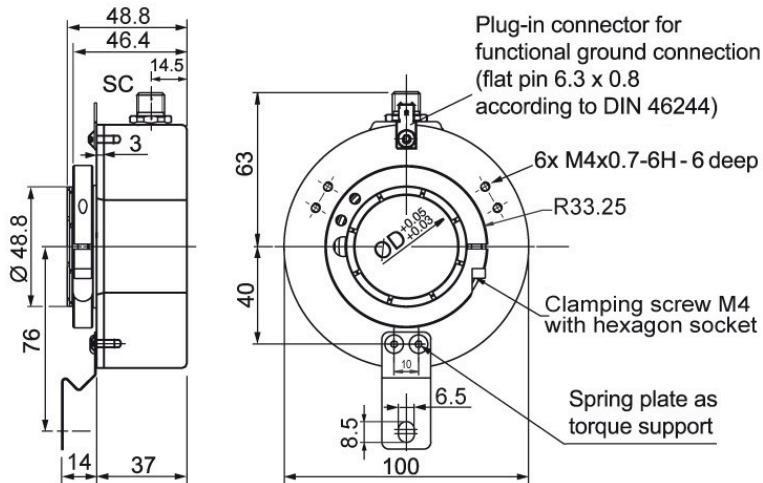
ABN inv. poss.

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

•

Assignments			
	S5R 12-pin	S5R 12-pin	S5R 12-pin
Circuit	F05, H05, F24, H24, H30	P05, R05, P24, R24, 245, 645, R30	SIN
GND	10	10	10
(+) Vcc	12	12	12
A	5	5	5
B	8	8	8
N	3	3	3
-	-	-	-
A inv.	-	6	6
B inv.	-	1	1
N inv.	-	4	4
n. c.	1, 2, 4, 6, 7, 9, 11	2, 7, 9, 11	2, 7, 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	SC5	SC8	SC8	SC12
	4-pin	5-pin	8-pin	8-pin	12-pin
Circuit	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
GND	3	3	1	1	3
(+) Vcc	1	1	2	2	1
A	2	4	3	3	4
B	4	2	4	5	6
N	-	5	5	7	8
-	-	-	-	-	-
A inv.	-	-	6	4	9
B inv.	-	-	7	6	7
N inv.	-	-	8	8	10
n. c.	-	-	-	-	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 [-40 °F up to +176 °F] (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 [10.197 kp]

Permitted Shaft-Loading, radial: 120 N [12.236 kp]

Max. PPR: 20480 ppr

Starting-torque: approx. 5 Ncm [7.081 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 <https://www.wachendorff-automation.com/download-gtd-incremental-encoders/>

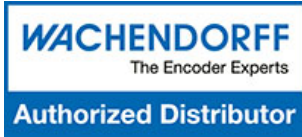
Please extend the standard order code with a three figure number, specifying the cable length in decimetres.

Example: 5 m cable = 050

Order key

XXX = Decimeter

Example Order No.	Type										Your encoder				
WDG 100I	WDG 100I										WDG 100I				
	Bore size														
38	25; 1Z; 30; 32; 38; 40; 42														
	Pulses per revolution PPR:														
1024	512, 1024, 2048, 2500, 3600, 4096, 4500, 5000, 8192, 10240, 16384, 20480 1 Vpp Sin/Cos only 1024, 2048 Other PPRs on request														
	Channels:														
ABN	AB, ABN														
	Output circuit														
H24	Resolution PPR	Power supply VDC	Output circuit				-	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							
	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				-	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									
	Without option					Empty									
	Cable length					XXX = Decimeter									
Example Order No.=	WDG 100I	38	1024	ABN	H24	K3		WDG 100I							Your encoder



For further information please contact our local distributor.
Here you find a list of our distributors worldwide.
<https://www.wachendorff-automation.com/contact-en/wachendorff-world-wide/>

WACHENDORFF

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