



Online Data Sheet

인크리멘탈 옵티컬 로터리 엔코더 - Ø70mm

WDG 70B 시리즈

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 70B

www.wachendorff-automation.com/wdgi70b

IndustrieROBUST

Encoder WDG1 70B



1. 견고한 산업 표준 엔코더

2. IP67 보호 등급의 방수/방진 로터리 엔코더 - Shaft Sealing - IP65

3. 옵티컬(Optical) 방식으로 고정밀, 고분해능 - MAX 2500PPR

4. 고출력 주파수 - 600kHz/2MHz

5. UL 및 CE 인증 제품

Resolution

Max. pulses per revolution PPR	up to 25000 PPR
--------------------------------	-----------------

Mechanical Data

Housing

Flange	clamping flange
Flange material	aluminum
Housing cap	die cast aluminum, powder coated
Housing	Ø 70 mm

Shaft(s)

Shaft material	stainless steel
Starting torque	approx. 1 Ncm at ambient temperature

Shaft	Ø 12 mm
Shaft length	L: 26 mm
Max. Permissible shaft loading radial	200 N
Max. Permissible shaft loading axial	150 N

Bearings

Bearings type	2 precision ball bearings
Nominal service life	1 x 10 ⁹ revs. at 100 % rated shaft load 1 x 10 ¹⁰ revs. at 40 % rated shaft load 1 x 10 ¹¹ revs. at 20 % rated shaft load
Max. operating speed	8000 rpm

Machinery Directive: basic data safety integrity level

MTTF _d	200 a
Mission time (TM)	25 a
Nominal service life (L10h)	1 x 10 ¹¹ revs. at 20 % rated shaft load and 8000 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 F24, G24, H24, I24, P24, R24 only
--------------------	--

Accuracy

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

General Data

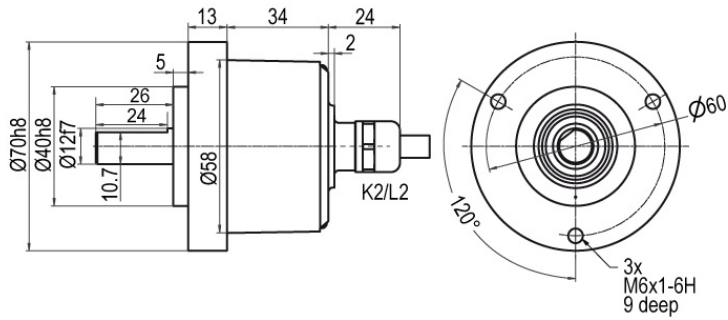
Weight	approx. 380 g
Connections	cable or connector outlet
Protection rating (EN 60529)	IP67, shaft sealed to IP65
Operating temperature	Connector: -20 °C up to +85 °C, cable: -20 °C up to +80 °C, (Option ACA: -40 °C up to +85 °C) 1 Vpp: -10 °C up to +70 °C
Storage temperature	Connector: -30 °C up to +85 °C, cable: -30 °C up to +80 °C, option ACA: -40 °C up to +85 °C

More Information

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

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

WDGI 70B: Cable connection K2, L2 with 2 m cable

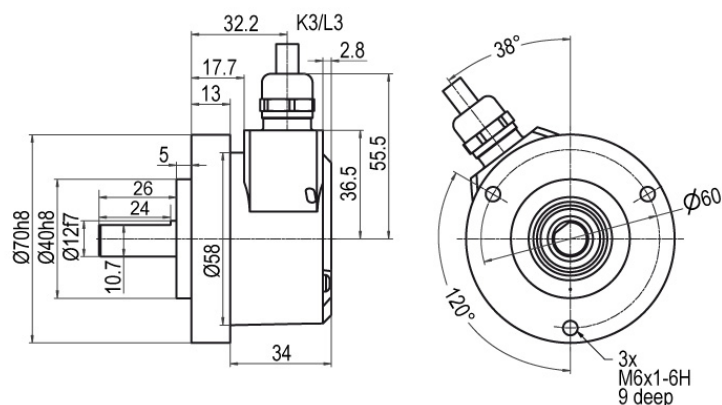


Description

ABN inv. poss.

K2	axial, shield not connected	•
L2	axial, shield connected to encoder housing	•

Assignments					
	K2, L2	K2, L2	K2, L2	K2, L2	L2
Circuit	G05, G24	F05, H05, F24, H24, H30	I05, I24, 524	P05, R05, P24, R24, 245, 645, R30	SIN
GND	WH	WH	WH	WH	WH
(+) Vcc	BN	BN	BN	BN	BN
A	GN	GN	GN	GN	GN
B	YE	YE	YE	YE	GY
N	GY	GY	GY	GY	-
Light reserve warning	PK	-	PK	-	-
A inv.	-	-	RD	RD	YE
B inv.	-	-	BK, (BU at ACA)	BK, (BU at ACA)	PK
N inv.	-	-	VT	VT	-
Shield	flex	flex	flex	flex	flex

WDGI 70B: Cable connection K3, L3 with 2 m cable

Description
ABN inv. poss.
K3 radial, shield not connected

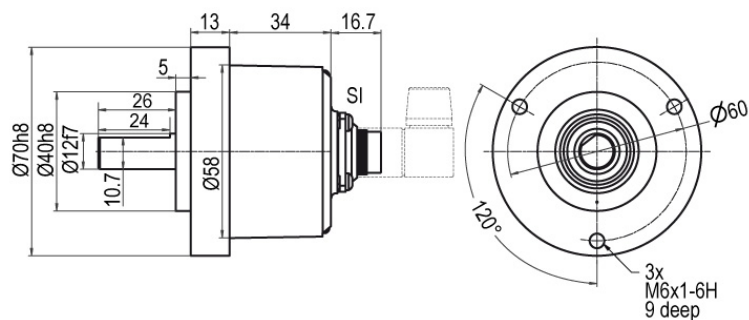
•

L3 radial, shield connected to encoder housing

•

Assignments

	K3, L3	K3, L3	K3, L3	K3, L3	L3
Circuit	G05, G24	F05, H05, F24, H24, H30	I05, I24, 524	P05, R05, P24, R24, 245, 645, R30	SIN
GND	WH	WH	WH	WH	WH
(+) Vcc	BN	BN	BN	BN	BN
A	GN	GN	GN	GN	GN
B	YE	YE	YE	YE	GY
N	GY	GY	GY	GY	-
Light reserve warning	PK	-	PK	-	-
A inv.	-	-	RD	RD	YE
B inv.	-	-	BK, (BU at ACA)	BK, (BU at ACA)	PK
N inv.	-	-	VT	VT	-
Shield	flex	flex	flex	flex	flex

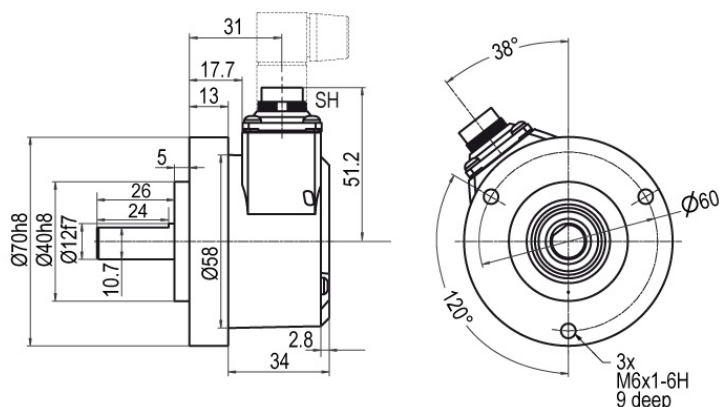
WDGI 70B: Connector (M16x0.75) SI, 5-, 6-, 8-, 12-pin

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

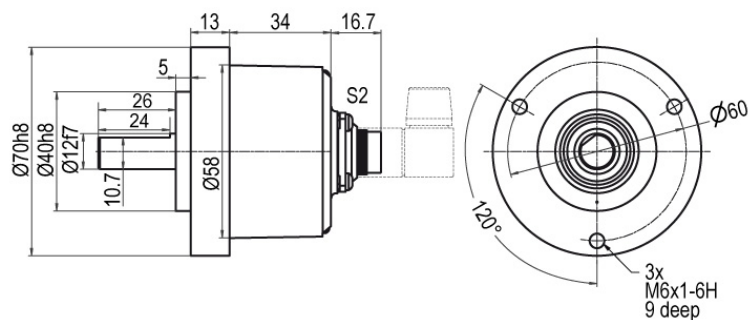
	SI5	SI6	SI6	SI8	SI8	SI8	SI12	SI12	SI12	SI12	SI12
	5-pin	6-pin	6-pin	8-pin	8-pin	8-pin	12-pin	12-pin	12-pin	12-pin	12-pin
Circuit	 F05, H05, F24, H24, H30	 G05, G24	 F05, H05, F24, H24, H30	 F05, H05, F24, H24, H30	 P05, R05, P24, R24, R30, 245, 645	 SIN	 G05, G24	 F05, H05, F24, H24, H30	 I05, I24, 524	 P05, R05, P24, R24, 245, 645, R30	 SIN
GND	1	6	6	1	1	1	K, L	K, L	K, L	K, L	K, L
(+) Vcc	2	1	1	2	2	2	M, B	M, B	M, B	M, B	M, B
A	3	2	2	3	3	3	E	E	E	E	E
B	4	4	4	4	4	4	H	H	H	H	H
N	5	3	3	5	5	-	C	C	C	C	-
Light reserve warning	-	5	-	-	-	-	G	-	G	-	-
A inv.	-	-	-	-	6	6	-	-	F	F	F
B inv.	-	-	-	-	7	7	-	-	A	A	A
N inv.	-	-	-	-	8	-	-	-	D	D	-
n. c.	-	-	5	6, 7, 8	-	5, 8	A, D, F, J	A, D, F, G, J	J	G, J	D, G, J
Shield	-	-	-	-	-	-	-	-	-	-	-

WDGI 70B: 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	•

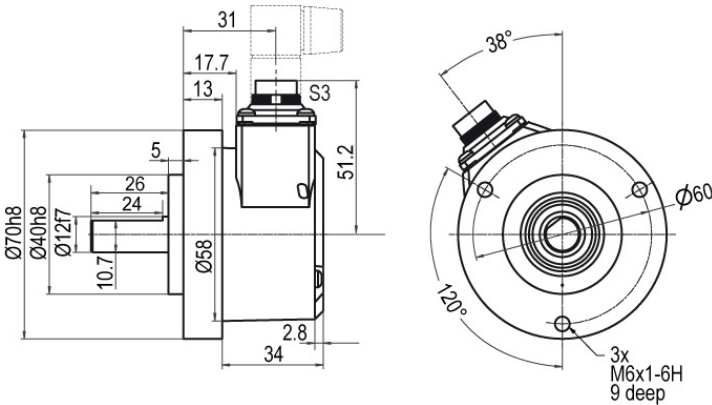
Assignments											
	SH5	SH6	SH6	SH8	SH8	SH8	SH12	SH12	SH12	SH12	SH12
	5-pin	6-pin	6-pin	8-pin	8-pin	8-pin	12-pin	12-pin	12-pin	12-pin	12-pin
Circuit	F05, H05, F24, H24, H30	G05, G24	F05, H05, F24, H24, H30	F05, H05, F24, H24, H30	P05, R05, P24, R24, R30, 245, 645	SIN	G05, G24	F05, H05, F24, H24, H30	I05, I24, 524	P05, R05, P24, R24, 245, 645, R30	SIN
GND	1	6	6	1	1	1	K, L	K, L	K, L	K, L	K, L
(+) Vcc	2	1	1	2	2	2	M, B	M, B	M, B	M, B	M, B
A	3	2	2	3	3	3	E	E	E	E	E
B	4	4	4	4	4	4	H	H	H	H	H
N	5	3	3	5	5	-	C	C	C	C	-
Light reserve warning	-	5	-	-	-	-	G	-	G	-	-
A inv.	-	-	-	-	6	6	-	-	F	F	F
B inv.	-	-	-	-	7	7	-	-	A	A	A
N inv.	-	-	-	-	8	-	-	-	D	D	-
n. c.	-	-	5	6, 7, 8	-	5, 8	A, D, F, J	A, D, F, G, J	J	G, J	D, G, J
Shield	-	-	-	-	-	-	-	-	-	-	-

WDGI 70B: Connector (M16x0.75) S2, 7-pin

Description
ABN inv. poss.
S2 axial, 7-pin, Connector connected to encoder housing

-

Assignments		
	S2	S2
	7-pin	7-pin
Circuit	G05, G24	F05, H05, F24, H24, H30
GND	1	1
(+) Vcc	2	2
A	3	3
B	4	4
N	5	5
Light reserve warning	6	-
A inv.	-	-
B inv.	-	-
N inv.	-	-
n. c.	7	6, 7
Shield	-	-

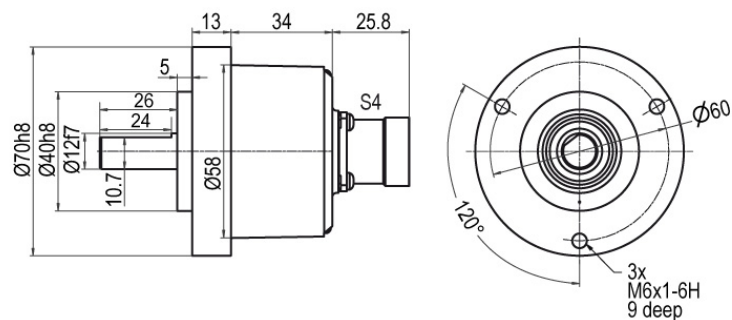
WDGI 70B: Connector (M16x0.75) S3, 7-pin



Description	ABN inv. poss.
S3 radial, 7-pin, Connector connected to encoder housing	-

Assignments		
	S3 7-pin	S3 7-pin
Circuit	G05, G24	F05, H05, F24, H24, H30
GND	1	1
(+) Vcc	2	2
A	3	3
B	4	4
N	5	5
Light reserve warning	6	-
A inv.	-	-
B inv.	-	-
N inv.	-	-
n. c.	7	6, 7
Shield	-	-

WDGI 70B: Connector (M23) S4, 12-pin



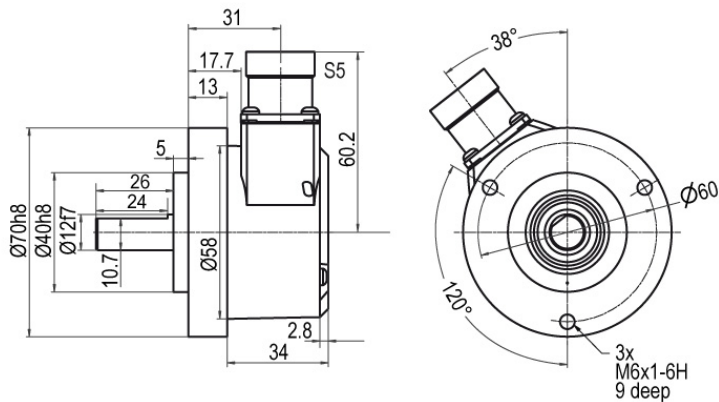
Description

ABN inv. poss.

S4 axial, 12-pin, Connector connected to encoder housing

•

Assignments					
	S4	S4	S4	S4	S4
	12-pin	12-pin	12-pin	12-pin	12-pin
Circuit	G05, G24	F05, H05, F24, H24, H30	I05, I24, 524	P05, R05, P24, R24, 245, 645, R30	SIN
GND	10	10	10	10	10
(+) Vcc	12	12	12	12	12
A	5	5	5	5	5
B	8	8	8	8	8
N	3	3	3	3	-
Light reserve warning	11	-	11	-	-
A inv.	-	-	6	6	6
B inv.	-	-	1	1	1
N inv.	-	-	4	4	-
n. c.	1, 2, 4, 6, 7, 9	1, 2, 4, 6, 7, 9, 11	2, 7, 9	2, 7, 9, 11	2, 3, 4, 7, 9, 11
Shield	-	-	-	-	-

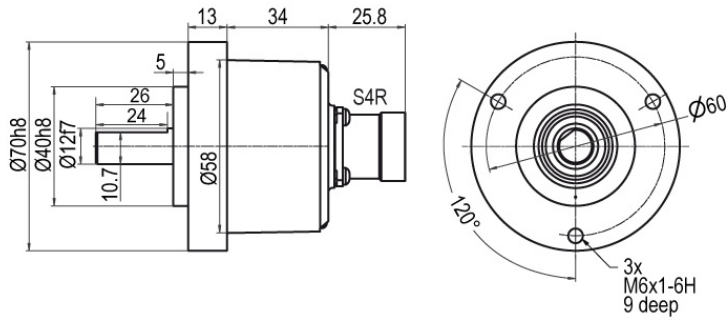
WDGI 70B: Connector (M23) S5, 12-pin**Description****ABN inv. poss.****S5** radial, 12-pin, Connector connected to encoder housing

•

Assignments

	S5	S5	S5	S5	S5
	12-pin	12-pin	12-pin	12-pin	12-pin
Circuit	G05, G24	F05, H05, F24, H24, H30	I05, I24, 524	P05, R05, P24, R24, 245, 645, R30	SIN
GND	10	10	10	10	10
(+) Vcc	12	12	12	12	12
A	5	5	5	5	5
B	8	8	8	8	8
N	3	3	3	3	-
Light reserve warning	11	-	11	-	-
A inv.	-	-	6	6	6
B inv.	-	-	1	1	1
N inv.	-	-	4	4	-
n. c.	1, 2, 4, 6, 7, 9	1, 2, 4, 6, 7, 9, 11	2, 7, 9	2, 7, 9, 11	2, 3, 4, 7, 9, 11
Shield	-	-	-	-	-

WDGI 70B: Connector (M23) S4R, 12-pin (clockwise)



Description

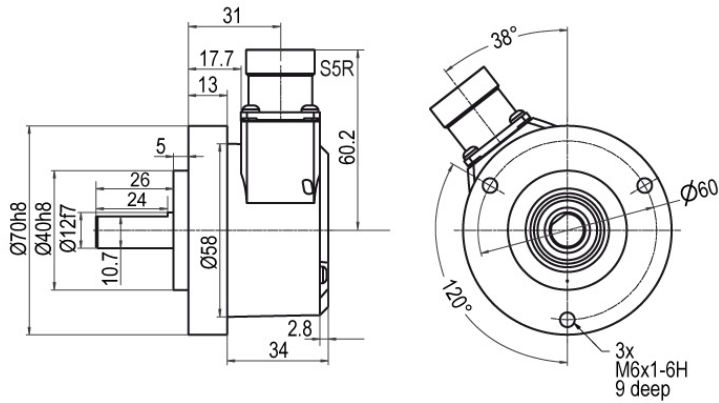
ABN inv. poss.

S4R axial, 12-pin, Connector connected to encoder housing

•

Assignments					
	S4R 12-pin	S4R 12-pin	S4R 12-pin	S4R 12-pin	S4R 12-pin
Circuit	G05, G24	F05, H05, F24, H24, H30	I05, I24, 524	P05, R05, P24, R24, 245, 645, R30	SIN
GND	10	10	10	10	10
(+) Vcc	12	12	12	12	12
A	5	5	5	5	5
B	8	8	8	8	8
N	3	3	3	3	-
Light reserve warning	11	-	11	-	-
A inv.	-	-	6	6	6
B inv.	-	-	1	1	1
N inv.	-	-	4	4	-
n. c.	1, 2, 4, 6, 7, 9	1, 2, 4, 6, 7, 9, 11	2, 7, 9	2, 7, 9, 11	2, 3, 4, 7, 9, 11
Shield	-	-	-	-	-

WDGI 70B: Connector (M23) S5R, 12-pin (clockwise)



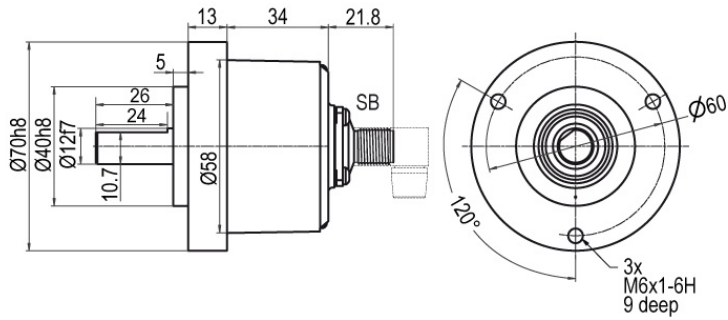
Description

ABN inv. poss.

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

•

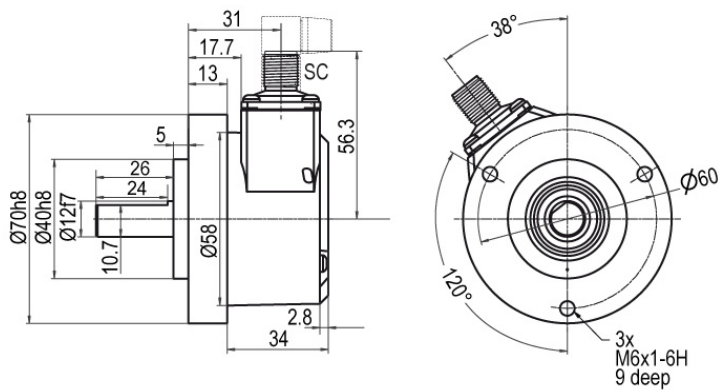
Assignments					
	S5R	S5R	S5R	S5R	S5R
	12-pin	12-pin	12-pin	12-pin	12-pin
Circuit	G05, G24	F05, H05, F24, H24, H30	I05, I24, 524	P05, R05, P24, R24, 245, 645, R30	SIN
GND	10	10	10	10	10
(+) Vcc	12	12	12	12	12
A	5	5	5	5	5
B	8	8	8	8	8
N	3	3	3	3	-
Light reserve warning	11	-	11	-	-
A inv.	-	-	6	6	6
B inv.	-	-	1	1	1
N inv.	-	-	4	4	-
n. c.	1, 2, 4, 6, 7, 9	1, 2, 4, 6, 7, 9, 11	2, 7, 9	2, 7, 9, 11	2, 3, 4, 7, 9, 11
Shield	-	-	-	-	-

WDGI 70B: 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	SB8	SB8	SB12	SB12	SB12	SB12
	4-pin	5-pin	8-pin	8-pin	8-pin	12-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	G05, G24	F05, H05, F24, H24, H30	I05, I24, 524	P05, R05, P24, R24, 245, 645, R30
GND	3	3	1	1	1	3	3	3	3
(+) Vcc	1	1	2	2	2	1	1	1	1
A	2	4	3	3	3	4	4	4	4
B	4	2	4	4	5	6	6	6	6
N	-	5	5	5	-	8	8	8	8
Light reserve warning	-	-	-	-	-	5	-	5	-
A inv.	-	-	-	6	4	-	-	9	9
B inv.	-	-	-	7	6	-	-	7	7
N inv.	-	-	-	8	-	-	-	10	10
n. c.	-	-	6, 7, 8	-	7, 8	2, 7, 9, 10, 11, 12	2, 5, 7, 9, 10, 11, 12	2, 11, 12	2, 5, 11, 12
Shield	-	-	-	-	-	-	-	-	-

WDGI 70B: 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	SC8	SC12	SC12	SC12	SC12
	4-pin	5-pin	8-pin	8-pin	8-pin	12-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	G05, G24	F05, H05, F24, H24, H30	I05, I24, 524	P05, R05, P24, R24, 245, 645, R30
GND	3	3	1	1	1	3	3	3	3
(+) Vcc	1	1	2	2	2	1	1	1	1
A	2	4	3	3	3	4	4	4	4
B	4	2	4	4	5	6	6	6	6
N	-	5	5	5	-	8	8	8	8
Light reserve warning	-	-	-	-	-	5	-	5	-
A inv.	-	-	-	6	4	-	-	9	9
B inv.	-	-	-	7	6	-	-	7	7
N inv.	-	-	-	8	-	-	-	10	10
n. c.	-	-	6, 7, 8	-	7, 8	2, 7, 9, 10, 11, 12	2, 5, 7, 9, 10, 11, 12	2, 11, 12	2, 5, 11, 12
Shield	-	-	-	-	-	-	-	-	-

Options

IP67 Shafts sealed to IP67 (not for 1 Vpp Sin/Cos)

Order key

The encoder WDGI 70B can be supplied in a full IP67 version.

AAO

Max. RPM: 3200 rpm

Permitted Shaft-Loading, axial: 110 N

Permitted Shaft-Loading, radial: 110 N

Max. PPR: 2500 ppr

Starting-torque: approx. 5 Ncm at ambient temperature

Low temperature

Order key

The encoder WDGI 70B with the output circuit types F24, G24, H24, I24, P24, R24, F05, G05, H05, I05, P05, R05, 245, 524, 645 is also available with the extended temperature range -40 °C up to +85 °C [-40 °F up to +185 °F] (measured at the flange).

ACA

Pressure equalising membrane

Order key

The WDGI 70B shaft encoder is also optionally available with a pressure equalising membrane. This prevents water from penetrating into the encoder housing in the case of high air humidity.

ACR

The IP67 protection level, temperature range and salt spray resistance are maintained.

Resistant to chemicals and solvents in accordance with DIN EN ISO 2812-1.

Cable length

Order key

The encoder WDGI 70B 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

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
WDGI 70B	WDGI 70B					WDGI 70B
	Shaft					
12	12					
	Pulses per revolution PPR:					
5000	2, 5, 10, 15, 20, 24, 25, 30, 36, 40, 48, 50, 60, 64, 72, 87, 90, 100, 120, 125, 127, 128, 150, 160, 180, 200, 216, 236, 240, 250, 254, 256, 300, 314, 320, 360, 400, 500, 512, 571, 600, 625, 720, 750, 768, 800, 810, 900, 1000, 1024, 1200, 1250, 1270, 1440, 1500, 1800, 2000, 2048, 2400, 2500, 3000, 3600, 4000, 4096, 4685, 5000, 10000, 12500, 20000, 25000 1 Vpp Sin/Cos only 1024, 2048 Other PPRs on request					
	Channels:					
ABN	AB, ABN (SIN: AB)					
	Output circuit					
G24	Resolution PPR	Power supply VDC	Output circuit	Light reserve warning	Order key	
	up to 2500	5 - 30	HTL	-	H30	
		5 - 30	HTL inverted	-	R30	
	up to 5000	4.75 - 5.5	TTL	•	G05	
		4.75 - 5.5	TTL	-	H05	
		4.75 - 5.5	TTL, RS422 comp., inverted	•	I05	
		4.75 - 5.5	TTL, RS422 comp., inverted	-	R05	
		10 - 30	HTL	•	G24	
		10 - 30	HTL	-	H24	
		10 - 30	HTL inverted	•	I24	
		10 - 30	HTL inverted	-	R24	
		10 - 30	TTL, RS422 comp., inverted	•	524	
		10 - 30	TTL, RS422 comp., inverted	-	245	
	(higher frequency) 1200 up to 25000	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												
K2	Description							ABN inv. poss.		Order key		
	Cable: length (2 m standard, WDG 58T: 1 m)											
	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, 5-pin, radial							-		SH5		
	connector, M16x0.75, 6-pin, axial							-		SI6		
	connector, M16x0.75, 6-pin, radial							-		SH6		
	connector, M16x0.75, 8-pin, axial							•		SI8		
	connector, M16x0.75, 8-pin, radial							•		SH8		
	connector, M16x0.75, 12-pin, axial							•		SI12		
	connector, M16x0.75, 12-pin, radial							•		SH12		
	connector, M16x0.75, 7-pin, axial							-		S2		
	connector, M16x0.75, 7-pin, radial							-		S3		
	connector, M23, 12-pin, axial							•		S4		
	connector, clockwise pin count, M23, 12-pin, axial							•		S4R		
	connector, M23, 12-pin, radial							•		S5		
	connector, clockwise pin count, M23, 12-pin, radial							•		S5R		
	sensor-connector, M12x1, 4-pin, axial							-		SB4		
	sensor-connector, M12x1, 4-pin, radial							-		SC4		
	sensor-connector, M12x1, 5-pin, axial							-		SB5		
	sensor-connector, M12x1, 5-pin, radial							-		SC5		
	sensor-connector, M12x1, 8-pin, axial							•		SB8		
	sensor-connector, M12x1, 8-pin, radial							•		SC8		
	sensor-connector, M12x1, 12-pin, axial							•		SB12		
	sensor-connector, M12x1, 12-pin, radial							•		SC12		
Options												
	Description							Order key				
	IP67							AAO				
	Low temperature							ACA				
	Pressure equalising membrane							ACR				
	Without option							Empty				
	Cable length							XXX = Decimeter				
Example Order No.= WDG1 70B 12 5000 ABN G24 K2 WDG1 70B Your encoder												

Example Order No. =	WDGI 70B	12	5000	ABN	G24	K2		WDGI 70B								Your encoder
---------------------	----------	----	------	-----	-----	----	--	----------	--	--	--	--	--	--	--	--------------



For further information please contact our local distributor.
Here you find a list of our distributors worldwide.
http://www.wachendorff-automation.com/distributors_worldwide.html

CREKEN

주식회사 크레켄

경기도 성남시 중원구 사기막골로 124
SKn테크노파크 메가동 514호 우편번호:13207

Phone: 031) 608-3200 Fax: 031) 776-2320
E-Mail: sales@creken.co.kr
www.creken.co.kr



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

Phone: +49 67 22 / 99 65 25
Fax: +49 67 22 / 99 65 70
E-Mail: wdg@wachendorff.de
www.wachendorff-automation.de

