WACHENDORFF
The Encoder Experts

Online Data sheet

HM 2603

Encoder WDG 145H

www.wachendorff-automation.com/wdg145h

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 145H

Illustration similar

- Thru-bore encoder for direct installation on large electric motors
- Maximum mechanical and electrical safety
- Highly interference-resistant when used with frequency converters
- Meets protection class IP54, optional IP64
- Full connection protection with 10 VDC up to 30 VDC
- With light reserve warning

www.wachendorff-automation.com/wdg145h

Resolution	
Pulses per revolution PPR	up to 2500 PPR

Mechanical Data	
Flange	hollow shaft (through-bored)
Flange material	aluminum
Housing material	aluminum
Torque supports	incl. 3 torque supports WDGDS10001
- 1. Spring plate compensation	axial: ±0.8 mm [0.0315"], radial: ±0.2 mm [0.0079"]
- 2. Cylinder pin 4 mm	needs accessories WDGDS10005
- Compensation	axial: ±0.5 mm [0.0197"], radial: ±1.5 mm [0.0591"], Max. operating speed: 800 rpm
Flange diameter	Ø 145 mm [Ø 4.528"]

Shaft(s)	
Shaft material	stainless steel
Starting torque	approx. 1.5 Ncm [2.124 in-ozf] at ambient temperature
Fixing	permanently attached clambing ring

Shaft	Ø 45 mm [Ø 1.772"]
Shaft length	L: 59 mm [2.323"]
Insertion depth min.	69 mm [2.717"]
Max. Permissible shaft loading radial	200 N [20.394 kp]
Max. Permissible shaft loading axial	100 N [10.197 kp]

Shaft	Ø 48 mm [Ø 1.89"]
Shaft length	L: 59 mm [2.323"]
Insertion depth min.	69 mm [2.717"]
Max. Permissible shaft loading radial	200 N [20.394 kp]
Max. Permissible shaft loading axial	100 N [10.197 kp]

Shaft	Ø 50 mm [Ø 1.969"]
Shaft length	L: 59 mm [2.323"]
Insertion depth min.	69 mm [2.717"]
Max. Permissible shaft loading radial	200 N [20.394 kp]
Max. Permissible shaft loading axial	100 N [10.197 kp]

Shaft	Ø 55 mm [Ø 2.165"]
Shaft length	L: 59 mm [2.323"]
Insertion depth min.	69 mm [2.717"]
Max. Permissible shaft loading radial	200 N [20.394 kp]
Max. Permissible shaft loading axial	100 N [10.197 kp]

Shaft	Ø 60 mm [Ø 2.362"]
Shaft length	L: 59 mm [2.323"]
Insertion depth min.	69 mm [2.717"]
Max. Permissible shaft loading radial	200 N [20.394 kp]
Max. Permissible shaft loading axial	100 N [10.197 kp]

Shaft	Ø 65 mm [Ø 2.56"]
Shaft length	L: 59 mm [2.323"]
Insertion depth min.	69 mm [2.717"]
Max. Permissible shaft loading radial	200 N [20.394 kp]
Max. Permissible shaft loading axial	100 N [10.197 kp]

Shaft	Ø 72 mm [Ø 2.835"]
Shaft length	L: 59 mm [2.323"]
Insertion depth min.	69 mm [2.717"]
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 4 x 10'11 revs. at 40 % rated shaft load 3 x 10'12 revs. at 20 % rated shaft load
Max. operating speed	1600 min'-1 (with cylinder pin 800 min'-1)

Machinery Directive: basic data safety integrity level	
$MTTF_d$	200 a
Mission time (TM)	25 a
Nominale service life (L10h)	3 x 10'12 revs. at 20 % rated shaft load and 1600 min'-1 (with cylinder pin 800 min'-1)
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 TTL, RS422 compatible, inv. HTL HTL, inv.
Pulse frequency	TTL ≤ 2500 ppr: max. 200 kHz HTL ≤ 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° ± max. 7.5 % of the period duration
pulse-/pause-ratio	50 % ± max. 7 %

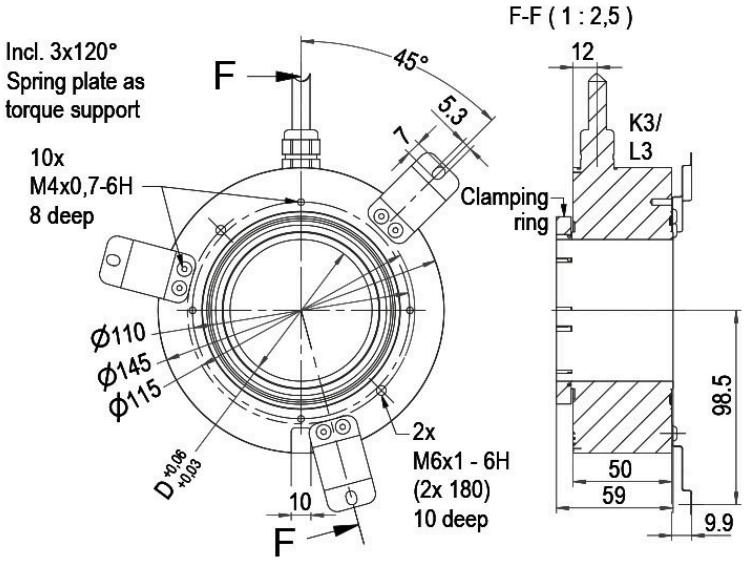
Environmental data	
ESD (DIN EN 61000-4-2):	8 kV
Burst (DIN EN 61000-4-4):	2 kV
includes EMC:	DIN EN 61000-6-2 DIN EN 61000-6-3
Vibration: (DIN EN 60068-2-6)	50 m/s² (10 Hz up to 2000 Hz)
Shock: (DIN EN 60068-2-27)	1000 m/s² (6 ms)
Electrial Safety:	according DIN VDE 0160

Duty information	
Customs tariff number:	90318020
Country of origin:	Germany

General Data	
Weight	approx. 1700 g [59.965 oz] up to 2500 g [88.183 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]
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**

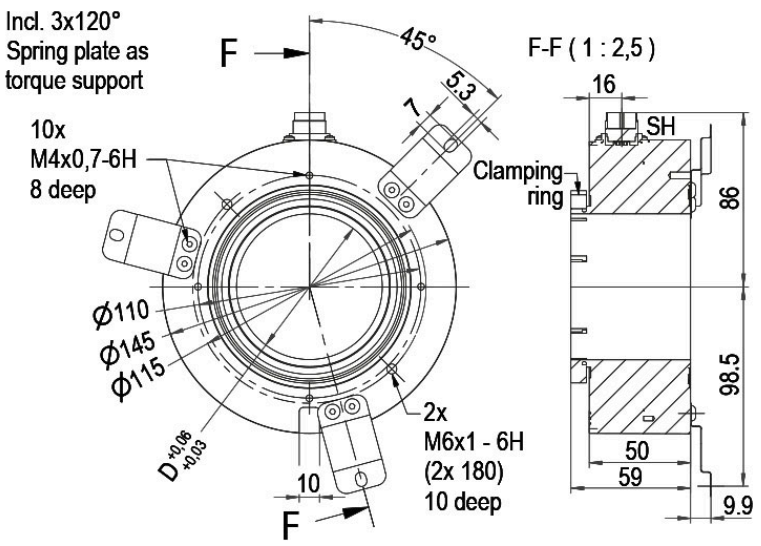
Cable connection K3, L3 with 2 m cable



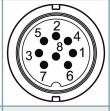
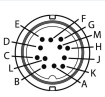
Description		ABN inv. poss.
K3	radial, shield not connected	•
L3	radial, shield connected to encoder housing	•

Assignments		
	K3, L3	**K3, L3**
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, (BU at ACA)
N inv.	-	VT
Shield	flex	flex

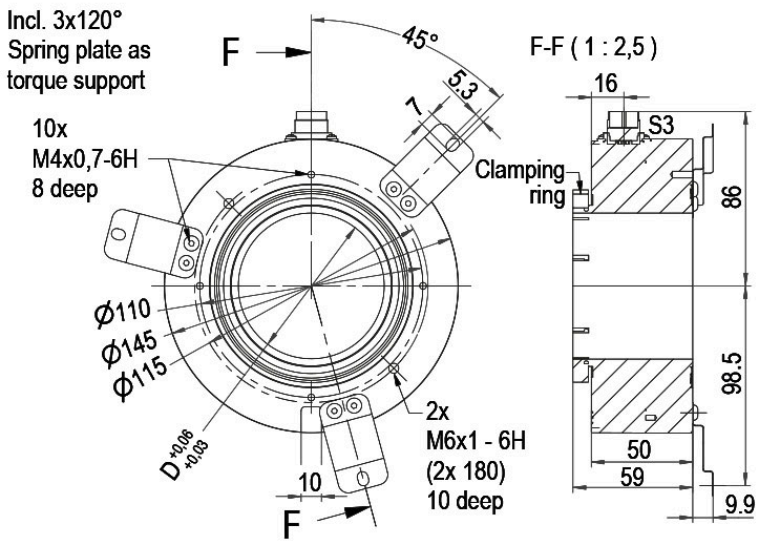
Connector (M16x0.75) SH, 5-, 6-, 8-, 12-pin



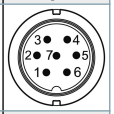
Description		ABN inv. poss.
SH5	radial, 5-pin, Connector connected to encoder housing	-
SH6	radial, 6-pin, Connector connected to encoder housing	-
SH8	radial, 8-pin, Connector connected to encoder housing	•
SH12	radial, 12-pin, Connector connected to encoder housing	•

Assignments				
	SH5	**SH6**	**SH8**	**SH12**
	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	-	-	-	-

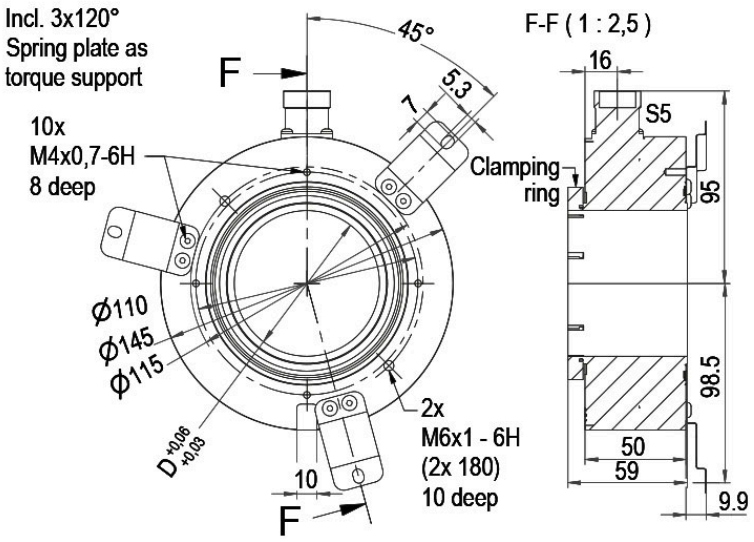
Connector (M16x0.75) S3, 7-pin



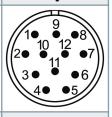
Description		ABN inv. poss.
S3	radial, 7-pin, Connector connected to encoder housing	-

Assignments	
	S3
	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	-

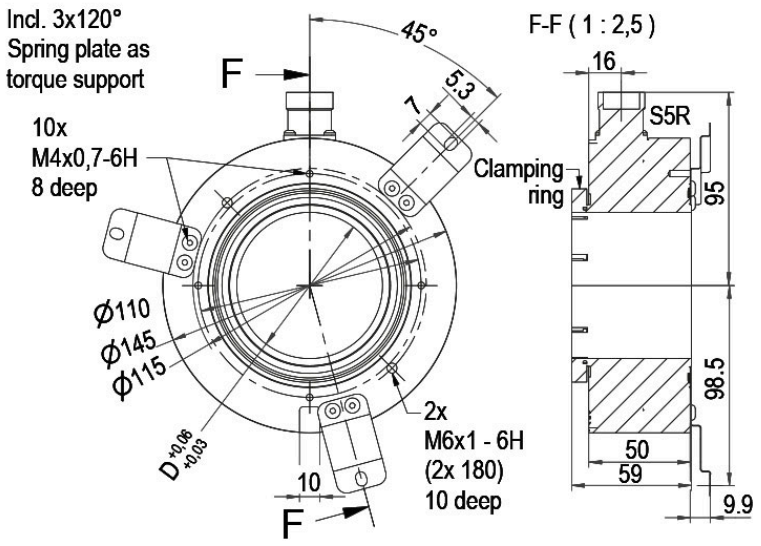
Connector (M23) S5, 12-pin



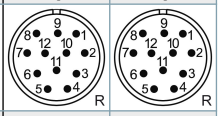
Description		ABN inv. poss.
S5	radial, 12-pin, Connector connected to encoder housing	•

Assignments		
	S5	**S5**
	12-pin	**12-pin**
		
Circuit	H05, H24	R05, R24
GND	10	10
(+) Vcc	12	12
A	5	5
B	8	8
N	3	3
-	-	-
A inv.	-	6
B inv.	-	1
N inv.	-	4
n. c.	1, 2, 4, 6, 7, 9, 11	2, 7, 9, 11
Shield	-	-

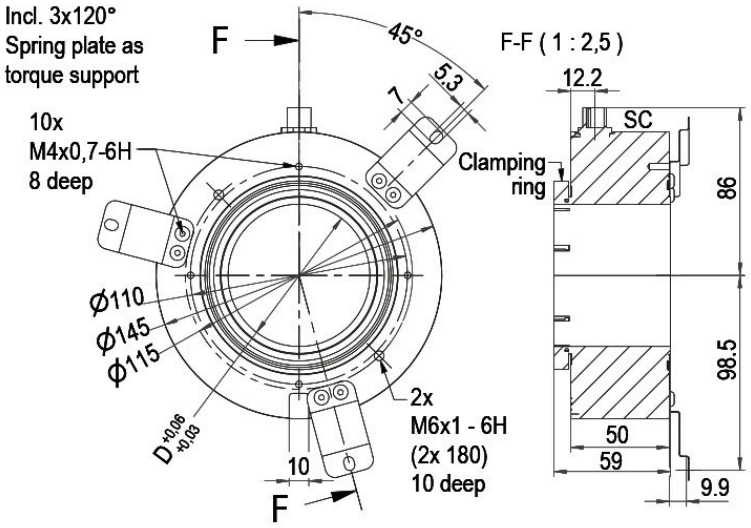
Connector (M23) S5R, 12-pin (clockwise)



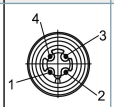
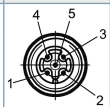
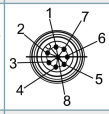
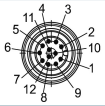
Description		ABN inv. poss.
S5R	radial, 12-pin, Connector connected to encoder housing	•

Assignments		
	S5R	**S5R**
	12-pin	**12-pin**
		
Circuit	H05, H24	R05, R24
GND	10	10
(+) Vcc	12	12
A	5	5
B	8	8
N	3	3
-	-	-
A inv.	-	6
B inv.	-	1
N inv.	-	4
n. c.	1, 2, 4, 6, 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**	**SC12**
	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

IP64 all around	Order key
The encoder WDG 145H can be supplied in a full IP64 version. Max. RPM: 500 rpm Starting-torque: approx. 5 Ncm [7.081 in-ozf] at ambient temperature	**AEK**

Cable length	Order key
The encoder WDG 145H 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	**XXX = Decimeter**

Example Order No.	Type					Your encoder
WDG 145H	WDG 145H					WDG 145H
	Bore size					
65	45; 48; 50; 55; 60; 65; 72					
	Pulses per revolution PPR:					
1024	1024, 2500 Other PPRs on request					
	Channels:					
ABN	AB, ABN					
	Output circuit					
H24	**Resolution PPR**	**Power supply VDC**	**Output circuit**	**-**	**Order key**	
	1024, 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					
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**		
	IP64			AEK		
	Without option			Empty		
	Cable length			XXX = Decimeter		

Example Order No.=	WDG 145H	65	1024	ABN	H24	K3		WDG 145H							Your encoder