Absolute encoders - parallel

End or hollow shaft ø12 mm

Optical singleturn encoders 12 bit

BFF, BFG parallel

BFF parallel with end shaft

Features

- **Encoder singleturn / parallel**
- **Optical sensing**
- **Resolution: 12 bit**
- **Small profile depth**
- **High interference immunity**
- **End or hollow shaft ø12 mm**

Technical data - electrical ratings

Voltage supply	5 VDC ±10 % 10...30 VDC
Consumption w/o load (typ.)	120 mA (5 VDC) 70 mA (24 VDC)
Initializing time (typ.)	170 ms after power on
Interface	12 parallel outputs
Function	Singleturn
Steps per turn	≤4096 / 12 bit
Absolute accuracy	±0.05 °
Sensing method	Optical
Code	Gray
Code sequence	CW default
Interference immunity	DIN EN 61000-6-2
Emitted interference	DIN EN 61000-6-3
Approval	UL approval / E217823

Technical data - mechanical design

Dimensions (flange)	ø58 mm
Protection DIN EN 60529	IP 65
Operating speed	≤12000 rpm (mechanical) ≤6000 rpm (electric)
Operating temperature	-20...+85 °C
Relative humidity	95 % non-condensing
Resistance	DIN EN 60068-2-6 Vibration 10 g, 10-2000 Hz DIN EN 60068-2-27 Shock 50 g, 11 ms
Weight approx.	300 g
Connection	Connector M16, 19-pin Cable 2 m
BFG	
Shaft	ø12 mm hollow shaft
Operating torque typ.	0.0175 Nm (IP 42) 0.047 Nm (IP 65)
Materials	Housing: aluminium Flange: aluminium
BFF	
Shaft	ø12 mm end shaft
Operating torque typ.	0.009 Nm (IP 42) 0.037 Nm (IP 65)
Materials	Housing: aluminium Housing: steel (connection -5) Flange: aluminium

BFF, BFG parallel

Part number

Hollow shaft

BFG 1G. [ ][ ] - [ ][ ] - [ ]

Connection
- 5 Cable 2 m, radial
- 9 Connector radial

Shaft
- B2 Hollow shaft ø12 mm, IP 42, with clamping ring
- E2 Hollow shaft ø12 mm, IP 65, with clamping ring

Resolution
- 360 9 bit singleturn (capped)
- 512 9 bit singleturn
- 1024 10 bit singleturn
- 3600 13 bit singleturn (cut)
- 4096 12 bit singleturn

Voltage supply / signals
- 05N 5 VDC / parallel NPN
- 24K 10...30 VDC / parallel, push-pull short-circuit proof

End shaft

BFF 1G. [ ][ ] - [ ][ ] - [ ]

Connection
- 5 Cable 2 m, radial
- 9 Connector radial

Shaft
- 12 End shaft ø12 mm, IP 42
- B2 End shaft ø12 mm, IP 42, with clamping ring
- L2 End shaft ø12 mm, IP 65
- E2 End shaft ø12 mm, IP 65, with clamping ring

Resolution
- 360 9 bit singleturn (capped)
- 512 9 bit singleturn
- 1024 10 bit singleturn
- 3600 13 bit singleturn (cut)
- 4096 12 bit singleturn

Voltage supply / signals
- 05N 5 VDC / parallel NPN
- 24K 10...30 VDC / parallel, push-pull short-circuit proof

Accessories

Connectors and cables

10111837	Female connector M16, 19-pin, straight
10130370	Female connector M16, 19-pin, straight, 2 m
10130371	Female connector M16, 19-pin, straight, 5 m

Mounting accessories

10110616	Clamp set ø15 mm
10107540	Torque pin
10109520	Torque spring washer
10136635	Set of spring coupling for encoders ø58 mm
10142556	Clamping ring set for 12 mm hollow shaft

Absolute encoders - parallel

End or hollow shaft ø12 mm

Optical singleturn encoders 12 bit

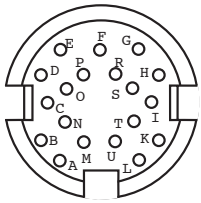
BFF, BFG parallel

Terminal assignment

Cable / connector
for connection reference **-9** and **-5**

Connector	Core colour	Resolution 4096	Resolution 1024	Resolution 360/512
Pin A	white	0 V	0 V	0 V
Pin B	brown	+Vs	+Vs	+Vs
Pin D	green	Bit 1 LSB	Bit 1 LSB	Bit 1 LSB
Pin E	yellow	Bit 2	Bit 2	Bit 2
Pin F	grey	Bit 3	Bit 3	Bit 3
Pin G	pink	Bit 4	Bit 4	Bit 4
Pin H	blue	Bit 5	Bit 5	Bit 5
Pin I	red	Bit 6	Bit 6	Bit 6
Pin K	black	Bit 7	Bit 7	Bit 7
Pin L	violett	Bit 8	Bit 8	Bit 8
Pin M	grey/pink	Bit 9	Bit 9	Bit 9 MSB
Pin N	white/green	Bit 10	Bit 10 MSB	n.c.
Pin O	brown/green	Bit 11	n.c.	n.c.
Pin P	yellow/brown	Bit 12 MSB	n.c.	n.c.
Pin R	white/yellow	Bit 12 MSB comp. [1)]	Bit 10 MSB comp. [1)]	Bit 9 MSB comp. [1)]
-	red/blue	n.c.	n.c.	n.c.
Screen	connected to housing			
Cable data	16 x 0,14 mm²			

[1)] The direction of rotation for encoders with gray-code can be defined by connecting the MSB or MSB comp. If MSB is connected, the encoder counts up as the shaft rotates clockwise (CW). If MSB inv. is connected, the encoder counts up if the shaft rotates counter clockwise (CCW).



Terminal significance

+Vs	Encoder supply voltage.
0 V	Encoder ground connection relating to +Vs.
Bit 1-x	x: 9...12 parallel output signals.

Trigger level

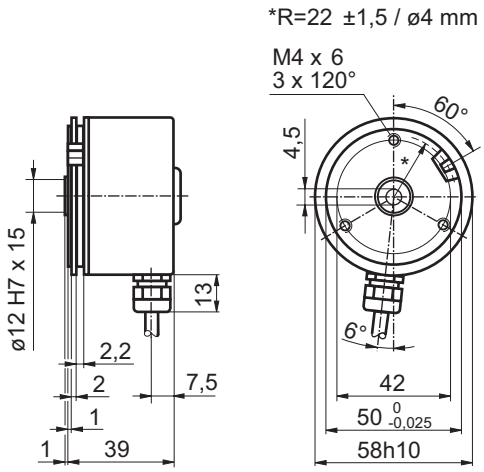
Parallel outputs 05N	**Output circuit** NPN
Output level High	typ. 4,5 V
Output level Low	<0,5 V
Load High	<100 mA / Output
Load Low	<100 mA / Output

Parallel outputs 24K	**Output circuit** Push-pull short-circuit protection
Output level High	>UB - 5,5 V (I = -30 mA)
Output level Low	<5,5 V (I = 30 mA)
Load High	<30 mA / Output
Load Low	<30 mA / Output

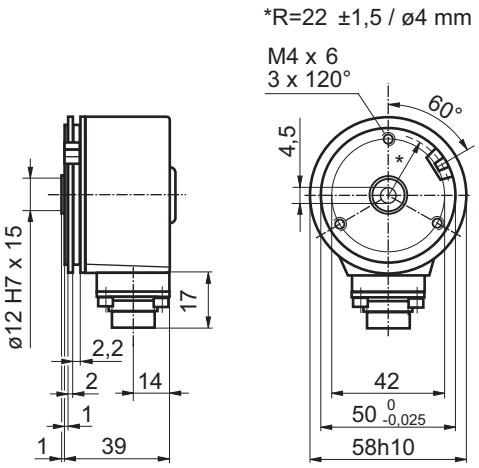
BFF, BFG parallel

Dimensions

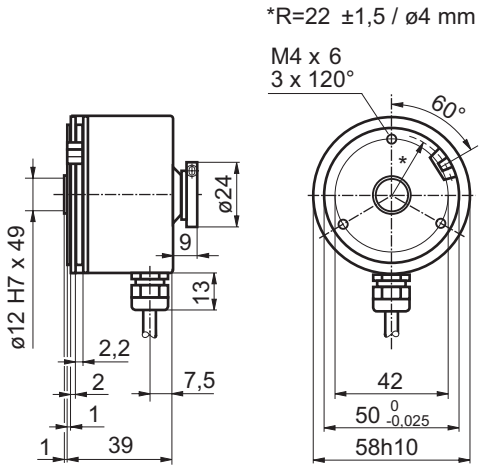
BFF parallel, cable radial



BFF parallel, connector output radial



BFG parallel, cable radial



BFG parallel, connector output radial