

# Absolute encoders - parallel

End or hollow shaft  $\varnothing 12$  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  $\varnothing 12$  mm

### Technical data - electrical ratings

Voltage supply	5 VDC $\pm 10$ % 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	$\leq 4096$ / 12 bit
Absolute accuracy	$\pm 0.05^\circ$
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)	$\varnothing 58$ mm
Protection DIN EN 60529	IP 65
Operating speed	$\leq 12000$ rpm (mechanical) $\leq 6000$ rpm (electric)
Operating temperature	$-20 \dots +85^\circ\text{C}$
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 M23, 19-pin Cable 2 m

### BFG

Shaft	$\varnothing 12$ mm hollow shaft
Operating torque typ.	0.0175 Nm IP 42 0.047 Nm IP 65
Materials	Housing: aluminium Flange: aluminium

### BFF

Shaft	$\varnothing 12$ 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

# Absolute encoders - parallel

End or hollow shaft  $\varnothing$ 12 mm

Optical singleturn encoders 12 bit

BFF, BFG parallel

## Part number

### Hollow shaft

BFG 1G.   -  -

				<u>Connection</u>
			5	Cable 2 m, radial
			9	Connector radial
				<u>Shaft</u>
	B2	Hollow shaft $\varnothing$ 12 mm, IP 42, with clamping ring		
	E2	Hollow shaft $\varnothing$ 12 mm, IP 65, with clamping ring		
				<u>Resolution</u>
	360	9 bit singleturn (capped)		
	512	9 bit singleturn		
	1024	10 bit singleturn		
	3600	13 bit singleturn (cut)		
	4096	12 bit singleturn		
				<u>Voltage supply / signals</u>
5V		DC / parallel NPN		
10k		.30 VDC / parallel, push-pull short-circuit proof		
24k				

### End shaft

BFF 1G.   -  -

				<u>Connection</u>
			5	Cable 2 m, radial
			9	Connector radial
				<u>Shaft</u>
	12	End shaft $\varnothing$ 12 mm, IP 42		
	B2	End shaft $\varnothing$ 12 mm, IP 42, with clamping ring		
	L2	End shaft $\varnothing$ 12 mm, IP 65		
	E2	End shaft $\varnothing$ 12 mm, IP 65, with clamping ring		
				<u>Resolution</u>
	360	9 bit singleturn (capped)		
	512	9 bit singleturn		
	1024	10 bit singleturn		
	3600	13 bit singleturn (cut)		
	4096	12 bit singleturn		
				<u>Voltage supply / signals</u>
5V		DC / parallel NPN		
10k		.30 VDC / parallel, push-pull short-circuit proof		
24k				

## Accessories

### Connectors and cables

10111837	Female connector M23, 19-pin, straight
10130370	Female connector M23, 19-pin, straight, 2 m
10130371	Female connector M23, 19-pin, straight, 5 m

### Mounting accessories

10110616	Clamp set
10107540	Torque pin
10109520	Torque spring washer
10136635	Set of spring coupling for encoders $\varnothing$ 58 mm
10142556	Clamping ring set for 12 mm hollow shaft

# Absolute encoders - parallel

End or hollow shaft  $\varnothing 12$  mm

Optical singleturn encoders 12 bit

## BFF, BFG parallel

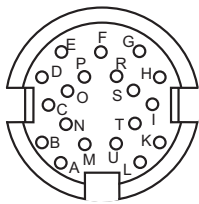
### Terminal assignment

#### 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. <sup>1)</sup>	Bit 10 MSB comp. <sup>1)</sup>	Bit 9 MSB comp. <sup>1)</sup>
-	red/blue	n.c.	n.c.	n.c.
Screen	connected to housing			
Cable data	16 x 0,14 mm <sup>2</sup>			

<sup>1)</sup> 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

# Absolute encoders - parallel

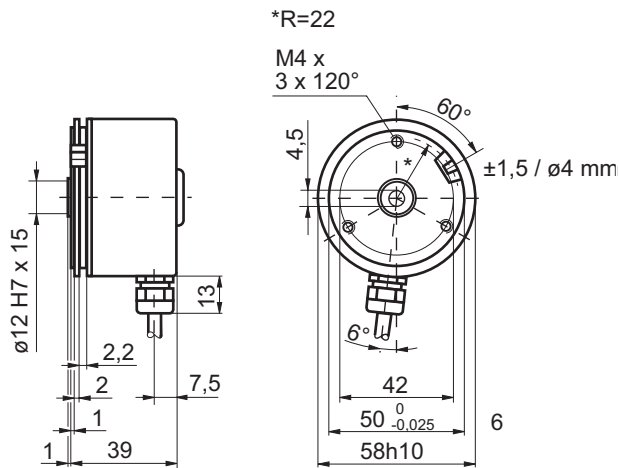
End or hollow shaft  $\varnothing 12$  mm

Optical singleturn encoders 12 bit

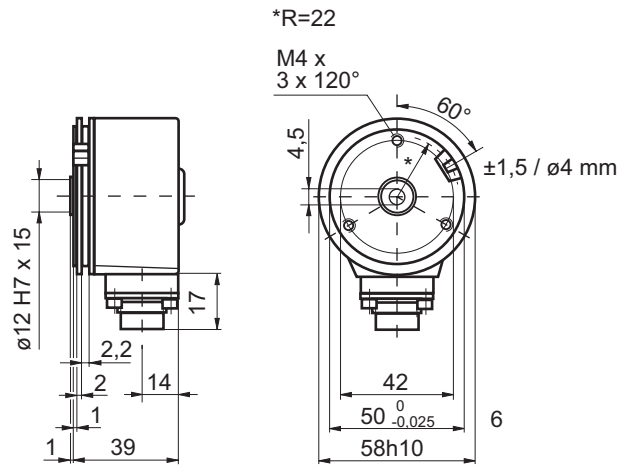
**BFF, BFG parallel**

## Dimensions

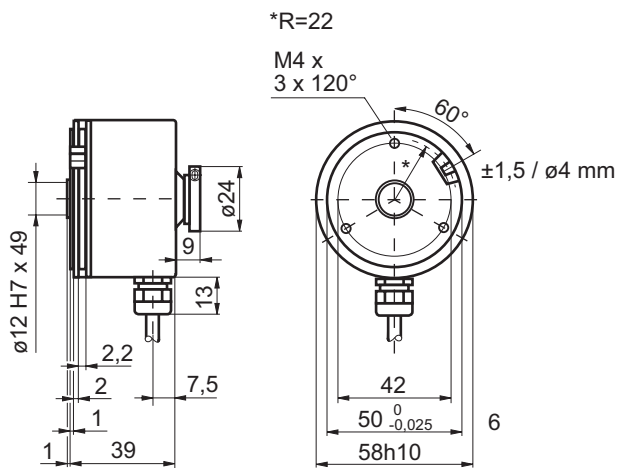
**BFF parallel, cable radial**



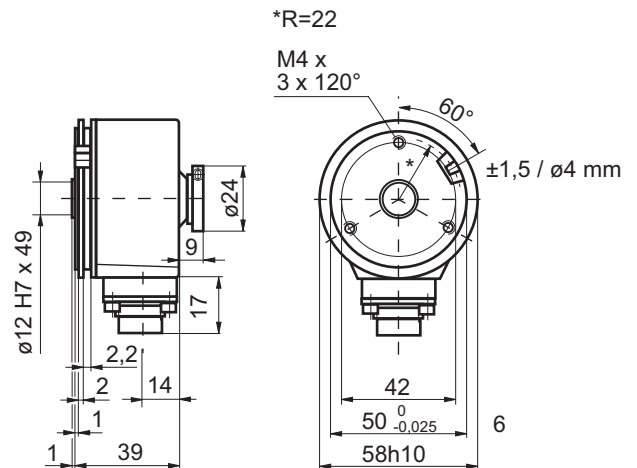
**BFF parallel, connector output radial**



**BFG parallel, cable radial**



**BFG parallel, connector output radial**



Subject to modification in technic and design. Errors and omissions excepted.