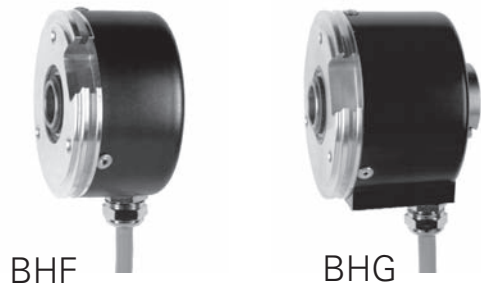


Incremental hollow shaft encoders BHF/BHG

features

- simple mounting
- end shaft mounting (BHF)
- through shaft mounting (BHG)
- various hollow shaft adapters
- small mounting depth



general data

voltage supply	5 VDC $\pm 10\%$ (05A) 4,5 - 30 VDC (25W) 10 - 30 VDC (24K)
max. supply current no load	typ. 80 mA (at 5 VDC) (05A) typ. 180 mA (at 4,5 VDC) (25W) typ. 60 mA (at 24 VDC) (24K)
max. measuring steps	40'000 steps at 10'000 ppr (05A / 24K)
pulse range	see order designation
pulse tolerance	$\pm 10\%$
max. switching frequency	200 kHz (24K) 300 kHz (05A / 25W) 750 kHz (05A > 5000 ppr)

mechanical data

max. revolutions	12'000 rpm (IP 42) 6'000 rpm (IP 65)
moment of inertia	BHF/BHG with clamp ring typ. $18,5 \times 10^{-7}$ kgm ² BHF without clamp ring typ. $13,6 \times 10^{-7}$ kgm ²
torque	
BHF	typ. 0,9 cNm IP 42 typ. 3,7 cNm IP 65
BHG	typ. 1,75 cNm IP 42 typ. 4,7 cNm IP 65 (3'000 rpm / 20 °C)
product life	depending on ambient conditions (typ. 10^9 revolutions)
max. protection class	IP 65
material	housing: aluminum BHF with connection ref. -5 : steel flange: aluminum
weight	approx. 300 g

ambient conditions

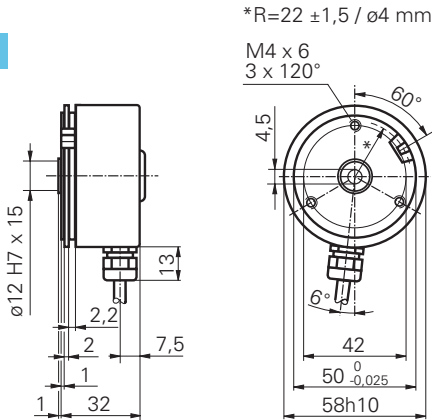
temperature range	-20...+85 °C
relative humidity	max. 95% non condensing
vibration	IEC 60068-2-6 (≤ 100 m/s ² / 10 - 200 Hz)
shock	IEC 60068-2-27 (≤ 500 m/s ² / 11 ms)
noise immunity	EN 61000-6-2
emitted interference	EN 61000-6-3



dimensions and connection dimensions

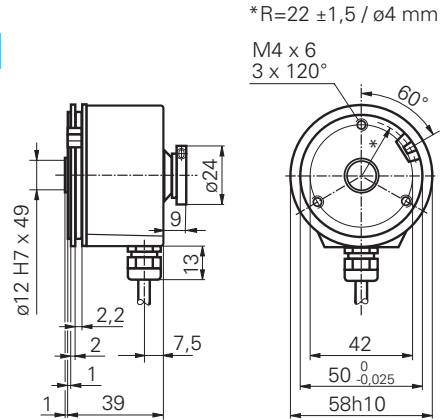
BHF

-5

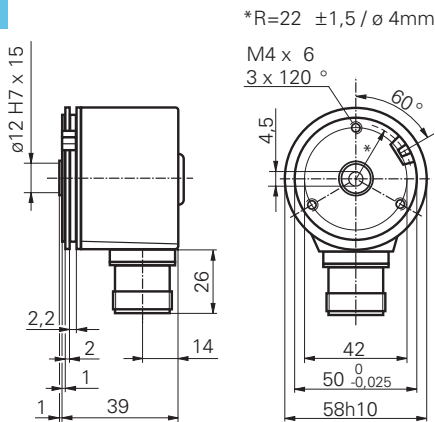


BHG

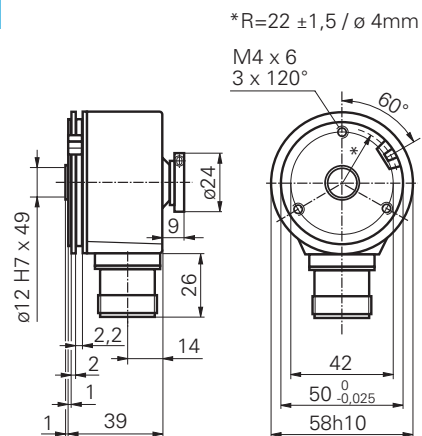
-5



-A



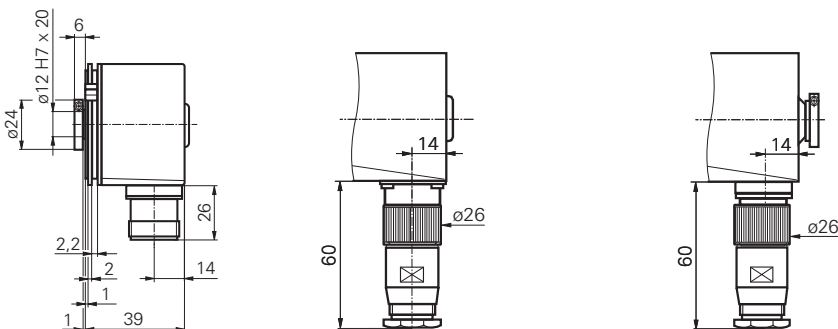
-A



-E2 with clamping ring

-A

-A



Note
Mounting drawings see end of chapter.

Incremental hollow shaft encoders BHF/BHG

assignment cable

for connection reference **-5**

05A (5 VDC complementary)

25W (4,5 - 30 VDC push-pull, complementary, short-circuit protection)

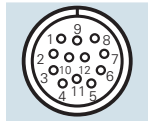
cable color	signals
brown	+Vs
green	CHA
red	CHA compl.
yellow	CHB
blue	CHB compl.
pink	CHN
grey	CHN compl.
white	0V
screen	connected to connector housing
cable data	8 x 0,14 mm ² , max. ext. ø 5,7 mm

24K (10 - 30 VDC complementary, short-circuit protection)

cable color	signals
brown	+Vs
green	CHA
yellow	CHB
pink	CHN
white	0V
screen	connected to connector housing
cable data	5 x 0,14 mm ² , max. ext. ø 5,4 mm

assignment connector M23 male

for connection reference **-A**



05A (5 VDC complementary)

24K (10 - 30 VDC complementary, short-circuit protection)

25W (4,5 - 30 VDC push-pull, complementary, short-circuit protection)

pin number	signals
1	CHA compl.
2	+Vs
3	CHN
4	CHN compl.
5	CHB
6	CHB compl.
7	n.c.
8	CHA
9	housing
10	0 V
11	0 V
12	+Vs

push-pull version **24K** without CHx complementary signals



1

order designation BHF

BHF 16. [] [] [] - [] - []

connection
5 cable 2 m radial
A connector radial M23

shaft
12 end shaft 12 mm IP 42 ²⁾
B2 end shaft 12 mm IP 42 ²⁾ with clamping ring
L2 end shaft 12 mm IP 65
E2 end shaft 12 mm IP 65 with clamping ring

standard pulse range

10	120	1000	3600
30	200	1024	5000
50	250	1250	7200¹⁾
60	360	2000	8192¹⁾
100	500	2500	10000¹⁾

other pulses on request

voltage range, output signals

05A 5 VDC complementary
24K 10 - 30 VDC push-pull, short-circuit protection
25W 4,5 - 30 VDC push-pull, complementary, short-circuit protection

encoder type
F end shaft encoder

order designation BHG

BHG 16. [] [] [] - [] - []

connection
5 cable 2 m radial
A connector radial M23

shaft
B2 through shaft 12 mm IP 42 with clamping ring
E2 through shaft 12 mm IP 65 with clamping ring

standard pulse range

10	120	1000	3600
30	200	1024	5000
50	250	1250	7200¹⁾
60	360	2000	8192¹⁾
100	500	2500	10000¹⁾

other pulses on request

voltage range, output signals

05A 5 VDC complementary
24K 10 - 30 VDC push-pull, short-circuit protection
25W 4,5 - 30 VDC push-pull, complementary, short-circuit protection

encoder type
G through shaft encoder

¹⁾ only for complementary **05A** and push-pull **24K**

²⁾ shaft adapter must be ordered separately

Other versions on request.

accessories

connector M23 female reference -A 12-pin straight	
for complementary 05A	part nr. 107687
for push-pull 24K	part nr. 107687
for complementary 25W	part nr. 107687
cable with connector M23 female (pre-assembled) ref. -A	
2 m	part nr. 130367
5 m	part nr. 118532
clamp set	part nr. 110616
torque pin	part nr. 107540
torque spring ³⁾	part nr. 109520
spring plate set	part nr. 136635
shaft adapters	see chapter accessories
clamping ring set	
12 mm hollow shaft	part nr. 142556

³⁾ encoder is delivered with fixed rubber torque spring

Incremental hollow shaft encoder BHF high resolution, programmable

features

- high resolution
- programmable over BiSS (accessories necessary)
- end-hollow shaft mounting
- easy mounting with spring plate



general data

voltage supply	5 VDC $\pm 10\%$ (05A) 10 - 30 VDC (24K)
max. supply current no load	typ. 30 mA (at 5 VDC) (05A) typ. 20 mA (at 24 VDC) (24K)
max. measuring steps	1'280'000 steps at 320'000 ppr
pulse range	see order designation
pulse tolerance	$\pm 10\%$
max. switching frequency	1,3 MHz

mechanical data

max. revolutions	6'000 rpm
moment of inertia	BHF with clamping ring typ. $18,5 \times 10^{-7}$ kgm ² BHF without clamping ring typ. $13,6 \times 10^{-7}$ kgm ²
torque	typ. 0,9 cNm IP 42 typ. 3,7 cNm IP 65 (3'000 rpm / 20 °C)
product life	depending on ambient conditions (typ. 10^9 revolutions)
max. protection class	IP 65
material	aluminum
weight	approx. 300 g

ambient conditions

temperature range	-20...+85 °C
relative humidity	max. 95% non condensing
vibration	IEC 60068-2-6 (≤ 100 m/s ² / 10 - 200 Hz)
shock	IEC 60068-2-27 (≤ 500 m/s ² / 11 ms)
noise immunity	EN 61000-6-2
emitted interference	EN 61000-6-3



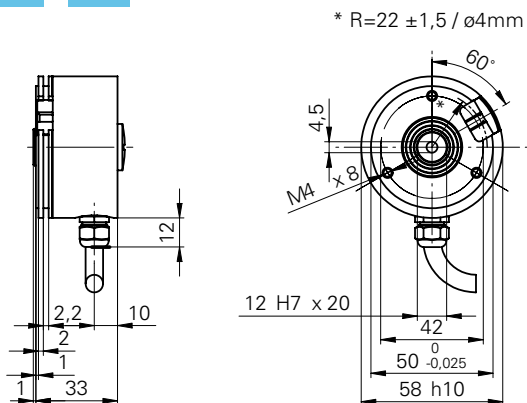
dimensions and connection dimensions

BHF

1

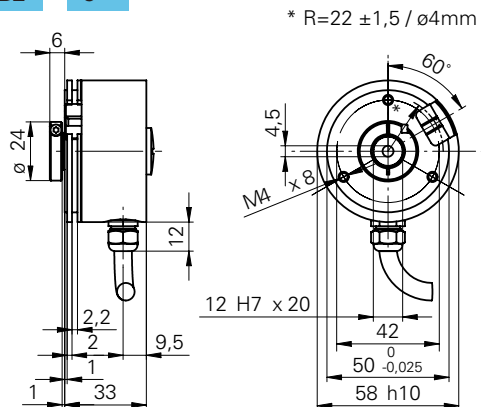
-12

-5



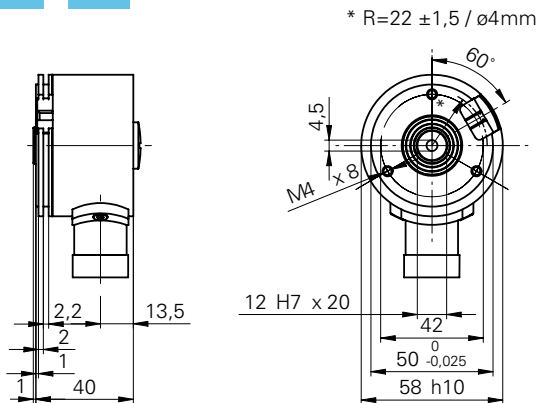
-B2

-5



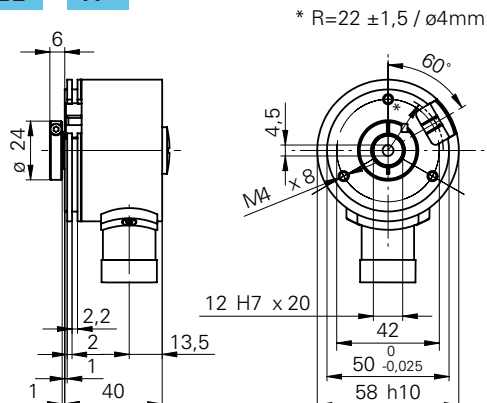
-12

-A



-B2

-A



Incremental hollow shaft encoder BHF high resolution, programmable

assignment cable

for connection reference **-5**

05A (5 VDC complementary)

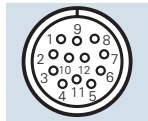
cable color	signals
brown	+Vs
green	CHA
red	CHA compl.
yellow	CHB
blue	CHB compl.
pink	CHN
grey	CHN compl.
white	0 V
black	BiSS data
purple	BiSS clock
screen	connected to connector housing
cable data	10 x 0,14 mm ² , max. ext. ø 6,1 mm

24K (10 - 30 VDC push-pull, short-circuit protection)

cable color	signals
brown	+Vs
green	CHA
red	n.c.
yellow	CHB
blue	n.c.
pink	CHN
grey	n.c.
white	0 V
black	BiSS data
purple	BiSS clock
screen	connected to connector housing
cable data	10 x 0,14 mm ² , max. ext. ø 6,1 mm

assignment connector M23 male

for connection reference **-A**



05A (5 VDC complementary)

24K (10 - 30 VDC push-pull, short-circuit protection)

pin number	signals
1	CHA compl.
2	+Vs
3	CHN
4	CHN compl.
5	CHB
6	CHB compl.
7	BiSS data
8	CHA
9	housing
10	0 V
11	BiSS clock
12	n.c.

push-pull version **24K** without CHx complementary signals

BHF high resolution, programmable



1

order designation BHF

BHF 1P.

connection

- 5** cable 2 m radial
- A** connector radial M23

shaft

- 12** end shaft 12 mm IP 42 ²⁾
- L2** end shaft 12 mm IP 65 ²⁾
- B2** end shaft 12 mm IP 42
with clamping ring
- E2** end shaft 12 mm IP 65
with clamping ring

pulse range

programmable (pulse disk 2'048)

- 4096**
- 8192**
- 16384**
- 32768**
- 65536**
- 131072**

programmable (pulse disk 5'000)

- 10000**
- 20000**
- 40000**
- 80000**
- 160000**
- 320000**

voltage range, output signals

- 05A** 5 VDC complementary
- 24K** 10 - 30 VDC push-pull, short-circuit protection

programmable
(with software and adaptor, refer to accessories)

encoder type

- F** end shaft encoder

²⁾ shaft adapter must be ordered separately

Other versions on request.

accessories

software and BiSS-adaptor	part nr. 161910
connector M23 female reference -A for 05A and 24K	part nr. 107687
spring plate set	part nr. 136635
shaft adapters	see chapter accessories
clamping ring set 12 mm hollow shaft	part nr. 142556

Incremental hollow shaft encoders

BHF/BHG

Sine

features

- hollow shaft encoders with sine output
- end shaft mounting (BHF)
- through shaft mounting (BHG)
- various hollow shaft adapters
- small mounting depth

general data

voltage supply	5 VDC ±5%
max. supply current no load	typ. 100 mA
max. measuring steps	200'000 steps with electronic interpolation 10-fold and 4-fold evaluation (see page 4. 18)
pulse range	see order designation
max. switching frequency	160 kHz

mechanical data

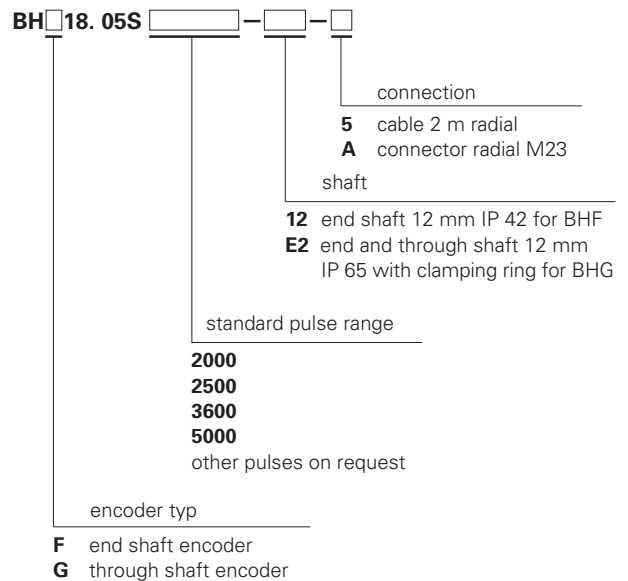
max. revolutions	12'000 rpm (IP 42) 6'000 rpm (IP 65)
moment of inertia	BHF typ. $13,6 \times 10^{-7}$ kgm ² BHG typ. $18,5 \times 10^{-7}$ kgm ²
torque	BHF typ. 0,93 cNm BHG typ. 3,7 cNm (3000 rpm / 20 °C)
product life	depending on ambient conditions (typ. 10 ⁹ revolutions)
max. protection class	IP 65
material	housing: aluminum with connection ref. -5 : steel flange: aluminum
weight	approx. 300 g

ambient conditions

temperature range	-20...+85 °C
relative humidity	max. 95% non condensing
vibration	IEC 60068-2-6 (≤ 100 m/s ² / 10 - 200 Hz)
shock	IEC 60068-2-27 (≤ 500 m/s ² / 11 ms)
noise immunity	EN 61000-6-2
emitted interference	EN 61000-6-3



order designation



Other versions on request.

accessories

connector M23 female reference -A	
12-pin straight, IP 67	part nr. 116717
cable with connector M23 female (pre-assembled)	
2 m	part nr. 130368
5 m	part nr. 130369
clamp set	part nr. 110616
torque pin	part nr. 107540
torque spring ¹⁾	part nr. 109520
spring plate set	part nr. 136635
couplings	see chapter accessories
clamping ring set	
12 mm hollow shaft	part nr. 142556

¹⁾ encoder is delivered with fixed rubber torque spring

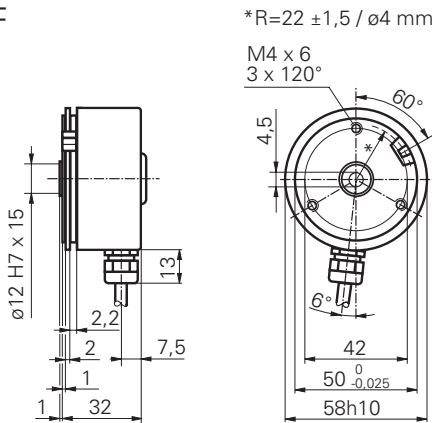


Sine

dimensions and connection dimensions

BHF

-5



assignment cable

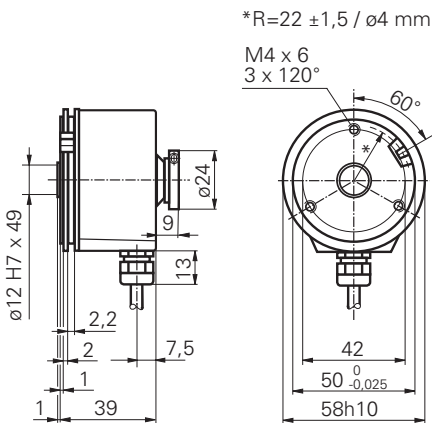
for connection reference **-5**

05S (5 VDC sine)

cable color	signals
brown	As+
green	As-
red	Ns+
yellow	n.c.
blue	+Vs
pink	Bs-
grey	Bs+
white	0 V
black	Ns-
screen	connected to flange
cable data	9 x 0,14 mm ² , max. ext ø 5,7 mm

BHG

-5



assignment connector M23 male

for connection reference **-A**

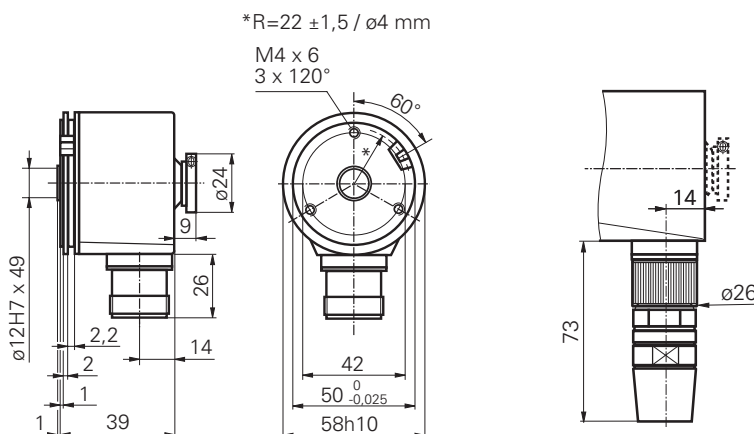


05S (5 VDC sine)

pin number	signals
1	Bs-
2	+Vs
3	Ns+
4	Ns-
5	As+
6	As-
7	n.c.
8	Bs+
9	n.c.
10	0 V
11	0 V
12	+Vs

BHF/BHG

-A



Note

Mounting drawings see end of chapter.