Programmable optical absolute multi-turn shaft encoders BMC/BMD parallel

features

- high-resolution multi-turn encoder
- parallel interface
- resolution up to 24 Bit
- Gray-, BCD- and Binary-Code
- high protection class

BMC

BMD

general data

voltage supply	10 - 30 VDC with reverse polarity protection
max. supply current no load	50 mA (at 24 VDC)
max. resolution	from 2 up to 4096 steps/rev any and from 1 up to 4096 steps/rev programmable in Base 2
pulse tolerance	±1/2 step
input signal	F/R-input, STORE/ENABLE, zero set input
code switching speed	400 kHz

mechanical data

|	
max. revolutions	mechanical 10,000 /min electrical 6000 /min
rotor inertia	2×10^{-6} kgm^2
torque	<0.010 Nm (no clamping ring) <0.015 Nm (with clamping ring
max. shaft load	axial: 20 N radial: 40 N
max. protection class	IP 65
material	housing: steel flange: aluminum
weight	approx. 600 g

ambient conditions

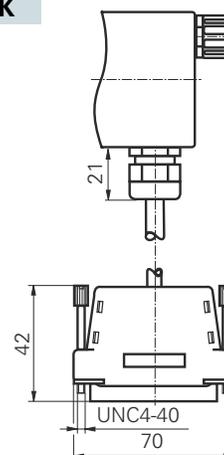|	
temperature range	-20 to +70 °C
relative humidity	max. 95% non condensing
vibration	DIN EN 60068-2-6 (≤ 100 m/s^2 / 16-2000 Hz)
shock	DIN EN 60068-2-27 (≤ 2000 m/s^2 / 6 ms)
noise immunity	DIN EN 61000-6-2
emitted interference	DIN EN 61000-6-4

housing and connection dimensions

BMC

-J

M4 x 7
3 x 120°

UNC4-40
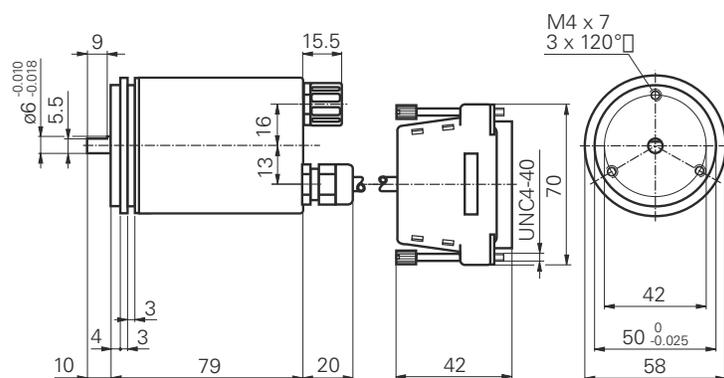
cable length 1 m

-K

cable length 1 m

BMD

-J

M3 x 7
3 x 120°

UNC4-40
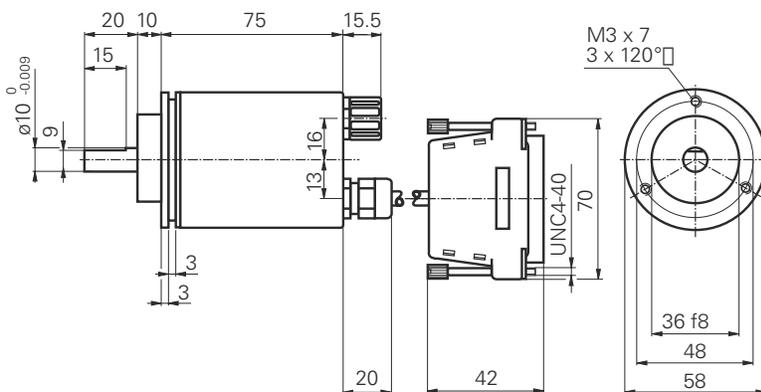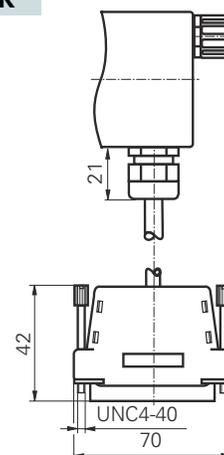
cable length 1 m

-K

cable length 1 m

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absolute multi-turn shaft encoders
BMC/BMD parallel

Designation parallel		
cable connector	signal	cable color
37-pin		
1	D0	WH white
2	D1	BN brown
3	D2	GN green
4	D3	YE yellow
5	D4	GY grey
6	D5	PK pink
7	D6	BK black
8	D7	VT violet
9	D8	GY/PK grey/pink
10	D9	RD/BU red/blue
11	D10	WH/GN white/green
12	D11	BN/GN brown/green
13	D12	WH/YE white/yellow
14	D13	YE/BN yellow/brown
15	D14	WH/GY white/grey
16	D15	GY/BN grey/brown
17	D16	WH/PK white/pink
18	D17	PK/BN pink/brown
19	D18	WH/BK white/black
20	D19	BN/BK brown/black
21	D20	GY/GN grey/green
22	D21	YE/GY yellow/grey
23	D22	PK/GN pink/green
24	D23	YE/PK yellow/pink
25	-	- -
26	-	- -
27	$\overline{\text{ZERO}}$	YE/BU yellow/blue
28	$\overline{\text{ENABLE}}$	BN/BU brown/blue
29	$\overline{\text{STORE}}$	BN/RD brown/red
30	F/$\overline{\text{R}}$	GN/BU green/blue
31	-	- -
32	-	- -
33	-	- -
34	GND-Sense	WH/BU white/blue
35	Vs-Sense	WH/RD white/red
36	+Vs	RD red
37	GND	BU blue

1 - 24		24 parallel output signals.
D0 - D23		Data lines D0 to D23. With PNP, pull down; with NPN, 4.7 kΩ pull up resistors recommended for each data line.
27	ZERO	Zero setting input for setting a zero at any point within the programmed encoder resolution. The zero setting process is triggered by a HIGH pulse and should take place after direction of rotation selection (F/$\overline{\text{R}}$). For maximum interference immunity after zero setting, connect to GND. Pulse duration ≥ 100 ms.
28	$\overline{\text{ENABLE}}$	If this input is at LOW level, the output drivers will be activated. On application of HIGH potential (or unconnected), the output drivers assume a HIGH-resistance state.
29	$\overline{\text{STORE}}$	By applying a LOW level, the data of the absolute encoder will be buffered. If this input is connected to HIGH potential or remains open, the current position data of the absolute encoder will be switched through to the output drivers. For reliable readout of the data, this line must be used in the case of Binary-Code.
30	F/$\overline{\text{R}}$	By applying a HIGH potential, ascending values will be output when the shaft rotates cw (looking at shaft). If LOW potential is applied, descending values will be output.
34	GND-Sense	This contact is connected internally to GND and assists, together with Vs-sense, to measure the supply voltage at the encoder via the follow-up electronic.
35	Vs-Sense	This contact is connected internally to +Vs. If the sensor line is not to be used, this contact must be isolated (danger of short circuit).
36	+Vs	Supply voltage.
37	GND	Ground connection to encoder.

Screen: In the case of encoders with cable output, the screen is connected to the housing.
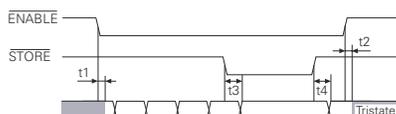
BMC
BMD

inputs

One control signal each $\overline{\text{ENABLE}}$ for activation of the output driver, $\overline{\text{STORE}}$ for storing the output data, F/$\overline{\text{R}}$ for selection at positive direction of rotation and ZERO for zeroing in any position.

input voltage	(Vs = 10 - 30 VDC)
level HIGH	0.7 Vs up to Vs
level LOW	0 up to 0.3 Vs

Wiring:
Inputs with 10 kΩ to Vs, except zero set input with 10 kΩ to GND.

signal characteristic $\overline{\text{STORE}}$/$\overline{\text{ENABLE}}$

Signals	time typically	10 - 30 VDC
$\overline{\text{ENABLE}}$	t1/t2	60 µs
$\overline{\text{STORE}}$	t3/t4	200 µs

order designation

BM ☐ 3P . 24 ☐ 4 0 9 6 – ☐ – ☐

connection cable
J axial with D-Sub connector cable length 1 m
K radial with D-Sub connector cable length 1 m

shaft
C6 6 mm IP 65 (BMC)
C0 10 mm IP 65 (BMD)

output signals
N NPN (short-circuit protection), OC
P PNP (short-circuit protection), OC

housing
C servo flange
D clamping flange

needed for programming

- PC with RS 232-interface and Windows-operating system
- Progeber software and handbook
- programming cable, connects encoder with PC

outputs

24 parallel output signals with $\overline{\text{STORE}}$ and tristate function ($\overline{\text{ENABLE}}$).
All outputs with short circuit protection PNP or NPN output stages (OC).

level HIGH (PNP)	≥ +Vs - 4.5 V (at I = -15 mA)
level LOW (NPN)	≤ 3.5 V (at I = 15 mA)
load HIGH (PNP)	≤ -20 mA
load LOW (NPN)	≤ 20 mA
tristate	≤ 200 µA

accessories

mounting adapter	part nr. 117667
fixing screws and servo clamps	part nr. 117668
mounting bracket	part nr. 117698
programming software with cable and user manual (cable length 2 m)	part nr. 117666