Encoders

magnetic Encoder, digital outputs
3 channels, 32 - 1024 lines per revolution

For combination with
DC-Micromotors
Brushless DC-Motors

Series IE3 – 1024

		IE3 – 32	IE3 – 64	IE3 – 128	IE3 – 256	IE3 – 512	IE3 – 1024	
Lines per revolution	N	32	64	128	256	512	1024	
Frequency range, up to [1]	f	15	30	60	120	240	430	kHz
Signal output, square wave		2+1 Index						channels
Supply voltage	U_{DD}	4,5 … 5,5						V DC
Current consumption, typical [2]	I_{DD}	typ. 16, max. 23						mA
Output current, max. allowable [3]	I_{OUT}	4						mA
Index Pulse width [4]	P_0	90 ± 45				90 ± 75		°e
Phase shift, channel A to B [4]	Φ	90 ± 45				90 ± 75		°e
Signal rise/fall time, max. (C_{LOAD} = 50 pF)	tr/tf	0,1 / 0,1						µs
Inertia of code disc	J	0,08						gcm²
Operating temperature range		– 40 ... + 100						°C

[1] speed (rpm) = f (Hz) x 60/N
[2] U_{DD} = 5 V: with unloaded outputs
[3] U_{DD} = 5 V: low logic level < 0,4 V, high logic level > 4,5 V: CMOS- and TTL compatible
[4] at 5 000 rpm

For combination with motor

Dimensional drawing A	<L1 [mm]
2237...CXR	52,5

Dimensional drawing B	<L1 [mm]
2342...CR	60,5
2642...CR	60,5
2642...CXR	60,5
2657...CR	75,5
2657...CXR	75,5
3242...CR	60,5
3257...CR	75,5
3272...CR	90,5

Dimensional drawing C	<L1 [mm]
2444...B - K1838	55,3
3056...B - K1838	67,3
3564...B -K1838	75,3
4490...B - K1838	100,3
4490...BS - K1838	100,3

Dimensional drawing D	<L1 [mm]
2232...BX4	50,2
2232...BX4S	50,2
2250...BX4	68,2
2250...BX4S	68,2

Dimensional drawing E	<L1 [mm]
3242...BX4	60,0
3268...BX4	86,0

Dimensional drawing F	<L1 [mm]
3863...CR - 2016	82,6
3890...CR - 2016	108,6

Features

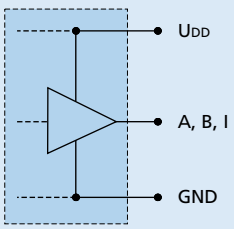
These incremental encoders have 3 output channels, in combination with the FAULHABER Motors are used for the indication and control of both shaft velocity and direction of rotation as well as for positioning.

A permanent magnet on the shaft creates a moving magnetic field which is captured using a single-chip angular sensor and further processed. At the encoder outputs, two 90° phase-shifted rectangular signals are available with up to 1024 impulses and an index impulse per motor revolution.

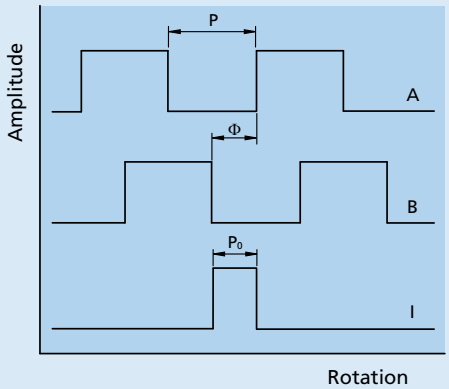
The encoder is available in a variety of different resolutions. Motor and encoder are connected via a common flexboard.

Circuit diagram / Output signals

Output circuit



Output signals
with clockwise rotation as seen from the shaft end



Admissible deviation of phase shift:

$$\Delta\Phi = \left| 90° - \frac{\Phi}{P} * 180° \right| \leq 75°$$

Admissible deviation of Index pulse:

$$\Delta P_0 = \left| 90° - \frac{P_0}{P} * 180° \right| \leq 75°$$

Connector information / Variants

No.	Function
1	n.c.
2	Channel I (Index)
3	GND
4	U_{DD}
5	Channel B
6	Channel A

Caution:
Incorrect lead connection will damage the motor electronics!

Connection Encoder

Cable
PVC-ribbon cable
6-AWG 28, 1,27 mm

Option

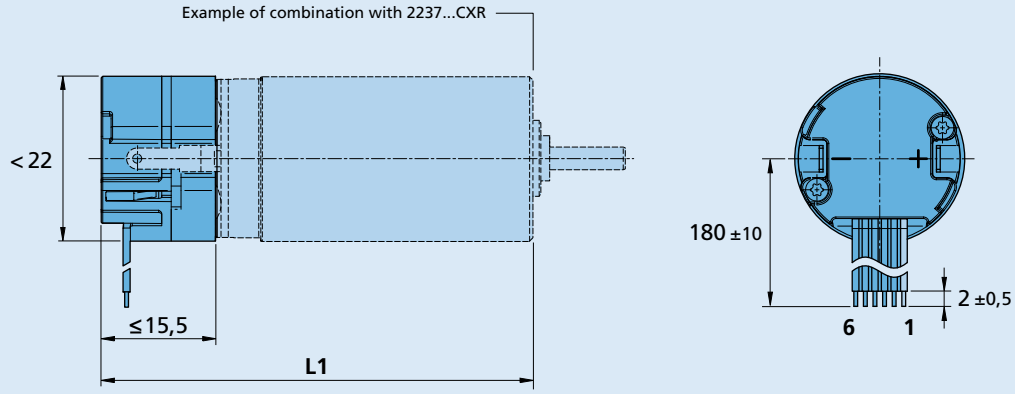
- Connector variants (Option no.: 3807)
  AWG 28 / PVC ribbon cable (6-conductors), with connector PicoBlade (pitch 1,25 mm)

- Resolutions from 1 - 127 lines per revolution are available by request.

Full product description

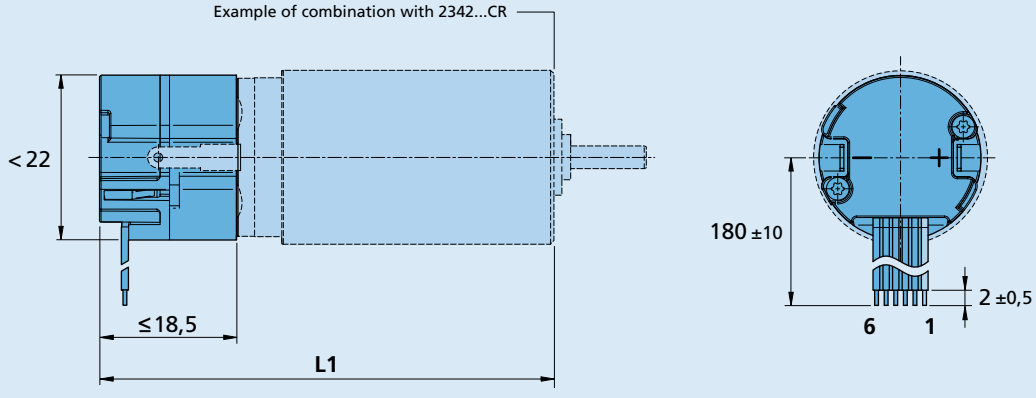
- Example:
  2444S024B K1838 IE3-1024
  2232S024BX4 IE3-256

Dimensional drawing A



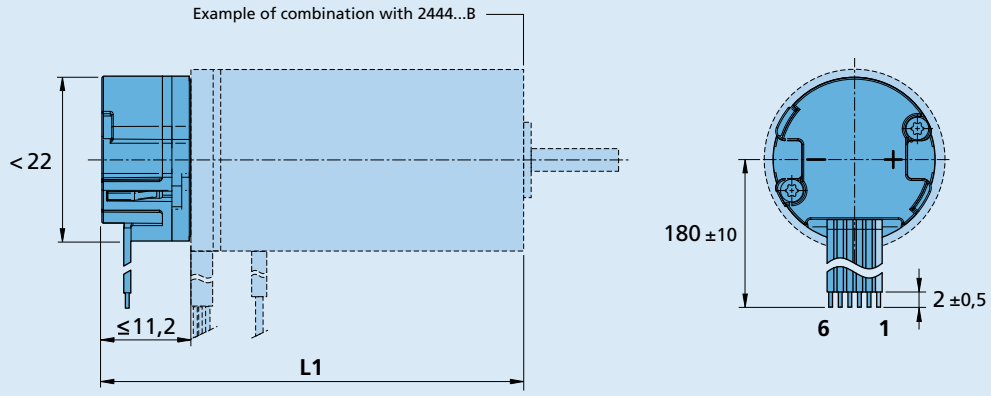
IE3 – 32 ... 1024

Dimensional drawing B



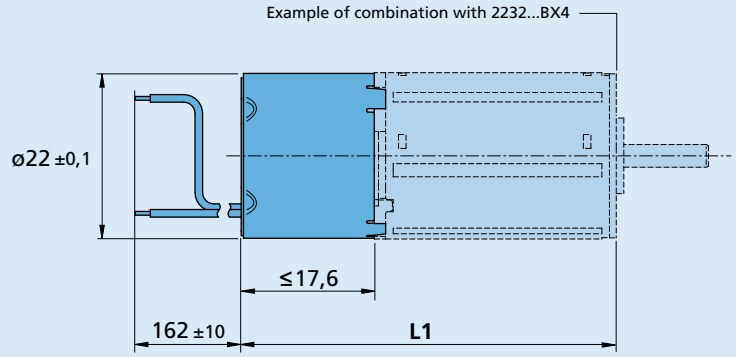
IE3 – 32 ... 1024

Dimensional drawing C

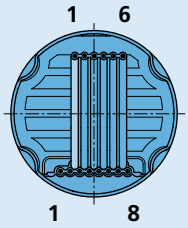


IE3 – 32 ... 1024

Dimensional drawing D



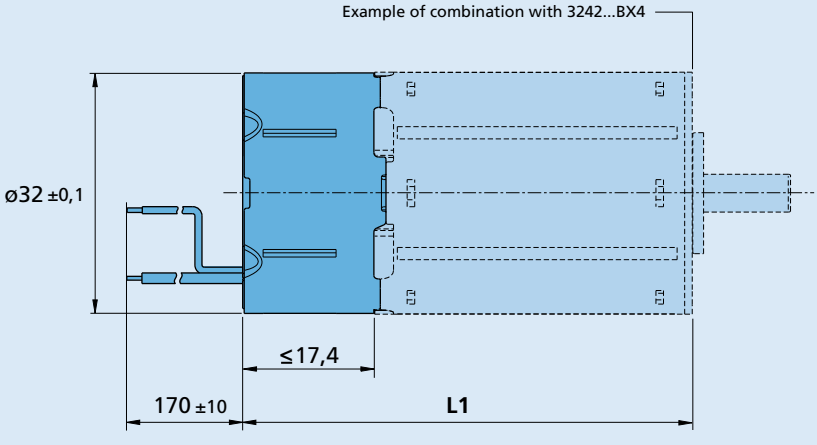
Connection Encoder



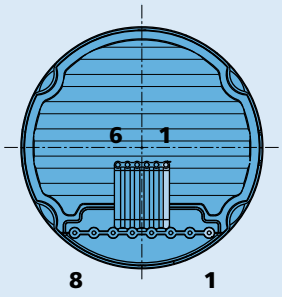
Connection Motor

IE3 – 32 ... 1024

Dimensional drawing E



Connection Encoder

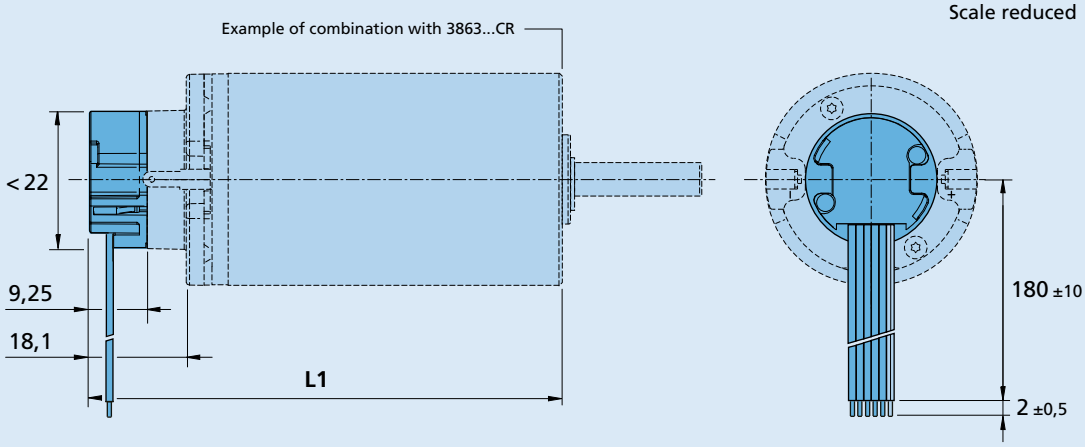


Connection Motor

IE3 – 32 ... 1024

Dimensional drawing F

Scale reduced



IE3 – 32 ... 1024