

Encoders

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

For combination with
DC-Micromotors
Brushless DC-Motors

Series IE3 – 1024 L

		IE3 – 32 L	IE3 – 64 L	IE3 – 128 L	IE3 – 256 L	IE3 – 512 L	IE3 – 1024 L	
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 and complementary outputs						channels
Supply voltage	U _{DD}	4,5 ... 5,5						V DC
Current consumption, typical ²⁾	I _{DD}	typ. 17, max. 25						mA
Index Pulse width ³⁾	P ₀	90 ± 45						°e
Phase shift, channel A to B ³⁾	Φ	90 ± 45						°e
Inertia of code disc	J	0,08						gcm ²
Operating temperature range		- 40 ... + 85						°C

¹⁾ speed (rpm) = f (Hz) x 60/N

²⁾ U_{DD} = 5V: with unloaded outputs

³⁾ at 5 000 rpm

Notes: The output signals are TIA-422 compatible.

Examples of Line driver Receivers: ST26C32ABD (STM), ST26C32IP16 (EXAR), DS26C32AT (NSC).

For combination with motor

Dimensional drawing A	<L1 [mm]	Dimensional drawing C	<L1 [mm]	Dimensional drawing E	<L1 [mm]
2237...CXR	52,5	2444...B - K1838	55,3	3242...BX4	60,0
		3056...B - K1838	67,3	3268...BX4	86,0
Dimensional drawing B	<L1 [mm]			Dimensional drawing F	<L1 [mm]
2342...CR	60,5	3564...B - K1838	75,3	3863...CR - 2016	82,6
2642...CR	60,5	4490...B - K1838	100,3	3890...CR - 2016	108,6
2642...CXR	60,5				
2657...CR	75,5	Dimensional drawing D	<L1 [mm]		
2657...CXR	75,5	2232...BX4	50,2		
3242...CR	60,5	2232...BX4S	50,2		
3257...CR	75,5	2250...BX4	68,2		
3272...CR	90,5	2250...BX4S	68,2		

Features

These incremental encoders have 3 output channels, in combination with the FAULHABER DC-Micromotors 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 1 024 impulses and an index impulse per motor revolution.

The Line Driver version has differential signal outputs (TIA-422). Differential signals reduce ambient interference and are suitable for applications with high ambient interference.

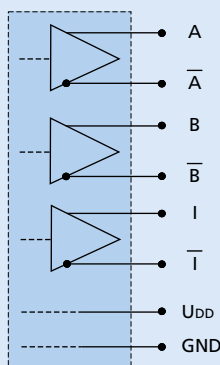
The line driver amplifies the encoder signal which means that long cables can be used without signal degradation.

Differential signal outputs must be decoded by the appropriate receiver module.

The encoder is available in a variety of different resolutions. The motor and encoder are connected via separate ribbon cables.

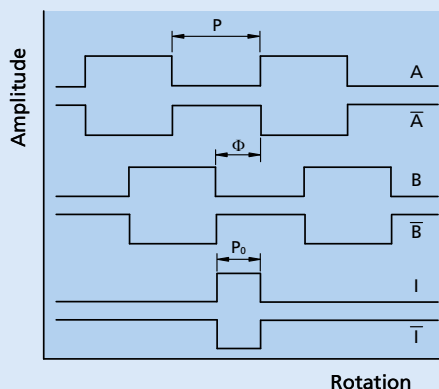
Circuit diagram / Output signals

Output circuit



Output signals

with clockwise rotation as seen from the shaft end



Admissible deviation of phase shift:

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

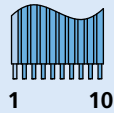
Admissible deviation of Index pulse:

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

Connector information / Variants

No.	Function
1	n.c.
2	U ₀₀
3	GND
4	n.c.
5	Channel A
6	Channel A
7	Channel B
8	Channel B
9	Channel I (Index)
10	Channel I (Index)

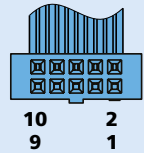
Connection Encoder



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

Option

- Connector variants (Option no.: 3806)
AWG 28 / PVC ribbon cable (10-conductors),
with connector DIN-41651 (pitch 2,54 mm)
- Resolutions from 1 - 127 lines per revolution
are available by request.

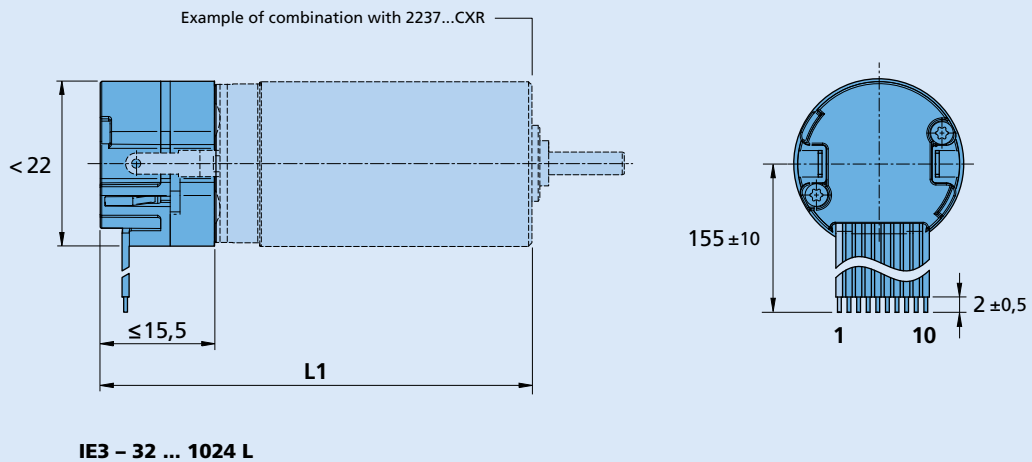


Caution:
Incorrect lead connection
will damage the
motor electronics!

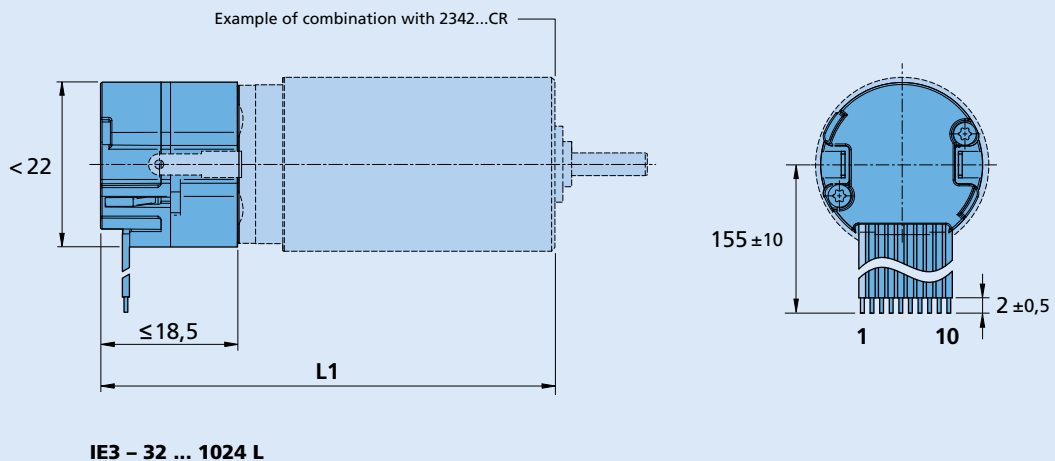
Full product description

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

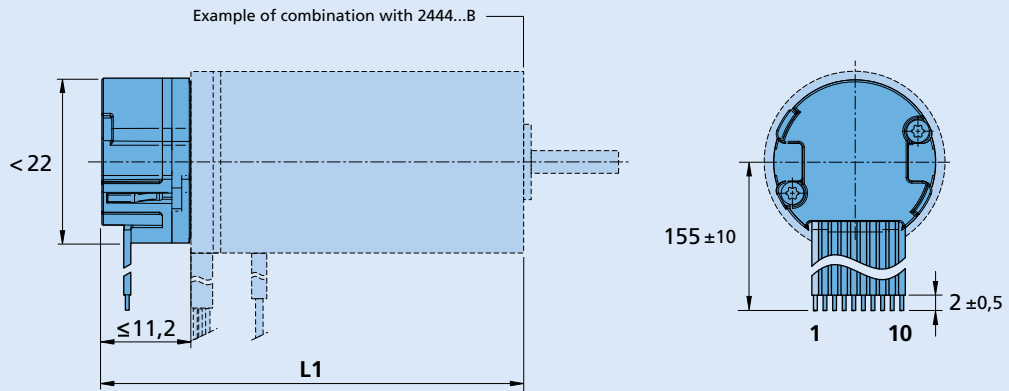
Dimensional drawing A



Dimensional drawing B

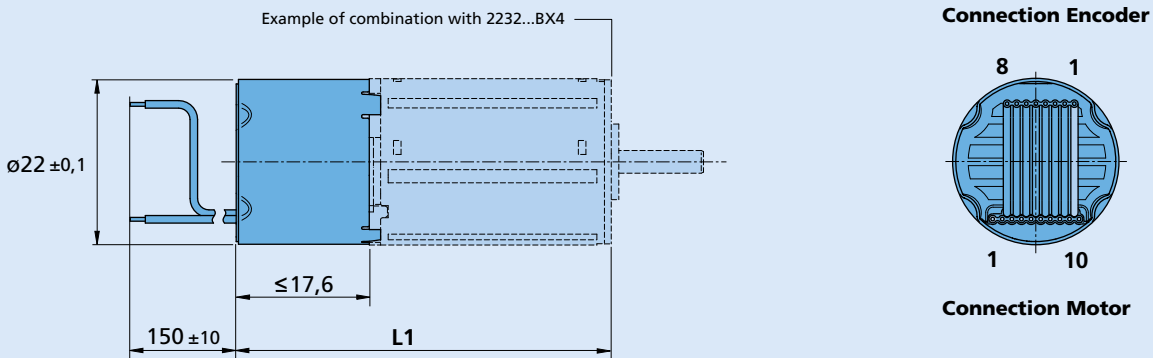


Dimensional drawing C



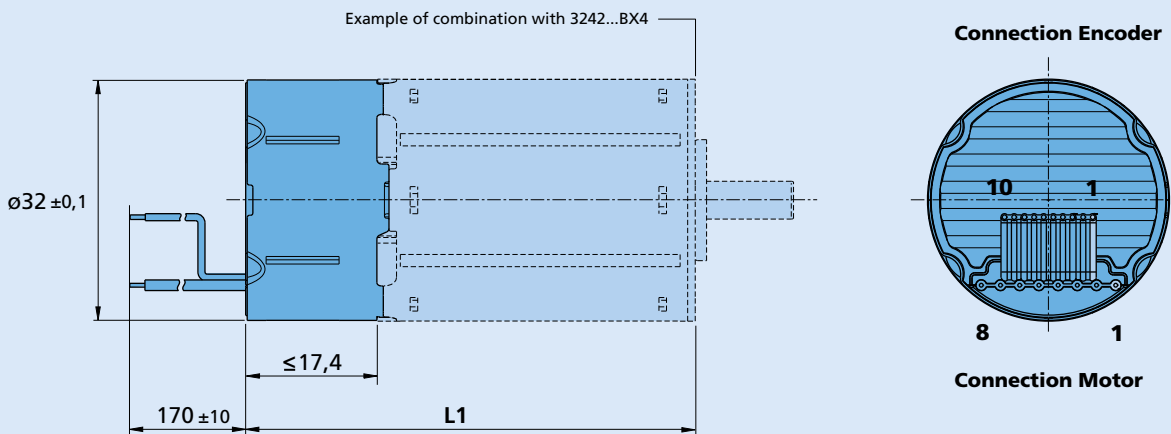
IE3 - 32 ... 1024 L

Dimensional drawing D



IE3 - 32 ... 1024 L

Dimensional drawing E



IE3 - 32 ... 1024 L

Dimensional drawing F

