NEW

Encoder

optical Encoder, digital outputs, 3 channels,
250 - 500 lines per revolution, Line Driver

FAULHABER

For combination with
DC-Micromotors
Brushless DC-Motors

Series IERS3-500 L

		IERS3-250 L	IERS3-500 L	
Lines per revolution	N	250	500	
Frequency range, up to [1]	f	55	110	kHz
Signal output, square wave		2+1 Index and complementary outputs		Channels
Supply voltage	U_{DD}	4,5 … 5,5		V
Current consumption, typical [2]	I_{DD}	typ. 17, max. 25		mA
Index Pulse width	P_0	90 ± 15		°e
Phase shift, channel A to B	Φ	90 ± 20		°e
Inertia of code disc	J	typ. 0,14		gcm^2
Operating temperature range		– 20 ... + 85		°C
Accuracy		typ. 0,3		°m
Repeatability		typ. 0,05		°m
Hysteresis		< 0,05		°m
Edge spacing, min.		600		ns
Mass		typ. 8		g

[1] Velocity (min^{-1}) = f (Hz) x 60/N
[2] U_{DD} = 5 V: with unloaded outputs

Note: The output signals are TIA-422 compatible. Examples of Line Driver Receivers: ST26C32ABD (STM), ST26C32IP16 (EXAR), DS26C32AT (NSC).

Product combination

Dimensional drawing A	<L1 [mm]
2237 ... CXR	52,5
3274 ... BP4	90,5

Dimensional drawing B	<L1 [mm]
2342 ... CR	60,5
2642 ... CXR	60,5
2642 ... CR	60,5
2657 ... CXR	75,5
2657 ... CR	75,5
2668 ... CR	86,5
3242 ... CR	60,5
3257 ... CR	75,5
3272 ... CR	90,5

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

Characteristics

These incremental encoders with 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.

With a reflective code disc two quadature signal with 90° phase shift with up to 500 lines per revolution and one index impulse per motor revolution are generated.
The optical measurement principle allows high accuracy and repeatability for positioning applications.

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. In addition, a suitable line termination resistance (100 ohm) is eventually useful.
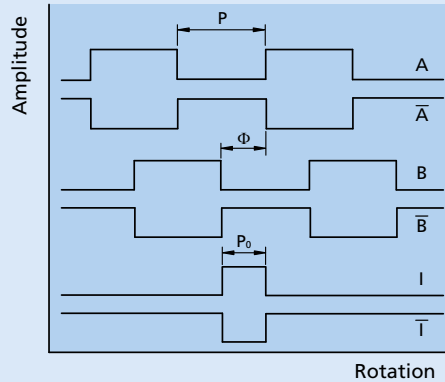
The encoder is connected via a ribbon cable. The pins are compatible to the FAULHABER Encoder IE3 L.

Circuit diagram / Output signals

Output circuit

A
$\overline{A}$
B
$\overline{B}$
I
$\overline{I}$
U_{DD}
GND
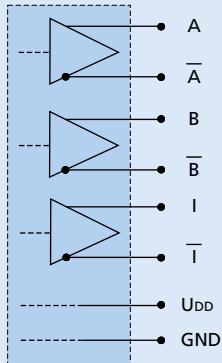
Output signals
with clockwise rotation as seen from the shaft end

Rotation

Admissible deviation of phase shift:

$$\Delta\Phi = \left| 90° - \frac{\Phi}{P} * 180° \right| \leq 20°$$
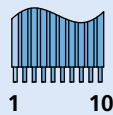
Admissible deviation of Index pulse:

$$\Delta P_0 = \left| 90° - \frac{P_0}{P} * 180° \right| \leq 15°$$

Connector information / Variants

No.	Function
1	N.C.
2	U_{DD}
3	GND
4	N.C.
5	Channel $\overline{A}$
6	Channel A
7	Channel $\overline{B}$
8	Channel B
9	Channel $\overline{I}$
10	Channel I

Caution:
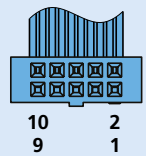Incorrect lead connection will damage the motor electronics!

Connection Encoder

1   10

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

Option

■ Connector variants AWG 28 / PVC ribbon cable with connector Pancon DIN-41651, 050-010-435A, recommended mating connector Berg 71918-010.
Option no.: 3806 for combination with DC-Motors series CR, CXR and with Brushless DC-Servomotor series 3274 BP4.

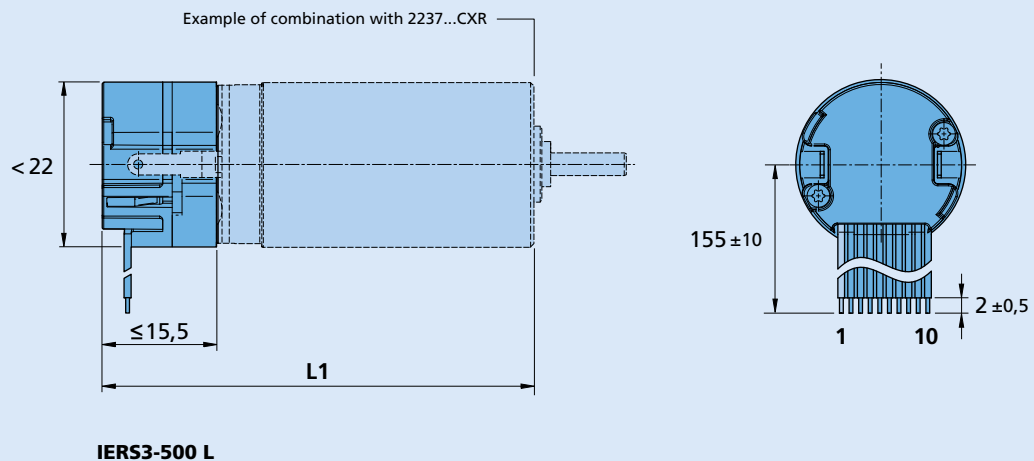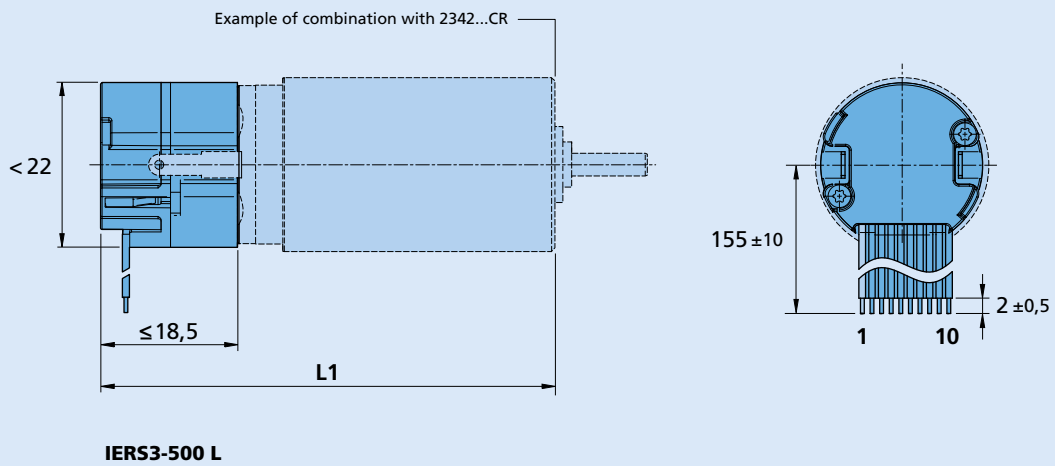### Full product description
■ Example:
2237S012CXR IERS3-500L
3863H024CR IERS3-250L 3806

10   2
9   1

Dimensional drawing A

Example of combination with 2237...CXR

< 22

≤15,5

L1

IERS3-500 L

155 ±10

2 ±0,5

1   10

Dimensional drawing B

Example of combination with 2342...CR

< 22

≤ 18,5

L1

155 ±10

2 ±0,5

1   10

IERS3-500 L

Dimensional drawing C

Scale reduced

Example of combination with 3863...CR

< 22

18,1

L1

155 ±10

2 ±0,5

1   10

IERS3-500 L

For notes on technical data and lifetime performance
refer to "Technical Information".
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