

## Encoders

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

For combination with  
Brushless DC-Motors  
DC-Micromotors

### Series IERS3-500 L

		IERS3-250 L	IERS3-500 L	
Lines per revolution	<i>N</i>	250	500	
Frequency range, up to <sup>1)</sup>	<i>f</i>	55	110	kHz
Signal output, square wave		2+1 Index and complementary outputs		Channels
Supply voltage	<i>U<sub>DD</sub></i>	4,5 ... 5,5		V
Current consumption, typical <sup>2)</sup>	<i>I<sub>DD</sub></i>	typ. 17, max. 25		mA
Index Pulse width	<i>P<sub>0</sub></i>	90 ± 15		°e
Phase shift, channel A to B	<i>Φ</i>	90 ± 20		°e
Inertia of code disc	<i>J</i>	0,14		gcm <sup>2</sup>
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

<sup>1)</sup> Velocity (min<sup>-1</sup>) = *f*(Hz) x 60/N

<sup>2)</sup> *U<sub>DD</sub>* = 5 V: with unloaded outputs

**Note:** The output signals are TIA-422 compatible.  
Examples of Line Driver Receivers: ST26C32AB (STM), AM26C32 (TI).

For combination with Motor	
Dimensional drawing A	<L1 [mm]
2214 ... BXT H	26,8
3216 ... BXT H	28,7
4221 ... BXT H	34,0
Dimensional drawing D	<L1 [mm]
3863 ... CR - 2016	82,6
3890 ... CR - 2016	108,6
Dimensional drawing B	<L1 [mm]
2237 ... CXR	52,5
2264 ... BP4	79,1
3274 ... BP4	90,8
Dimensional drawing C	<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

### 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 square wave signals with 90° phase shift with up to 500 lines per revolution and one index impulse per motor revolution are generated.

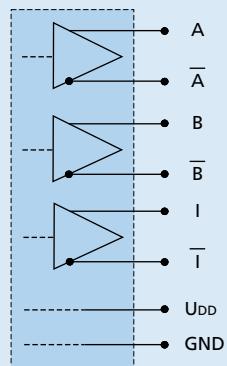
The optical measurement principle allows high accuracy and repeatability for positioning applications.

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

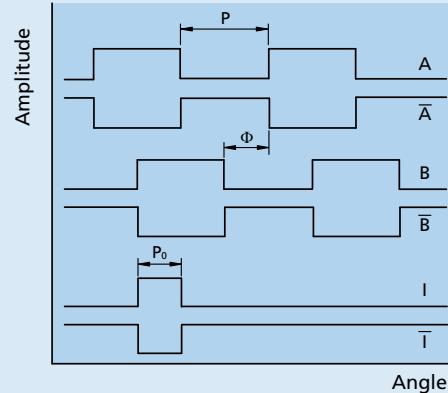
The Line Driver amplifies the encoder signal which means that long cables can be used without signal degradation. Differential signal outputs must be decoded by the appropriate receiver module. In addition, a suitable line termination resistance (100 ohm) is possibly useful.

The encoder is connected via a ribbon cable. The pins are compatible to the FAULHABER Encoder IE3 L.

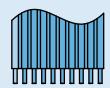
To view our large range of accessory parts, please refer to the "Accessories" chapter.

**Circuit diagram / Output signals**
**Output circuit**

**Output signals**

with clockwise rotation as seen from the shaft end


**Connector information / Variants**

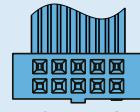
No.	Function
1	N.C.
2	UDD
3	GND
4	N.C.
5	Channel A
6	Channel A
7	Channel B
8	Channel B
9	Channel I
10	Channel I

**Connection Encoder**

**Cable**

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

**Option**

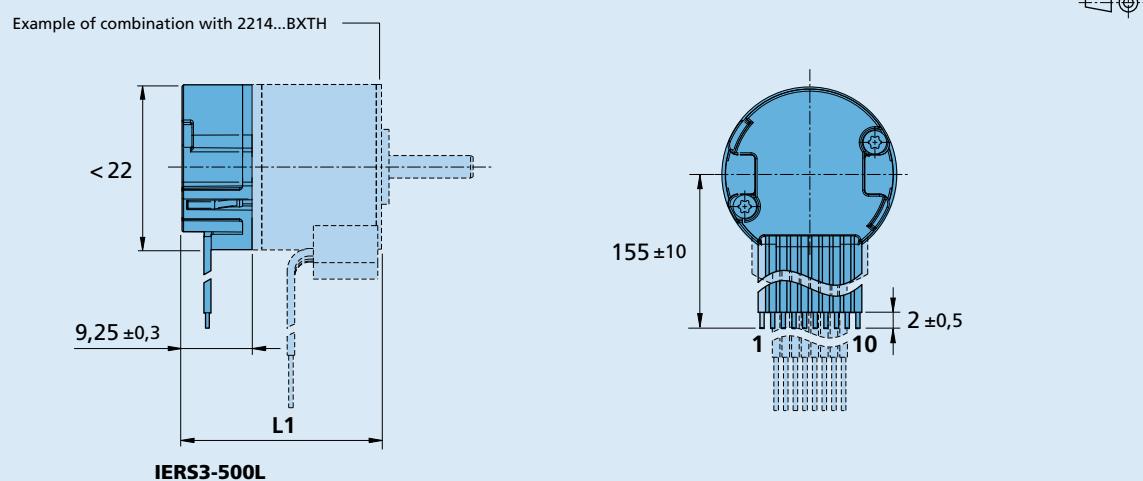
- Connector variants AWG 28 / PVC ribbon cable with connector EN 60603-13 / DIN-41651. Option no.: 3806 for combination with DC-Motors series CR, CXR and with Brushless DC-Servomotor series BP4 and BXT H.

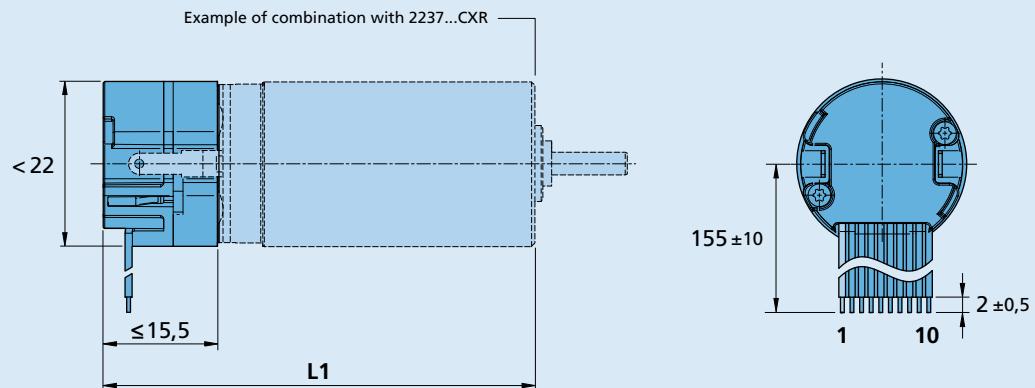
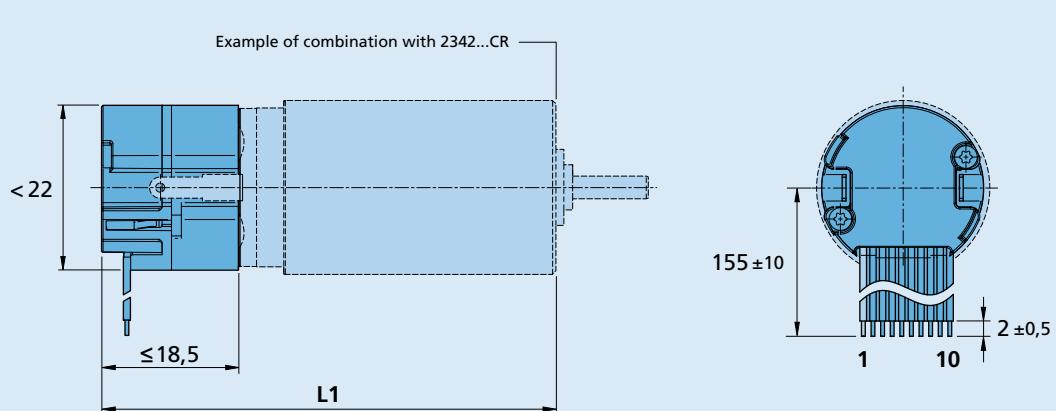
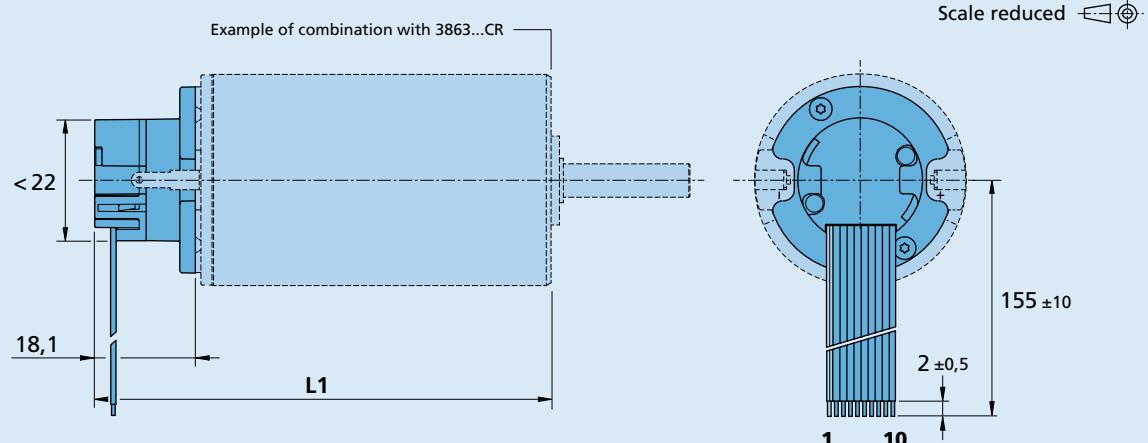

**Full product description**

- Example:  
**2237S012CXR IERS3-500L**  
**3863H024CR IERS3-250L 3806**

**Caution:**

Incorrect lead connection will damage the motor electronics!

**Dimensional drawing A**


**Dimensional drawing B**

**IERS3-500 L**
**Dimensional drawing C**

**IERS3-500 L**
**Dimensional drawing D**

**IERS3-500 L**