

## Encoders

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

For combination with  
Brushless DC-Motors  
DC-Micromotors

### Series IERS3-500

		IERS3-250	IERS3-500	
Lines per revolution	$N$	250	500	
Frequency range, up to <sup>1)</sup>	$f$	55	110	kHz
Signal output, square wave		2+1 Index		Channels
Supply voltage	$U_{DD}$	4,5 ... 5,5		V
Current consumption, typical <sup>2)</sup>	$I_{DD}$	typ. 17, max. 25		mA
Output current, max. <sup>3)</sup>	$I_{OUT}$	4		mA
Index Pulse width	$P_0$	90 ± 15		°e
Phase shift, channel A to B	$\Phi$	90 ± 20		°e
Signal rise/fall time, max. ( $C_{LOAD} = 50$ pF)	$tr/tf$	0,1 / 0,1		µs
Inertia of code disc	$J$	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>  $U_{DD} = 5$  V: with unloaded outputs

<sup>3)</sup>  $U_{DD} = 5$  V: low logic level < 0,4 V, high logic level > 2,4 V: TTL compatible

#### For combination with Motor

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

#### 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.

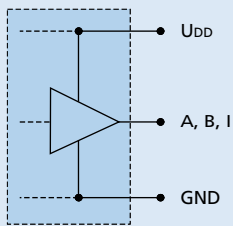
The optical measurement principle allows high accuracy and repeatability for positioning applications.

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

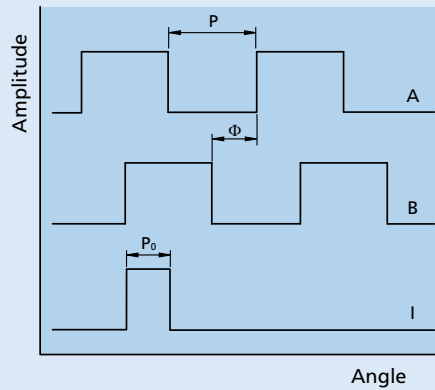
To view our large range of accessory parts, please refer to the "Accessories" chapter.

**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	Channel I
3	GND
4	U <sub>DD</sub>
5	Channel B
6	Channel A

**Connection Encoder**



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

**Option**

- Connector variants AWG 28 / PVC ribbon cable with connector MOLEX Picoblade 51021-0600, recommended mating connector 53047-0610. Option no.: 3807 for combination with DC-Micromotors series CXR, CR and for Brushless DC-Servomotors series BP4.



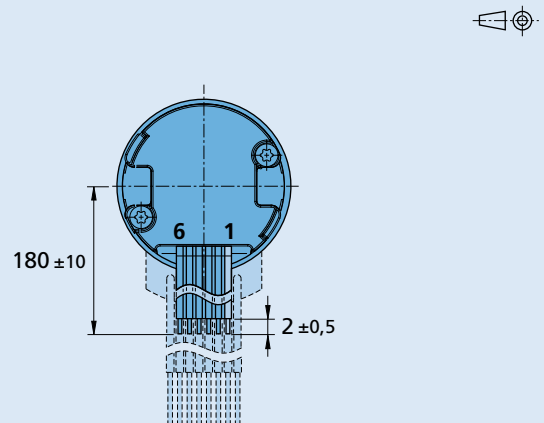
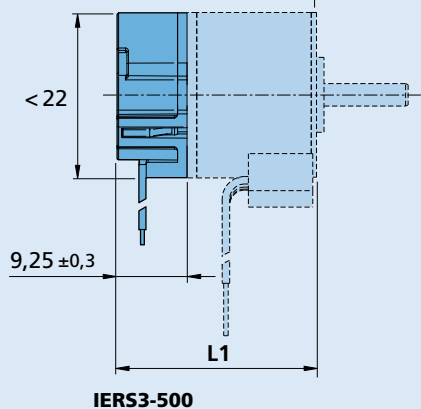
**Caution:**  
Incorrect lead connection will damage the motor electronics!

**Full product description**

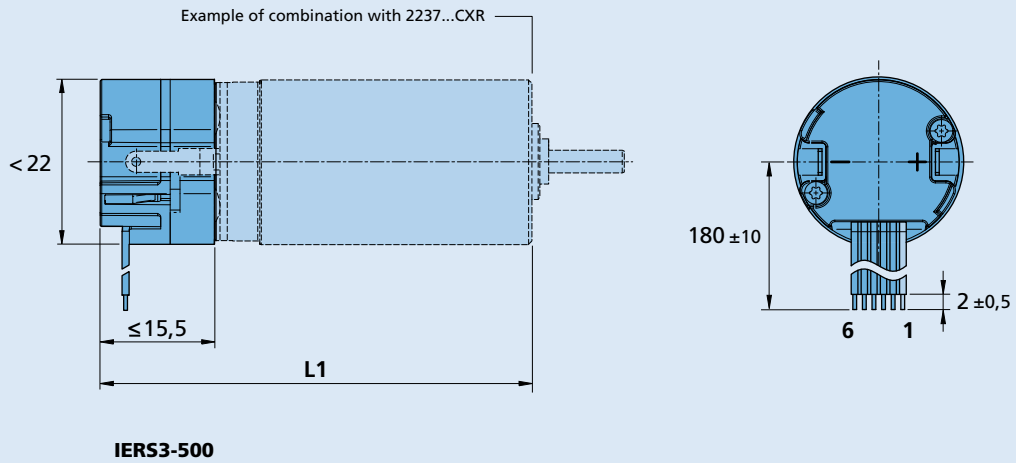
- Example:  
2237S012CXR IERS3-500  
3863H024CR IERS3-250 3807

**Dimensional drawing A**

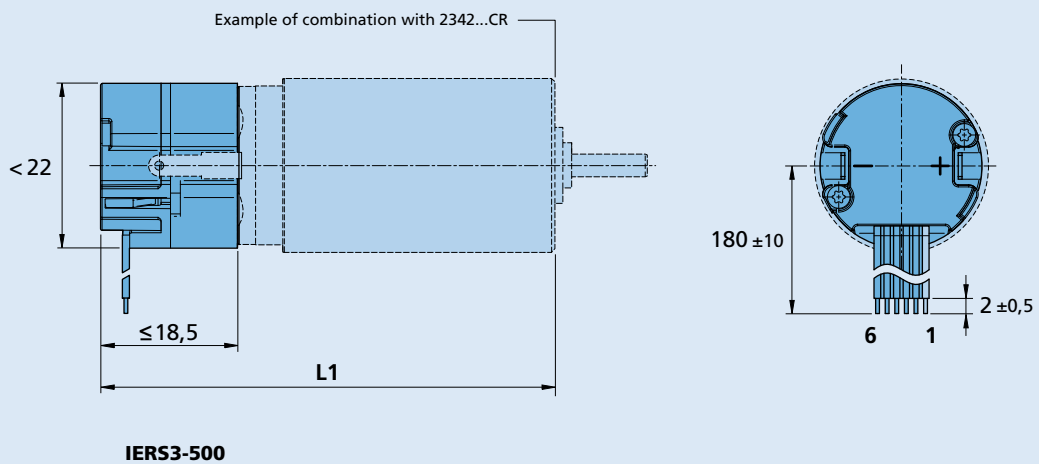
Example of combination with 2214...BXTH



**Dimensional drawing B**



**Dimensional drawing C**



**Dimensional drawing D**

