

## Encoders

magnetic Encoder, digital outputs, 3 channels,  
16 - 4096 lines per revolution, Line Driver

For combination with  
DC-Micromotors

### Series IEX3-4096 L

	IEX3	-16L	-32L	-64L	-128L	-256L	-512L	-1024L	-2048L	-4096L		
Lines per revolution	$N$	16	32	64	128	256	512	1 024	2 048	4 096		
Frequency range, up to <sup>1)</sup>	$f$	5	10	17	35	70	140	275	550	1 000	kHz	
Signal output, square wave		2+1 Index and complementary outputs										
Supply voltage	$U_{DD}$	3,0 ... 3,6 / 4,5 ... 5,5										
Current consumption, typical <sup>2)</sup>	$I_{DD}$	typ. 26, max. 35										
Index Pulse width <sup>3)</sup>	$P_0$	90 ± 25										
Phase shift, channel A to B <sup>3)</sup>	$\Phi$	90 ± 25								90 ± 45		°e
Inertia of sensor magnet	$J$	0,03										
Operating temperature range		-40 ... +100										
Accuracy, typ.		0,3										
Repeatability, typ.		0,05										
Hysteresis		0,08								0,04		°m
Edge spacing, min.		125										
Mass, typ.		3,9										

<sup>1)</sup> Velocity ( $\text{min}^{-1}$ ) =  $f$  (Hz) x 60/ $N$

<sup>2)</sup>  $U_{DD}$  = 3,3 or 5 V: with unloaded outputs

<sup>3)</sup> At 5 000  $\text{min}^{-1}$

**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]		
1627 ... SXR	36,8		
1627 ... GXR	36,8		

#### 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.

A permanent magnet on the shaft creates a moving magnetic field which is captured using an angular sensor and further processed.

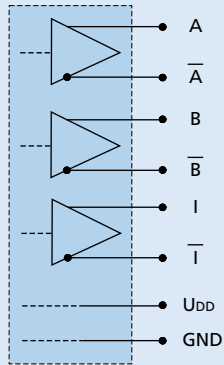
At the encoder outputs, two 90° phase-shifted square wave signals are available with up to 4.096 impulses as standard and up to 10.000 impulses per request and an index impulse per motor revolution.

The encoder has a high accuracy and a high repeatability for positioning applications.

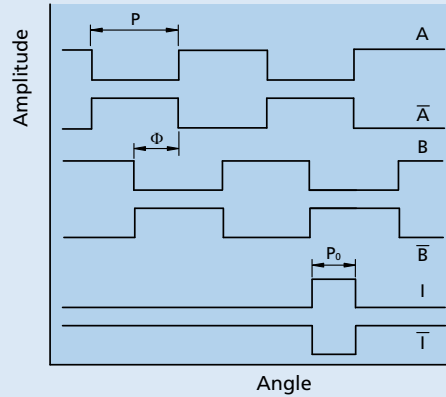
The Line Driver amplifies the encoder signal which means that long cables can be used without signal degradation.

Differential signal outputs must be decoded by the appropriate receiver module. In addition, a suitable line termination resistance (100 ohm) is possibly useful.

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**

Example product designation: 1627X012SXR IEX3-4096 L 7957

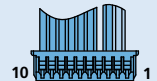
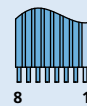
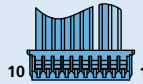
Option	Type	Description
7956	Ribbon Cable PVC	For combination with DC-Motors series SXR/GXR, encoder ribbon cable PVC, length 50 mm
X7956	Ribbon Cable PVC	For combination with DC-Motors series SXR/GXR, encoder ribbon cable PVC, length 100 mm
7958	Ribbon cable FEP	For combination with DC-Motors series SXR/GXR, encoder ribbon cable FEP, length 150 mm
7957	Connector	For combination with DC-Motors series SXR/GXR, connector variant with MOLEX Picoblade 51021-1000, recommended mating connector 53047-1010
7980	Temperature range	For combination with DC-Motors series SXR/GXR, up to 125°C, with encoder ribbon cable FEP, length 150 mm
7959	Single leads	For combination with DC-Motors series SXR/GXR, with single leads PTFE, length 150 mm
	Resolutions	Resolutions from 1 - 10 000 lines per revolution are available by request.

**Connection Encoder Standard**

No.	Function
1	U <sub>DD</sub>
2	GND
3	Channel $\bar{A}$
4	Channel A
5	Channel $\bar{B}$
6	Channel B
7	Channel $\bar{I}$
8	Channel I

**Option 7957**

No.	Function
1	N.C.
2	U <sub>DD</sub>
3	GND
4	N.C.
5	Channel $\bar{A}$
6	Channel A
7	Channel $\bar{B}$
8	Channel B
9	Channel $\bar{I}$
10	Channel I


**Standard cable**  
 PVC-ribbon cable,  
 8-AWG 28, 1 mm

**Dimensional drawing A**
