

# Encoders

magnetic Encoder, digital outputs, 2 channels,  
50 - 400 lines per revolution

For combination with  
DC-Micromotors

## Series IE2 – 400

		IE2 – 50	IE2 – 100	IE2 – 200	IE2 – 400	
Lines per revolution	N	50	100	200	400	
Frequency range, up to <sup>1)</sup>	f	20	40	80	160	kHz
Signal output, square wave		2				channels
Supply voltage	U <sub>DD</sub>	4,5 ... 5,5				V DC
Current consumption, typical <sup>2)</sup>	I <sub>DD</sub>	typ. 8,5, max. 12				mA
Output current, max. allowable <sup>3)</sup>	I <sub>OUT</sub>	5				mA
Phase shift, channel A to B	Φ	90 ± 45				°e
Signal rise/fall time, max. (C <sub>LOAD</sub> = 50 pF)	tr/tf	0,1 / 0,1				µs
Inertia of code disc	J	0,05				gcm <sup>2</sup>
Operating temperature range		– 25 ... + 85				°C

<sup>1)</sup> speed (rpm) = f(Hz) × 60/N

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

<sup>3)</sup> U<sub>DD</sub> = 5V: low logic level < 0,5V, high logic level > 4,5V: CMOS- and TTL compatible

### For combination with motor

Dimensional drawing A	<L1 [mm]		
1319T...SR	21,9		
1331T...SR	33,9		

### Features

These incremental shaft encoders 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.

The encoder is integrated in the DC-Micromotors SR-Series and extends the overall length by only 1,7 mm!

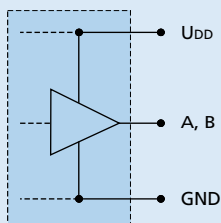
Hybrid circuits with sensors and a low inertia magnetic disc provide two channels with 90° phase shift.

The supply voltage for the encoder and the DC-Micromotor as well as the two channel output signals are interfaced through a ribbon cable with connector.

Details for the DC-Micromotors and suitable reduction gearheads are on separate catalogue pages.

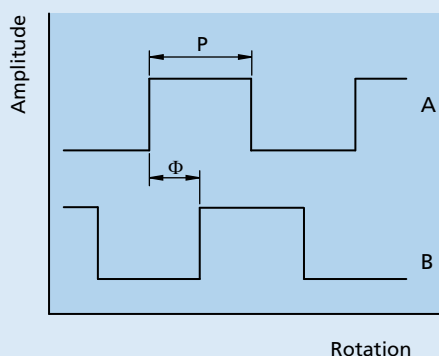
### Output signals / Circuit diagram

#### Output circuit



#### Output signals

with clockwise rotation as seen from the shaft end



Admissible deviation of phase shift:

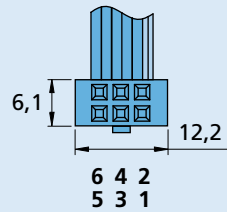
$$\Delta\Phi = \left| 90^\circ - \frac{\Phi}{P} * 180^\circ \right| \leq 45^\circ$$

### Connector information / Variants

No.	Function
1	Motor - *
2	Motor + *
3	GND
4	U <sub>00</sub>
5	Channel B
6	Channel A

\*Note: The terminal resistance of all motors with precious metal commutation is increased by approx. 0.4 Ω, and the max. allowable motor current in combination is 1A, depending on the motor can also be lower.

#### Connection Encoder



**Cable**  
PVC-ribbon cable  
6-conductors, 0,09 mm<sup>2</sup>

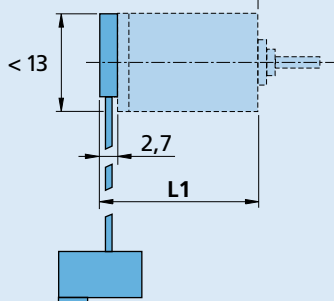
**Connector**  
DIN-41651  
grid 2,54 mm

#### Full product description

- Example:  
1319T012SR IE2-50  
1331T012SR IE2-400

### Dimensional drawing A

Example of combination with 1319...SR



IE2 - 50 ... 400

