# Encoders

magnetic Encoder, digital outputs,
2 channels, 16 lines per revolution

**For combination with**
DC-Micromotors

## Series IE2-16

| | | IE2-16 | |
|---|---|---|---|
| Lines per revolution | *N* | 16 | |
| Frequency range, up to[1] | *f* | 7 | kHz |
| Signal output, square wave | | 2 | Channels |
| Supply voltage | $U_{DD}$ | 4 ... 18 | V |
| Current consumption, typical[2] | $I_{DD}$ | typ. 6, max. 12 | mA |
| Output current, max.[3] | $I_{OUT}$ | 15 | mA |
| Phase shift, channel A to B | $\Phi$ | 90 ± 45 | °e |
| Signal rise/fall time, max. ($C_{LOAD}$ = 100 pF) | *tr*/*tf* | 2,5 / 0,3 | µs |
| Inertia of sensor magnet | *J* | 0,11 | gcm² |
| Operating temperature range | | -25 ... +85 | °C |

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

| For combination with Motor | |
|---|---|
| **Dimensional drawing A** | **<L1 [mm]** |
| 1336 ... CXR - 123 | 47,5 |
| **Dimensional drawing B** | **<L1 [mm]** |
| 1516 ... SR | 18,2 |
| 1524 ... SR | 26,2 |
| 1717 ... SR | 19,4 |
| 1724 ... SR | 26,4 |
| 2224 ... SR | 26,6 |
| 2232 ... SR | 34,6 |
| **Dimensional drawing C** | **<L1 [mm]** |
| 1727 ... CXR - 123 | 38,2 |
| 1741 ... CXR - 123 | 52,2 |

### Characteristics

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 1,4 mm!

Solid state Hall sensors and a low inertia magnetic disc provide two channels with 90° phase shift.

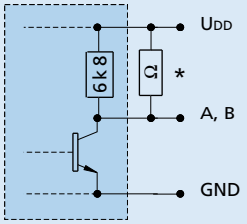
The supply voltage for the encoder and the DC-Micromotor as well as the two channel output signals are interfaced through a ribbon cable with connector.

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

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

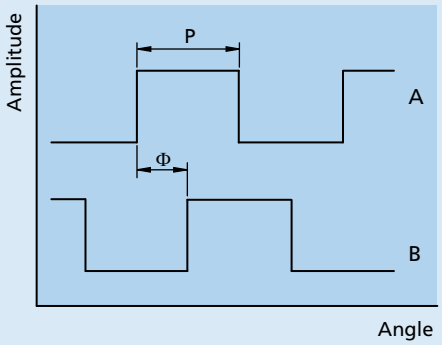
## Circuit diagram / Output signals

**Output circuit**




* An additional external pull-up resistor can be added to improve the rise time. Caution: $I_{OUT}$ max. 15 mA must not be exceeded!

**Output signals**
with clockwise rotation as seen from the shaft end

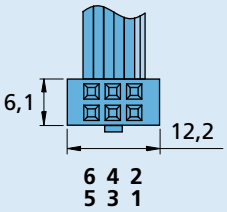



## Connector information / Variants

| No. | Function |
|---|---|
| 1 | Motor – * |
| 2 | Motor + * |
| 3 | GND |
| 4 | UDD |
| 5 | Channel B |
| 6 | Channel A |

* **Note:** DC-Micromotors series CXR have separate motor leads.

**Connection Encoder**



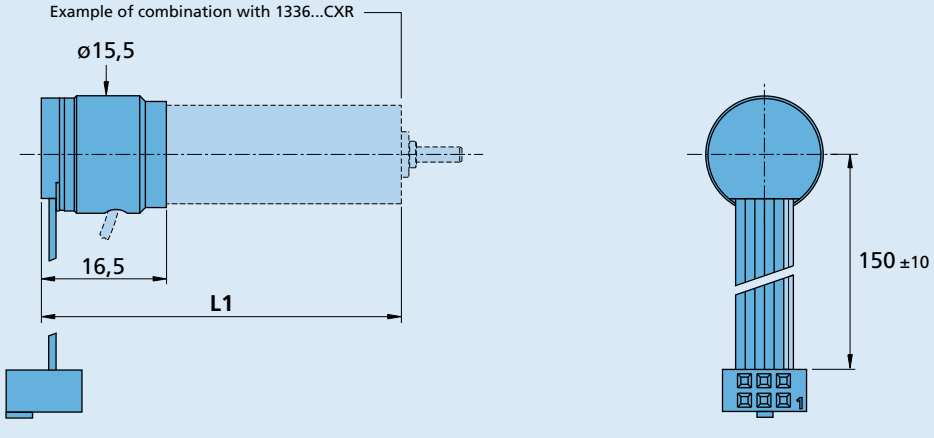

**Cable**
PVC-ribbon cable
6-conductors, 0,09 mm²

**Connector**
EN 60603-13 / DIN-41651,
grid 2,54 mm

**Full product description**

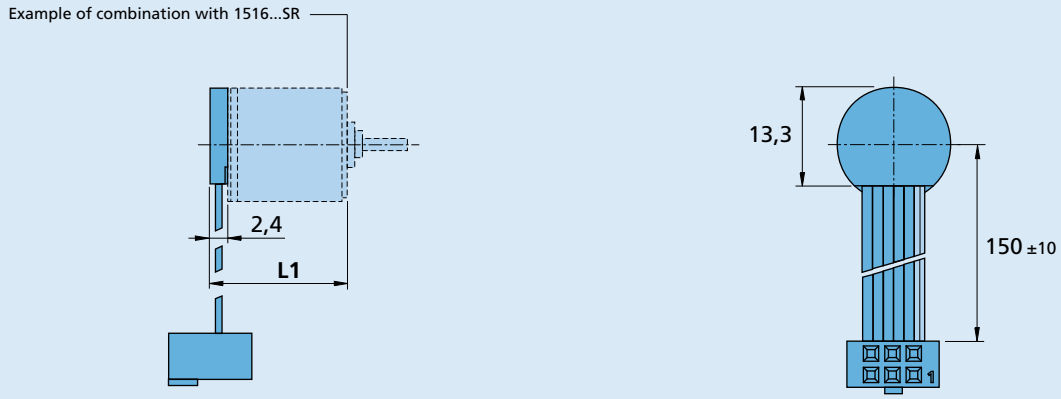
- Example:
  **1336U012CXR-123 IE2-16**
  **1516T006SR IE2-16**

## Dimensional drawing A



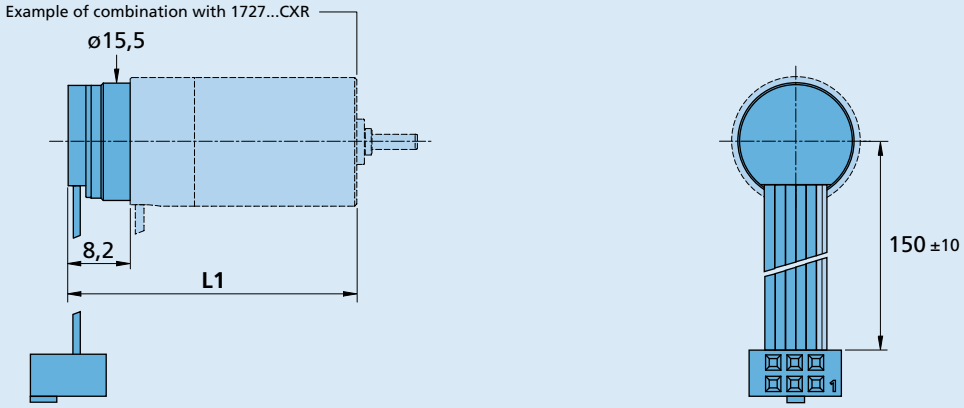

**IE2-16**

## Dimensional drawing B




**IE2-16**

## Dimensional drawing C




**IE2-16**