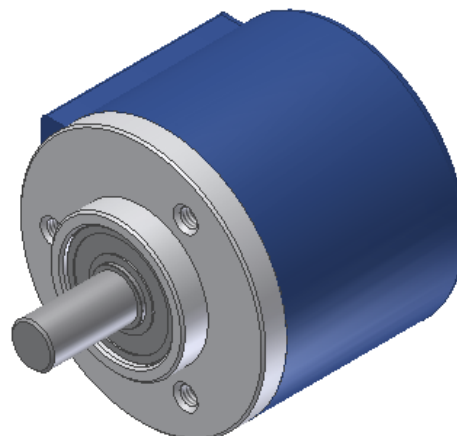


|             |            |          |                            |
|-------------|------------|----------|----------------------------|
| Code        | Project    | Release  | Title                      |
| <b>ST18</b> | <b>A33</b> | <b>A</b> | <b>TECHNICAL DATASHEET</b> |

## OPTICAL ENCODER EN531

### GENERAL FEATURES

- Optical rotary encoder.
- Bi-directional signals with zero pulse.
- Flange and body made of aluminium.
- Output by connector or cable (with sealing fairlead), radial or axial.



### MECHANICAL AND ELECTRICAL FEATURES

|   |   |  |             |                |
|---|---|--|-------------|----------------|
| <b>MECHANICAL</b><br><ul style="list-style-type: none"> <li>• Flange and body made of aluminium.</li> <li>• Shaft made of stainless steel.</li> <li>• Ball bearings with special high-sealed screens.</li> <li>• High protection even in harsh environmental conditions.</li> </ul> <b>ELECTRICAL</b><br><ul style="list-style-type: none"> <li>• Protection against short circuits.</li> <li>• Protection against inversion of polarity.</li> <li>• High stability of output signals.</li> <li>• Reading device with an infra-red light emitter and receiving photodiodes.</li> <li>• A and B output signals with phase displacement of 90° electrical.</li> </ul> | <b>Code EN531</b>   | <b>PP</b>  | <b>LD</b>   | <b>OC</b>      |
|   | <b>Pulses per revolution</b>  | 5 to 64000 ppr                                     |             |                |
|   | <b>Max. rotating speed</b>  | momentary  | 12000 rpm   |                |
|   |   | permanent  | 8000 rpm    |                |
|   | <b>Max. load on shaft</b>   | 100 N (radial) – 100 N (axial)                     |             |                |
|   | <b>Shaft (diameter A x length L) mm</b>                                 | Ø6x10-Ø8x20 -Ø9.52x20 -Ø10x20<br>others on request |             |                |
|   | <b>Protection class</b>   | IP65 (standard) *<br>IP67 (optional)               |             |                |
|   | <b>Operating temperature</b>  | 0 ÷ 70°C   |             |                |
|   | <b>Storage temperature</b>  | -20 ÷ 80°C   |             |                |
|   | <b>Humidity</b>   | 20 ÷ 90% (not condensed)                           |             |                |
|   | <b>Power supply</b>   | 5 V ± 5%<br>5 ÷ 28 V ± 5%                          |             |                |
|   | <b>Max. consumption at 5 V (with no load)</b>                           | 25 mA  |             |                |
|   | <b>Max. output current (each channel)</b>                               | 30 mA  |             |                |
|   | <b>Max. frequency</b>   | 300 kHz  |             |                |
|   | <b>Output</b>   | Push-Pull  | Line Driver | Open Collector |
|   | <b>Standard length of cable</b>   | 1 m  |             |                |
| <b>Electrical connections</b>   | see the rel. table  |  |             |                |
| <b>Electrical protection</b>  | inversion of power supply polarity<br>and short circuits on output port |  |             |                |
| <b>Weight (according to model)</b>  | 280 ÷ 340 g   |  |             |                |

\* It is important to note that shaft rotates more freely in the version with protection class IP65.

### ORDERING CODE

| MODEL        | CABLE/ CONN. OUTPUT | ACCURACY | PPR          | POWER SUPPLY | SHAFT Ø    | CABLE / CONN. | OUTPUT    | CONNECTION | OPTIONS   |
|--------------|---------------------|----------|--------------|--------------|------------|---------------|-----------|------------|-----------|
| <b>EN531</b> | <b>HR</b>           | <b>S</b> | <b>xxxxx</b> | <b>05V</b>   | <b>D06</b> | <b>CE</b>     | <b>PP</b> | <b>2</b>   | <b>V2</b> |

|                           |                                   |                          |   |  |  |                             |  |
|---------------------------|-----------------------------------|--------------------------|---|--|--|-----------------------------|--|
| HR = radial<br>HA = axial | No code = standard<br>S = special | 05V = 5V<br>0528 = 5÷28V | D06 = Ø6 mm<br>D08 = Ø8 mm<br>9.52 = Ø9.52 mm<br>D10 = Ø10 mm | M.5 = 0.5m<br>M01 = 1m<br>CE = 7P Amph.<br>CF = 10P Amph.<br>CG = 12P Connei | LD = LINE DRIVER<br>PP = PUSH-PULL<br>ON = OC NPN<br>OP = OC PNP | C = cable<br>n = no. wiring | No code = . standard configuration<br>V2 = protection class IP67 |
|---------------------------|-----------------------------------|--------------------------|---|--|--|-----------------------------|--|

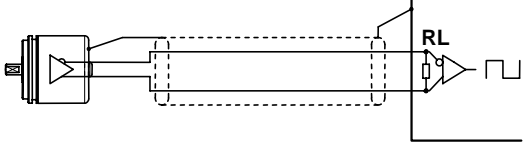
Example **OPTICAL ENCODER EN531 HRS 01000 05V D06CE PP2 V2**

|                     |                       |                     |                                     |
|---------------------|-----------------------|---------------------|-------------------------------------|
| Code<br><b>ST18</b> | Project<br><b>A33</b> | Release<br><b>A</b> | Title<br><b>TECHNICAL DATASHEET</b> |
|---------------------|-----------------------|---------------------|-------------------------------------|

**CABLE AND ELECTRICAL CONNECTIONS**

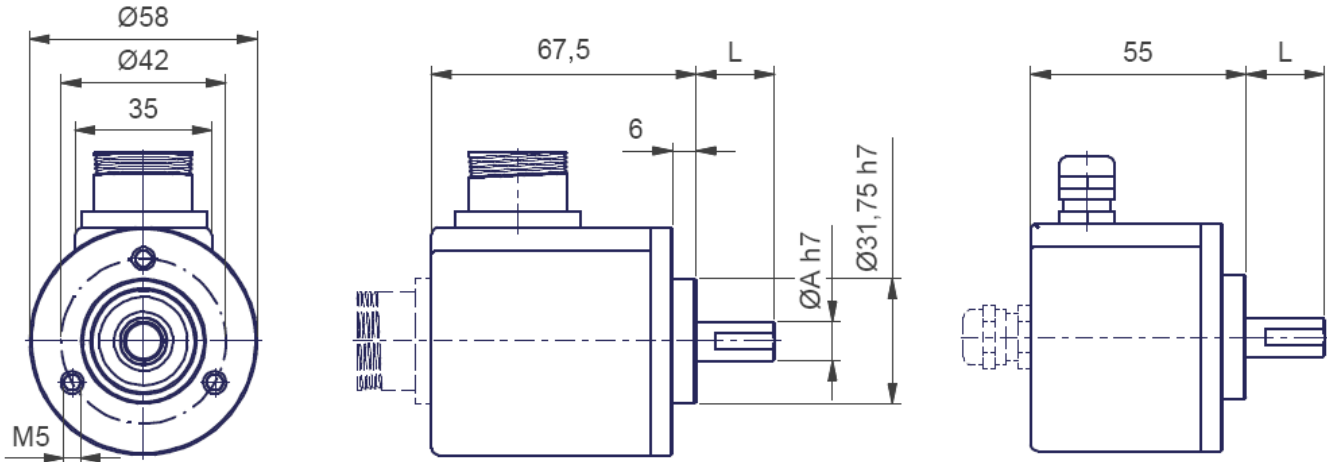
|   |                |                    |               |                    |
|---|----------------|--------------------|---------------|--------------------|
| <b>Cable 8 cores <math>\varnothing = 6.5</math> mm, PVC external sheath</b><br><b>Wires section:</b><br>- for power supply: $0.5 \text{ mm}^2$<br>- for signals: $0.14 \text{ mm}^2$<br><b>Cable 5 cores <math>\varnothing = 5.4</math> mm, PVC external sheath</b><br><b>Wires section:</b><br>- for power supply: $0.22 \text{ mm}^2$<br>- for signals: $0.14 \text{ mm}^2$<br><br>NOTES:<br>Do not exceed the minimum cable bending radius of 30 mm. | <b>PP / OC</b> |                    | <b>LD</b>     |                    |
|   | <b>SIGNAL</b>  | <b>WIRE COLOUR</b> | <b>SIGNAL</b> | <b>WIRE COLOUR</b> |
|   | A              | Green              | A             | Green              |
|   | B              | White              | B             | White              |
|   | Z              | Brown              | Z             | Brown              |
|   |                |                    | $\bar{A}$     | Orange             |
|   |                |                    | $\bar{B}$     | Light Blue         |
|   |                |                    | $\bar{Z}$     | Yellow             |
|   | V+             | Red                | V+            | Red                |
|   | GND            | Blue               | GND           | Blue               |
| $\perp$   | Shield         | $\perp$            | Shield        |                    |

**SHIELDED CABLE**


|  |                               |               |
|--|-------------------------------|---------------|
|  | <b>LINE DRIVER CONNECTION</b> |               |
|  | <b>POWER SUPPLY</b>           | <b>RL</b>     |
|  | 5 V                           | 120 $\Omega$  |
|  | 12 V                          | 330 $\Omega$  |
|  | 24 V                          | 1000 $\Omega$ |

In case of cable extension, the electrical connection between the body of connectors must be ensured.

**DIMENSIONS AND RECOMMENDED FIXING**

|   |
|---|
|           |
| <ul style="list-style-type: none"> <li>Use an elastic coupling for shaft junction.</li> </ul> |

**WHAT TO AVOID**

|   |   |
|---|---|
| <ul style="list-style-type: none"> <li>Any type of mechanical working (cut, drill, mill, etc.)</li> <li>Any modification either on the body or on the shaft of the encoder</li> <li>Any kind of bad usage</li> <li>External hits or stresses</li> </ul> |  |
|---|---|