

**MAIN FEATURES**

Hollow shaft encoder series for industrial applications with high mechanical resistance requirements. These encoders are designed to withstand high radial and axial shaft loads.

- 3 channel encoder (A / B / Z) up to 24000 ppr
- Power supply up to +28 VDC with several electronic interfaces available
- Up to 500 kHz output frequency
- Cable or connector output
- Available with metal cover for heavy duty applications
- Blind hollow shaft diameter up to 15 mm
- Mounting by stator coupling, spring or anti-rotation pin


**ORDERING CODE**
**ER 58G M\* 500 S 5/28 N 8 X 3 P R .XXX**
**SERIES**

incremental encoder series **EL**  
 incremental encoder series **ER**

**MODEL**

blind hollow shaft with stator coupling **58F**  
 blind hollow shaft with anti-rotation pin **58G**  
 blind hollow shaft with spring **63F**  
 blind hollow shaft with anti-rotation pin **63G**

**METAL COVER**

\* add for metal cover **M**

**RESOLUTION**

ppr from **1** to **24000**  
 see table for pulses availability

**ZERO PULSE**

without zero pulse **S**  
 with zero pulse **Z**

**POWER SUPPLY**

(with L electronic interface) 5 V DC **5**  
 (with L or PC electronic interface) 8 ... 24 V DC **8/24**  
 5 ... 28 V DC **5/28**

**ELECTRONIC INTERFACE**

NPN **N**  
 NPN open collector **C**  
 push-pull **P**  
 push-pull protected (AEIC-7272) **PC**  
 line driver **L**  
 power supply 5/28V - output RS-422 **RS**

**BORE DIAMETER**

mm **8**  
 mm **10**  
 mm **12**  
 mm **14**  
 mm **15**

**ENCLOSURE RATING**

IP 54 **X**  
 IP 66 **S**

**MAX ROTATION SPEED**

3000 rpm **3**

**OUTPUT TYPE**

cable (standard length 1,5 m) **P**  
 MIL connector **M**  
 JIS-C-5432 connector **J**  
 M12 connector **M12**  
 M23 connector **C**  
 IP40 IEC 60130-9 connector **C**

female connector included, without female please add 162 as variant code

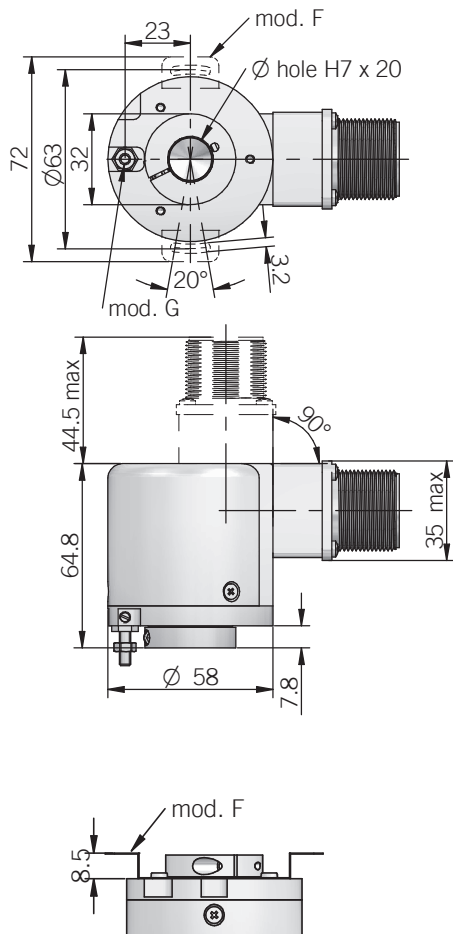
**DIRECTION TYPE**

axial **A**  
 radial **R**

**VARIANT**

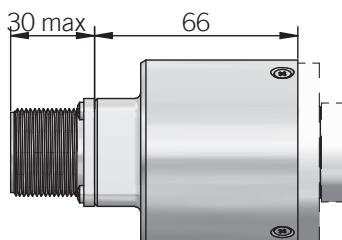
custom version **XXX**

## EL - ER 58 F / G



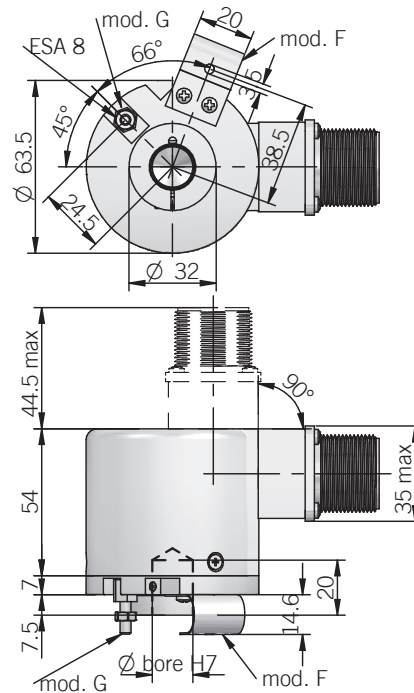
anti-rotation pin is included in model G, for mounting instruction please refer to product installation notes

### Dimensions with metal cover axial output

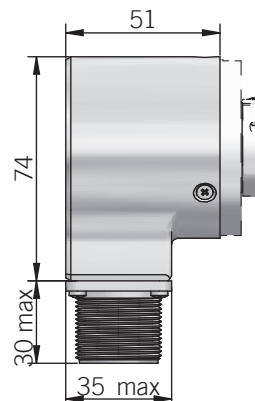


dimensions in mm

## EL - ER 63 F / G



### Dimensions with metal cover radial output



## ELECTRICAL SPECIFICATIONS

|                                      |                                                                                                             |
|--------------------------------------|-------------------------------------------------------------------------------------------------------------|
| <b>Resolution</b>                    | from 1 to 2500 ppr (58 G)<br>from 1 to 24000 ppr (58 F - 63 F / G)                                          |
| <b>Power supply</b>                  | 5 = 4,5 ... 5,5 V DC<br>5/28 = 4,75 ... 29,4 V DC<br>8/24 = 7,6 ... 25,2 V DC (reverse polarity protection) |
| <b>Power draw without load</b>       | 800 mW                                                                                                      |
| <b>Max load current</b>              | N / C / P / PC = 50 mA / channel<br>L / RS = 20 mA / channel                                                |
| <b>Output type*</b>                  | NPN / NPN open collector / push-pull / line driver                                                          |
| <b>Max output frequency</b>          | 250 kHz up to 6000 ppr<br>500 kHz from 7200 ppr                                                             |
| <b>Counting direction</b>            | A leads B clockwise (shaft view)                                                                            |
| <b>Electromagnetic compatibility</b> | IEC 61000-6-2<br>IEC 61000-6-4                                                                              |

\*output levels according to power supply, for further details please see under Technical basics section

## EL SERIES RESOLUTIONS

1 - 2 - 4 - 5 - 10 - 15 - 16 - 20 - 25 - 30 - 32 - 40 - 50 - 60 - 70 - 80 - 90 - 160 - 180 - 350 - 450 - 660 - 700

## ER SERIES RESOLUTIONS

100 - 120 - 128 - 150 - 200 - 240 - 250 - 256 - 300 - **360** - 400 - 480 - **500** - **512** - **600** - 625 - **720** - 750 - 800 - 900 - **1000** - **1024** - 1200 - 1250 - 1440 - 1500 - 1600 - 1800 - **2000** - **2048** - **2500** - 3000 - **3600** - 4000 - 4096 - **5000** - 6000 - **7200** - 8000 - 8192 - 9000 - **10000** - 10240 - 12000 - **14400** - 16000 - 16384 - 18000 - **20000** - 20480 - 24000

please directly contact our offices for other pulses, preferred resolutions in bold

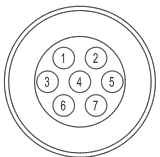
## MECHANICAL SPECIFICATIONS

|                                               |                                                                                         |
|-----------------------------------------------|-----------------------------------------------------------------------------------------|
| <b>Bore diameter</b>                          | ø 8 / 10 / 12 / 14 / 15 mm                                                              |
| <b>Enclosure rating</b>                       | X = IP 54 (IEC 60529)<br>S = IP 64 (IEC 60529)                                          |
| <b>Max rotation speed</b>                     | 3000 rpm                                                                                |
| <b>Shock</b>                                  | 50 G, 11 ms (IEC 60068-2-27)                                                            |
| <b>Vibration</b>                              | 10 G, 10 ... 2000 Hz (IEC 60068-2-6)                                                    |
| <b>Moment of inertia</b>                      | $4 \times 10^{-6} \text{ kgm}^2$                                                        |
| <b>Starting torque<br/>(at +20°C / +68°F)</b> | < 0,02 Nm (IP 54)<br>< 0,06 Nm (IP 66)                                                  |
| <b>Body material</b>                          | EN-AW 2011 aluminum                                                                     |
| <b>Shaft material</b>                         | 1.4305 / AISI 303 stainless steel                                                       |
| <b>Housing material</b>                       | PA66 glass fiber reinforced / painted aluminum                                          |
| <b>Bearings</b>                               | 2 ball bearings                                                                         |
| <b>Bearings life</b>                          | 10 <sup>9</sup> revolutions                                                             |
| <b>Operating temperature</b>                  | -10° ... +60°C (+14° ... +140°F) EL series<br>-20° ... +70°C (-4° ... +158°F) ER series |
| <b>Storage temperature</b>                    | -25° ... +70°C (-13° ... +158°F)                                                        |
| <b>Fixing torque for collar clamping</b>      | 1,5 Nm recommended                                                                      |
| <b>Weight</b>                                 | 350 g (12,35 oz)                                                                        |

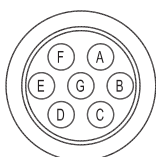
## CONNECTIONS

| Function | Cable output   | Cable output | 7 pin J output | 7 pin J output      | 7 pin M output | 7 pin M output      | 10 pin J output       | 10 pin M output       | 5 pin M12 output | 8 pin M12 output | 12 pin H output | 5 pin C output | 8 pin C output |
|----------|----------------|--------------|----------------|---------------------|----------------|---------------------|-----------------------|-----------------------|------------------|------------------|-----------------|----------------|----------------|
|          | N / C / P / PC | Line driver  | N / C / P / PC | Line Driver no Zero | N / C / P / PC | Line Driver no Zero | Line Driver with Zero | Line Driver with Zero | N / C / P / PC   | Line Driver      | CCW             | N / C / P / PC | Line Driver    |
| +V DC    | red            | red          | 6              | 4                   | F              | D                   | 4 - 5                 | D - E                 | 2                | 7                | 12              | 5              | 7              |
| 0 V      | black          | black        | 1              | 6                   | A              | F                   | 6                     | F                     | 4                | 1                | 10              | 1              | 8              |
| Ch. A    | green          | green        | 3              | 1                   | C              | A                   | 1                     | A                     | 3                | 6                | 5               | 2              | 1              |
| Ch. A-   | /              | brown        | /              | 3                   | /              | C                   | 7                     | G                     | /                | 5                | 6               | /              | 2              |
| Ch. B    | yellow         | yellow       | 5              | 2                   | E              | B                   | 2                     | B                     | 1                | 4                | 8               | 4              | 3              |
| Ch. B-   | /              | orange       | /              | 5                   | /              | E                   | 8                     | H                     | /                | 3                | 1               | /              | 4              |
| Ch. Z    | blue           | blue         | 4              | /                   | D              | /                   | 3                     | C                     | 5                | 2                | 3               | 3              | 5              |
| Ch. Z-   | /              | white        | /              | /                   | /              | /                   | 9                     | I                     | /                | 8                | 4               | /              | 6              |
| ≡        | shield         | shield       | 7              | 7                   | G              | G                   | 10                    | J                     | housing          | housing          | 9               | /              | /              |

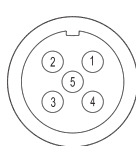
J connector (7 pin)  
JIS-C-5432 Size 16  
solder side view FV



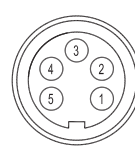
M connector (7 pin)  
Amphenol MS3102-E-16-S  
solder side view FV



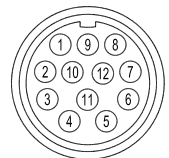
M12 connector (5 pin)  
M12 A coded  
solder side view FV



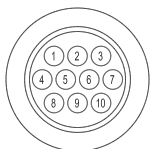
C connector (5 pin)  
IEC 60130-9  
solder side view FV



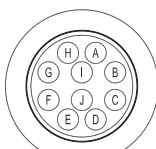
H connector (12 pin) - M23 CCW  
Hummel 7.410.000000 -  
7.002.912.603  
solder side view FV



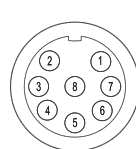
J connector (10 pin)  
JIS-C-5432 Size 16  
solder side view FV



M connector (10 pin)  
Amphenol MS3102-E-18-1  
solder side view FV



M12 connector (8 pin)  
M12 A coded  
solder side view FV



C connector (8 pin)  
IEC 60130-9  
solder side view FV

