

# TECHNICAL DATASHEET

## Absolute Encoder AD 58



- For brushless servo motors
- All-digital and highspeed
- +120°C operating temperature
- 10,000 rpm continuous operation
- Optical encoder with a true geared multiturn
- BiSS or SSI interface
- Option Sinewave 1 Vpp: Harmonic distortion less than 1%
- Bandwidth 500 kHz



### GENERAL INFORMATION

The AD58 is an absolute encoder with a true geared Multiturn and optical sensing technology: The mechanical design consists of two ball bearings and a flexible torque support. The AD58 is ideally suited for integration into BLDC servo motors for demanding applications such as CNC precision machining and printing in professional quality. Through its low current consumption the AD58 is contributing to lowering cost of ownership.

#### Fully digital control loop

The new and completely digital OptoAsic technology enables the transition to a truly digital drive system. The conventional absolute encoders still have analog sine wave signals for the feedback of speed and position data. The AD 58, however, provides fully digital position data up to 22 Bit (Singleturn) and 12 Bit (Multiturn) over the BiSS interface with a variable clock rate up to 10 MHz. This corresponds a singleturn resolution of more than 4 million measured steps.

### TECHNICAL DATA mechanical

|                                               |                                                            |
|-----------------------------------------------|------------------------------------------------------------|
| Housing diameter                              | 58 mm                                                      |
| Shaft diameter                                | 10 mm (Cone hollow shaft)<br>10 mm (Cone solid shaft)      |
| Flange<br>(Mounting of housing)               | Tether                                                     |
| Protection class shaft input<br>(EN 60529)    | IP40                                                       |
| Protection class housing<br>(EN 60529)        | IP40                                                       |
| Axial endplay of mounting<br>shaft (hubshaft) | ± 0.5 mm                                                   |
| Radial runout of mating<br>shaft (hubshaft)   | ± 0.1 mm                                                   |
| Max. speed                                    | max. 10 000 rpm (continuous), max. 12 000 rpm (short term) |
| Starting torque typ.                          | ≤ 1 Ncm                                                    |
| Moment of inertia                             | ca. $3.8 \times 10^{-6}$ kgm <sup>2</sup>                  |
| Vibration resistance<br>(DIN EN 60068-2-6)    | 100 m/s <sup>2</sup> (10 ... 2000 Hz)                      |
| Shock resistance<br>(DIN EN 60068-2-27)       | 1000 m/s <sup>2</sup> (6 ms)                               |
| Operating temperature                         | -15 °C ... +120 °C                                         |
| Storage temperature <sup>1</sup>              | -15 °C ... +85 °C                                          |
| Weight                                        | approx. 260 g (ST) / 310 g (MT)                            |
| Connection                                    | PCB connector, 12 pole                                     |

<sup>1</sup> due to packing

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#### TECHNICAL DATA electrical

|                        |                                                      |
|------------------------|------------------------------------------------------|
| Supply voltage         | ± 10% DC 5 V or DC 10 - 30 V                         |
| Max. current w/o load  | 70 A (ST), 100 A (MT)                                |
| Resolution singleturn  | 13 Bit (SSI)<br>max. 22 Bit (BiSS)                   |
| Resolution multiturn   | 12 Bit                                               |
| Output code            | Binary, Gray                                         |
| Incremental signals    | Sinus-Cosinus 1 Vpp                                  |
| Number of pulses       | 2048                                                 |
| 3dB limiting frequency | 500 kHz                                              |
| Absolute accuracy      | ±35"                                                 |
| Repeatability          | ±7"                                                  |
| Parametrization        | Resolution, Code type, Direction, Warning, Alarm     |
| Alarm output           | Alarm bit (SSI Option), warning and alarm bit (BiSS) |

#### ELECTRICAL CONNECTIONS PCB connector, 12 pole

| Colour      | PIN | Signals               |
|-------------|-----|-----------------------|
| violet      | 1a  | Data                  |
| green       | 2a  | A+                    |
| brown/green | 3a  | 0 V Sensor            |
| blue        | 4a  | B+                    |
| brown       | 5a  | Clock                 |
| red//blue   | 6a  | 5 V Sensor            |
| green/pink  | 1b  | DC 5 V/ 7 -30 V       |
| white       | 2b  | Clock                 |
| red         | 3b  | B-                    |
| white/green | 4b  | 0 V (U <sub>N</sub> ) |
| yellow      | 5b  | A-                    |
| black       | 6b  | Data                  |

#### CONNECTION ENCODER SIDE

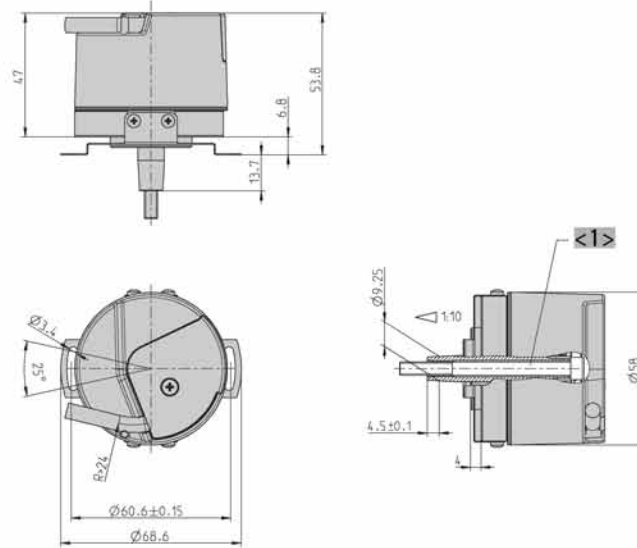


12 pin PCB connector  
manufacture Berg, type Minitex  
Screen is connected over a  
length of 10 mm with  
encoder housing.

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## DIMENSIONED DRAWINGS



- <1> Central mounting screw, Singleturn: DIN 912 M5x50  
<1> Central mounting screw, Multiturn: DIN 912 M5x65

Shaft code: "K"  
Flange code: "T" (with tether), "O" (without tether)

Dimensions in mm

## ORDERING INFORMATION

| Type                                                                                | Resolution                                                                                                                             | Supply voltage                                                                      | Flange, Protection, Shaft                                                           | Interface                                                                             | Connection                                                                                                               |
|-------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|
|  |                                                     |  |  |  |                                     |
| <b>AD58</b>                                                                         | <b>0013</b> 13 Bit ST<br><b>0022</b> 22 Bit ST (BiSS)<br><b>1213</b> 12 Bit MT + 13 Bit ST<br><b>1222</b> 12 Bit MT + 22 Bit ST (BiSS) | <b>A</b> DC 5 V<br><b>E</b> DC 10 - 30 V                                            | <b>1.0K</b> Spring tether, IP40, cone 10 mm                                         | <b>BI</b> BiSS<br><b>SC</b> SSI Gray (+SinCos 1Vpp)                                   | <b>0</b> PCB connector, axial, 12 pole<br><b>B</b> PCB connector, radial, 12 pole, with mating connector and 0.5 m cable |

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### Absolute Encoder AD 58 Accessories

#### DISPLAYS

|                              | Ordering code |
|------------------------------|---------------|
| Position indicator Signo-SSI | 0 727 111     |