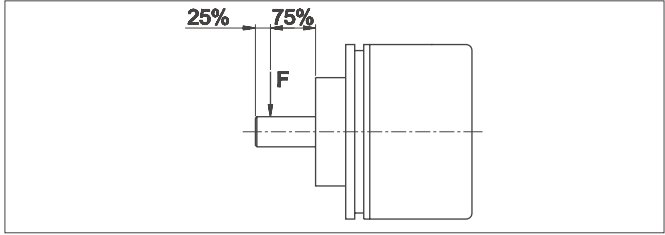


Mechanically rugged

All encoders have double and clearance-free shaft bearings with the maximum possible distance between the bearings, thus obtaining maximum long-term load capacity.



Radial bearing load F

The bearings are treated with a special grease able to withstand extreme temperatures, high speeds and loads, as well as constant operation in reverse. The grease remains stable over a long period of time. The indicated radial-bearing load relates to the point F of the applied force. The useful life of the bearings is stated in the number of revolutions. The life can be converted into hours using the following formula:

$$\text{Life in hours} = \frac{\text{Number of Revolutions}}{\text{RPM} \times 60}$$

Special low-friction bearings

Our MDG encoders are fitted with special sealing rings on the bearings. The corresponding starting torque values are given in the following table or with the appropriate encoder. Should you need a particularly easy-running low-friction encoder, then MDG encoder models 40S, 40A, 58A, 58B and 58D can be ordered as "Low-friction encoders AAC" please note the changes in the specifications.

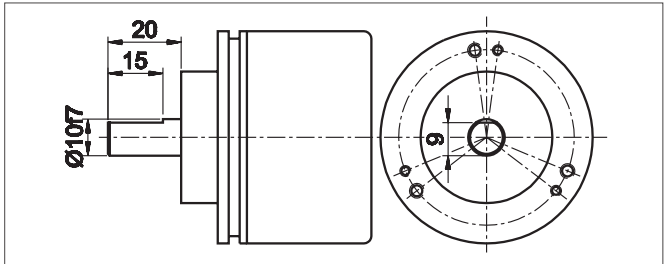
Model	Operation	Torque	Protection at shaft
40A	Low -friction	ä 0,10 Ncm	IP50
	Standard	ä 0,20 Ncm	IP65
40S	Low -friction	ä 0,10 Ncm	IP50
	Standard	ä 0,20 Ncm	IP65
58A	Low -friction	ä 0,25 Ncm	IP50
	Standard	ä 0,50 Ncm	IP65
58B	Low -friction	ä 0,50 Ncm	IP50
	Standard	ä 1,00 Ncm	IP65
58D	Low -friction	ä 0,80 Ncm	IP50
	Standard	ä 1,60 Ncm	IP65

When ordering a low-friction encoder, please use the appropriate standard encoder order code and add the suffix code -AAC

Example: MDG58B as a particularly low-friction encoder:
MDG58B-100-AB-G24-K3-AAC

Shaft with flat

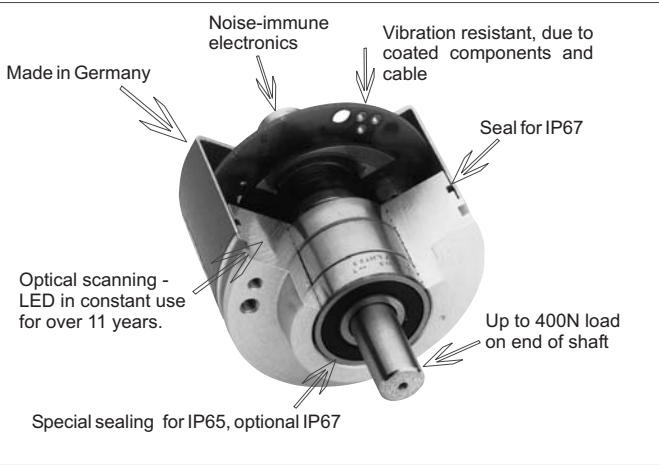
Model MDG 58B has a 10mm shaft. In some cases a flat is needed. This can be ordered in accordance with the drawing below. Should you need alternative dimensions, please call us. We will be pleased to offer you a shaft which meets your requirements.



MDG 58 B with flat

When ordering a shaft with flat, please add the suffix code -AAF

Example : MDG 58B with flat
MDG 58B-100-AB-G24-K3-AAF



Open view of encoder model MDG 58B

Safety checked

100% final check: each encoder is subjected to rigorous final testing which include functionality tests under changing operating conditions and also a temperature-cycle test.
Burn-in test: the failure of electronic devices typically follows the so-called "bath-tub curve" i.e. they either fail at the beginning of their life or they work without problems for a long time. When you install your encoder in your application, it will already typically have been in operation for around 100 hours. This means that all the components have been pre-aged, so that you may then be assured that they will operate trouble-free for many years.

Safety of Connection

All encoders with an HTL driver output are completely reverse polarity protected even if incorrectly wired for an extended period of time. However with encoders which have a TTL driver, incorrectly reversing the polarity of the power supply, short-circuiting of the outputs or applying power to the outputs can lead to encoder failure.

Noise Immunity

Years of wide-ranging application experience has been taken into consideration when designing our encoders, with the aim that all hitherto known types of noise interference will have no effect on the functionality of our units. This has resulted in our encoders being particularly noise immune.

Ambient Temperature Range

The standard temperature range of our encoders is from -10°C to + 70° C. Should you require an extended temperature range, please ask.

Electrically Reliable

- Highly integrated Chip Technology: latest SMD technology with optical ASIC evaluation, circuit power pack and line driver ensures safe and reliable operation, even under extreme conditions.
- Differential scanning : Twin scanning and differential analysis of each output signal. This type of analysis ensures the highest degree of accuracy and safety even under changing operating conditions.
- High Output Power : each output circuit is fitted with a line driver, which permits even long cables to be connected.
- LED Ageing Compensation : the natural ageing of the light source is Compensated for, in order to make full use of its long life.

Resistance to Vibration and Shock

One of the most important tests of an encoder's construction is for vibration and shock. Each of our encoder models is tested to the specified vibration value with a modern 'shaker' for a minimum of 300 hours and tested on each axis 1000 times to the specified shock value. As a result we provide encoders that are guaranteed to last a long time in rugged industrial applications. All the larger components as well as the connection of the cable to the PCB are epoxy-coated.

High IP Protection Standard

Almost all our encoders meet the high protection standard IP67, with the shaft sealed to IP65. This is achieved by fitting a special bearing seal, an O-ring between the cover and the flange and a threaded cable connector or alternatively a sealed connector. Please note that this protection can only be achieved by using a properly connected plug. For further information see the section on Accessories from page 51.

Shafts sealed to IP67

Encoder models MDG 40S, 58B and 90B can be supplied in a full IP67 version. This is achieved using a ring type oil shaft seal. Please note the following specification changes :

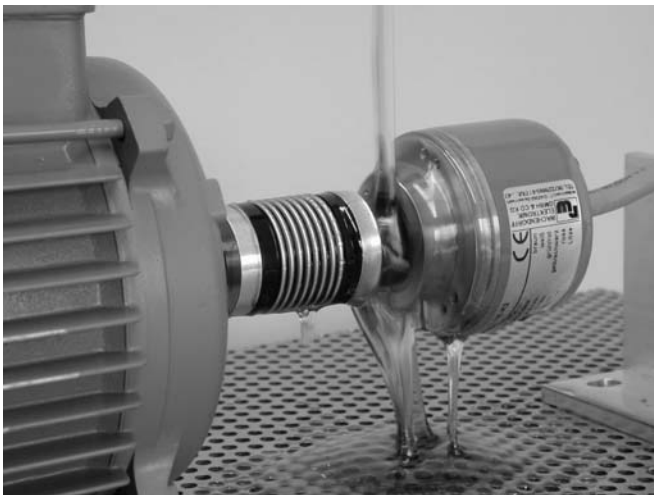
	Max. RPM	Permitted shaft loading		Max. PPR	Starting torque
		axial	radial		
40S	3.500	30 N	45 N	1.250	ca. 1,2 Ncm
58B	3.500	100 N	110 N	2.500	ca. 4 Ncm
58K	8.000	50 N	80 N	2.500	ca. 4 Ncm
90B	3.200	110 N	110 N	2.500	ca. 5 Ncm
115T	8.000	80 N	110 N	2.500	ca. 4 Ncm
115M	8.000	100 N	120 N	2.500	ca. 5 Ncm

When ordering encoders with shaft protection to IP67, please add the suffix code -AAO

Example: MDG with IP67 shaft protection:
MDG 58B-100-AB-G24-K3-AAO

Resistance to Certain Liquids

In certain applications the encoder is positioned in an area where it can get sprayed with certain liquids (for example oil, lubricants etc.) Our encoders can be used in these environments, thanks to certain measures we have taken with the housings, seals, bearings and cable. Please ask us about the possibilities for your specific application.

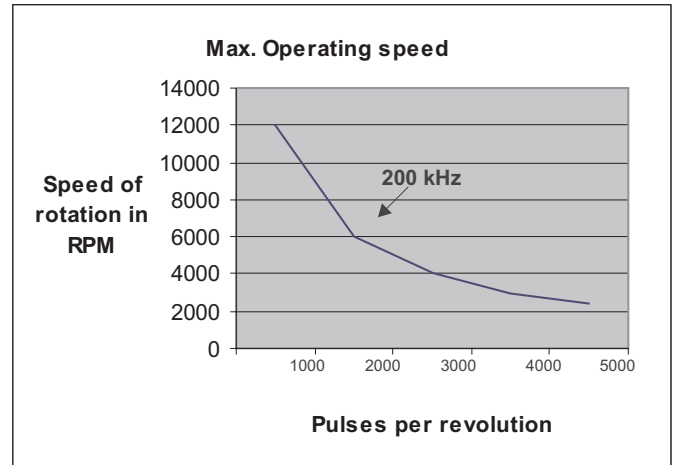


Oil resistant Encoder MDG 58B

Maximum Operating Speeds

The maximum operating speed is limited by the maximum mechanical operating speed (shaft speed) and by the number of pulses per revolution (PPR). The maximum operating speed is given in the specifications. The maximum speed with relation to the pulse frequency can be expressed as follows :

$$\text{Max. speed of rotation RPM} = \frac{\text{Max. Frequency of encoder in Hz} \times 60}{\text{PPR of encoder}}$$



Max. operating speed