

DG 60 L Incremental Encoder

Features

Incremental encoder with
60 mm outer diameter

Rugged die-cast aluminum housing

Quadrature output with reference
marker, complementary output
signals

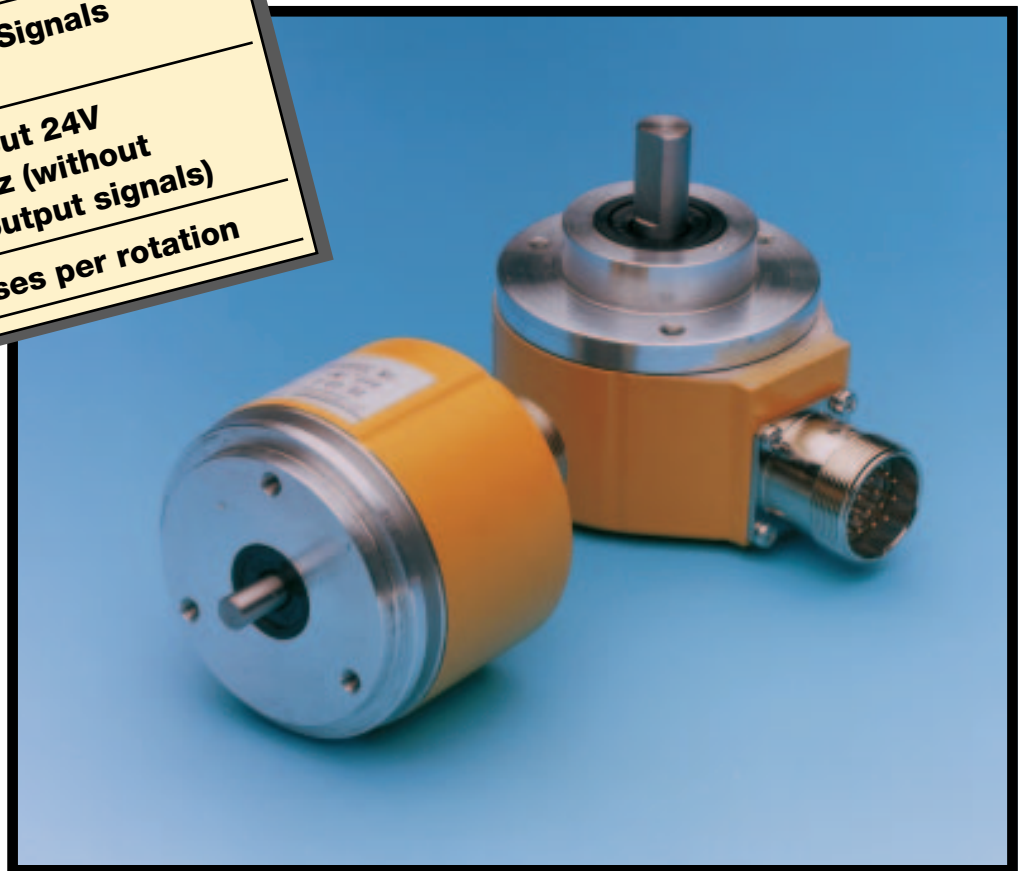
Protection to IP 67

Square wave output 5V
RS 422 300 kHz / 600 kHz

1Vp-p Sine/Cosine Signals
(5 VDC supply)

Square wave output 24V
push-pull 200 kHz (without
complimentary output signals)

1 to 10,000 pulses per rotation



Technical Data/Features according to DIN 32878

Number of pulses per revolution (Z): 1 to 100*, 125, 150, 160, 180, 200, 244, 250, 256, 297, 300, 308, 314, 318, 336, 360, 400, 500, 512, 570, 600, 625, 700, 720, 750, 768, 785, 800, 900, 938, 1000, 1005, **1024**, 1200, 1250, 1375, 1500, 1800, 2000, 2048, 2500, 3000, 3600, 4000, 4096, 4500, 5000, 6000, 7200, 8000, 8192, 9000, 10000

Note: Number of pulses per revolution ≥ 5000 only available with Driver F

Interfaces		RS 422 Short circuit-proof Push-Pull output 1Vp-p Sine/Cosine
Dimensions		See drawing (mm)
Mass		Approx. 0.3 kg
Moment of inertia of the rotor	DG 60 LW DG 60 LX	25 gcm ² 13 gcm ²
Measurement step (degrees)		90 / no. of pulses
Reference signal	Number Position	1 90° (electrically gated with K1 and K2)
Error limits	100 \leq Z < 1250 1250 < Z \leq 10000	45 / Z + 0.054 degrees 45 / Z + 0.015 degrees
Measurement step deviation (degrees)		45 / Z
Max. output frequency	RS 422 Push-pull	300 kHz (600 at >5000 pulses) 200 kHz
Max operating speed **	With shaft seal Without shaft seal	6000 rpm 10000 rpm
Max. angular acceleration		5 x 10 ⁵ rad/s ²
Operating torque	With shaft seal Without shaft seal	1 Ncm 0.1 Ncm
Starting torque	With shaft seal Without shaft seal	1.5 Ncm 0.2 Ncm
Permissible shaft loading		
-Radial	DG 60 L W.. DG 60 L X..	40 N 20 N
-Axial	DG 60 L W.. DG 60 L X..	20 N 10 N
Service life of bearings		3.6 x 10 ¹⁰ Revolutions
Design performance temperature range		0 to +85 °C
Operating temperature range		-20 to +85 °C
Storage temperature range		-30 to +85 °C
Permissible relative humidity		90% (condensation not permitted)
Shock resistance to DIN IEC 68 Part 2 - 27		30 / 11 g/ms
Vibration resistance to DIN IEC 68 Part 2 - 6		20/10 to 150 g/Hz
Degree of protection to DIN VDE 0470 Part 1	Housing Side	Flange Side
With connector exit	IP 67	IP 65
With cable exit	IP 67	IP 65
Design performance voltage range	RS 422 Push-pull	4 to 6 VDC 10 to 30 VDC
Design performance current draw (at no load)	at 24 V at 5 V	100 mA 120 mA
Signal cable (power supply at no potential to housing, shield is at housing potential)	Diameter Min. bending radius Length	8 mm 40 mm 1.5m

* 1 - 100 pulses per revolution available on request.

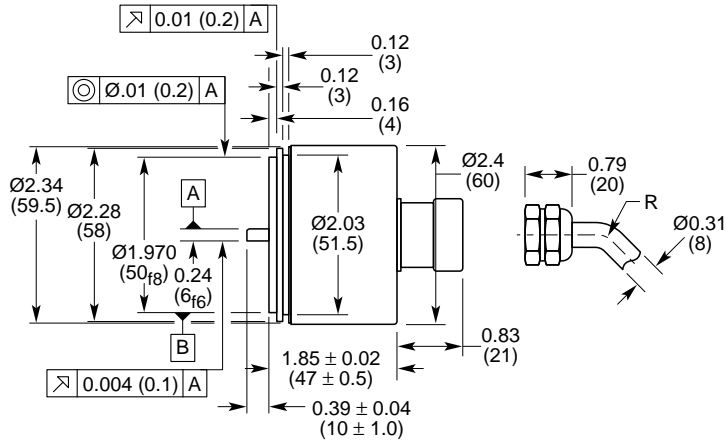
** At speeds in excess of 6,000 rpm, the shaft seal must be removed.

DG 60 L

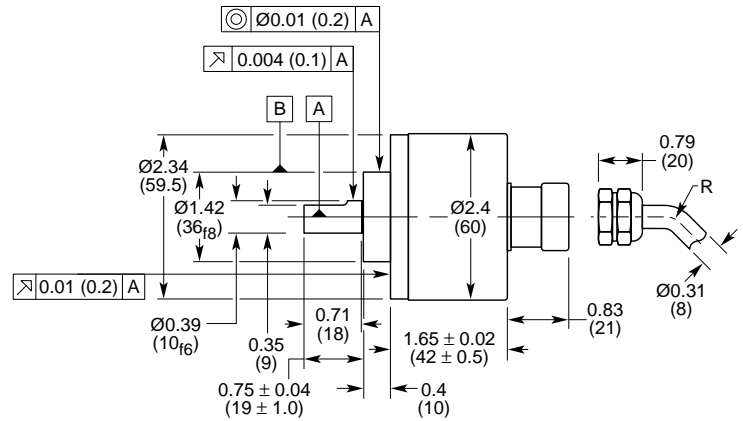


Dimensions (mm)

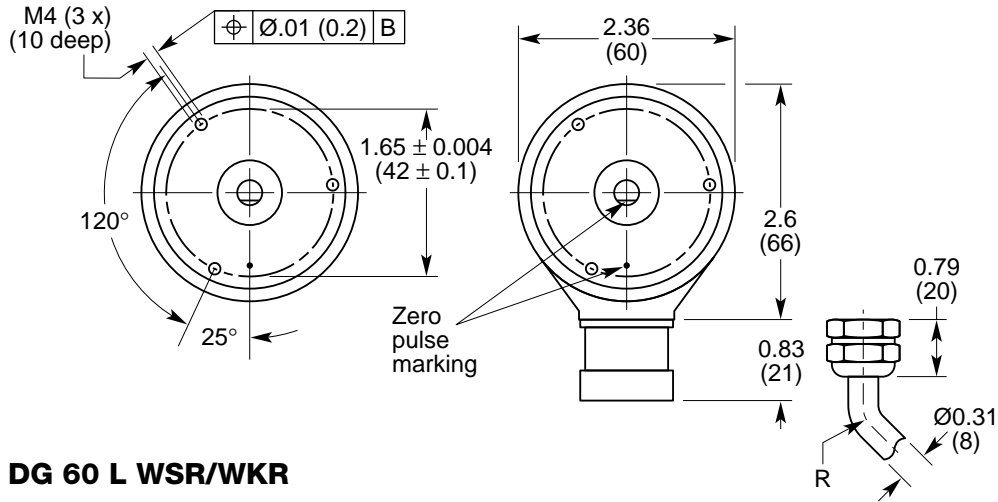
DG 60 L XSA/XKA



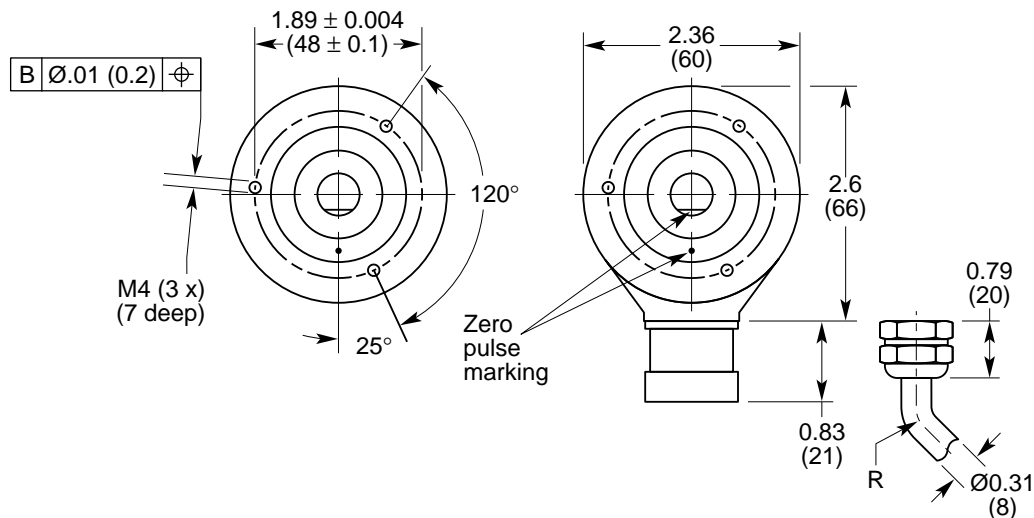
DG 60 L WSA/WKA



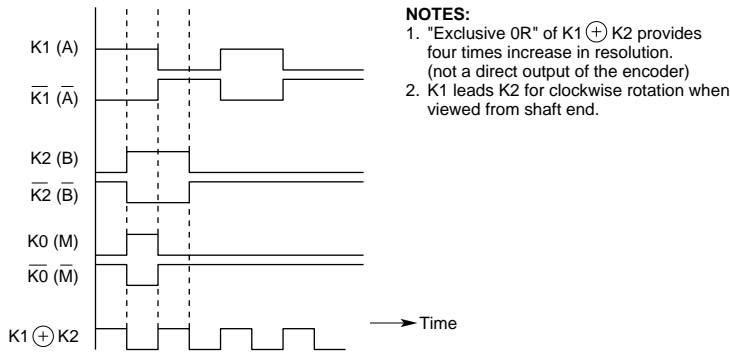
DG 60 L XSR/XKR



DG 60 L WSR/WKR



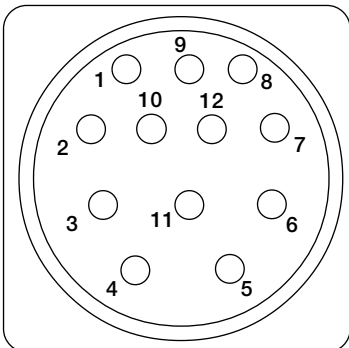
Output Wave Forms



Electrical Connections Standard Cable Length 1.5Mf

Pin	Signal 24 V	Signal 5 V	Color of Cable	Explanation
1	N.C.	$\overline{K2}$	Black	\overline{B} output
2	N.C.	Sense +	Grey	Connected internally to $U_s (+V_s)$
3	K0	K0	Lilac	M output
4	N.C.	$\overline{K0}$	Yellow	\overline{M} output
5	K1	K1	White	A output
6	N.C.	$\overline{K1}$	Brown	\overline{A} output
7	N.C.	N.C.	Orange	Not connected
8	K2	K2	Pink	B output
9	Shield	Shield		Shield
10	GND	GND	Blue	Encoder's ground connection
11	N.C.	Sense -	Green	Connected internally to ground
12	$U_s (+V_s)$	$U_s (+V_s)$	Red	Encoder power supply (+Vs)

Pin Out of Receptacle Connector on Encoder



DG 60 L

How To Order

Type	Radial Connector Exit	Axial Connector Exit	Radial Cable Exit 1.5 m	Axial Cable Exit 1.5 m
Servo flange Shaft 6 mm 5V Diff. Line Driver (RS 422)	DG 60 L-XSR-F	DG 60 L-XSA-F	DG 60 L-XKR-F	DG 60 L-XKA-F
Face mounting flange Shaft: 10mm 5V Diff. Line Driver (RS 422)	DG 60 L-WSR-F	DG 60 L-WSA-F	DG 60 L-WKR-F	DG 60 L-WKA-F
Servo flange Shaft 6 mm 10 to 30 VDC Push-Pull	DG 60 L-XSR-6	DG 60 L-XSA-6	DG 60 L-XKR-6	DG 60 L-XKA-6
Face mounting flange Shaft: 10mm 10-30 VDC Push-Pull	DG 60 L-WSR-6	DG 60 L-WSA-6	DG 60 L-WKR-6	DG 60 L-WKA-6
Servo flange Shaft 6 mm 10 to 30 VDC in; 5V Diff. Line Driver (RS 422) out	DG 60 L-XSR-G	DG 60 L-XSA-G	DG 60 L-XKR-G	DG 60 L-XKA-G
Face mounting flange Shaft: 10mm 10-30 VDC in; 5V Diff. Line Driver (RS 422) out	DG 60 L-WSR-G	DG 60 L-WSA-G	DG 60 L-WKR-G	DG 60 L-WKA-G
Servo flange Shaft 6 mm 1Vp-p Sine/Cosine	DG 60 L-XSR-K	DG 60 L-XSA-K	DG 60 L-XKR-K	DG 60 L-XKA-K
Face mounting flange Shaft: 10mm 1Vp-p Sine/Cosine	DG 60 L-WSR-K	DG 60 L-WSA-K	DG 60 L-WKR-K	DG 60 L-WKA-K



Example for ordering

To order a DG 60 L, 5V RS 422, face mounting flange, radial cable exit, shaft 10 mm, 1024 pulses per rotation = **DG 60 L-WKR-F, 1024**

Order Mating Connectors Separately

Description	Part #
12-pin round	7-400048-00