- **Contactless sensor system**
- **Compact and robust design for heavy duty engineering**
- **Up to 10680 counts per revolution**
- **More than 1500 different resolutions**
- **Output circuits for 5 VDC and 24 VDC transmission**
- **Option: Analogue output 0(4) - 20 mA, or ± 20 mA for rpm measurement**
- **Protection grade IP 65**

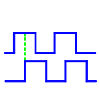
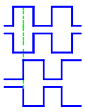
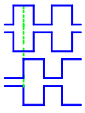
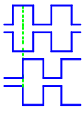
Functional discription

A toothed rotor changes the magnetic flux through two field plate resistors and generates two sinusoidal signals (sine and cosine). The integral electronics multiplies the number of signals per revolution and transforms them into square type counts. The resolution, i.e. the number of counts per revolution, can be multiplied externally by 2 or by 4 up to 42720 counts per revolution.

Mechanical construction

Mounting flange in aluminium with galvanic plating. Housing in glass-fiber reinforced plastic (FRP).Shaft in stainless steel. All joints with o-ring seals. Electrical connections either by plug and socket or by cable leads.

Output signals and electrical data

Model code ▶	**GIM 900 V**	**GIM 900 T**	**GIM 900 X**	**GIM 900 U**
Output signal shape ▶				
Counts per revolution	10 ... 10680 Number of counts can be multiplied by external electronics.			
Supply voltage U_B	10 to 35 VDC	5 VDC ± 5%	10 to 35 VDC	10 to 35 VDC
Signal level U_A	10 to 35 VDC	5 VDC [1)]	10 to 35 VDC	5 VDC [1)]
Signal current I_A (cf. to diagram page 2)	100 mA			
Maximum signal frequency	200 kHz			
Slope distance at 200 kHz	≥ 0.6 µs			
Pulse rate	1:1 ± 15 %			
Phase shift	90° ± 25°			
Consumption at $R_L = \infty$	by U_B = 10 to 35 VDC : ≤ 1.3 W by U_B = 5 VDC : ≤ 1.0 W			
Zero signal	Option **N**			
Analogue output	Options **A**, **B** or **C** (cf. page 3)			

1) RS 422 and RS 485 compatible.

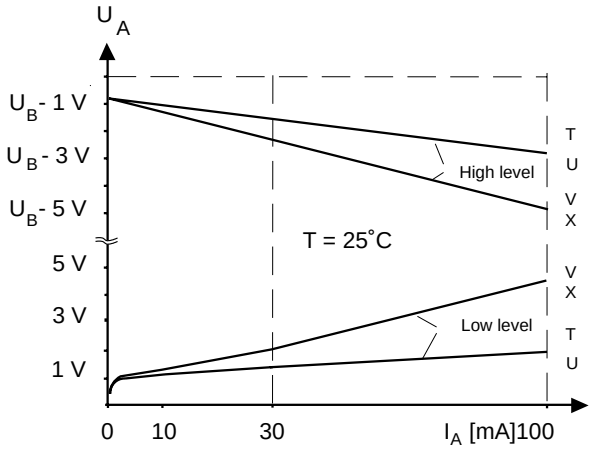
Standard number of counts per revolution

50	60	90	100	120	125	150	180
200	250	256	300	360	400	500	512
600	720	750	800	900	1000	1024	1200
1250	1500	1800	2000	2048	2500	3000	3500
3600	4000	4096	5000	6000	7000	7200	8000
8192	9000	10000					

For complete list of available resolutions please ask for data sheet GIM 10545.

Output current diagram at $I_A \leq 100$ mA

(applies to signal shape U and UN at U_A = 5V)



Mechanical data of GIM 900

- Operating speed: 10000 r.p.m. max.
- Inertia of rotor: ≤ 700 gcm²
- Operating torque: ≤ 3 Ncm
- Wind-up torque: ≤ 5 Ncm
- Permissible shaft loads
  - axial / radial: 200 N
- Bearing life expectancy*: 2 x 10^9 revolutions
- Mass : ~ 0.7 kg

* Applies to max. shaft loads. Life time increases at lower loads.

Environmental data

- Operating temperature range: - 20°C to + 80°C
- Storage temperature range: - 40°C to + 105°C
- Resistance to shock: 1000 m/s² ; 11 ms (DIN IEC 68)
- Resistance to vibration: 10 to 2000 Hz ; 100 m/s² (DIN IEC 68)
- Insulating resistance: Ri > 1 MΩ , at 500 V (DIN 57660 part 500/8.8.2)
- Protection grade: IP 65 (DIN 40 050)
- For additional protection layout: Cf. to options.

Ordering code

GIM 9 0 0 A V N 1000

- Counts per revotution
- Zero signal: optional
- Signal shape: V, T, X or U
- Analogue output *: A, B or C (cf. page 3)
- Electrical connection :
  - 1 = axial socket
  - 2 = radial socket
  - 3 = axial lead, 1m long
  - 4 = radial lead, 1m long
  - 5 = axial lead, 5m long
  - 6 = radial lead, 5m long
- Shaft diameter:
  - 1 = 12 mm 3 = 8 mm
  - 2 = 10 mm 4 = 6 mm
- GIM 900 series, 90 mm housing diameter

* Please state speed range (rpm).

Options *

- WF : Shaft with Woodruff key to DIN 6888

Additional protection against rough environmental conditions *

- SL : Humidity sealing of electronic components
- SM : Vibration sealing of electronic components
- LM : SL and SM sealings combined

* Please add code letters to ordering code as above.

Permissible lead length L_{max}

between encoder and outside electronics

(typical data applying to cable type LiYCY 6 (10) x 0.25 mm²)

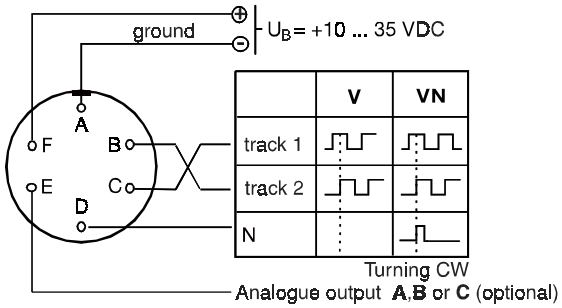
T, TN ; U, UN :	U_A= 5 VDC					
f [kHz]	5	10	20	50	100	200
L_{max} [m]	>200	>200	>200	>200	145	72

V, VN :	U_A= 20 VDC					
f [kHz]	5	10	20	50	100	200
L_{max} [m]	>200	>200	>200	80	40	20

X, XN :	U_A= 20 VDC					
f [kHz]	5	10	20	50	100	200
L_{max} [m]	>200	200	100	40	20	10

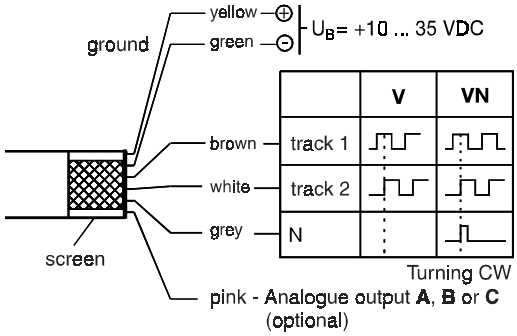
Electrical connections

GIM 901 and GIM 902 6-way male socket

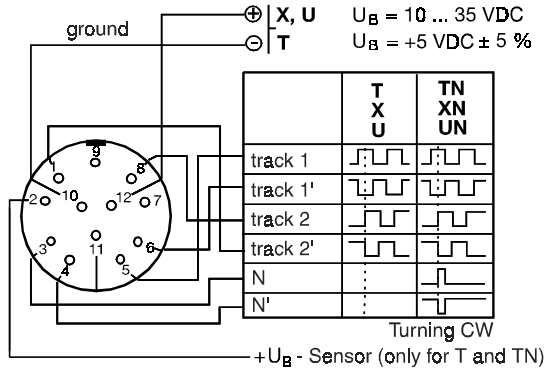


View on socket at encoder housing

GIM 903 and GIM 904 6-way cable

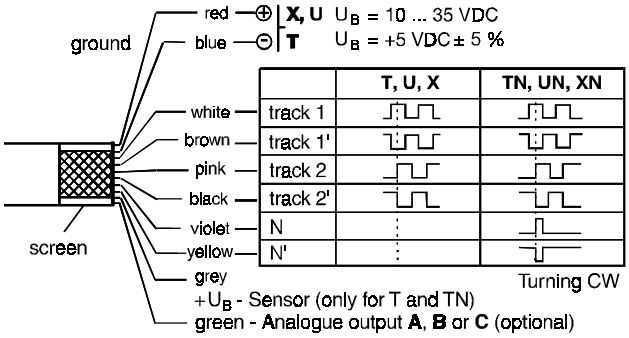


GIM 901 and GIM 902 12-way male socket



Analogue output **A**,**B** or **C** (optional) at pin No. 7
View on socket at encoder housing

GIM 903 and GIM 904 10-way cable



Analogue output for rpm measuring

The analogue output is generated by integration of the pulse frequency. The current signal is proportional to the speed. The speed range must be stated on order, e.g. 0 to 3000 rpm equal to 0 to 20 mA. Even at lower speed ranges, e.g. 0 to 0.5 rpm, there is only small distortion of the current signal.

The following diagrams show the interdependence of increasing and decreasing slopes, time lag, attenuation and pulse frequency.

Output code	**A**	**B**	**C**
Signal shape			
Output range	± 20 mA	0 ... 20 mA	4 ... 20 mA
Max. load voltage (V)	U_B - 7 V	U_B - 5 V	
Max. load resistance (Ω)	50 U_B - 350	50 U_B - 250	
Nominal current tolerance	< 1‰		
Linearity tolerance	< 1‰		
Reproducibility	100 %		
Temperature drift	< ± 3 µA/° K		
Minimum speed range (electrical) 0 ... n	$n = \frac{1{,}5 \cdot 10^3}{\text{counts per rev.}}$ rpm		
Maximum speed range (electrical) 0 ... n	$n = \frac{6 \cdot 10^6}{\text{counts per rev.}}$ rpm		

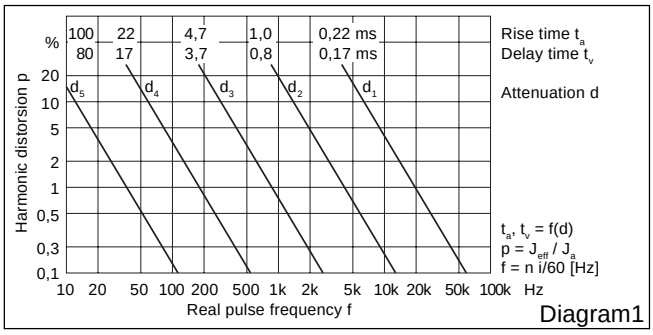


Diagram1

Diagram 1:
Harmonic distorsion of the current signal dependent on the real pulse frequency and on the attenuation as chosen by user.

Diagram 2:
Rise time t_a and delay time t_V at discontinuous changes of speed.

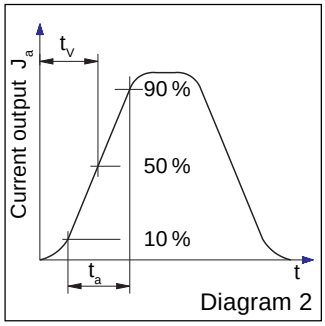
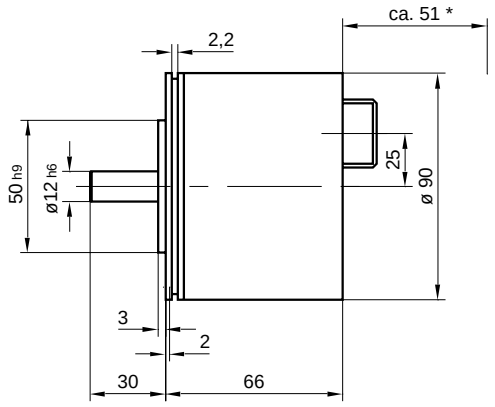


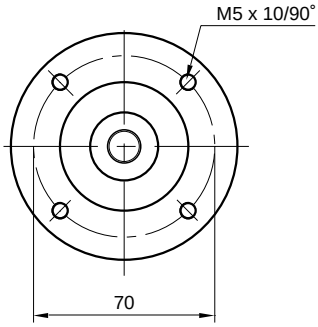
Diagram 2

Dimensions in mm

GIM 911 (Standard)

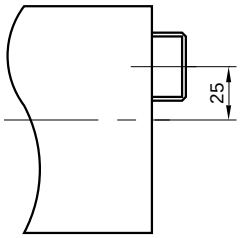


* including mating plug

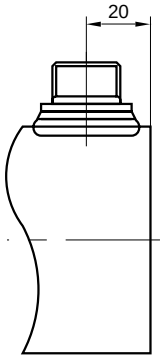


6 or 12-way male socket

GIM 901

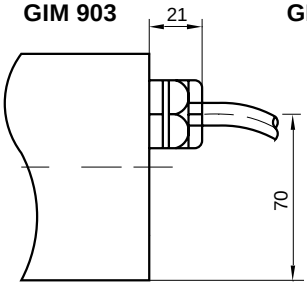


GIM 902



6 or 10-way cable

GIM 903



GIM 904