

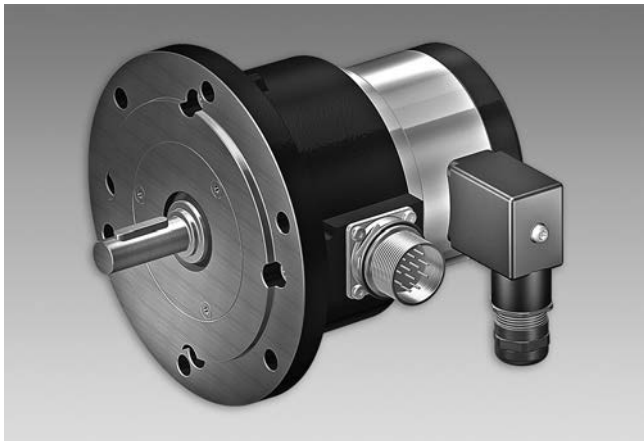
# Combination

## Encoder and tachogenerator in combination

### Solid shaft with EURO flange B10

100...5000 pulses per revolution

#### FOG 9 + GT 7



FOG 9 + GT 7

#### Technical data - electrical ratings (tachogenerator)

Reversal tolerance	≤0.1 %
Linearity tolerance	≤0.15 %
Temperature coefficient	±0.05 %/K (open-circuit)
Isolation class	B
Calibration tolerance	±5 %
Climatic test	Humid heat, constant (IEC 60068-2-3, Ca)
Performance	GT 7.08: 0.3 W (speed ≥5000 rpm) GT 7.16: 0.6 W (speed ≥5000 rpm)
Armature-circuit time-constant	<4 μs
Open-circuit voltage	10...60 mV per rpm

#### Technical data - electrical ratings (encoder)

Voltage supply	9...30 VDC; 5 VDC ±5 %
Consumption w/o load	≤100 mA
Pulses per revolution	100...5000
Phase shift	90° ±20°
Duty cycle	40...60 %
Reference signal	Zero pulse, width 90°
Output frequency	≤120 kHz ≤300 kHz (on request)
Output signals	K1, K2, K0 + inverted Error output (option EMS)
Output stages	HTL; TTL/RS422

#### Features

- Compact, robust die-cast housing
- Flange connector with metal mating connector
- EURO flange B10 / solid shaft ø11 mm
- Temperature compensation of tacho voltage as standard
- Open circuit voltage 10...60 mV per rpm

#### Optional

- Connecting cable
- Function control with EMS (Enhanced Monitoring System)

#### Technical data - mechanical design

Size (flange)	ø115 mm
Shaft type	ø11 mm solid shaft
Admitted shaft load	≤200 N axial ≤300 N radial
Flange	EURO flange B10
Protection DIN EN 60529	IP 55
Operating speed	≤10000 rpm
Operating torque typ.	6 Ncm
Rotor moment of inertia	160 gcm <sup>2</sup>
Materials	Housing: aluminium die-cast Shaft: stainless steel
Operating temperature	-30...+100 °C -25...+100 °C (>3072 pulses per revolution)
Resistance	IEC 60068-2-6 Vibration 10 g, 10-2000 Hz IEC 60068-2-27 Shock 100 g, 6 ms
Corrosion protection	IEC 60068-2-52 Salt mist for ambient conditions C4 according to ISO 12944-2
Connection	Flange connector M23, 12-pin Screw terminal connector Connecting cable (option)
Weight approx.	1.3 kg (GT 7.08), 1.6 kg (GT 7.16)
Interference immunity	EN 61000-6-2
Emitted interference	EN 61000-6-3
Approval	CE

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## Part number

FOG9       **DN**          **+ GT7**      

### Open-circuit voltage

.08L/410	10 mV per rpm
.08L/420	20 mV per rpm
.08L/430	30 mV per rpm
.16L/440	40 mV per rpm
.16L/460	60 mV per rpm

### Voltage supply / signals

- I 9...30 VDC / output stage HTL with inverted signals
- TTL 5 VDC / output stage TTL with inverted signals
- R 9...30 VDC / output stage TTL with inverted signals

Pulse number - see table

### Output signals

DN K1, K2, K0

EMS - Enhanced Monitoring System

Without EMS

.2 With EMS

## Pulse number

100	200	400	900	2048
120	250	500	1000	2500
128	256	512	1024	3072
180	300	600	1200	4096
192	360	720	1250	5000

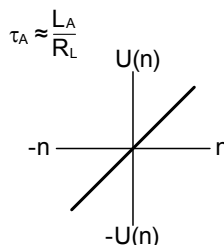
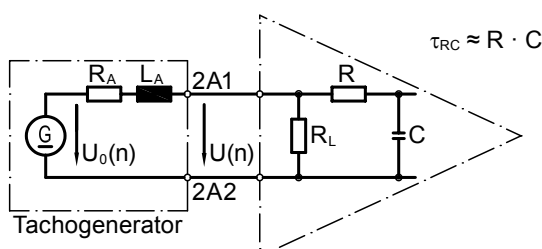
Other pulse numbers on request.

## Data according to type

Type	Off-load voltage $U_0$ [mV/rpm]	Minimum load required depending on speed range [rpm]			Maximum operating speed $n_{max}$ [rpm]	Armature resistance $R_A$ (20°C) [Ω]	Armature inductance $L_A$ [mH]
		0-3000	0-6000	0- $n_{max}$			
GT7.08L/410	10	$R_L \geq 5$	$R_L \geq 12$	$R_L \geq 27$	9000	60	20
GT7.08L/420	20	$R_L \geq 20$	$R_L \geq 48$	$R_L \geq 108$	9000	230	80
GT7.08L/430	30	$R_L \geq 45$	$R_L \geq 108$	$R_L \geq 243$	9000	550	180
GT7.16L/440	40	$R_L \geq 40$	$R_L \geq 96$	$R_L \geq 216$	9000	410	160
GT7.16L/460	60	$R_L \geq 90$	$R_L \geq 215$	$R_L \geq 223$	6100	760	360

Superimposed ripple (for  $\tau_{RC} = 0.3$  ms):  $\leq 0.6\%$  (peak-peak)  $\leq 0.25\%$  (rms)

## Replacement switching diagram



Polarity for positive rotating direction:

2A1: + (VDE)  
2A2: -

$$U(n) = U_0(n) \frac{R_L}{R_A + R_L} \approx U_0(n) \text{ for } R > R_L \gg R_A$$

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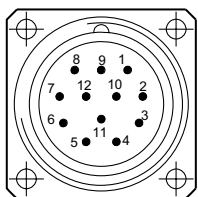
#### FOG 9 + GT 7

##### Terminal assignment

###### View A

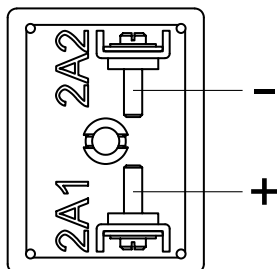
Flange connector M23 FOG 9, 12 pin, male contacts, CW

Pin	Assignment	Connecting cable assignment Cable colour
1	$\overline{K2}$ (K2 inv.)	Yellow
2	Do not use	---
3	K0 (Zero pulse)	Grey
4	$\overline{K0}$ (Zero pulse inv.)	Pink
5	K1	White
6	$\overline{K1}$ (K1 inv.)	Brown
7	Do not use (Option EMS: $\overline{Err}$ )	---
8	K2	Green
9	Do not use (Option EMS: 0 V)	---
10	0 V	Blue
11	Do not use	---
12	+UB	Red



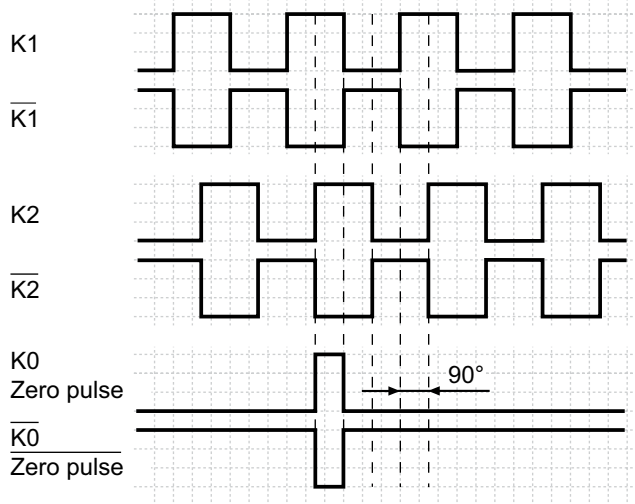
###### View A - Connecting terminal GT 7

Polarity for positive rotating direction



##### Output signals

At positive rotating direction



##### Option EMS: LED status / Error output

Flash light red*	Error of signal sequence, zero pulse or pulses (Error output = HIGH-LOW alternation)
Red	Overload output driver (Error output = LOW)
Flash light green	Device o.k., rotating (Error output = HIGH)
Green	Device o.k., stopped (Error output = HIGH)
No light	No voltage supply connection or wrong connection (Error output = LOW)

\* Only at rotating device

##### Accessories

###### Connectors and cables

HEK 8 Sensor cable for encoders

###### Mounting accessories

K 35 Spring washer coupling for solid shaft  $\varnothing 6...12$  mm

K 50 Spring washer coupling for solid shaft  $\varnothing 11...16$  mm

K 60 Spring washer coupling for solid shaft  $\varnothing 11...22$  mm

###### Diagnostic accessories

11075858 Analyzer for encoders HENQ 1100

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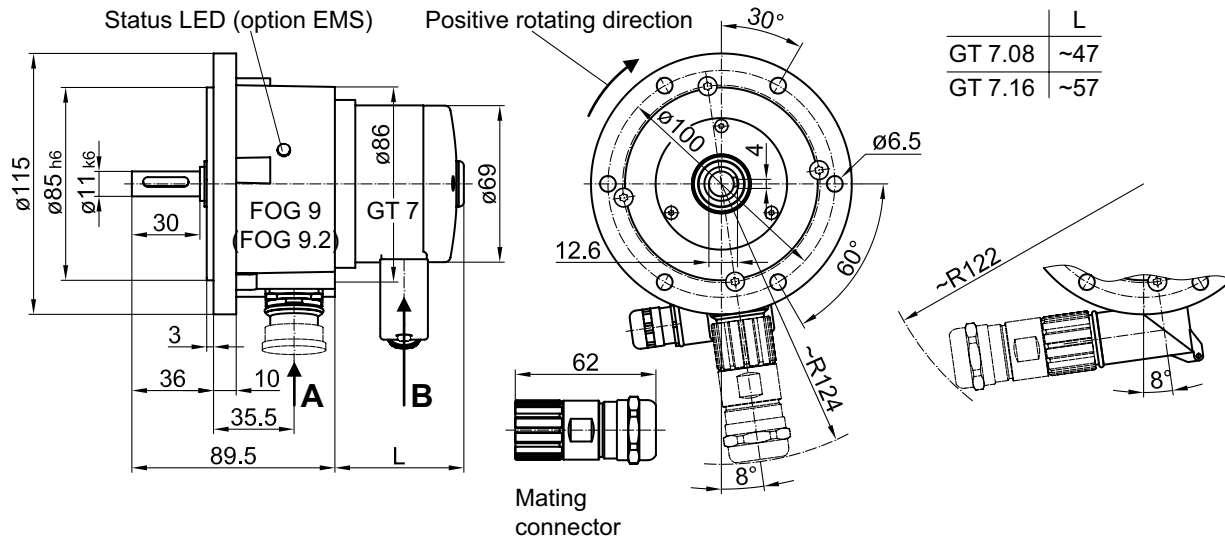
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#### Dimensions

##### Version with flange connector



##### Version with connecting cable

