



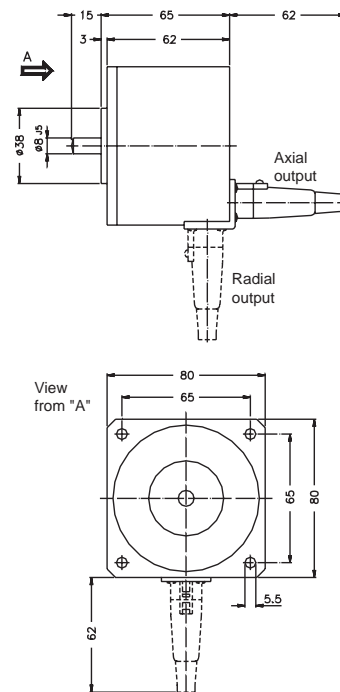
### Main features

- Monodirectional encoder with position hysteresis; outputs x1, x2, x4 (EG01)
- Monodirectional or bidirectional, with or without separate zero reference output, encoder (EG02)
- Tachometer with analogue output proportional to the speed and digital output (EG03)
- The power supply requirements and output signal levels are compatible with all the GEFran instruments.

### TECHNICAL DATA

EG01	Monodirectional with hysteresis of the position signal, outputs x1, x2, x4
EG02	Monodirectional, bidirectional, or bidirectional with zero position reference signal (EG02)
EG03	Monodirectional with an analogue output proportional to angular speed (1V/100 r.p.m. - 1V/1000 r.p.m.) depending on scale range, and a digital output which retransmits the fundamental frequency of the encoder (EG03)
Supply	5V , 8...24V (EG01-EG02) - 11...25V (EG03)
Max. consumption	30mA (free outputs)
Digital output	Supply 8...24V VH = Vcc-2V; IOH = 2mA; VL 0.8V; I max = 30mA Supply 5V VH = 2,4V; IOH = 0,7mA; VL 0.4V; FAN OUT = 8TTL
Frequency	Fmax = 50kHz. For the output with hysteresis, the x4 signal is a train of rectangular pulses with a width of 60 µsec.
Analogue output (EG03)	1V/100 r.p.m. for range: 1 to 200 r.p.m. 1V/1000 r.p.m. for ranges: 2 to 2000 r.p.m. 5 to 5000 r.p.m.
Linearity of analogue output	0,2% F.S.
Time constant	(Time to reach 63% f.s.) 350 msec.
Digital output (EG03)	Open collector. V max. 30V, I max. 30mA 240 pulses/turn for ranges: 1 to 2000 r.p.m., 2 to 2000 r.p.m. 100 pulses/turn for range 5 to 5000 r.p.m.
Light source	Infrared LED - estimated life of 10 <sup>5</sup> hours
Connections	6 pole connector with axial or radial output

### MECHANICAL DIMENSIONS AND DATA



Torque	0,5 Ncm
Maximum speed	5000 r.p.m.
Moment of inertia	50gr. cm <sup>2</sup>
Angular acceleration	2000 rad/sec <sup>2</sup>
Axial load	30N
Radial load	34N
Working temperature	0-50°C
Relative humidity	95% non condensing
Case	Anodised aluminium flange. Cover in self-extinguishing plastic
Grade of protection	IP65
Mechanical life	10 <sup>8</sup> turns
Weight	300 g

## GENERAL DATA

The output signals from channel A and B are rectangular waveforms with 50% duty cycle.

The two channels are 1/4 period out of phase or 90° electrically. The two signals enable detection of the direction of rotation, by observing the time sequence of the output pulses. In practical industrial applications, the presence of vibration can create problems with monodirectional encoders.

The method usually employed to avoid uncertainty is to design an hysteresis on the switch point level with internal logic.

This type of hysteresis could be called "analogue" since it operates on the amplitude of the output signal, and it is present on any type of optical encoder.

The EG01 not only employs "analogue" hysteresis, but uses another original type of hysteresis.

It uses the second channel to obtain the largest possible hysteresis with a logic discrimination, which is 90° electrically.

A larger width would mean loss of information, since it would be larger than the resolution of the encoder and would thus mask an output pulse.

If N is the number of pulses per turn, then the 360° mechanically is equivalent to 360 x N degrees electrically.

Thus for an encoder with an output of 250 pulses per turn, 90° electrically is equivalent to 90/250=0.36 degrees mechanically.

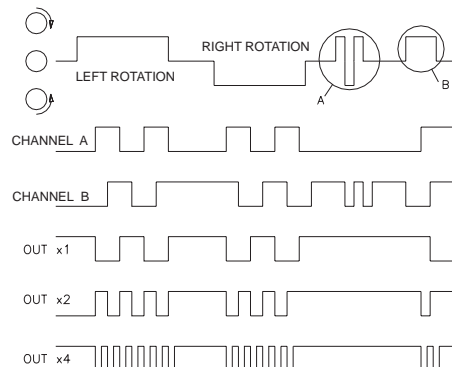
This means that no new output pulse can occur until the encoder shaft is rotated more than 0.36°.

The following diagram illustrates the behaviour in the case of vibration that is less than or greater than 90° electrically (cases A and B respectively).

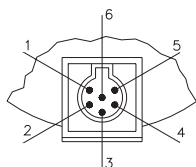
The x2 and x4 outputs of the encoder allow the resolution of the system to be correspondingly increased.

Both outputs have the property of hysteresis.

The x2 output is a logic combination of channels A and B, while the x4 output is a 60 microsecond pulse triggered by each leading and trailing edge of the pulse train obtained in the x2 output. In the latest case, to avoid overlapping of the pulses, it is not possible to exceed a frequency of 5 kHz (1.2 kHz at the input).



## ELECTRICAL CONNECTIONS



### EG 01

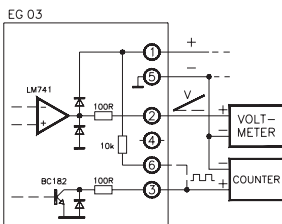
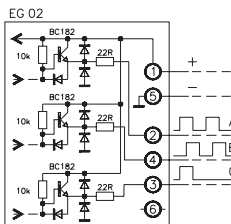
- 1+/ 5- Supply
- 2 x2 output
- 3 Not connected
- 4 x4 output (max. fre. 5 kHz)
- 6 x1 output

### EG 02

- 1+/ 5- Supply
- 2 Channel A
- 3 Zero reference signal
- 4 Channel B
- 6 Not connected
- \* The channel A is present for the monodirectional version

### EG 03

- 1+/ 5- Supply
- 2 Analog output
- 1V/1000 turns for scales 2-5
- 1V/100 turns for scale 1
- 3 Open collector output of encoder frequency
- 4 Not connected
- 6 Pull-up resistance for open collector (10kOhm connected internally to + V supply)



## OPTIONAL ACCESSORIES

	Code
Mating connector	CON 801
Flexible joint	GIU 000

## ORDER CODE

EG		
<b>MODEL</b>		
Monodirectional with position hysteresis	<b>EG01</b>	
Mono/Bidirectional zero reference output	<b>EG02</b>	
Tachometer	<b>EG03</b>	
<b>SCALE (EG03 only)</b>		
1 to 200 r.p.m.	<b>1</b>	
2 to 2000 r.p.m.	<b>2</b>	
5 to 5000 r.p.m.	<b>5</b>	
<b>SUPPLY</b>		
5Vcc (EG01/EG02)	<b>A</b>	
8-24Vcc (EG01/EG02)	<b>B</b>	
11-25Vcc (EG03)	<b>---</b>	
<b>OUTPUT (EG02 only)</b>		
Monodirectional	<b>M</b>	
Bidirectional	<b>B</b>	
<b>NR of pulses/rev (EG01/EG02 only)</b>		
60 pulses/rev	<b>60</b>	
100 pulses/rev	<b>100</b>	
200 pulses/rev	<b>200</b>	
240 pulses/rev	<b>240</b>	
250 pulses/rev	<b>250</b>	
<b>CONNECTOR</b>		
With radial outlet	<b>R</b>	
With axial outlet	<b>A</b>	
<b>ZERO REF. SIGNAL (EG02 only)</b>		
With zero indication	<b>Z</b>	
Without zero indication	<b>---</b>	

GEFRAN spa reserves the right to make any kind of design or functional modification at any moment without prior notice

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