

Rotary Measuring Technology

Absolute Multiturn Encoder with Profibus-DP interface

Multiturn ENF 90 Profibus-DP



- Field bus interface: **PROFIBUS-DP**
- Hollow shaft up to Ø 28 or shaft Ø 12 mm (ESF 90)
- Shock resistant up to 250 g
- Only 60 mm clearance needed
- Patented integrative technology ®
- Very easy mounting of the hollow shaft version. The encoder is mounted directly on the drive shaft without coupling. This saves up to 30 % cost and 50 % clearance compared to shaft versions.
- Divisions: up to 8192 (13 bits) per revolution, 4096 (12 bits) revolutions
- Contactless multiturn gear with new Intelligent-Sensing-Technology (IST)
- Simply connection patent pending connecting system with removable socket box
- Integrated T-coupler
- Protection: IP 65
- available as explosion proof zone 2 and 22

Mechanical characteristics:

Speed: ¹⁾	max. 6000 min ⁻¹
Rotor moment of inertia:	approx. 72 x 10 ⁻⁶ kgm ²
Starting torque hollow shaft version:	< 0.2 Nm
Starting torque shaft version:	< 0.05 Nm
Radial load capacity of shaft: ²⁾	radial: 80 N, axial 40 N
Weight:	approx. 0.9 kg
Protection acc. to EN 60 529:	IP 65
Working temperature:	-10° C ... +70 °C ³⁾
Operating temperature:	-10° C ... +80 °C ³⁾
Shaft:	stainless steel, hollow shaft H7
Shock resistance acc. to DIN-IEC 68-2-27	2500 m/s ² , 6 ms
Vibration resistance acc. to DIN-IEC 68-2-6:	100 m/s ² , 10 ... 2000 Hz

¹⁾ For continuous operation 3000 min⁻¹

²⁾ Shaft version only (at shaft end)

³⁾ Non-condensing



Specification to
Profibus-DP 2.0 standard
(DIN 19245 Part 3)

Electrical characteristics:

Supply voltage (U _B):	10 ... 30 V DC
Current consumption type:	max. 0.29 A
recommended fuse	T 0,315 A
Linearity	±1/2 LSB (± 1 LSB at 13, 14, 25 bit resolution)
Code	Binary
Interface	RS 485
Protocol	Profibus-DP, encoder profile class 2
Rate	max. 12 Mbit/s
Address	adjustable with DIP-switches
Conforms to CE requirements acc. to EN 61000-6-1, EN 61000-6-4 and EN 61000-6-3	
Performance against magnetic influence acc. to EN61000-4, 5	

Profibus Encoder-Profile:

The basic functions of the PROFIBUS DP are only described in extracts in here. For additional information, please refer to the standards on PROFIBUS DP, i.e. DIN 19245-3 and EN 50170 respectively or see page 35-

The following parameters can be programmed:

- Direction of rotation
- Scaling factor
 - number of pulse/rotation
 - total resolution
- Preset value
- Diagnostics mode

The following functionality is integrated:

- Galvanic insulation of the Fieldbus stage with DC/DC converter
- Line driver according to RS 485 max. 12 MB
- Addressing by means of rotary switches
- Diagnostics LED
- Full Class 1 and Class2 functionality

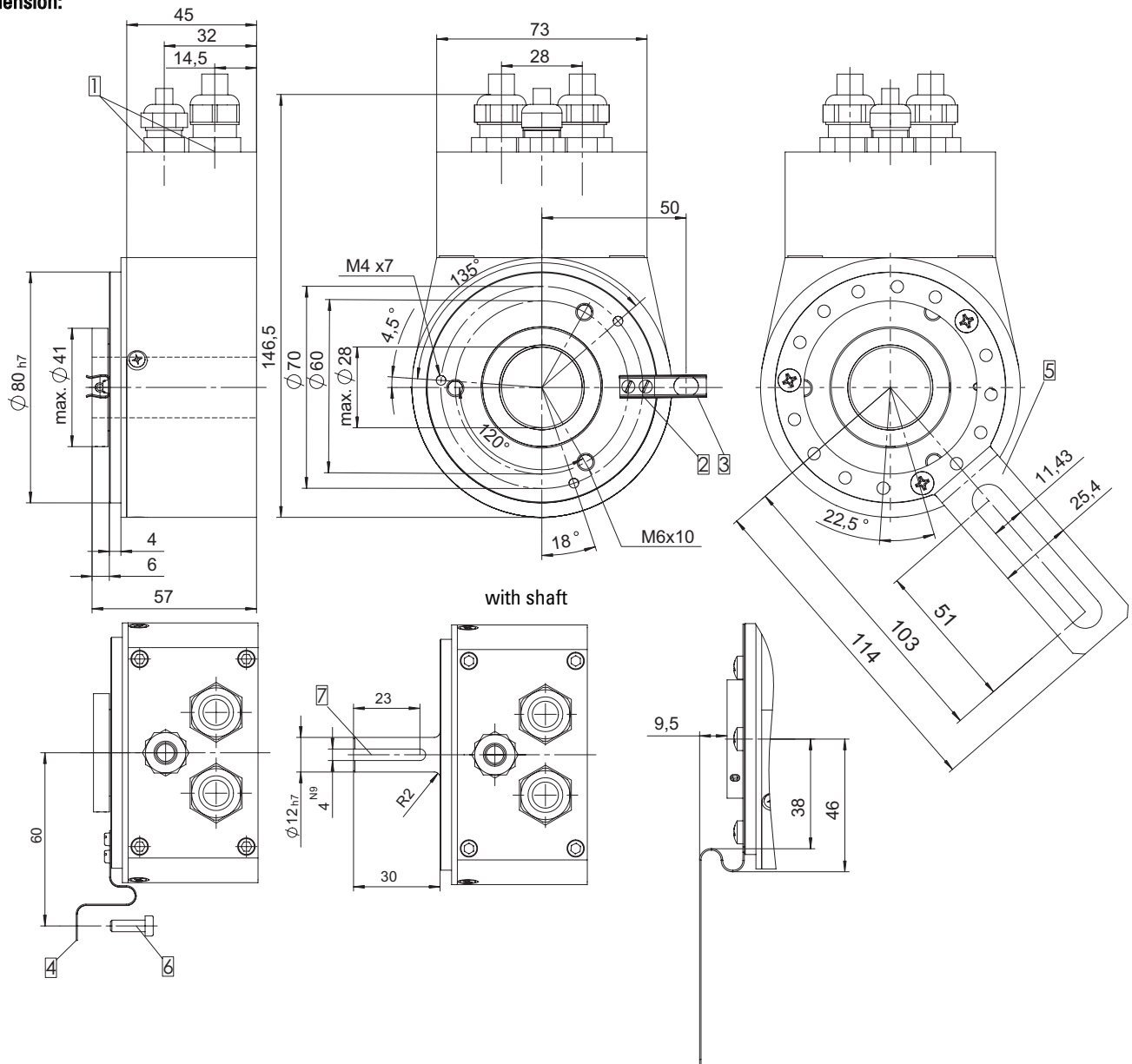
Rotary Measuring Technology

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Signal :	ENC.		BUS IN			BUS OUT			ENC.		Shield 1)	
	+V DC	GND	GND	B	A	A	B	GND	GND	+V DC		
Pin:	1	2	3	4	5	6	7	8	9	10	11	12

Dimension:



Mounting advice:

The brackets and shafts of the encoder and drive should not both be rigidly coupled together at the same time!

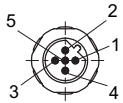
- 1 Socket box
- 2 Spring device for pin acc. to DIN 6325 Ø6
- 3 Spring device short (Bracket No. 2)
- 4 Spring device long (Bracket No. 3)
- 5 Slotted hole for screw M4
- 6 Mounting bracket (Bracket No. 4)
- 7 2,5 mm deep

Rotary Measuring Technology

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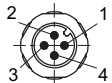
Multiturn ENF 90 Profibus-DP

Terminal assignment M12 Connector version:



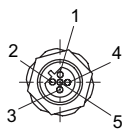
Bus in:

Signal :	-	BUS-A	-	BUS-B	-
Pin:	1	2	3	4	5



Power supply:

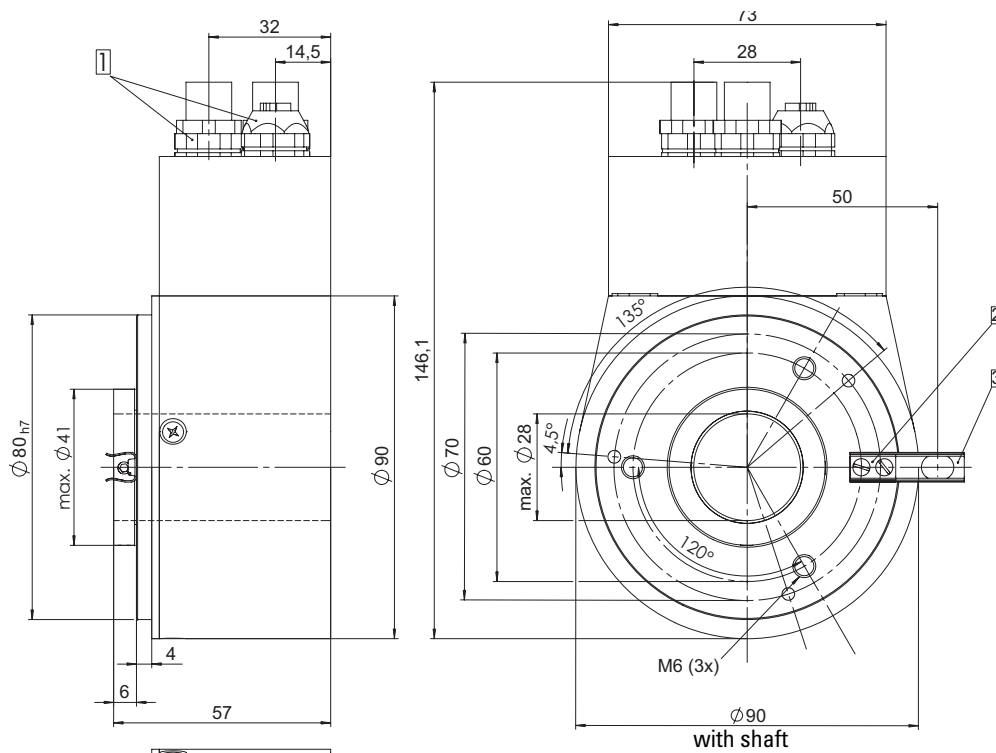
Signal :	U _B	-	0 V	-
Pin:	1	2	3	4



Bus out:

Signal :	BUS_VDC	BUS-A	BUS_GND	BUS-B	Shield
Pin:	1	2	3	4	5

Dimension (M12 connector version):



- 1 M12 connector
- 2 Spring device short (Bracket No. 2) for pin acc. to DIN 6325 ø 6
- 3 Spring device long (Bracket No. 3) for pin acc. to DIN 6325 ø 6
- 4 Slotted hole for screw M4
- 5 Mounting bracket (Bracket No. 4)
- 6 2,5 mm deep

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Multiturn Profibus-DP

Integrative Technology®

Compact construction, higher resistance to shock and EMI together with greater reliability due to:

- Integration of all components on just one PCB board instead of a sandwich structure
- Innovative assembly techniques
- Use of self-balancing Opto ASICs instead of potentiometers

Intelligent-Sensing-Technology (I-S-T)

An innovative principle of operation based on a non-contact electronic multiturn stage overcomes system disadvantages previously associated with encoders that had mechanical gears or with traditional electronic gear technology.

Advantages:

- High operational reliability
- Logic filter and innovative principle of operation compensate for high EMC interference
- Free from wear

Order code:

ENF 90.XXXX.XXXX

Range

Bracket
 1 = without mounting aid
 2 = with short spring device
3 = with long spring device
 4 = with mounting bracket

Shaft/hollow shaft
 1 = hollow shaft Ø 12 mm
 2 = hollow shaft Ø 15 mm
3 = hollow shaft Ø 20 mm
 4 = hollow shaft Ø 24 mm
5 = hollow shaft Ø 28 mm
 6 = hollow shaft Ø 5/8"
 7 = hollow shaft Ø 1"
 9 = hollow shaft Ø 16 mm
 C = hollow shaft Ø 25 mm

Interface and supply voltage
3 = Profibus-DP 10 ... 30 V DC

Profibus DP
 3001 = Profibus Class 2

Type of connection
 1 = socket box with PG7 screwed connections and integrated T-coupler
 2 = M12-Connector

Delivery includes:

GSD-file and documentation on CD
 Use Couplings for the connection BUS-IN and Connectors for the connection BUS-OUT.
 Compatible self-assembly connectors:
 Connector (BUS-OUT): 05.B8251-0/9
 Coupling (BUS-IN): 05.B8151-0/9
 See also Connection Technology section for cable assemblies.