

PRESENTATION

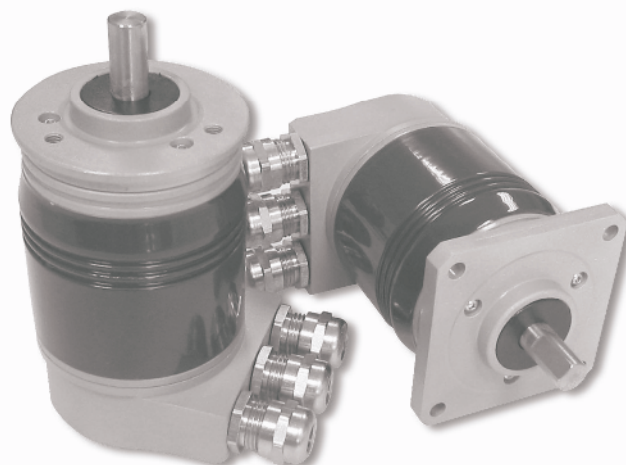
The Eltra singleturn Profibus encoder series (Identification Number 0x0599) is complying to the Profibus DP standard as described on the European Standard EN 50170 Volume 2. Particularly, Eltra Profibus encoders are according to "PROFIBUS-Profile for Encoders, Order No. 3.062". The Profibus DP interface maintains the same maximum resolution and characteristics (8192 ppr) of the stand-alone version and adds the plus of the Profibus DP network.

By the Profibus DP network is possible:

- During the periodic data exchange, getting the indication of the angular position from the encoder.
- During the set up, setting the resolution as number positions within the single turn.
- During the set up, changing the default increase direction count.
- To perform the PRESET operation (set the encoder to read a specific position).
- Reading the diagnostic operating mode.
- Getting info about the code supplied by the device.

Directly from the device it is possible:

- To display the ON/OFF status.
- To display the device activity on the bus.
- Setting the device address.
- If requested, inserting in the bus the termination resistance.
- Inverting the counting direction.



HARDWARE INSTALLATION DEVICE

Installing the Eltra Profibus encoder in a network requires the execution of the standard steps necessary for configuring any Profibus DP slave. The sequence of steps is as follow:

1. Commissioning the slave on the master (see corresponding paragraph).
2. Wiring the encoder into the Profibus network using or not terminations depending on the physical position the devices has in the bus.
3. Directly set the address (which must be unique in the network and the same as the one chosen in point 1) for the slave.
4. Preparing the master side application/s and setting up the Profibus network.

On the back cover of the encoder (see picture) there is a led inspection window.

The device operating status can be controlled by the two led through the window. The green one shows the power presence and must be permanently switched on. The red led switches off only during the periodic data exchange between the Profibus master and the encoder.

In the section plan along side the 2 dip-switches of termination line and the 8 dip switches of device address are shown. In the particular shown configuration, the 2 termination line contacts are set to OFF so the termination of the bus is not expected to occur on the encoder.

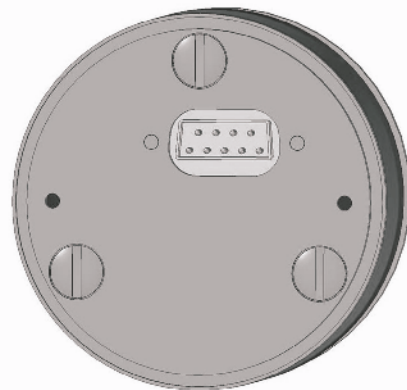
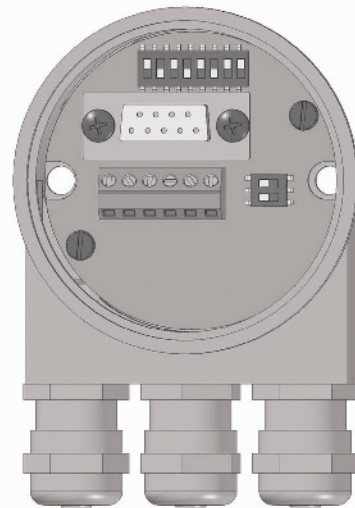
Only seven out of the eight available dip-switches are used to address the slave because the maximum number of devices that can be connected to a Profibus network is 126. For addressing the device, only the first seven dip switches out of the eight available are used.

The contact number 8 is the LSB while the number 2 is the MSB.

The eight contact (1) is used to invert the code.

CONNECTION TO THE NETWORK

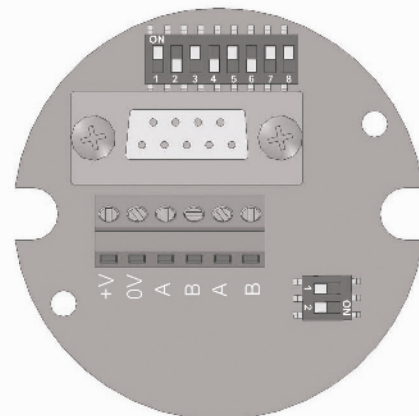
For connecting Profibus encoders to the network, cables within the device can be accessed by the three skintop (in any event only two of them can be used).



TERMINAL BLOCK ACCESS

To access the terminal block, unscrew the two screws on the rear plug and release the rear case from the main one by sliding it out from the sunken connector. Then, connect wires according to the diagram on the connector and as reported on the table on the right.

Please NOTE:
to set and configure the slave into the Profibus DP master ('commissioning' step) it is necessary to use the "Exx_0599.gsd" file delivered with the encoder. This file can eventually be downloaded from our following web site: www.eltra.it.

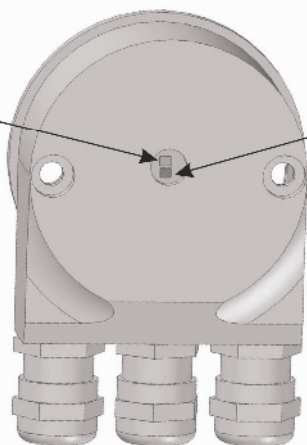


Cable connections

+V	SUPPLY VOLTAGE
0V	GROUND
A	PROFIBUS DP LINE OUT (Green)
B	PROFIBUS DP LINE OUT (Red)
A	PROFIBUS DP LINE IN (Green)
B	PROFIBUS DP LINE IN (Red)

LED

Input voltage LED, NORMALLY TURN ON



Active on network LED, NORMALLY TURN OFF

NETWORK SPECIFICATIONS

Usually, an A type cable is used to wire a DP/FMS network. This cable has to have the following characteristics:

Parameter	Cable type A
Characteristics in Ω	135 ... 165 at a frequency of (3 ... 20 Mhz)
Operating capacity (pF/m)	< 30
Loop resistance (Ω /km)	< = 110
Core diameter (mm)	> 0.64*
Core cross-section (mm ²)	> 0.34*

This cable allows an optimum network utilization. In fact, it is possible to reach the maximum communication speed allowed (12MBaud). However, there are some limitations due to the maximum physical dimensions of a bus segment as follows:

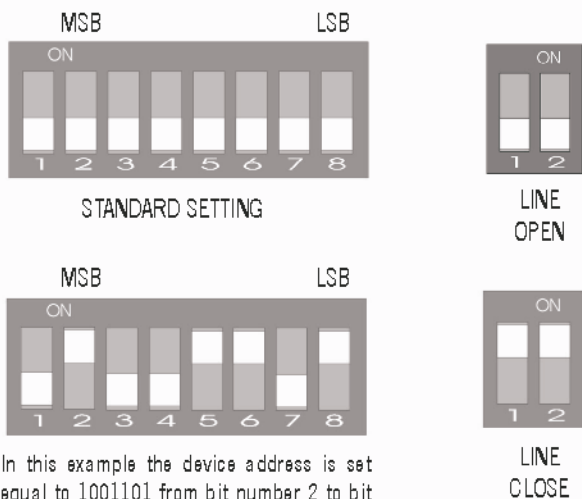
Baud rate (kbit/s)	Range/Segment
9.6	1200 m
19.2	1200 m
93.75	1200 m
187.5	1000 m
500	400 m
1500	200 m
12000	100 m

Finally, main physical and topographical specifications of a Profibus network are as follows:

Specifications	
Maximum number of station participating in the exchange of user data	DP: 126 (address from 0 ... 125) FMS: 127 (address from 0 ... 126)
Maximum number of stations per segment including repeaters	32
Available data transfer rates in kbit/s	9.6, 19.2, 45.45, 93.75, 187.5, 500, 1500, 3000, 6000, 12000
Max number of segments in series	According to EN 50170, a maximum of 4 repeaters are allowed between any two stations. Dependent on the repeater type and manufacturer, more than 4 repeaters are allowed in some cases. Refer to the manufacturer's technical specification for details.

DIP-SWITCHES SETTING

Below it is reported an example of the standard position of address and termination dip switches as well as settings for closing a Profibus line.



In this example the device address is set equal to 1001101 from bit number 2 to bit number 8 corresponding to HEX 77. Meanwhile, the first bit represents the inversion of the code (activated in this case).

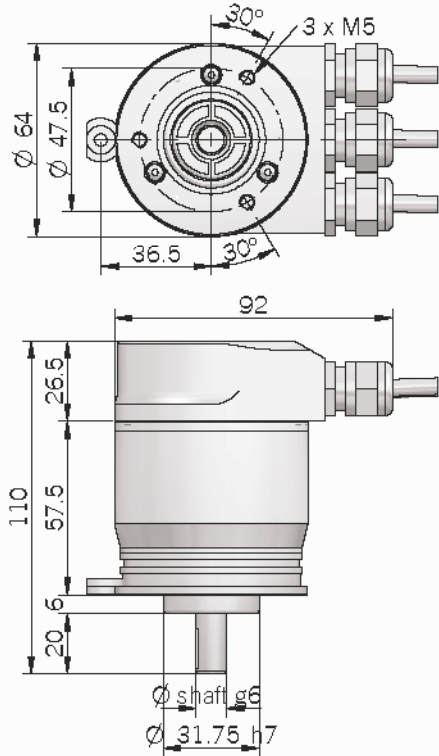
Output connections for PROFIBUS® DP encoder			
Function	S3 connector 5-pin (power supply)	S3 connector 5-pin (line out)	S3 connector 5-pin (line in)
+ Vdc	2		
0 Volt	4		
signal A (out)		2	
signal B (out)		4	
signal A (in)			2
signal B (in)			4

PROFIBUS ENCODER ORDERING CODE

EA	63	A	4096 B	12/28 F	X	X	10	X	3	P3	R	. XXX
SERIES											VARIANT	
absolute encoder singleturn EA											XXX custom version	
SIZE											OUTPUT DIRECTION	
mm 58											R radial	
mm 63											OUTPUT TYPE	
mm 90											P3 cable glands	
mm 115											S3 M12 connectors	
TYPE											MAX ROTATION SPEED	
synchronous flange ø 31.75 mm (EA63) A											3 3000 rpm with IP 66	
synchronous flange ø 40 mm (EA90) A											6 6000 rpm	
REO444 flange (EA115) A											ENCLOSURE RATING	
synchronous flange ø 50 mm (EA58) B											X IP 54	
fixing flange ø 36 mm (EA58) C											S optional IP 66 with the exception of EA63F/G - EA115	
centering square flange ø 31.75 mm (EA63) D											SHAFT DIAMETER	
centering square flange ø 50 mm (EA63) E											6 mm - 58B	
blind hollow shaft with spring (EA58 / 63) F											8 mm - 58B - 63A/D/E - 90A	
blind hollow shaft with anti-rotation pin (EA63) G											9 mm (9.52 mm 3/8") - 63A/D/E - 90A	
RESOLUTION											10 mm - 58B/C - 63A/D/E - 90A - 115A	
4096 / 8192											11 mm - 115A	
<i>N.B.: programmable 2 ... 4096 / 2 ... 8192</i>											BORE DIAMETER ONLY FOR MOD. 58F - 63F/G	
<i>during commissioning</i>											8 mm	
CODE TYPE											9 mm (9.52 mm 3/8")	
Binary B											10 mm	
POWER SUPPLY											12 mm	
12 ... 28 V DC 12/28											14 mm	
ELECTRONIC INTERFACE											15 mm	
PROFIBUS DP V0 CLASS 2 F												
LOGIC												
to be reported if not used X												
OPTIONS												
to be reported if not used X												

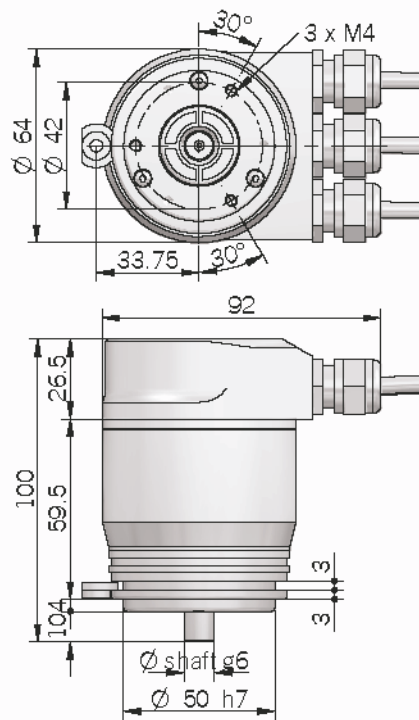
EA 63 A

* servofasteners not included

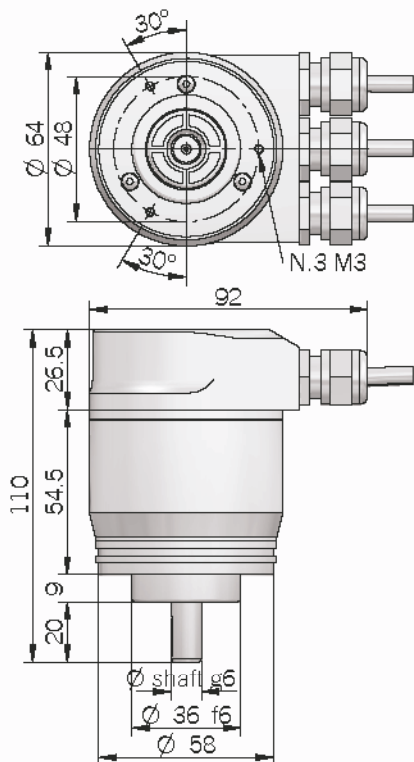


EA 58 B

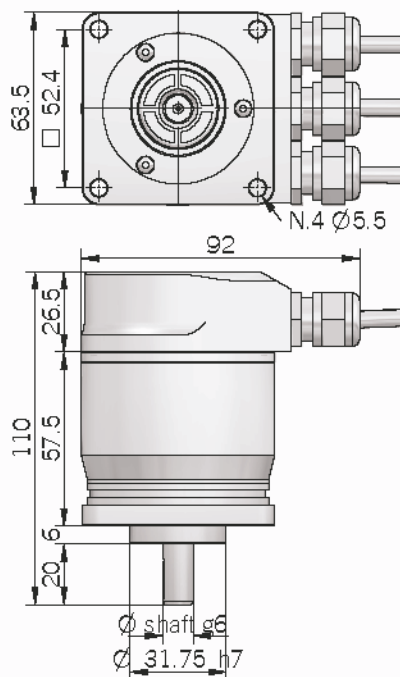
* servofasteners not included



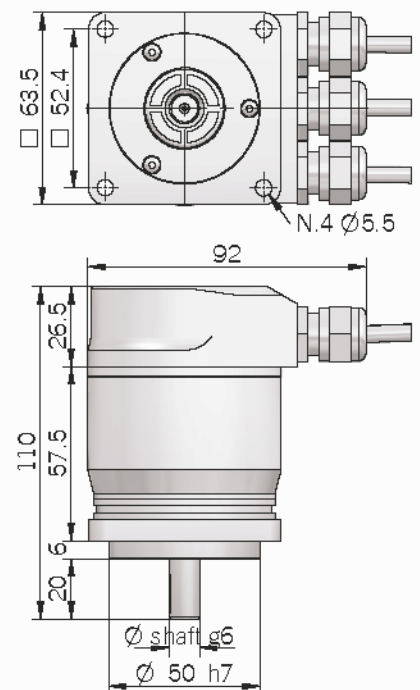
EA 58 C



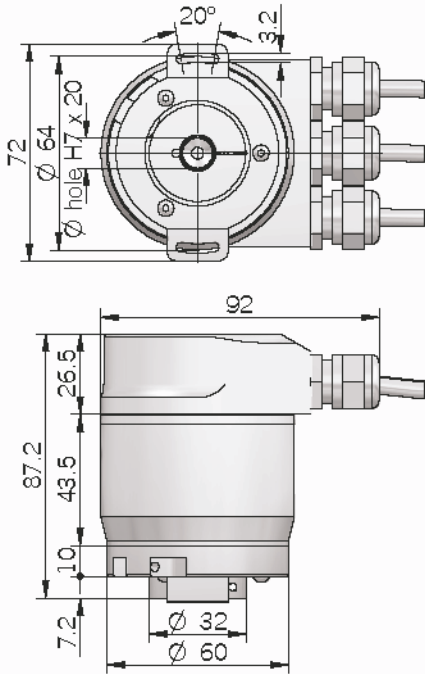
EA 63 D



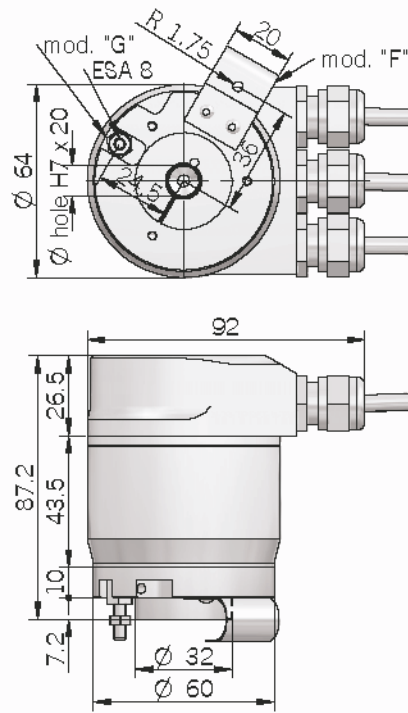
EA 63 E



EA 58 F

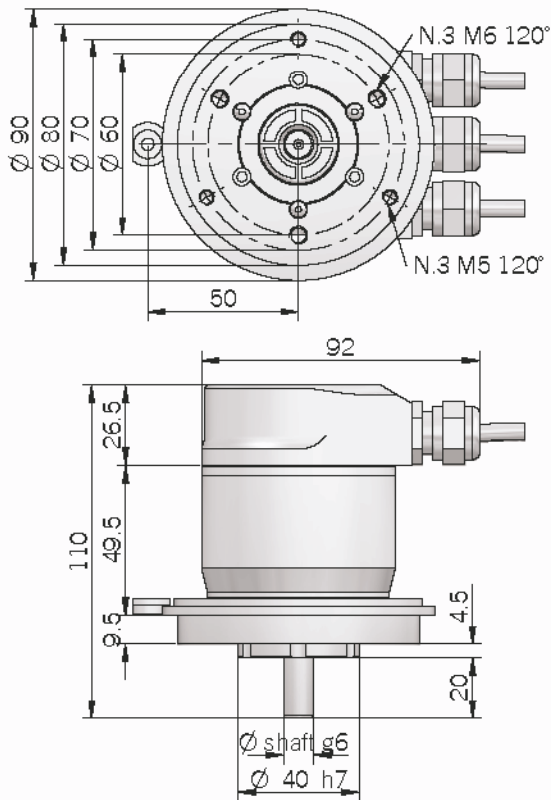


EA 63 F / G

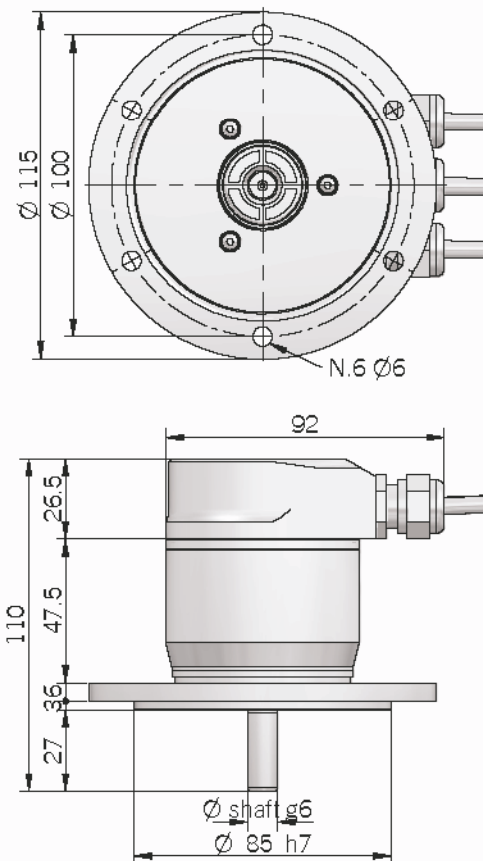


EA 90 A

* servofasteners not included



EA 115 A



Electrical specifications

Resolution	2 ... 4096 / 2 ... 8192 <i>programmable during commissioning</i>
Power supply	12 ... 28 VDC \pm 5%
Current consumption without load	300 mA
Electronic interface	RS 485 galvanically isolated
Max bus frequency	12 Mbaud
Diagnostic features	frequency warning position warning / alarm <i>please refer to installation guide for more informations</i>
Response frequency	25 kHz
Accuracy	\pm 1/2 LSB
Counting direction	programmable during commissioning
Start-up time	500 ms
Electromagnetic compatibility	IEC 61000-6-2 IEC 61000-6-4

Mechanical specifications

Shaft diameter (mm)	6 (58B) 8 (58B - 63A/D/E - 90A) 9.52 (3/8") (63A/D/E - 90A) 10 (58B - 63A/D/E - 90A - 115A) 11 (115A) mm
Bore diameter (only for mod.58F - 63F/G)	8 / 9 (3/8") / 10 / 12 / 14 / 15 mm
Enclosure rating	IP 54 (IEC 60529) IP 66 (IEC 60529) optional for -58B/C -63A/D/E -90A
Max rotation speed	6000 rpm continuous 3000 rpm continuous for 58F - 63G 3000 rpm with IP66
Max shaft load	10 N (1 Kp) axial with ϕ 6 shaft 20 N (2 Kp) radial with ϕ 6 shaft 100 N (10 Kp) axial 100 N (10 Kp) radial
Shock	50 G, 11 ms (IEC 60068-2-27)
Vibrations	10 G, 10 ... 2000 Hz (IEC 60068-2-8)
Bearings life	10 ⁹ revolutions
Bearings	n° 2 ball bearings
Shaft material	1.4305 / AISI 303 stainless steel
Body / Cover material	EN-AW 2011 aluminum
Housing material	pa inted aluminium
Flange material	EN-AW 2011 aluminum
Operating temperature	0° ... +60°C
Storage temperature	-15° ... +70°C
Weight	350 g - 58B/C - 63A/D/E/G 750 g - 90A - 115A
Accessories	set N° 3 fastners for models -63A -58B -90A Ord. Cod.: 94080001 