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ABSOLUTE ROTARY ENCODER
SINGLE-TURN BIT PARALLEL

Main Features

- Compact and Heavy-Duty Industrial Model
- Interface: Bit-parallel, Push Pull
  Short Circuit Proof
- Housing: 58 mm ∅
- Shaft: 6 or 10 mm ∅, Hub- 15 mm ∅
- Resolution: max. 16 Bit = 65,536 Steps per Revolution
- Code: Gray / Binary
- EMC: EN61000-6-2, EN61000-6-4, CE
- UL Listed

Applications

Sensing of

- Angles
- Distances
- Tracks
- Inclinations
- Differences Between Two or More Axes

Mechanical Structure

- Aluminum Flange and Housing
- Stainless Steel Shaft
- Sealed Precision Ball Bearings
- Unbreakable and Durable Polycarbonate Code Disc

Electrical Features

- Temperature Insensitive IR-Opto-ASIC with Integrated Signal Conditioning
- Monitored Integrated IR-Illumination
- Reliable SMD and FPGA Technology
- Polarity Inversion Protection
- Over-Voltage-Peak Protection

FRABA Inc.
1800 East State Street, Suite 148, Hamilton, NJ 08609, USA
Tel. +1 609 750 8705, Fax. +1 609 750 8703
www.posital.com, info@posital.com

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Technical Data

Electrical Data

Outputs	Bit-Parallel, Push Pull
Output Level “High”	~ Supply Voltage (Load Dependent)
Output Current	max. 20 mA Each Channel
Internal Cycle Time	< 3 µs
Step Frequency LSB	Max. 200 kHz
Turn on Time	< 1 s
Accuracy of Division	± ½ LSB (12 Bit), ± 2 LSB (16 Bit)
EMC	Emitted Interference: EN 61000-6-4, Noise Immunity: EN 61000-6-2
Supply Voltage	10-30 V DC (Absolute Limits) *
Current Consumption	max. 230 mA (10 V DC), max. 100 mA (24 V DC)
Electrical Lifetime	> 10^5 h
Connection	Connector or Cable Exit 1m (~3ft)

* Supply Voltage According to EN 50 178 (Safety Extra-Low Voltage)

Mechanical Data

Housing	Aluminum, Optional Stainless Steel			
Max. Shaft Load	Axial 40 N, Radial 110 N (9 lbs / 25 lbs)			
Moment of Inertia of Rotor	≤ 30 gcm^2 (0.16 oz-in^2)			
Friction Torque	≤ 3 Ncm (4.2 oz-in) (without Shaft Sealing)			
RPM (Continuously Operation)	max. 12,000			
Shock (EN 60068-2-27)	≤ 100 g (Half Sine, 6 ms)			
Permanent Shock (EN 60028-2-29)	≤ 10 g (Half Sine, 16 ms)			
Vibration (EN 60068-2-6)	≤ 10 g (10 Hz ... 2,000 Hz)			
Weight, Single-Turn	~200 g, ~0.4 lbs; ~400 g (~0.9 lbs) stainless steel			
Flange	**Synchro (S)**		**Clamp (C)**	**Hub shaft (B)**
Shaft Diameter	6 mm (~0.236 in)	10 mm (~0.394 in)	10 mm (~0.394 in)	15 mm (~0.591 in)
Shaft Length	10 mm (~0.394 in)	20mm (~0.787 in)	20 mm (~0.787 in)	*

* Mating Shaft: min: 15 mm (~0.591 in) / max: 30 mm (~1.181 in)

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Minimal (Mechanical) Lifetime

Flange	Lifetime in 10^8 Turns on F_a / F_r		
	40 N / 60 N 9 lbs / 13 lbs	40 N / 80 N 9 lbs / 18 lbs	40 N / 110 N 9 lbs / 25 lbs
C10 (Clamp Flange 10 x 20)	240	100	40
S10 (Synchro Flange 10 x 20)	210	90	30
S6 (Synchro Flange 6 x 10) without Shaft Sealing*	710	300	110

* S6 (Synchro Flange 6 x 10) with Shaft Sealing: max. 20 N Axial, 80 N Radial (5 lbs / 18 lbs)

Environmental Conditions

Operating Temperature	- 40 ... + 85 °C (- 40 ... + 185 °F)*
Storage Temperature	- 40 ... + 85 °C (- 40 ... + 185 °F)*
Humidity	98 % (No Condensation)
Protection Class (EN 60529)	Casing Side: IP 65
	Shaft Side: IP 64 (Optional with Shaft Sealing: IP66)

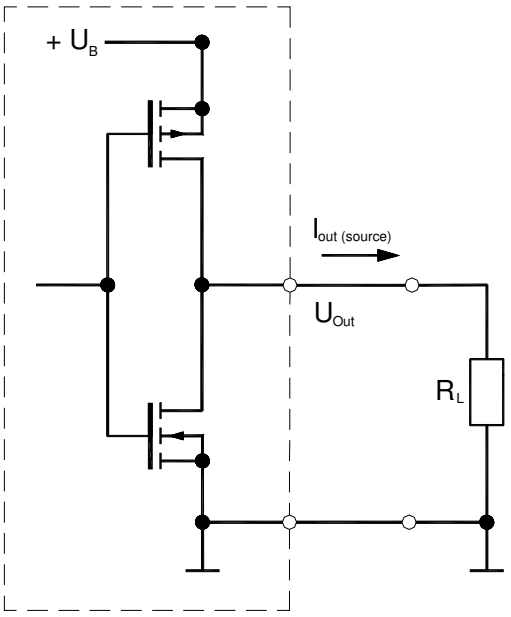
* Cable Exit: - 30 … + 70 °C (- 22 … + 158 °F) (Stationary), - 5 … + 70 °C (23 … 158 °F) (Flexing)

Interface

Push Pull

Transmission	Data Transmission via Two Transistors in Push-Pull Circuit
Transfer	Transfer Distance up to 50 m (164 ft)
Shielded lines	Shielded Lines are Essential to Attain Extremely High Noise Immunity
Connectable	Connectable to All Usual PLC Concepts with Digital I/Os
Optional	Binary Code Transmission with Integrated Latch Function

Output Circuit



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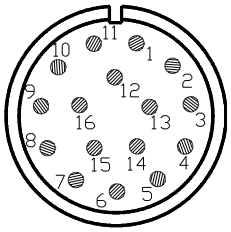
Electrical Interface

Signals	Cable Color	Round connector Pin
Bit 1	White	1
Bit 2	Brown	2
Bit 3	Green	3
Bit 4	Yellow	4
Bit 5	Grey	5
Bit 6	Pink	6
Bit 7	Blue	7
Bit 8	Red	8
Bit 9	Black	9
Bit 10	Violet	10
Bit 11	Grey-Pink	11

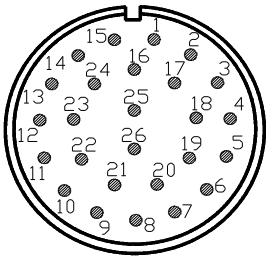
Signals	Cable Color	16 / 16 / 26* pol. Connector
Bit 12	Blue-Red	12
Bit 13	White-Green	- / 13 / 13
Bit 14	Brown-Green	- / - / 14
Bit 15	White-Yellow	- / - / 15
Bit 16	Yellow-Brown	- / - / 16
Preset (Optional)	Pink-Brown	14** / - / 22
Latch ***	Brown-Blue	14 / - / 23
Complement	White-Blue	13 / 14 / 24
$+U_b$ = 10-30 V	White-Red	15 / 15 / 25
GND	Brown-Red	16 / 16 / 26

* > 13 Bit ** only for Graycode, ***(only for binary or 26 Pol. Connector)

16 Pin Connector (male)



26 Pin Connector (male)



COMPLEMENT-Input		Encoder Counting Direction at Clockwise Rotation (As Seen on Shaft)
Function	Level	
Direction of Rotation Switch Time < 3 µs	0 (Input = N.C.* or GND)	Up
	1 (Input to + U_b or ≧ 4.5 V)	Down
Preset-Input (Optional)		Function should not be used during rotation of the shaft
Function	Level	
Preset	0 (Input = N.C.* or GND)	Preset
	1 (Input to + U_b or ≥ 4.5 V)	Set Preset Value to 0 (After 100 ms)
Latch-Input (Optional)		Latch-Input Function
Function	Level	
Latch	0 (Input = N.C. or GND)	Latch
Latch Time < 3 µs	1 (Input to + U_b or ≥ 4.5 V)	Latch Time < 3 µs

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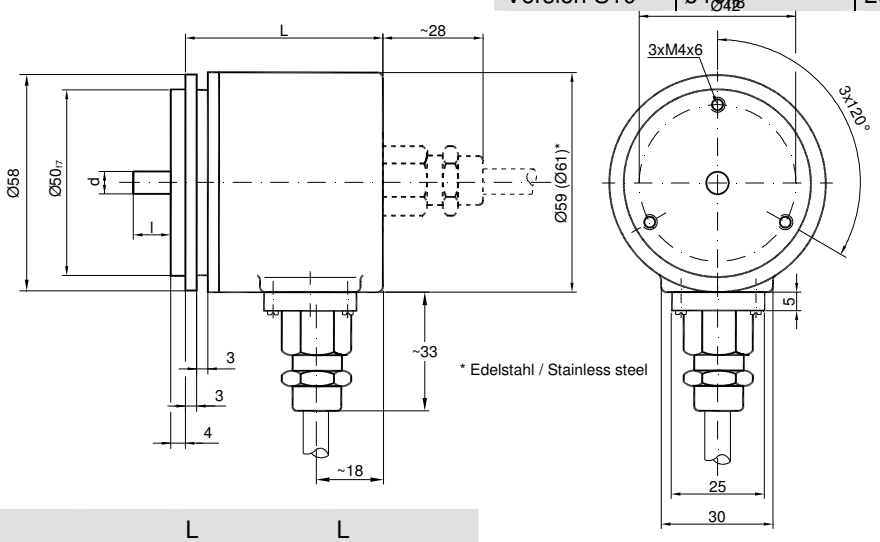
Mechanical Drawings (all dimensions in mm)

Synchro Flange (S)

Two versions available

Cable Exit (~ ø 10 mm)

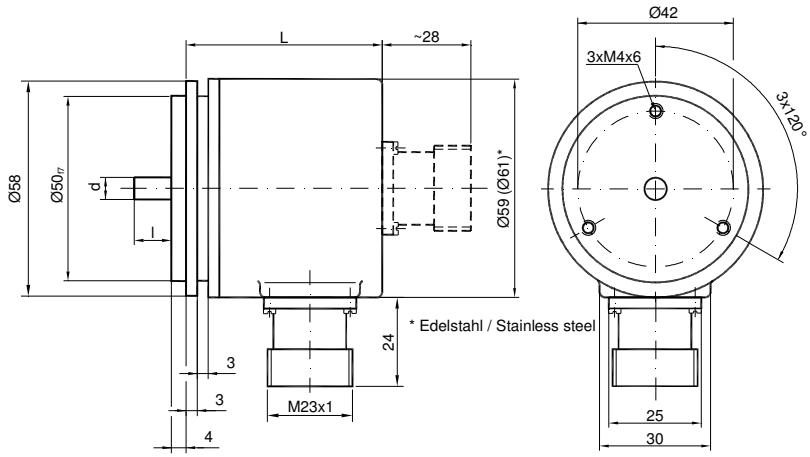
Synchro Flange	d [mm]	l [mm]
Version S06	ø6_{f6}	10
Version S10	ø10_{f8}	20



		L	L
		Parallel	Parallel Preset
Single-Turn	Axial	42	53
	Radial	53	53

Connector exit

(for > 13 Bit only with M27x1 connector axial)



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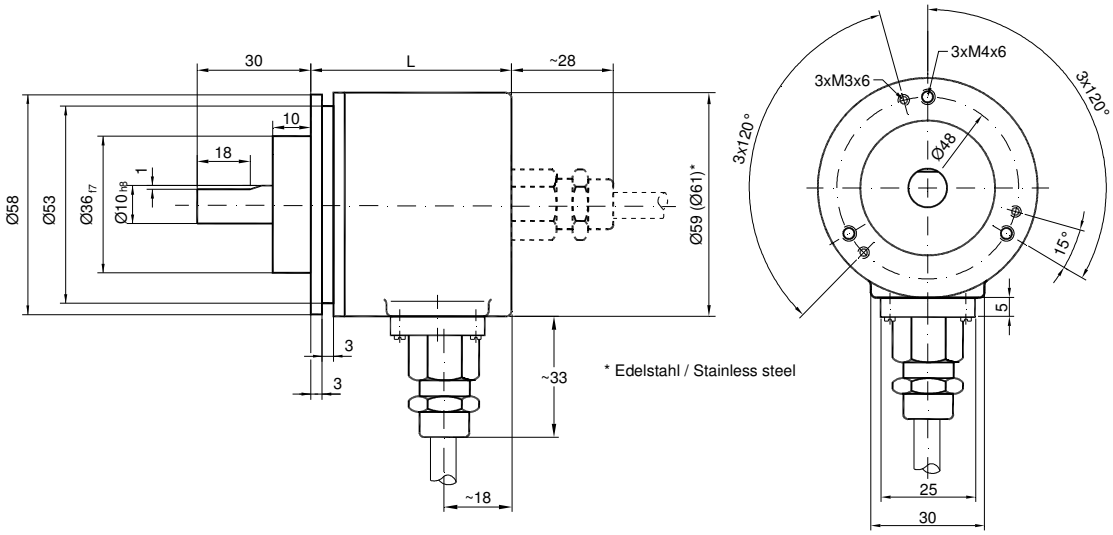
Clamp Flange (C)

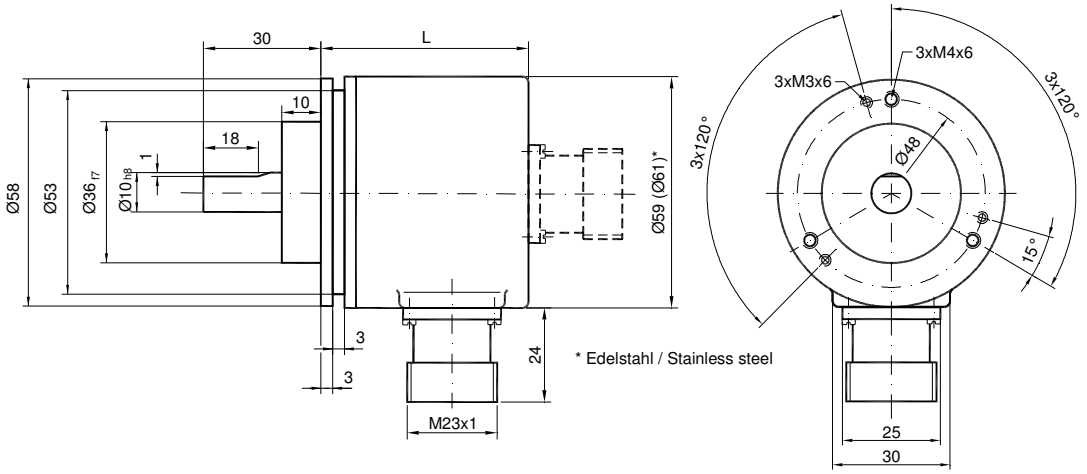
Cable Exit (~ ø 10 mm)



		L	L
		Parallel	Parallel Preset
Single-Turn	Axial	42	53
	Radial	53	53

Connector exit

(for > 13 Bit only with M27x1 axial connector)



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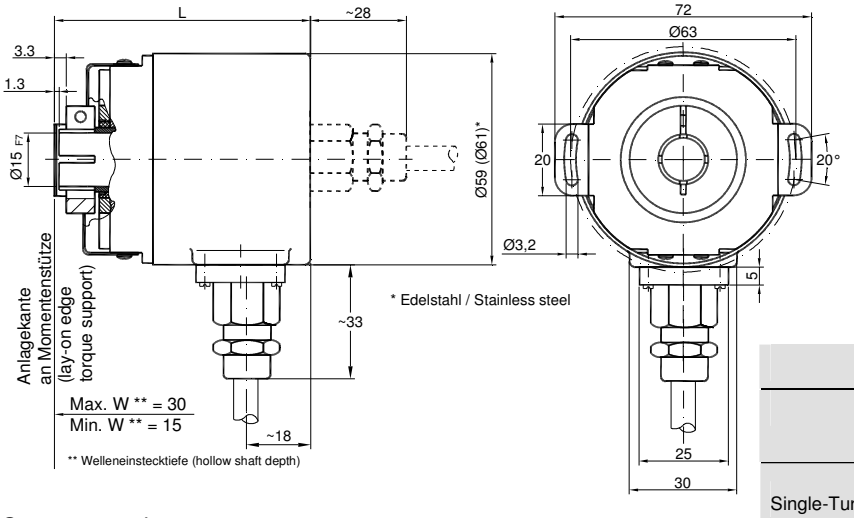
Hub Shaft (B)

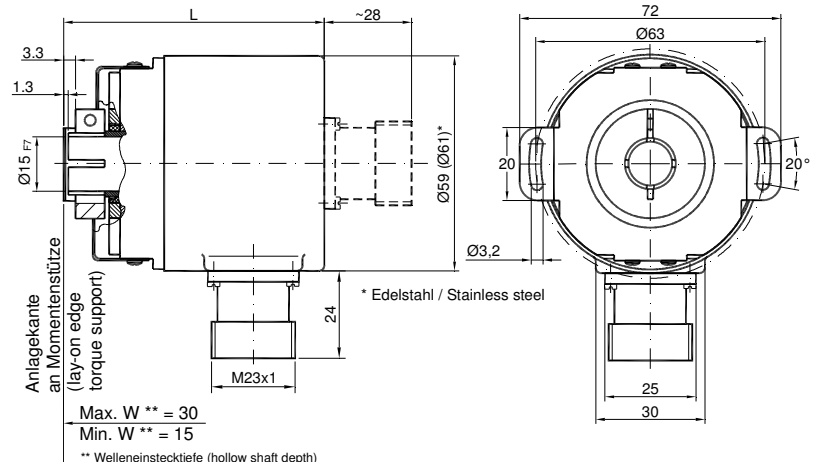
Cable Exit (~ ø 10 mm)



		L	
		Parallel	Parallel Preset
Single-Turn	Axial	61	72
	Radial	72	72

Connector exit

(for > 13 Bit only with M27x1 axial connector)



Mounting Instructions

Do not tighten the clamp ring unless the machine shaft is properly inserted into the bore of the hub shaft.

The diameter of the hub shaft can be reduced to 12 mm, 10 mm or 8 mm by using an adapter (this reducing adapter can be pushed into the hub shaft).

Allowed shaft movements of the drive element are listed in the table.

	Axial	Radial
Static	± 0.3 mm (~0.012 in)	± 0.5 mm (~0.020 in)
Dynamic	± 0.1 mm (~0.004 in)	± 0.2 mm (~0.008 in)

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Models / Ordering Description

Description	Type Key										
Optocode	**OCD**	-_ _	A1	_ -	00	_ _ -	_	_ _	_ -	_ _ _	-_ _ _
Interface Push Pull		**PP**									
Push Pull Preset		P1									
Version			A1								
Code	Gray			**G**							
	Binary			B							
Bits for Revolutions	Single-Turn				**00**						
Steps per Revolution	360**					AA					
	4,096 (0.09°)					**12**					
	8,192 (0.04°)					13					
	65,536 (0.005°)					16					
Flange	Clamp Flange						**C**				
	Synchro Flange						**S**				
	Hub Shaft						**B**				
Shaft	ø10 mm							**10**			
	ø06 mm							**06**			
	ø15 mm (Only for Hub Shaft)							**15**			
Mechanical Options	Without								**0**		
	Shaft Sealing								S		
	Stainless Steel (Only Axial Exit Possible)								V		
	Customized								C		
Connection	Connector Axial, < 14 bit									PAP	
	Connector Axial, > 13 bit									PAT	
	Connector Radial, max. 13 bit *									PRP	
	1m Cable Exit, Axial									CAW	
	1m Cable Exit, Radial *									CRW	
Options	Number for Special Options										

Standard = Bold, Further Models on Request

All types UL-listed

* Not available in Stainless Steel
** Encoder Length Like Preset Version

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Accessories

Description		Type
Connector, Counterpart	Circular Connector, 16 pins	PAP
Connector, Counterpart	Circular Connector, 26 pins	PAT
Cable for PAP	12 x 2 x 0,14 mm^2	STK-24
Cable for PAT	28 x 0,14 mm^2 + 2 x 1,5 mm^2	STK-30
Shaft Coupling *	Diameter: 10 mm	GS 10
	Diameter: 6 mm	GS 06
Clamp Disc *	4 pcs. / OCD	SP 15
Clamp Ring *	2 pcs. / OCD	SP H
Reducing Adapter **	15 mm to 12 mm (to ~0.472 in)	RR12
	15 mm to 10 mm (to ~0.394 in)	RR10
	15 mm to 8 mm (to ~0.315 in)	RR8

Note: All datasheets and manuals can be downloaded for free from our website www.posital.com

* not for hub shaft

** only for hub shaft

We do not assume responsibility for technical inaccuracies or omissions. Specifications are subject to change without notice.