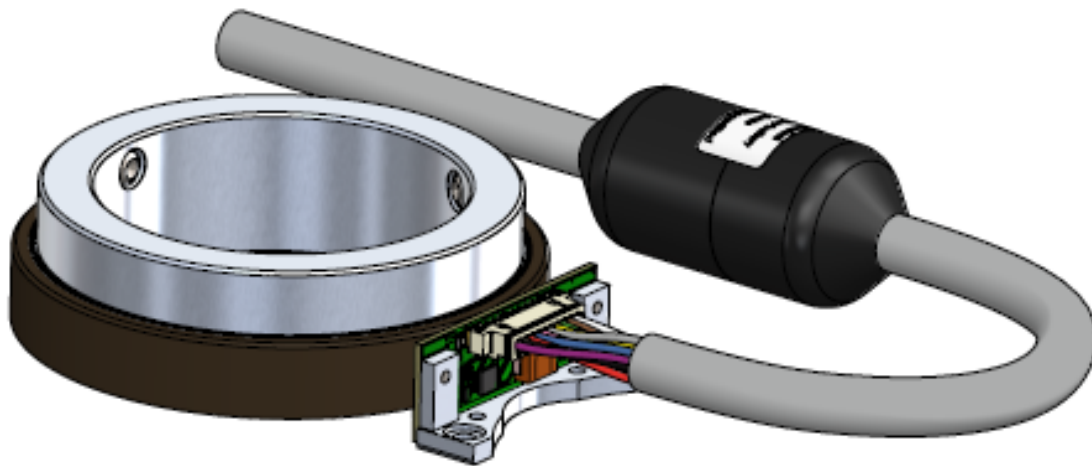


# Absolute encoder Multiturn



## Features

- Resolution: Singleturn: up to 262,144 (**18 Bit**) steps per revolution  
Multiturn: up to 16,777,216 (**24 Bit**) revolutions
- Interface: **SSI** (synchron serial interface) or **BiSS** (bidirectional serial synchron)
- Maximum shaft diameter: **57.80 mm**
- Rotation speed: up to **25.000 rpm**
- Preset (for zero position)
- Error Monitoring
- Battery buffered



## Description

The IMEA 64 is an absolute magnetic multiturn encoder. It is a rotary kit system consisting of a magnetic hub and a sensor head (including the circuit board and mounting bracket).

The IMEA 64 is a reliable encoder with large hollow shafts which can be fixed quickly and easily onto different sizes of motor shafts.

The encoder is developed for absolute positioning, for motors with gearboxes, servo motors, torque motors and direct drives. The IMEA 64 is a real time system for rough environments.

The encoder is available with different interfaces: SSI or BiSS. SPI would be possible on customer request. The Power supply is 5V and the signals are provided by a Molex connector or cable.

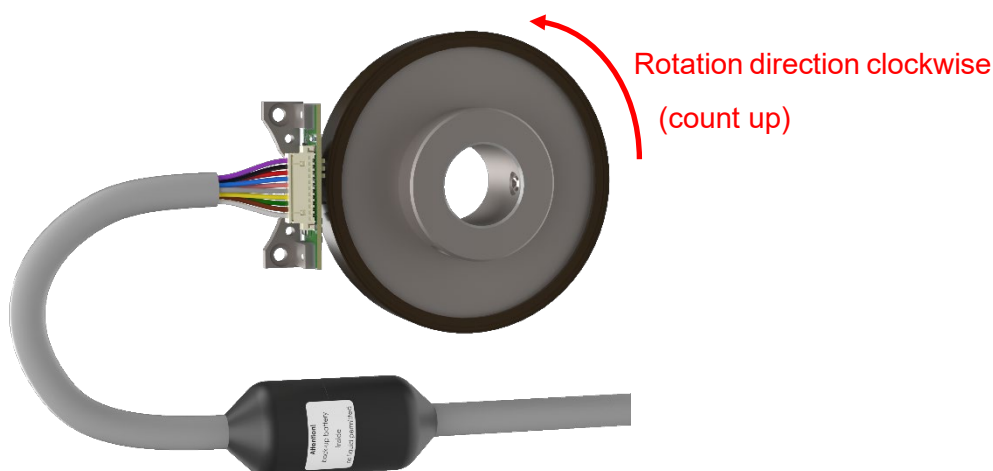
The backup battery is mandatory for the absolute position. The battery can be integrated in the encoder, in the cable or in the control unit.

The capacity of the backup battery determines the service life of the encoder. Up to 24 years can be achieved.

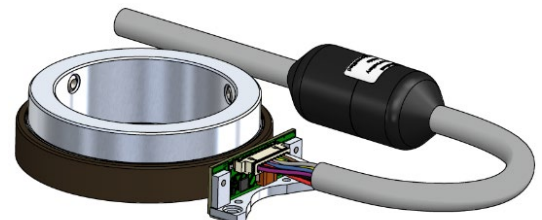
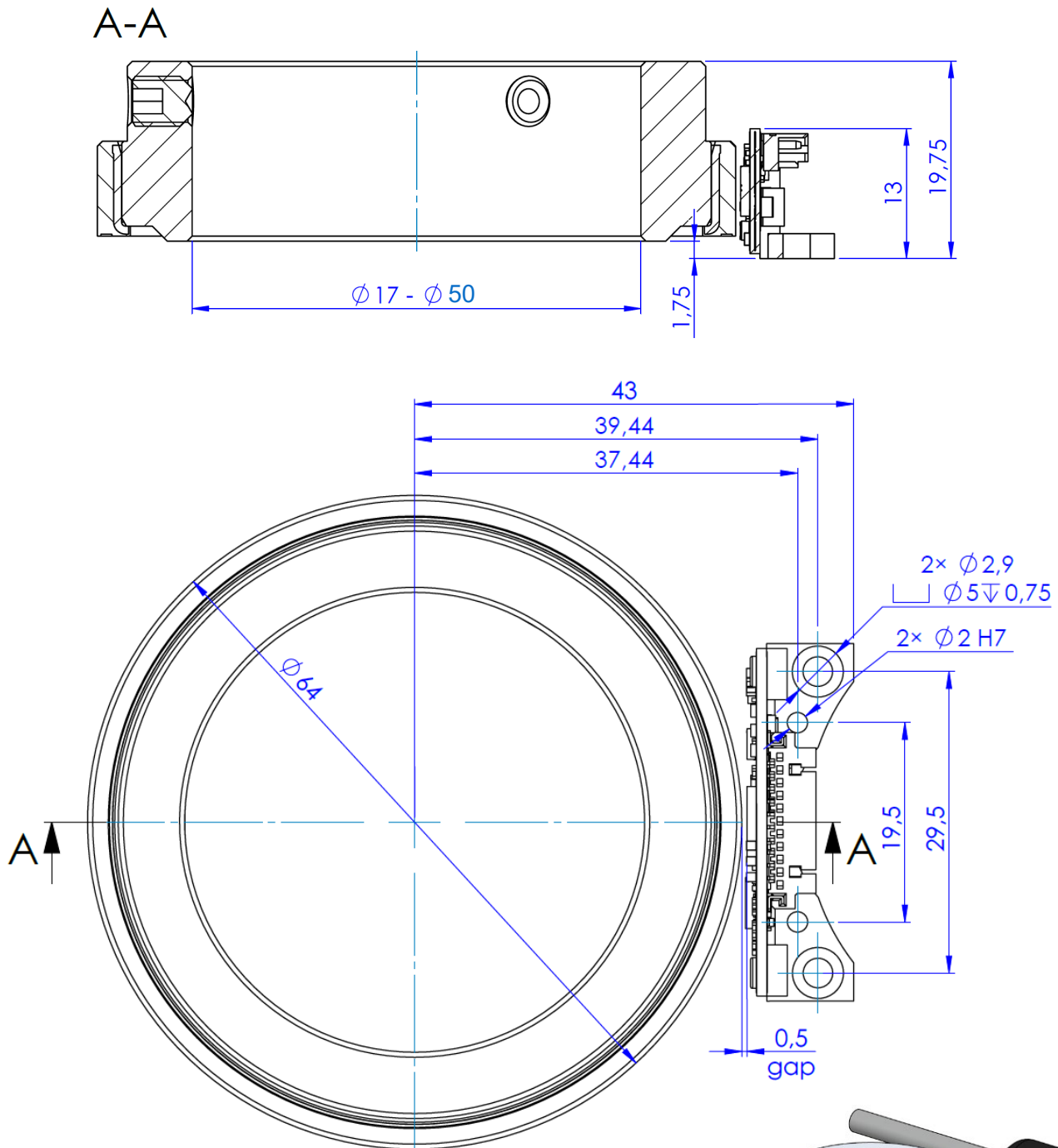
## Main characteristics

- Absolute rotary encoder
- Magnetic sensing
- Multiturn by electronic gear
- Hollow shaft encoder
- High performance in compact size
- Robust for rough environment
- Quick and easy assembly
- Several shaft diameter options
- Operating temperature range -40 °C to +85 °C
- Compliant EU-directive 2011/65/EU (RoHS)

## Direction of rotation



## Dimensions



## Recommended operating conditions

Typical values at 25 °C.

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Supply voltage	$U_B$	4.75	5.0	5.25	$V_{DC}$	
Supply current	$I_{UB}$	80	100	120	mA	no load
Reverse polarity protection	$U_B$	-6			$V_{DC}$	
Start up time	$t_T$			2	ms	
Absolute accuracy			+/- 0.07°			
Relative accuracy			+/- 0.01			
Rotation speed	RPM			25,000	rpm	
Acceleration	$\alpha_{max}$			160	$10^{3^{\circ}}/s^2$	
ESD voltage	$U_{ESD}$			2	kV	discharged over 1,5k $\Omega$
<b>SSI/ BiSS</b>						
Clock frequency	f	80		5000	kHz	
Scan ratio of T		40	50	60	%	
Monoflop time	$t_m$		T/2		$\mu s$	adaptive Encoder Timeout
High level output voltage	$V_{oH}$	2.0	3.0	5.5	$V_{DC}$	$R_L = 120\Omega$
Low level output voltage	$V_{oL}$			0.8	$V_{DC}$	$R_L = 120\Omega$
High level input voltage	$V_{iH}$	2.0		5.5	$V_{DC}$	
Low level input voltage	$V_{iL}$			0.8	$V_{DC}$	
Output current per channel	$I_{out}$	-1.0	30	50	mA	overload protection
<b>BiSS</b>						
CRC Polynomial			0x43		hex	$x^6 + x^1 + x^0$
CRC Start Value			0x0000		hex	
CRC Bits			6			
CDM						inverted
<b>Environment</b>						
Operating temperature	$T_A$	-40	25	85	°C	optional 100°C
Storage temperature	$T_S$	-40		85	°C	
Humidity exposure				90	%RH	not condensing
Vibration				2000	Hz	20g
<b>Backup battery</b>						
Supply voltage	$U_{Batt}$	3.3	3.6	5.0	$V_{DC}$	
Warning voltage	$U_{Warn}$		3.2		$V_{DC}$	
Error voltage	$U_{Err}$		3.1		$V_{DC}$	

## Mechanical characteristics and drawings

Parameter	Value	Tolerance	Unit
Magnet wheel outer diameter Ø	64.0	±0.1	mm
Shaft diameter Ø <sub>w</sub>	17 / 50 / 57.8 *	±0.01	mm
Permissible radial displacement	0	±0.15	mm
Permissible tangential displacement	0	±0.15	mm
Permissible axial displacement	0	±0.3	mm
Permissible eccentricity	0	±0.15	mm
Sensor to magnet wheel distance	0.5	±0.3	mm
Moment of inertia of the magnet wheel	20.0	±1.0	gmm <sup>2</sup>
Mounting screw size	M 2,5 x 6	-	-
Tightening torque of the screws	30	-5	Ncm
Permissible rotational speed	45.000	-	rpm
Dimension PCB	35 x 13 x 11 (see Page 3)	-	rpm
Total weight	25	-	g
Protection grade according to DIN 40500	IP50 (according to DIN 40500)	-	-

Note: \* Further shaft diameters on request

The maximum specified angular accuracy of the encoder can only be achieved with ideal mounting.

## Pin out description SSI & BiSS

Connector Pin	Connector Signal	Cable color of wire
1	Backup +	white
2	UB	red
3	GND	blue
4	Data +	pink
5	Data -	grey
6	Clock -	yellow
7	Clock +	green
8	Backup -	brown

PCB connector: Molex 53048-0810

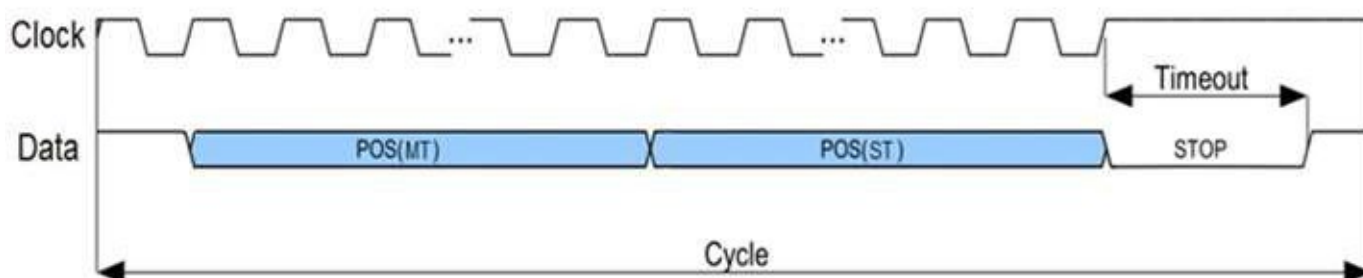
Cable Signal	Cable color of wire
UB	red
GND	blue
Data +	pink
Data -	grey
Clock +	green
Clock -	yellow

Standard cable 05B1 with backup

## Interface:

### Data transfer: SSI

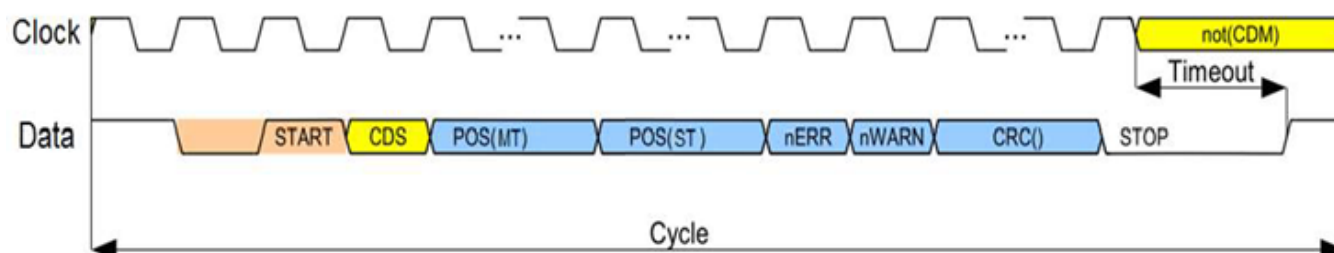
Gray-Code



The position data increases when the shaft rotates in the direction of clockwise

### Data transfer: BiSS (C-Mode)

Binary-Code



The position data increases when the shaft rotates in the direction of clockwise

For a detailed description of the protocol, see separate interface specification.

Preset is programmable by a BiSS command.

Error monitoring is also controlled via the BiSS interface.

## Ordering code:

**IMEA 64 X - XX - XXX - X - XX / YY - 05 - XXXX - 2 - X**

Encoder Type	Inner diameter	Design	Encoder Interface	Resolution	Cable / Backup **	Performance
R: Radial	17: 17mm	Y01: Bracket	S: SSI	Singleturn XX: 12: 12 Bit 16: 16 Bit 18: 18 Bit	05B1: 0.5m/1Ah	S: Standard
A: Axial *	50: 50mm	Y03: PCB*	B: BiSS	Multiturn YY: 00: None 16: 16 Bit 24: 24 Bit	05B4: 0.5m/4Ah	E: Extended *
L: Linear *	57: 57,8mm*	Y02: Housing*	P: SPI *		05B7: 0.5m/7Ah	
					0300: 0.3mm/-	

\* Optional (customer-specific)

\*\* Backup lifetime (Basis of calculation: Additional document PWB):

- 1Ah ≈ 3.5 years      Ø 20 mm
- 4Ah ≈ 10 years      Ø 23 mm
- 7Ah ≈ 17 years      Ø 31 mm
- 13Ah ≈ 24 years      Ø 39 mm

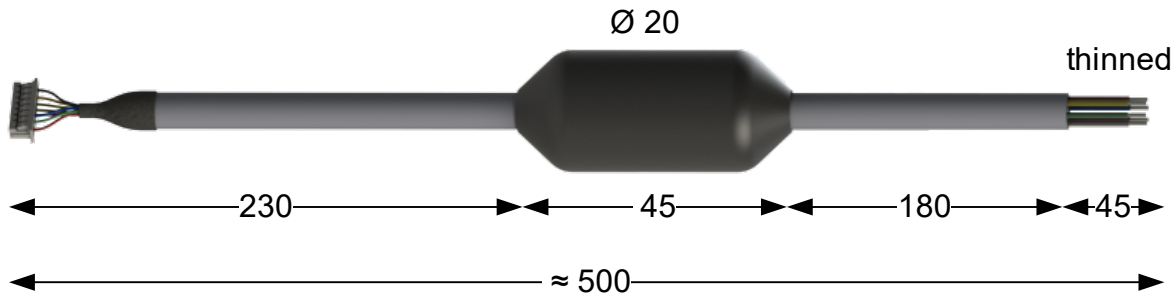
The backup battery voltage is permanently monitored. If the voltage is too low, a warning is displayed (in the data string). However, the function is still guaranteed.  
If the backup system is out of function, the error bit is set.

### IMPORTANT NOTICE

The guarantee will be voided by misuse, accident, modification, unsuitable physical or operating environment, operation in other than the specified operating environment, or failure caused by a product for which **PWB encoders GmbH** is not responsible.

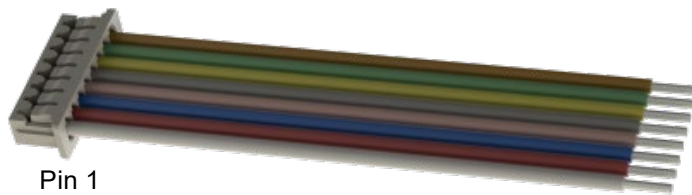
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## Standard cable 05B1



Attention!  
Backup battery inside  
No liquid permitted

## Cable 0300



Cable without backup (length 300 mm)  
[for applications with backup on customer control]

## Accessories

For communication with the IMEA 64, a USB converter box (PWB5C) is available from PWB encoders. The software is available from PWB on request. The software can help for the first use and for visualization of the position data. It is not necessary for operation in the customer application with the customer control.



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