Sensors for Motion Control and Positioning

MEYLE ENCODER

Selection Guide Encoder

Meyer Industrie-Electronic GmbH-MEYLE

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Meyer Industrie-Electronic GmbH-MEYLE

Companyprofile

MEYLE - Meyer Industrie Electronic GmbH is an ISO 9001:2015 certified engineering and manufacturing company of a wide range of components and systems for the automation and process control Industries, based in Lengerich, Germany and represented worldwide.

Established in 1965, MEYLE Germany is a family owned company group, specialized in the development and production of optoelectric and magnetic encoder, sensors, safety switches and automation systems.

MEYLE Encoder Events:

In 2006, the first programmable output incremental encoder was published In 2011,

high protection grade magnetic encoder lanched

In 2012, linear displacement sensor was published

In 2013, EIN series of new industrial incremental encoder was published

In 2019, IMG Drehimpulsgeber was acquired

Company business

Comprehensive range of incremental, absolute and bus encoder as solid shafts and hollow shaft versions.
- heavy duty encoder
- draw wire sensors
- linear encoder and speed monitors
- encoder overspeed switch combinations
- redundant encoder
- encoder with large hollow shafts
- robust encoder for conveyors and steel works.

MEYLE expanded the encoder program range that has been built up for over 20 years with new versions and over 40 years of know-how from IMG-Drehimpulsgeber which was integrated into Meyle group in 2021.

MEYLE®

Intro. and Quick Selection
Incremental encoder
Absolute encoder
special position device
Accessories and Kits

CONTENTS

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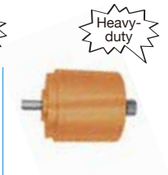
MEYLE®

Incremental Encoder

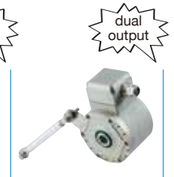
	EINS24	EINB24	EINS30	EINS40	EINH40	EINB40
Outside diameter	24	24	28	38	38	38
Page number	25	27	29	31	33	35
Output signal	PUSH-PULL	PUSH-PULL	RS422, PUSH-PULL	RS422, PUSH-PULL	RS422, PUSH-PULL	RS422, PUSH-PULL
Supply voltage	10-30VDC	10-30VDC	5VDC,10-30VDC	5VDC,10-30VDC	5VDC,10-30VDC	5VDC,10-30VDC
Shaft/aperture	4/5/6	4/5/6	5/6/8	6/8	6/8	6/8
Max. speed	6000rpm	6000rpm	8000rpm	10000rpm	10000rpm	10000rpm
Max. resolution	2500	2500	3600	5000	5000	5000
Max. load Axial/radial	20/20	20/200	20/40	30/60	30/60	30/60
Max. frequency	150kHz	150kHz	150kHz	150kHz	150kHz	150kHz
Temperature	-25°C to +85°C	-25°C to +85°C	-25°C to +85°C	-25°C to +85°C	-25°C to +85°C	-25°C to +85°C
Protection class	IP65	IP65	IP65	IP65/IP67	IP65/IP67	IP65/IP67

	EINH90	EINH145	FINS58	FINH58	MINS58	MINH58
Outside diameter	90	145	58	58	58	58
Page number	49	51	53	55	57	59
Output signal	RS422, PUSH-PULL	RS422, PUSH-PULL	RS422(HTL/TTL) PUSH-PULL, sine	RS422(HTL/TTL) PUSH-PULL, sine	PUSH-PULL (HTL/TTL)	PUSH-PULL (HTL/TTL)
Supply voltage	5VDC,10-30VDC	5VDC,10-30VDC	5VDC,10-30VDC	5VDC,10-30VDC	5-30VDC	5-30VDC
Shaft/aperture	20/25/30/32	48/55/65/72	6/8/10/12	6/8/10/12/14	6/10	10/12/14/15
Max. speed	5000rpm	800rpm	15000rpm	15000rpm	6000rpm	6000rpm
Max. resolution	6000	2500	6000/80000	6000/80000	65536	65536
Max. load Axial/radial	100/200	200/200	50/100	50/100	40/80	40/80
Max. frequency	100kHz	100kHz	300 kHz	300 kHz	900 kHz	900 kHz
Temperature	-20°C to +85°C	-10°C to +70°C	-25°C to +85°C	-25°C to +85°C	-20°C to +85°C	-20°C to +85°C
Protection class	IP65	IP54	IP65/IP67	IP65/IP67	IP65	IP65

* Cable length is 1 meter by default for extension please contact us



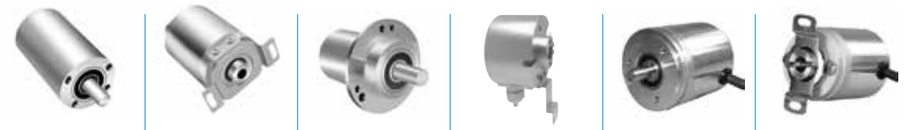
	EINS50	EINH50	EINS58	EINH58	EINB58	EINS90
Outside diameter	50	50	58	58	58	90
Page number	37	39	41	43	45	47
Output signal	RS422, PUSH-PULL	RS422, PUSH-PULL	RS422, PUSH-PULL	RS422, PUSH-PULL	RS422, PUSH-PULL	RS422, PUSH-PULL
Supply voltage	5VDC,10-30VDC	5VDC,10-30VDC	5VDC,10-30VDC	5VDC,10-30VDC	5VDC,10-30VDC	5VDC,10-30VDC
Shaft/aperture	6/8/10	6/8/10	6/8/10/12	6/8/10/12/15	6/8/10/12/15	12/16
Max. speed	10000rpm	10000rpm	12000rpm	12000rpm	12000rpm	5000rpm
Max. resolution	10000	10000	10000	10000	10000	6000
Max. load Axial/radial	40/80	40/80	50/100	60/80	50/100	100/200
Max. frequency	150kHz	150kHz	150kHz	150kHz	150kHz	100kHz
Temperature	-25°C to +85°C	-25°C to +85°C	-25°C to +85°C	-25°C to +85°C	-25°C to +85°C	-20°C to +85°C
Protection class	IP65/IP67	IP65/IP67	IP65/IP67	IP65/IP67	IP65/IP67	IP66



	MINS100	MINH100	IMG30	IMG60 / 65	IMG100	IMG115
Outside diameter	100	100				
Page number	61	63	65	67	69	71
Output signal	RS422(HTL/TTL) PUSH-PULL	RS422(HTL/TTL) PUSH-PULL	PUSH-PULL	sine, PUSH-PULL	RS422, PUSH-PULL	PUSH-PULL (HTL/TTL)
Supply voltage	5VDC,10-30VDC	5VDC,10-30VDC	10-30VDC	5VDC,10-30VDC	5VDC,10-30VDC	5-30VDC
Shaft/aperture	11	12/16			12/16/17	
Max. speed	6000rpm	6000rpm	8000rpm	3000rpm	6000rpm	10000rpm
Max. resolution	5000	5000	1435	1000	10000	6000
Max. load Axial/radial	350/400	400/500	5/10	20/30	500/1000	250/350
Max. frequency	300 kHz	300 kHz	200 kHz	200 kHz	200 kHz	100 kHz
Temperature	-20°C to +85°C	-20°C to +85°C	0°C to +80°C -30°C to +80°C	0°C to +80°C	-20°C to +80°C	-25°C to +100°C
Protection class	IP66	IP66	IP64	IP67(60) IP43(65)	IP67	IP56

* Cable length is 1 meter by default for extension please contact us

Absolute encoder



	DAXS37	DAXB37	DAXS58	DAXB58	EAXS40	EAXB40
Outside diameter	37	37	58	58	40	40
Page number	73	75	77	79	81	83
Output signal	SSI/CANopen	SSI/CANopen	SSI/CANopen	SSI/CANopen	SSI/CANopen	SSI/CANopen
Supply voltage	5VDC,10-30VDC	5VDC,10-30VDC	5VDC,10-30VDC	5VDC,10-30VDC	5VDC,10-30VDC	5VDC,10-30VDC
Shaft/aperture	6	6	6/8	10/12/14	6	6
Max. speed	8000rpm	8000rpm	8000rpm	8000rpm	8000rpm	8000rpm
Max. resolution	16 bit(ST),14 bit(MT)	16 bit(ST),14 bit(MT)	16 bit(ST),14 bit(MT)	16 bit(ST),14 bit(MT)	21 bit(ST),14 bit(MT)	21 bit(ST),14 bit(MT)
Max. load Axial/radial	20/40	20/40	50/100	50/100	50/100	50/100
Max. frequency	-	-	-	-	-	-
Temperature	-40°C to +80°C	-40°C to +80°C	-40°C to +80°C	-40°C to +80°C	-40°C to +80°C	-40°C to +80°C
Protection class	IP65/IP67	IP65/IP67	IP65/IP67	IP65/IP67	IP65	IP65

	EAXS58	EAXB58	EAXS58	EAXB58	EAXS58	EAXB58
Outside diameter	58	58	58	58	58	58
Page number	85	87	89	91	93	95
Output signal	SSI	SSI	Modbus/Analog	Modbus/Analog	CANopen/Devicenet	CANopen/Devicenet
Supply voltage	5VDC,10-30VDC	5VDC,10-30VDC	10-30VDC	10-30VDC	10-30VDC	10-30VDC
Shaft/aperture	6/10	6/10	6/10	6/10	6/10	6/10
Max. speed	12000rpm	12000rpm	12000rpm	12000rpm	12000rpm	12000rpm
Max. resolution	21 bit(ST),14 bit(MT)	21 bit(ST),14 bit(MT)	21 bit(ST),14 bit(MT)	21 bit(ST),14 bit(MT)	21 bit(ST),14 bit(MT)	21 bit(ST),14 bit(MT)
Max. load Axial/radial	50/100	50/100	50/100	50/100	50/100	50/100
Max. frequency	-	-	-	-	-	-
Temperature	-40°C to +80°C	-40°C to +80°C	-40°C to +80°C	-40°C to +80°C	-40°C to +80°C	-40°C to +80°C
Protection class	IP66	IP66	IP66	IP66	IP66	IP66

* Cable length is 1 meter by default for extension please contact us

	EAXS58	EAXB58	EAXS58	EAXB58	EAXS58	EAXB58
Outside diameter	58	58	58	58	58	58
Page number	97	99	101	103	105	107
Output signal	ProfibusDP	ProfibusDP	Ethernet	Ethernet	Parallel	Parallel
Supply voltage	10-30VDC	10-30VDC	10-30VDC	10-30VDC	10-30VDC	10-30VDC
Shaft/aperture	6/10	6/10	6/10	6/10	6/10	6/10
Max. speed	12000rpm	12000rpm	12000rpm	12000rpm	12000rpm	12000rpm
Max. resolution	21 bit(ST),14 bit(MT)	21 bit(ST),14 bit(MT)	21 bit(ST),14 bit(MT)	21 bit(ST),14 bit(MT)	21 bit(ST),14 bit(MT)	21 bit(ST),14 bit(MT)
Max. load Axial/radial	50/100	50/100	50/100	50/100	50/100	50/100
Max. frequency	-	-	-	-	-	-
Temperature	-40°C to +80°C	-40°C to +80°C	-40°C to +80°C	-40°C to +80°C	-40°C to +80°C	-40°C to +80°C
Protection class	IP66	IP66	IP66	IP66	IP66	IP66

	EAXS90	EAXH90	EAXS90	EAXH90
Outside diameter	90	90	90	90
Page number	109	111	113	115
Output signal	SSI/CANopen	SSI/CANopen	ProfibusDP	ProfibusDP
Supply voltage	10-30VDC	10-30VDC	10-30VDC	10-30VDC
Shaft/aperture	11/12	20/25/30	11/12	20/25/30
Max. speed	6000rpm	6000rpm	6000rpm	6000rpm
Max. resolution	13 bit(ST),16 bit(MT)	13 bit(ST),16 bit(MT)	13 bit(ST),16 bit(MT)	13 bit(ST),16 bit(MT)
Max. load Axial/radial	100/200	100/200	100/200	100/200
Max. frequency	-	-	-	-
Temperature	-20°C to +90°C	-20°C to +90°C	-10°C to +80°C	-10°C to +80°C
Protection class	IP65/IP67	IP65/IP67	IP65/IP67	IP65/IP67

* Cable length is 1 meter by default for extension please contact us

Overspeed switch



	6KB4110	FINS130	AOSH90
Outside diameter	120	115	90
Page number	117	119	121
Output signal	2 relay	PUSH-PULL/RS422+relay	PUSH-PULL/RS422+relay
Supply voltage	No power	10-30VDC	10-30VDC
Shaft/aperture	Pin connector	11/12	12/16/20/25
Max. speed	6000rpm	3600rpm	3600rpm
Max. resolution	-	80000	4000
Max. load Axial/radial	-	-	-
Max. frequency	-	-	-
Temperature	-25°C to +75°C	-20°C to +85°C	-20°C to +85°C
Protection class	IP65	IP67	IP67

Linear encoder



	EMLXX	EC/EDXX
Page number	123	125
Output signal	PUSH-PULL, RS422	Incremental：PUSH-PULL, RS422 Absolute: 4-20mA, SSI, MODbus, DP, CANopen, Profinet
Supply voltage	5VDC, 10-30VDC	5VDC, 10-30VDC
Range	50 m	20 m
Resolution	1 μm	The selected encoder
Temperature	-20°C to +85°C	-30°C to +75°C (EC) -40°C to +80°C (ED)
Protection class	IP68	IP65 (EC) IP50 (ED)

* Cable length is 1 meter by default for extension please contact us







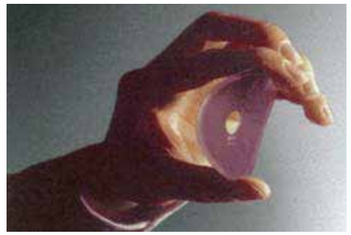





GENERAL/OVERVIEW
Introduction

Description

The optical rotary encoder is an angular position sensor. It is made source of light, light emitting diode (or LED), a receptor and a disk rotating in between. The optical disk with dark and clear radial lines is mounted on the rotating shaft of the encoder. Most of the disks used by Meyle are Polyfass (Mylar-Mica composite) and are unbreakable (see photo). The light from the LED crosses the lines on the disk and creates an analogical signal in the receptor, which is later amplified and could be converted in either square-wave or sine-cosine signals. All Meyle encoders use the differential reading, helping to compensate the reduction of theamplitude of the signals due to higher temperature, age, wearing of the bearings, etc.
Incremental encoders simply count the number of pulses engraved on the disk and in case of power shut-down, it is necessary to find out the origin at every new start.



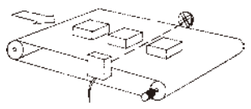
Single-turn absolute encoders determine their position at all times using a single code in a given single revotution, even if there is no reference measurement.

Multi-turn absolute encoders provide in addition a reading of the position within the revolution and is capable of counting the number of turns made.

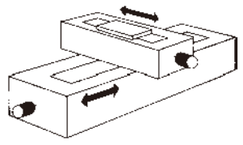
Applications

Stop dog positioning

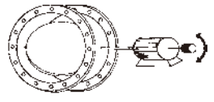
Workpiece lengthmeasurement system with opto electric and encoder



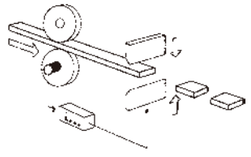
Crosstable positioning



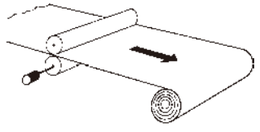
Valve position control



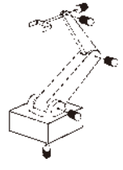
Length dimension with measuring wheel



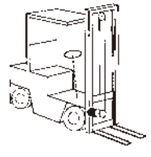
Lengthmeasuring of textile or paper rolls



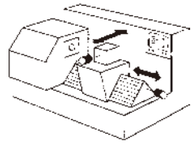
Roboter axis control



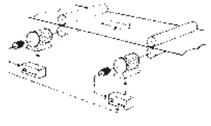
Fork hight measuring at fork trucks



Positioning at CNC-tooling-machines

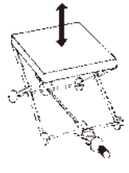


Tensile stress control



Control of transport vehicles

Adjustment of lift platforms



GENERAL/OVERVIEW
General

Conformity:

All Meyle encoders fully comply with the CE-regulations and are intensively tested in our EMC laboratories. They conform to CE requirements according to EN 50082-2, EN 50081-2 and EN 55011 class B.

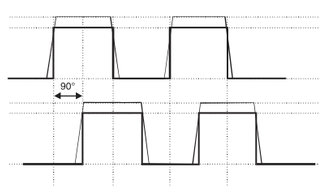
High quality of signals:

All encoders from Meyle, are equipped with ageing and temperature compensation to ensure a long term and stable signal also after many years of operation.

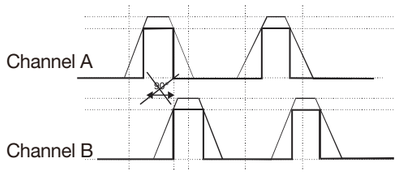
Ageing compensation:

Each LED source will inevitably lose it's power over a period of time. As a result, the output signal degrades. The phase shift between channel A and B of 90° becomes less and less. The direction of rotation may no longer be detected. Properly by the control, a special electronic circuit, which is built in the specific ASIC prevents this effect.

Signals of a new encoder or encoders with ageing compensation:



Signals of an older encoder without ageing compensation:



Benefit: The ageing compensation circuit ensures the same signal, even after many years of operating time. The down time of machines will be reduced dramatically and the reliability is increased.

Temperature compensation:

This specialised circuit ensures that the quality of the signal will stay on the same high level over the whole working temperature range.

Benefit:
The positioning accuracy of a machine will not be affected by temperature changes.

Environmental conditions:

A significant influence on the lifetime of the encoder is set by the environment in which the encoder is operating, e.g.:

- The ambient temperature
- The expected shaft load
- The possible grade of dust/dirt and humidity/liquids

The support design and the use of high quality components makes our encoders suitable for applications in rough conditions.
Many references such as from Bosch, Siemens, Bombardier and other customers proof these high requirements.

Temperature:
Definition according to DIN standards 32 878

Working temperature:
Is defined as the environmental temperature, in which the encoder will produce the signals defined in the data sheets.

Operating temperature:
Is defined as the environmental temperature which the encoder can withstand without getting damaged.

GENERAL/OVERVIEW
General

Dirt/dust and humidity/water: The IP classification according to EN 60529 describes how the encoder is protected against particles and water. It is described as an abbreviation "IP" followed by two numbers.

The first digit defines the size of the particles. The higher the number the smaller the particles.

The second digit defines the resistance against water. The higher the number, the higher the water pressure can be.

Our encoders have a protection up to IP 67.

These two tables summarise the most used IP ratings:

Protection against particles (first digit):

0	not protected
1	protected against particles 50 mm and larger
2	protected against particles 12,5 mm and larger
3	protected against particles 2,5 mm and larger
4	protected against particles 1,0 mm and larger
5	protected against dust
6	dust proof

Protection against water (second digit)

0	not protected
1	protected against vertically falling drops of water
2	protected against falling drops of water up to 15° from vertical
3	protected against water sprayed up to 60° from vertical
4	protected against water sprayed from all directions, limited ingress permitted
5	protected against low pressure jets from all directions, limited ingress permitted
6	protected against strong jets of water, e.g. for use on ship decks, limited ingress permitted
7	protection against the affects of immersion between 15 cm and 1 m
8	protected against long periods of immersion under pressure

Designation of colours
to DIN standard 757

abbreviation	colour		
BK	black	VT	violet
BN	brown	GY	grey
RD	red	WH	white
OG	orange	PK	pink
YE	yellow	GD	gold
GN	green	TQ	turquoise
BU	blue	SR	silver

Shaft Load:

Due to misalignment and other mechanical influences from outside, the shaft of the encoder is exposed to a number of different loads. This has a direct impact on the lifetime of the ball bearings and also on the electrical signal itself. If there is an overload there will be an early wear and in the worst case it will lead to a failure of the unit and to a destruction of the optical system inside.

For shaft encoders the maximal radial and axial load should not be exceeded. It is highly recommended to use a coupling between the encoder shaft and the drive shaft, see also the accessories and the mounting suggestions.

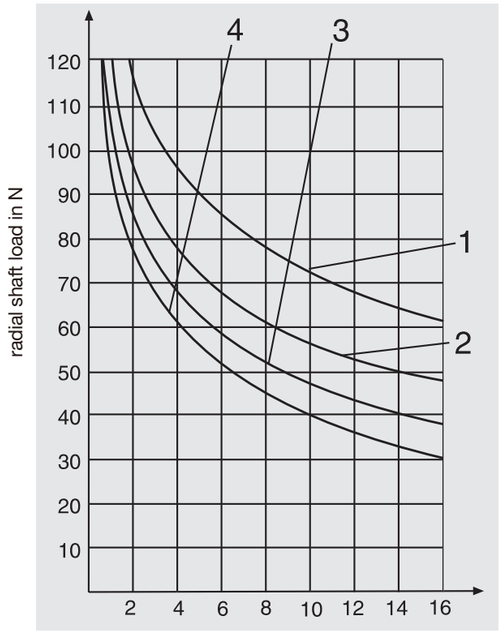
In the technical data sheets of the encoders, typical values for the radial and axial load at the shaft end are listed. This is based on the lifetime of the ball bearing, the speed, the mechanical load and the temperature.

To easily find the lifetime for the specific application the following diagrams can be used. All of the diagrams are based on the following parameters:

- 60° C environmental temperature
- The axial load is always half the load compared to the radial load

GENERAL/OVERVIEW
General

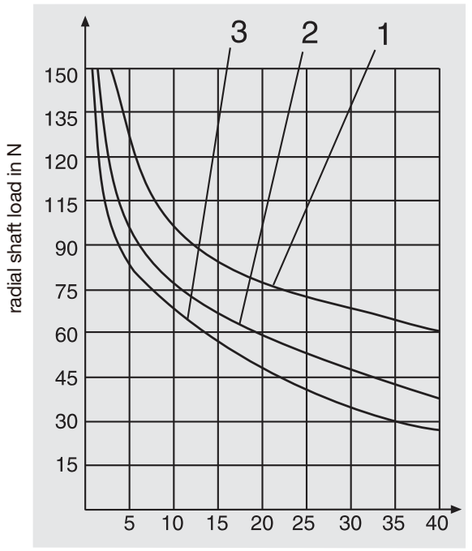
Type series 58 mm diameter



Bearing's lifetime in years

1 n = 3000 min^{-1}
2 n = 6000 min^{-1}
3 n = 9000 min^{-1}
4 n = 12000 min^{-1}

Type series 90 mm diameter



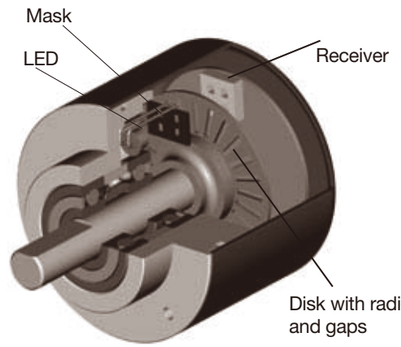
Bearing's lifetime in years

1 n = 2000 min^{-1}
2 n = 4000 min^{-1}
3 n = 6000 min^{-1}

Incremental encoder
Assembly and function:

Meyle encoders operate on an electro-optical scanning principle.

A disk with a radial grating of lines and gaps rotates between a light source (mostly a LED) and a receiver which produces a sine wave signal proportional to the light received.



Processing of the signals:

The sine wave signals are processed further in an electronic circuitry, usually a specific ASIC. This is necessary because most controllers controls (like e.g. counters) require digital signals with a certain voltage level. For that the signals are pre-processed in the encoder. The pre-processed signals are transmitted by the output circuit depending on the application.

GENERAL/OVERVIEW
General

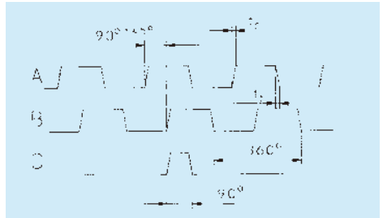
Selecting an incremental encoder:

When selecting the encoder, following parameters should be considered in addition to the topic mentioned on page 8–10.

Number of channels:

Encoders with one output channel
Encoders with one output channel are used where no direction sensing is needed, e.g. speed control or length measuring.

Encoders with two output channels
Applications, where the direction of a rotation should be sensed, e.g. positioning, require encoders with two channels A and B being shifted 90° out of phase. By detecting the phase shift, the direction can be located.



- Shaft turning clockwise, top-view of shaft
- Inverted signals available
- 0-pulse is linked to AND with channel A and B

t_r = rise time
t_f = fall time

Encoders with three output channels
In addition to the two channels A and B there is a zero signal available, that appears once per turn. This can be used e.g. as a reference signal during the first revolution after power up.

Multiplication of pulses:

The resolution of a two channel encoder can be multiplied by two or four using a special edge detecting. An encoder with physically 5000 pulses per revolution can generate 20000 pulses per revolution using this technique

Inverted signals:

When used in environments, with a lot of electrical noise and/or if very long cable distances are required, we recommend to use encoders with inverted (complementary) signals. These signals are always available with output circuits of the RS 422 type and sine wave outputs. Meyle also offers them for push-pull outputs.

Resolution:

Example: An encoder is equipped with a measuring wheel. Every revolution corresponds to a distance of 200 mm (circumference). The accuracy should be 0,1 mm. What is the required resolution (ppr)?

Given: Circumference of the measuring wheel: U = 200 [mm]
Accuracy of the system: G = 0,1 [mm]
Wanted: Resolution of the encoder: A = ? [pulses/resolution]

$$\text{resolution} = \frac{\text{Circumference}}{\text{Accuracy}} = \frac{U}{G}$$

The required resolution would be 2000 ppr (pulses per revolution).

GENERAL/OVERVIEW
General

Pulse frequency:

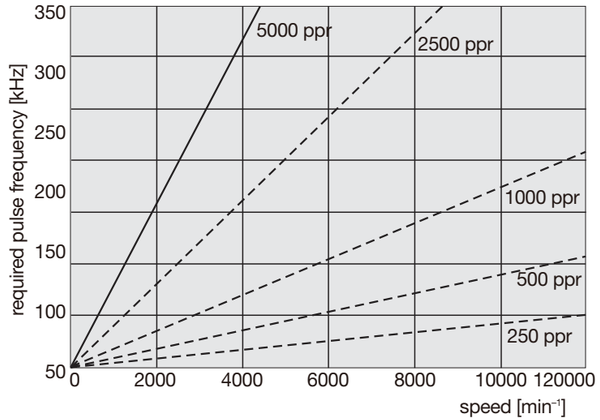
The required pulse frequency can be calculated. This is based on the number of pulses per turn (ppr) and the speed (rpm). The max. pulse frequency is listed for each encoder. Usually it is 300 kHz. Meyle also offers high resolution encoders with a pulse frequency of up to 800 kHz.

Example
of how to calculate the required pulse frequency f_{max}:
Given: Speed n= 3000 min^{-1}
Resolution of the encoder
R = 1000 ppr

$$f_{max} = \frac{n \times R}{60}$$

The required pulse frequency is 50 kHz. Now you can compare this result with the data of the encoder you would like to choose.

This diagram can be used for the most common resolutions as a quick guide:



Outputs and voltage supplies (overview):

Meyle offers a wide range of possible outputs and voltage supplies for any application.

Output	Inverted signals	Voltage supply
RS 422	Yes	5 V DC
RS 422	Yes	10 ... 30 V DC or 5 ... 30 V DC
Push Pull output	No	10 ... 30 V DC or 5 ... 30 V DC
Push Pull output	Yes	10 ... 30 V DC or 5 ... 30 V DC
Sine wave voltage output	Yes	5 V DC
Sine wave voltage output	Yes	10 ... 30 VDC

If the encoder is used in an environment with strong electrical noise and long cables we highly recommend the use of inverted signals.

Sensor outputs:

The sensor outputs are used if the distance from the encoder to the control unit is very long and the voltage supply at the encoder could drop due to this long distance.
The input impedance of the sensor inputs (Controller) is very high, and the voltage drop on the sensor output line is almost zero. Due to this it is possible to detect the actual supply voltage of the encoder (e.g. 4,2 V instead of 5 V). Based on this information the controller will increase the voltage supply to e.g. 5,8 V.

GENERAL/OVERVIEW

General

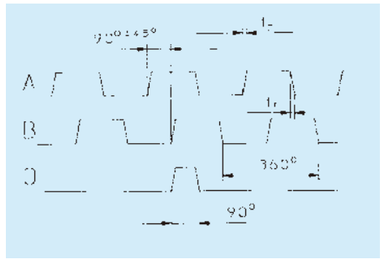
Digital outputs:

The sine wave signal from the optical system is first digitised to have square wave signals available.

- Shaft turning clockwise, top view of shaft
- Inverted signals are available
- 0-pulse is linked to AND with channel A and B

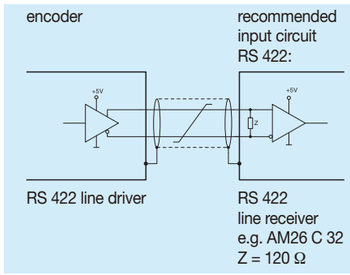
To transmit the signals there are two possible outputs available. RS 422 (TTL compatible) or push-pull (covers PNP or NPN). For choosing the suitable output for the application the following points have to be considered:

- The corresponding unit / controller the encoder will be connected to



- The distance from the encoder to the receiver unit
- The sensitivity against electrical noise or other interferences.

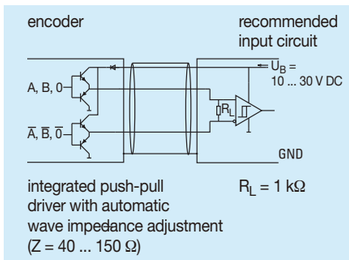
Output circuit and recommended input circuit RS 422:



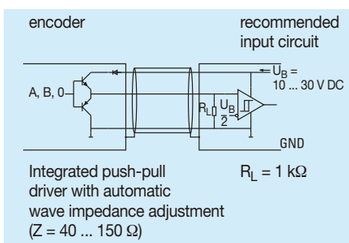
Push-pull:

Push-pull outputs are suitable for count interface cards, electronic counters or PLC inputs.

Output circuit and recommended input circuit push-pull with inverted signals:



Output circuit and recommended input circuit push-pull without inverted signals:

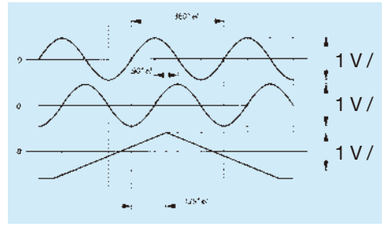


GENERAL/OVERVIEW

General

Sine wave outputs:

The sine wave signals are available as voltage signals. They can be further processed and can be multiplied by a factor of usually 10, 20, 50, 100, 400, 500, 1000 res. binary factors (512, 1024). Due to the interpolation of the two signals, which are 90° out of phase, a very high resolution can be achieved. This makes these kind of signals specially useful for applications where very high resolutions are required. Further they are very suitable for digital drives with a very slow and precise movement, e.g. for grinding machines or lifts and elevators.



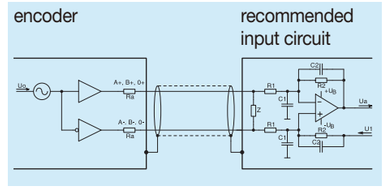
- Shaft turning clockwise, top view of shaft
- 0-pulse is generated once per turn

Output circuit and recommended input circuit for sine wave voltage signals:

R_a = 10 Ω
C_1 = 150 pF
C_2 = 10 pF
R_1 = 10 kΩ
R_2 = 33 kΩ
U_0 = 2,5 V ±0,5 V

Z = 120 Ω
$U_1 = U_0$

OPV: z.B. MC33074



Cable length:

Depending on the output circuit and the electrical noise the following cable lengths are recommended:

Output circuit	max. cable length	Encoder connected to e.g.
Push-pull without inverted signals	100 m	counter/PLC
Push-pull with inverted signals	250 m	PLC/IPC[1])
RS 422 with inverted signals	up to 1000 m (> 50 m depending on frequency)	PLC/IPC[1])
Voltage sinus with inverted signals	50 m	PLC/IPC[1])

1)IPC = industrial PC

Annotations:

- Depending on the application the recommended cable length can be shorter, especially in areas with strong electrical noise.
- Always use shielded cables
- The core diameter of the signal cores should be ∅ 0,14 mm²
- The core diameter of the voltage supply cores should be large enough depending on the cable length, that the voltage supply of the encoder is high enough and the signals do not go below the minimum levels!

We strictly recommend the use of the cable types written down in the accessories.

GENERAL/OVERVIEW
General

Selecting an Absolute encoder

Design and function:

Absolute encoders have a disk with a digital coding on concentric tracks. This code is read by a Opto-Asic. A unique bit pattern is assigned to each position.

The advantage is, that after power failure true position verification is available as soon as power is up again, even if the shaft was moved during the dead state.

Advantage:

No reference drives after starting-up are necessary as with incremental systems. Safety is increased and the time taken for reference drives is saved.

Selecting an absolute encoder:

When selecting the right absolute encoder the following parameters should be considered in addition to the recomendations on page 8–10.

- Supply voltage
- Type of code
- Interface(SSI,parallel,fieldbus, 4...20mA)

Versions:

Singleturn encoders:

Depending on the number of divisions they genrate up to 131072 (17 Bit) unique per turn. This corresponds to an angular resolution of 0,0028°. After one revolution the process re-starts.

Singleturn encoders can be used in applications where revolution is sufficient, e.g. measurement of angles, robotic.

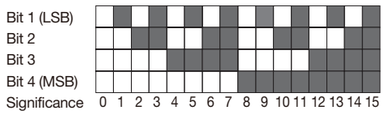
Multiturn encoders:

They are available with up to 131072 (17 Bit) definite angular positions per revolution and in addition 4096 (12 Bit) definite revolutions. This corresponds to 70 billion definite positions.

Multiturn encoders can be used for positioning applications e.g. automatic storage, retiered systems, lift elevators, cranes, machine tool, etc.

Code types:

Binary Code:



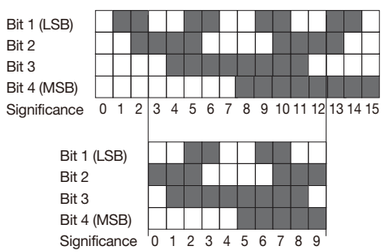
The binary code can be processed very easily by computer systems. When using optical read-out, errors may occure, because the change from one bit to another on the different concentric tracks (LSB, LSB+1...) is not exactly synchronized. Due to this, without any correction of the code, the position information could be wrong.

Gray Code:

The Gray Code is a single-step code. This indicates, that from one position to the next only 1 bit is changed. The reliability of the code detection is increased, which leads to a high position-reliability.

The gray code is used to opticaly read out the position for all absolute encoders

Symmetrically cut Gray Code (Gray-Excess):

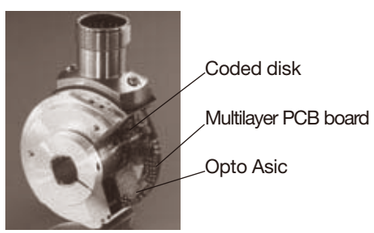


The extraction of a defined part of the gray code leads to the gray-excess code. This code enables the generation of non binary based divisions, e.g. 360, 720, 1000, 1440.

Reversion of the Gray Code:

The code values increase when the shaft is turning clockwise. If the most significant bit (MSB) is inverted, the code values decrease when the shaft is turning clockwise

Optical disk in Gray code



GENERAL/OVERVIEW
General

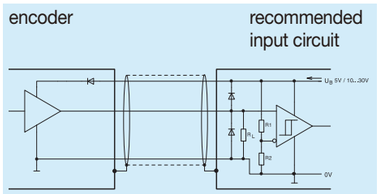
Outputs

To transfer the position data to a controller, different interfaces are available.

Parallel output:

This type of transfer is very fast. All bits of a position are transferred simultaneously each via a separate line.

Output circuit and recommended input circuit parallel interface:

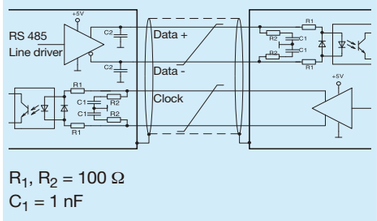


Synchronous Serial Interface (SSI):

SSI

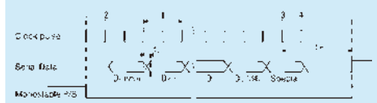
Compared to the parallel interface, the SSI interface needs less components and the EMC-characteristics are much better. In addition less cores are needed for transmission and the possible cable length is much longer.

Output circuit and recommended input circuit of the SSI-Interface:



R_1, R_2 = 100 Ω
C_1 = 1 nF

Synchronous-serial Transfer (SSI):



T = clock pulse period
t_m = storage time of monostable element
t_m ranging from 10 µs to 30 µs
t_v = 100 ns

The number of clock pulses necessary for data transfer is independent of the resolution of the absolute shaft encoder.

The clock signal can be interrupted at any point, or continued in ring-register mode for repeated polling.

With the first shift of the clock signal from low to high ② the most significant bit (MSB) of the angular data is applied to the shaft encoder's serial output.

With each succeeding rising edge, the next less significant bit is shifted to the data output.

After transmission of the least significant bit (LSB) the Alarm bit or other special bits are transferred, depending on configuration. Then the data line switches to low ③ until the time t_m has passed.

A further transfer of data cannot be started until the data line switches to high ④ again. If the clock pulse sequence is not interrupted at point ③, the ring-register mode is activated automatically. This means that the data stored at the first clock pulse transition ① are returned to the serial input si via the terminal so. As long as the clock pulse is not interrupted at ③, the data can be read out as often as wanted (multiple transfer).

GENERAL/OVERVIEW
Interface

Cable length:

Depending on the desired output circuit, we recommend following cable lengths:

Interface and output circuit	max. cable length	Connected to
Parallel CMOS/TTL	2 m	PLC/IPC[1])
Parallel push-pull	100 m	PLC/IPC[1])
SSI	up to 1200 m	PLC/IPC[1])
RS 422 /RS 485	(> 50 m depending on frequency)	

[1])IPC = Industrial PC

Notes:
- Depending on the application the max. allowed cable length can be shorter, especially in areas with strong electrical noise.
- Always use shielded cables
- The core diameter of the signal cores should be Ø 0,14 mm_2
- The core diameter of the voltage supply cores should be large enough depending on the cable length, that the voltage supply of the encoder is high enough and the signals do not go below the minimum levels!

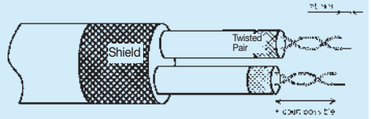
We strictly recommend the use of the cable types written down in the accessories.

Connection – precautions

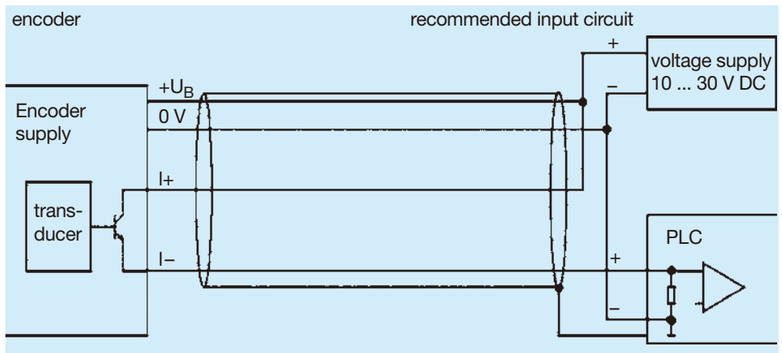
For the connection of the shield braids, refer to the logic control documentation. In all cases, for grounding, the braids must be covered through 360º. All unused conductors must be connected to the same potential at both ends.

Keep the encoder connection cables as far away from the power cables as possible and avoid running them in parallel. Finally, for the same regulated power supply, only connect encoders drawing the current that the power supply can deliver. Group the signals of the same type by pair, CLK+ with CLK-, DATA+ with DATA-.

SSI Transmission



Type of connection and recommended input circuit



BiSS Sensor Communication
Bi-directional and fully-digital
BISS

BiSS is a fully-digital and bi-directional sensor interface. It defines communication between one master and several slaves (sensors) in industrial control systems. BiSS manifests a new standard in technology and is available license-free (GPL). Due to its high performance, it constitutes an efficient alternative to the standard combination of data interface and analog sine/cosine incremental output.

BiSS only needs a total of 6 lines (4 data, 2 power), does not require any hardware for analog signals (cable(s)/drive interpolation electronics) – and so helps to reduce system costs.

Bus Networking:
Up to 8 sensors can be connected to a bus-master. Wiring and control cost is considerably reduced for multi axe applications.

GENERAL/OVERVIEW
General

Bus systems:

The use of a network of sensor-actuator bus systems has essential advantages:
- Reduced expenditure concerning connection: All members are linked by one cable.
- Wide range diagnostics and programming possibility of the units.

In the following please find the available bus systems:

INTERBUS DeviceNet™ PROFIBUS CANopen

CAN:

CANopen

- CAN fullfils the real time demands of the automobile industries (ABS, Airbag, Motormanagement)
- Multi-Master system
- The message text (speed, position...) itself is marked by an identifier through the whole network, instead of indexing the nodes.
- Check for importance of message
- Accept or ignore ® network wide broadcasting
- high allocation on the network
- Monitoring (high reliability)
- Bus Specification according to CAN High Speed ISO/DIN 11898 for transmission rates of up to 1 Mbaud.

Introduction

The Meyle CANopen encoder is an absolute encoder. The version described sends its current position to another station via the "CAN-bus" transmission medium (physically: screened and twisted two-wire line).

The serial bus system CAN (Controller Area Network), which had been originally developed for automotive uses, is gaining ground in industrial automation technology. The system is multimaster compatible, i.e. several CAN- stations are able to request the bus at the same time. The data transfer is regulated by the message's priority. The message with the highest priority (determined by the identifier) will be received immediately. Within the CAN system, there are message identifiers but no transport addresses. The message which is being sent can be received by all stations at the same time (broadcast). By means of a special filter method, the station only accepts the relevant messages which is of importance for this station. The identifier transmitted with the message is the basis for the decision as to whether the message will be accepted or not.

The bus coupler is standardised according to the international standard ISO-DIS 11898 (CAN High Speed) and allows data to be transferred at a maximum rate of 1 MBit/s. The most significant feature of the CAN-protocol is its high level of transmission reliability (Hamming distance = 6). The CAN-Controller Intel 82527 used in the encoder is basic as well as full-CAN compatible and supports the CAN-specification 2.0 part B (standard protocol with 11-bit- identifier as well as extended protocol with 29-bit identifier).

Field of application

In applications, where the position of a drive or of other parts of a machine has to be recorded and signalled to the control system, the encoder can carry out this function. The encoder can resolve, for instance, positioning tasks by sending the check-back signal concerning the present drive position via the CAN bus to the positioning unit.

GENERAL/OVERVIEW
General

The CANopen Profile

CANopen allows for:
- synchronisation of the devices,
- auto-configuration of the network,
- comfortable access to all device parameters.
- simultaneous data input and output.
- cyclical and event-controlled process data processing,

CANopen uses four communication objects (COB) with different features:
- Process Data Objects (PDO) for real-time data
- Service Data Objects (SDO) for the transfer of parameters and programs
- Network Management (NMT, Life-Guarding)
- predefined objects (for synchronisation, time stamp, emergency message)

All device parameters are stored in an object directory. The object directory contains the description, data type and structure of the parameters as well as their addresses (index).

The directory consists of three parts:
- communication
- profile parameters,
- device profile parameters and manufacturer specific parameters.

Existing Profiles

The following device profiles already exist:
- CiA Draft Standard Proposal 401 for Input/Output Modules
- CiA Draft Standard Proposal 402 for Drives and Motion Control
- CiA Work Item 403 for Human-Machine Interfaces
- CiA Draft Standard Proposal 404 for Closed-Loop Controllers and Transformers
- CiA Work Item 405 for IEC-1131 Interfaces
- CiA Draft Standard Proposal 406 for Encoders
- CiA Work Item 407 for Public Transport
- CiA Work Item 408 for Fork-Lifts

The encoder device profile (CIA DSP 406)

This profile describes a standardised and binding, but manufacturer-independent definition of the interface for encoders. The profile not only defines which CANopen functions are to be used, but also how they are to be used. This standard allows an open and manufacturer-independent bus system. The device profile consists of two object categories
- the standard category C1 describes all the basic functions the shaft encoder must contain
- the extended category C2 contains a variety of additional functions which either have to be supported by category C2 shaft encoders (mandatory) or which are optional. Category C2 devices thus contain all C1 and C2 mandatory functions as well as, depending on the manufacturer, further optional functions. In addition, an addressable area is defined in the profile, to which, depending on the manufacturer, different functions can be assigned.

DATA Transmission

In CANopen, the data is transferred by means of two different communication types (COB = Communication Object) with different features:
- Process Data Objects (PDO)
- Service Data Objects (SDO)

The priority of the message objects is determined by the COB identifier.

The process data objects (PDO) serve the highly dynamic exchange of real-time data (e.g. position of the shaft encoder) with a maximum length of 8 Byte.

This data is transferred with high priority (low COB identifier). PDOs are broadcast messages and put their information simultaneously at the disposal of all desired receivers. The service data objects (SDO) form the communication channel for the transfer of device parameters (e.g. programming of the shaft encoder's resolution). Since these parameters are transferred acyclically (e.g. only once when starting up the network), the SDO objects have a low priority (high COB identifier).

GENERAL/OVERVIEW
General

Profibus: General Information

PROFIBUS

Introduction

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.

The Meyle Profibus encoders are absolute encoders. The version described sends its current position to another station via the transmission medium "PROFIBUS DP" (physically: screened and twisted pair line). The Profibus encoder supports all class 1 and 2 functions listed in the encoder profile.

PROFIBUS-DP is standardised and binding, but manufacturer-independent definition for a variety of applications in the field of production, process and automation. The requirements of openness and independence from the manufacturer are stipulated in the European standard EN 50 170.

PROFIBUS-DP permits the communication of devices produced by different manufacturers without any particular adaptations of the interfaces. PROFIBUS DP is a special standard version for a quick data exchange within the field level which has been optimised in terms of speed and low connection costs. Central with local field devices like drives, valves, or encoders. The data exchange between these devices is predominantly cyclical. The communication functions required for this exchange are determined by the functions of the PROFIBUS DP according to the EN 50 170 European standard.

Field of application

In systems, where the position of a drive or of any other part of a machine has to be recorded and transmitted to the control system, the encoder is doing this function. The encoder can resolve, for instance,

positioning tasks by sending the feedback signal concerning the present drive position via the PROFIBUS DP to the positioning unit.

Basic function of the Profibus DP

The central control system (master) cyclically reads out the input information from the slaves and transmits the output information to the slaves. For this purpose, the bus cycle time has to be shorter than the program cycle time of the central control system (e.g. SPC, or IPC), which amounts to approx. 10 ms for several applications. Beside the cyclical user data transfer, the PROFIBUS DP version also disposes of powerful functions for diagnosis and initial operation procedures. The data traffic is controlled by watchdog functions on both the slave and the master side. In the following the basic functions of the PROFIBUS DP are summarised in short.

PROFIBUS DP Basic Functions

Transmission technology:
- RS-485 twisted pair line
- Baud rates ranging from 9.6 kbit/s up to 12 Mbit/s

Bus access:
- Monomaster or multimaster systems possible
- Token passing procedure between the masters and master-slave procedures for slaves
- Master and slave devices, max. of 126 stations at a single bus

Communication:
- Point-to-point (user data communication) or multicas (control commands)
- Cyclical master-slave user data communication and acyclical master-master data transfer

Operating state:
- Operate: cyclical transfer of input and output data
- Stop: only master-master data transfer is possible
- Clear: The input data are read, the output data remain in the safe status
- Synchronisation: Control commands enable a synchronisation of the input and output data
- Sync mode: Output data are being synchronised

Functionality:
- Address assignment for the DP slaves via the bus
- Cyclical user data transfer between DP master and DP slave(s)
- Configuration of the DP master (DPM1) via the bus
- Single DP slaves are dynamically activated or deactivated
- Control of the DP slave's configuration.
- Powerful diagnostic functions, 3 stepped diagnostic message levels.
- Maximum of 246 byte input and output data per DP slave possible
- Synchronisation of in- and/ or output
- Protection functions:
- Access protection of the DP slaves' input/output
- All messages are transferred with a hamming distance of HD=4
- Response control at the DP slaves
- Monitoring of the user data communication with adjustable control timer at the master

Device types:
- DP master class 2 (DPM2), e.g. programming/ project planning devices
- DP master class 1 (DPM1), e.g. central automation devices like SPC, PC
- DP slave e. g. devices with binary or analogue input/output, drives, valves

GENERAL/OVERVIEW
General

Diagnostic function

The extensive diagnostic functions of PROFIBUS DP allow a quick localisation of possible errors. The diagnostic messages are transmitted by means of the bus and are joined together at the master.

System Performance

To ensure a high level of exchangeability between the devices, the system performance of PROFIBUS DP has also been standardised. It is mainly determined by the operational status of the DPM1. The DPM1 can either be controlled locally or via the bus by the project planning device. The following three main states are available:

Operate

The DPM1 has entered the data transfer phase. In case of a cyclical data traffic, the input is read by the DP slaves while the output is transferred to the DP slaves. After an error has occurred during the data transfer phase of the DPM1, like for example, the failure of a DP slave, the response of the system is determined by the operating parameter "Auto Clear". If this parameter has been set to true, the DPM1 will set the output of all the respective DP slaves to the safe status, as soon as a DP slave is no longer available for user data communication. Afterwards, the DPM1 changes to the clear status. If this parameter is = false, the DPM1 remains, even if an error occurs, in the operate status, and the user can determine the response of the system at his own decision.

Stop

There is no data traffic between DPM1 and the DP slaves.

Clear

The DPM1 reads the input information of the DP slaves and maintains the safe status of the DP slaves' output.

Cyclical data transfer between DPM1 and the DP SLAVES

The data traffic between the DPM1 and the respective DP slaves is automatically handled by the DPM1 in a fixed, recurring order. When configuring the bus system, the user assigns a DP slave to the DPM1. In addition

the slaves are in- or excluded from the user data communication. The data traffic between the DPM1 and the DP slaves is subdivided in three phases: parameterisation, configuration, and data transfer.

Before including a DP slave in the data transfer phase, the DPM1 checks during the parameterisation and configuration phase, whether the planned set configuration corresponds to the actual configuration of the device. For this check, the device type, the information on the format and the length as well as the number of input and output lines have to be correct. Due to this check it is ensured that the parameterisation is reliable and correct at the end. In addition to the user communication, which is automatically executed by the DPM1, the user can request the new parameterisation data to be sent to the DP slaves.

GENERAL/OVERVIEW
General

Profile

PROFINET, launched by PROFIBUS International (PI), is a new-generation industrial-ethernet-technology-based automation bus standard.

PROFINET provides a sound and complete network solution for automation communication, including topical issues in the field of automation such as real-time Ethernet, motion control, distributed automation, fail-safe and network security. This cross-supplier technology is compatible with industrial Ethernet and existing profibus technology to protect existing investment.

Technology

To achieve the above communication functions, the following three communication protocol levels are defined. [1]

- TCP/IP is for PROFINET CBA and factory debugging, with a response time of about 100ms.
- RT (real-time) communication protocol is for PROFINET CBA and PROFINET IO, with a response time of less than 10ms.
- IRT (isochronous real-time) communication protocol is for PROFINET IO communication of the drive system, with a response time of less than 1ms. Ethernet analysis tools help to record and display the packets of the PROFINET communication protocol. Some software interpret PROFINET data frames.

PROFINET component model

A PROFINET CBA system includes many automated components, mechanical, electronic or IT variables generated by standard programming tools. Components are described by PROFINET Component Description (PCD) files in XML format. Planning tools load these descriptions and establish logical relationships between the different components. This mode is considerably influenced by the EC 61499 standard. The basic concept of PROFINET CBA is that many times the automation system can be divided into several small subsystems, clearly distinguished from each other. PROFINET components are generally controlled by only a few input signals. With these components, the program written by the user activates a specific function in the component and transmits the output signal to another, using a maker-neutral technology. Component-based communication requires only planning, not programming. PROFINET CBA communication (non-real-time communication) is suitable for systems with a bus cycle time of 50-100 ms.

PROFINET and peripherals

PROFINET network communicates with external devices through PROFINET IO. PROFINET IO defines the communication function of external devices connected to the field. Its basis is the real-time concept of cascading. PROFINET IO defines the controller (with "master function" equipment) and other equipment (with "slave function" equipment) complete data exchange, parameter setting and diagnosis functions. PROFINET IO is designed to provide fast data transmission between Ethernet-connected devices and supports the provider-consumer model. Devices that support the PROFIBUS communication protocol can be seamlessly connected to the PROFINET network without the need for IO-proxy and other devices. Device developers may use commercially available Ethernet controllers to develop PROFINET IO devices.
PROFINET IO is suitable for systems with network cycle times of several milliseconds. [2]

PROFINET IO system package:

- IO controller that controls the automated task.
- IO devices, generally field devices controlled and monitored by IO controller. One IO device may include several modules or sub-modules.
- IO monitor, a PC software, can set parameters and diagnose the status of individual modules.

PROFINET IO establishes an application relation (AR) between the IO controller and the IO device, in which communication relations (CR) with different characteristics such as parameter transmission, periodic data exchange, and warning processing are defined.

General/Overview

General

PROFINET IO Addressing

Each module in the PROFINET network has the following three addresses:
- MAC address。
- IP address。
- Device name is the logical name defined for the module in the entire network configuration.

Since PROFINET uses TCP/P, MAC address and IP address are used. In case a device is replaced with another, its MAC address changes, and the IP address is the result of dynamic addressing. To have a fixed name for a certain device on the network, a device is named.
To assign IP addresses, subnet masks and default gateways, the following two methods are defined:
DCP (Protocol) (Discovery and Configuration Protocol).
DHCP (Dynamic Host Configuration Protocol).

PROFINET and real-time

In the PROFINET IO network, program data and warnings are transmitted in real time. The real-time of PROF-INET is according to the definition of IEEE and IEC, which allows real-time services to be processed within a limited time within a network cycle. Real-time communication is the basis for PROFINET IO data exchange. When processing, the real-time data is higher than that of TCP (UDPVIP data in priority. PROFINET RT, the basis for decentralized peripheral real-time communication, is also for the PROFINET component model (PROFINET CBA). The bus cycle time for general data exchange is within hundreds of microseconds.

PROFINET and Isochronous Communication

The isochronous data exchange of PROF-INET is defined in the isochronous real time (IRT) function.
PROFINET IO field devices with IRT functionality have switch ports integrated in the field devices and can be based on Ether-net controllers ERTEC 400/200.The bus cycle time for general data exchange is from hundreds of milliseconds to several micro-seconds. The difference between isochro-nous communication and real-time commu-nication is that the former features a high degree of certainty. The start time of the bus cycle can be maintained to a high accuracy with a jitter of up to 1 µs. Motion control applications like motor position control programs use isochronous real-time commu-nication.

Application profile

Application profile (profile) is a special device or a pre-defined function and feature configu-ration for a special application.
The PROFINET application profile is formu-lated by the PI (PROFIBUS & PROFINET International Association) working group and issued by PI. Application profiles contribute to the openness, interoperability and interchange-ability of equipment, so end users can be sure that similar equipment provided by different equipment manufacturers will have standardized functions and usage methods. Choices by users promote the competition of equipment manufacturers, which improves the function of the product and lowers the cost. PROFINET has many application profiles, such as for encoders, PROFIdriveand PROFIsafe. There are even dedicated application profiles for trains. In 2009, German automakers proposed the PROF-lenergy application profile, which mainly manages energy consumption during vehicle manufacturing.

EC/EDXX

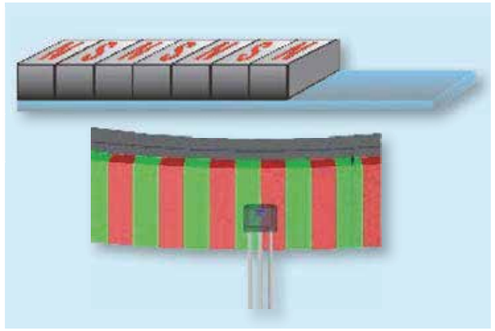
Magnetic Linear Incremental Encoder System MyLin

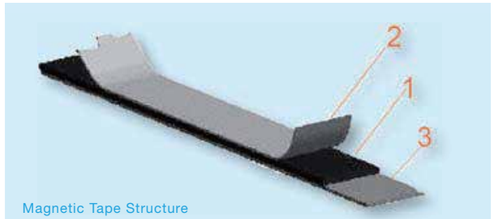
The purpose of linear encoder systems is to measure the displace-ment on industrial an automation systems. It is an incremental meas-uring system, which consists of a sensing head and a magnetic encode tape.

The tape has alternating magnetic north-south poles with a gap up to 2.5 mm.

The sensor head is moved along the magnetic tape and produces an output signal equivalent to an incremental encoder or linear scale with a resolution up to 1 µm.

A distance up to 2.5 mm (approx. 50 % of the pole width) between sensor head and magnetic tape is allowed.





Magnetic Tape Structure

This system is highly immune to contermination of oils, dust, etc. and his ideal for use is harsh, dusty industrial environments.

The highly rugged, flexible magnetic tape can be applied to a tool very easy.
1. magnetic tape
2. magnetised steel cover tape
3. carrier tape

EINS24

Micro Solid Shaft Encoder

Features

- ϕ 24mm micro od, suitable for small space
- Fast response and high precision
- Max. 2500 pulses
- Suitable for small instrument applications

Specifications

Electrical Specifications

Supply Voltage	10-30VDC
Current Consumption	60mA (P-P)
Output Circuit	PUSH-PULL output
Resolution	2500PPR (Max.)
Output Frequency	150kHz
Permissible Load/Channel	Max. 30mA
Rise Time	200ns
Electrical Protection	Short Circuit, reverse polarity and lightning Protection
Level signal	H: >70%VCC L: <1V

Mechanical Specifications

Maximum speed	6000rpm
Shaft load	Axial 20N Radial 20N
Starting Torque	<0.005Nm
Shock Resistance	EN 60068-2-27 1000m/s² 6ms
Vibration Resistance	EN 60068-2-6 100m/s² 55....2000HZ
Operating Temperature	-25°C to +85°C
Protection Class	IP65
Material	Aluminum (shell) , stainless steel (shaft)
Weight	50g

Incremental Encoder | **Optical**

MEYLE

Intro. and Quick Selection

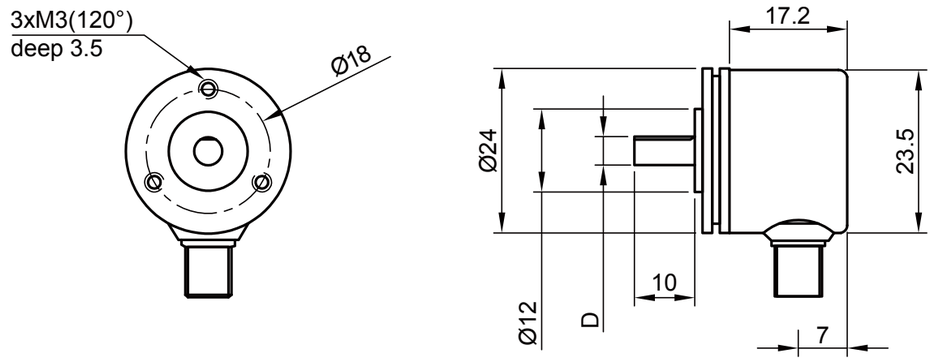
Incremental encoder

Absolute encoder

special position device

Accessories and Kits

Dimension (Installation flanges, hole positions, etc. shall be subject to the order confirmation)



unit: mm

D=4,5,6,on request

Connection

Function	3A / 3R
GND	white
VCC	brown
A	green
B	yellow
Z	grey
$\overline{A}$	pink
$\overline{B}$	blue
$\overline{Z}$	red

Ordering Code

Example: EINS2404A593R-1024
24 micro solid shaft encoder 1024 pulse push-pull output with ABZ inverse signal, axle diameter 4mm, radial straight out cable

EINS24	shaft	output	signals	connection	resolution
	04=4x10mm	**A5**=10-30V	**8**=ABZ	**3A**=axial output	36/50/100
	05=5x10mm	push-pull	**9**=ABZ$\overline{A}\overline{B}\overline{Z}$	**3R**=radial output	125/128/200
	06=6x10mm				256/500/512
	XX=custom-made				1000/1024
					1250/1500
					2000/2048
					2500
					36-2500
					customizable

EINB24

Micro Blind Shaft Encoder

Features

- ϕ 24mm micro od, suitable for small space
- Fast response and high precision
- Max. 2500 pulses
- Suitable for small instrument applications

Specifications

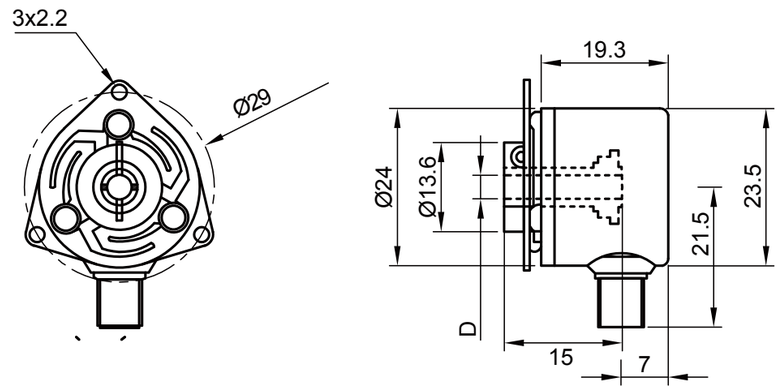
Electrical Specifications

Supply Voltage	10-30VDC
Current Consumption	60mA (P-P)
Output Circuit	PUSH-PULL output
Resolution	2500PPR (Max.)
Output Frequency	150kHz
Permissible Load/Channel	Max. 30mA
Rise Time	200ns
Electrical Protection	Short Circuit, reverse polarity and lightning Protection
Level signal	H: >70%VCC L: <1V

Mechanical Specifications

Maximum speed	6000rpm
Shaft load	Axial 20N Radial 20N
Starting Torque	<0.005Nm <0.005Nm
Shock Resistance	EN 60068-2-27 1000m/s² 6ms
Vibration Resistance	EN 60068-2-6 100m/s² 55....2000HZ
Operating Temperature	-25°C to +85°C
Protection Class	IP65
Material	Aluminum
Weight	50g

Dimension (Installation flanges, hole positions, etc. shall be subject to the order confirmation)



unit: mm

D=4,5,6,on request

Connection

Function	3A / 3R
GND	white
VCC	brown
A	green
B	yellow
Z	grey
$\overline{A}$	pink
$\overline{B}$	blue
$\overline{Z}$	red

Ordering Code

Example: EINB2404A593R-1024
24 micro blind shaft encoder 1024 pulse push-pull output with ABZ inverse signal, aperture 4mm, radial straight out cable

EINB24	shaft	output	signals	connection	resolution
	04=4mm	**A5**=10-30V	**8**=ABZ	**3A**=axial output	36/50/100
	05=5mm	push-pull	**9**=ABZ$\overline{A}\overline{B}\overline{Z}$	**3R**=radial output	125/128/200
	06=6mm				256/500/512
	XX=custom-made				1000/1024
					1250/1500
					2000/2048
					2500
					36-2500
					customizable

EINS30

Small Solid Shaft Encoder

Features

- High precision, short response time
- ϕ28mm OD, Suitable for inserting installation
- Max. 3600 pulses
- Suitable for engraving machine, printing machine and other applications

Specifications

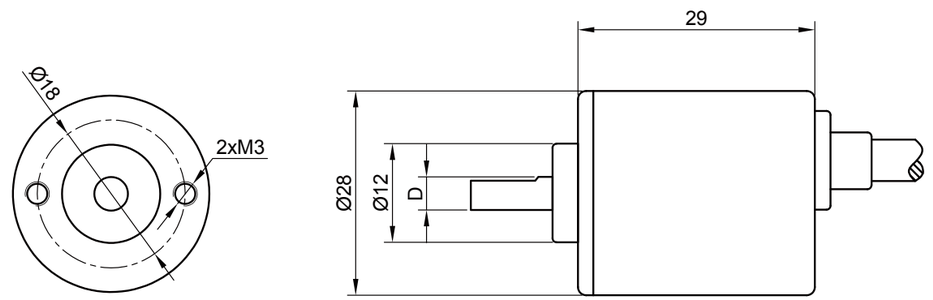
Electrical Specifications

Supply Voltage	5VDC, 10-30VDC
Current Consumption	60mA (P-P) , 140mA (RS422)
Output Circuit	PUSH-PULL output , RS422
Resolution	3600PPR (Max.)
Output Frequency	150kHz
Permissible Load/Channel	Max. 30mA
Rise Time	200ns
Electrical Protection	Short Circuit, reverse polarity and lightning Protection
Level signal	H: >70%VCC L: <1V

Mechanical Specifications

Maximum speed	8000rpm
Shaft load	Axial 20N Radial 40N
Starting Torque	<0.005Nm
Shock Resistance	EN 60068-2-27 1000m/s² 6ms
Vibration Resistance	EN 60068-2-6 100m/s² 55....2000HZ
Operating Temperature	-25°C to +85°C
Protection Class	IP65
Material	Aluminum (shell) , stainless steel (shaft)
Weight	90g

Dimension (Installation flanges, hole positions, etc. shall be subject to the order confirmation)



unit: mm

D=5,6,8,on request

Connection

Function	3A / 3R
GND	white
VCC	brown
A	green
B	yellow
Z	grey
$\overline{A}$	pink
$\overline{B}$	blue
$\overline{Z}$	red

Ordering Code

Example: EINS3006A593R-1024
30 small solid shaft encoder 1024 pulse push-pull output with ABZ inverse signal, axle diameter 6mm, radial straight out cable

EINS30	shaft	output	signals	connection	resolution
	04=4x10mm	**A2**=5V RS422	**8**=ABZ	**3A**=axial output	36/50/100
	06=6x10mm	**A5**=10-30V	**9**=ABZ$\overline{A}\overline{B}\overline{Z}$	**3R**=radial output	125/150/200
	08=8x12mm	push-pull			256/500/512
	XX=custom-made				1000/1024
					1250/1500
					2000/2048
					2500/3000
					3600
					36-3600
					customizable

EINS40

Small Solid Shaft Encoder

Features

- High precision, Stable working performance
- ϕ38mm OD, Optional IP67
- Max. 5000 pulses
- Suitable for robot, machine tool and other applications

Specifications

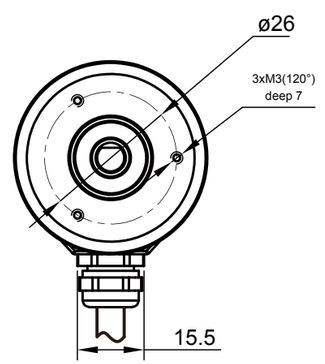
Electrical Specifications

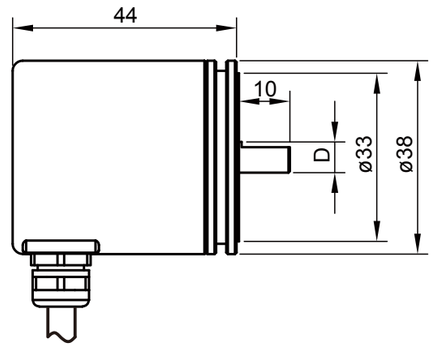
Supply Voltage	5VDC, 10-30VDC
Current Consumption	60mA (P-P) , 140mA (RS422)
Output Circuit	PUSH-PULL output , RS422
Resolution	5000PPR (Max.)
Output Frequency	150kHz
Permissible Load/Channel	Max. 30mA
Rise Time	200ns
Electrical Protection	Short Circuit, reverse polarity and lightning Protection
Level signal	H: >70%VCC L: <1V

Mechanical Specifications

Maximum speed	10000rpm
Shaft load	Axial 30N Radial 60N
Starting Torque	<0.025Nm
Shock Resistance	EN 60068-2-27 1000m/s² 6ms
Vibration Resistance	EN 60068-2-6 100m/s² 55....2000HZ
Operating Temperature	-25°C to +85°C
Protection Class	IP65/IP67 (option)
Material	Aluminum (shell) , stainless steel (shaft)
Weight	120g

Dimension (Installation flanges, hole positions, etc. shall be subject to the order confirmation)





unit: mm

D=6,8,on request

Connection

Function	3A / 3R
GND	white
VCC	brown
A	green
B	yellow
Z	grey
$\overline{A}$	pink
$\overline{B}$	blue
$\overline{Z}$	red

Ordering Code

Example: EINS4006A593R-1024
40 small solid shaft encoder 1024 pulse push-pull output with ABZ inverse signal, axle diameter 6mm, radial straight out cable

EINS40	shaft	output	signals	connection	resolution
	06=6x10mm	**A2**=5V RS422	**8**=ABZ	**3A**=axial output	100/125/128
	08=8x12mm	**A5**=10-30V	**9**=ABZ$\overline{A}\overline{B}\overline{Z}$	**3R**=radial output	200/256/500
	XX=custom-made	push-pull			512/1000/1024
					1250/1500
					2000/2048
					2500/3000
					3600/4000
					4096/5000
					50-5000
					customizable

EINH40

Small Hollow Shaft Encoder

Features

- High precision, Stable working performance
- ϕ38mm OD, Optional IP67
- Max. 5000 pulses
- Suitable for robot, machine tool and other applications

Specifications

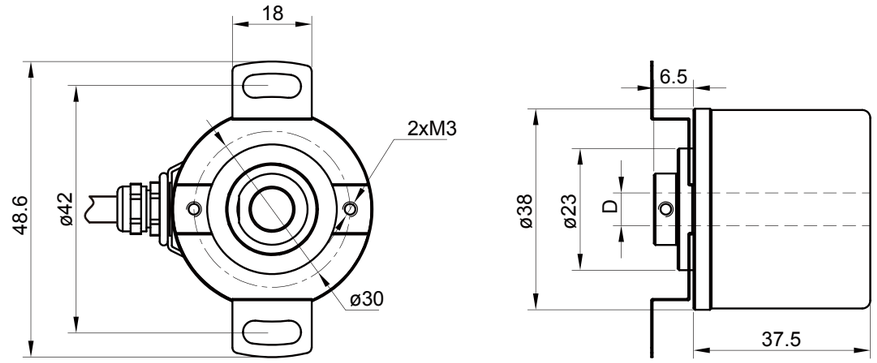
Electrical Specifications

Supply Voltage	5VDC, 10-30VDC
Current Consumption	60mA (P-P) , 140mA (RS422)
Output Circuit	PUSH-PULL output , RS422
Resolution	5000PPR (Max.)
Output Frequency	150kHz
Permissible Load/Channel	Max. 30mA
Rise Time	200ns
Electrical Protection	Short Circuit, reverse polarity and lightning Protection
Level signal	H: >70%VCC L: <1V

Mechanical Specifications

Maximum speed	10000rpm
Shaft load	Axial 30N Radial 60N
Starting Torque	<0.025Nm
Shock Resistance	EN 60068-2-27 1000m/s² 6ms
Vibration Resistance	EN 60068-2-6 100m/s² 55....2000HZ
Operating Temperature	-25°C to +85°C
Protection Class	IP65/IP67(Option)
Material	Aluminum
Weight	120g

Dimension (Installation flanges, hole positions, etc. shall be subject to the order confirmation)



unit: mm

D=6,8,on request

Connection

Function	3R
GND	white
VCC	brown
A	green
B	yellow
Z	grey
$\overline{A}$	pink
$\overline{B}$	blue
$\overline{Z}$	red

Ordering Code

Example: EINH4006A593R-1024
40 small hollow shaft encoder 1024 pulse push-pull output with ABZ inverse signal, aperture 6mm, radial straight out cable

EINH40	shaft	output	signals	connection	resolution
	06=6mm **08**=8mm **XX**=custom-made	**A2**=5V RS422 **A5**=10-30V push-pull	**8**=ABZ **9**=ABZ$\overline{A}\overline{B}\overline{Z}$	**3R**=axial output	100/125/128 200/256/500 512/1000/1024 1250/1500 2000/2048 2500/3000 3600/4000 4096/5000 50-5000cus-tomizable

EINB40

Small Blind Shaft Encoder

Features

- High precision, Stable working performance
- ϕ38mm OD, Optional IP67
- Max. 5000 pulses
- Suitable for robot, machine tool and other applications

Specifications

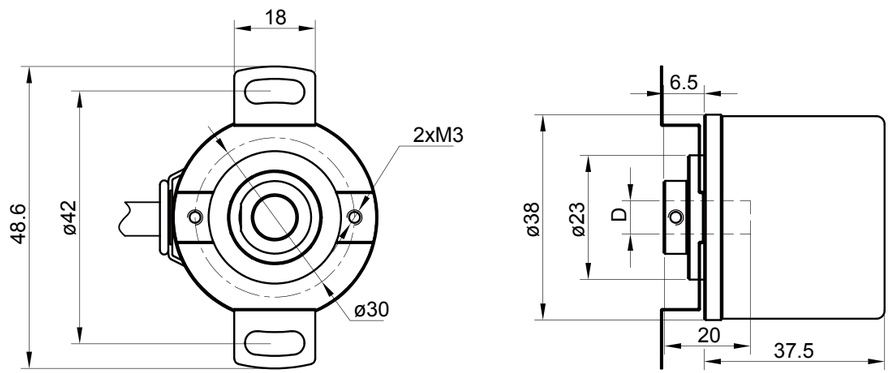
Electrical Specifications

Supply Voltage	5VDC, 10-30VDC
Current Consumption	60mA (P-P) , 140mA (RS422)
Output Circuit	PUSH-PULL output , RS422
Resolution	5000PPR (Max.)
Output Frequency	150kHz
Permissible Load/Channel	Max. 30mA
Rise Time	200ns
Electrical Protection	Short Circuit, reverse polarity and lightning Protection
Level signal	H: >70%VCC L: <1V

Mechanical Specifications

Maximum speed	10000rpm
Shaft load	Axial 30N Radial 60N
Starting Torque	<0.025Nm
Shock Resistance	EN 60068-2-27 1000m/s² 6ms
Vibration Resistance	EN 60068-2-6 100m/s² 55....2000HZ
Operating Temperature	-25°C to +85°C
Protection Class	IP65/IP67(Option)
Material	Aluminum
Weight	120g

Dimension (Installation flanges, hole positions, etc. shall be subject to the order confirmation)



unit: mm

D=6,8,on request

Connection

Function	3R
GND	white
VCC	brown
A	green
B	yellow
Z	grey
$\overline{A}$	pink
$\overline{B}$	blue
$\overline{Z}$	red

Ordering Code

Example: EINB4006A593R-1024
40 small blind shaft encoder 1024 pulse push-pull output with ABZ inverse signal, aperture 6mm, radial straight out cable

EINB40	shaft	output	signals	connection	resolution
	06=6mm **08**=8mm **XX**=custom-made	**A2**=5V RS422 **A5**=10-30V push-pull	**8**=ABZ **9**=ABZ$\overline{A}\overline{B}\overline{Z}$	**3R**=axial output	100/125/128 200/256/500 512/1000/1024 1250/1500 2048/2000 2500/3000 3600/4000 4096/5000 50-5000cus-tomizable

EINS50

Universal Solid Shaft Encoder

Features

- Responsiveness , Optional IP67
- Standard ϕ50mm OD
- Max. 10000 pulses
- Suitable for flow monitoring, transmission control and other applications

Specifications

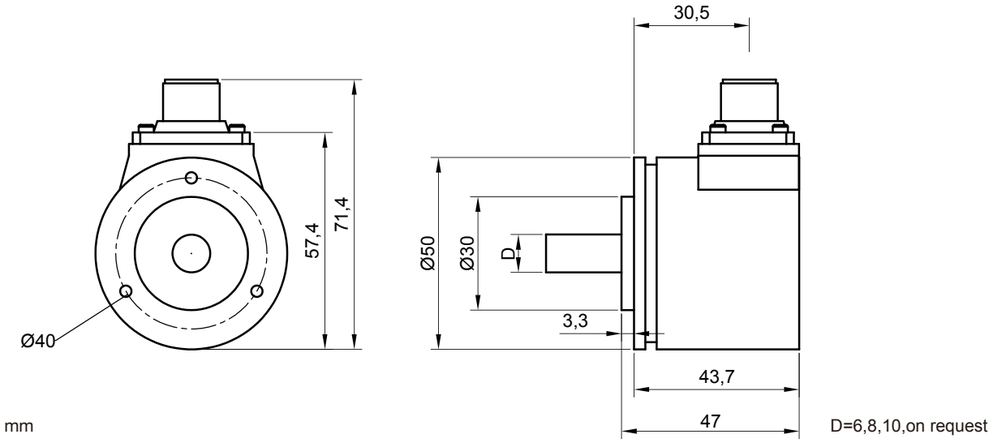
Electrical Specifications

Supply Voltage	5VDC, 10-30VDC
Current Consumption	60mA (P-P) , 140mA (RS422)
Output Circuit	PUSH-PULL output , RS422
Resolution	10000PPR (Max.)
Output Frequency	150kHz
Permissible Load/Channel	Max. 30mA
Rise Time	200ns
Electrical Protection	Short Circuit, reverse polarity and lightning Protection
Level signal	H: >70%VCC L: <1V

Mechanical Specifications

Maximum speed	10000rpm
Shaft load	Axial 40N Radial 80N
Starting Torque	<0.025Nm
Shock Resistance	EN 60068-2-27 1000m/s² 6ms
Vibration Resistance	EN 60068-2-6 100m/s² 55....2000HZ
Operating Temperature	-25°C to +85°C
Protection Class	IP65/IP67 (option)
Material	Aluminum (shell) , stainless steel (shaft)
Weight	190g

Dimension (Installation flanges, hole positions, etc. shall be subject to the order confirmation)



unit: mm

D=6,8,10,on request

Connection

Function	3A / 3R	6A/6R/8A/8R
GND	white	1
VCC	brown	2
A	green	3
B	yellow	4
Z	grey	5
$\overline{A}$	pink	6
$\overline{B}$	blue	7
$\overline{Z}$	red	8

Ordering Code

Example: EINS5006A593R-1024
50 universal solid shaft encoder 1024 pulse push-pull output with ABZ inverse signal, axle diameter 6mm, radial straight out cable

EINS50	shaft	output	signals	connection	resolution
	06=6x10mm	**A2**=5V RS422	**8**=ABZ	**3A**=axial output	200/256/500
	08=8x12mm	**A5**=10-30V	**9**=ABZ$\overline{A}\overline{B}\overline{Z}$	**3R**=radial output	512/1000/1024
	10=10x20mm	push-pull		**6A**=connector axial output (cw)	1250/1500
	XX=custom-made				2000/2048
					2500/3000
				6R=connector radial output (cw)	3600/4000
					4096/5000
				8A=connector axial output (cw)	6000/7000
					7500/8000
					8192/9000
				8R=connector radial output (cw)	10000
					50-10000
					customizable

EINH50

Universal Hollow Shaft Encoder

Features

- Responsiveness , Optional IP67
- Standard ϕ50mm OD
- Max. 10000 pulses
- Suitable for flow monitoring, transmission control and other applications

Specifications

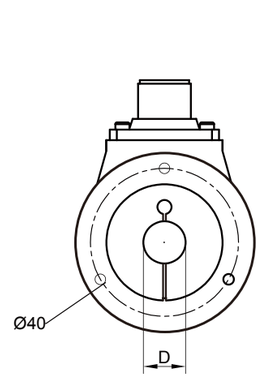
Electrical Specifications

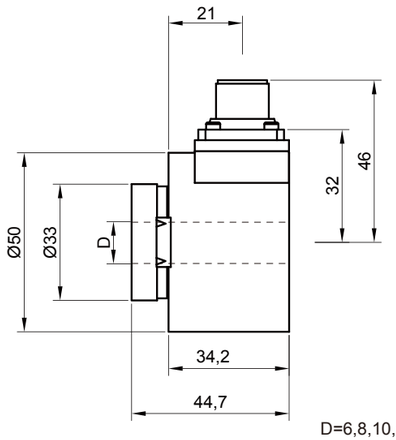
Supply Voltage	5VDC, 10-30VDC
Current Consumption	60mA (P-P) , 140mA (RS422)
Output Circuit	PUSH-PULL output , RS422
Resolution	10000PPR (Max.)
Output Frequency	150kHz
Permissible Load/Channel	Max. 30mA
Rise Time	200ns
Electrical Protection	Short Circuit, reverse polarity and lightning Protection
Level signal	H: >70%VCC L: <1V

Mechanical Specifications

maximum speed	10000rpm
Shaft load	Axial 40N Radial 80N
Starting Torque	<0.03Nm
Shock Resistance	EN 60068-2-27 1000m/s² 6ms
Vibration Resistance	EN 60068-2-6 100m/s² 55....2000HZ
Operating Temperature	-25°C to +85°C
Protection Class	IP65/IP67 (option)
Material	Aluminum
Weight	190g

Dimension (Installation flanges, hole positions, etc. shall be subject to the order confirmation)





unit: mm

D=6,8,10,on request

Connection

Function	3R	6R/8R
GND	white	1
VCC	brown	2
A	green	3
B	yellow	4
Z	grey	5
$\overline{A}$	pink	6
$\overline{B}$	blue	7
$\overline{Z}$	red	8

Ordering Code

Example: EINH5006A593R-1024
50 universal hollow shaft encoder 1024 pulse push-pull output with ABZ inverse signal, aperture 6mm, radial straight out cable

EINH50	shaft	output	signals	connection	resolution
	06=6mm **08**=8mm **10**=10mm **XX**=custom-made	**A2**=5V RS422 **A5**=10-30V push-pull	**8**=ABZ **9**=ABZ$\overline{A}\overline{B}\overline{Z}$	**3R**=radial output **6R**=connector radial output (cw) **8R**=connector radial output (ccw)	1024/1250 1500/2000 2048/2500 3000/3600 4000/4096 5000/6000 7000/7500 8000/8192 9000/10000 50-10000 customizable

EINS58

Standard Solid Shaft Encoder

Features

- High protection grade, up to IP67, suitable for various occasions
- Standard ϕ58mm OD, easy to install and pair
- Max. 10000 pulses
- Suitable for applications such as industrial automation and drive control

Specifications

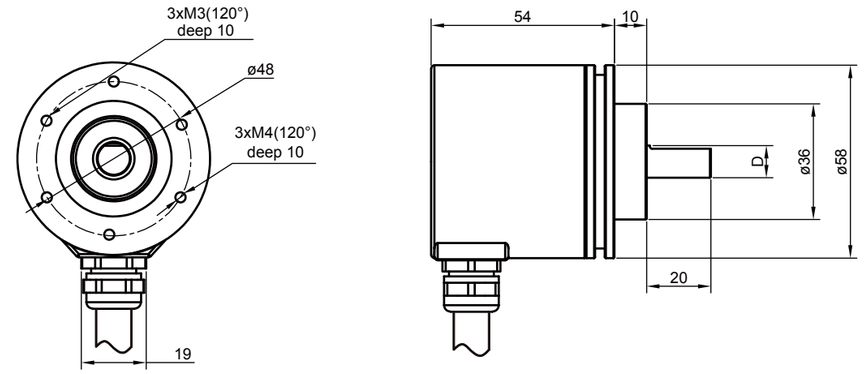
Electrical Specifications

Supply Voltage	5VDC, 10-30VDC
Current Consumption	60mA (P-P) , 140mA (RS422)
Output Circuit	PUSH-PULL output , RS422
Resolution	10000PPR (Max.)
Output Frequency	150kHz
Permissible Load/Channel	Max. 30mA
Rise Time	200ns
Electrical Protection	Short Circuit, reverse polarity and lightning Protection
Level signal	H: >70%VCC L: <1V

Mechanical Specifications

Maximum speed	12000rpm
Shaft load	Axial 50N Radial 100N
Starting Torque	<0.05Nm
Shock Resistance	EN 60068-2-27 1000m/s² 6ms
Vibration Resistance	EN 60068-2-6 100m/s² 55....2000HZ
Operating Temperature	-25°C to +85°C
Protection Class	IP65/IP67 (option)
Material	Aluminum alloy / Stainless steel
Weight	300g

Dimension (Installation flanges, hole positions, etc. shall be subject to the order confirmation)



unit: mm

D=6,8,10,12,on request

Connection

Function	3A / 3R	6A/6R/8A/8R
GND	white	1
VCC	brown	2
A	green	3
B	yellow	4
Z	grey	5
$\overline{A}$	pink	6
$\overline{B}$	blue	7
$\overline{Z}$	red	8

Ordering Code

Example: EINS5806A593R-1024
58 standard solid shaft encoder 1024 pulse push-pull output with ABZ inverse signal, axle diameter 6mm, radial straight out cable

EINS58	shaft	output	signals	connection	resolution
	06=6x10mm	**A2**=5V RS422	**8**=ABZ	**3A**=axial output	200/256/500
	08=8x12mm	**A5**=10-30V	**9**=ABZ$\overline{A}\overline{B}\overline{Z}$	**3R**=radial output	512/1000/1024
	10=10x20mm	push-pull		**6A**=connector axial output (cw)	1250/1500
	12=12x25mm				2000/2048
	XX=custom-made			**6R**=connector radial output (cw)	2500/3000
					3600/4000
				8A=connector axial output (ccw)	4096/5000
					6000/7000
					7500/8000
				8R=connector radial output (ccw)	8192/9000
					10000
					50-10000
					customizable

EINH58

Standard Hollow Shaft Encoder

Features

- High protection grade, up to IP67, suitable for various occasions
- Standard ϕ58mm OD, easy to install and pair
- Max. 10000 pulses
- Suitable for applications such as industrial automation and drive control

Specifications

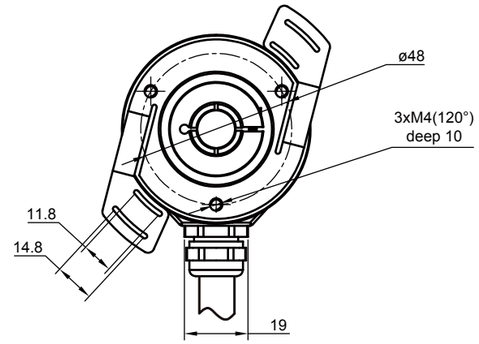
Electrical Specifications

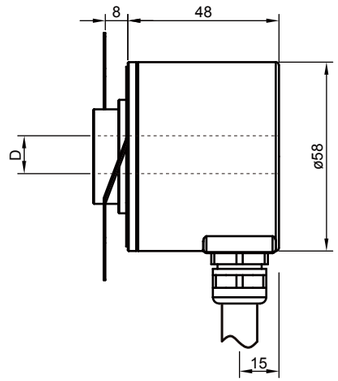
Supply Voltage	5VDC, 10-30VDC
Current Consumption	60mA (P-P) , 140mA (RS422)
Output Circuit	PUSH-PULL output , RS422
Resolution	10000PPR (Max.)
Output Frequency	150kHz
Permissible Load/Channel	Max. 30mA
Rise Time	200ns
Electrical Protection	Short Circuit, reverse polarity and lightning Protection
Level signal	H: >70%VCC L: <1V

Mechanical Specifications

maximum speed	12000rpm
Shaft load	Axial 50N Radial 100N
Starting Torque	<0.05Nm
Shock Resistance	EN 60068-2-27 1000m/s² 6ms
Vibration Resistance	EN 60068-2-6 100m/s² 55....2000HZ
Operating Temperature	-25°C to +85°C
Protection Class	IP65/IP67 (option)
Material	Aluminum
Weight	300g

Dimension (Installation flanges, hole positions, etc. shall be subject to the order confirmation)





unit: mm

D=6,8,10,12,14,on request

Connection

Function	3R	6R/8R
GND	white	1
VCC	brown	2
A	green	3
B	yellow	4
Z	grey	5
$\overline{A}$	pink	6
$\overline{B}$	blue	7
$\overline{Z}$	red	8

Ordering Code

Example: EINH5806A593R-1024
58 standard hollow shaft encoder 1024 pulse push-pull output with ABZ inverse signal, aperture 6mm, radial straight out cable

EINH58	shaft	output	signals	connection	resolution
	06=6mm **08**=8mm **10**=10mm **12**=12mm **14**=14mm **15**=15mm **XX**=custom-made	**A2**=5V RS422 **A5**=10-30V push-pull	**8**=ABZ **9**=ABZ$\overline{A}\overline{B}\overline{Z}$	**3R**=radial output **6R**=connector radial output (cw) **8R**=connector radial output (ccw)	200/256/500/ 512/1000/1024/ 1250/1500/ 2000/2048/ 2500/3000/ 3600/4000/ 4096/5000/ 6000/7000/ 7500/8000/ 8192/9000/ 10000/ 50-10000 customizable

EINB58

Standard Blind Shaft Encoder

Features

- High protection grade, up to IP67, suitable for various occasions
- Standard ϕ58mm OD, easy to install and pair
- Max. 10000 pulses
- Suitable for applications such as industrial automation and drive control

Specifications

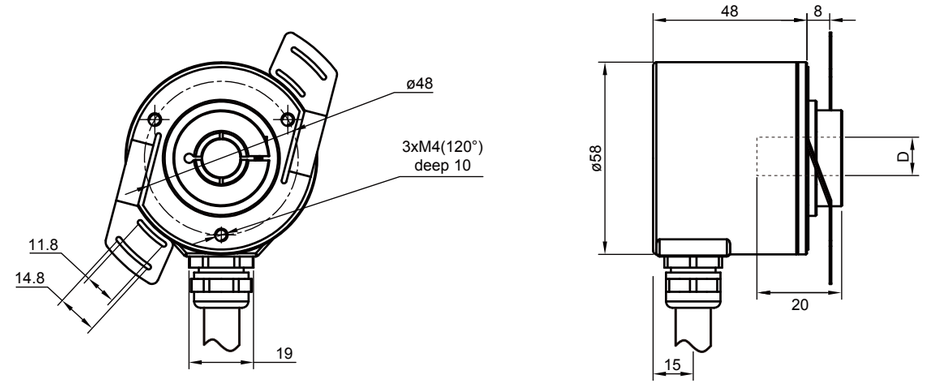
Electrical Specifications

Supply Voltage	5VDC, 10-30VDC
Current Consumption	60mA (P-P) , 140mA (RS422)
Output Circuit	PUSH-PULL output , RS422
Resolution	10000PPR (Max.)
Output Frequency	150kHz
Permissible Load/Channel	Max. 30mA
Rise Time	200ns
Electrical Protection	Short Circuit, reverse polarity and lightning Protection
Level signal	H: >70%VCC L: <1V

Mechanical Specifications

maximum speed	12000rpm
Shaft load	Axial 50N Radial 100N
Starting Torque	<0.05Nm
Shock Resistance	EN 60068-2-27 1000m/s² 6ms
Vibration Resistance	EN 60068-2-6 100m/s² 55....2000HZ
Operating Temperature	-25°C to +85°C
Protection Class	IP65/IP67 (option)
Material	Aluminum
Weight	300g

Dimension (Installation flanges, hole positions, etc. shall be subject to the order confirmation)



unit: mm

D=6,8,10,12,14,on request

Connection

Function	3A / 3R	6A/6R/8A/8R
GND	white	1
VCC	brown	2
A	green	3
B	yellow	4
Z	grey	5
$\overline{A}$	pink	6
$\overline{B}$	blue	7
$\overline{Z}$	red	8

Ordering Code

Example: EINB5806A593R-1024
58 standard blind shaft encoder 1024 pulse push-pull output with ABZ inverse signal, aperture 6mm, radial straight out cable

EINB58	shaft	output	signals	connection	resolution
	06=6mm	**A2**=5V RS422	**8**=ABZ	**3A**=axial output	200/256/500
	08=8mm	**A5**=10-30V	**9**=ABZ$\overline{A}\overline{B}\overline{Z}$	**3R**=radial output	512/1000/1024
	10=10mm	push-pull		**6A**=connector axial output (cw)	1250/1500
	12=12mm				2000/2048
	14=14mm			**6R**=connector radial output (cw)	2500/3000
	15=15mm				3600/4000
	XX=custom-made				4096/5000
				8A=connector axial output (ccw)	6000/7000
					7500/8000
					8192/9000
				8R=connector radial output (ccw)	10000
					50-10000
					customizable

EINS90

Heavy-duty Solid Shaft Encoder

Features

- Heavy-duty encoder
- High precision, short response time used
- Max. 6000 pulses
- Suitable for crane, excavator and other heavy machinery

Specifications

Electrical Specifications	
Supply Voltage	5VD, 10-30VDC 5VDC, 10-30VDC
Current Consumption	60mA (P-P) , 140mA (RS422)
Output Circuit	PUSH-PULL output , RS422
Resolution	6000PPR (Max.)
Output Frequency	100kHz
Permissible Load/Channel	Max. 30mA
Rise Time	200ns
Level signal	H:>70%VCC L:<1V
Electrical Protection	Short Circuit, reverse polarity and lightning Protection

Mechanical Specifications	
maximum speed	5000rpm
Shaft load	Axial 100N Radial 200N
Starting Torque	<0.08Nm
Shock Resistance	EN 60068-2-27 1000m/s² 6ms
Vibration Resistance	068-2-6 100m/s² 55....2000HZ EN 60068-2-6 100m/s² 55....2000HZ
Operating Temperature	-20°C to +85°C
Protection Class	IP66
Material	Aluminum alloy / Stainless steel
Weight	850g

Incremental Encoder | **Optical**

MEYLE

Intro. and Quick Selection

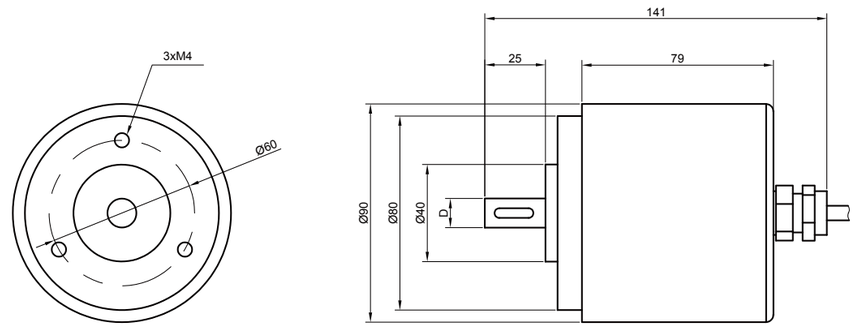
Incremental encoder

Absolute encoder

special position device

Accessories and Kits

Dimension (Installation flanges, hole positions, etc. shall be subject to the order confirmation)



unit: mm

D=12,16,on request

Connection

Function	3A / 3R	6A/6R/8A/8R
GND	white	1
VCC	brown	2
A	green	3
B	yellow	4
Z	grey	5
$\overline{A}$	pink	6
$\overline{B}$	blue	7
$\overline{Z}$	red	8

Ordering Code

Example: EINS9012A593R-1024
90 heavy-duty solid shaft encoder 1024 pulse push-pull output with ABZ inverse signal, axle diameter12mm, radial straight out cable

EINS90	shaft	output	signals	connection	resolution
	12=12x25mm **16**=16x30mm **XX**=custom-made	**A2**=5RS422 **A5**=10-30V push-pull	**8**=ABZ **9**=ABZ$\overline{A}\overline{B}\overline{Z}$	**3A**=axial output **3R**=radial output **6A**=connector axial output (cw) **6R**=connector radial output (cw) **8A**=connector axial output (ccw) **8R**=connector radial output (ccw)	200/256/500 512/1000/1024 1250/1500 2000/2048 2500/3000 3600/4000 4096/5000 6000 50-6000 customizable

EINH90

Heavy-duty Hollow Shaft Encoder

Features

- Heavy-duty encoder
- High precision, short response time used
- Max. 6000 pulses
- Suitable for crane, excavator and other heavy machinery

Specifications

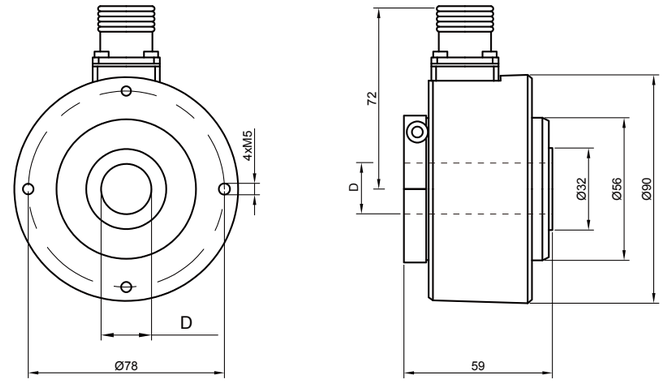
Electrical Specifications

Supply Voltage	5VDC,10-30VDC
Current Consumption	60mA (P-P) , 140mA (RS422)
Output Circuit	PUSH-PULL output , RS422
Resolution	6000PPR (Max.)
Output Frequency	100kHz
Permissible Load/Channel	Max. 30mA
Rise Time	200ns
Level signal	H:>70%VCC L:<1V
Electrical Protection	Short Circuit, reverse polarity and lightning Protection

Mechanical Specifications

maximum speed	5000rpm
Shaft load	Axial 100N Radial 200N
Starting Torque	<0.08Nm
Shock Resistance	EN 60068-2-27 1000m/s² 6ms
Vibration Resistance	EN 60068-2-6 100m/s² 55....2000HZ
Operating Temperature	-20°C to +85°C
Protection Class	IP65
Material	Aluminum
Weight	850g

Dimension (Installation flanges, hole positions, etc. shall be subject to the order confirmation)



unit: mm

D=20,25,30,32,on request

Connection

Function	3R	6R/8R
GND	white	1
VCC	brown	2
A	green	3
B	yellow	4
Z	grey	5
$\overline{A}$	pink	6
$\overline{B}$	blue	7
$\overline{Z}$	red	8

Ordering Code

Example: EINH9020A593R-1024
90 heavy-duty hollow shaft encoder 1024 pulse push-pull output with ABZ inverse signal, aperture 20mm, radial straight out cable

EINH90	shaft	output	signals	connection	resolution
	20=20mm **25**=25mm **30**=30mm **32**=32mm **XX**=custom-made	**A2**=5V RS422 **A5**=10-30V push-pull	**8**=ABZ **9**=ABZ$\overline{A}\overline{B}\overline{Z}$	**3R**=radial output **6R**=connector radial output (cw) **8R**=connector radial output (ccw)	200/256/500/ 512/1000/1024/ 1250/1500/ 2000/2048/ 2500/3000/ 3600/4000/ 4096/5000/ 6000/ 50-6000 customizable

EINH145

Heavy-duty Hollow Shaft Encoder

Features

- Large aperture, suitable for large spindle size
- Can be equipped with shaft sleeve protection
- Max. 2500 pulses
- Suitable for large motor large water pump control and other applications

Specifications

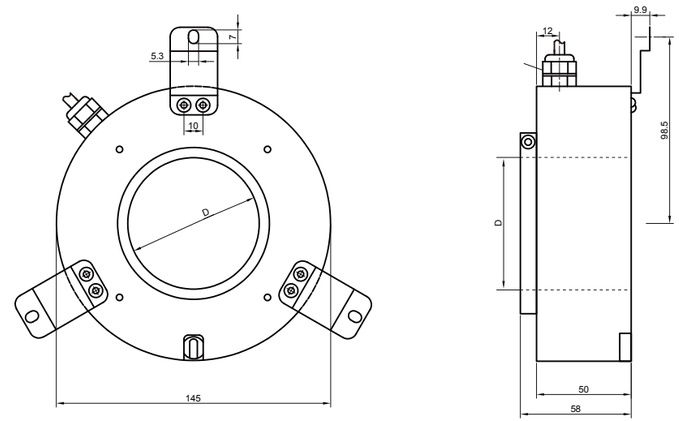
Electrical Specifications

Supply Voltage	5VDC,10-30VDC
Current Consumption	60mA (P-P) , 140mA (RS422)
Output Circuit	PUSH-PULL output , RS422
Resolution	2500PPR (Max.)
Output Frequency	100kHz
Permissible Load/Channel	Max. 30mA
Rise Time	200ns
Level signal	H:>70%VCC L:<1V
Electrical Protection	Short Circuit, reverse polarity and lightning Protection

Mechanical Specifications

Maximum speed	800rpm
Shaft load	Axial 200N Radial 200N
Starting Torque	<1.5Nm
Shock Resistance	EN 60068-2-27 1000m/s² 6ms
Vibration Resistance	50m/s² 10....2000Hz
Operating Temperature	-10°C to +70°C
Protection Class	IP54
Material	Aluminum
Weight	1700g

Dimension (Installation flanges, hole positions, etc. shall be subject to the order confirmation)



unit: mm

D=58,55,65,72,on request

Connection

Function	3R	6R
GND	white	1
VCC	brown	2
A	green	3
B	yellow	4
Z	grey	5
$\overline{A}$	pink	6
$\overline{B}$	blue	7
$\overline{Z}$	red	8

Ordering Code

Example: EINH14548A593R-1024
145 heavy-duty hollow shaft encoder 1024 pulse push-pull output with ABZ inverse signal, aperture 48mm, radial straight out cable

EINH145	shaft	output	signals	connection	resolution
	48=48mm **55**=55mm **65**=65mm **72**=72mm **XX**=custom-made	**A2**=5V RS422 **A5**=10-30V push-pull	**8**=ABZ **9**=ABZ$\overline{A}\overline{B}\overline{Z}$	**3R**=radial output **6R**=connector radial output (CW)	1024/2500 50-2500 customizable

FINS58

High Performance Solid Shaft Encoder

Features

- Excellent performance, wide selection, IP67 structure optiona
- Optional sinusoidal output or square wave output, the resolution can be double frequency output
- Maximum 80000 pulses, can be equipped with special accessories and FINH58 (FINS58) combination
- Suitable for papermaking equipment, steel industry and other industrial fields

Specifications

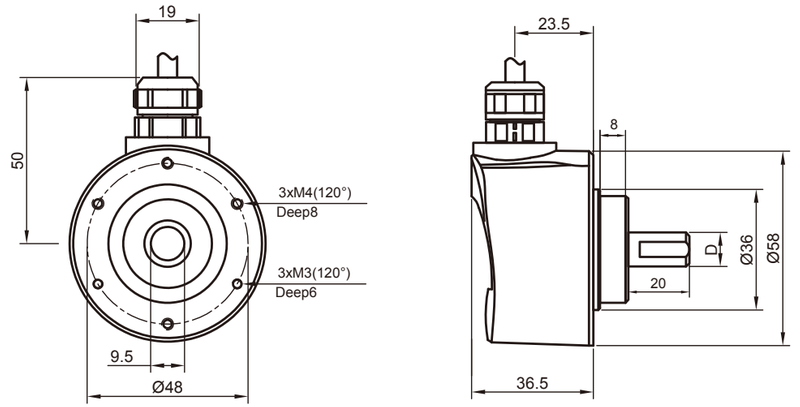
Electrical Specifications

Supply Voltage	5VDC, 10-30VDC
Current Consumption	60mA (P-P) , 140mA (RS422)
Output Circuit	PUSH-PULL output , RS422
Resolution	Square Wave：10000PPR (Max.) Sine Wave：6000PPR Adjustable ：50-6000PPR
Output Frequency	300kHz
Permissible Load/Channel	Max. 30mA
Rise Time	200ns
Level signal	H:>70%VCC L:<1V
Electrical Protection	Short Circuit, reverse polarity and lightning Protection

Mechanical Specifications

Maximum speed	15000rpm
Shaft load	Axial 50N Radial 100N
Starting Torque	<0.05Nm
Shock Resistance	EN 60068-2-27 1000m/s² 6ms
Vibration Resistance	EN 60068-2-6 100m/s² 55....2000HZ
Operating Temperature	-25°C to +85°C
Protection Class	IP65/IP67 (option)
Material	Aluminum (shell) , stainless steel (shaft)
Weight	260g

Dimension (Installation flanges, hole positions, etc. shall be subject to the order confirmation)



unit: mm

D=6,8,10,12,on request

Connection

Function	3R	6R/8R
GND	white	1
VCC	brown	2
A	green	3
B	yellow	4
Z	grey	5
$\overline{A}$	pink	6
$\overline{B}$	blue	7
$\overline{Z}$	red	8

Ordering Code

Example: FINS5806A593R-1024
58 high performance solid shaft encoder 1024 pulse push-pull output with ABZ inverse signal, axle diameter 6mm, radial straight out cable

FINS58 — shaft — output — signals — connection — resolution

- **shaft**
  - **06**=6x10mm
  - **08**=8x12mm
  - **10**=10x20mm
  - **12**=12x25mm
  - **XX**=custom-made
- **output**
  - **A2**=5V RS422 (TTL)
  - **A5**=10-30V push-pull
  - **A8**=10V-30V RS422 (HTL) sine
  - **S1**=sine wave output 1V PP frequency doubling
  - **D2**=5V RS422 (TTL)
  - **D5**=10-30V push-pull
  - **D8**=10V-30V RS422 (HTL)
- **signals**
  - **8**=ABZ
  - **9**=ABZ$\overline{A}\overline{B}\overline{Z}$
- **connection**
  - **3R**=radial output
  - **6R**=connector radial output (cw)
  - **8R**=connector radial output (ccw)
- **resolution**
  - standard：
  - Max. 80000
  - frequency doubling:
  - basic resolution
  - Max. 6000
  - sine:
  - Max. 2500

FINH58

High Performance Hollow Shaft Encoder

Features

- Excellent performance, wide selection, IP67 structure optiona
- Optional sinusoidal output or square wave output, the resolution can be double frequency output
- Maximum 80000 pulses, can be equipped with special accessories and FINH58 (FINS58) combination
- Suitable for papermaking equipment, steel industry and other industrial fields

Specifications

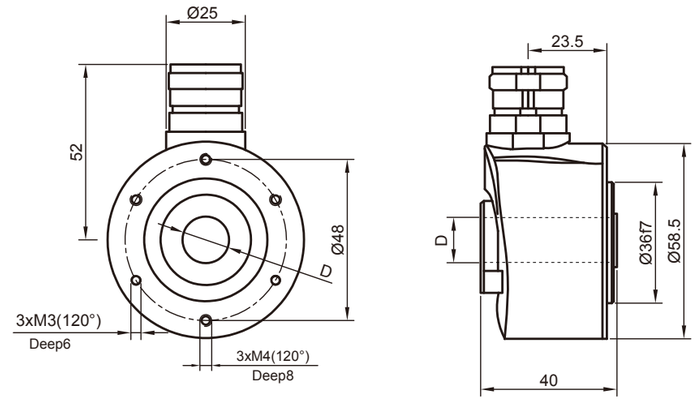
Electrical Specifications

Supply Voltage	5VDC, 10-30VDC
Current Consumption	60mA (P-P) , 140mA (RS422)
Output Circuit	PUSH-PULL output , RS422
Resolution	Square Wave：10000PPR (Max.) Sine Wave：6000PPR Adjustable ：50-6000PPR
Output Frequency	300kHz
Permissible Load/Channel	Max. 30mA
Rise Time	200ns
Level signal	H:>70%VCC L:<1V
Electrical Protection	Short Circuit, reverse polarity and lightning Protection

Mechanical Specifications

Maximum speed	15000rpm
Shaft load	Axial 50N Radial 100N
Starting Torque	<0.05Nm
Shock Resistance	EN 60068-2-27 1000m/s² 6ms
Vibration Resistance	EN 60068-2-6 100m/s² 55....2000HZ
Operating Temperature	-25°C to +85°C
Protection Class	IP65/IP67 (option)
Material	Aluminum
Weight	260g

Dimension (Installation flanges, hole positions, etc. shall be subject to the order confirmation)



unit: mm

D=6,8,10,12,14,on request

Connection

Function	3R	6R/8R
GND	white	1
VCC	brown	2
A	green	3
B	yellow	4
Z	grey	5
$\overline{A}$	pink	6
$\overline{B}$	blue	7
$\overline{Z}$	red	8

Ordering Code

Example: FINH5806A593R-1024
58 high performance hollow shaft encoder 1024 pulse push-pull output with ABZ inverse signal, aperture 6mm, radial straight out cable

FINH58	shaft	output	signals	connection	resolution
	06=6mm **08**=8mm **10**=10mm **12**=12mm **14**=14mm **XX**=custom-made	**A2**=5V RS422 (TTL) **A5**=10-30V push-pull **A8**=10V-30V RS422 (HTL) sine **S1**=sine wave output 1V PP frequency doubling **D2**=5V RS422 (TTL) **D5**=10-30V push-pull **D8**=10V-30V RS422 (HTL)	**8**=ABZ **9**=ABZ$\overline{A}\overline{B}\overline{Z}$	**3R**=radial output **6R**=connector radial output (cw) **8R**=connector radial output (ccw)	standard: Max. 80000 frequency doubling: basic resolution Max. 6000 sine: Max. 2500

MINS58

Programmable Solid Shaft Encoder

Features

- Resolution, output, direction and so on can be freely programmed by supporting software
- Standard ϕ58mm OD, easy to install
- Max programmable to 65536 pulses
- Suitable for pipeline monitoring, servo system and other applications

Specifications

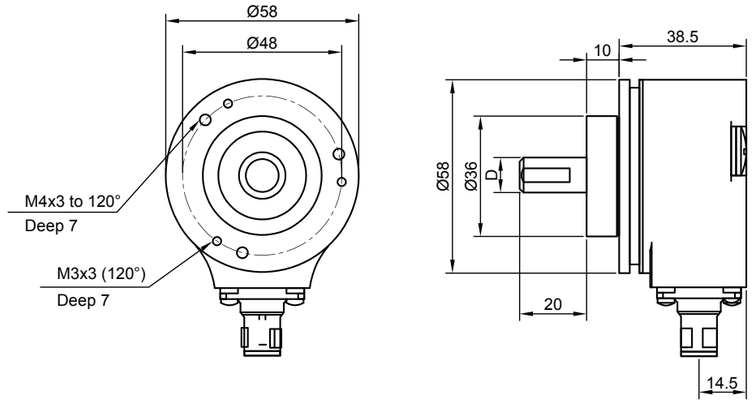
Electrical Specifications

Supply Voltage	5VDC, 10-30VDC
Current Consumption	60mA (P-P)
Output Circuit	PUSH-PULL output , RS422
Resolution	65536PPR (Max.) , Software Modification
Output Frequency	900kHz
Permissible Load/Channel	Max. 30mA
Rise Time	200ns
Level signal	H:>70%VCC L:<1V
Electrical Protection	Short Circuit, reverse polarity and lightning Protection

Mechanical Specifications

Maximum speed	6000rpm
Shaft load	Axial 40N Radial 80N
Starting Torque	<0.02Nm
Shock Resistance	EN 60068-2-27 1000m/s² 6ms
Vibration Resistance	EN 60068-2-6 100m/s² 55....2000HZ
Operating Temperature	-20°C to +85°C
Protection Class	IP65
Material	Aluminum (shell) , stainless steel (shaft)
Weight	300g

Dimension (Installation flanges, hole positions, etc. shall be subject to the order confirmation)



unit: mm

D=6, 10,on request

Connection

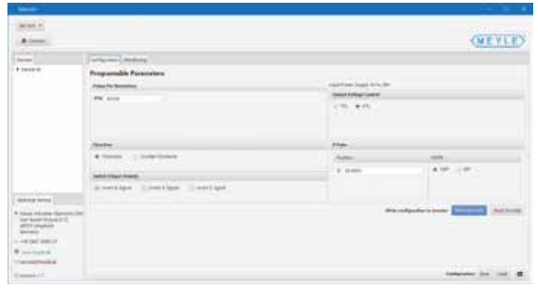
Function	3R	8R
GND	white	1
VCC	brown	2
A	green	3
B	yellow	4
Z	grey	5
$\overline{A}$	pink	6
$\overline{B}$	blue	7
$\overline{Z}$	red	8

Ordering Code

Example: PINS5806A593R-1024
58 programmable solid shaft encoder 1024 pulse push-pull output with ABZ inverse signal, axle diameter 6mm, radial straight out cable

PINS58	shaft	output	signals	connection	resolution
	06=6x10mm **10**=10x20mm **XX**=custom-made	**A5**=5-30V push-pull	**8**=ABZ **9**=ABZ$\overline{A}\overline{B}\overline{Z}$	**3R**=radial output **8R**=connector radial output (ccw)	1-65536 (Customer setup)

Programming Software



MINH58

Programmable Hollow Shaft Encoder

Features

- Resolution, output, direction and so on can be freely programmed by supporting software
- Standard ϕ58mm OD, easy to install
- Max programmable to 65536 pulses
- Suitable for pipeline monitoring, servo system and other applications

Specifications

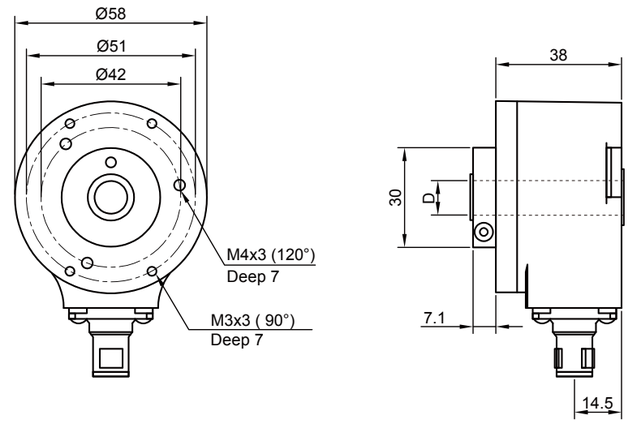
Electrical Specifications

Supply Voltage	5VDC, 10-30VDC
Current Consumption	60mA (P-P)
Output Circuit	PUSH-PULL output , RS422
Resolution	65536PPR (Max.) , Software Modification
Output Frequency	900kHz
Permissible Load/Channel	Max. 30mA
Rise Time	200ns
Level signal	H:>70%VCC L:<1V
Electrical Protection	Short Circuit, reverse polarity and lightning Protection

Mechanical Specifications

Maximum speed	6000rpm
Shaft load	Axial 40N Radial 80N
Starting Torque	<0.02Nm
Shock Resistance	EN 60068-2-27 1000m/s² 6ms
Vibration Resistance	EN 60068-2-6 100m/s² 55....2000HZ
Operating Temperature	-20°C to +85°C
Protection Class	IP65
Material	Aluminum
Weight	300g

Dimension (Installation flanges, hole positions, etc. shall be subject to the order confirmation)



unit: mm

D=10,12,14,15,on request

Connection

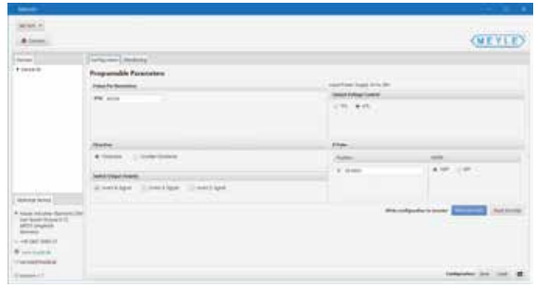
Function	3R	8R
GND	white	1
VCC	brown	2
A	green	3
B	yellow	4
Z	grey	5
$\bar{A}$	pink	6
$\bar{B}$	blue	7
$\bar{Z}$	red	8

Ordering Code

Example: PINH5806A593R-1024
58 programmable hollow shaft encoder 1024 pulse push-pull output with ABZ inverse signal, aperture 6mm, radial straight out cable

PINH58	shaft	output	signals	connection	resolution
	10=10mm **12**=12mm **14**=14mm **15**=15mm **XX**=custom-made	**A5**=push-pull HTL **A9**=push-pull TTL	**8**=ABZ **9**=ABZ$\bar{A}\bar{B}\bar{Z}$	**3R**=radial output **8R**=connector radial output (ccw)	1-65536 (Customer setup)

Programming Software



MINS100

Dual-output Solid Shaft Encoder

Features

- Double output type, no response time difference
- Heavy-duty encoder
- Max. 5000 pulses
- Suitable for large machinery monitoring and other applications

Specifications

Electrical Specifications	
Supply Voltage	5VDC, 10-30VDC
Current Consumption	60mA (P-P) , 140mA (RS422)
Output Circuit	PUSH-PULL output , RS422
Resolution	5000PPR (Max.)
Output Frequency	300kHz
Permissible Load/Channel	Max. 30mA
Rise Time	200ns
Level signal	H:>70%VCC L:<1V
Electrical Protection	Short Circuit, reverse polarity and lightning Protection

Mechanical Specifications	
Maximum speed	6000rpm
Shaft load	Axial 350N Radial 400N
Starting Torque	<0.08Nm
Shock Resistance	EN 60068-2-27 2500m/s² 6ms
Vibration Resistance	EN 60068-2-6 300m/s² 55....2000HZ
Operating Temperature	-20°C to +85°C
Protection Class	IP66
Material	Aluminum (shell) , stainless steel (shaft)
Weight	1800g

Incremental Encoder | **Optical**

MEYLE

Intro. and Quick Selection

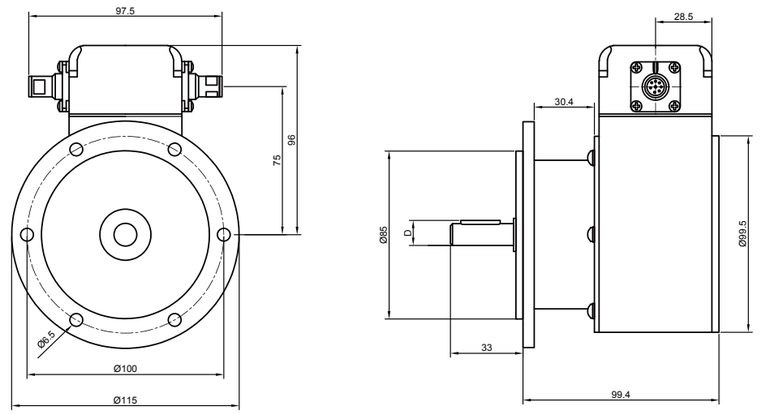
Incremental encoder

Absolute encoder

special position device

Accessories and Kits

Dimension (Installation flanges, hole positions, etc. shall be subject to the order confirmation)



unit: mm

D=11,on request

Connection

Function	BR
GND	1
VCC	2
A	3
B	4
Z	5
$\overline{A}$	6
$\overline{B}$	7
$\overline{Z}$	8

Ordering Code

Example: MINS10011A593R-1024D
100 dual-output solid shaft encoder 1024 pulse push-pull output with ABZ inverse signal, axle diameter 12mm, radial straight out cable

MINS100	shaft	output	signals	connection	resolution
	11=11x33mm **XX**=custom-made	**A2**=5V RS422 (TTL) **A5**=10-30V push-pull **A8**=10V-30V RS422 (HTL)	**8**=ABZ **9**=ABZ$\overline{A}\overline{B}\overline{Z}$	**BR**=terminal	single channel: 1024/2048 2500/4096 5000 double channel: 1024D.2048D 50-6000 customizable

MINH100

Dual-output Hollow Shaft Encoder

Features

- Double output type, no response time difference
- Heavy-duty encoder
- Max. 5000 pulses
- Suitable for large machinery monitoring and other applications

Specifications

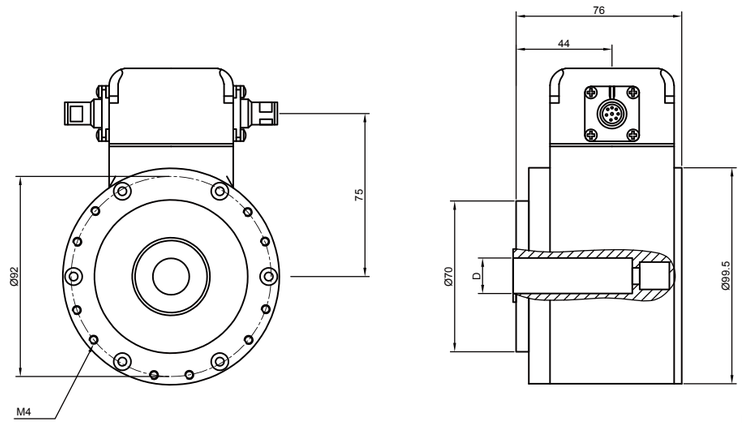
Electrical Specifications

Supply Voltage	5VDC, 10-30VDC
Current Consumption	60mA (P-P) , 140mA (RS422)
Output Circuit	PUSH-PULL output , RS422
Resolution	5000PPR (Max.)
Output Frequency	200kHz
Permissible Load/Channel	Max. 30mA
Rise Time	200ns
Level signal	H:>70%VCC L:<1V
Electrical Protection	Short Circuit, reverse polarity and lightning Protection

Mechanical Specifications

Maximum speed	6000rpm
Shaft load	Axial 400N Radial 500N
Starting Torque	<0.06Nm
Shock Resistance	EN 60068-2-27 2500m/s² 6ms
Vibration Resistance	EN 60068-2-6 300m/s² 55....2000HZ
Operating Temperature	-20°C to +85°C
Protection Class	IP66
Material	Aluminum
Weight	1700g

Dimension (Installation flanges, hole positions, etc. shall be subject to the order confirmation)



unit: mm

D=12,16,on request

Connection

Function	BR
GND	1
VCC	2
A	3
B	4
Z	5
$\overline{A}$	6
$\overline{B}$	7
$\overline{Z}$	8

Ordering Code

Example: MINH10012A593R-1024D
100 dual-output hollow shaft encoder 1024 pulse push-pull output with ABZ inverse signal, aperture 12mm, radial straight out cable

MINH100	shaft	output	signals	connection	resolution
	12=12mm **16**=16mm **XX**=custom-made	**A2**=5V RS422 (TTL) **A5**=10-30V push-pull **A8**=10V-30V RS422 (HTL)	**8**=ABZ **9**=ABZ$\overline{A}\overline{B}\overline{Z}$	**BR**=terminal	single channel: 1024/2048 2500/4096 5000 double channel: 1024D.2048D 50-6000 customizable

IMG30

Special solid shaft encoder

Features

- Special encoder for speed measurement
- Compact size for easy installation
- Three pulses outputs,Optional high temperature type
- Dedicated to small equipment speed control and other applications

Specifications

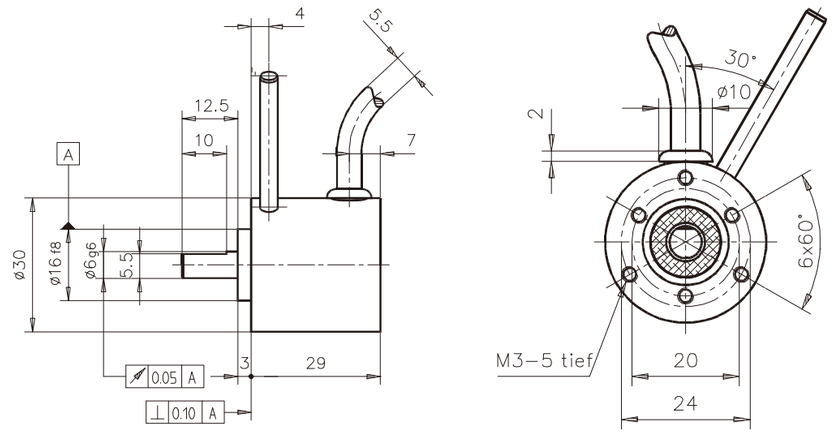
Electrical Specifications

Supply Voltage	10-24VDC
Current Consumption	50mA
Output Circuit	HTL
Resolution	A:1435 B:1435 (A90°Phase difference) C:572
OutputFrequency	200kHz
Electrical Protection	short circuit protection, reverse polarity protection, lightning strike protection

Mechanical Specifications

Maximum speed	8000rpm
Shaft load	Axial 5N Radial 10N
Starting Torque	<0.015Nm
Shock Resistance	EN 60068-2-27 1000m/s² 6ms
Vibration Resistance	EN 60068-2-6 100m/s² 55....2000HZ
Operating Temperature	0°Cto+80°C, -30°Cto+80°C (On Request)
Protection Class	IP64
Material	Cover：Auminium solid (high-grade steel on inquiry) Shaft：steel (stainless)
Weight	127g

Dimension (Installation flanges, hole positions, etc. shall be subject to the order confirmation)



unit: mm

Connection

Function	Color	Plug
GND	white	1
VCC	brown	2
A	green	3
B	grey	4
C	blue	5

Ordering Code

IMG30B–1435/572–AB/C–PT

Example: A:1435 pulse
B:1435 pulse
C:572 pulse
axle diameter 6mm
radial straight out cable

IMG60

Special solid shaft encoder

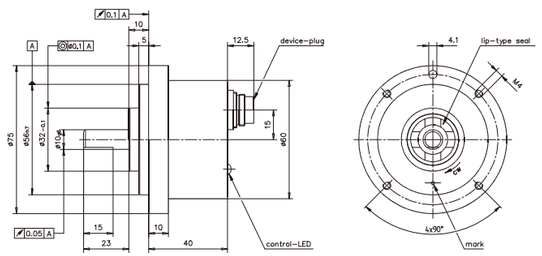
Features

- Special encoder for speed measurement
- Corrosion resistance, high protection, high stability
- Four pulses outputs
- Dedicated to processing equipment speed control and other applications

Specifications

Supply Voltage	10-24VDC
Current Consumption	50mA
Output Circuit	HTL
Resolution	A:10 B:400 C:1 D:1000
OutputFrequency	200kHz
Maximum speed	3000rpm
Shaft load	Axial 20N Radial 30N
Shock Resistance	EN 60068-2-27 100m/s² 6ms
Vibration Resistance	EN 60068-2-6 100m/s² 55....2000HZ
Operating Temperature	0°C to +80°C
Protection Class	IP67
Weight	320g

Dimension (Installation flanges, hole positions, etc. shall be subject to the order confirmation)



unit: mm

Function	plug
VCC	4
GND	5
A	1
B	2
C	3
D	6

Ordering Code

IMG60B–10/400/1/1/1000–ABCD–PT

Example:

A:10pulse/B400pulse/C1pulse/D1000pulse, axle diameter 10mm, radial straight out cable

IMG65

Special solid shaft encoder

Features

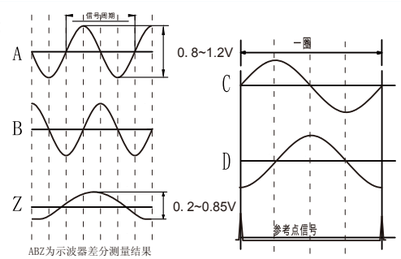
- Sine/cosine output
- Conical hole installation, can be equipped with special screw
- 10-phase output
- Dedicated to applications such as elevators

Specifications

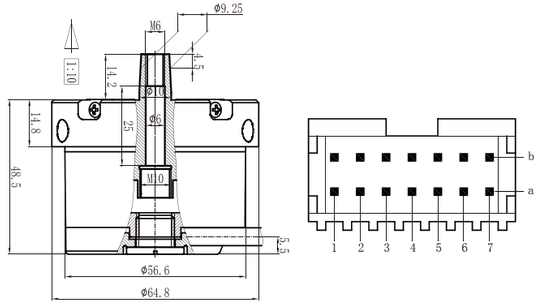
Supply Voltage	5VDC
Current Consumption	50mA
Output Circuit	Sin/Cos
OutputFrequency	300kHz
Maximum speed	6000rpm
Shaft load	Axial 50N Radial 100N
Operating Temperature	-40°C to +85°C
Protection Class	IP43

Waveform

Resolution:
2048



Dimension (Installation flanges, hole positions, etc. shall be subject to the order confirmation)



unit: mm

No.	Function	No.	Function
1b	5V	5a	$\overline{B}$
7a	5V	4b	Z
5b	0V	4a	$\overline{Z}$
3a	0V	7b	C
6b	A	1a	$\overline{C}$
2a	$\overline{A}$	2b	D
3b	B	6a	$\overline{D}$

Ordering Code

IMG65Z9S10BR/2048

Example:

5VDC sinusoidal signal, 10 phase output conical hole encoder, 2048pulse

IMG100

Special Hollow Shaft Encoder

Features

- Super heavy load encoder
- Special lightning protection, anti - static design, tap lock link
- Max. 6000 pulses
- Dedicated to wind power equipment and other applications

Specifications

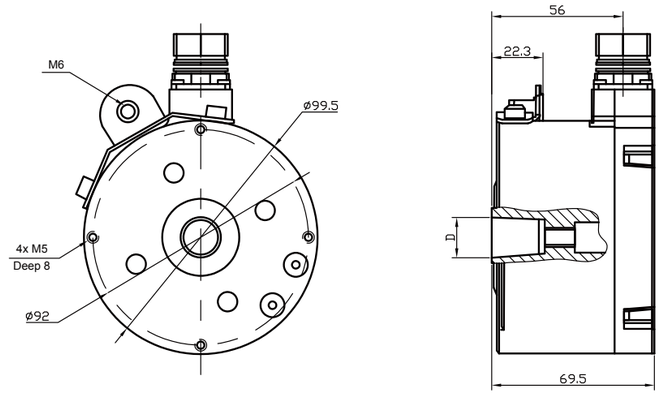
Electrical Specifications

Supply Voltage	5VDC,10-30VDC
Current Consumption	60mA(P-P) , 140mA (RS422) Short Circuit Protection
Output Circuit	PUSH-PULL output , RS422
Resolution	6000PPR (Max.)
Output Frequency	200kHz
Permissible Load/Channel	Max. 30mA
Rise Time	200ns
Level signal	H:>70%VCC L:<1V
Electrical Protection	Short Circuit, reverse polarity and lightning Protection

Mechanical Specifications

maximum speed	6000rpm
Shaft load	
Starting Torque	<0.08Nm
Shock Resistance	EN 60068-2-27 4000m/S² 3.5ms
Vibration Resistance	EN 60068-2-6 200m/s² 55....2000Hz
Operating Temperature	-20°C to +80°C
Protection Class	IP67
Material	Aluminum
Weight	1300g

Dimension (Installation flanges, hole positions, etc. shall be subject to the order confirmation)



unit: mm

D=12,14,16,17,on request

Connection

Function	3R	6R/8R
GND	white	1
VCC	brown	2
A	green	3
B	yellow	4
Z	grey	5
$\overline{A}$	pink	6
$\overline{B}$	blue	7
$\overline{Z}$	red	8

Ordering Code

Example: IMG10012A593R-1024
100 special hollow shaft encoder 1024 pulse push-pull output with ABZ inverse signal, aperture 12mm, radial straight out cable

IMG100	shaft	output	signals	connection	resolution
	12=12mm **14**=14mm **16**=16mm **17**=17mm **XX**=custom-made	**A2**=5V RS422 **A5**=10-30V push-pull	**8**=ABZ **9**=ABZ$\overline{A}\overline{B}\overline{Z}$	**3R**=radial output **6R**=connector radial output (cw) **8R**=connector radial output (ccw)	10/50/200 256/500/512 1000/1024 1250/1500 2000/2048 2500/3000 3600/4000 4096/5000 6000/50-6000 10000 10-10000 customizable

IMG115

Special Solid Shaft Encoder

Features

- Special Flange connection of European standard (EURO flange flange B10)
- Heavy duty encoder, high vibration and impact resistance
- Max. 5000 pulses
- Dedicated to wind power equipment and other applications

Specifications

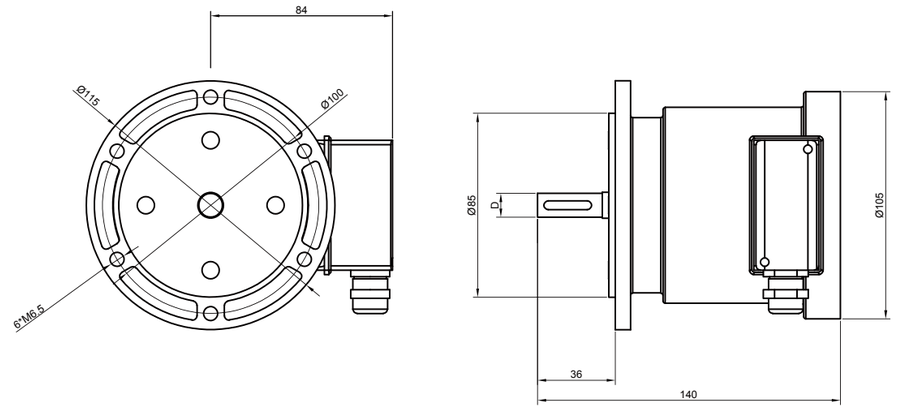
Electrical Specifications

Supply Voltage	10-30VDC，5VDC
Current Consumption	60mA (P-P)
Output Circuit	PUSH-PULL outuput(HTL/TTL)
Resolution	5000PPR (Max.)
Output Frequency	100kHz (300kHz on request)
Permissible Load/Channel	Max. 30mA
Rise Time	200ns
Level signal	H:>70%VCC L:<1V
Electrical Protection	Short Circuit, reverse polarity and lightning Protection

Mechanical Specifications

Maximum speed	10000rpm
Shaft load	Axial 250N Radial 350N
Starting Torque	<0.08Nm
Shock Resistance	EN 60068-2-27 3000m/s² 1ms
Vibration Resistance	EN 60068-2-6 100m/s² 10....2000Hz
Operating Temperature	-25°C to +100°C
Protection Class	IP56
Material	Aluminum
Weight	1400g

Dimension (Installation flanges, hole positions, etc. shall be subject to the order confirmation)



unit: mm

D=12,15,16,on request

Connection

Function	BR
GND	1
VCC	2
A	3
B	4
Z	5
$\overline{A}$	6
$\overline{B}$	7
$\overline{Z}$	8

Ordering Code

Example: IMG11512A593R-1024
115 special solid shaft encoder 1024 pulse push-pull output with ABZ inverse signal, axle diameter 12mm, radial straight out cable

IMG115	shaft	output	signals	connection	resolution
	12=12x36mm **15**=15x36mm **16**=16x36mm **XX**=custom-made	**A5**=push-pull (HTL) **A9**=push-pull (TTL)	**8**=ABZ **9**=ABZ$\overline{A}\overline{B}\overline{Z}$	**BR**=terminal	300/500/512 1000/1024 1250/1500 2000/2048 2500/3000 3600/4000 4096/5000 6000 50-5000 customizable

DAXS37

Small Solid Shaft Encoder

Features

- Small size, easy to install
- Standard CANopen protocol, SSI and biss protocol
- Up to 16 bit singleturn,14 bit multiturn
- Suitable for instrument and other applications

CANopen SSI

Specifications

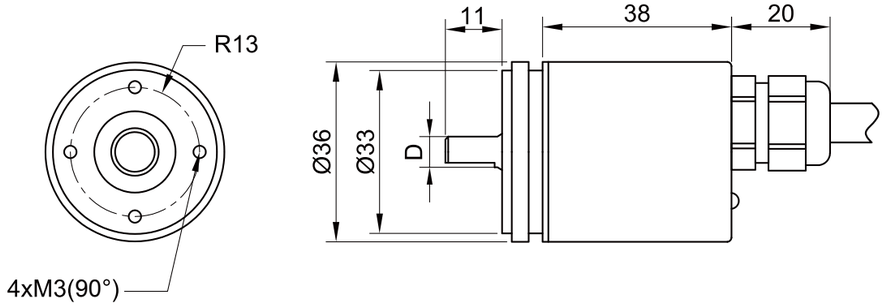
Electrical Specifications

Interface	CAN open	SSI/BISS
Supply Voltage	10-30VDC, 5VDC	
Current Consumption	50mA	80mA
Output Code	Binary	Binary/Gray
Resolution	16 bit single turn (Max.), 14 bit multiturn (Max.)	
Output speed	1MBit/s	0.1-2 MBit/s
Criterion	DSP406, Class 1 Class2	RS422
linearity	1LSB	

Mechanical Specifications

Maximum speed	8000rpm
Shaft load	Axial 20N Radial 40N
Starting Torque	<0.02Nm
Shock Resistance	EN 60068-2-27 1000m/s² 6ms
Vibration Resistance	EN 60068-2-6 100m/s² 55....2000HZ
Operating Temperature	-40°C to +80°C
Protection Class	IP65/IP67 (option)
Material	Stainless steel (316L)
Weight	150g

Dimension (Installation flanges, hole positions, etc. shall be subject to the order confirmation)



unit: mm

D=6,on request

Connection

SSI	3A/3R
GND	white
VCC	brown
CLCOK+	green
CLOCK-	yellow
DATE+	grey
DATE-	pink
ZERO	blue
DIR	red

CANopen	3A/3R
GND	white
VCC	brown
CAN_GROUND	green
CAN_LOW(-)	yellow
CAN_HIGH(+)	grey

Ordering Code

Example: DASS370012E06SB3A
37single turn 12 bit resolution SSI binary solid shaft encoder, power voltage 10-30V DC, radial straight out cable

DAXS37	resolution	power	shaft	output	connection
DASS=ST **DAMS**=MT	**1212**=12 MT 12 ST **1213**=12 MT 13 ST **1214**=12 MT 14 ST **1216**=12 MT 16 ST **0012**=12 ST **0016**=16 ST custom-made	**A**=5VDC **E**=10-30VDC	**06**=6x11mm **XX**=custom-made	**SB**=SSI binary **SG**=SSI gray **CO**=CANopen	**3A**=axial output **3R**=radial output

DAXB37

Small Blind Shaft Encoder

CANopen SSI

Features

- Small size, easy to install
- Standard CANopen protocol, SSI and biss protocol
- Up to 16 bit singleturn,14 bit multiturn
- Suitable for instrument and other applications

Specifications

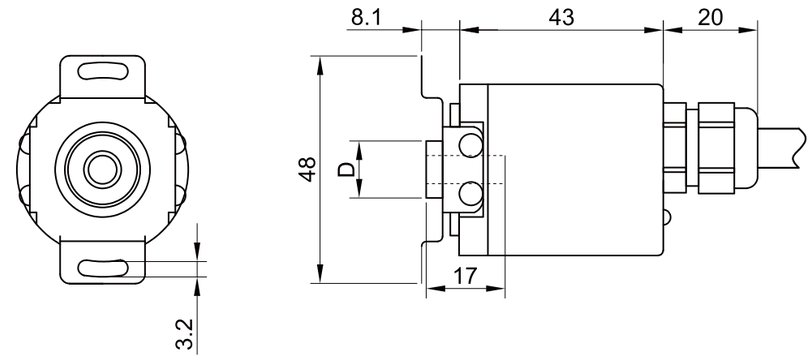
Electrical Specifications

Interface	CAN open	SSI/BISS
Supply Voltage	10-30VDC, 5VDC	
Current Consumption	50mA	80mA
Output Code	Binary	Binary/Gray
Resolution	16 bit single turn (Max.), 14 bit multiturn (Max.)	
Output speed	1MBit/s	0.1-2 MBit/s
Criterion	DSP406, Class 1 Class2	RS422
linearity	1LSB	

Mechanical Specifications

Maximum speed	8000rpm
Shaft load	Axial 20N Radial 40N
Starting Torque	<0.02Nm
Shock Resistance	EN 60068-2-27 1000m/s² 6ms
Vibration Resistance	EN 60068-2-6 100m/s² 55....2000HZ
Operating Temperature	-40°C to +80°C
Protection Class	IP65/IP67（option）
Material	stainless steel（316L）
Weight	150g

Dimension (Installation flanges, hole positions, etc. shall be subject to the order confirmation)



unit: mm

D=6,on request

Connection

SSI	3A/3R
GND	white
VCC	brown
CLCOK+	green
CLOCK-	yellow
DATE+	grey
DATE-	pink
ZERO	blue
DIR	red

CANopen	3A/3R
GND	white
VCC	brown
CAN_GROUND	green
CAN_LOW(-)	yellow
CAN_HIGH(+)	grey

Ordering Code

Example: DASB370012E06SB3A
37single turn 12 bit resolution SSI binary blind shaft encoder, power voltage 10-30V DC, radial straight out cable

DAXB37	resolution	power	shaft	output	connection
DASB=ST **DAMB**=MT	**1212**=12 MT 12 ST **1213**=12 MT 13 ST **1214**=12 MT 14 ST **1216**=12 MT 16 ST **0012**=12 ST **0016**=16 ST custom-made	**A**=5VDC **E**=10-30VDC	**06**=6mm **XX**=custom-made	**SB**=SSI binary **SG**=SSI gray **CO**=CANopen	**3A**=axial output **3R**=radial output

DAXS58

Standard Solid Shaft Encoder

Features

- Strong anti-interference capability
- Standard CANopen protocol, SSI and biss protocol
- Up to 16 bit singleturn,14 bit multiturn
- Suitable for assembly line monitoring and other applications

CANopen SSI

Specifications

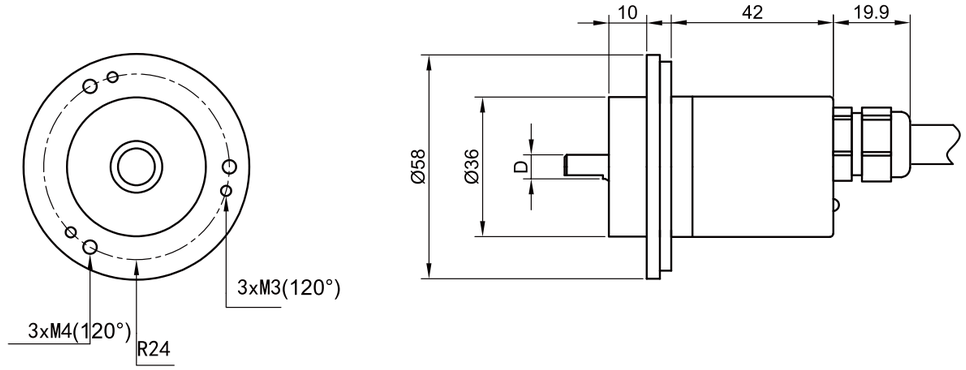
Electrical Specifications

Interface	CAN open	SSI/BISS
Supply Voltage	10-30VDC, 5VDC	
Current Consumption	50mA	80mA
Output Code	Binary	Binary/Gray
Resolution	16 bit single turn (Max.), 14 bit multiturn (Max.)	
Output speed	1MBit/s	0.1-2 MBit/s
Criterion	DSP406, Class 1 Class2	RS422
linearity	1LSB	

Mechanical Specifications

Maximum speed	8000rpm
Shaft load	Axial 50N Radial 100N
Starting Torque	<0.05Nm
Shock Resistance	EN 60068-2-27 1000m/s² 6ms
Vibration Resistance	EN 60068-2-6 100m/s² 55....2000HZ
Operating Temperature	-40°C to +80°C
Protection Class	IP65/IP67 (option)
Material	Stainless steel (316L)
Weight	150g

Dimension (Installation flanges, hole positions, etc. shall be subject to the order confirmation)



unit: mm

D=6,8,on request

Connection

SSI	3A/3R	6A/6R
GND	white	2
VCC	brown	1
CLCOK+	green	6
CLOCK-	yellow	4
DATE+	grey	5
DATE-	pink	8
ZERO	blue	7
DIR	red	3

CANopen	3R	6R
GND	white	3
VCC	brown	2
CAN_GROUND	green	1
CAN_LOW(-)	yellow	5
CAN_HIGH(+)	grey	4

Ordering Code

Example: DASS580012E06SB3A
58single turn 12 bit resolution SSI binary solid shaft encoder, power voltage 10-30V DC, radial straight out cable

DAXS58	resolution	power	shaft	output	connection
DASS=ST **DAMS**=MT	**1212**=12 MT 12 ST **1213**=12 MT 13 ST **1214**=12 MT 14 ST **1216**=12 MT 16 ST **0012**=12 ST **0016**=16 ST custom-made	**A**=5VDC **E**=10-30VDC	**06**=6x10mm **08**=8x12mm **XX**=custom-made	**SB**=SSI binary **SG**=SSI gray	**3A**=axial output **3R**=radial output **6A**=connector axial output (cw) **6R**=connector radial output (cw)

DAXB58

Standard Blind Shaft Encoder

Features

- Strong anti-interference capability
- Standard CANopen protocol, SSI and biss protocol
- Up to 16 bit singleturn,14 bit multiturn
- Suitable for assembly line monitoring and other applications

CANopen SSI

Specifications

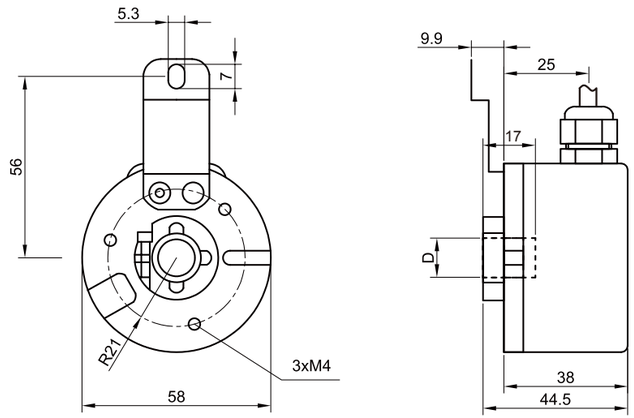
Electrical Specifications

Interface	CAN open	SSI/BISS
Supply Voltage	10-30VDC, 5VDC	
Current Consumption	50mA	80mA
Output Code	Binary	Binary/Gray
Resolution	16 bit single turn (Max.), 14 bit multiturn (Max.)	
Output speed	1MBit/s	0.1-2 MBit/s
Criterion	DSP406, Class 1 Class2	RS422
linearity	1LSB	

Mechanical Specifications

Maximum speed	8000rpm
Shaft load	Axial 50N Radial 100N
Starting Torque	<0.05Nm
Shock Resistance	EN 60068-2-27 1000m/s² 6ms
Vibration Resistance	EN 60068-2-6 100m/s² 55....2000HZ
Operating Temperature	-40°C to +80°C
Protection Class	IP65/IP67 (option)
Material	stainless steel（316L）
Weight	150g

Dimension (Installation flanges, hole positions, etc. shall be subject to the order confirmation)



unit: mm

D=10,12,14,on request

Connection

SSI	3A/3R	6A/6R
GND	white	2
VCC	brown	1
CLCOK+	green	6
CLOCK-	yellow	4
DATE+	grey	5
DATE-	pink	8
ZERO	blue	7
DIR	red	3

CANopen	3R	6R
GND	white	3
VCC	brown	2
CAN_GROUND	green	1
CAN_LOW(-)	yellow	5
CAN_HIGH(+)	grey	4

Ordering Code

Example: DASB580012E06SB3A
58single turn 12 bit resolution SSI binary blind shaft encoder, power voltage 10-30V DC, radial straight out cable

DAXB58	resolution	power	shaft	output	connection
DASB=ST **DAMB**=MT	**1212**=12 MT 12 ST **1213**=12 MT 13 ST **1214**=12 MT 14 ST **1216**=12 MT 16 ST **0012**=12 ST **0016**=16 ST custom-made	**A**=5VDC **E**=10-30VDC	**10**=10mm **12**=12mm **14**=14mm **XX**=custom-made	**SB**=SSI binary **SG**=SSI gray	**3A**=axial output **3R**=radial output **6A**=connector axial output (cw) **6R**=connector radial output (cw)

EAXS40

Small Solid Shaft Encoder

Features

- Easy installation and integration
- Standard CANopen protocol, SSI protocol
- Up to 21 bit singleturn,14 bit multiturn
- Suitable for printer applications

CANopen SSI

Specifications

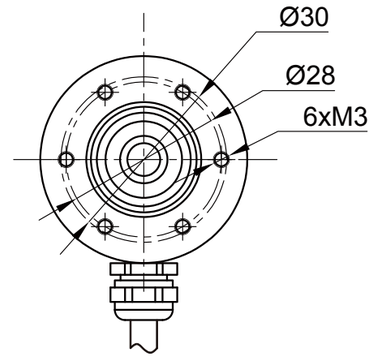
Electrical Specifications

Interface	CAN open	SSI/BISS
Supply Voltage	10-30VDC, 5VDC	10-30VDC, 5VDC
Current Consumption	50mA	80mA
Output Code	Binary	Binary/Gray
Resolution	21 bit single turn (Max.), 14 bit multiturn (Max.),	21 bit single turn (Max.) 14 bit multiturn (Max.)
Output speed	1MBit/s	0.1-2 MBit/s
Criterion	DSP406, Class 1 Class2	RS422
linearity	1LSB	1LSB

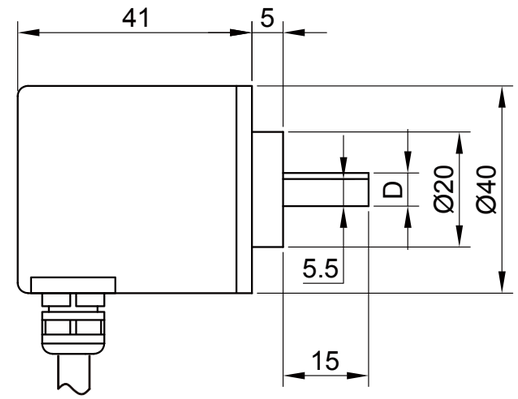
Mechanical Specifications

Maximum speed	8000rpm
Shaft load	Axial 30N Radial 60N
Starting Torque	<0.02Nm
Shock Resistance	EN 60068-2-27 1000m/s² 6ms
Vibration Resistance	EN 60068-2-6 100m/s² 55....2000HZ
Operating Temperature	-40°C to +80°C
Protection Class	IP66
Material	stainless steel (316L)
Weight	150g

Dimension (Installation flanges, hole positions, etc. shall be subject to the order confirmation)



unit: mm



D=6,10,on request
Singleturn: H=38, Multiturn: H=43

Connection

SSI	3A/3R	6A/8A
GND	brown	2
VCC	white	1
CLCOK+	yellow	6
CLOCK-	green	4
DATE+	pink	5
DATE-	grey	8
ZERO	black	7
DIR	blue	3

CANopen	3A/3R	6A/8A
GND	white	3
VCC	brown	2
CAN_GROUND	green	1
CAN_LOW(-)	yellow	5
CAN_HIGH(+)	grey	4

Ordering Code

Example: EASS400012E06SB3A
37single turn 12 bit resolution SSI binary solid shaft encoder, power voltage 10-30V DC, radial straight out cable

EAXS40	resolution	power	shaft	output	connection
EASS=ST **EAMS**=MT	**1212**=12 MT 12 ST **1214**=12 MT 14 ST **1021**=10 MT 21 ST **1220**=12 MT 20 ST **1418**=14 MT 18 ST **0012**=12 ST **0021**=21 ST custom-made	**A**=5VDC **E**=10-30VDC	**06**=6x15mm **XX**=custom-made	**SB**=SSI binary **SG**=SSI gray **CO**=CANopen	**3A**=axial output **3R**=radial output **6A**=connector axial output (cw) **8A**=connector axial output (ccw)

EAXB40

Small Blind Shaft Encoder

Features

- Easy installation and integration
- Standard CANopen protocol, SSI protocol
- Up to 21 bit singleturn,14 bit multiturn
- Suitable for printer applications

CANopen SSI

Specifications

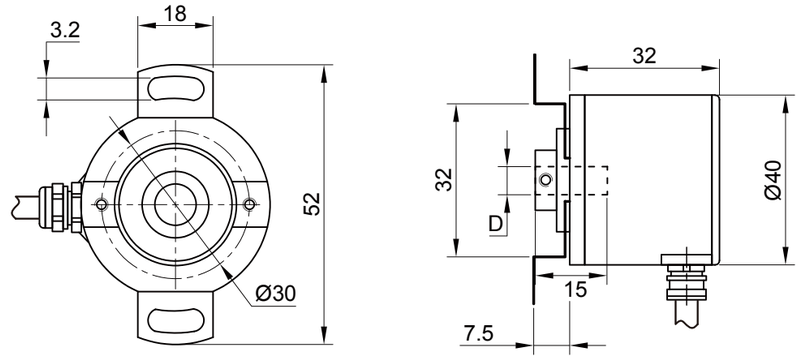
Electrical Specifications

Interface	CAN open	SSI/BISS
Supply Voltage	10-30VDC, 5VDC	10-30VDC, 5VDC
Current Consumption	50mA	80mA
Output Code	Binary	Binary/Gray
Resolution	21 bit single turn (Max.), 14 bit multiturn (Max.)	21 bit single turn (Max.), 14 bit multiturn (Max.)
Output speed	1MBit/s	0.1-2 MBit/s
Criterion	DSP406, Class 1 Class2	RS422
linearity	1LSB	1LSB

Mechanical Specifications

Maximum speed	8000rpm
Shaft load	Axial 30N Radial 60N
Starting Torque	<0.02Nm
Shock Resistance	EN 60068-2-27 1000m/s² 6ms
Vibration Resistance	EN 60068-2-6 100m/s² 55....2000HZ
Operating Temperature	-40°C to +80°C
Protection Class	IP66
Material	stainless steel (316L)
Weight	150g

Dimension (Installation flanges, hole positions, etc. shall be subject to the order confirmation)



unit: mm

D=6,10,on request
Singleturn: H=38, Multiturn: H=43

Connection

SSI	3A/3R
GND	brown
VCC	white
CLCOK+	yellow
CLOCK-	green
DATE+	pink
DATE-	grey
ZERO	black
DIR	blue

CANopen	3A/3R
GND	white
VCC	brown
CAN_GROUND	green
CAN_LOW(-)	yellow
CAN_HIGH(+)	grey

Ordering Code

Example: EASB400012E06SB3A
37single turn 12 bit resolution SSI binary blind shaft encoder, power voltage 10-30V DC, radial straight out cable

EAXB40	shaft	output	signals	connection	resolution
EASB=ST **EAMB**=MT	**1212**=12 MT 12 ST **1214**=12 MT 14 ST **1021**=10 MT 21 ST **1220**=12 MT 20 ST **1418**=14 MT 18 ST **0012**=12 ST **0021**=21 ST custom-made	**A**=5VDC **E**=10-30VDC	**06**=6mm **XX**=custom-made	**SB**=SSI binary **SG**=SSI gray **CO**=CANopen	**3A**=axial output **3R**=radial output

EAXS58

SSI Solid Shaft Encoder

Features

- Standard ϕ58mm OD, easy to install
- high precision ,Standard SSI and biss protocol
- Up to 21 bitsingleturn,14bitmultiturn
- Suitable for system control and other applications

Specifications

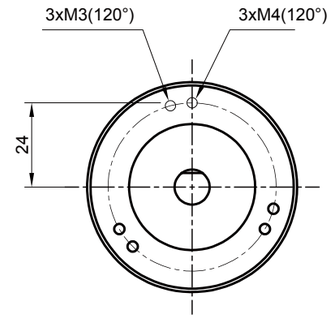
Electrical Specifications

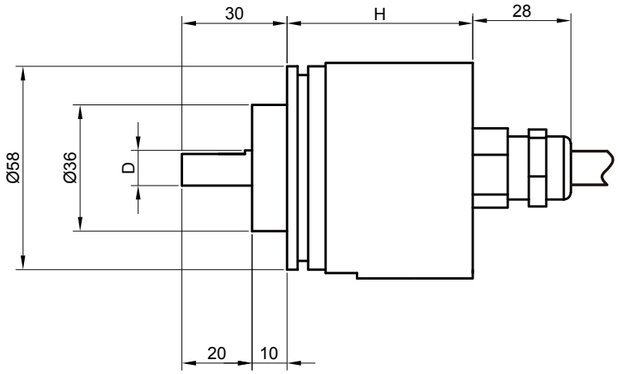
Interface	SSI
Supply Voltage	5VDC, 10-30VDC
Current Consumption	80mA
Output Code	Binary/Gray
Resolution	21 bit single turn (Max.), 14 bit multiturn (Max.)
Output speed	0.1-2 MBit/s
Criterion	RS422
linearity	1LSB
Incremental output	Refer to EINS58 parameter

Mechanical Specifications

Maximum speed	12000rpm
Shaft load	Axial 50N Radial 100N
Starting Torque	<0.05Nm
Shock Resistance	EN 60068-2-27 1000m/s² 6ms
Vibration Resistance	EN 60068-2-6 100m/s² 55....2000HZ
Operating Temperature	-40°C to +80°C
Protection Class	IP66
Material	stainless steel (316L)
Weight	300g

Dimension (Installation flanges, hole positions, etc. shall be subject to the order confirmation)





unit: mm

D=6,10,on request
Singleturn: H=47, Multiturn: H=54

Connection

SSI	3A/3R	6A/6R/8A/8R
GND	brown	2
VCC	white	1
CLCOK+	yellow	6
CLOCK-	green	4
DATE+	pink	5
DATE-	grey	8
ZERO	black	7
DIR	blue	3

Ordering Code

Example: EASS580012E06SB3R
58single turn 12 bit resolution SSI binary solid shaft encoder, power voltage 10-30V DC, axle diameter 6mm, radial straight out cable

EASS58	resolution	power	shaft	output	connection
EASS=ST **EAMS**=MT	**1212**=12 MT 12 ST **1214**=12 MT 14 ST **1021**=10 MT 21 ST **1220**=12 MT 20 ST **1418**=14 MT 18 ST **0012**=12 ST **0021**=21 ST custom-made	**A**=5VDC **E**=10-30VDC	**06**=6x10mm **10**=10x20mm **XX**=custom-made	**SB**=SSI binary **SG**=SSI gray	**3A**=axial output **3R**=radial output **6A**=connector radial output (cw) **6R**=connector axial output (cw) **8A**=connector radial output (ccw) **8R**=connector axial output (ccw)

option: incremental output
1024/2048/4096

EAXB58

SSI Blind Shaft Encoder

Features

- Standard ϕ58mm OD, easy to install
- high precision ,Standard SSI and biss protocol
- Up to 21 bitsingleturn,14bitmultiturn
- Suitable for system control and other applications

Specifications

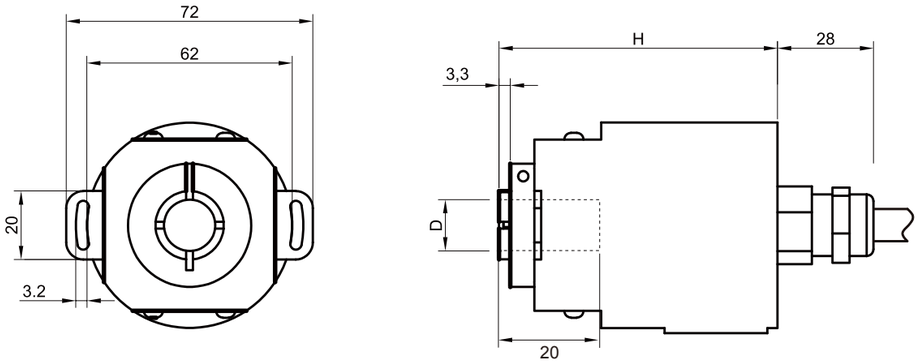
Electrical Specifications

Interface	SSI
Supply Voltage	5VDC, 10-30VDC
Current Consumption	80mA
Output Code	Binary/Gray
Resolution	21 bit single turn (Max.), 14 bit multiturn (Max.)
Output speed	0.1-2 MBit/s
Criterion	RS422
linearity	1LSB
Incremental output	Refer to EINS58 parameter

Mechanical Specifications

Maximum speed	12000rpm
Shaft load	Axial 50N Radial 100N
Starting Torque	<0.05Nm
Shock Resistance	EN 60068-2-27 1000m/s² 6ms
Vibration Resistance	EN 60068-2-6 100m/s² 55....2000HZ
Operating Temperature	-40°C to +80°C
Protection Class	IP66
Material	stainless steel (316L)
Weight	300g

Dimension (Installation flanges, hole positions, etc. shall be subject to the order confirmation)



unit: mm

D=6,10,on request
Singleturn: H=47, Multiturn: H=54

Connection

SSI	3A/3R	6A/6R/8A/8R
GND	brown	2
VCC	white	1
CLCOK+	yellow	6
CLOCK-	green	4
DATE+	pink	5
DATE-	grey	8
ZERO	black	7
DIR	blue	3

Ordering Code

Example: EASB580012E06SB3R
58single turn 12 bit resolution SSI binary blind shaft encoder, power voltage 10-30V DC, aperture 6mm, radial straight out cable

EASB58	resolution	power	shaft	output	connection
EASB=ST **EAMB**=MT	**1212**=12 MT 12 ST **1214**=12 MT 14 ST **1021**=10 MT 21 ST **1220**=12 MT 20 ST **1418**=14 MT 18 ST **0012**=12 ST **0021**=21 ST custom-made	**A**=5VDC **E**=10-30VDC	**06**=6mm **10**=10mm **XX**=custom-made	**SB**=SSI binary **SG**=SSI gray	**3A**=axial output **3R**=radial output **6A**=connector radial output (cw) **6R**=connector axial output (cw) **8A**=connector radial output (ccw) **8R**=connector axial output (ccw)

option: incremental output
1024/2048/4096

EAXS58

Analog Solid Shaft Encoder

Features

- Standard ϕ58mm OD, easy to install protection grade up to IP67
- high precision ,Standard MODBUS protocol 4-20mA output
- Address, baud rate, etc
- Suitable for field testing applications

MODBUS/485 4-20mA

Specifications

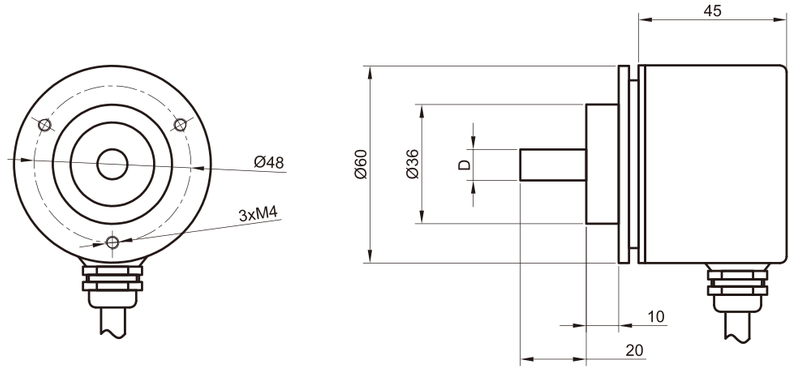
Electrical Specifications

Interface	MODBUS and Analog
Supply Voltage	10-30VDC
Current Consumption	50mA
Output Code	Binary
Resolution	21 bit single turn (Max.), 14 bit multiturn (Max.)
Output speed	4-20mA
Criterion	GB/Z19582
linearity	1LSB

Mechanical Specifications

Maximum speed	12000rpm
Shaft load	Axial 50N Radial 100N
Starting Torque	<0.05Nm
Shock Resistance	EN 60068-2-27 1000m/s² 6ms
Vibration Resistance	EN 60068-2-6 100m/s² 55....2000HZ
Operating Temperature	-40°C to +80°C
Protection Class	IP66
Material	aluminium alloy
Weight	300g

Dimension (Installation flanges, hole positions, etc. shall be subject to the order confirmation)



unit: mm

D=6,10,on request

Connection

Modbus/AO	3A/3R	6A/6R/8A/8R
GND	brown	1
VCC	blue	2
MOD_A(pro.)	black	3
MOD_B(pro.)	white	4
ANA+	red	5
ANA-	yellow	6
RST	grey	7
pro.	green	8

Ordering Code

Example: EASS580012E06MA3R
58single turn 12 bit resolution MODBUS/analog solid shaft encoder, power voltage 10-30V DC, axle diameter 6mm, radial straight out cable

EASS58	resolution	power	shaft	output	connection
EASS=ST **EAMS**=MT	**1212**=12 MT 12 ST **1214**=12 MT 14 ST **1021**=10 MT 21 ST **1220**=12 MT 20 ST **1418**=14 MT 18 ST **0012**=12 ST **0021**=21 ST custom-made	**E**=10-30VDC	**06**=6x10mm **10**=10x20mm **XX**=custom-made	**MA**=analog& MODBUS RTU	**3A**=axial output **3R**=radial output **6A**=connector radial output (cw) **6R**=connector axial output (cw) **8A**=connector radial output (ccw) **8R**=connector axial output (ccw)

EAXB58

Analog Blind Shaft Encoder

Features

- Standard ϕ58mm OD, easy to install protection grade up to IP67
- high precision ,Standard MODBUS protocol 4-20mA output
- Address, baud rate, etc
- Suitable for field testing applications

MODBUS/485 4-20mA

Specifications

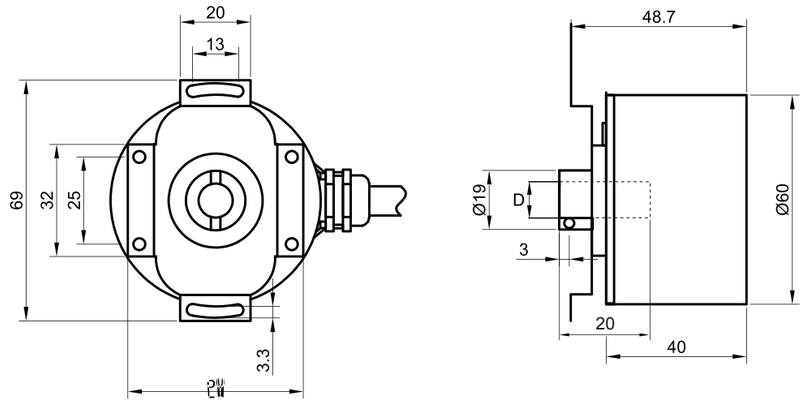
Electrical Specifications

Interface	MODBUS and Analog
Supply Voltage	10-30VDC
Current Consumption	50mA
Output Code	Binary
Resolution	21 bit single turn (Max.), 14 bit multiturn (Max.)
Output speed	4-20mA
Criterion	GB/Z19582
linearity	1LSB

Mechanical Specifications

Maximum speed	12000rpm
Shaft load	Axial 50N Radial 100N
Starting Torque	<0.05Nm
Shock Resistance	EN 60068-2-27 1000m/s² 6ms
Vibration Resistance	EN 60068-2-6 100m/s² 55....2000HZ
Operating Temperature	-40°C to +80°C
Protection Class	IP66
Material	aluminium alloy
Weight	300g

Dimension (Installation flanges, hole positions, etc. shall be subject to the order confirmation)



unit: mm

D=6,10,on request

Connection

Modbus/AO	3A/3R	6A/6R/8A/8R
GND	brown	1
VCC	blue	2
MOD_A(pro.)	black	3
MOD_B(pro.)	white	4
ANA+	red	5
ANA-	yellow	6
RST	grey	7
pro.	green	8

Ordering Code

Example: EASB580012E06MA3R
58single turn 12 bit resolution MODBUS/analog blind shaft encoder, power voltage 10-30V DC, aperture 6mm ,radial straight out cable

EAXB58	resolution	power	shaft	output	connection
EASB=ST **EAMB**=MT	**1212**=12 MT 12 ST **1214**=12 MT 14 ST **1021**=10 MT 21 ST **1220**=12 MT 20 ST **1418**=14 MT 18 ST **0012**=12 ST **0021**=21 ST custom-made	**E**=10-30VDC	**06**=6mm **10**=10mm **XX**=custom-made	**MA**=analog& MODBUS RTU	**3A**=axial output **3R**=radial output **6A**=connector radial output (cw) **6R**=connector axial output (cw) **8A**=connector radial output (ccw) **8R**=connector axial output (ccw)

EAXS58

CANopen Solid Shaft Encoder

Features

- Integrated bus interface, supporting all DeviceNet and CANopen
- Programmable working mode
- Up to 21 bitsingleturn,14bitmultiturn
- Suitable for automation integration and other applications

CANopen DeviceNet

Specifications

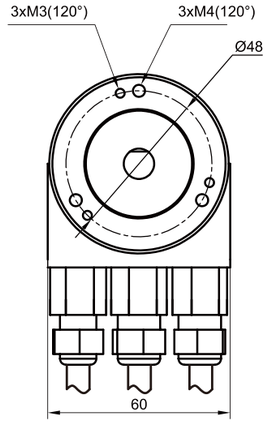
Electrical Specifications

Interface	CANopen/DeviceNet
Supply Voltage	10-30VDC
Current Consumption	180mA
Output Code	Binary
Resolution	21 bit single turn (Max.), 14 bit multiturn (Max.)
Output speed	0.5MBit/s(DeviceNet) 1MBit/s(CANopen)
Criterion	DSP406, Class 1 Class2
linearity	1LSB

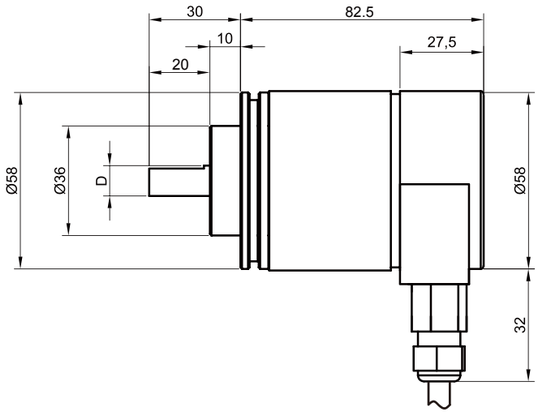
Mechanical Specifications

Maximum speed	12000rpm
Shaft load	Axial 50N Radial 100N
Starting Torque	<0.05Nm
Shock Resistance	EN 60068-2-27 1000m/s² 6ms
Vibration Resistance	EN 60068-2-6 100m/s² 55....2000HZ
Operating Temperature	-40°C to +80°C
Protection Class	IP66
Material	aluminium alloy
Weight	300g

Dimension (Installation flanges, hole positions, etc. shall be subject to the order confirmation)



unit: mm



D=6,10,on request

Connection

CANopen DeviceNet	Z
VCC	1
GND	2
CAN_G	3
CAN_LOW	4
CAN_HIGH	5
CAN_G	6
CAN_LOW	7
CAN_HIGH	8

Ordering Code

Example: EASS580012E06COZ
58single turn 12 bit resolution CANopen solid shaft encoder, power voltage 10-30V DC, axle diameter 6mm, terminal box

EAXS58	resolution	power	shaft	output	connection
EASS=ST **EAMS**=MT	**1212**=12 MT 12 ST **1214**=12 MT 14 ST **1021**=10 MT 21 ST **1220**=12 MT 20 ST **1418**=14 MT 18 ST **0012**=12 ST **0021**=21 ST custom-made	**E**=10-30VDC	**06**=6x10mm **10**=10x20mm **XX**=custom-made	**CO**=CANopen **VD**=DeviceNet	**Z**=tenminal 3xPG9

EAXB58

CANopen Blind Shaft Encoder

Features

- Integrated bus interface, supporting all DeviceNet and CANopen
- Programmable working mode
- Up to 21 bitsingleturn,14bitmultiturn
- Suitable for automation integration and other applications

CANopen DeviceNet

Specifications

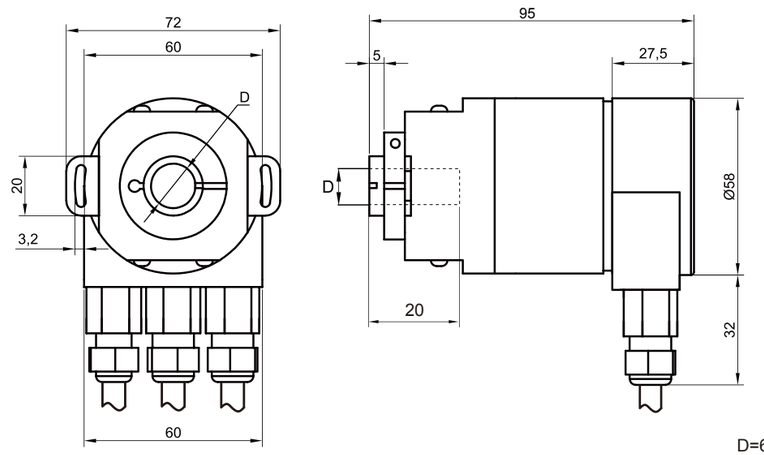
Electrical Specifications

Interface	CANopen/DeviceNet
Supply Voltage	10-30VDC
Current Consumption	180mA
Output Code	Binary
Resolution	21 bit single turn (Max.), 14 bit multiturn (Max.)
Output speed	0.5MBit/s(DeviceNet) 1MBit/s(CANopen)
Criterion	DSP406, Class 1 Class2
linearity	1LSB

Mechanical Specifications

Maximum speed	12000rpm
Shaft load	Axial 50N Radial 100N
Starting Torque	<0.05Nm
Shock Resistance	EN 60068-2-27 1000m/s² 6ms
Vibration Resistance	EN 60068-2-6 100m/s² 55....2000HZ
Operating Temperature	-40°C to +80°C
Protection Class	IP66
Material	aluminium alloy
Weight	300g

Dimension (Installation flanges, hole positions, etc. shall be subject to the order confirmation)



unit: mm

D=6,10,on request

Connection

CANopen DeviceNet	Z
VCC	1
GND	2
CAN_G	3
CAN_LOW	4
CAN_HIGH	5
CAN_G	6
CAN_LOW	7
CAN_HIGH	8

Ordering Code

Example: EASB580012E06COZ
58single turn 12 bit resolution CANopen blind shaft encoder, power voltage 10-30V DC, aperture 6mm ,terminal box

EAXB58	resolution	power	shaft	output	connection
EASB=ST **EAMB**=MT	**1212**=12 MT 12 ST **1214**=12 MT 14 ST **1021**=10 MT 21 ST **1220**=12 MT 20 ST **1418**=14 MT 18 ST **0012**=12 ST **0021**=21 ST custom-made	**E**=10-30VDC	**06**=6mm **10**=10mm **XX**=custom-made	**CO**=CANopen **VD**=DeviceNet	**Z**=tenminal 3xPG9

EAXS58

DP Solid Shaft Encoder

Features

- With optical coupler isolation standard PROFIBUS-DP interface
- Terminal resistance, address and so on can be set (dip switch)
- Up to 21 bitsingleturn,14bitmultiturn
- Suitable for group control with industrial bus and other applications

Specifications

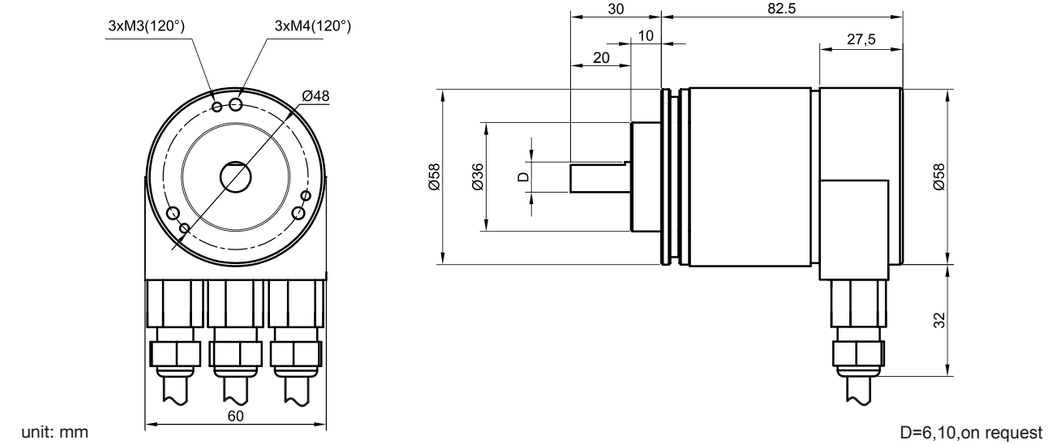
Electrical Specifications

Interface	Profibus DP
Supply Voltage	10-30VDC
Current Consumption	200mA
Output Code	Binary
Resolution	21 bit single turn (Max.), 14 bit multiturn (Max.)
Output speed	0.001-12MBit/s
Criterion	DPV0,DPV1 and DPV2 Class 2
linearity	1LSB

Mechanical Specifications

Maximum speed	12000rpm
Shaft load	Axial 50N Radial 100N
Starting Torque	<0.05Nm
Shock Resistance	EN 60068-2-27 1000m/s² 6ms
Vibration Resistance	EN 60068-2-6 100m/s² 55....2000HZ
Operating Temperature	-40°C to +80°C
Protection Class	IP66
Material	aluminium alloy
Weight	300g

Dimension (Installation flanges, hole positions, etc. shall be subject to the order confirmation)



unit: mm

D=6,10,on request

Connection

DP	Z
BUS IN(B)	5
BUS IN(A)	6
BUS IN(0 V)	2
BUS IN(+ V)	1
BUS OUT(B)	7
BUS OUT(A)	8
BUS OUT(0 V)	4
BUS OUT(+ V)	3

Ordering Code

Example: EASS580012E06DPZ
58single turn 12 bit resolution profibus solid shaft encoder, power voltage 10-30V DC, axle diameter 6mm, terminal box

EAXS58	resolution	power	shaft	output	connection
EASS=ST **EAMS**=MT	**1212**=12 MT 12 ST **1214**=12 MT 14 ST **1021**=10 MT 21 ST **1220**=12 MT 20 ST **1418**=14 MT 18 ST **0012**=12 ST **0021**=21 ST custom-made	**E**=10-30VDC	**06**=6x10mm **10**=10x20mm **XX**=custom-made	**DP**=profinbus	**Z**=tenminal 3xPG9

EAXB58

DP Blind Shaft Encoder

Features

- With optical coupler isolation standard PROFIBUS-DP interface
- Terminal resistance, address and so on can be set (dip switch)
- Up to 21 bitsingleturn,14bitmultiturn
- Suitable for group control with industrial bus and other applications

Specifications

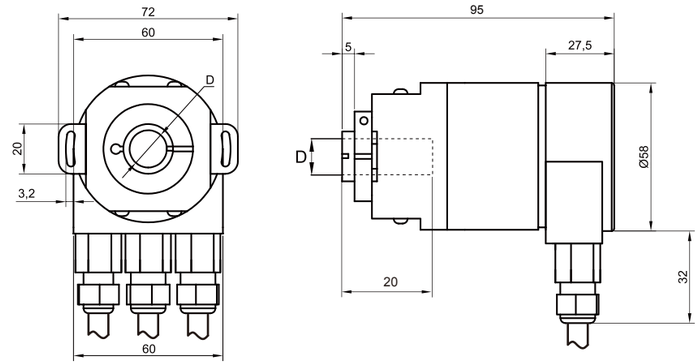
Electrical Specifications

Interface	Profibus DP
Supply Voltage	10-30VDC
Current Consumption	200mA
Output Code	Binary
Resolution	21 bit single turn (Max.), 14 bit multiturn (Max.)
Output speed	0.001-12MBit/s
Criterion	DPV0,DPV1 and DPV2 Class 2
linearity	1LSB

Mechanical Specifications

Maximum speed	12000rpm
Shaft load	Axial 50N Radial 100N
Starting Torque	<0.05Nm
Shock Resistance	EN 60068-2-27 1000m/s² 6ms
Vibration Resistance	EN 60068-2-8 100m/s², 55 ... 2000 Hz
Operating Temperature	-40°C to +80°C
Protection Class	IP66
Material	aluminium alloy
Weight	300g

Dimension (Installation flanges, hole positions, etc. shall be subject to the order confirmation)



unit: mm

D=6,10,on request

Connection

DP	Z
BUS IN(B)	5
BUS IN(A)	6
BUS IN(0 V)	2
BUS IN(+ V)	1
BUS OUT(B)	7
BUS OUT(A)	8
BUS OUT(0 V)	4
BUS OUT(+ V)	3

Ordering Code

Example: EASB580012E06DPZ
58single turn 12 bit resolution profibus blind shaft encoder, power voltage 10-30V DC, aperture 6mm, terminal box

EAXB58	resolution	power	shaft	output	connection
EASB=ST **EAMB**=MT	**1212**=12 MT 12 ST **1214**=12 MT 14 ST **1021**=10 MT 21 ST **1220**=12 MT 20 ST **1418**=14 MT 18 ST **0012**=12 ST **0021**=21 ST custom-made	**E**=10-30VDC	**06**=6mm **10**=10mm **XX**=custom-made	**DP**=profinbus	**Z**=tenminal 3xPG9

EAXS58

Ethernet Solid Shaft Encoder

Features

- Standard Ethernet interface, ϕ58mm standard od
- Supports Profinet, PowerLink, TCP/IP and other protocols
- Up to 21 bitsingleturn,14bitmultiturn
- Suitable for industrial Internet of Things and other applications

INDUSTRIAL ETHERNET

Specifications

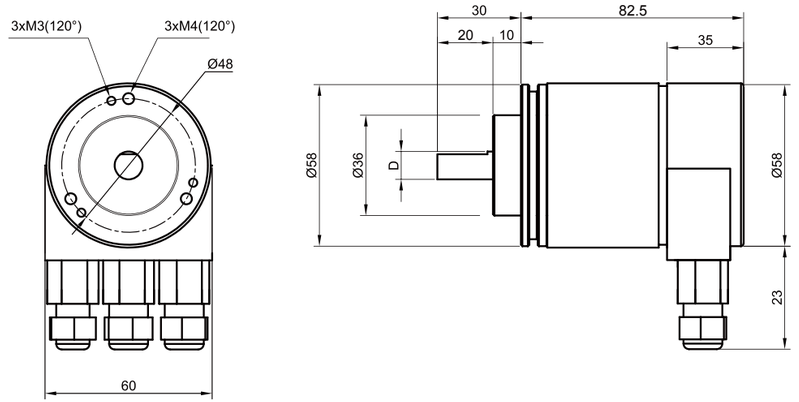
Electrical Specifications

Interface	Ethernet
Supply Voltage	10-30VDC
Current Consumption	4W
Output Code	Binary
Resolution	21 bit single turn (Max.), 14 bit multiturn (Max.)
Output speed	10M or 100MBit/s
Criterion	Standard Ethernet
linearity	0.5LSB

Mechanical Specifications

Maximum speed	12000rpm
Shaft load	Axial 50N Radial 100N
Starting Torque	<0.05Nm
Shock Resistance	EN 60068-2-27 1000m/s² 6ms
Vibration Resistance	EN 60068-2-6 100m/s² 55....2000HZ
Operating Temperature	-40°C to +80°C
Protection Class	IP66
Material	aluminium alloy
Weight	300g

Dimension (Installation flanges, hole positions, etc. shall be subject to the order confirmation)



unit: mm

D=6,10,on request

Connection

NET	CD(M12)
RXD+	1(X1,X2)
TXD+	2(X1,X2)
RXD-	3(X1,X2)
TXD+	4(X1,X2)
/	5(X1,X2)
VCC	1(X3)
VCC	2(X3)
GND	3(X3)
GND	4(X3)
PE	5(X3)

Ordering Code

Example: EASS580012E06PNCD
58single turn 12 bit resolution profinet solid shaft encoder, power voltage 10-30V DC, axle diameter 6mm, terminal box

EAXS58	resolution	power	shaft	output	connection
EASS=ST **EAMS**=MT	**1212**=12 MT 12 ST **1214**=12 MT 14 ST **1021**=10 MT 21 ST **1220**=12 MT 20 ST **1418**=14 MT 18 ST **0012**=12 ST **0021**=21 ST custom-made	**E**=10-30VDC	**06**=6x10mm **10**=10x20mm **XX**=custom-made	**PN**=profinet **PL**=Powerlink **TI**=TCIP/IP	**CD**=M12 A-coded+M12 D-coded*2

EAXB58

Ethernet Blind Shaft Encoder

INDUSTRIAL ETHERNET

Features

- Standard Ethernet interface, ϕ58mm standard od
- Supports Profinet, PowerLink, TCP/IP and other protocols
- Up to 21 bitsingleturn,14bitmultiturn
- Suitable for industrial Internet of Things and other applications

Specifications

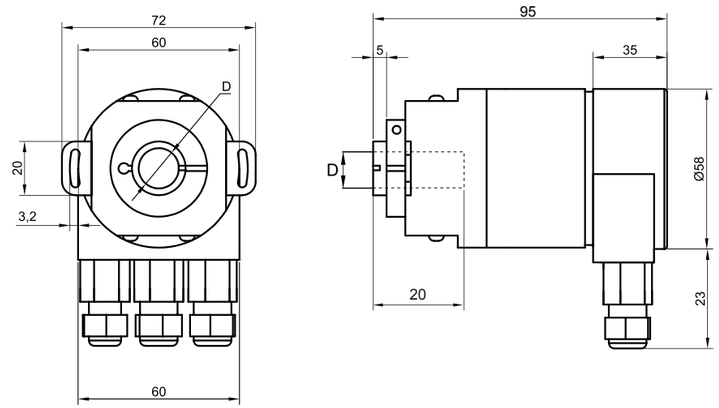
Electrical Specifications

Interface	Ethernet
Supply Voltage	10-30VDC
Current Consumption	300Ma
Output Code	Binary
Resolution	21 bit single turn (Max.), 14 bit multiturn (Max.)
Output speed	10M or 100MBit/s
Criterion	Standard Ethernet
linearity	0.5LSB

Mechanical Specifications

Maximum speed	12000rpm
Shaft load	Axial 50N Radial 100N
Starting Torque	<0.05Nm
Shock Resistance	EN 60068-2-27 1000m/s² 6ms
Vibration Resistance	EN 60068-2-6 100m/s² 55....2000HZ
Operating Temperature	-40°C to +80°C
Protection Class	IP66
Material	aluminium alloy
Weight	300g

Dimension (Installation flanges, hole positions, etc. shall be subject to the order confirmation)



unit: mm

D=6,10,on request

Connection

NET	CD(M12)
RXD+	1(X1,X2)
TXD+	2(X1,X2)
RXD-	3(X1,X2)
TXD+	4(X1,X2)
/	5(X1,X2)
VCC	1(X3)
VCC	2(X3)
GND	3(X3)
GND	4(X3)
PE	5(X3)

Ordering Code

Example: EASB580012E06PNCD
58single turn 12 bit resolution profinet blind shaft encoder, power voltage 10-30V DC, aperture 6mm, terminal box

EAXB58	resolution	power	shaft	output	connection
EASB=ST **EAMS**=MT	**1212**=12 MT 12 ST **1214**=12 MT 14 ST **1021**=10 MT 21 ST **1220**=12 MT 20 ST **1418**=14 MT 18 ST **0012**=12 ST **0021**=21 ST custom-made	**E**=10-30VDC	**06**=6mm **10**=10mm **XX**=custom-made	**PN**=profinet **PL**=Powerlink **TI**=TCIP/IP	**CD**=M12 A-coded+M12 D-coded*2

EAXS58

Parallel Solid Shaft Encoder

Features

- High speed parallel interface, binary or gray code optional
- Up to 21 bit singleturn,14 bit multiturn
- Frequency 400Khz
- Suitable for measurement laboratory applications

Parallel

Specifications

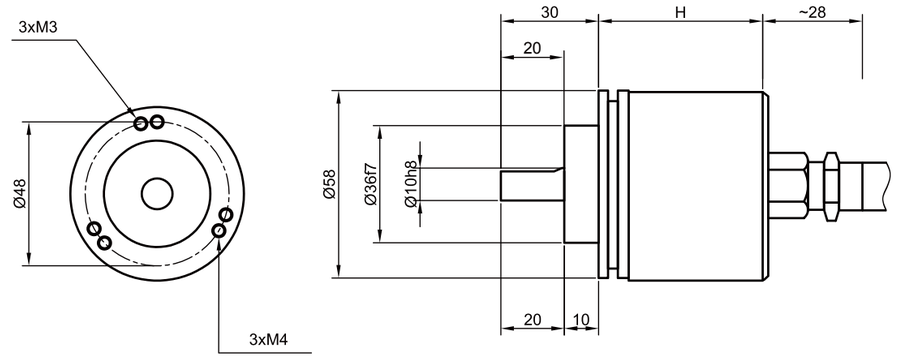
Electrical Specifications

Interface	Parallel Interface
Supply Voltage	10-30VDC
Current Consumption	140mA
Output Code	Binary/Gray
Resolution	21 bit single turn (Max.), 14 bit multiturn (Max.)
Electrical interface	Push-pull output with short circuit protection
Frequency	400KHZ
linearity	0.5LSB

Mechanical Specifications

Maximum speed	12000rpm
Shaft load	Axial 50N Radial 100N
Starting Torque	<0.05Nm
Shock Resistance	EN 60068-2-27 1000m/s² 6ms
Vibration Resistance	EN 60068-2-6 100m/s² 55....2000HZ
Operating Temperature	-40°C to +80°C
Protection Class	IP66
Material	aluminium alloy
Weight	300g

Dimension (Installation flanges, hole positions, etc. shall be subject to the order confirmation)



unit: mm

D=6,10,on request
Singleturn: H=53, Multiturn: H=62

Connection

	PD/3A/3R			PD/3A/3R	
GND	1	WH	DATA	14	BR/GN
VCC	2	BR	DATA	15	WH/YE
DATA	3	GN	DATA	16	YE/BR
DATA	4	YE	DATA	17	WH/GY
DATA	5	GY	DATA	18	GY/BR
DATA	6	PK	DATA	19	WH/PK
DATA	7	BL	DATA	20	PK/BR
DATA	8	RD	DATA	21	WH/BL
DATA	9	BK	DATA	22	BR/BL
DATA	10	PE	DATA	23	WH/RD
DATA	11	GY/PK	LATCH	24	YE/GY
DATA	12	RD/BL	DIR	25	GY/GN
DATA	13	WH/GN	RST	26	YE/

Ordering Code

Example: EASS580012E06PB3R
58single turn 12 bit resolution parallel solid shaft encoder, power voltage 10-30V DC, axle diameter 6mm, radial straight out cable

EAXS58	resolution	power	shaft	output	connection
EASS=ST **EAMS**=MT	**1212**=12 MT 12 ST **1214**=12 MT 14 ST **1021**=10 MT 21 ST **1220**=12 MT 20 ST **1418**=14 MT 18 ST **0012**=12 ST **0021**=21 ST custom-made	**E**=10-30VDC	**06**=6x10mm **10**=10x20mm **XX**=custom-made	**PB**= binary **PG**= gray	**3A**=axial output **3R**=radial output **PD**=25针 D-coder

EAXB58

Parallel Blind Shaft Encoder

Features

- High speed parallel interface, binary or gray code optional
- Up to 21 bit singleturn,14 bit multiturn
- Frequency 400Khz
- Suitable for measurement laboratory applications

Parallel

Specifications

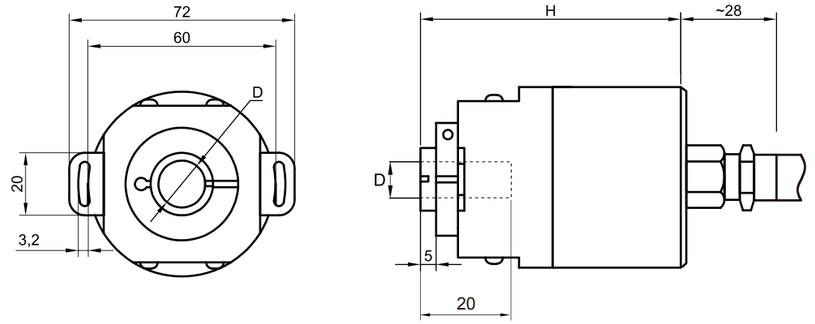
Electrical Specifications

Interface	Parallel Interface
Supply Voltage	10-30VDC
Current Consumption	140mA
Output Code	Binary/Gray
Resolution	21 bit single turn (Max.), 14 bit multiturn (Max.)
Electrical interface	Push-pull output with short circuit protection
Frequency	400KHZ
linearity	0.5LSB

Mechanical Specifications

Maximum speed	12000rpm
Shaft load	Axial 50N Radial 100N
Starting Torque	<0.05Nm
Shock Resistance	EN 60068-2-27 1000m/s² 6ms
Vibration Resistance	EN 60068-2-6 100m/s² 55....2000HZ
Operating Temperature	-40°C to +80°C
Protection Class	IP66
Material	aluminium alloy
Weight	300g

Dimension (Installation flanges, hole positions, etc. shall be subject to the order confirmation)



unit: mm

D=6,10,on request
Singleturn: H=72, Multiturn: H=80

Connection

	PD/3A/3R			PD/3A/3R	
GND	1	WH	DATA	14	BR/GN
VCC	2	BR	DATA	15	WH/YE
DATA	3	GN	DATA	16	YE/BR
DATA	4	YE	DATA	17	WH/GY
DATA	5	GY	DATA	18	GY/BR
DATA	6	PK	DATA	19	WH/PK
DATA	7	BL	DATA	20	PK/BR
DATA	8	RD	DATA	21	WH/BL
DATA	9	BK	DATA	22	BR/BL
DATA	10	PE	DATA	23	WH/RD
DATA	11	GY/PK	LATCH	24	YE/GY
DATA	12	RD/BL	DIR	25	GY/GN
DATA	13	WH/GN	RST	26	YE/

Ordering Code

Example: EASB580012E06PB3R
58single turn 12 bit resolution parallel blind shaft encoder, power voltage 10-30V DC, aperture 6mm ,radial straight out cable

EAXB58	resolution	power	shaft	output	connection
EASB=ST **EAMB**=MT	**1212**=12 MT 12 ST **1214**=12 MT 14 ST **1021**=10 MT 21 ST **1220**=12 MT 20 ST **1418**=14 MT 18 ST **0012**=12 ST **0021**=21 ST custom-made	**E**=10-30VDC	**06**=6mm **10**=10mm **XX**=custom-made	**PB**= binary **PG**= gray	**3A**=axial output **3R**=radial output **PD**=25针 D-coder

EAXS90

Heavy-duty Solid Shaft Encoder

Features

- Heavy duty large size absolute encoder
- Standard CANopen protocol, SSI protocol
- Up to 13 bit singleturn,16 bit multiturn
- Suitable for steel, mining and other heavy industry applications

CANopen SSI

Specifications

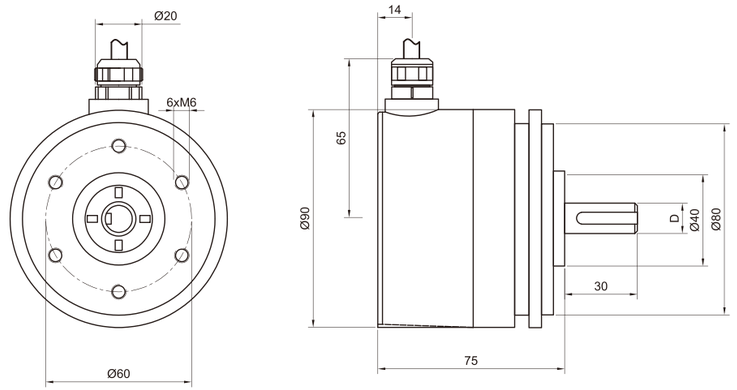
Electrical Specifications

Interface	CAN open	SSI/BISS
Supply Voltage	10-30VDC	10-30VDC
Current Consumption	120mA	100mA
Output Code	Binary	Binary/Gray
Resolution	13 bit single turn (Max.), 16 bit multiturn (Max.)	13 bit single turn (Max.), 16 bit multiturn (Max.)
Output speed	1MBit/s	0.1-2 MBit/s
Criterion	DSP406, Class 1 Class2	RS422
linearity	1LSB	1LSB

Mechanical Specifications

Maximum speed	6000rpm
Shaft load	Axial 100N Radial 200N
Starting Torque	<0.06Nm
Shock Resistance	EN 60068-2-27 1000m/s² 6ms
Vibration Resistance	EN 60068-2-6 100m/s² 55....2000HZ
Operating Temperature	-20°C 至 +90°C -20°C to +90°C
Protection Class	IP65/IP67(option)
Material	galvanized aluminum housing/ Stainless steel
Weight	1500g

Dimension (Installation flanges, hole positions, etc. shall be subject to the order confirmation)



unit: mm

D=11,12,on request

Connection

SSI	3A/3R	6A/6R/8A/8R
GND	brown	2
VCC	white	1
CLCOK+	yellow	6
CLOCK-	green	4
DATE+	pink	5
DATE-	grey	8
ZERO	pink	7
DIR	blue	3

CANopen	3A/3R	6A/6R/8A/8R
GND	white	3
VCC	brown	2
CAN_GROUND	green	1
CAN_LOW(-)	yellow	5
CAN_HIGH(+)	grey	4

Ordering Code

Example: EASS90SS0012E12SB3R
90single turn 12 bit resolution SSI binary solid shaft encoder, power voltage 10-30V DC, radial straight out cable, stainless steel housing

EAXS90	shell	resolution	power	shaft
EASS=ST **EAMS**=MT	**L**=Galvanized aluminum **SS**=stainless steel	**1212**=12 MT 12 ST **1412**=14 MT 12 ST **1612**=16 MT 12 ST **0012**=12 ST customizable	**E**=10-30VDC	**11**=11x30mm **12**=12x30mm

output	connection
SB=SSI binary **SG**=SSI gray **CO**=CANopen	**3A**=axial output **3R**=radial output **6A**=connector axial output (cw) **6R**=connector radial output (cw) **8A**=connector axial output (ccw) **8R**=connector radial output (ccw)

EAXH90

Heavy-duty Hollow Shaft Encoder

CANopen SSI

Features

- Heavy duty large size absolute encoder
- Standard CANopen protocol, SSI protocol
- Up to 13 bit singleturn,16 bit multiturn
- Suitable for steel, mining and other heavy industry applications

Specifications

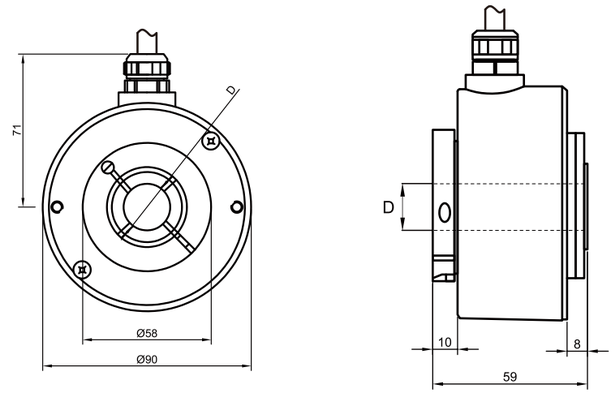
Electrical Specifications

Interface	CAN open	SSI/BISS
Supply Voltage	10-30VDC	10-30VDC
Current Consumption	120mA	100mA
Output Code	Binary	Binary/Gray
Resolution	13 bit single turn (Max.), 16 bit multiturn (Max.)	13 bit single turn (Max.), 16 bit multiturn (Max.)
Output speed	1MBit/s	0.1-2 MBit/s
Criterion	DSP406, Class 1 Class2	RS422
linearity	1LSB	1LSB

Mechanical Specifications

Maximum speed	6000rpm
Shaft load	Axial 100N Radial 200N
Starting Torque	<0.06Nm
Shock Resistance	EN 60068-2-27 1000m/s² 6ms
Vibration Resistance	EN 60068-2-6 100m/s² 55....2000HZ
Operating Temperature	-20°C to +90°C
Protection Class	IP65/IP67 (option)
Material	galvanized aluminum housing/Stainless steel
Weight	1200g

Dimension (Installation flanges, hole positions, etc. shall be subject to the order confirmation)



unit: mm

D=20,25,30,on request

Connection

SSI	3A	6A/8A
GND	brown	2
VCC	white	1
CLCOK+	yellow	6
CLOCK-	green	4
DATE+	pink	5
DATE-	grey	8
ZERO	pink	7
DIR	blue	3

CANopen	3A	6A/8A
GND	white	3
VCC	brown	2
CAN_GROUND	green	1
CAN_LOW(-)	yellow	5
CAN_HIGH(+)	grey	4

Ordering Code

Example: EASH90SS0012E25SB3R
90single turn 12 bit resolution SSI binary blind shaft encoder, power voltage 10-30V DC, radial straight out cable, stainless steel housing

EAXH90	shell	resolution	power	shaft
EASH=ST **EAMH**=MT	**L**=Galvanized aluminum **SS**=stainless steel	**1212**=12 MT 12 ST **1412**=14 MT 12 ST **1612**=16 MT 12 ST **0012**=12 ST customizable	**E**=10-30VDC	**20**=20mm **25**=25mm **30**=30mm

output	connection
SB=SSI binary **SG**=SSI gray **CO**=CANopen	**3R**=radial output **6R**=connector radial output (cw) **8R**=connector radial output (ccw)

EAXS90

Heavy-duty Solid Shaft Encoder

Features

- Heavy duty large size absolute encoder
- Standard profibus protocol
- Up to 13 bit singleturn,16 bit multiturn
- Suitable for mining machinery, power plants, and other occasions

Specifications

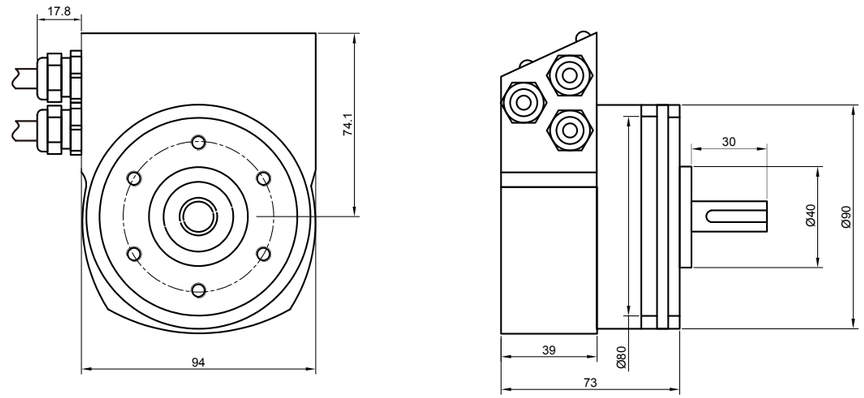
Electrical Specifications

Interface	Profibus DP
Supply Voltage	10-30VDC
Current Consumption	200mA
Output Code	Binary
Resolution	13 bit single turn (Max.), 16 bit multiturn (Max.)
Output speed	0.001-12MBit/s
Criterion	DPV0,DPV1 and DPV2 Class 2
linearity	1LSB

Mechanical Specifications

Maximum speed	6000rpm
Shaft load	Axial 100N Radial 200N
Starting Torque	<0.06Nm
Shock Resistance	EN 60068-2-27 1000m/s² 6ms
Vibration Resistance	EN 60068-2-6 100m/s² 55....2000HZ
Operating Temperature	-10°C to +80°C
Protection Class	IP65/IP67 (option)
Material	galvanized aluminum housing/ Stainless steel
Weight	1500g

Dimension (Installation flanges, hole positions, etc. shall be subject to the order confirmation)



unit: mm

D=11,12,on request

Connection

DP	Z
A	1
B	2
+	3
-	4
A	5
B	6
+	7
-	8

Ordering Code

Example: EASS90SS0012E12DPZ
90single turn 12 bit resolution profinet solid shaft encoder, power voltage 10-30V DC, axle diameter 12mm, terminal box, stainless steel housing

EAXS90	shell	resolution	power	shaft
EASS=ST **EAMS**=MT	**L**=Galvanized aluminum **SS**=stainless steel	**1212**=12 MT 12 ST **1412**=14 MT 12 ST **1612**=16 MT 12 ST **0012**=12 ST customizable	**E**=10-30VDC	**11**=11x30mm **12**=12x30mm

output	connection
DP=profinbus	**Z**=terminal 3xPG9

EAXH90

Heavy-duty Hollow Shaft Encoder

Features

- Heavy duty large size absolute encoder
- Standard profibus protocol
- Up to 13 bit singleturn,16 bit multiturn
- Suitable for mining machinery, power plants, and other occasions

Specifications

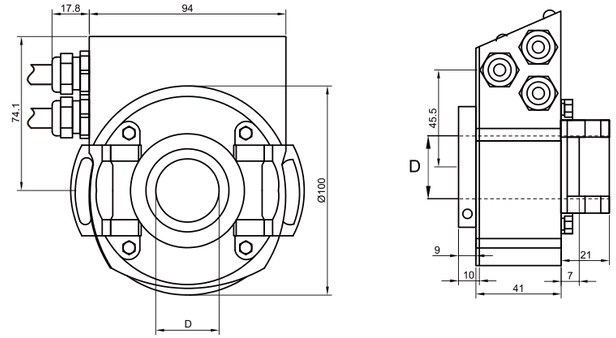
Electrical Specifications

Interface	Profibus DP
Supply Voltage	10-30VDC
Current Consumption	200mA
Output Code	Binary
Resolution	13 bit single turn (Max.), 16 bit multiturn (Max.)
Output speed	0.001-12MBit/s
Criterion	DPV0,DPV1 and DPV2 Class 2
linearity	1LSB

Mechanical Specifications

Maximum speed	6000rpm
Shaft load	Axial 100N Radial 200N
Starting Torque	<0.06Nm
Shock Resistance	EN 60068-2-27 1000m/s² 6ms
Vibration Resistance	EN 60068-2-6 100m/s² 55....2000HZ
Operating Temperature	-10°C to +80°C
Protection Class	IP65/IP67 (option)
Material	galvanized aluminum housing/ Stainless steel
Weight	1200g

Dimension (Installation flanges, hole positions, etc. shall be subject to the order confirmation)



unit: mm

D=20,25,30,on request

Connection

DP	Z
A	1
B	2
+	3
-	4
A	5
B	6
+	7
-	8

Ordering Code

Example: EASH90SS0012E25DPZ
90single turn 12 bit resolution profinet blind shaft encoder, power voltage 10-30V DC, aperture 25mm ,terminal box, stainless steel housing

EAXH90	shell	resolution	power	shaft
EASH=ST **EAMH**=MT	**L**=Galvanized aluminum **SS**=stainless steel	**1212**=12 MT 12 ST **1412**=14 MT 12 ST **1612**=16 MT 12 ST **0012**=12 ST customizable	**E**=10-30VDC	**20**=20mm **25**=25mm **30**=30mm

output	connection
DP=profinbus	**Z**=terminal 3xPG9

If the product information is updated, please refer to the order confirmation

6KB 4110

Rotary Overspeed Switch

Features

- Accurate speed alarm and fast response time
- Rotation Speed can be set from 60 to 6000rpm
- No extra power, purely mechanical principle
- Separate clockwise and counterclockwise rotation control

Specifications

Electrical Data

Supply Voltage	NO
Speed Range	60-6000 rpm
Relay	twin channel (CW/CCW) MAX.400VAC 5A 1250W 240VDC 5A 150W

Mechanical Data

Material	Glass fiber reinforced plastic ; oil, grease and acid resistant
Operating Temperature	-25°C - +75°C
Protection Class	IP65

Testing and Qualification of the Item

Humidity	DINIEC68-2-30
Lower temp . +25°C	hum. 97%
Upper temp. +55°C	hum. 93%
Testduration	6days

Vibration	DINEN60068-2-6
Frequency	10–150Hz
Amplitude	35 mm
Resp.acceleration	5g

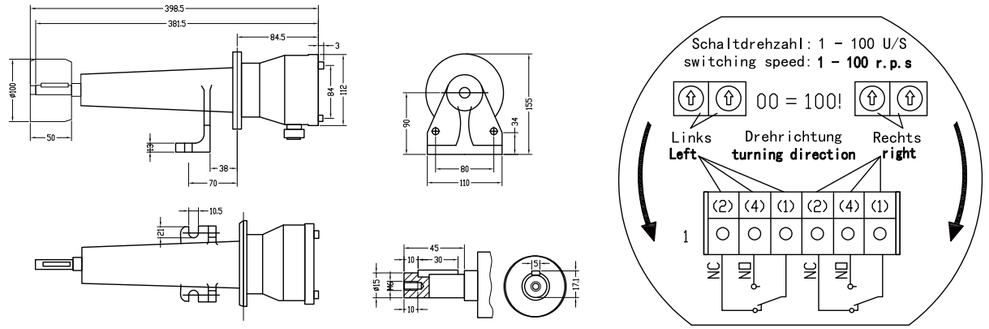
Shock loads	DINEN60068-2-27
Shock type	semi-sine
Amplitude	30g
Duration	18ms
Shocks per orientation	3

Shock loads	DINEN60068-2-29
Shock type	semi-sine
Amplitude	25g
Duration	6ms
Shocks per orientation	1000

Isolation	DIN/VDE0435 Part 303
Check value	2kVAC

Emission	DINEN55022
LINE B	

Dimension



unit: mm

Speed Setting

Pos.	rps	rpm	Pos.	rps	rpm	Pos.	rps	rpm	Pos.	rps	rpm	Pos.	rps	rpm
0:1	1	60	2:1	21	1260	4:1	41	2460	6:1	61	3660	8:1	81	4860
0:2	2	120	2:2	22	1320	4:2	42	2520	6:2	62	3720	8:2	82	4920
0:3	3	180	2:3	23	1380	4:3	43	2580	6:3	63	3780	8:3	83	4980
0:4	4	240	2:4	24	1440	4:4	44	2640	6:4	64	3840	8:4	84	5040
0:5	5	300	2:5	25	1500	4:5	45	2700	6:5	65	3900	8:5	85	5100
0:6	6	360	2:6	26	1560	4:6	46	2760	6:6	66	3960	8:6	86	5160
0:7	7	420	2:7	27	1620	4:7	47	2820	6:7	67	4020	8:7	87	5220
0:8	8	480	2:8	28	1680	4:8	48	2880	6:8	68	4080	8:8	88	5280
0:9	9	540	2:9	29	1740	4:9	49	2940	6:9	69	4140	8:9	89	5340
1:0	10	600	3:0	30	1800	5:0	50	3000	7:0	70	4200	9:0	90	5400
1:1	11	660	3:1	31	1860	5:1	51	3060	7:1	71	4260	9:1	91	5460
1:2	12	720	3:2	32	1920	5:2	52	3120	7:2	72	4320	9:2	92	5520
1:3	13	780	3:3	33	1980	5:3	53	3180	7:3	73	4380	9:3	93	5580
1:4	14	840	3:4	34	2040	5:4	54	3240	7:4	74	4440	9:4	94	5640
1:5	15	900	3:5	35	2100	5:5	55	3300	7:5	75	4500	9:5	95	5700
1:6	16	960	3:6	36	2160	5:6	56	3360	7:6	76	4560	9:6	96	5760
1:7	17	1020	3:7	37	2220	5:7	57	3420	7:7	77	4620	9:7	97	5820
1:8	18	1080	3:8	38	2280	5:8	58	3480	7:8	78	4680	9:8	98	5880
1:9	19	1140	3:9	39	2340	5:9	59	3540	7:9	79	4740	9:9	99	5940
2:0	20	1200	4:0	40	2400	6:0	60	3600	8:0	80	4800	0:0	100	6000

Ordering Code

6KB 4111	speed	relay	serial number
	60-6000rpm	bistable state	SI 099 SI 101

FINS130

Solid Shaft Encoder+ Overspeed Switch

Features

- Heavy-duty encoder Add overspeed alarm switch
- Accurate speed alarm and fast response time
- Max. 1024 pulses
- Suitable for heavy machinery and other applications

Specifications

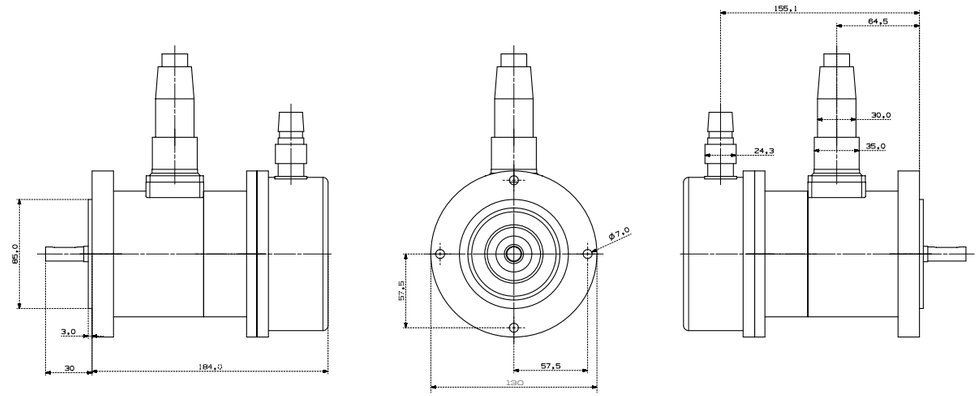
Electrical Specifications

Supply Voltage	10-30VDC	Switching hysteresis	40% of switching speed
Current Consumption	70mA (P-P) , 150mA (RS422)	Shock Resistance	EN 60068-2-27 1000m/s²
Resolution	1024PPR (MAX.)	Vibration Resistance	EN 60068-2-6 100m/s² 55....2000HZ
Electrical Protection	short circuit protection, reverse polarity protection, lightning strike protection	Operating Temperature	-20°C - +85°C
Maximum speed	3600rpm	Protection Class	IP67
Range	720-3000rpm	Material	Aluminum
Switch precision	<20% (MAX.)	Weignt	1620g

◎ Encoder parameters refer to EINS90 series

Solid Shaft Encoder+Overspeed Switch

Dimension (Installation flanges, hole positions, etc. shall be subject to the order confirmation)



unit: mm

Connection

Function	Color	端子
0	white	1(X1)
+	brown	2(X1)
A	green	3(X1)
B	yellow	4(X1)
Z	grey	5(X1)
$\overline{A}$	pink	6(X1)
$\overline{B}$	blue	7(X1)
$\overline{Z}$	red	8(X1)
NC	brown	1(X2)
NO	blue	2(X2)
COM	red	3(X2)

Ordering Code

Example: FINS13012597RFS970-1024
Solid shaft encoder 1024 pulse push-pull output with ABZ inverse signal, axle diameter 12mm, 1-way switch, 970rpm alarm

FINS130	shaft	output	signals	connection
	11=11x30mm **12**=12x30mm	**square wave:** **5**=5-30 V push-pull **2**=5V RS422 **programmable:** **D5**=5-30 V push-pull **D2**=RS422 (TTL) **D7**=RS422 (HTL) **sine signals:** **S1**=1V p-p	**9**=A, B, Z $\overline{A}$, $\overline{B}$, $\overline{Z}$	**7R**

overspeed num.	speed	resolution
-FS **-FS2**	**XXXX**=XXXX rpm	80000 max.

If the product information is updated, please refer to the order confirmation

AOSH90

Hollow Shaft Encoder +Overspeed Switch

Features

- Heavy-duty encoder Add overspeed alarm switch
- Special installation components are included
- Max. 4000 pulses
- Suitable for heavy machinery and other applications

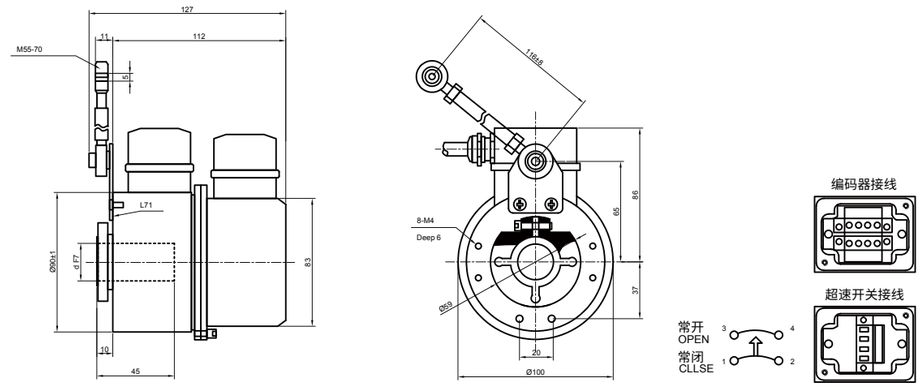
Specifications

Electrical Specifications

Supply Voltage	10-30VDC	Switching hysteresis	40% of switching speed
Current Consumption	70mA (P-P) , 150mA (RS422)	Shock Resistance	EN 60068-2-27 1000m/s² 6m/s
Resolution	4000PPR (MAX.)	Vibration Resistance	EN 60068-2-6 100m/s² 55....2000HZ
Electrical Protection	short circuit protection, reverse polarity protection, lightning strike protection	Operating Temperature	-20°C - +85°C
Maximum speed	3600rpm	Protection Class	IP67
Range	720-3000rpm	Material	Aluminum
Switch precision	<20% (MAX.)	Weignt	1620g

◎ Encoder parameters refer to EINH90 series

Dimension (Installation flanges, hole positions, etc. shall be subject to the order confirmation)



unit: mm

Connection

Function	Color	端子
0	white	1(X1)
+	brown	2(X1)
A	green	3(X1)
B	yellow	4(X1)
Z	grey	5(X1)
$\overline{A}$	pink	6(X1)
$\overline{B}$	blue	7(X1)
$\overline{Z}$	red	8(X1)
NC+	brown	1(X2)
NC-	blue	2(X2)
NO+	red	3(X2)
NO-	white	4(X2)

Ordering Code

Example: AOSH9012597RFS970-1024
Hollow shaft encoder 1024 pulse push-pull output with ABZ inverse signal, aperture 12mm,1-way switch, 970rpm alarm

AOSH90	shaft	output	signals	connection
	12=12 mm **16**=16 mm **20**=20 mm **25**=25 mm	**square wave:** **5**=5-30 V push-pull **2**=5V RS422	**9**=A, B, Z $\overline{A}$, $\overline{B}$, $\overline{Z}$	**7R**

overspeed num.	speed	resolution
-FS **-FS2**	**XXXX**=XXXX rpm	4000 max.

If the product information is updated, please refer to the order confirmation

EMLXX

Magnetic Linear Encoder

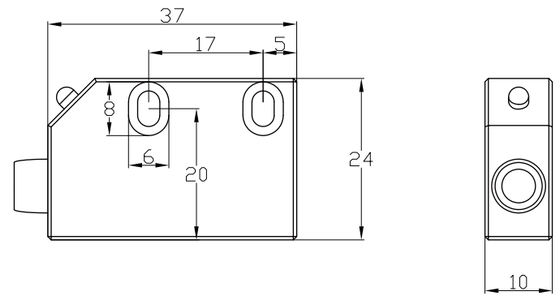
Features

- Linear distance measurement, wide parameter selection
- Standard general purpose, can be specially IP68 housing
- Strong adaptability to environment
- Suitable for factory assembly line

Specifications

Electrical Specifications	EML	EMLH
Supply Voltage	5V, 10-30VDC	5V, 10-30VDC
Output Circuit	PUSH-PULL,RS422	PUSH-PULL
Non-load current	30mA	30mA
accuracy	0.01mm/m	0.01mm/m
linearity	0.01%	0.01%
resolution	5μm/10μm /25μm /62.5μm	1μm
Speed	25m/s	25m/s
Magnetic moment	5mm	2mm
Shock Resistance	EN 60068-2-27 1000m/s² 11m/s	
Vibration Resistance	EN 60068-2-6 100m/s² 50....2000HZ	
Operating Temperature	-20°C - +85°C	
Protection Class	IP68	

Dimension (Installation flanges, hole positions, etc. shall be subject to the order confirmation)



unit: mm

Connection

Function	Color
VCC	white
GND	brown
A	green
B	yellow
Z	grey
$\overline{A}$	red
$\overline{B}$	pink
$\overline{Z}$	blue

Ordering Code

Example: EML05A5910
Linear encoder push-pull output with ABZ signal, range 10meter, resolution 5μm

EML	accuracy	output	signals	length
	05=5μm **10**=10μm **25**=25μm **62**=62μm	**A2**=RS422 **A5**=push-pull	**8**=ABZ **9**=ABZ$\overline{A}\overline{B}\overline{Z}$	max.50m

If the product information is updated, please refer to the order confirmation

EC/EDXX

Draw Wire+Incremental /Absolute Encoder

Features

- Linear distance measurement, Optional digital output and analog output, incremental encoder or absolute encoder
- With 6mm shaft servo flange ,easy to install, Fast displacement speed, can do high speed movement
- Economy type or high protection type free choice
- Suitable for all kinds of linear measurement design

Specifications

Electrical Data

Shock Resistance	EN 60068-2-27 1000m/s² 11m/s
Vibration Resistance	EN 60068-2-6 100m/s 55....2000HZ
Operating Temperature	-40°C - +80°C(ED) -30°C - +75°C(EC)
Protection Class	IP65(ED) IP50(EC)
Supply Voltage	5VDC, 10-30VDC
Output Circuit	Incremental: push-pull output, RS422 Absolute: 4-20 ma, SSI, MODbus, DP, CANopen, Profinet, etc

Ordering Code

EC/ED	serial	range	encoder
	12 / 20 / 30 50 / 100 150 / 200	xxxx=xxxxmm	Incremental (The specific model is selected according to the encoder) Absolute (The specific model is selected according to the encoder)

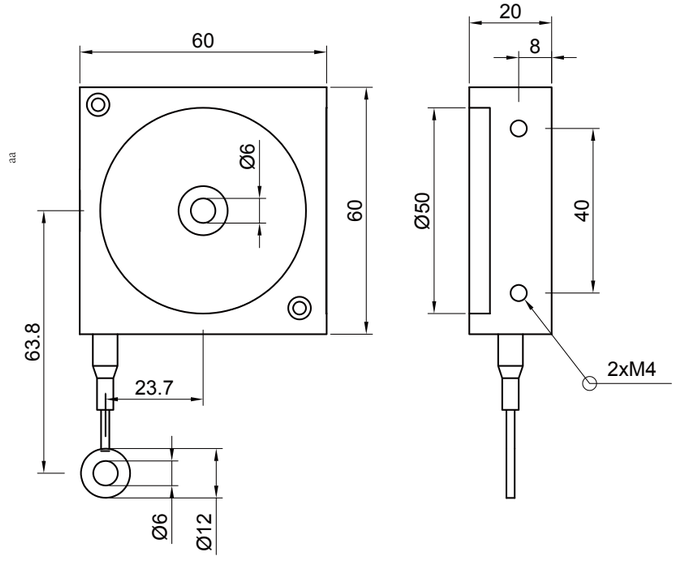
Example: ED2001000EINS5810593R-1024:High precision type draw wire encoder range 1meter with eins58 incremental encoder

EC

EC12

Range	0-1.2m	Materials	Aluminium Alloy
Repeatability	<0.2mm	Single turn length	150mm
Linearity	<2mm	Resilience force	1N-1.4N
Hysteresis	<0.5mm	Diameter	0.5mm
Weight	80g	Accelerated Speed	5m/s²
Weight (drawstring)	0.58g/m	Lifetime	5000,000
Materials (drawstring)	304 stainless steel		

Dimension



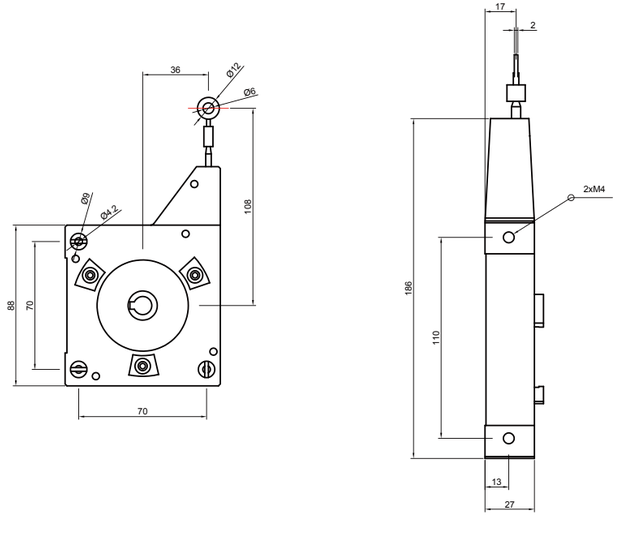
unit: mm

EC

EC30

Range	0-3m	Materials	Aluminium Alloy
Repeatability	<0.3mm	Single turn length	250mm
Linearity	<2mm	Resilience force	3.3N-4.4N
Hysteresis	<1.2mm	Diameter	0.6mm
Weight	250g	Accelerated Speed	10m/s²
Weight (drawstring)	1.2g/m	Lifetime	5000,000
Materials (drawstring)	316 stainless steel		

Dimension



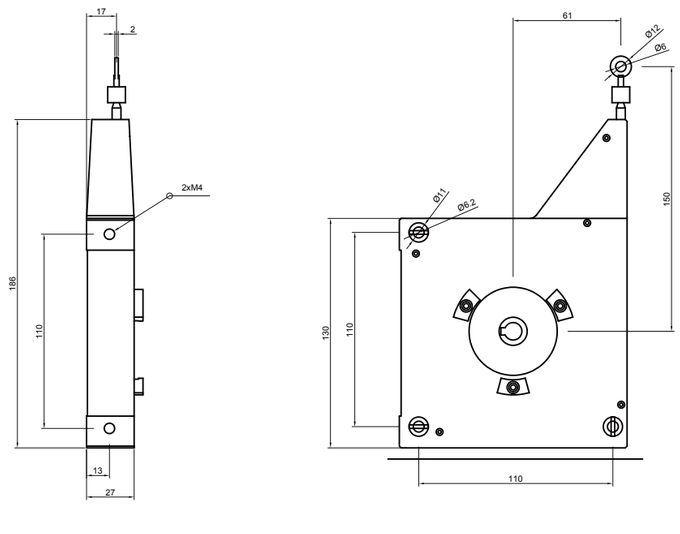
unit: mm

EC

EC50

Range	0-5m	Materials	Aluminium Alloy
Repeatability	<0.3mm	Single turn length	385mm
Linearity	<2mm	Resilience force	1N-1.4N
Hysteresis	<1.2mm	Diameter	0.6mm
Weight	800g	Accelerated Speed	10m/s²
Weight (drawstring)	1.2g/m	Lifetime	5000,000
Materials (drawstring)	316 stainless steel		

Dimension



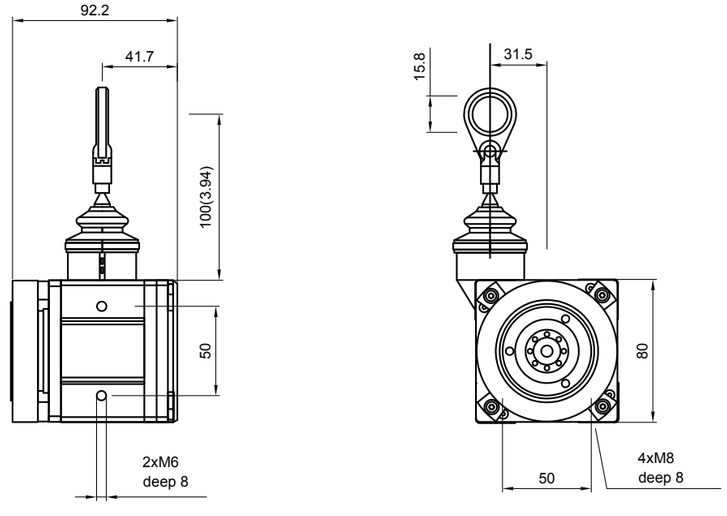
unit: mm

ED

EC20

Range	0-2m	Materials	Die-casting zinc
Repeatability	<0.2mm	Single turn length	200mm
Linearity	<2mm	Resilience force	6N-14N
Hysteresis	<1mm	Diameter	1.2mm
Weight	1.3kg	Accelerated Speed	40m/s²
Weight (drawstring)	7.1g/m	Lifetime	500,000
Materials (drawstring)	316 stainless steel		

Dimension



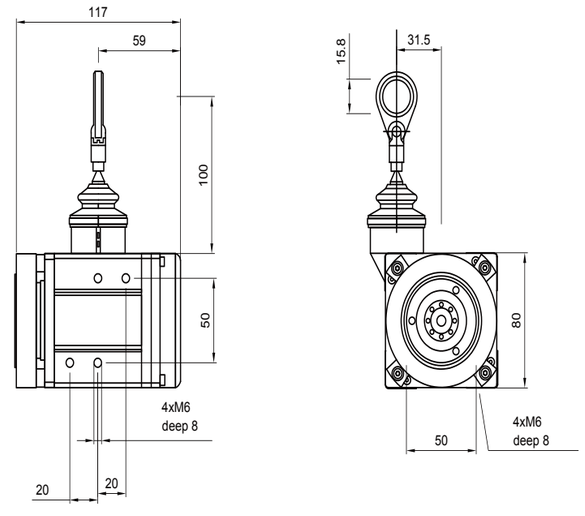
unit: mm

ED

ED30

Range	0-3m	Materials	Die-casting zinc
Repeatability	<0.2mm	Single turn length	200mm
Linearity	<2mm	Resilience force	6N-14N
Hysteresis	<1mm	Diameter	1.2mm
Weight	1.5kg	Accelerated Speed	40m/s²
Weight (drawstring)	7.1g/m	Lifetime	500,000
Materials (drawstring)	316 stainless steel		

Dimension



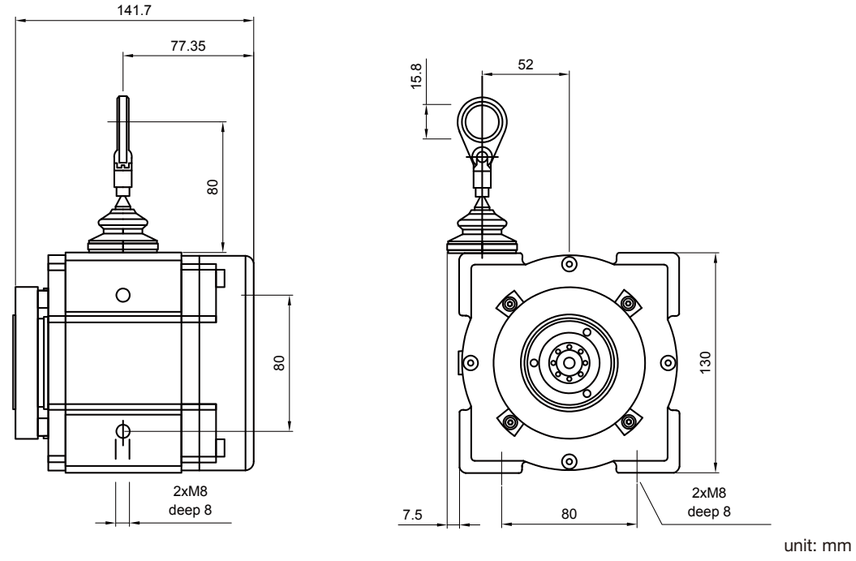
unit: mm

ED

ED50

Range	0-5m	Materials	Plastic
Repeatability	<0.5mm	Single turn length	333mm
Linearity	<3mm	Resilience force	15N-20N
Hysteresis	<2mm	Diameter	1.2mm
Weight	2.8kg	Accelerated Speed	70m/s²
Weight (drawstring)	7.1g/m	Lifetime	500,000
Materials (drawstring)	316 stainless steel		

Dimension



unit: mm

draw wire encoder

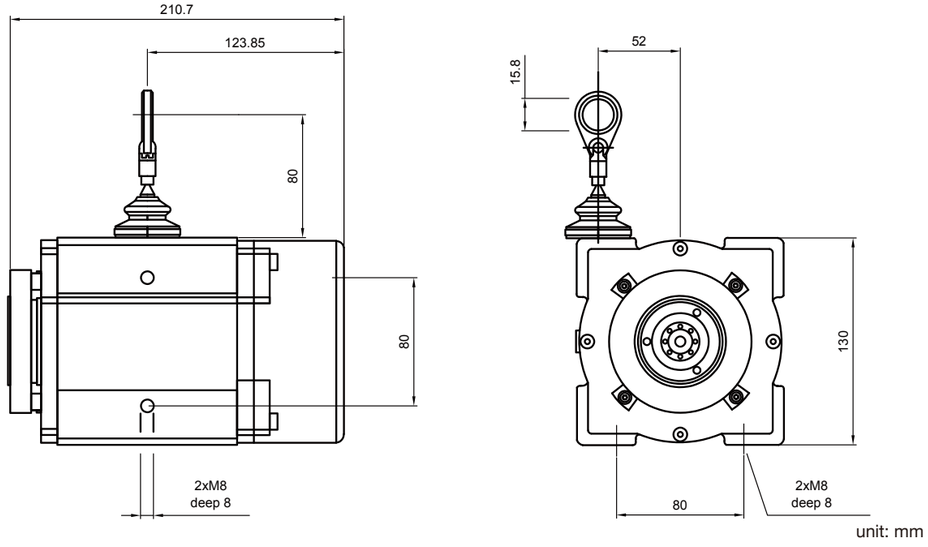
Intro. and Quick Selection
Incremental encoder
Absolute encoder
special position device
Accessories and Kits

ED

ED100

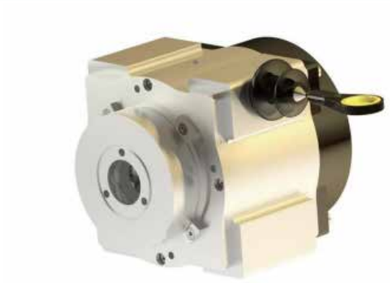
Range	0-5m	Materials	Plastic
Repeatability	<0.5mm	Single turn length	333mm
Linearity	<3mm	Resilience force	15N-20N
Hysteresis	<2mm	Diameter	1.2mm
Weight	2.8kg	Accelerated Speed	70m/s²
Weight (drawstring)	7.1g/m	Lifetime	500,000
Materials (drawstring)	316 stainless steel		

Dimension



unit: mm

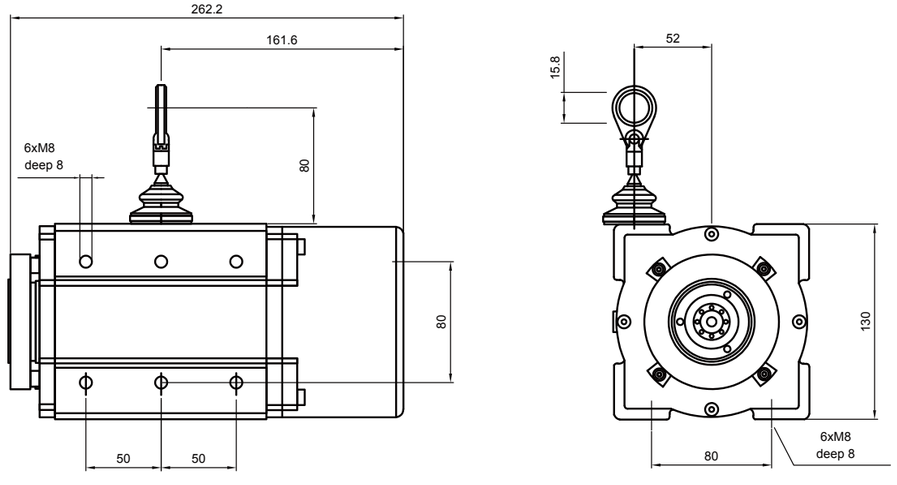
ED



ED150

Range	0-15m	Materials	Plastic
Repeatability	<2mm	Single turn length	333mm
Linearity	<10mm	Resilience force	10N-20N
Hysteresis	<6mm	Diameter	0.8mm
Weight	5kg	Accelerated Speed	30m/s²
Weight (drawstring)	2.6g/m	Lifetime	500,000
Materials (drawstring)	316 stainless steel		

Dimension



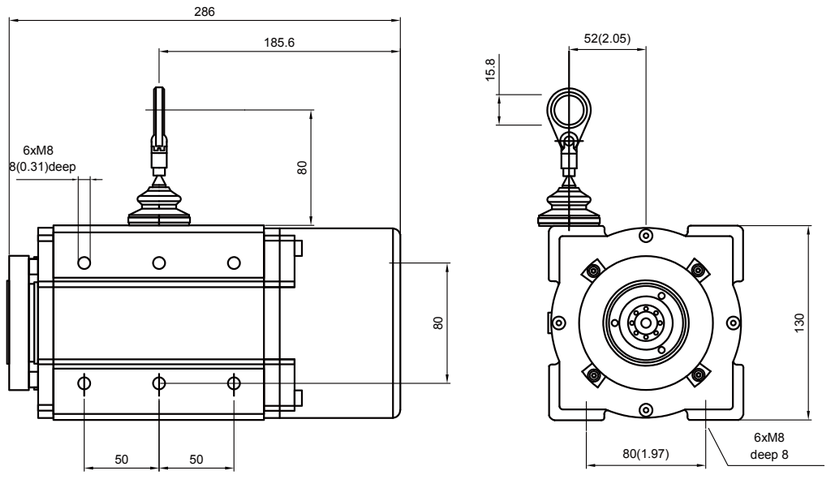
unit: mm

ED

ED200

Range	0-20m	Materials	Plastic
Repeatability	<2mm	Single turn length	333mm
Linearity	<10mm	Resilience force	10N-20N
Hysteresis	<6mm	Diameter	0.8mm
Weight	5kg	Accelerated Speed	30m/s²
Weight (drawstring)	2.6g/m	Lifetime	500,000
Materials (drawstring)	316 stainless steel		

Dimension

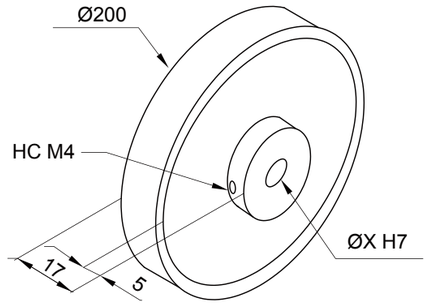


unit: mm

Rotary Overspeed Switch

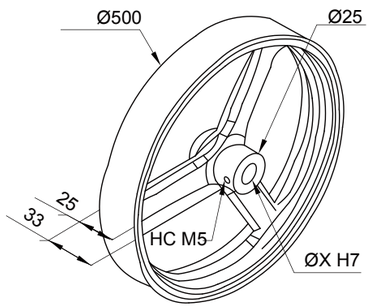
Perimeter 200mm

	H7	shell
9108/06	6	carboxamide
9108/08	8	
9108/10	10	
9109/06	6	rubber
9109/08	8	
9109/10	10	
9110/06	6	aluminium alloy



Perimeter 500mm

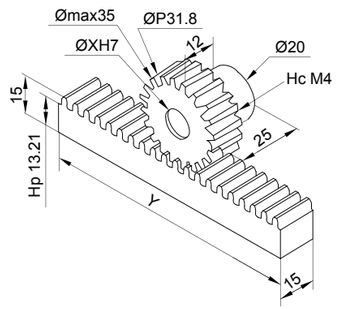
	H7	shell
9101/08	8	carboxamide
9101/10	10	
9101/12	12	
9102/08	8	rubber
9102/10	10	
9102/12	12	
9103/12	12	aluminium alloy



rack and pinion length1.591

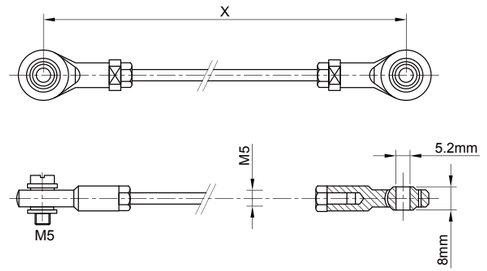
	Y	shell
9212/08	8	stainless steel
9212/10	10	

	H7	shell
9215/002	8	stainless steel
9215/004	10	
9215/005	12	



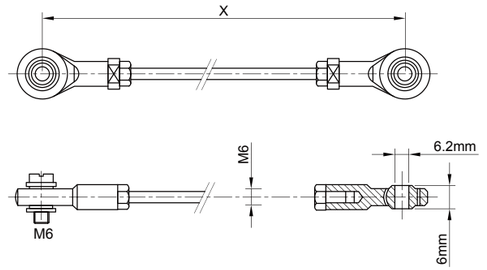
Torque arm

Type A size



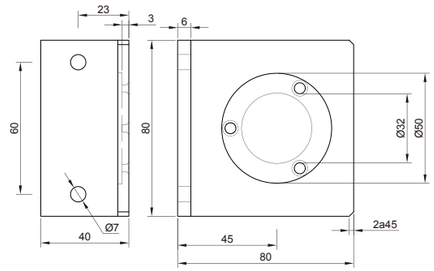
9100A	X
9100A/001	68
9100A/002	100
9100A/003	150
9100A/004	200

Type B size



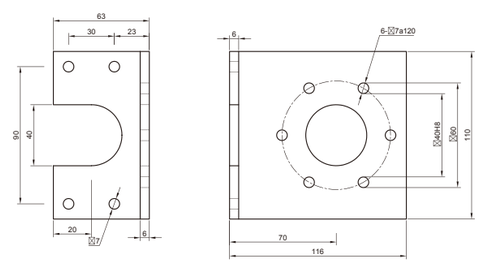
9100B	X
9100B/001	68
9100B/002	100
9100B/003	150
9100B/004	200

L Support



9202

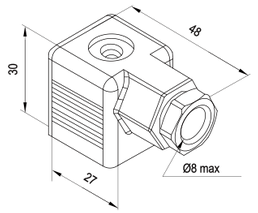
Suitable for 58 solid shaft series



9302

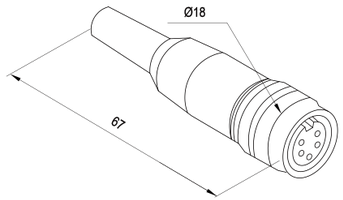
Suitable for 90 solid shaft series

Cable Connector



9412/F

4 hole plug

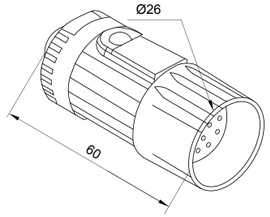


9414/F4

4 hole plug

9414/F5

5 hole plug

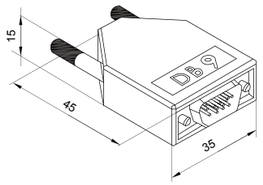


9416/F12A

12 pin plug, CW

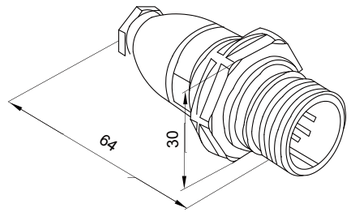
9416/F12B

12 pin plug, CCW



8213

9 pin plug



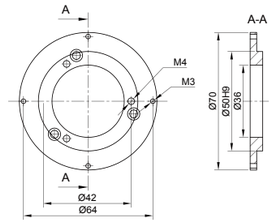
9416/E12A

12 pin plug, CW

9416/E12B

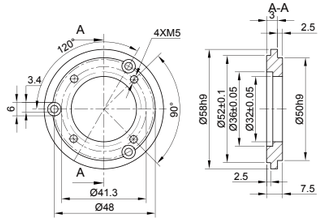
12 pin plug, CCW

Flange



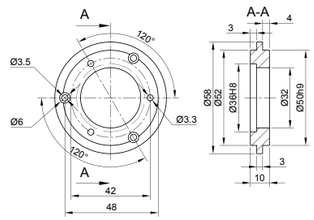
9500/002 aluminium alloy

Suitable for 58 solid shaft series



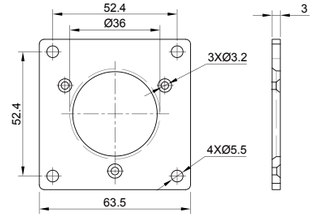
9500/003 aluminium alloy

Suitable for 58 solid shaft series



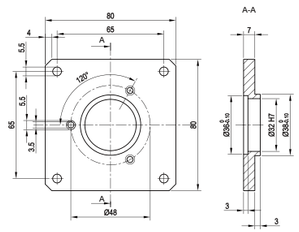
9500/004 aluminium alloy

Suitable for 58 solid shaft series



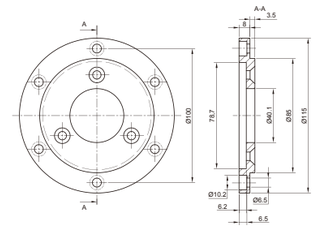
9500/005 aluminium alloy

Suitable for 58 solid shaft series



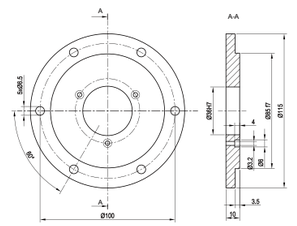
9500/006 aluminium alloy

Suitable for 58 solid shaft series



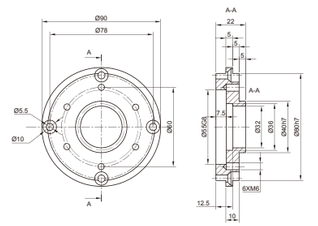
9500/007 aluminium alloy

Suitable for 90 solid shaft series



9500/010 aluminium alloy

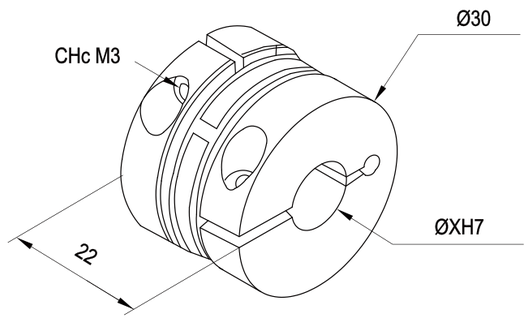
Suitable for 58 hollow shaft series



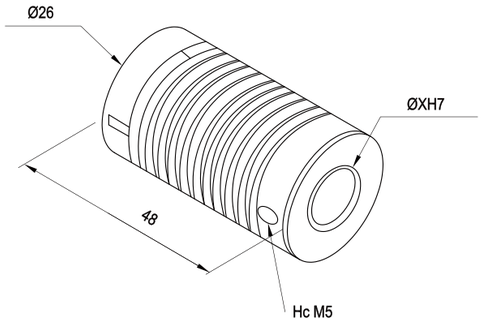
9500/011 aluminium alloy

Suitable for 90 hollow shaft series

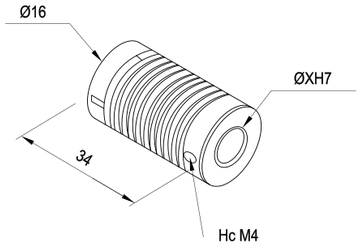
Shaft Coupling



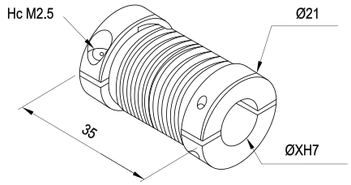
	X1 H7	X2 H7
9400/12-12	12	12
9400/10-10	10	10
9400/06-06	6	6
9400/06-10	6	10
9400/06-12	6	12
9400/10-10	10	12
9400/08-08	8	8
9400/08-06	8	6
9400/08-10	8	10
9400/08-12	8	12



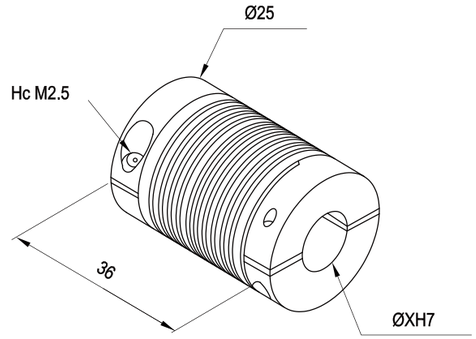
	X1 H7	X2 H7
9401/12-12	12	12
9401/10-10	10	10
9401/06-06	6	6
9401/06-10	6	10
9401/06-12	6	12
9401/10-10	10	12
9401/08-08	8	8
9401/08-06	8	6
9401/08-10	8	10
9401/08-12	8	12
9401/12-14	12	14
9401/12-14	14	14



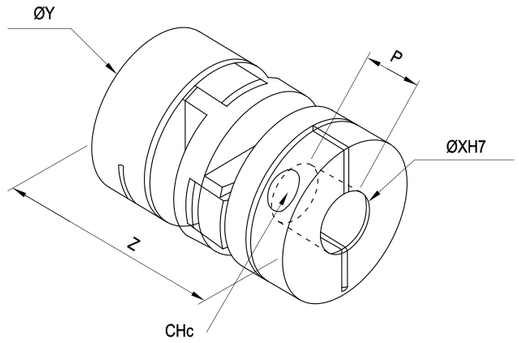
	X1 H7	X2 H7
9402/10-10	10	10
9402/06-06	6	6



	X1 H7	X2 H7
9403/10-10	10	10
9403/06-06	6	6
9403/06-10	6	10

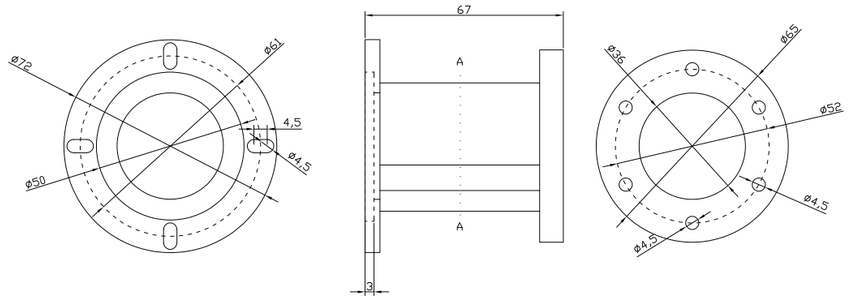


	X1 H7	X2 H7
9404/12-12	12	12
9404/10-10	10	10
9404/06-06	6	6
9404/06-10	6	10
9404/06-12	6	12
9404/10-10	10	12
9404/08-08	8	8
9404/08-06	8	6
9404/08-10	8	10
9404/08-12	8	12



	X1 H7	X2 H7	Y	Z	P
9410/C06-06	6	6	25.4	28.4	8.6
9410/C06-10	6	10	25.4	28.4	8.6
9410/C10-10	10	10	25.4	28.4	8.6
9410/A06-06	6	6	33.3	48	13
9410/A06-10	6	10	33.3	48	13
9410/A08-08	8	8	33.3	48	13
9410/A08-12	8	12	33.3	48	13
9410/A10-10	10	10	33.3	48	13
9410/A12-12	12	12	33.3	48	13
9410/B10-10	10	10	41.3	50.8	16.7
9410/B12-12	12	12	41.3	50.8	16.7

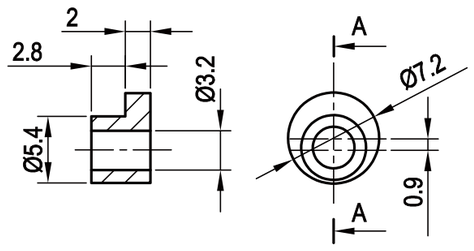
Torque arm



9800/001 aluminium alloy

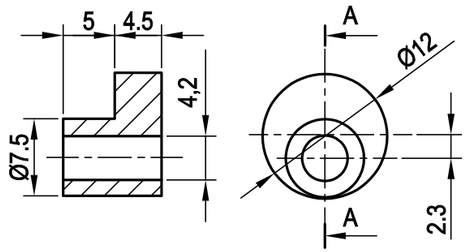
Suitable for 58 encoder and direct fixing of DC motor

Eccentric wheel



9601

Suitable for synchronous flange installation

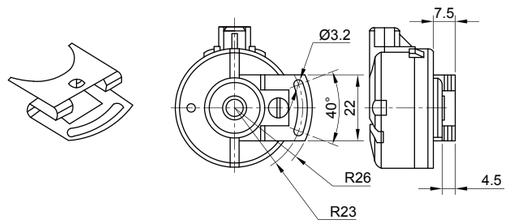


9602

Suitable for synchronous flange installation

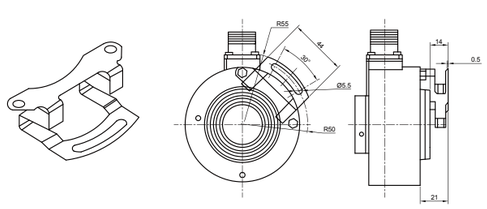
Spring Support

Single wing support



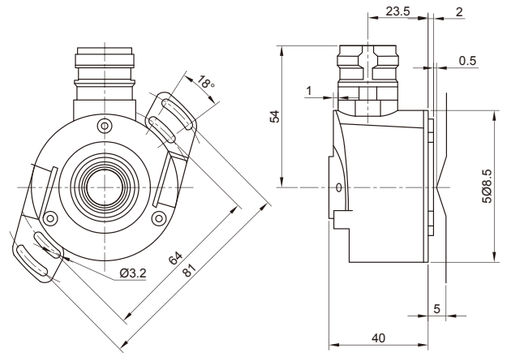
9445/001

Suitable for 40 hollow shaft and blind shaft series



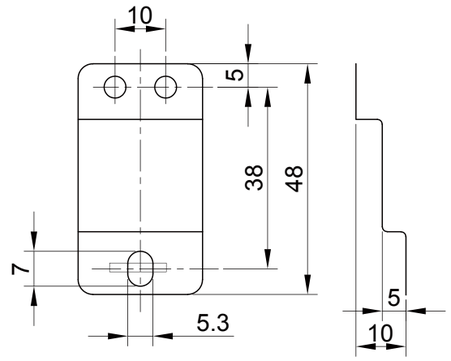
9445/002

Suitable for 90 hollow shaft and blind shaft series



9445/003

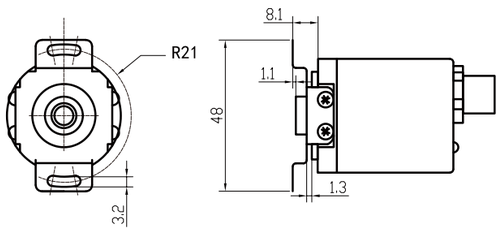
Suitable for 58 hollow shaft and blind shaft series



9445/004

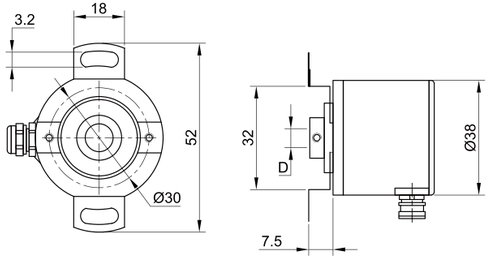
Suitable for 40 hollow shaft and blind shaft series

Double wing support



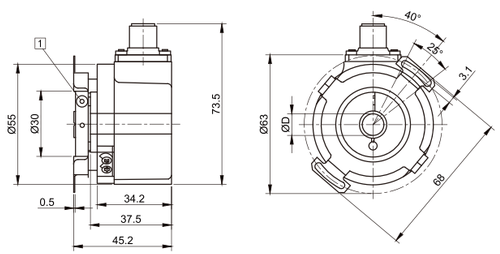
9445/010

Suitable for 37 hollow shaft and blind shaft series



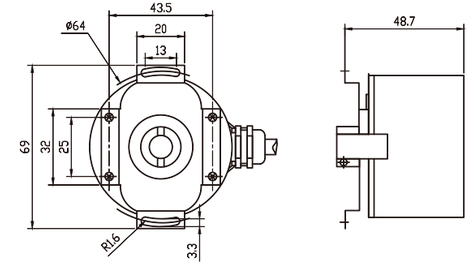
9445/011

Suitable for 40 hollow shaft and blind shaft series



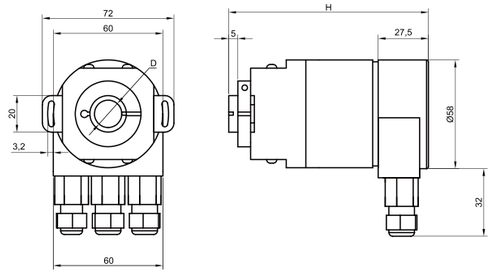
9445/012

Suitable for 50 hollow shaft and blind shaft series



9445/013

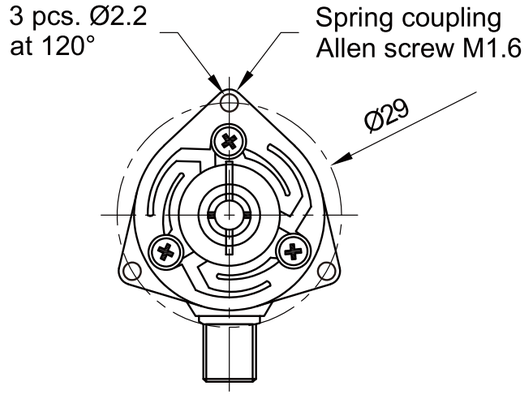
Suitable for 58 hollow shaft and blind shaft series，front fixation

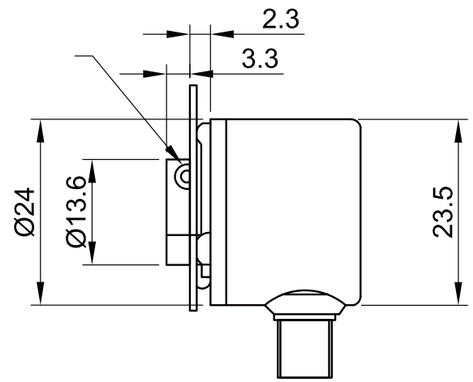


9445/014

Suitable for 58 hollow shaft and blind shaft series，lateral fixation

Triangular support

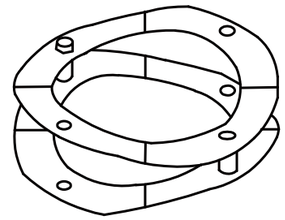


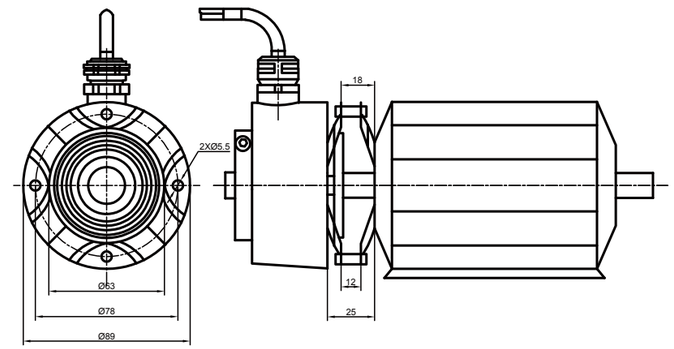


9445/020

Suitable for 24 hollow shaft and blind shaft series

Double end bracket





9445/030

Suitable for 90 heavy duty and motor connection