

Incremental Encoder Absolute Encoder



Measuring
Driving
Controlling



...three companies, one service ...

IHM

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HERBERT MEYER

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SELECTION GUIDE



Incremental Encoders

Version	Incremental encoder shaft BINS24	Incremental encoder hollow shaft BINB24	Incremental encoder shaft BINS37	Incremental encoder hollow shaft BINH37
Type series				
Electrical characteristics				
Output	Push-pull	Push-pull	RS 422/Push-pull	RS 422/Push-pull
Supply voltage (VDC)	5 ... 24 or 8 ... 30	5 ... 24 or 8 ... 30	5 or 5 ... 30	5 or 5 ... 30
Mechanical characteristics				
Shaft Ø (mm)	4/5/6	4/6	4/5/6/8	4/5/6/8
housing diameter (mm)	24	24	36,8	36,8
max. speed (min ⁻¹)	12000	12000	6000	6000
max. shaft load radial/axial (N)	10/20		20/10	
max. working temp. (°C)	-20 ... +85	-20 ... +85	-20 ... +70	-20 ... +70
Protection to	IP 64	IP 64	IP 65/IP 67	IP 65/IP 67
Type of connection	cable	cable	cable	cable
max. resolution	1080	1024	1024	1024
highlights or product differentiations	miniature version	miniature hollow shaft version	economical version	economical hollow shaft version
page	22	24	26	28



Incremental Encoders

Version	Incremental encoder shaft AINS40/AINS40Z	Incremental encoder hollow shaft AINH40Z	Incremental encoder shaft AINS41	Incremental encoder shaft and hollow shaft FINS58/FINH58
Type series				
Electrical characteristics				
Output	RS 422/Push-pull	RS 422/Push-pull	RS 422/Push-pull	RS 422/Push-pull/sine wave
Supply voltage (VDC)	5 or 11 ... 30 or 5 ... 24	5 or 11 ... 30 or 5 ... 24	5 or 4, 75 ... 30	5 or 5 ... 30 or 4,75 ... 30
Mechanical characteristics				
Shaft Ø (mm)	6	6	6	6/10 or 6/8/10/12/14
housing diameter (mm)	40	40	41	58
max. speed (min ⁻¹)	12000	12000	6000	9000/12000
max. shaft load radial/axial (N)	20/10	20/10	20/30	100/50
max. working temp. (°C)	-20 ... +80	-20 ... +80	-20 ... +70	-30 ... +100
Protection to	IP 54	IP 52	IP 65	IP 65/IP 67
Type of connection	cable	cable	cable	cable, connector
max. resolution	2500/1024	1024	2499	80000 (interpolated)
highlights or product differentiations	standard version	standard hollow shaft version	economical version	standard version Option: programmable sine wave output
page	31	32	33	35



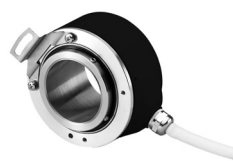
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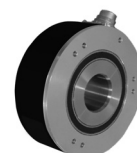
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SELECTION GUIDE



Incremental Encoders

Version	Incremental encoder shaft AINS58	Incremental encoder hollow shaft AINH58	Incremental encoder hollow shaft CINH76	Incremental encoder shaft AINS90/AINS90S
Type series				
Electrical characteristics				
Output	RS 422/Push-pull	RS 422/Push-pull	RS 422/Push-pull	RS 422/Push-pull
Supply voltage (VDC)	5 or 4, 75 ... 30	5 or 4, 75 ... 30	5 or 10 ... 30	5 or 11 ... 30
Mechanical characteristics				
Shaft Ø (mm)	6/10	6/10/12	15 ... 42	11/12
housing diameter (mm)	58	58	76	90
max. speed (min ⁻¹)	8000	6000	6000	6000
max. shaft load radial/axial (N)	38/40			200/100
max. working temp. (°C)	-20 ... +70	-20 ... +70	-25 ... +100	-20 ... +80
Protection to	IP 65	IP 65	IP 40/IP 64	IP 65
Type of connection	cable, connector	cable, connector	cable	cable, connector
max. resolution	2499	2499	10000	10000
highlights or product differentiations	economical version Option: up to +100 °C	economical version Option: up to +100 °C	large hollow shaft diameter	heavy duty high resolution
page	38	40	42	44



Incremental Encoders

Version	Incremental encoder shaft FINS90	Incremental encoder hollow shaft AINH90/AINH90S	Incremental encoder hollow shaft AINH95	Incremental encoder hollow shaft DINH100
Type series				
Electrical characteristics				
Output	RS 422/Push-pull	RS 422/Push-pull	RS 422/Push-pull	RS 422/Push-pull
Supply voltage (VDC)	5 or 4, 75 ... 30	5 or 11 ... 30	5 or 4, 75 ... 30	4,75 ... 5,5 or 10 ... 30
Mechanical characteristics				
Shaft Ø (mm)	6/12	12/20/25/30/32	12/20/25	25 ... 45
housing diameter (mm)	90	90	90	100
max. speed (min ⁻¹)	6000	4500	6000	3500
max. shaft load radial/axial (N)	50/60			200/100
max. working temp. (°C)	-20 ... +70	-20 ... +80	-20 ... +70	-10 ... +70
Protection to	IP 65	IP 65	IP 65	IP 54
Type of connection	cable, connector	cable, connector	cable, connector	cable, connector
max. resolution	2499	10000	2499	4096
highlights or product differentiations	economical version heavy duty Option: up to +100 °C	heavy duty hollow shaft	economical version heavy duty Option: up to +100 °C	heavy duty large hollow shaft diameter
page	46	48	50	52

SELECTION GUIDE



Incremental Encoders

Version	Incremental encoder hollow shaft DINH145	Draw Wire CDxx
Type series		
Electrical characteristics		
Output	RS 422/Push-pull	see section
Supply voltage (VDC)	4,75 ... 5,5 or 10 ... 30	
Mechanical characteristics		
Shaft Ø (mm)	48 ... 72	
housing diameter (mm)	145	
max. speed (min ⁻¹)	800	
max. shaft load radial/axial (N)	200/100	
max. working temp. (°C)	-10 ... +70	
Protection to	IP 54	
Type of connection	cable, connector	
max. resolution	2500	
highlights or product differentiations	heavy duty large hollow shaft diameter	incremental or absolute encoder
page	54	56



Absolute Encoders

Version	Absolute encoder, singleturn and multiturn shaft, hollow and blind shaft CAXx37	Absolute encoder, singleturn and multiturn shaft, hollow and blind shaft BAXx58
Type series		
Electrical characteristics		
Output	SSI/BiSS option SinCos	SSI/BiSS/Profibus CANopen/CANlift
Supply voltage (VDC)	5 or 7 ... 30	5 or 10 ... 30
Mechanical characteristics		
Shaft Ø (mm)	6 or 8	6/10 or 10/12/14/15
housing diameter (mm)	37,5	58/60
max. speed (min ⁻¹)	12000	12000/9000
max. shaft load radial/axial (N)		80/40
max. working temp. (°C)	-25 ... +100/-15 ... +120	-40 ... +90
Protection to	IP 64/IP 40	IP 65/IP 67
Type of connection	cable, PCB connector	cable connector
max. resolution	29/31 Bits	29 Bit
highlights or product differentiations	miniature version high temperature	through hollow shaft version (SSI/BiSS) Safe operation in strong magnetic fields
page	58	61



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SELECTION GUIDE



Absolute Encoders

Version	Absolute encoder, singleturn and multiturn shaft and blind shaft
Type series	CAXx58
Electrical characteristics	
Output	SSI/BiSS/Parallel/Profibus DP/Device Net/CANopen/Interbus
Supply voltage (VDC)	5 or 10 ... 30
Mechanical characteristics	
Shaft Ø (mm)	6/10 or 10/12
housing diameter (mm)	58
max. speed (min ⁻¹)	12000
max. shaft load radial/axial (N)	60/40
max. working temp. (°C)	-40 ... +100
Protection to	IP 64/IP 67
Type of connection	cable, connector
max. resolution	29 Bit
highlights or product differentiations	High temperature
page	82



Absolute encode multiturn shaft and hollow shaft
FAxx90

SSI/Profibus/CANopen
Parallel on request
11 ... 30
11/12 or 12/20/25/30
90
9000/6000
200/100
-20 ... +90
IP 65/IP 67
cable, connector
29 Bit
heavy duty
large hollow shaft diameter

88



Special versions

Version	Incremental encoder shaft	Incremental encoder shaft	Absolute encoder, singleturn, taper shaft	Absolute encoder shaft
Type series	DINS53	DINS58	GAST37	MyA2
Electrical characteristics				
Output	RS 422/Push-Pull	RS 422/Push-Pull	12/13 bits	analog
Supply voltage (VDC)	4,75 ... 5,5 or 10 ... 30	4,75 ... 5,5 or 10 ... 30	4,75 ... 5,25	15 ... 30
Mechanical characteristics				
Shaft Ø (mm)	6	12	5,5; taper 1:3	6
housing diameter (mm)	53	58	37	58
max. speed (min ⁻¹)	6000	8000	12000	12000
max. shaft load radial/axial (N)	20/10	400/400		20/10
max. working temp. (°C)	-10 ... +70	-10 ... +70	-40 ... +115	0 ... +70
Protection to	IP 68	IP 65/IP 67	IP 40	IP 65
Type of connection	cable, connector	cable, connector	12 pin PCB connector	connector
max. resolution	1500	5000	13 Bit	10 Bit
highlights or product differentiations	High protection class IP 68, easy mounting	High shaft load	Absolute motor encoder Small dimensions Mounted stator coupling	analog output 4-20 mA/0-10 V according to angle 0-360°
page	on request	on request	on request	on request

- Specifications are subject to change without notice.
- Due to RoHS EU directive 2002/95/EC, housings will be changed to lead free colours without further notice. For actual RoHS status please consult factory



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GENERAL/OVERVIEW

Introduction

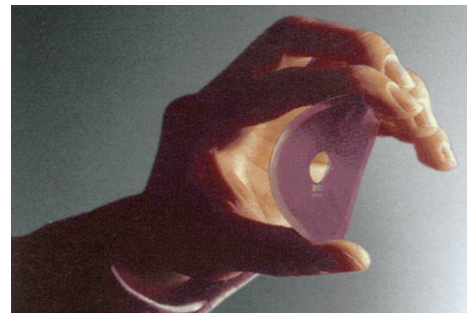
Description

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 the amplitude 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.

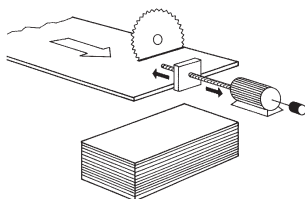
Single-turn absolute encoders determine their position at all times using a single code in a given single revolution, even if there is no reference measurement.

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.

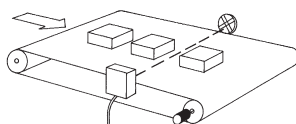


Applications

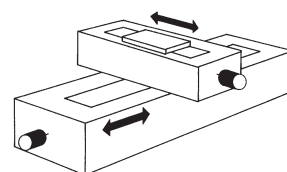
Stop dog positioning



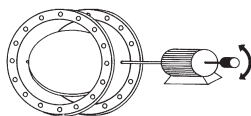
Workpiece length measurement system with opto electric and encoder



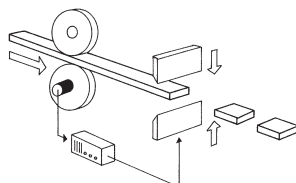
Crosstable positioning



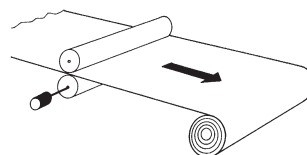
Valve position control



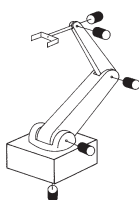
Length dimension with measuring wheel



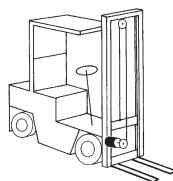
Lengthmeasuring of textile or paper rolls



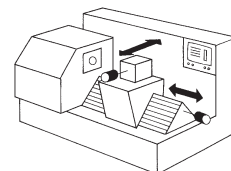
Roboter axis control



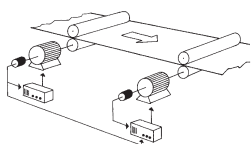
Fork height measuring at fork trucks



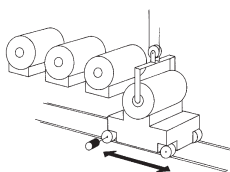
Positioning at CNC-tooling-machines



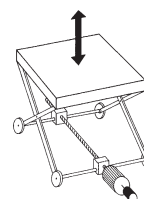
Tensile stress control



Control of transport vehicles



Adjustment of lift platforms



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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:

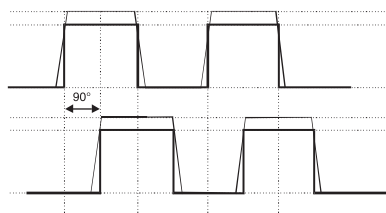
All encoders from Meyle, are equipped with ageing and temperature compensation to ensure a long term and stable signal also after many years of operation.

Ageing compensation:

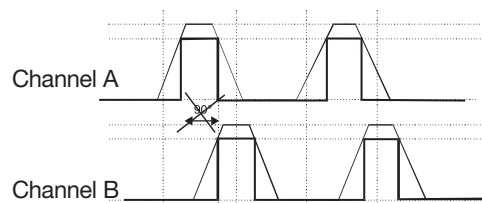
Each LED source will inevitably lose its power over a period of time. As a result, the output signal degrades. The phase shift between channel A and B of 90° becomes

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
BN	brown
RD	red
OG	orange
YE	yellow
GN	green
BU	blue

VT	violet
GY	grey
WH	white
PK	pink
GD	gold
TQ	turquoise
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



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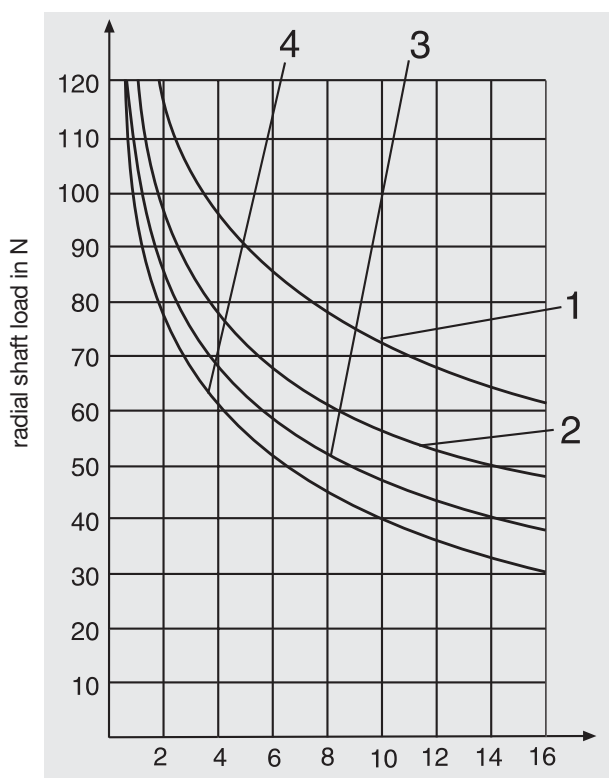
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GENERAL/OVERVIEW

General

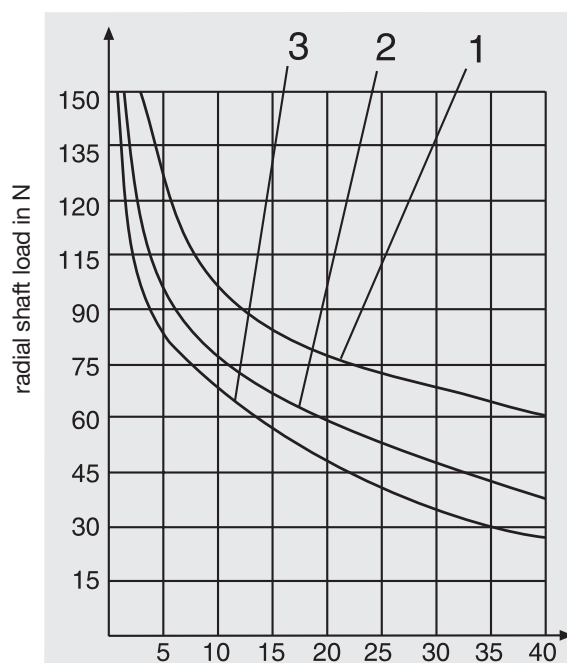
Type series 58 mm diameter



Bearing's lifetime in years

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

Type series 90 mm diameter



Bearing's lifetime in years

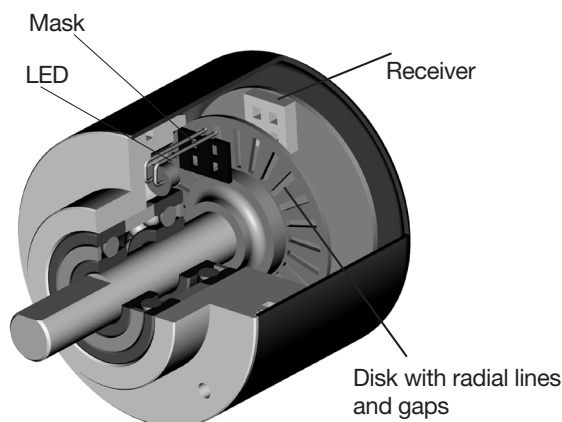
- 1 $n = 2000 \text{ min}^{-1}$
- 2 $n = 4000 \text{ min}^{-1}$
- 3 $n = 6000 \text{ min}^{-1}$

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.



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GENERAL/OVERVIEW

General

Selecting an incremental encoder:

Number of channels:

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

Encoders with one output channel

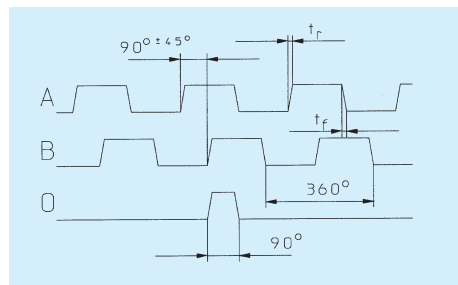
Encoders with one output channel are used where no direction sensing is needed, e.g.

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

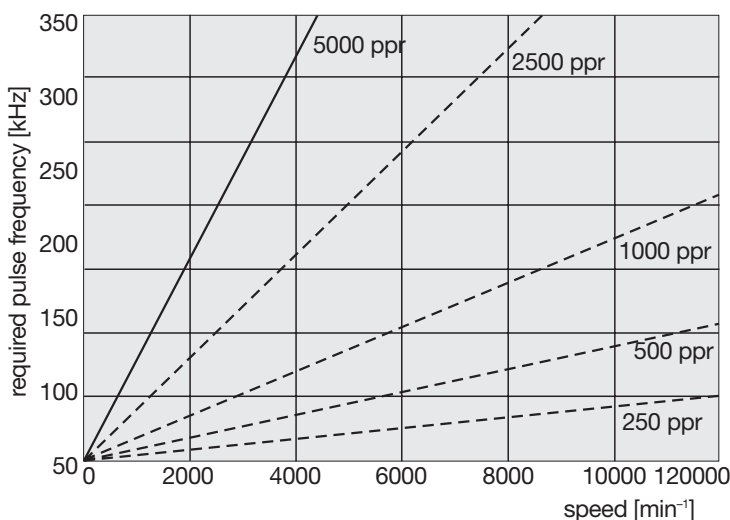
of how to calculate the required pulse frequency $f_{\max}$:

Given: Speed $n = 3000 \text{ min}^{-1}$
Resolution of the encoder
 $R = 1000 \text{ ppr}$

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

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

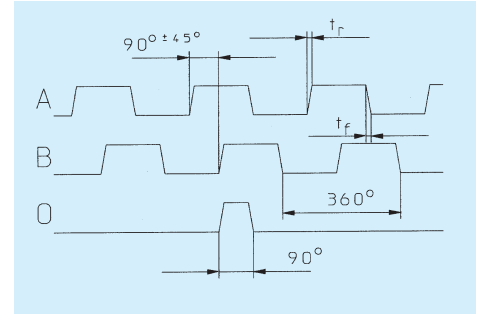
Digital outputs:

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

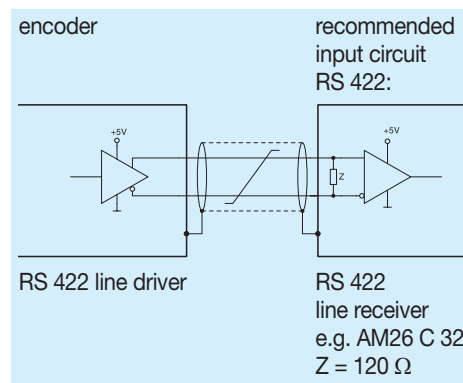
To transmit the signals there are two possible outputs available. RS 422 (TTL compatible) or push-pull (covers PNP or NPN). For choosing the suitable output for the application the following points have to be considered:

- 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.

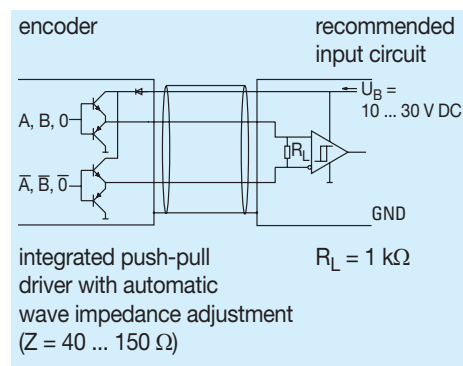
Output circuit and recommended input circuit RS 422:



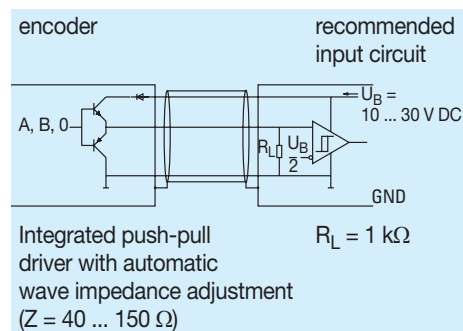
Push-pull:

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:

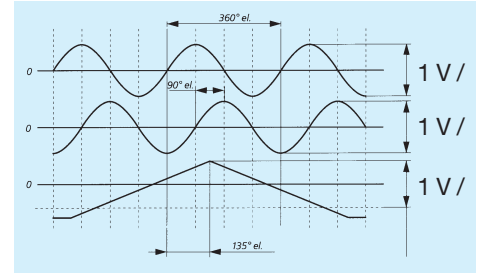


GENERAL/OVERVIEW

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.

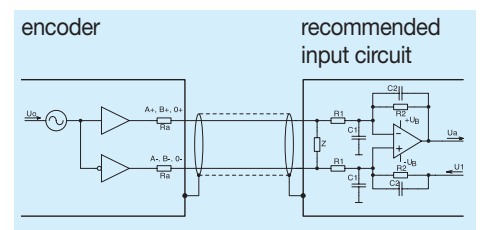


- Shaft turning clockwise, top view of shaft
- 0-pulse is generated once per turn

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

$R_a = 10 \Omega$
 $C_1 = 150 \text{ pF}$
 $C_2 = 10 \text{ pF}$
 $R_1 = 10 \text{ k}\Omega$
 $R_2 = 33 \text{ k}\Omega$
 $U_0 = 2,5 \text{ V} \pm 0,5 \text{ V}$

$Z = 120 \Omega$
 $U_1 = U_0$
 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 $\varnothing 0,14 \text{ mm}^2$
- 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.

GENERAL/OVERVIEW

General

Selecting an Absolute encoder

Design and function:

Selecting an absolute encoder:

Versions:

Code types:

Binary Code:

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.

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

Singleturn encoders:

Depending on the number of divisions they generate 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.

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.

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

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, retired systems, lift elevators, cranes, machine tool, etc.

Bit 1 (LSB)																
Bit 2																
Bit 3																
Bit 4 (MSB)																
Significance	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

The binary code can be processed very easily by computer systems. When using optical read-out, errors may occur, 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 optically read out the position for all absolute encoders

Symmetrically cut Gray Code (Gray-Excess):

Bit 1 (LSB)																
Bit 2																
Bit 3																
Bit 4 (MSB)																
Significance	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

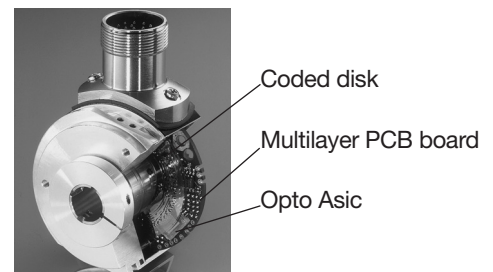
Bit 1 (LSB)										
Bit 2										
Bit 3										
Bit 4 (MSB)										
Significance	0	1	2	3	4	5	6	7	8	9

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



GENERAL/OVERVIEW

Interface

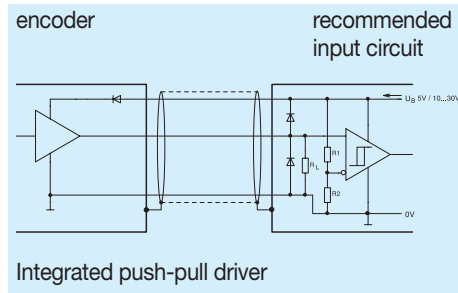
Outputs

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:



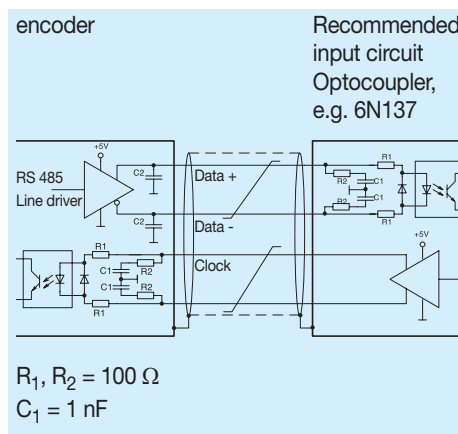
Synchronous Serial Interface (SSI):

SSI

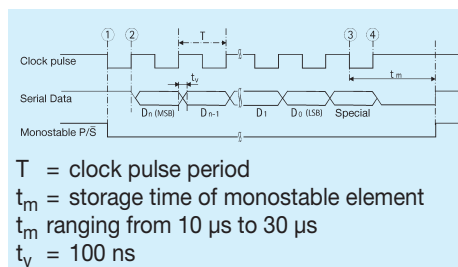
Compared to the parallel interface, the SSI interface needs less components and the EMC-characteristics are much better. In

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:



Synchronous-serial Transfer (SSI):



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.

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.

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 ④, 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 $\varnothing 0,14 \text{ mm}^2$
- 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!

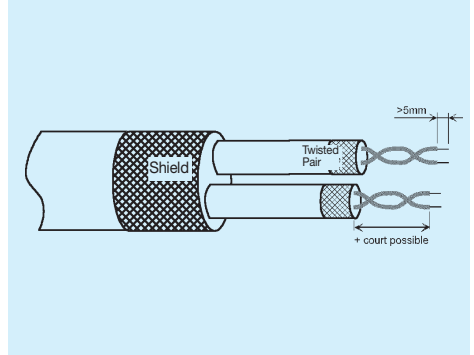
We strictly recommend the use of the cable types written down in the accessories.

Connection – precautions

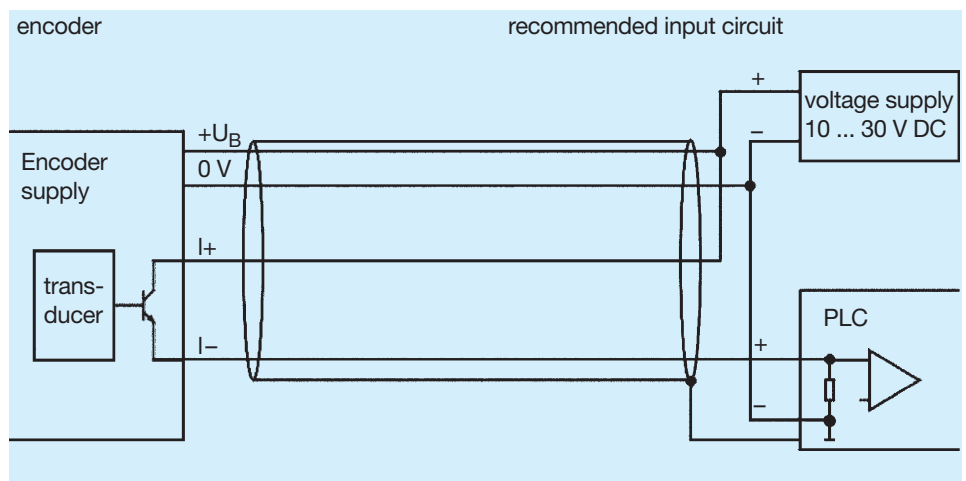
For the connection of the shield braids, refer to the logic control documentation. In all cases, for grounding, the braids must be covered through 360°. All unused conductors must be connected to the same potential at both ends.

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 axle 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:



DeviceNet™



CANopen

CAN:

CANopen

- CAN fulfils 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.



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GENERAL/OVERVIEW

General

The CANopen Profile

CANopen allows for:

- synchronisation of the devices,
- auto-configuration of the network,
- comfortable access to all device parameters.

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)

- simultaneous data input and output.
- cyclical and event-controlled process data processing,

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 Work Draft 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



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.

Introduction

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 multicast (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



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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.

- Low price at high performance
- IP 64
- Wide temperature range (-20 ... +85 °C)
- Housing is resistant against environmental influences due to chromium plated surface
- Sturdy cable output with multiple clamping
- Temperature compensation
- Broad input voltage range (5 ... 24 V or 8 ... 30 V)
- Highly flexible cable with stands constant flexing from 0 °C ... 70 °C
- Low power consumption despite high scanning rate
- Reverse connection protected and short-circuit proof



Mechanical characteristics:

Speed:	max. 12 000 min ⁻¹
Rotor moment of inertia:	appr. 0,1 x 10 ⁻⁶ kgm ²
Starting torque:	< 0,001 Nm
Radial load capacity of shaft:	10 N
Axial load capacity of shaft:	20 N
Weight:	appr. 0,06 kg
Protection acc. to EN 60529:	IP 64
Working temperature:	-20° C ... +85 °C
Shaft:	stainless steel
Shock resistance acc. to DIN-IEC 68-2-27:	1000 m/s ² , 6 ms
Vibration resistance acc. to DIN-IEC 68-2-6:	100 m/s ² , 55 ... 2000 Hz

Pulse rates available at short notice:

10, 25, 36, 50, 60, 100, 125, 180, 200, 250, 360, 500, 512, 1000, 1024, 1080

Electrical characteristics:

Output circuit:	Push-pull	Push-pull
Supply voltage:	5 ... 24 V DC	8 ... 30 V DC
Power consumption (no load):	max. 50 mA	max. 50 mA
Permissible load/channel:	max. 50 mA	max. 50 mA
Pulse frequency:	max. 160 kHz	max. 160 kHz
Signal level high:	min. U _B = -2,5 V	min. U _B = -3 V
Signal level low:	max. 0,5 V	max. 2,5 V
Rise time t _r :	max. 1 µs	max. 1 µs
Fall time t _f :	max. 1 µs	max. 1 µs
Short circuit proof outputs: DIN-IEC 68-2-27:	yes	yes
Conforms to CE requirements acc. to EN 50082-2, EN 50081-2 and EN 55011 Class B		

Applications:

- Pick and place machines
- Handling machines for electronic components
- Quality testing machines
- Medical machines
- Mail opening and mail stuffing machines
- Check weighers
- Labeling machines
- Mole machines (camera control)

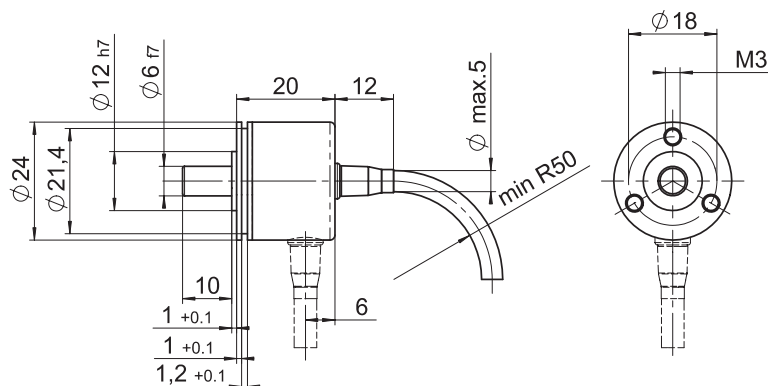
Terminal assignment

Signal:	0V	+UB	$\bar{A}$	A	$\bar{B}$	B	0	$\bar{O}$	
Colour:	WH	BN	GN	YE	GY	PK	BU	RD	
without inverted signal:	WH	BN	GN		YE		GY		

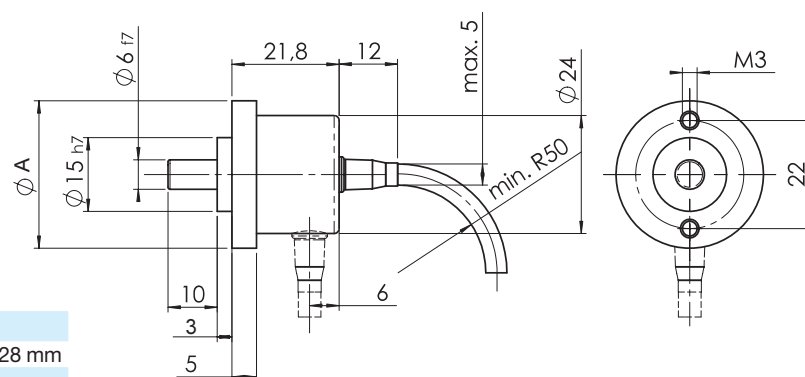
Insulate unused outputs before initial startup.

Dimensions:

Flange type 1
($\varnothing$ 24 mm)



Flange type 2
($\varnothing$ 30 mm)
Flange type 3
($\varnothing$ 28 mm)

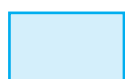


Flange type	2	3
A	$\varnothing$ 30 mm	$\varnothing$ 28 mm
B	3 mm	2 mm

Mounting advice:

Do not connect encoder and drive rigidly to one another at shafts and flanges! Always use couplings to prevent shaft overload (see chapter accessories).

ORDERING CODE



BINS24



Flange

- 1 = $\varnothing$ 24 mm
- 2 = $\varnothing$ 30 mm
- 3 = $\varnothing$ 28 mm



Shaft $\varnothing$

- 1 = $\varnothing$ 4 mm x 10 mm
- 2 = $\varnothing$ 6 mm x 10 mm
- 3 = $\varnothing$ 5 mm x 10 mm with flattening



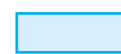
Output and voltage supply

- A1 = Push-pull (with inverted signals)
5 ... 24 V DC supply voltage
- A5 = Push-pull (with inverted signals)
8 ... 30 V supply voltage



Connection

- 3A = Cable axial (2 m PVC-cable)
- 3R = Cable radial (2 m PVC-cable)



Resolution

1080 max.

- Low price at high performance
- IP 64
- Wide temperature range (-20 ... +85 °C)
- Housing is resistant against environmental influences due to chromium plated surface
- Sturdy cable output with multiple clamping
- Temperature compensation
- Broad input voltage range (5 ... 24 V or 8 ... 30 V)
- Highly flexible cable with stands constant flexing at 0 °C ... 70 °C
- Low power consumption despite high scanning rate
- Reverse connection protected and short-circuit proof



Mechanical characteristics:

Speed:	max. 12000 min ⁻¹
Rotor moment of inertia:	appr. 0,1 x 10 ⁻⁶ kgm ²
Starting torque:	< 0,001 Nm
Weight:	appr. 0,06 kg
Protection acc. to EN 60 529:	IP 64
Working temperature:	-20 °C ... +85 °C
Shaft:	stainless steel
Shock resistance acc. to DIN-IEC 68-2-27:	1000 m/s ² , 6 ms
Vibration resistance acc. to IEC 68-2-6:	100 m/s ² , 55 ... 2000 Hz

Pulse rates available at short notice:

10, 25, 36, 50, 60, 100, 125, 180, 200, 250, 360, 500, 512, 1000, 1024

Other pulse rates on request

Electrical characteristics:

Output circuit:	Push-pull	Push-pull
Supply voltage:	5 ... 24 V DC	8 ... 30 V DC
Power consumption (no load):	max. 50 mA	max. 50 mA
Permissible load/channel:	max. 50 mA	max. 50 mA
Pulse frequency:	max. 160 kHz	max. 160 kHz
Signal level high:	min. U _B = -2,5 V	min. U _B = -3 V
Signal level low:	max. 0,5 V	max. 2,5 V
Rise time t _r :	max. 1 µs	max. 1 µs
Fall time t _f :	max. 1 µs	max. 1 µs
Short circuit proof outputs:	yes	yes
Conforms to CE requirements acc. to EN 50082-2, EN 50081-2 and EN 55011 Class B		

Applications:

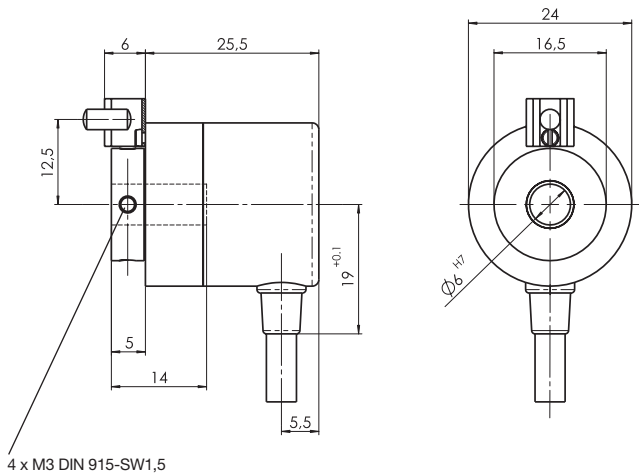
- Pick and place machines
- Handling machines for electronic components
- Quality testing machines
- Medical machines
- Mail opening and mail stuffing machines
- Check weighers
- Labeling machines
- Mole machines (camera control)

Terminal assignment

Signal:	0V	+U _B	A	$\bar{A}$	B	$\bar{B}$	0	$\bar{0}$	
Colour:	WH	BN	GN	YE	GY	PK	BU	RD	
without inverted signal:	WH	BN	GN		YE		GY		

Insulate unused outputs before initial startup.

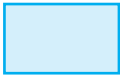
Dimensions



Mounting advice:

Do not connect encoder and drive rigidly to one another at shafts and flanges! Always use couplings to prevent shaft overload (see chapter accessories).

ORDERING CODE



BINB24



Flange
1 = Ø 24 mm



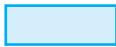
Shaft Ø
1 = Ø 4 mm Blind shaft
2 = Ø 6 mm Blind shaft



Output and voltage supply
A1 = Push-pull (with inverted signals)
5 ... 24 V DC supply voltage
A5 = Push-pull (with inverted signals)
8 ... 30 V supply voltage



Connection
3A = Cable axial (2 m PVC-cable)
3R = Cable radial (2 m PVC-cable)



Resolution
1024 max.

- Economical version
- Compact size only $\varnothing 37 \times 33$ mm
- Temperature- and ageing compensation
- Short circuit proof outputs
- Resolution up to 1024 ppr;
- Protection up to IP 67
- Flange and cover made from a new High-Tech-Material (composite material)
- High component integration leads to low profile design, high performance and economical pricing
- "Tube Tech®" cable outlet guarantees 10 x higher strain relief than traditional cabling methods
- Protection IP 67
- 1 1/2" (37 mm) diameter housing suitable for replacing resolvers.



Mechanical characteristics:

Speed:	max. 6000 min ⁻¹
Rotors moment of inertia:	appr. 0,4 x 10 ⁻⁶ kgm ²
Starting torque:	< 0,007 Nm
Radial load capacity of the shaft:	20 N
Axial load capacity of the shaft:	10 N
Weight:	appr. 0,1 kg
Protection acc. to EN 60 529:	bearing, shaft: IP 65 cable outlet: IP 67
Working temperature:	-20 °C up to +70 °C ¹⁾³⁾
Materials:	shaft: stainless steel; housing, flange: composite PPA, 40 % KF (carbon fiber) cable: PVC
Shock resistance acc. to DIN-IEC 68-2-27:	1000 m/s ² , 6 ms
Vibration resistance acc. to DIN-IEC 68-2-6:	100 m/s ² , 10 ... 2000 Hz

Pulse rates available at short notice:

10, 50, 60, 100, 180, 200, 250, 300, 360, 400, 500, 512, 600, 1024

Other pulse rates available on request

¹⁾ At push pull output and Supply voltage >15 V DC: max. 55 °C

³⁾ Higher temperatures up to 100 °C on request

Electrical characteristics:

Output circuit:	RS 422 (TTL-compatible)	Push-pull
Supply voltage:	5 V (±5%)	5 ... 30 V DC
Power consumption (no load)	typ. 70 mA /	typ. 70 mA/
with inverted signal:	max. 100 mA	max. 120 mA
Permissible load/channel:	max. ±20 mA	max. ±20 mA
Pulse frequency:	max. 250 kHz	max. 250 kHz
Signal level high:	min. 2,5 V	min. U _B -2,5 V
Signal level low:	max. 0,5 V	max. 0,5 V
Rise time t _r :	max. 200 ns	max. 1 µs
Fall time t _f :	max. 200 ns	max. 1 µs
Short circuit proof outputs ¹⁾ :	yes ²⁾	yes
Reverse connection protection at U _B :	no	no

Conforms to CE requirements acc. to EN 50082-2, EN 50081-2 and EN 55011 Class B

¹⁾ When supply voltage correctly applied

²⁾ Only one channel at a time:

(at U_B = 5 V short circuit to channel, 0 V, or +U_B is permitted).

Applications:

- Substitute for resolvers
- Packaging machines
- Electrical machines
- Vehicles
- Conveyers, elevators
- Semiconductor machines e.g. pick & place, cutting ...
- Material handling
- Special machines.



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49525 Lengerich/Germany

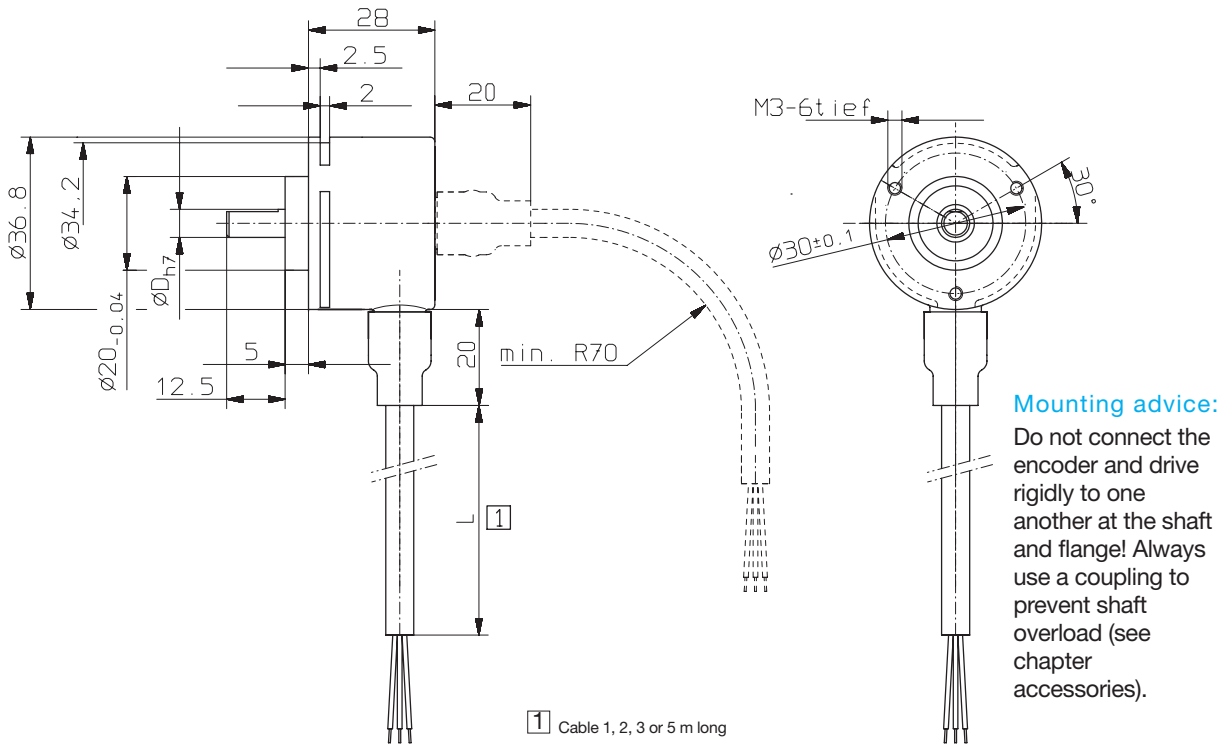
Tel.: +49 54 81-93 85-0
Fax: +49 54 81-93 85-12

Internet: www.meyle.de
E-Mail: sales@meyle.de

Signal:	0 V	+U _B	A	Ā	B	Ē	0	0̄	Shield
Colour:	WH	BN	GN	YE	GY	PK	BU	RD	

Using RS 422 outputs and long cable distances, a wave impedance has to be applied at each cable end. Insulate unused outputs before initial startup.

Dimensions:



ORDERING CODE

BINS37

Flange
1 = Ø 36,8 mm

Shaft Ø
1 = Ø 4 mm
2 = Ø 5 mm
3 = Ø 6 mm
4 = Ø 1/4"
6 = Ø 8 mm

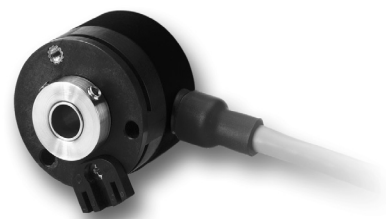
Output and voltage display
A2 = RS 422: 5 V DC ±5 %
A5 = Push-pull with inverted signals: 5 ... 30 V DC

Connection
3A = Cable* axial (1 m PVC-cable)
3R = Cable* radial (1 m PVC-cable)

Resolution
1024 max.

* "Tube Tech®" cable outlet guarantees 10 x higher strain relief than traditional cabling methods plus higher IP-Protection.
Other cable lengths on request.

- Economical version
- Compact unit size only $\varnothing 37 \times 32$ mm
- Very easy mounting. The encoder is mounted directly on the drive shaft without couplings. This saves up to 30 % cost and 60 % clearance compared to shaft versions.
- Temperature- and ageing compensation
- Short circuit proof outputs
- Resolution up to 1024 ppr
- Protection up to IP 67
- Flange and cover made from a new High-Tech-Material (composite material)
- High component integration leads to low profile design, high performance and economical pricing
- "Tube Tech®" cable outlet guarantees 10 x higher strain relief than traditional cabling methods plus higher IP-Protection.
- Also secures a protection of IP 67
- 1 1/2" (37 mm) diameter housing suitable for replacing resolvers.



Mechanical characteristics:

Speed:	max. 6000 min ⁻¹
Rotors moment of inertia:	appr. $1,4 \times 10^{-6}$ kgm ²
Starting torque:	< 0,01 Nm
Weight:	appr. 0,1 kg
Protection acc. to EN 60 529:	bearing, shaft: IP 65 cable outlet: IP 67
Working temperature:	-20° C up to +70 °C ¹⁾³⁾
Materials:	shaft: stainless steel; housing, flange: composite PPA, 40 % KF (carbon fiber) cable: PVC
Shock resistance acc. to DIN-IEC 68-2-27:	1000 m/s ² , 6 ms
Vibration resistance acc. to DIN-IEC 68-2-6:	100 m/s ² , 10 ... 2000 Hz

1) At push pull output and Supply voltage > 15 V DC: max. 55 °C

3) Higher temperatures up to 100 °C on request

Pulse rates available at short notice:

10, 50, 100, 180, 200, 250, 300, 360, 400, 500, 512, 600, 1024

Other pulse rates available on request

Electrical characteristics:

Output circuit:	RS 422 (TTL-compatible)	Push-pull
Supply voltage:	5 V ($\pm 5\%$)	5 ... 30 V DC
Power consumption (no load)	typ. 70 mA /	typ. 70 mA /
with inverted signal:	max. 100 mA	max. 120 mA
Permissible load/channel:	max. ± 20 mA	max. ± 20 mA
Pulse frequency:	max. 250 kHz	max. 250 kHz
Signal level high:	min. 2,5 V	min. $U_B - 2,5$ V
Signal level low:	max. 0,5 V	max. 0,5 V
Rise time t_r :	max. 200 ns	max. 1 μ s
Fall time t_f :	max. 200 ns	max. 1 μ s
Short circuit proof outputs ¹⁾ :	yes ²⁾	yes
Reverse connection protection at U_B :	no	no

Conforms to CE requirements acc. to EN 50082-2, EN 50081-2 and EN 55011 Class B

¹⁾When supply voltage correctly applied

²⁾Only one channel at a time:

(at $U_B = 5$ V short circuit to channel, 0 V, or + U_B is permitted).

Applications:

- Substitute for resolvers
- Packaging machines
- Electrical machines
- Vehicles
- Conveyers, elevators
- Semiconductor machines e.g pick & place, cutting ...
- Material handling
- Special machines.



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E-Mail: sales@meyle.de

Terminal assignment

Signal:	0 V	+U _B	A	$\bar{A}$	B	$\bar{B}$	0	$\bar{0}$	Shield
Colour:	WH	BN	GN	YE	GY	PK	BU	RD	

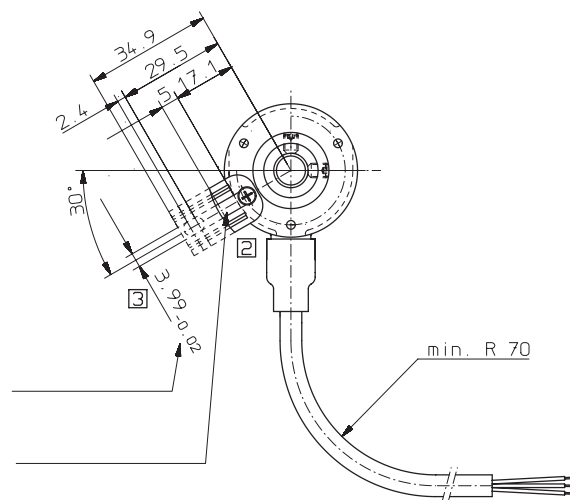
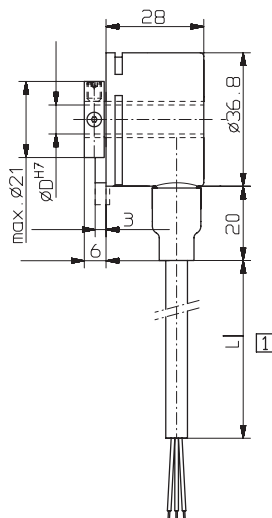
Using RS 422 outputs and long cable distances, a wave impedance has to be applied at each cable end.

Insulate unused outputs before initial startup.

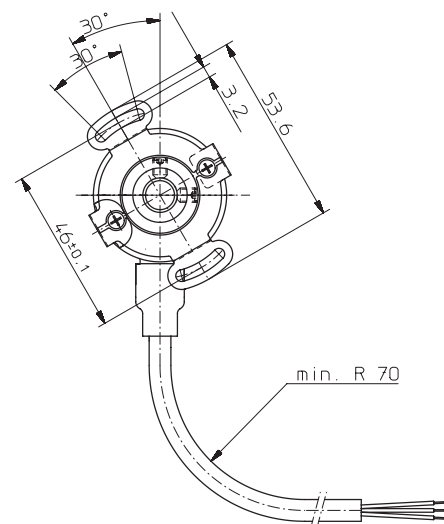
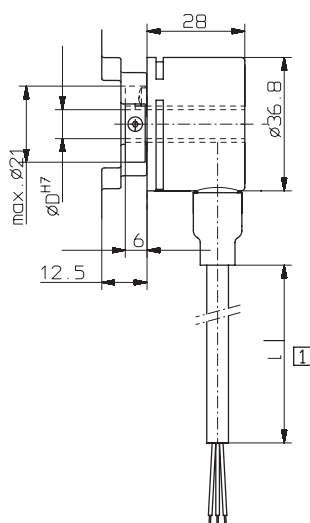
Dimension

Short torque stop version;

Long torque stop version is dashed

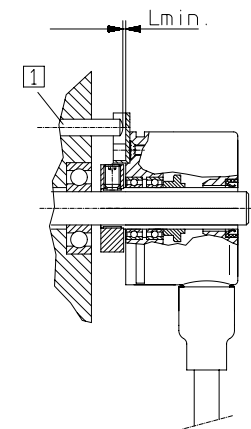


Stator coupling version



- 1 cable length 1, 2, 3 or 5 m
- 2 Slot for support torque, 3 mm deep
- 3 Recommended pin for long torque stop Cyl. pin acc. to DIN 7 ø 4 mm

Mounting advice:



1 Cyl.-pin to DIN 7 ø 4 mm

- 1) Do not connect the encoder and drive rigidly to one another at the shaft and flange!

2) To mount a hollow shaft encoder, we recommend the use of a pin and with torque stop slot or a stator coupling.
- 3) When mounting the encoder ensure that Lmin. is greater than the axial play of the drive.

When using the long torque stop, a greater axial play is possible.

Max. permissible drive shaft impact:
(measuring error ≤ ± 0,5 bit and 4 times evaluate in the sequential electronic).

	Mounting with stator coupling		Mounting with torque support
Pulses:	Permissible axial impact	Permissible radial impact	Permissible radial impact
up to 1024:	±0.4 mm	±0.09 mm	±0.075 mm

ORDERING CODE



BINH37



Flange

- 1 = Hollow shaft with short torque stop
- 2 = Hollow shaft with long torque stop
- 5 = Hollow shaft with stator coupling



Shaft Ø

- 1 = Ø 4 mm
- 2 = Ø 5 mm
- 3 = Ø 6 mm
- 4 = Ø 1/4"
- 6 = Ø 8 mm



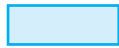
Output circuit and Supply voltage

- A2 = RS 422: 5 V DC ±5 %
- A5 = Push-pull (with inverted signals) 5 ... 30 V DC



Connection

- 3R = Cable* radial (1 m PVC-cable)



Resolution

- 1024 max.

* "Tube Tech®" cable outlet guarantees 10 x higher strain relief than traditional cabling methods plus higher IP-Protection.
Other cable lengths available on request.

INCREMENTAL ENCODER MyInc

AINS40 AINS40Z

AINS40/AINS40Z

- Up to 10.000 steps in 2500 cpt
- Applications: micro-robotics, printing...

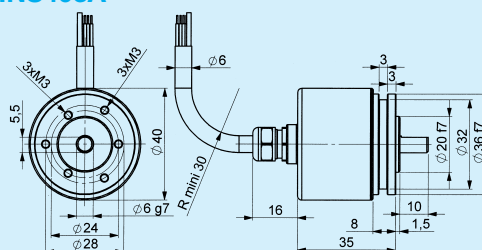


SPECIFICATIONS

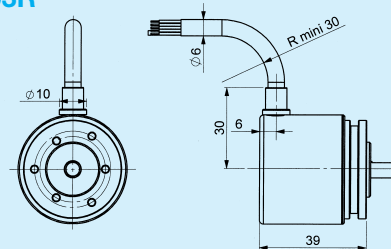
DIMENSIONS

	AINS40	AINS40Z		
• COVER	Aluminium	Zinc alloy	• MAX. SPEED	12 000 min ⁻¹
• BODY	Aluminium	Zinc alloy	• RADIAL SHAFT LOADING	20 N
• SHAFT	Stainless steel	Stainless steel	• AXIAL SHAFT LOADING	10 N
• TORQUE	0,2 Ncm	0,2 Ncm	• INERTIA	10 gcm ²
• WEIGHT	110 g	100 g	• PROTECTION	IP 54

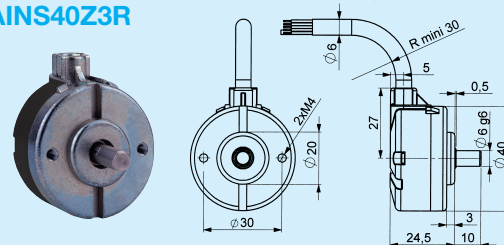
AINS403A



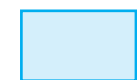
AINS403R



AINS40Z3R



ORDERING CODE



AINS40
AINS40Z



Shaft Ø
06 = 6 mm



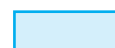
Output circuit
2 = 5 V RS422
5 = 11-30 V Driver
9 = 5-24 V Driver



Output signals
9= A, $\bar{A}$, B, $\bar{B}$, 0, $\bar{0}$
7= A, $\bar{A}$, B, $\bar{B}$
5= A, $\bar{A}$
A= Index gated on A
N= Index ungated



Connection
AINS40 :
3A = shielded cable,
axial output
3R = shielded cable,
radial output
AINS40Z :
3R = shielded cable,
radial output



Resolution
AINS40 : 2500 max
AINS40Z : 1024 max



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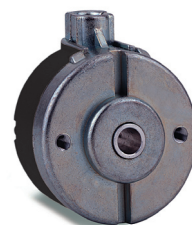
Tel.: +49 54 81-93 85-0

Fax: +49 54 81-93 85-12

Internet: www.meyle.de

E-Mail: sales@meyle.de

- Easy mounting by flexible anti-rotation blade
- Applications: micro-robotics, DC motors shears...

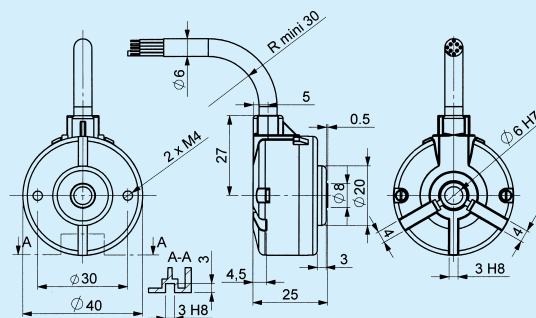


SPECIFICATIONS

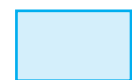
DIMENSIONS

• COVER	Zinc alloy	• MAX. SPEED	12 000 min ⁻¹
• BODY	Zinc alloy	• RADIAL SHAFT LOADING	20 N
• SHAFT	Aluminium	• AXIAL SHAFT LOADING	10 N
• TORQUE	0.25 Ncm	• INERTIA	5 gcm ²
• WEIGHT	100 g	• PROTECTION	IP 52

3R



ORDERING CODE



AINH40Z



Shaft Ø
06 = 6 mm



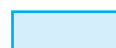
Output circuit
2 = 5 V RS422
5 = 11-30 V Driver
9 = 5-24 V Driver



Output signals
9= A, $\bar{A}$, B, $\bar{B}$, 0, $\bar{0}$
7= A, $\bar{A}$, B, $\bar{B}$
5= A, $\bar{A}$
A= Index gated on A
N= Index ungated



Connection
3R = shielded cable,
radial output



Resolution
1024 max



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E-Mail: sales@meyle.de

- Miniature Size Ø 41 mm
- IP 65 Protection
- Synchro Flange Mounting
- 4.75 to 30 Volts, RS 422 Compatible
- 300 kHz Maximum Frequency
- Resolutions up to 2499
- Economical version



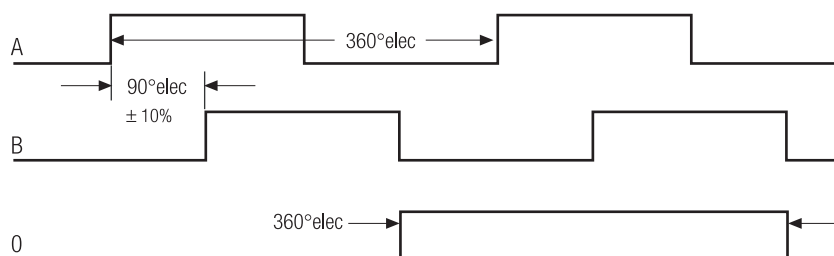
Electrical Specifications

Supply Voltage	4.75-30 VDC
Current Consumption	40 mA (max.)
Output Circuit	Push-Pull, RS 422A
Impulse Frequency	100 kHz (max.)
Logic Level (high)	V _{CC} - 0.7 Volt
Logic Level (low)	0.25 Volt (max.)
Short Circuit Protection	100 %

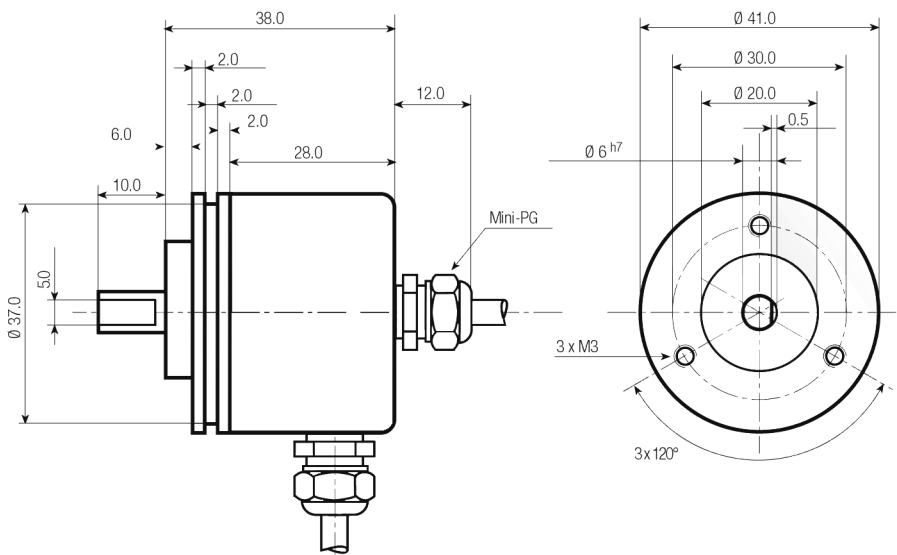
Mechanical Specifications

Cover	Aluminium
Body	Aluminium
Shaft	Stainless steel
Speed	6000 RPM (max.)
Torque	> 0.04 Nm
Loading	Axial 30 N, Radial 20 N
Protection	IP 65
Temperature	-20 °C . . . +70 °C
Weight	140 g

Output Signals



A Leads B in the CW Direction (facing shaft)
Complimentary channel also available



Connections

Function	Cable Colours, 3A, 3B
0 Volt	white
+ Volt	brown
A	green
B	yellow
0	grey
A	pink
B	blue
0	red

ORDERING CODE

AINS41	Shaft Ø 06 = 6 mm	Output Circuit A5 = Push Pull 4.75 to 30 VDC A2 = Line Driver 5 VDC, RS 422	Output Signals 9 = A+B+0+ Compliments	Connection 3A = shielded cable, 2 m, axial output 3R = shielded cable, 2 m, radial output	Resolution 2499 max.
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INCREMENTAL ENCODER MyInc

FINS58
FINH58

- Shaft (FINS) and hollow shaft (FINH) encoder with the same modular concept
 - Shaft diameters Ø 6 and Ø 10 mm for shafted encoders
 - Hollow shaft Ø 14 mm, aluminium reduction hubs of Ø 6, Ø 10 and Ø 12 mm
 - Robustness, excellent shock and vibration resistance
 - Easily achievable high degree of protection IP 67 with special sealing flange for shafted versions
 - High resolutions available up to 80000 cpt in 3 channels with complements
 - Available output signals: square wave, square wave programmable and sine wave
- Simple programmable resolution through dipswitch, no software, no hardware required
 - Universal electronic circuits from 4.75 Vdc to 30 VDC
 - High operating temperature performance: -30 °C up to 100 °C (encoder temperature)
 - High frequency response performance of the output signals: 300 kHz (push-pull & RS422)
 - Glass disks in standard, available with unbreakable disks in Polyfas (Composite Mylar-Mica) in option for resolutions <2500 cpt and temperature <80 °C



Replacment for GHM5, GHT5, GHK5, GHO5.

SPECIFICATIONS

	FINS58	FINH58
• COVER	Zinc-aluminium alloy	Zinc-aluminium alloy
• BODY	Aluminium	Aluminium
• SHAFT/HOLLOW SHAFT	Stainless steel	Stainless steel
• TORQUE	0,4 Ncm	0,6 Ncm
• WEIGHT	300 g	300 g
• MAX. SPEED	12 000 min ⁻¹	9 000 min ⁻¹
• RADIAL SHAFT LOADING	100 N	100 N with DAC
• AXIAL SHAFT LOADING	50 N	50 N with DAC
• INERTIA	10 gcm ²	22 gcm ²
• PROTECTION	IP 65	IP 65

MECHANICAL FEATURES

- Shock resistance: < 1000 m.s⁻² for 6 ms (EN60068-2-27)

Vibrations resistance: < 100 m.s⁻² from 50 to 2000 Hz

 - Standard IP 65, IP 67 available with a special flange for the shaft encoders of Ø 10 mm
 - Perfect sealing of the connectors (moulded in the encoder cover)
- Max. Acceleration: 1.105 rad.s⁻²

Lifetime of the bearings: 12 x 10⁹ turns



INCREMENTAL ENCODER MyInc

FIN58 FINH58

SQUARE-WAVE OUTPUT SIGNAL ENCODERS

Operating temperature: from -30 °C to 100 °C (encoder body)

AVAILABLE ELECTRONICS

	A5*	A7
Supply voltage	5–30 VDC, 75 mA max.	4.75–30 VDC, 75 mA max.
Output signals	4.5–30 VDC, push-pull 50 mA	5 VDC RS422, 40 mA
Frequency response	300 kHz	300 kHz
	A2	A2
Supply voltage	10–30 VDC, 75 mA max.	5 VDC±10 %, 75 mA max.
Output signals	10–30 VDC, push-pull 20 mA	5 VDC RS422, 40 mA
Frequency response	120 kHz	300 kHz

Protection against short circuits and reverse polarity in all electronics, except for A2, against short circuits only. Note: *A5 is compatible RS422 if encoder is supplied with 5 VDC -0/+10 %

Signals A, A\, B, B\, 0, 0\ :

Channel B (mounting front) arrives before A clock-wise seen from the body side of the encoders (not cover side). The shift between each fronts is given by the formula $a > 135/F$ (a in time in μ s, F, frequency in kHz). Ex. $a > 0,45 \mu$ s at $F=300$ kHz.

Available resolutions (100 °C electronic): 5 10 20 25 30 50 60 100 120 125 127 150 180 200 240 250 256 300 314 360 375 400 500 512 600 720 750 762 768 800 927 1000 1024 1200 1250 1280 1440 1500 1800 2000 2048 2400 2500 3000 3600 4000 4096 5000 6000 7200 8000 8192 10000.

Interpolated availabel resolutions (70 °C electronic): 1080 2560 2880 3072 4320 5120 7500 5760 9000 10240 10800 12000 12500 12288 14400 15000 16000 16384 18000 20000 20480 24000 25000 28800 30000 32000 32768 36000 40000 40960 43200 48000 49152 50000 57600 60000 64000 65536 72000 80000 96000.

PROGRAMMABLE ENCODERS: SQUARE-WAVE OUTPUT SIGNALS

Operating temperature: from -30 °C to 70 °C (encoder body)

AVAILABLE ELECTRONICS

	D5*	D7
Supply voltage	5–30 VDC, 75 mA max.	4.75–30 VDC, 75 mA max.
Output signals	4.5–30 VDC, push-pull 50 mA	5 VDC RS422, 40 mA
Frequency response	300 kHz	300 kHz

Protection against short circuits and reverse polarity for all electronics (except for A2, against short circuits only). Note: *D5 is compatible RS422 if encoder is supplied with 5 VDC -0/+10 %
Easy multiplication of the basic resolutions with a dipswitch, no hardware, nor specific software required. Interpolation factor: x1, x2, x3, x4, x5, x8, x10, x12, x16. For ex., with a basic resolution of 2500 cpt, the following resolutions could be programmed : 2500 5000 7500 10000 12500 20000 25000 30000 40000 cpt.

Available basic resolutions:

- for shaft encoders FIN58: 250, 256, 360, 500, 1024, 2500, 3000, 3600, 4000, 4096, 5000, 6000 cpt
 - for hollow shaft encoders FINH58: 250, 256, 360, 500, 1024, 2500, 3000, 3600, 4000, 4096, 5000, 6000 cpt
- Max resolution 96000 cpt with basic resolution of 6000 cpt.

SINE-WAVE OUTPUT SIGNALS

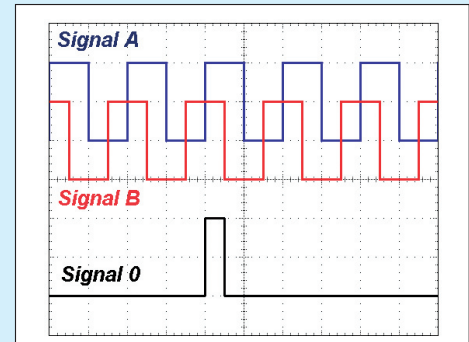
Electronics S1: supply voltage 5 VDC±10 %, 75 mA (without load), output circuits sine-wave output signals 1 VDC peak to peak. Protection against short circuits.
Operating temperature (encoder body): from -30 °C to 100 °C.

Signals S, S\, C, C\, 0, 0\ :

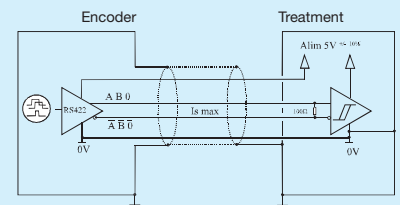
Channel C (cosine) arrives before channel S (sine) clockwise seen from the shaft side (for the shaft encoders) body side for the hollow shaft encoders: The secondary harmonics are 50 dB lower than first harmonics

Available basic resolutions:

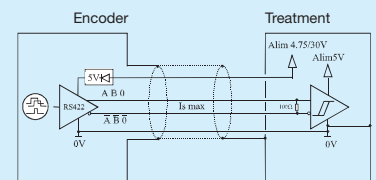
- for shaft encoders FIN58: 250, 256, 360, 500, 1024, 2500 cpt
- for hollow shaft encoders FINH58: 256, 360, 500, 1024, 2500 cpt



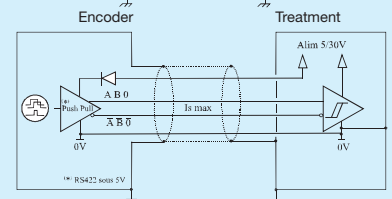
A2



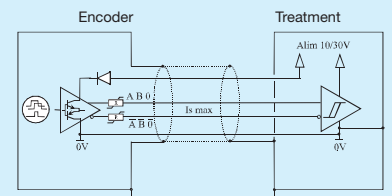
A7



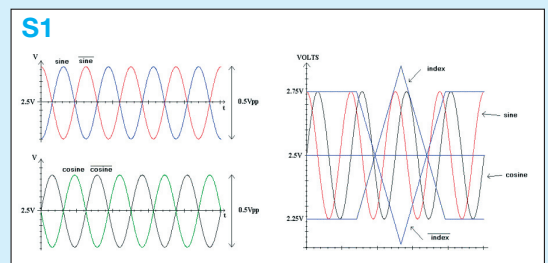
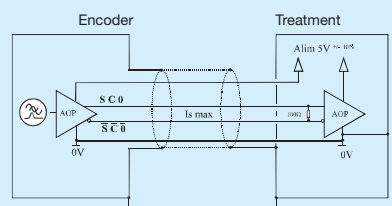
A5



AT



S1



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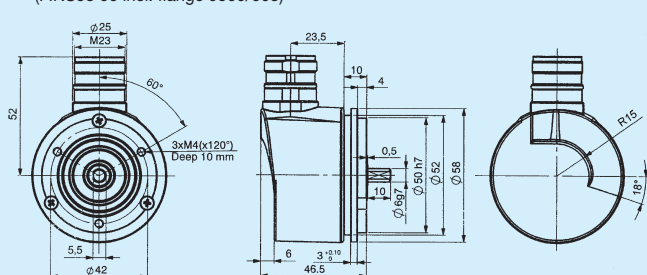
Terminal assignment

Signal:	OV	+U _B	A	$\bar{A}$	B	$\bar{B}$	0	$\bar{0}$	Shield
12 pin plug cw (6R) Pin:	1	2	3	6	4	7	5	8	connector body
12 pin plug cw (8R) Pin:	10 + 11	2 + 12	8	1	5	6	3	4	connector body
Cable colour:	WH	BN	GN	PK	YE	BU	GY	RD	general shielding

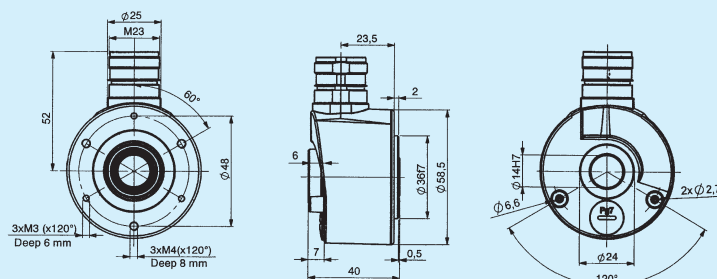
DIMENSIONS

FINS58 S6

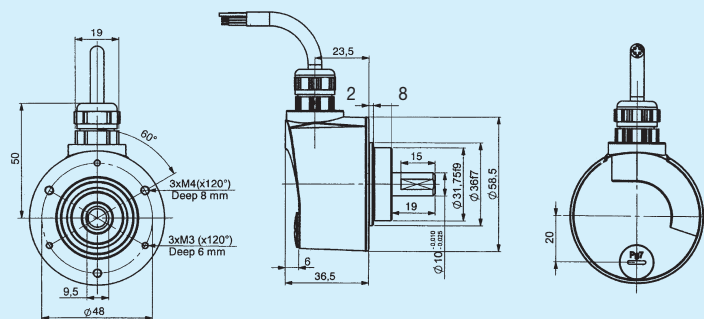
(FINS58 06 incl. flange 9500/003)



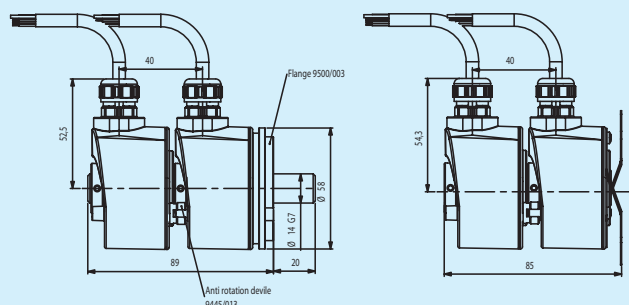
FINH58 14



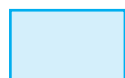
FINS58 10



FINx58 Double mounting



ORDERING CODE



**FINS58
shaft**



Shaft Ø

06 = 6 mm
10 = 10 mm
S6 = 06 mm
S0 = 10 mm

**FINH58
hollow shaft**

6 = 6 mm (with hub)
8 = 8 mm (with hub)
10 = 10 mm (with hub)
12 = 12 mm (with hub)
14 = 14 mm



Output circuit (p. 36)

Square-wave signals:
A5 = driver push-pull 5-30 VDC
A7 = 4,75-30 VDC RS422
A2 = driver 5 VDC RS422
AT = driver push-pull 10 to 30 VDC transistorized
Programmable:
D5 = 5-30 VDC driver push-pull
D2 = driver 5 VDC RS422
D7 = 4,75-30 VDC RS422
Sine-wave signals:
S1 = Sine-wave 1 V pp (peak to peak)



Output signals

9= A, $\bar{A}$, B, $\bar{B}$, 0, $\bar{0}$



Connection

3R = cable gland + 2 m cable
6R = M23 12 pins clock-wise standard
8R = M23 12 pins counter clock-wise standard



Resolution

standard encoder 80000 max.
programmable 6000 max. basic
sine-wave 2500 max.

INCREMENTAL ENCODER MyInc

AINS58

- Industry Standard Size Ø 58 mm
- IP 65 Protection
- 4.75 to 30 Volts, RS 422 Compatible
- 300 kHz Maximum Frequency
- Resolutions up to 2499 cpt
- Economical version



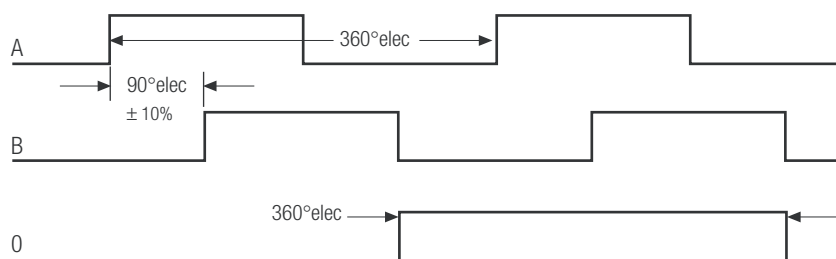
Electrical Specifications

Supply Voltage	4.75-30 VDC
Current Consumption	40 mA (max.)
Output Circuit	Push-Pull, RS 422A
Impulse Frequency	300 kHz (max.)
Logic Level (high)	Vcc - 0.7 Volt
Logic Level (low)	0.25 Volt (max.)
Short Circuit Protection	100 %

Mechanical Specifications

Cover	Aluminium
Body	Aluminium
Shaft	Stainless steel
Speed	8000 RPM (max.)
Torque	> 0.05 Nm
Loading	Axial 40 N, Radial 30 N
Protection	IP 65
Temperature	-20 °C . . . +70 °C
	+100° C optional
Weight	320 g

Output Signals



A Leads B in the CW Direction (facing shaft)
Complimentary channel also available



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**ORDERING CODE**

Output Circuit

Output Signals

Connection

Resolution

2499 max.

INCREMENTAL ENCODER MyInc

AINH58

- Industry hollow shaft encoder Ø 58
- Hollow shaft 6–12 mm
- 4.75 to 30 Volts, RS 422 Compatible
- 200 kHz Maximum Frequency
- Short circuit protection
- Resolutions up to 2499 cpt
- Economical version



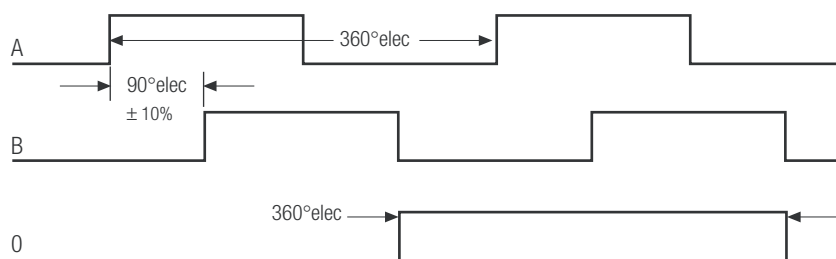
Electrical Specifications

Supply Voltage	4.75-30 VDC
Current Consumption	40 mA (max.)
Output Circuit	Push-Pull, RS 422A
Impulse Frequency	200 kHz (max.)
Logic Level (high)	Vcc - 0.7 Volt
Logic Level (low)	0.25 Volt (max.)

Mechanical Specifications

Cover	Aluminium
Body	Aluminium
Hollow shaft	Stainless Steel
Speed	6000 RPM (max.)
Torque	> 0.04 Nm
Loading	Axial 20 N, Radial 15 N
Protection	IP 65
Temperature	-20 °C . . . +70 °C +100 °C Optional
Weight	250 g

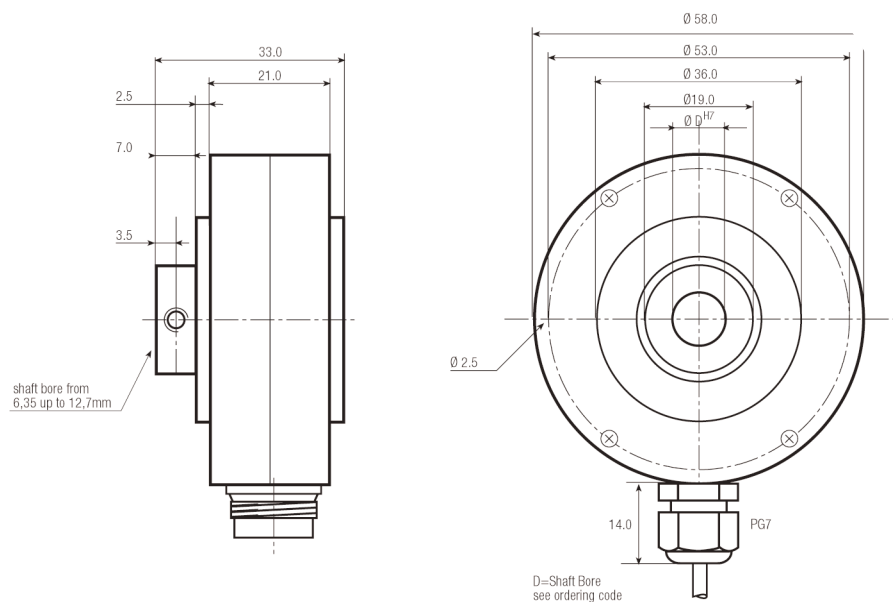
Output Signals



A Leads B in the CW Direction (facing shaft)
Complimentary channel also available



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Connections

Function	Cable Colours, 3R	8 Pin Connector, 6R
0 Volt	white	1
+ Volt	brown	2
A	green	3
B	yellow	4
0	grey	5
A	pink	6
B	blue	7
0	red	8

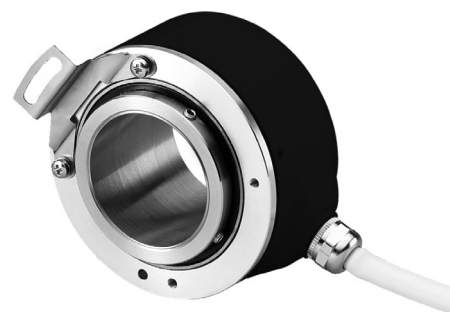
ORDERING CODE

AINH58	Shaft Ø	Output Circuit	Output Signals	Connection	Resolution
	06 = 6 mm 10 = 10 mm 12 = 12 mm	A5 = Push Pull 4.75 to 30 VDC A2 = Line Driver 5 VDC, RS 422 A9 = 8–30 V DC Line Driver 5 VDC, RS 422	9 = A+B+0+Compliments	3R = shielded cable, 2 m, radial output 6R = 8pin connector, radial output, cw	2499 max.

INCREMENTAL ENCODER MyInc

CINH76

- Through shaft with up to diameter 42 mm
- Short overall length with an outside diameter of only 76 mm
- Easy installation by means of clamping ring
- Operating temperature up to 100 °C
- Application e.g.:
 - motors
 - printing machines
 - lifts



Mechanical characteristics:

Speed:	at 70 °C and IP 64: 3600 RPM for Ø 15...25 at 70 °C and IP 64: 1800 RPM for Ø > 25...42 at 70 °C and IP 40: 6000 RPM for Ø 15...42 at 100 °C always: 1800 RPM for Ø 15...42
Rotor moment of inertia:	1,4 ... 42 x 10 ⁻⁶ kgm ²
Starting torque:	0,03 ... 0,10 Nm
Weight:	320-580 g
Protection acc. to EN 60 529:	IP 40 (option IP 64)
Working temperature:	-25 °C ... +100 °C
Shaft:	stainless steel
Shock resistance acc. to DIN-IEC 68-2-27:	1000 m/s ² (6 ms)
Vibration resistance acc. to IEC 68-2-6:	100 m/s ² (10 ... 2000 Hz)

Available resolutions:

50, 100, 250, 300, 500, 600, 900, 1000, 1024, 1500, 2048, 2500, 3072, 4096, 5000, 9000, 10000

Electrical characteristics:

Output circuit:	RS 422	Push-pull
Supply voltage:	5 VDC (± 10 %)	10 ... 30 VDC
Power consumption (no load)		
with inverted signals:	60 mA	60 mA
Permissible load/channel:	30 mA	30 mA
Pulse frequency:	max. 300 kHz	max. 200 kHz
Signal level high:	min. 2,5 V	min. U _B -3 V
Signal level low:	max. 0,5 V	max. 2 V
Short circuit proof outputs: ¹⁾	no	yes
Reverse connection protection at UB:	no	yes

Terminal assignment

Signal:	0V	0V Sensor	+U _B	+U _B Sensor	A	Ā	B	B̄	0	0̄	Shield ¹⁾
Cable colour:	WH/GN	VT	BN/GN	BU	BN	GN	GY	PK	RD	BK	

¹⁾connected to housing

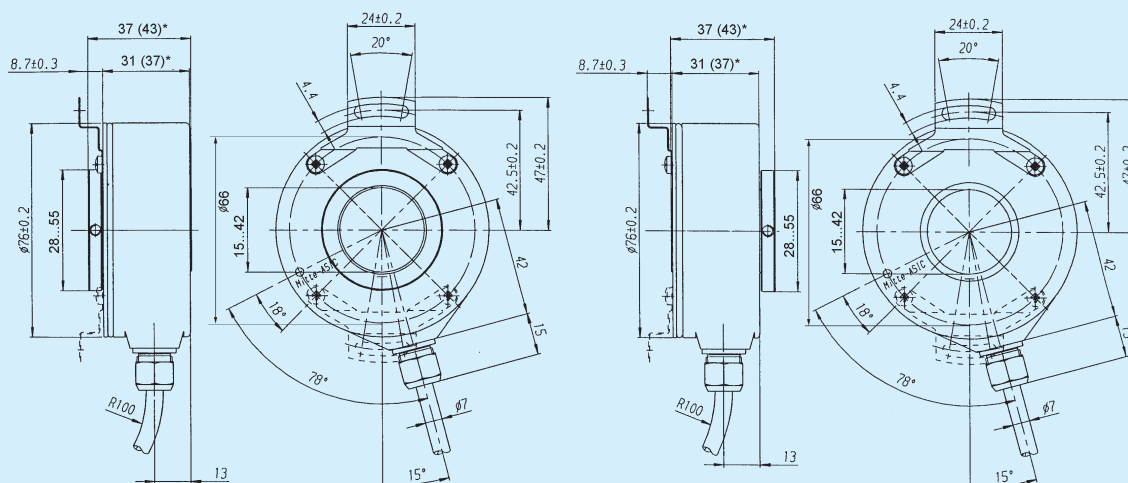


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Dimensioned drawing

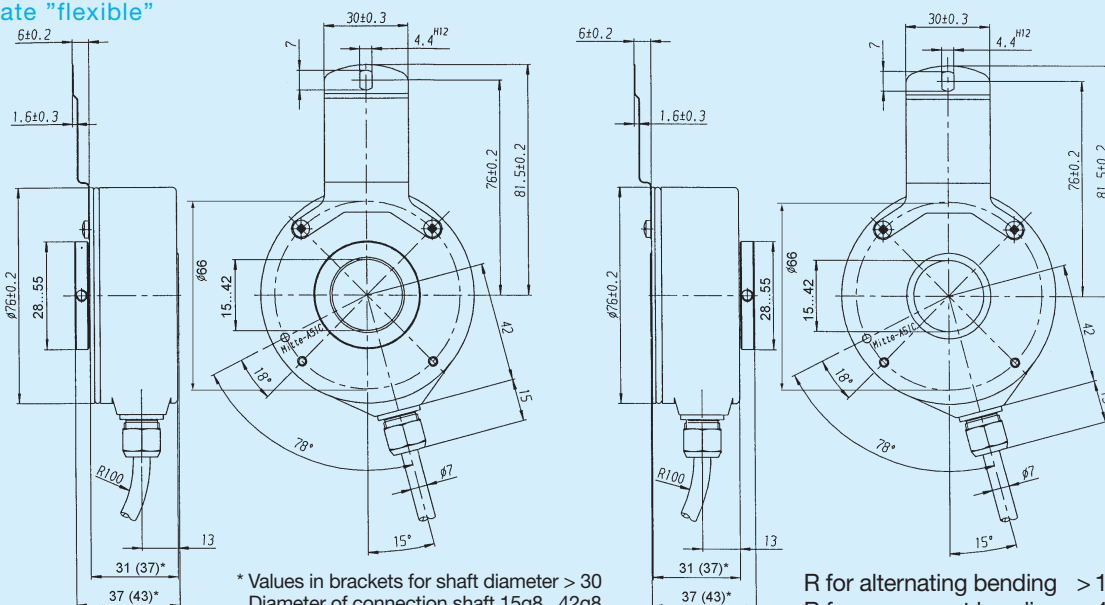
with spring plate "rigid"



* Values in brackets for shaft diameter > 30
Diameter of connection shaft 15g8...42g8

R for alternating bending > 100 mm
R for permanent bending > 40 mm

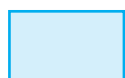
with spring plate "flexible"



* Values in brackets for shaft diameter > 30
Diameter of connection shaft 15g8...42g8

R for alternating bending > 100 mm
R for permanent bending > 40 mm

ORDERING CODE



CINH76

Mounting synchro
flange with
D = Front clamping ring
H = Rear clamping ring

Shaft
diameter¹⁾
15 ... 42
in mm

Output circuit and
supply voltage
A5 = Push-pull (with
inverted signal)
10 ... 30 V
supply voltage

A7 = RS422 (with invert-
ed signal) + Alarm,
10 ... 30 V
supply voltage

Protection
class
0 = IP 40
4 = IP 64

Spring
plate
O = without
A = flexible
N = rigid

Connection
3R = TPE-cable
radial

Resolution
10000 max.

- ¹⁾ Available with front clamping ring and IP 40: 15, 20, 24, 25, 27, 28, 30, 38, 40, 42, 50
Available with front clamping ring and IP 64: 15, 16, 18, 20, 24, 25, 27, 28, 30, 32, 38, 40, 42
Available with rear clamping ring and IP 40: 25, 28, 30, 32, 38, 40, 42
Available with rear clamping ring and IP 64: 20, 25, 30, 32, 38, 40, 42



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INCREMENTAL ENCODER MyInc

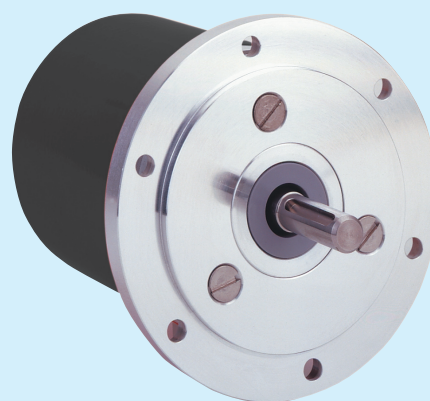
AINS90 AINS90S

- Heavy duty standard encoder
- Ø 90 mm synchro flange or Ø 115 mm tachoflange
- Applications: steel and paper mills, food industry, windmills

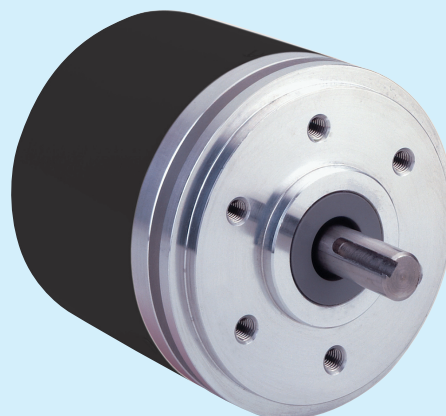


SPECIFICATIONS

	AINS90	AINS90S		
• COVER	Zinc alloy	Zinc alloy	• MAX. SPEED	6 000 min ⁻¹
• BODY	Aluminium	Stainless steel	• RADIAL SHAFT LOADING	200 N
• WEIGHT	1.3 kg	3 kg	• AXIAL SHAFT LOADING	100 N
• SHAFT	Stainless steel		• INERTIA	150 gcm ²
• TORQUE	1 Ncm		• PROTECTION	IP 66
• TEMPERATURE	-20 °C ... +85 °C			



AINS9011



AINS9012

Terminal assignment

Signal:	OV	+U _B	A	$\bar{A}$	B	$\bar{B}$	0	$\bar{0}$	Shield
12 pin plug cw (6R) Pin:	1	2	3	6	4	7	5	8	connector body
12 pin plug cw (8R) Pin:	10 + 11	2 + 12	8	1	5	6	3	4	connector body
Cable colour:	WH	BN	GN	PK	YE	BU	GY	RD	general shielding



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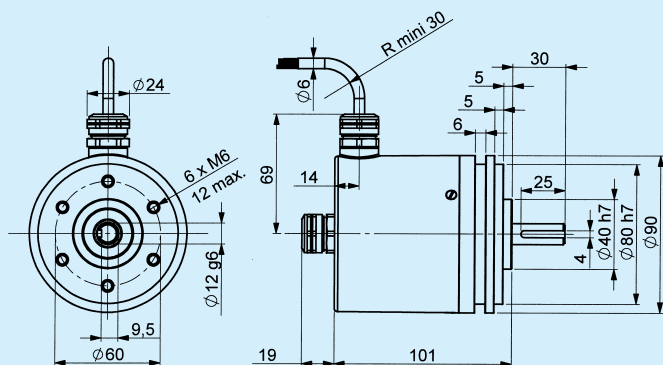
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INCREMENTAL ENCODER MyInc

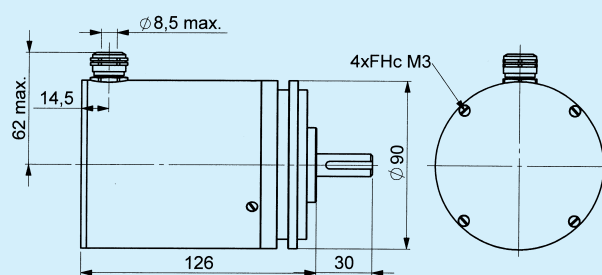
DIMENSIONS

AINS90 AINS90S

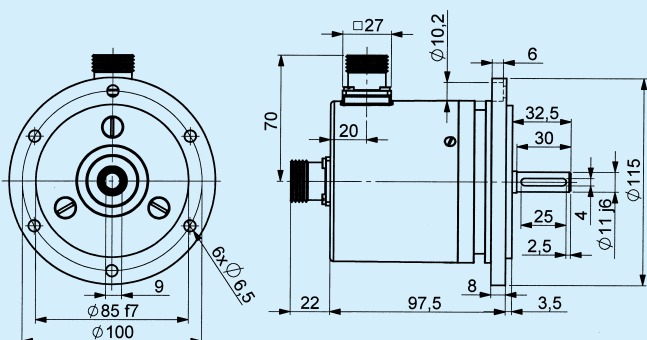
AINS912
3A, 3R



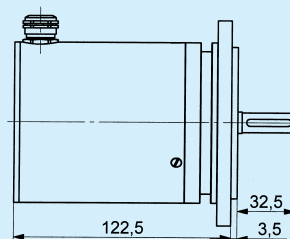
AINS912
with terminal box (BR)



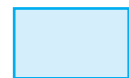
AINS911
5A, 5R, 6A, 6R, 8A, 8R



AINS911
with terminal box (BR)



ORDERING CODE



AINS90
AINS90S



Shaft $\varnothing$

11 = 11 mm
12 = 12 mm
C1 = 11 mm
Shaft length : 22,5 mm
C2 = 12 mm
Shaft length : 25 mm



Output circuit

2 = 5 V RS422
3 = 15-30 V Driver 12 V
5 = 11-30 V Driver
8 = 11-30 V RS422
T = 11-30 V Transistor
H = 11-30 V 150 mA



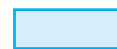
Output signals

9= A, $\bar{A}$, B, $\bar{B}$, 0, $\bar{0}$
7= A, $\bar{A}$, B, $\bar{B}$
5= A, $\bar{A}$
A= Index gated on A
N= Index ungated



Connection

3A = shielded cable, axial output
3R = shielded cable, radial output
5A = 12 pin connector, axial output, cw
5R = 12 pin connector, radial output, cw
6A = 12 pin connector, axial output, cw
6R = 12 pin connector, radial output, cw
8A = 12 pin connector, axial output, ccw
8R = 12 pin connector, radial output, ccw



Resolution

10000 max.



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Internet: www.meyle.de
E-Mail: sales@meyle.de

- Heavy Duty Construction Ø 90 mm
- IP 65 Protection (Optional IP 66)
- 25000 cpt Maximum
- 4.75 to 30 Volts, RS 422 Compatible
- 300 kHz Maximum Frequency
- Resolutions up to 2499 cpt
- Economical version



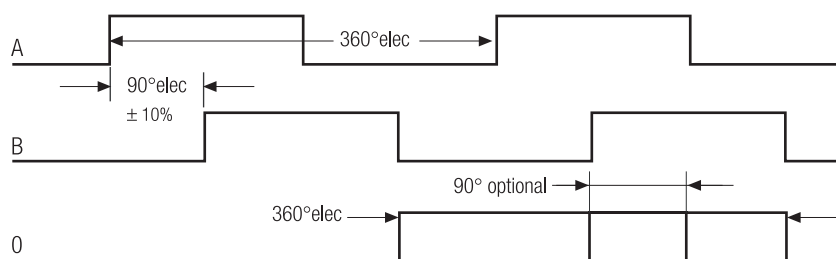
Electrical Specifications

Supply Voltage	4.75-30 VDC
Current Consumption	40 mA (max.)
Output Circuit	Push-Pull, RS 422A
Impulse Frequency	300 kHz (max.)
Logic Level (high)	Vcc - 0.7 Volt
Logic Level (low)	0.25 Volt (max.)
Short Circuit Protection	100 %

Mechanical Specifications

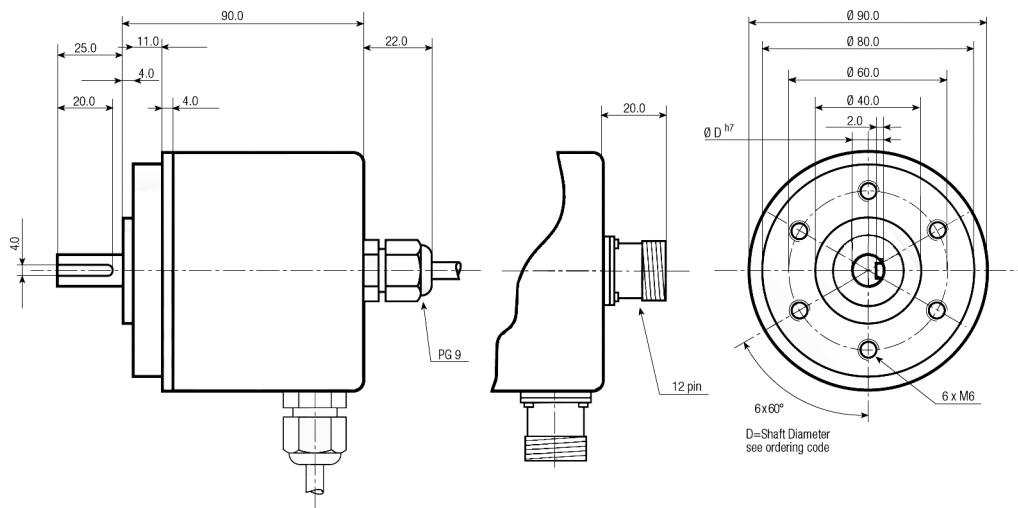
Cover	Steel
Body	Aluminium
Shaft	Stainless steel
Speed	6000 RPM (max.)
Torque	> 0.1 Nm
Loading	Axial 60 N, Radial 50 N
Protection	IP 65
Temperature	-20 °C . . . +70 °C
	+100° C optional
Weight	850 g

Output Signals



A Leads B in the CW Direction (facing shaft)
Complimentary channel also available

Optional Gated Marker Pulse
Gated with A+B Shown



Connections

Function	Cable Colours, 3A, 3R	12 Pin Connector, 6A, 6R
0 Volt	white	1
+ Volt	brown	2
A	green	3
B	yellow	4
0	grey	5
$\overline{A}$	pink	6
$\overline{B}$	blue	7
$\overline{0}$	red	8

ORDERING CODE

FINS90	Shaft Ø	Output Circuit	Output Signals	Connection	Resolution
	06 = 6 mm 12 = 12 mm	A5 = Push Pull 4.75 to 30 VDC A2 = Line Driver 5 VDC, RS 422 A9 = 8-30 VDC Line Driver 5 VDC, RS 422	9 = A+B+0+Compliments	3A = shielded cable, 2 m, axial output 3R = shielded cable, 2 m, radial output 6A = 12 pin connector, axial output, cw 6R = 12 pin connector, radial output, cw	2499 max.

INCREMENTAL ENCODER MyInc

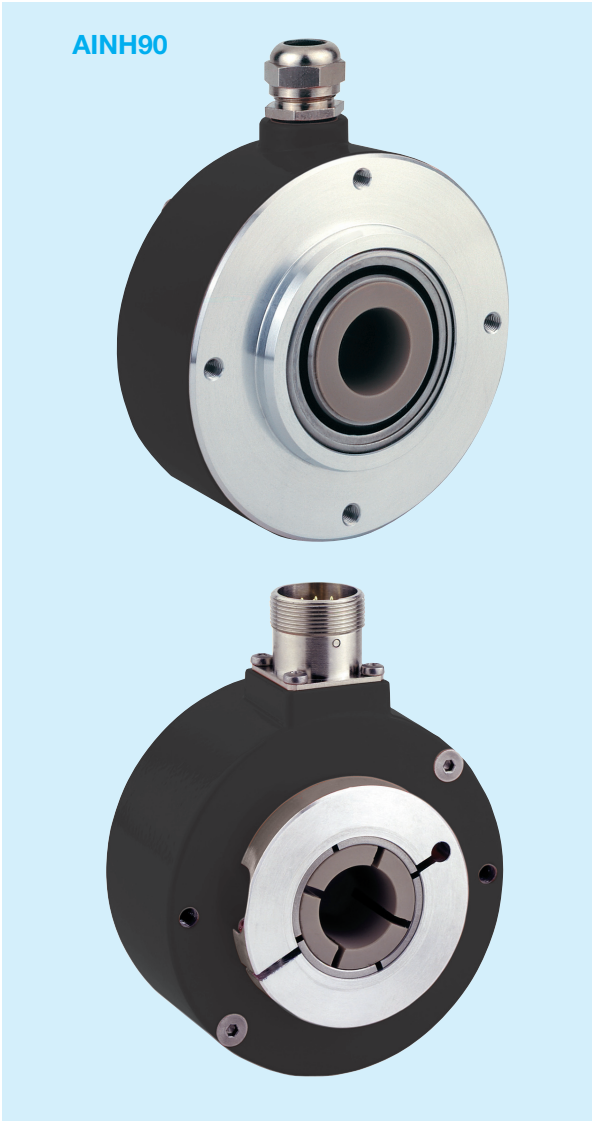
AINH90
AINH90S

- Heavy duty hollow shaft encoder.
- Adaptation of the diameter by reduction hubs in aluminium or in composite RDP (thermal and electrical insulation).
- Possibility of double or triple mounting with incremental, absolute or tachoencoders.



SPECIFICATIONS

	AINH90	AINH90S
• COVER	Zinc alloy	Stainless steel
• BODY	Aluminium	Stainless steel
• SHAFT	Stainless steel	Stainless steel
• TORQUE	2.5 Ncm	2.5 Ncm
• INERTIA	500 gcm ²	500 gcm ²
• AXIAL SHAFT LOADING	50 N	50 N
• RADIAL SHAFT LOADING	80 N	80 N
• MAX. SPEED	4 500 min ⁻¹	4 500 min ⁻¹
• PROTECTION	IP 65	IP 65
• TEMPERATURE	-20 °C ... +85 °C	-20 °C ... +85 °C
• WEIGHT	850 g	1 800 g



Terminal assignment

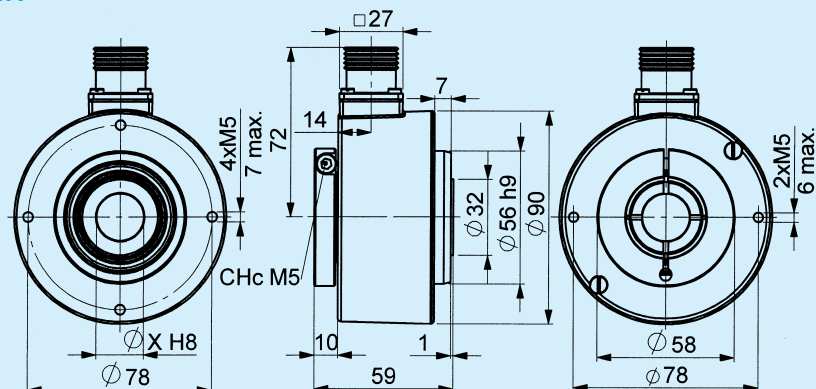
Signal:	OV	+U _B	A	Ā	B	Ē	0	0̄	Shield
12 pin plug cw (6R) Pin:	1	2	3	6	4	7	5	8	connector body
12 pin plug cw (8R) Pin:	10 + 11	2 + 12	8	1	5	6	3	4	connector body
Cable colour:	WH	BN	GN	PK	YE	BU	GY	RD	general shielding



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E-Mail: sales@meyle.de

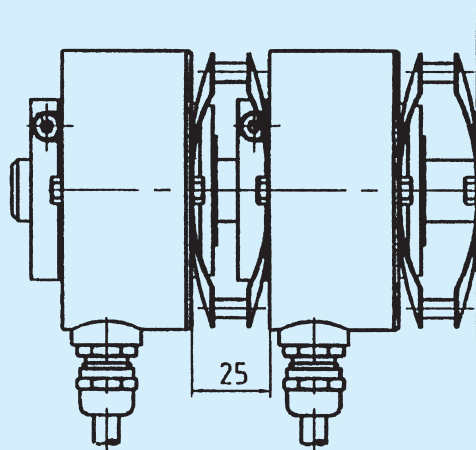
AINH90

5R, 6R, 8R

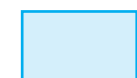


On request: Double mounting

3R



ORDERING CODE



AINH90
AINH90S

with
hub

without
hub



Shaft Ø

12 = 12 mm
20 = 20 mm
25 = 25 mm

30 = 30 mm
32 = 32 mm



Output circuit

2 = 5 V RS422
3 = 15-30 V Driver 12 V
5 = 11-30 V Driver
8 = 11-30 V RS422
T = 11-30 V Transistor
H = 11-30 V, 150 mA



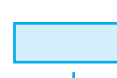
Output signals

9= $\bar{A}$, A, $\bar{B}$, B, 0, 0
7= $\bar{A}$, A, $\bar{B}$, B
5= $\bar{A}$, A
A= Index gated on A
N= Index ungated



Connection

3R = shielded cable,
radial output
8R = 12 pin connector,
radial output, ccw
6R = 12 pin connector,
radial output, cw
5R = 12 pin connector,
radial output, cw



Resolution

10000 max.

INCREMENTAL ENCODER MyInc

AINH95

- Heavy duty hollow shaft encoder
- Hollow shaft 12–30 mm
- 4.75 to 30 Volts, RS 422 Compatible
- 300 kHz Maximum Frequency
- Possibility of double or triple mounting with incremental, absolute or tachometer encoders
- Short circuit protection



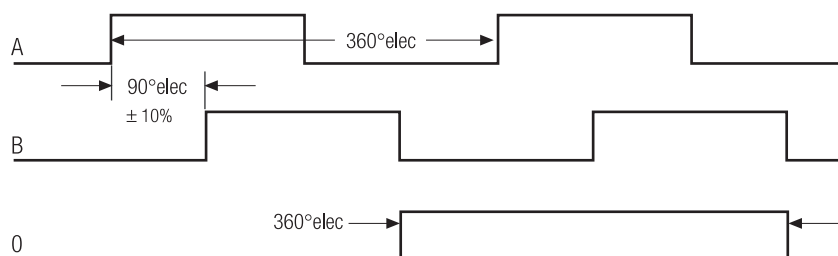
Electrical Specifications

Supply Voltage	4.75-30 VDC
Current Consumption	40 mA (max.)
Output Circuit	Push-Pull, RS 422A
Impulse Frequency	300 kHz (max.)
Logic Level (high)	Vcc - 0.7 Volt
Logic Level (low)	0.25 Volt (max.)

Mechanical Specifications

Cover	Aluminium
Body	Aluminium
Hollow shaft	Stainless steel
Speed	6000 RPM (max.)
Torque	> 0.04 Nm
Loading	Axial 50 N, Radial 30 N
Protection	IP 65
Temperature	-20 °C . . . +70 °C +100 °C Optional
Weight	570 g

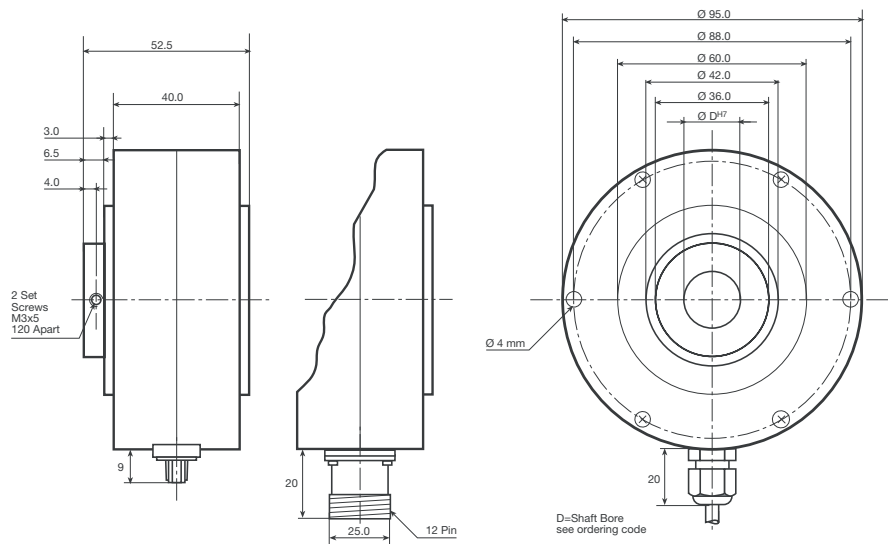
Output Signals



A Leads B in the CW Direction (facing shaft)
Complimentary channel also available



Meyer Industrie-Electronic GmbH – MEYLE
 Carl-Bosch-Straße 8 Tel.: +49 54 81-93 85-0 Internet: www.meyle.de
 49525 Lengerich/Germany Fax: +49 54 81-93 85-12 E-Mail: sales@meyle.de



Connections

Function	Cable Colour Code	9 Pin Connector	12 Pin Connector
0 Volt	white	1	1
+ Volt	brown	2	2
A	green	3	3
B	yellow	4	4
0	grey	5	5
$\overline{A}$	pink	6	6
$\overline{B}$	blue	7	7
$\overline{0}$	red	8	8

ORDERING CODE

AINH 95	Shaft Ø	Output Circuit	Output Signals	Connection	Resolution
	12 = 12 mm 20 = 20 mm 25 = 25 mm	A7 = Push Pull 4.75 to 30 VDC A2 = Line Driver 5 VDC, RS 422 A9 = 8-30 VDC Line Driver 5 VDC, RS 422	9 = A+B+0 +Compliments	3R = shielded cable, 2 m, radial output 6R = 12 pin connector, radial output, cw 9R = 9 pin Sub D connector, radial output	2499 max.

- Rugged and extremely thin hollow shaft encoder for extension on power motors
- Hollow shaft Ø max. 45 mm
- Easy mounting
- Meets protection class IP 54

Applications:
Power motors and three phase current motors with frequency transformation, system construction, crane systems



Mechanical characteristics:

Speed:	max. 3500 min-1
Starting torque:	1,5 Ncm
Radial load capacity of shaft*:	200 N
Axial load capacity of shaft*:	100 N
Weight:	720 g
Protection acc. to EN 60 529:	IP 54
Working temperature:	-10 °C ... +70 °C
Shaft:	stainless steel
Shock resistance acc. to DIN-IEC 68-2-27:	1000 m/s ² (6 ms)
Vibration resistance acc. to IEC 68-2-6:	50 m/s ² (10 ... 2000 Hz)

Available resolution:

1000, 1024, 2048, 2500, 4096

Electrical characteristics:

Output circuit:	RS 422	Push-pull
Supply voltage:	4,75 ... 5,5 VDC	10 ... 30 VDC
Power consumption (no load) without inverted signal:	–	–
Power consumption (no load) with inverted signals:	max. 70 mA	max. 70 mA
Permissible load:	max. 40 mA	max. 40 mA
Pulse frequency:	max. 200 kHz	max. 200 kHz
Signal level high at 20 mA:	min. 2,5 V	min. U _B -2,5 V
Signal level low at 20 mA:	max. 1,2 V	max. 2,5 V
Short circuit proof outputs:	no	yes

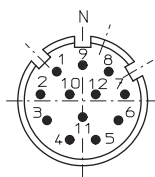
Terminal assignment

Signal:	0V	+U _B	A	$\bar{A}$	B	$\bar{B}$	0	$\bar{0}$	Shield
12 pin plug Pin	10	12	5	6	8	1	3	4	PH ¹⁾
Cable colour:	WH	BN	GN	RD	YE	BL	GY	PK	

¹⁾PH = Shield is attached to connector housing

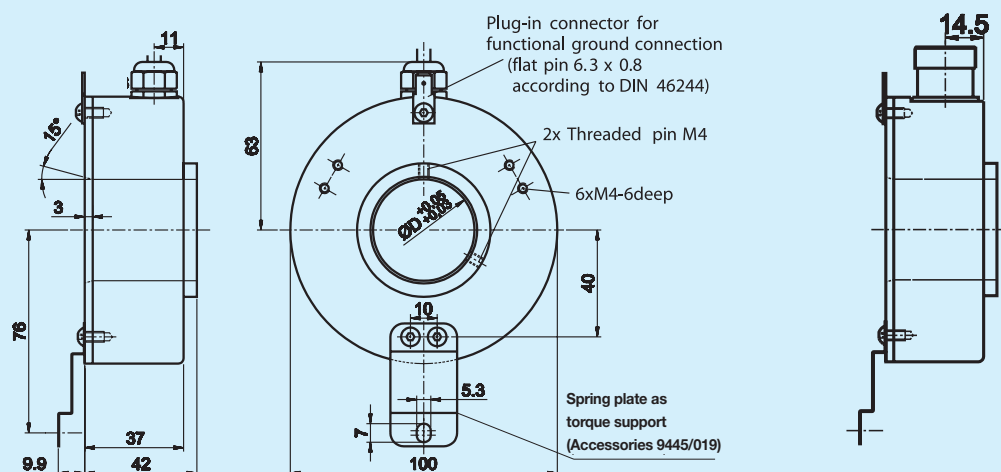
Top view of mating side, male contact base:

12 pin plug

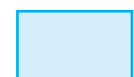


Dimensions

Connector, 12-pin.



ORDERING CODE



DINH100



Shaft Ø

25 = 25 mm
28 = 28 mm
30 = 30 mm
32 = 32 mm
38 = 38 mm
40 = 40 mm
42 = 42 mm
45 = 45 mm
Other diameters
on request.



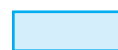
Output circuit and
supply voltage

A5 = Push-pull (with
inverted signal)
10 ... 30 V
supply voltage
A2 = RS422 (with
inverted signal)
5 V supply voltage



Output signals

9 = $\bar{A}$, A, $\bar{B}$, B, $\bar{0}$, 0
7 = $\bar{A}$, A, $\bar{B}$, B
5 = $\bar{A}$, A



Connection

Cable
3R = shielded cable
radial output
8R = 12 pin connector,
radial output, ccw



Resolution

1000
1024
2048
2500
4096
Other PPRs on
request.

- Hollow shaft encoder for direct installation on large electric motors
- Maximum mechanical and electrical safety
- Highly interference-resistant when used with frequency converters
- Meets protection class IP 54
- Hollow shaft Ø max. 72 mm



Mechanical characteristics:

Speed:	max. 800 min ⁻¹
Starting torque:	1,5 Ncm
Radial load capacity of shaft*:	200 N
Axial load capacity of shaft*:	100 N
Weight:	1700 ... 2500 g
Protection acc. to EN 60 529:	IP 54
Working temperature:	-10 °C ... +70 °C
Shaft:	stainless steel
Shock resistance acc. to DIN-IEC 68-2-27:	1000 m/s ² (6 ms)
Vibration resistance acc. to IEC 68-2-6:	50 m/s ² (10 ... 2000 Hz)

Available resolution:

1024, 2500

Electrical characteristics:

Output circuit:	RS 422	Push-pull
Supply voltage:	4,75 ... 5,5 VDC	10 ... 30 VDC
Power consumption (no load) without inverted signal:	–	–
Power consumption (no load) with inverted signals:	max. 70 mA	max. 70 mA
Permissible load:	max. 40 mA	max. 40 mA
Pulse frequency:	max. 200 kHz	max. 200 kHz
Signal level high at 20 mA:	min. 2,5 V	min. U _B -2,5 V
Signal level low at 20 mA:	max. 1,2 V	max. 2,5 V
Short circuit proof outputs:	no	yes

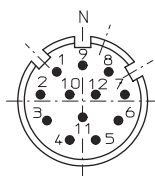
Terminal assignment

Signal:	0V	+U _B	A	$\bar{A}$	B	$\bar{B}$	0	$\bar{0}$	Shield
12 pin plug Pin	10	12	5	6	8	1	3	4	PH ¹⁾
Cable colour:	WH	BN	GN	RD	YE	BL	GY	PK	

¹⁾PH = Shield is attached to connector housing

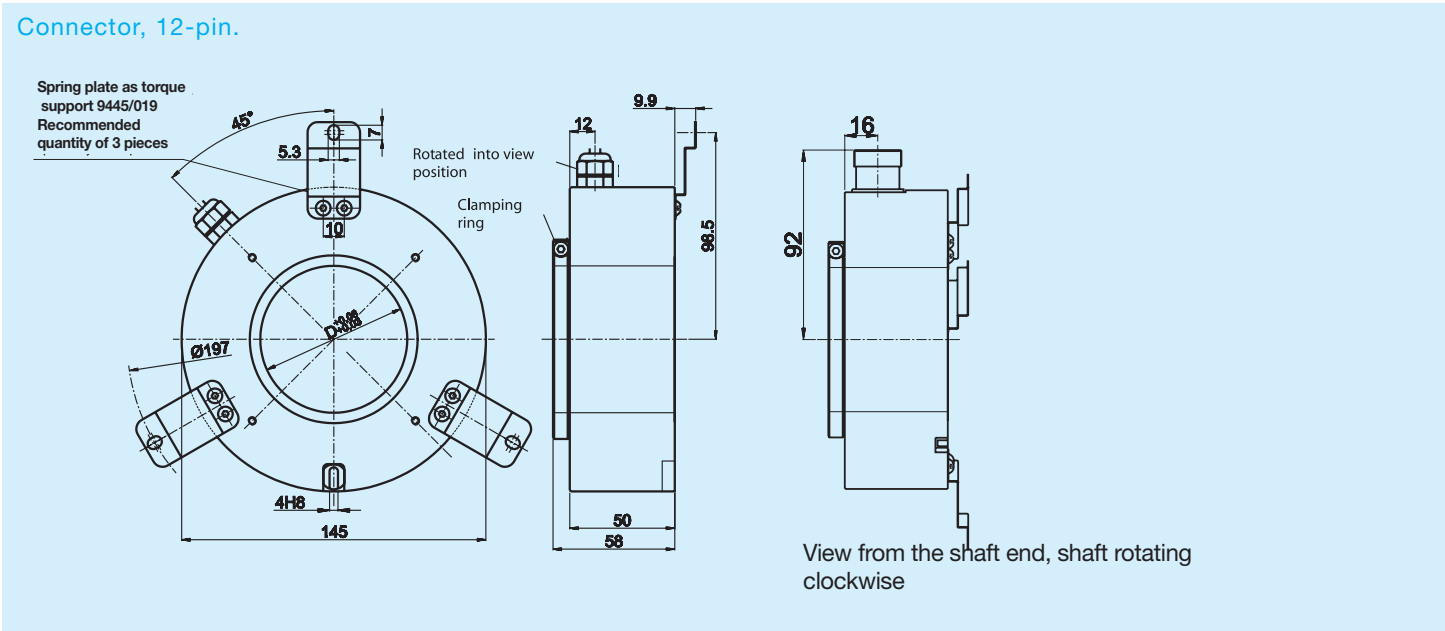
Top view of mating side, male contact base:

12 pin plug



Dimensions

Connector, 12-pin.



ORDERING CODE

DINH145	Shaft Ø	Output circuit and supply voltage	Output signals	Connection	Resolution
	48 = 48 mm 55 = 55 mm 65 = 65 mm 72 = 72 mm Other diameters on request.	A5 = Push-pull (with inverted signal) 10 ... 30 V supply voltage A2 = RS422 (with inverted signal) + Alarm, 5 V supply voltage	9 = $\bar{A}$, A, $\bar{B}$, B, $\bar{0}$, 0	Cable 3R = shielded cable radial output 8R = 12 pin connector, radial output, ccw	1024 2500 Other PPRs on request.

- The Draw wire Sensor makes it possible to measure to position or control systems of linear displacement.



SPECIFICATIONS

The sensor with cable does not require precise linear guidance. It is especially adapted to the severe industrial environments: iron and steel industry, transcribing, industry of wood (sawmills, joineries), etc...

Principle of operation

A **cable of measurement** out of steel inoxidable, of great flexibility coated with a film polyamide, is rolled up and been held on a drum of precision.

An **optical encoder**, interdependent of the drum of technology incremental, absolute, analog or potentiométrique

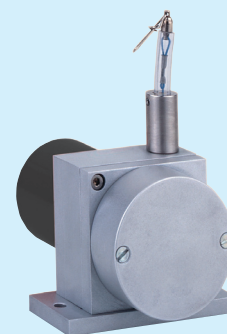
Our range of Draw Wire

DRAW WIRE	RANGE max. (mm)	Perimeter (mm)	Cable (mm)
CD50	1200	100	0,4 mm
CD60	1500	152,4 or 150	0,9 mm
CD80	2500	200 or 204,8	0,6; 0,9
CD80 MEC	2500	200 or 204,8	0,6; 0,9
CD115	3500	300	0,9
CD115 MEC	3500	300	0,9
CD150	5000	409,6	0,9
CD150 MEC	5000	409,6	0,9
CD230	8000	667,9	0,9
CD230-MEC	8000	667,9	0,9

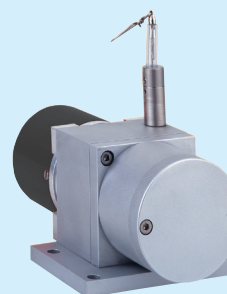
The modules in version MEC (Mechanical) can be provided separately of the encoder.

Note: Flange ref. 9500/003 built-in on each draw wire

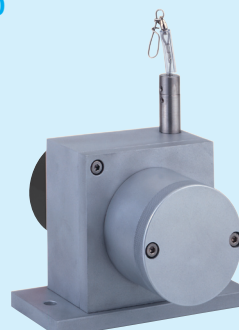
Ref. CD50



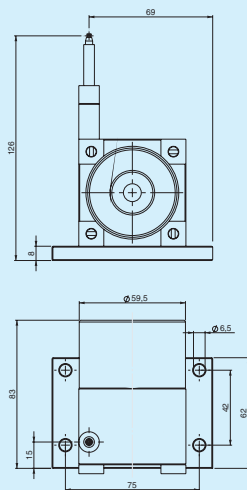
Ref. CD60



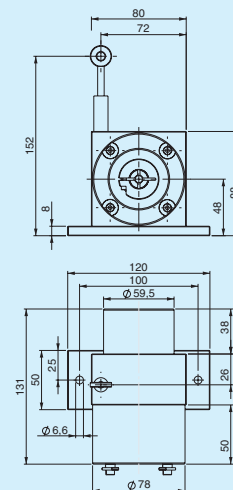
Ref. CD80



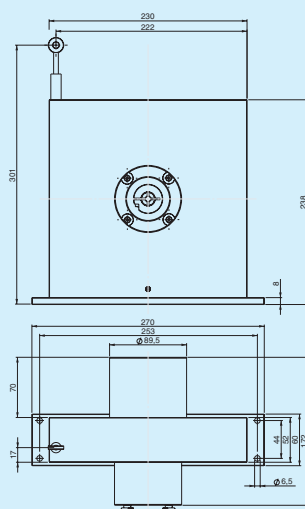
CD60



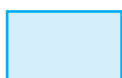
CD80



CD230



ORDERING CODE



CD



Serial number

50
60
80
80-MEC
115
115-MEC
150
150-MEC
230
230-MEC



Range

1200 mm
1500 mm
2500 mm
2500 mm
3500 mm
3500 mm
5000 mm
5000 mm
8000 mm
8000 mm



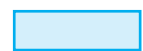
Incremental

IN/40/CD5
FINS5810
FINS5810
FINS5806
FINS5810
FINS5806
FINS5810
FINS5806
FINS5810
FINS5806



Absolute

/
ASS5810
ASS5810
ASS5806
ASS5810
ASS5806
ASS5810
ASS5806
ASS5810
ASS5806



Resolution

ABSOLUTE ENCODER MyAbs

CAXx37

- Housing Ø 37,5 mm shaft (CAXS37) and hollow/blind shaft (CAXH37) absolute encoder
- CAXS37: up to 17 bit single turn and 12 bit multiturn, + 100 °C operating temperature, 6 mm shaft Ø
- CAXH37: up to 19 bit single turn and 12 bit multiturn, + 120 °C operating temperature, 8 mm through hollow shaft

- SSI or BiSS interface
- Sinewave 1 Vpp
- Bandwidth 500 kHz



Electrical Data:

Shaft (CAXS37)

Hollow/blind shaft (CAXH37)

Supply voltage	DC 5 V, -5 %/+10 % or DC 7-30 V	DC 5 V, -5 %/+10 % or DC 7-30 V
Intrinsic current consumption ST/MT	50 mA/100 mA	50 mA/100 mA
Interface	Standard SSI or BiSS	Standard SSI or BiSS
Lines/Drivers	Clock and data / RS422	Clock and data / RS422
Output code	Gray or Binary	Gray
Singleturn resolution	12-17 Bit depending on version	12-19 Bit depending on version
Multiturn resolution	12 Bit	12 Bit
Incremental signals, optional	Sine – Cosine 1 Vpp	Sine – Cosine 1 Vpp
Number of increments	2048	2048
3 dB limiting frequency	500 kHz	500 kHz
Absolute accuracy	± 35"	± 35"
Repeatability	± 7"	± 7"
Connection	Cable axial or radial	Cable radial, PCB connector, 12-pole
Alarm output	Alarm Bit (SSI option), Warning Bit and alarm Bit (BiSS)	Alarm Bit (SSI option), Warning Bit and alarm Bit (BiSS)

Mechanical Data:

Shaft (CAXS37)

Hollow/blind shaft (CAXH37)

Housing diameter	37,5 mm	37,5 mm
Protection, shaft input	IP 64	IP 40
IP Protection class, housing	IP 64	IP 40
Flange types	pilot flange	spring tether
Shaft diameter	6 mm	8 mm
Max. speed	Continuous 10 000 ^{min-1} Short-term 12 000 ^{min-1}	Continuous 10 000 ^{min-1} Short-term 12 000 ^{min-1}
Starting Torque	0,01 Nm	0,01 Nm
Moment of inertia, rotor	2,5 x 10 ⁻⁶ kgm ²	2,5 x 10 ⁻⁶ kgm ²
Tolerance axial		± 0,5 mm
Tolerance radial		± 0,05 mm
Shock resistance IEC 68-2-27	1000 m/s ² (6 ms)	1000 m/s ² (6 ms)
Vibration resistance IEC 68-2-6	100 m/s ² (10-2000 Hz)	100 m/s ² (10-2000 Hz)
Working temperature	-25...+100 °C	-15...+120 °C
Storage temperature	-15...+85 °C (due to packaging)	-15...+85 °C (due to packaging)
Weight, approx. (ST/MT)	80 g/130 g	80 g/130 g



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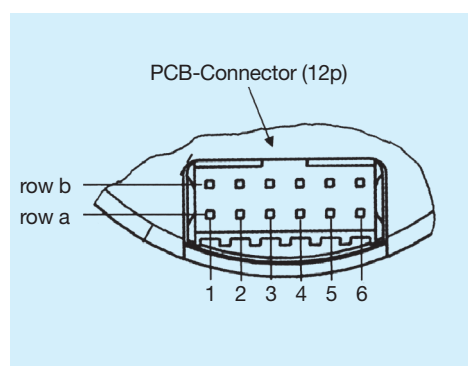
Internet: www.meyle.de
E-Mail: sales@meyle.de

Pin assignment CAxS37

Signal	Cable color
DC 5/7–30 V (U_B)	white
0 V (U_N)	brown
Clock	yellow
$\overline{\text{Clock}}$	green
Data	pink
$\overline{\text{Data}}$	grey
A	white/green ¹
$\overline{A}$	brown/green ¹
B	red/blue ¹
$\overline{B}$	grey/pink ¹
DC 5 V Sensor	violet ¹
0 V Sensor	black ¹

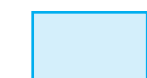
¹only with „SC“

Pin assignment CAxH37

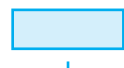


Signals	Pin	Cable color
Data	1a	grey
A +	2a	white/green
0 V Sensor	3a	black
B +	4a	red/blue
$\overline{\text{Clock}}$	5a	green
5 V Sensor	6a	violett
DC 5 V/7–30 V	1b	white
Clock	2b	yellow
B -	3b	grey/pink
0 V (U_N)	4b	brown
A -	5b	brown/green
Data	6b	pink

ORDERING CODE CAxS37



CASS37
Absolute singleturn shaft encoder
CAMS37
Absolute multiturn shaft encoder



Resolution

0012 = 12 Bit ST
0013 = 13 Bit ST
0014 = 14 Bit ST
0017 = 17 Bit ST
1213 = 12 Bit MT + 13 Bit ST
1217 = 12 Bit MT + 17 Bit ST BiSS



Supply voltage

A = 5 V DC
E = 7–30 VDC



Flange, Protection

K4 = Clamping,
IP 64



Shaft-Ø

06 = 6 mm shaft



Interface

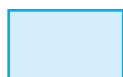
SC = SSI Gray +
SinCos
1Vpp
SB = SSI Binary
SG = SSI Gray
BB = BiSS



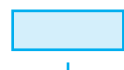
Connection

A = cable axial
B = cable radial

ORDERING CODE CAxH37



CASH37
Absolute singleturn shaft encoder
CAMH37
Absolute multiturn hollow shaft encoder



Resolution

0012 = 12 Bit ST
0013 = 13 Bit ST
0014 = 14 Bit ST
0017 = 17 Bit ST
0019 = 19 Bit ST (BiSS)
1213 = 12 Bit MT + 13 Bit ST
1217 = 12 Bit MT + 17 Bit ST
1219 = 12 Bit MT + 19 Bit ST (BiSS)



Supply voltage

A = 5 V DC
E = 7–30 VDC



Flange, Protection

H0 = Spring tether,
IP 40, through
hollow shaft
B0 = Spring tether,
IP 40, blind
shaft



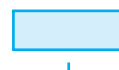
Shaft-Ø

08 = 8 mm
hollow/blind
shaft



Interface

SC = SSI Gray +
SinCos
1Vpp
BB = BiSS



Connection

B = cable radial
C = PCB-Connector 12-pole

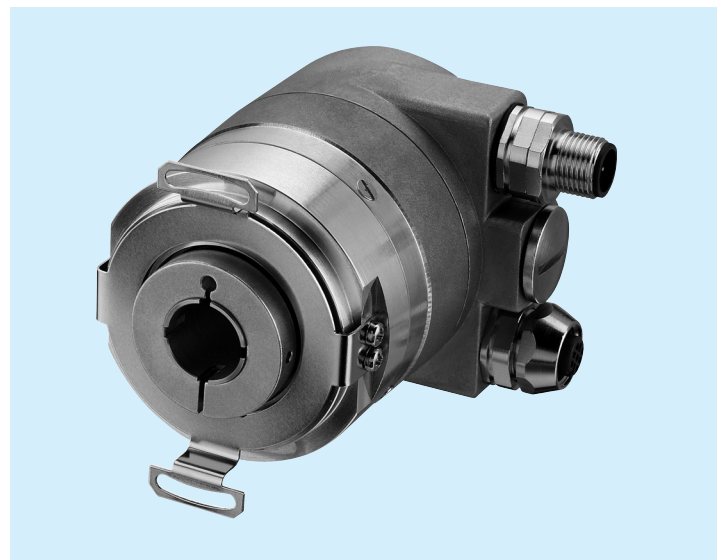
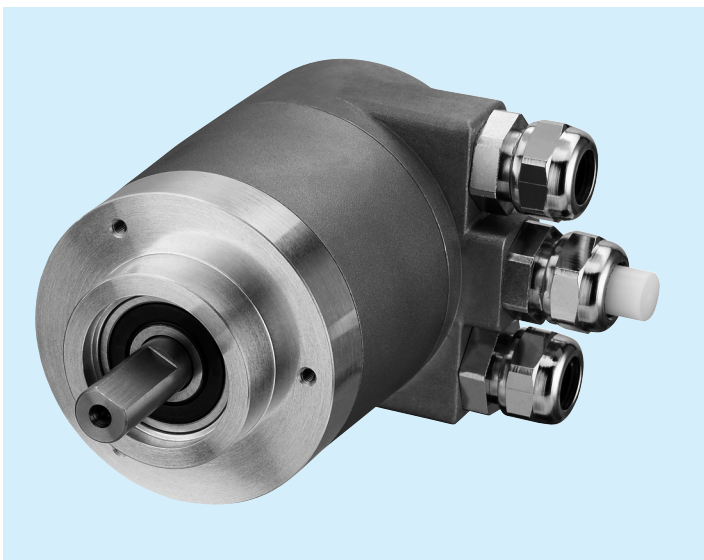
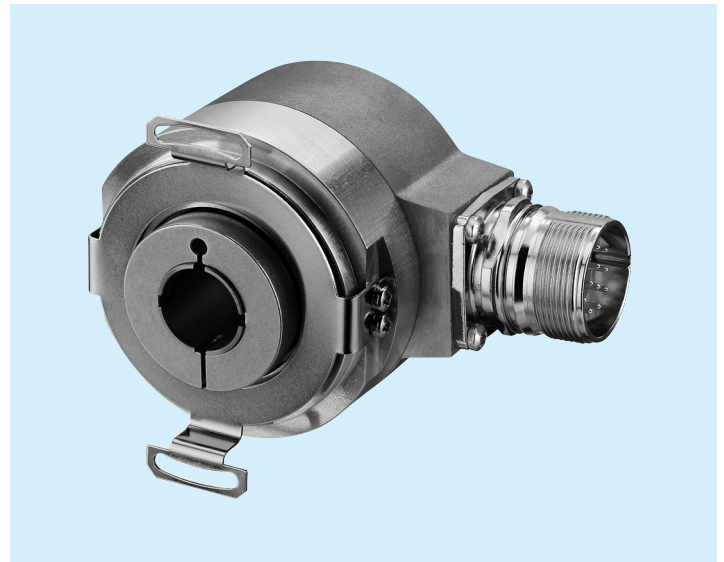
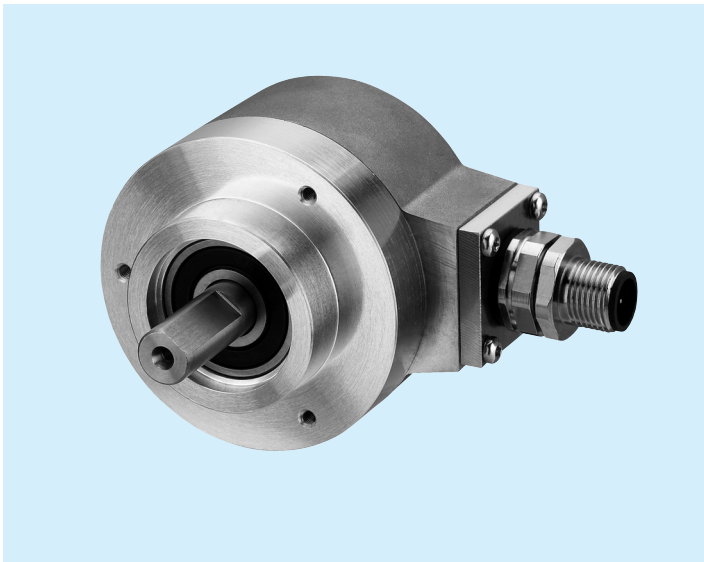


Meyer Industrie-Electronic GmbH – MEYLE

Carl-Bosch-Straße 8 Tel.: +49 54 81-93 85-0 Internet: www.meyle.de
49525 Lengerich/Germany Fax: +49 54 81-93 85-12 E-Mail: sales@meyle.de

- Absolute single- and multiturn encoders with SSI, Profibus, CANopen and CANlift outputs
- Shaft and hollow shaft versions with 58 mm diameter
- Resistant diecast housing and protection up to IP 67
- Stainless steel shaft
- Applications: sensing of:
 - Angles
 - Distances
 - Tracks
 - Inclinations
 - Differences between two or more axes

- Compact and heavy-duty industrial types
- Shaft Ø 6 or 10 mm
- Blind/hollow shaft Ø 10, 12, 14, 15 mm
- Absolutely safe operation even in strong magnetic fields with optical multiturn gear
- Interface:
 - SSI (RS485)
 - BiSS
 - Profibus DP 2.0 (Profile V1.1, Class 1+2)
 - CANopen/CANlift 2.0B (Profile D5 40683.1)
- New technology absolute encoder



SSI

BISS

CANopen

PROFI®
PROCESS FIELD BUS
BUS



Meyer Industrie-Electronic GmbH – MEYLE
 Carl-Bosch-Straße 8 Tel.: +49 54 81-93 85-0 Internet: www.meyle.de
 49525 Lengerich/Germany Fax: +49 54 81-93 85-12 E-Mail: sales@meyle.de

Electrical Data:	SSI, BiSS	Profibus	CANopen/CANlift
Supply voltage	5 VDC, $\pm 5\%$ or 10–30 VDC	10–30 VDC	10–30 VDC
Intrinsic current consumption (without load)	ST 5 VDC: max. 70 mA, 24 VDC: max. 20 mA MT 5 VDC: max. 75 mA, 24 VDC: max. 25 mA	24 VDC: max. 85 mA, 24 VDC: max. 90 mA	24 VDC: max. 60 mA, 24 VDC: max. 65 mA
Interface	Standard SSI or BiSS	Specification according Profibus DP2.0 Standard (DIN 19245 part 3) RS485 driver galvanically isolated	CAN high speed according ISO 11898, Basic- and full CAN CAN specification 2.0B
Protocol		Profibus encoder profile V1.1 Class 1 and Class 2	CAN open profile DS406 V3.1
Lines/Drivers	RS485 Transceiver Type		
Output code	SSI: Binary or Gray, BiSS: Binary	Binary	Binary
Singleturn resolution	10–17 Bit	13 Bit, scaleable up to 16 Bit	13 Bit, scaleable up to 16 Bit
Multiturn resolution	12 Bit	12 Bit	12 Bit
Incremental signals, optional	Sine-cosine 1 Vpp		
Number of increments	2048		
3 dB limiting frequency	400 kHz		
Connection	Cable or flange-connector	Bus cover, cable or flange connector	Bus cover, cable or flange connector
Parameterization	Resolution, codetype, sense of rotation, warning, alarm	According to Profibus Profile	According to CANopen, CANlift profile
Alarm output	open collector: optical sensor path faulty (code error, LED error), low voltage and over temperature		
Control input	Direction		
Set key	Zero or defined value (option)	Zero or defined value (option)	Zero or defined value (option)
Status LED	Red = alarm (option)	Green, red, yellow diagnostic LED	Green, red, yellow diagnostic LED

Mechanical Data:	SSI, BiSS	Profibus	CANopen/CANlift
Housing diameter	58 mm	58 mm/60 mm	58 mm/60 mm
Protection, shaft input	IP 65 or IP 67	IP 65 or IP 67	IP 65 or IP 67
IP Protection class, housing	IP 67	IP 67	IP 67
Flange types	Synchro-flange, clamping flange, spring tether	Synchro-flange, clamping flange, spring tether	Synchro-flange, clamping flange, spring tether
Shaft diameter	Solid shaft: 6, 10 mm; Hollow shaft: 10, 12, 14 mm; Blind shaft: 15 mm	Solid shaft: 6, 10 mm; Blind shaft: 10, 12, 14, 15 mm	Solid shaft: 6, 10 mm; Blind shaft: 10, 12, 14, 15 mm
Max. speed at 70 °C	BAXS58: continuous 10,000 min ⁻¹ short-term 12,000 min ⁻¹ BAXH58: continuous 6,000 min ⁻¹ short-term 9,000 min ⁻¹	BAXS58: continuous 7,000 min ⁻¹ short-term 9,000 min ⁻¹ BAXH58: continuous 7,000 min ⁻¹ short-term 9,000 min ⁻¹	BAXS58: continuous 7,000 min ⁻¹ short-term 9,000 min ⁻¹ BAXH58: continuous 7,000 min ⁻¹ short-term 9,000 min ⁻¹
Starting Torque	< 0,05 Nm (depending on version)	< 0,05 Nm (depending on version)	< 0,05 Nm (depending on version)
Moment of inertia, rotor	3 ... 7,5 x 10 ⁻⁶ kgm ²	3 ... 7,5 x 10 ⁻⁶ kgm ²	3 ... 7,5 x 10 ⁻⁶ kgm ²
Absolute max. shaft load	axial 40 N, radial 80 N	axial 40 N, radial 80 N	axial 40 N, radial 80 N
Shock resistance IEC 68-2-27	2500 m/s ² (6 ms)	2500 m/s ² (6 ms)	BASx58: 2500 m/s ² (6 ms) BAMx58: 1000 m/s ² (6 ms)
Vibration resistance IEC 68-2-6	100 m/s ² (55 ... 2,000 Hz)	100 m/s ² (55 ... 2,000 Hz)	100 m/s ² (55 ... 2,000 Hz)
Working temperature	–40 ... +90 °C (cable versions –30 ... +75 °C)	–40 ... +80 °C (cable versions –30 ... +75 °C)	–40 ... +80 °C (cable versions –30 ... +75 °C)
Weight, approx. (ST/MT)	350 g/450 g	530 g/570 g	530 g/570 g

ABSOLUTE SHAFT ENCODER

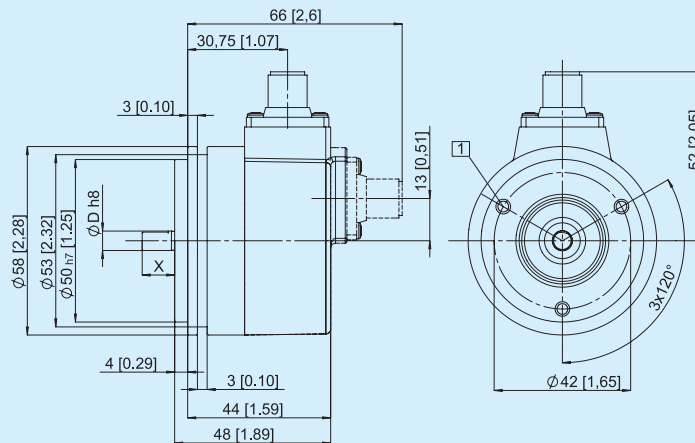
SINGLETURN, SSI, BiSS

Dimensioned drawing

Synchro flange

Ø 58 mm, M 12, M 23 connector, cable versions

Flange type S5 and S7 (Drawing with M 12 connector)

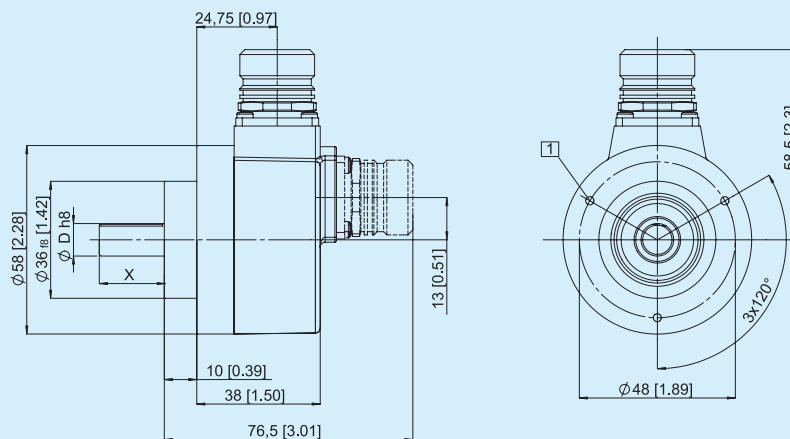


1 3xM4, 6 [0.24] deep

Clamping flange

Ø 58 mm, M 12, M 23 connector, cable versions

Flange type K5 and K7 (Drawing with M 23 connector)

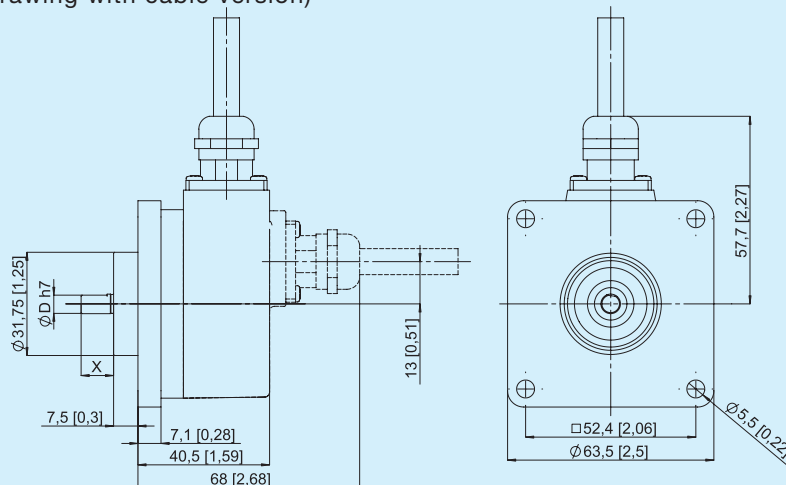


1 3xM3, 6 [0.24] deep

Square flange

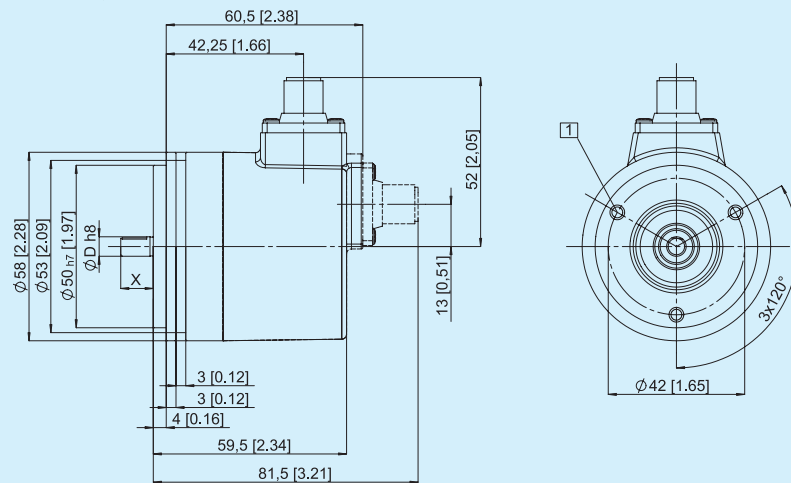
63.5 mm □, M12, M 23 connector, cable versions

Flange type Q5 and Q7 (Drawing with cable version)



Synchro flange

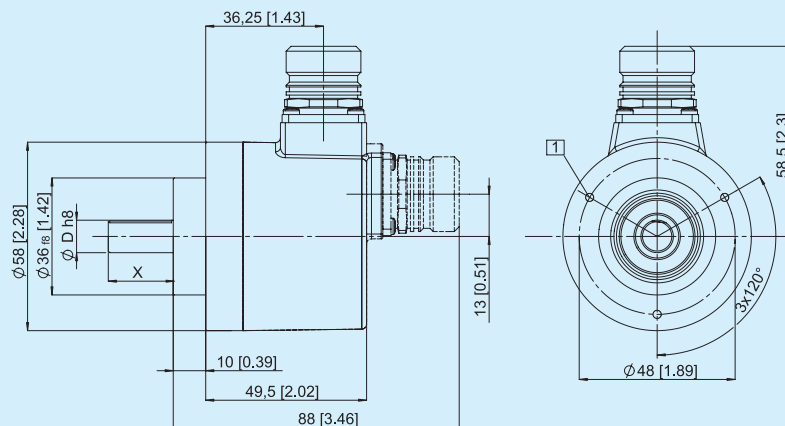
Ø 58 mm, M 12, M 23 connector, cable versions
Flange type S5 and S7 (Drawing with M 12 connector)



1 3xM4, 6 [0.24] deep

Clamping flange

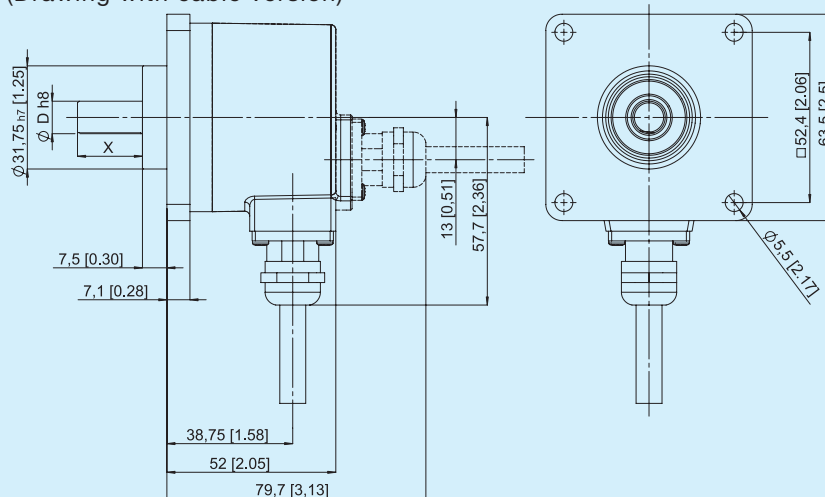
Ø 58 mm, M 12, M 23 connector, cable versions
Flange type K5 and K7 (Drawing with M 23 connector)



1 3xM3, 6 [0.24] deep

Square flange

63.5 mm □, M 12, M 23 connector, cable versions
Flange type Q5 and Q7 (Drawing with cable version)



ABSOLUTE SHAFT ENCODER

BASS58

SINGLETURN, Profibus DP, CANopen, CANlift

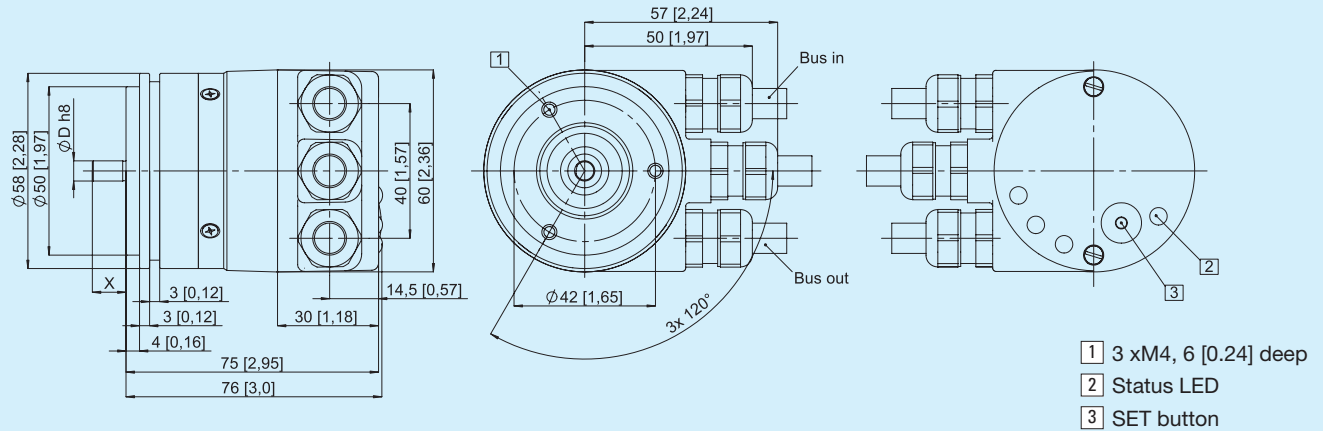
With removable bus terminal cover

Dimensioned drawing

Synchro flange

Ø 58 mm

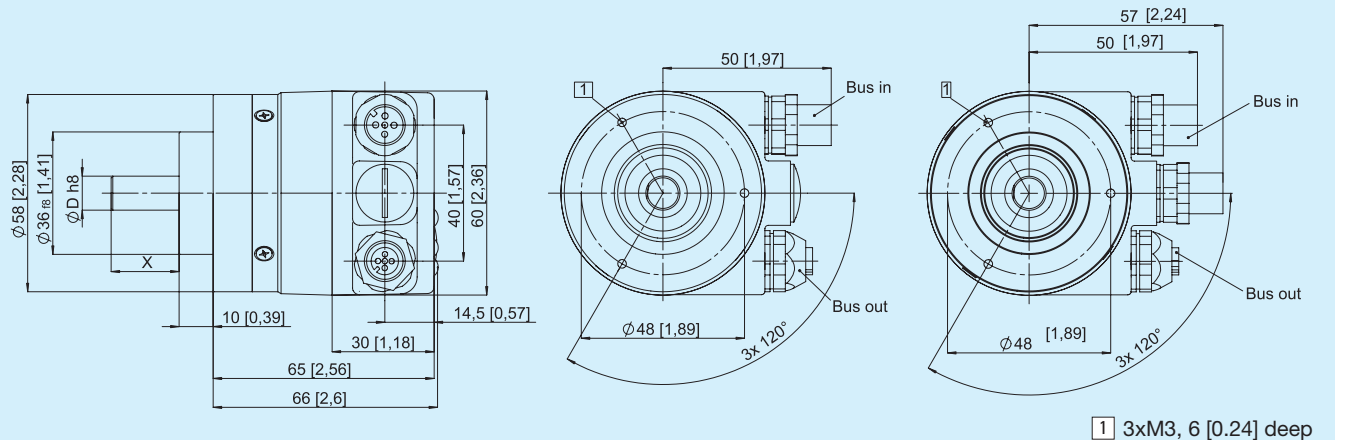
Flange type S5 and S7 (Drawing with cable version)



Clamping flange

Ø 58 mm

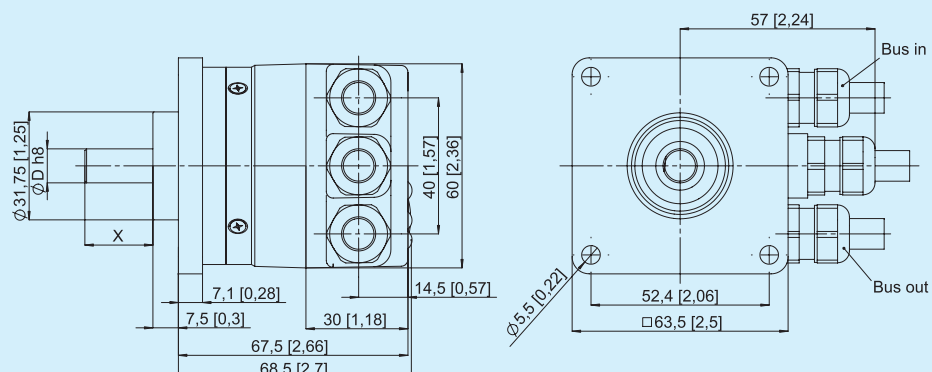
Flange type K5 and K7 (Drawing with 2 x M12 connector)



Square flange

63.5 mm □

Flange type Q5 and Q7 (Drawing with cable version)



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ABSOLUTE SHAFT ENCODER

BASS58

SINGLETURN, CANopen

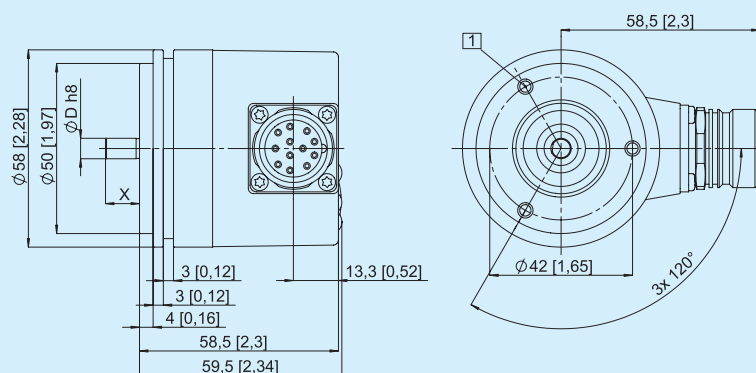
With fixed connection

Dimensioned drawing

Synchro flange

Ø 58 mm

Flange type S5 and S7 (Drawing with M 23 connector)

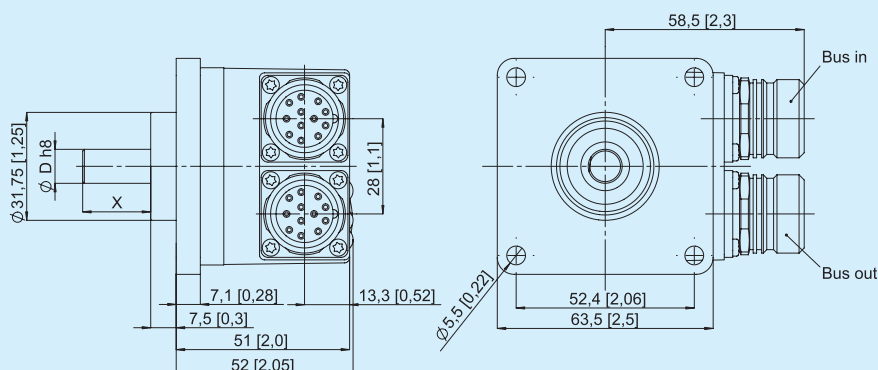


1 3xM4, 6 [0,24] deep

Square flange

63.5 mm □

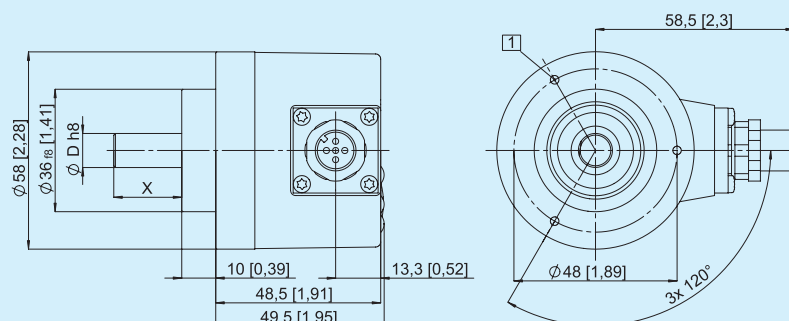
Flange type Q5 and Q7 (Drawing with 2 x M 23 connector)



Clamping flange

Ø 58 mm

Flange type K5 and K7 (Drawing with 1 x M12 connector)



1 3xM3, 6 [0,24] deep

ABSOLUTE SHAFT ENCODER

BASS58

SINGLETURN, CANopen

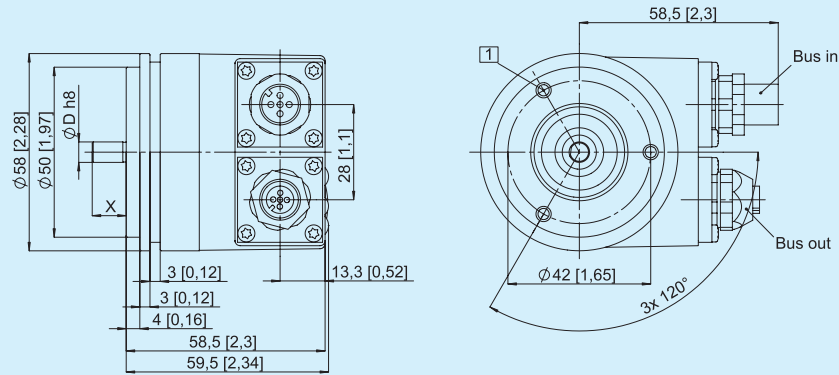
With fixed connection

Dimensioned drawing

Synchro flange

Ø 58 mm

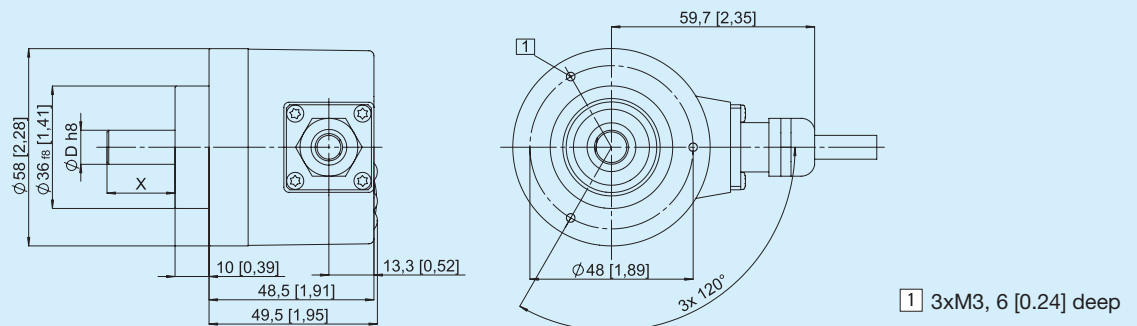
Flange type S5 and S7 (Drawing with 2 x M 12 connector)



Clamping flange

Ø 58 mm

Flange type K5 and K7 (Drawing with cable version)



ABSOLUTE SHAFT ENCODER

BAMS58

MULTITURN, Profibus DP, CANopen, CANlift

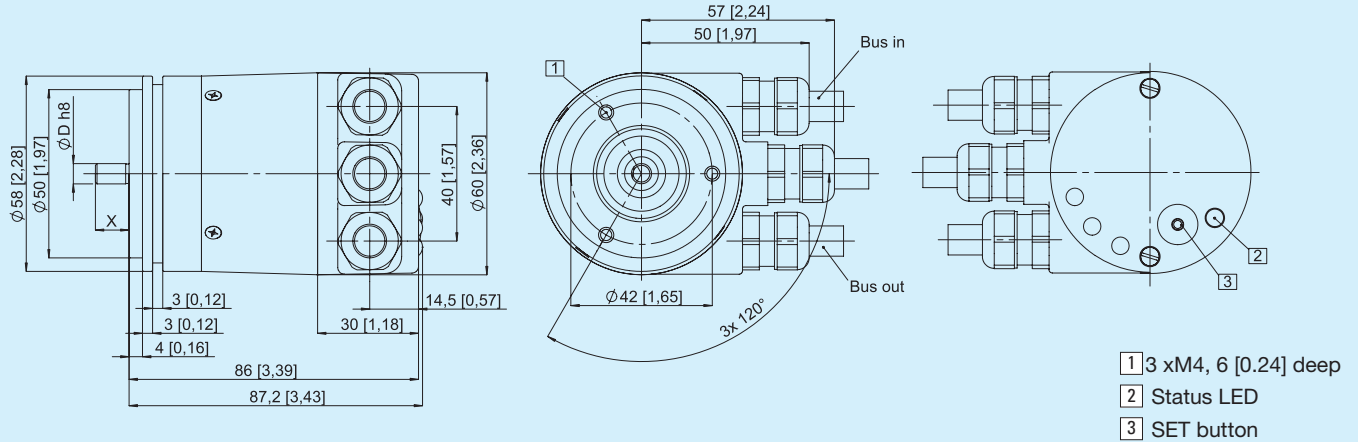
With removable bus terminal cover

Dimensioned drawing

Synchro flange

Ø 58 mm

Flange type S5 and S7 (Drawing with cable version)

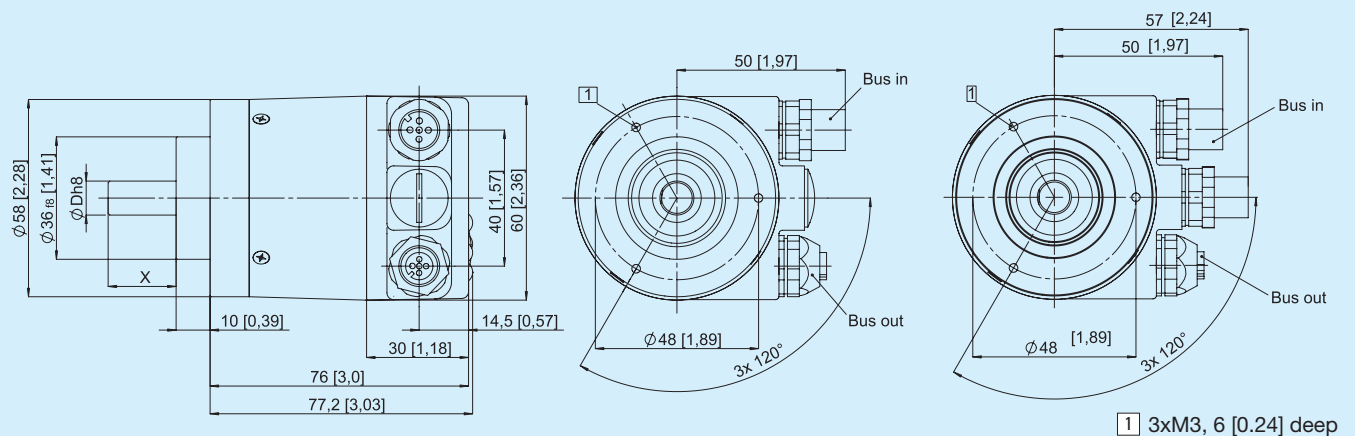


Clamping flange

Ø 58 mm

Flange type K5 and K7 (Drawing with 2 x M 12 connector)

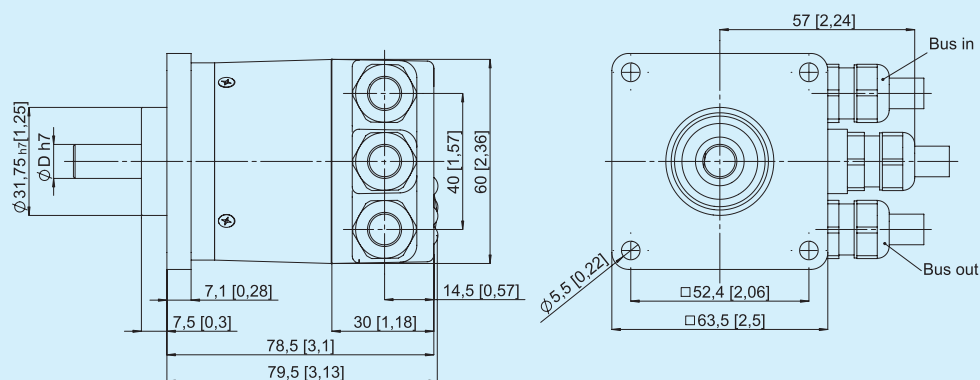
(Drawing with 3 x M 12 connector)



Square flange

63.5 mm □

Flange type Q5 and Q7 (Drawing with cable version)



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ABSOLUTE SHAFT ENCODER

BAMS58

MULTITURN, CANopen, CANlift

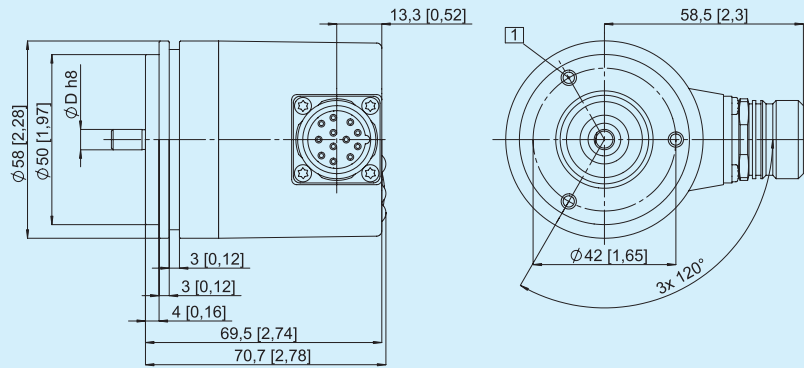
With fixed connection

Dimensioned drawing

Synchro flange

Ø 58 mm

Flange type S5 and S7 (Drawing with M 23 connector)

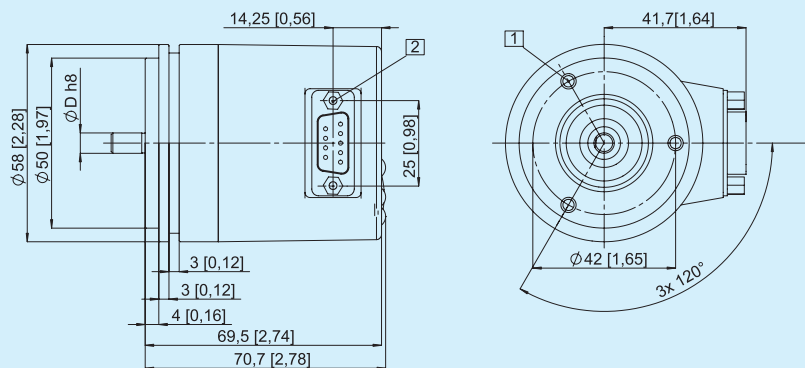


1 3 x M4, 6 [0.24]
deep

Synchro flange

Ø 58 mm

Flange type S5 and S7 (Drawing with D-SUB connector)

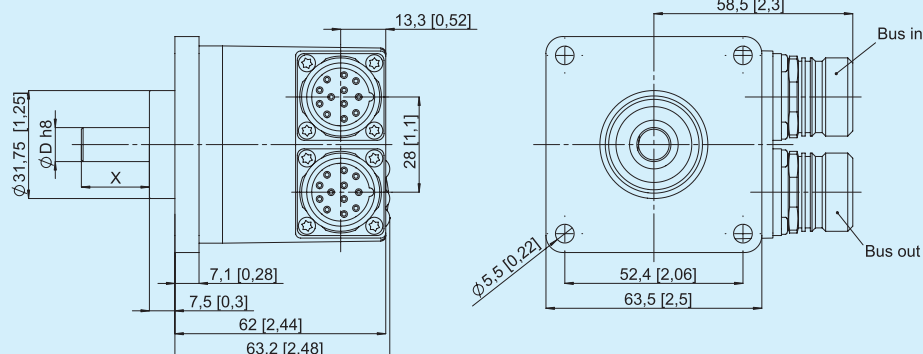


1 3 x M4, 6 [0.24] tief
2 2 x 4/40 UNC;
3,0 [0,12] tief

Square flange

63.5 mm □

Flange type Q5 and Q7 (Drawing with 2 x M 23 connector)



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ABSOLUTE SHAFT ENCODER

BAMS58

MULTITURN, CANopen, CANlift

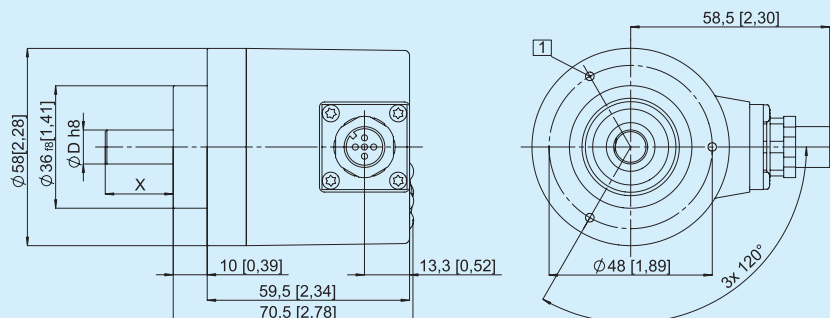
With fixed connection

Dimensioned drawing

Clamping flange

Ø 58 mm

Flange type K5 and K7 (Drawing with 1 x M 12 connector)

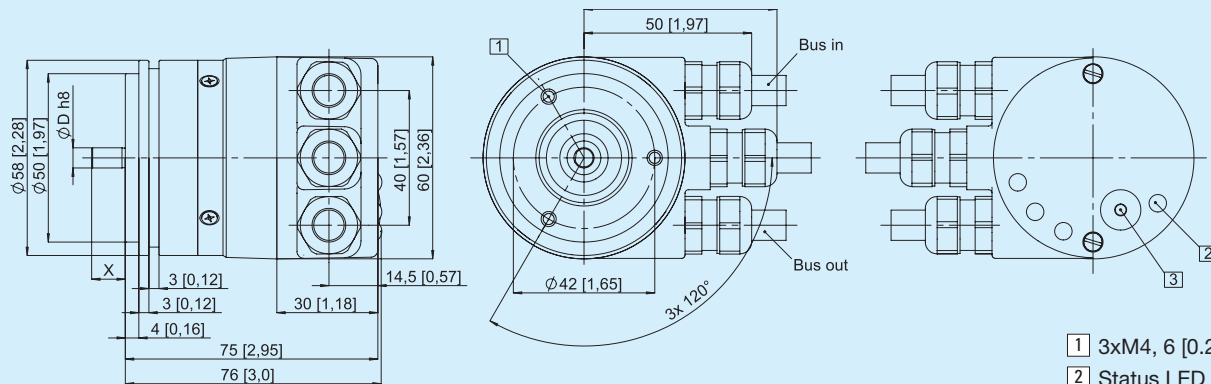


1 3xM3, 6 [0.24] deep

Synchro flange

Ø 58 mm

Flange type S5 and S7 (Drawing with 2 x M 12 connector)



1 3xM4, 6 [0.24] deep

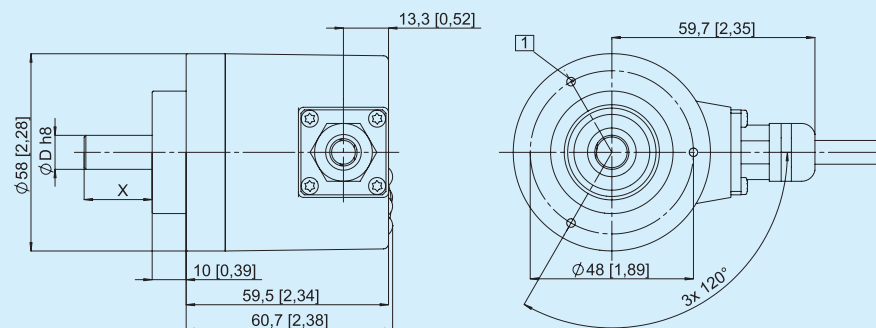
2 Status LED

3 SET button

Clamping flange

Ø 58 mm

Flange type K5 and K7 (Drawing with cable version)



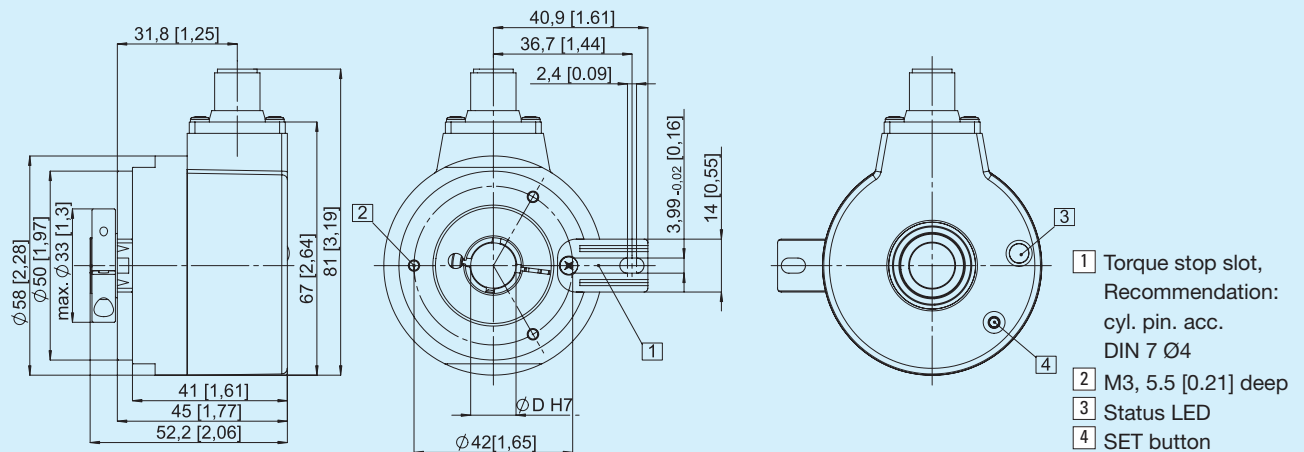
1 3xM3, 6 [0.24] deep

Dimensioned drawing

Flange with long torque stop

Ø 58 mm, M 12, M 23 connector, cable versions

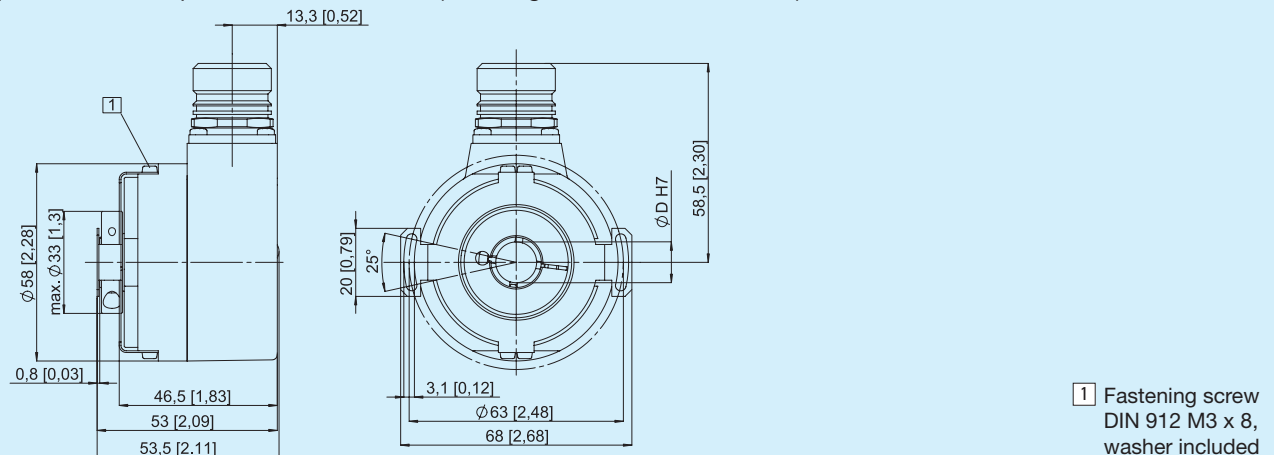
Flange type H5 and H7 (Drawing with M 12 connector)



Flange with stator coupling

Ø 58 mm, M 12, M 23 connector, cable versions

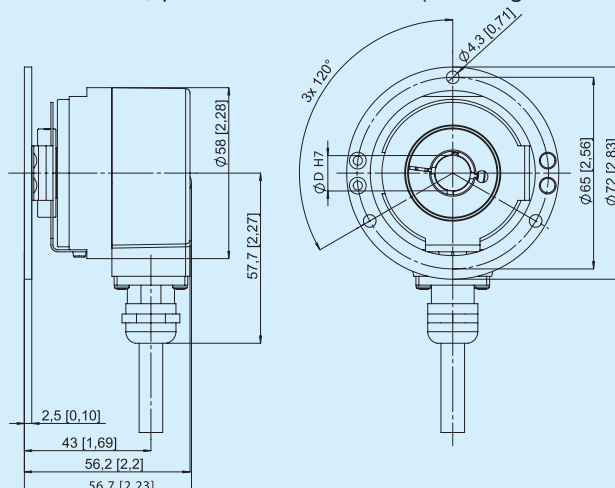
Flange type O5 and O7, pitch circle Ø 63 mm (Drawing with M 23 connector)



Flange with stator coupling

Ø 58 mm, M 12, M 23 connector, cable versions

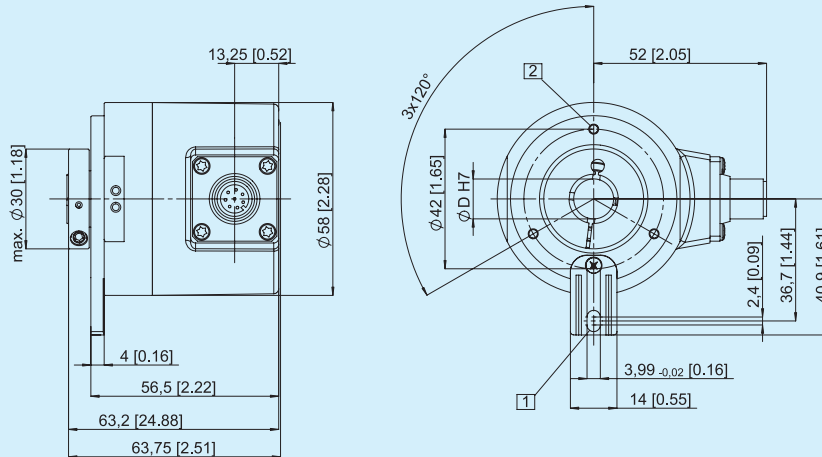
Flange type N5 and N7, pitch circle Ø 65 mm (Drawing with cable version)



Flange with long torque stop

Ø 58 mm, M 12, M 23 connector, cable versions

Flange type H5 and H7 (Drawing with M 12 connector)

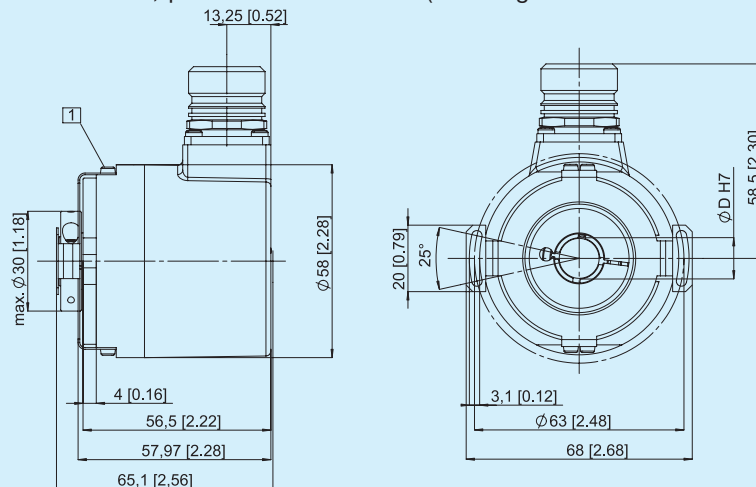


- 1 Torque stop slot,
Recommendation:
cyl. pin. acc. DIN 7 Ø4
- 2 3xM3, 5.5 [0.21] deep

Flange with stator coupling

Ø 58 mm, M 12, M 23 connector, cable versions

Flange type O5 and O7, pitch circle Ø 63 mm (Drawing with M 23 connector)

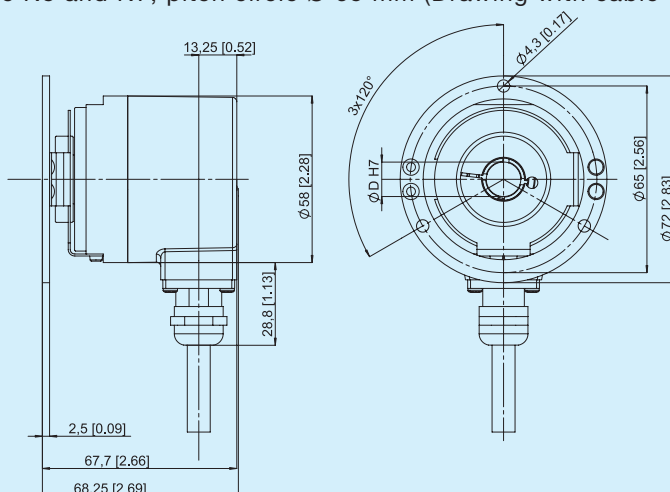


- 1 Fastening screw
DIN 912 M3 x 8,
washer included

Flange with stator coupling

Ø 58 mm, M 12, M 23 connector, cable versions

Flange type N5 and N7, pitch circle Ø 65 mm (Drawing with cable version)



ABSOLUTE HOLLOW SHAFT ENCODER

BASH58

SINGLETURN, Profibus DP, CANopen, CANlift

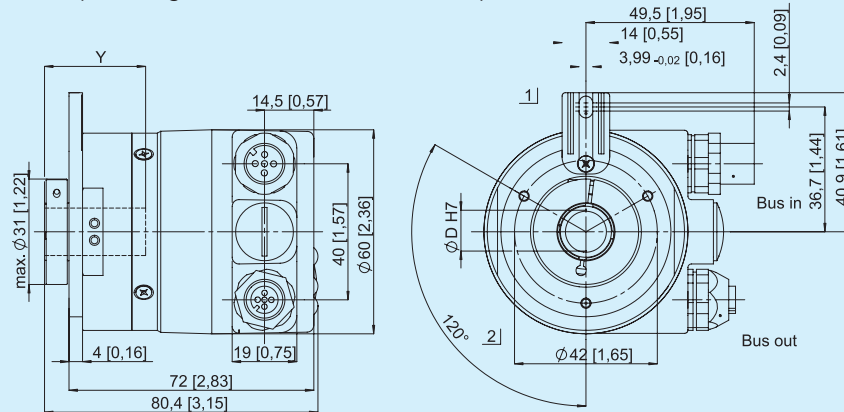
With removable bus terminal cover

Dimensioned drawing

Flange with long torque stop

Ø 58 mm, M 12, M 23 connector, cable versions

Flange type H5 and H7 (Drawing with 2 x M 12 connector)

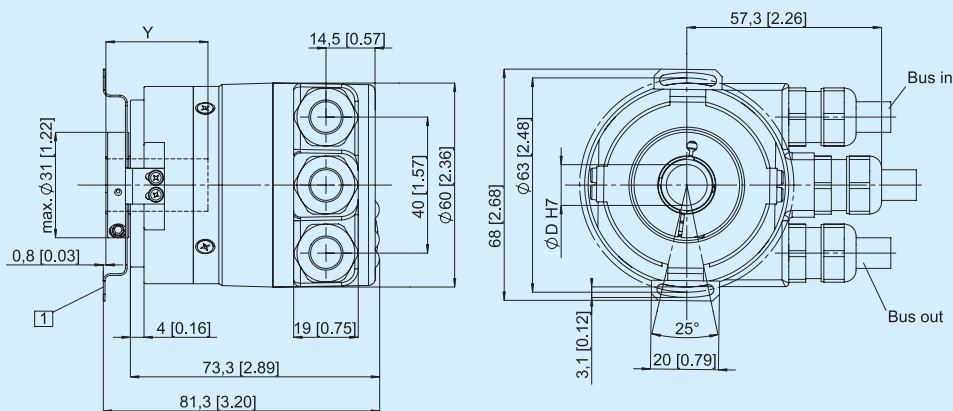


- 1 Torque stop slot,
Recommendation:
cyl. pin. acc.
DIN 7 Ø4
- 2 3 x M3, 5.5 [0.21]
deep

Flange with stator coupling

Ø 58 mm

Flange type O5 and O7, pitch circle Ø 63 mm (Drawing with cable version)

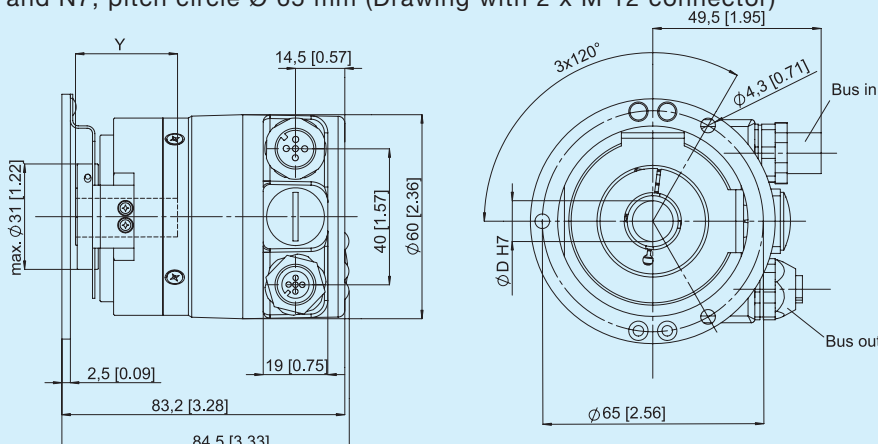


- 1 Fastening screw
DIN 912 M3 x 8,
washer included

Flange with stator coupling

Ø 58 mm

Flange type N5 and N7, pitch circle Ø 65 mm (Drawing with 2 x M 12 connector)



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ABSOLUTE HOLLOW SHAFT ENCODER

BASH58

SINGLETURN, CANopen

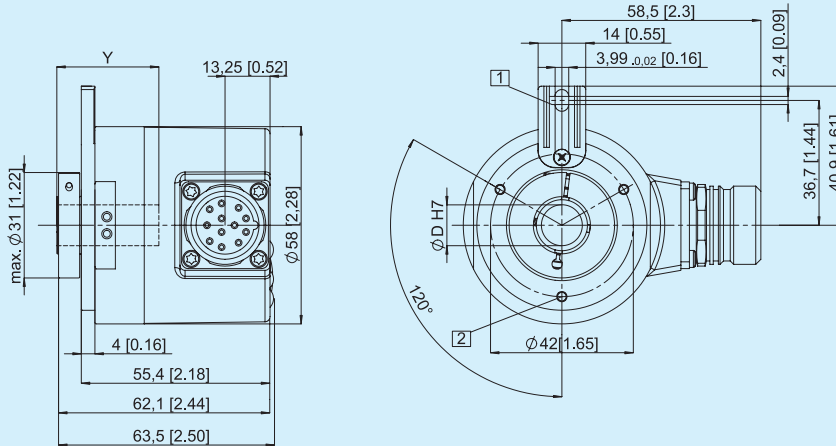
With fixed connection

Dimensioned drawing

Flange with long torque stop

Ø 58 mm

Flange type H5 and H7 (Drawing with M 23 connector)

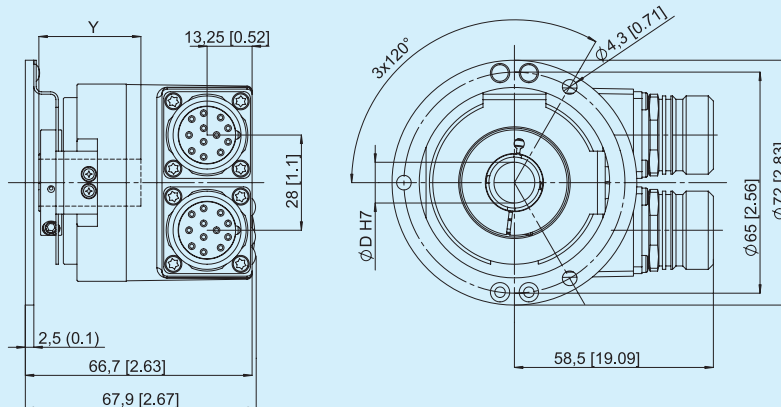


- 1 Torque stop slot,
Recommendation:
cyl. pin. acc.
DIN 7 Ø4
- 2 3 x M3, 5.5 [0.21]
deep

Flange with stator coupling

Ø 58 mm, M 12, M 23 connector, cable versions

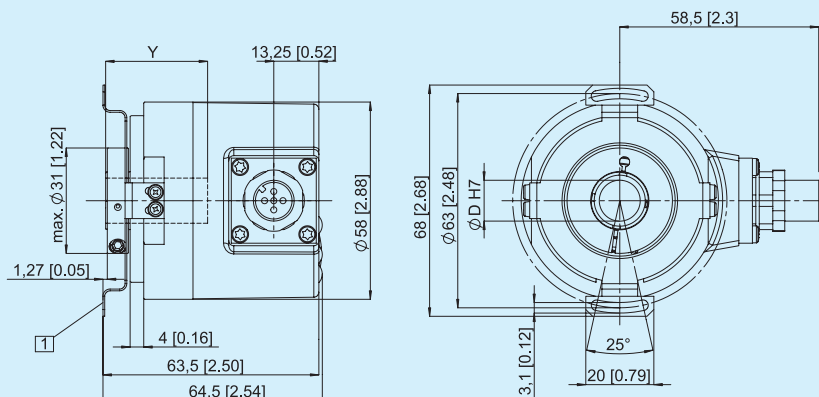
Flange type N5 and N7, pitch circle Ø 65 mm (Drawing with 2 x M 23 connector)



Flange with stator coupling

Ø 58 mm, M 12, M 23 connector, cable versions

Flange type O5 and O7, pitch circle Ø 63 mm (Drawing with M 12 connector)



- 1 Fastening screw
DIN 912 M3 x 8,
washer included
Y: Depth for blind
hollow shaft: 30 mm



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ABSOLUTE HOLLOW SHAFT ENCODER

BASH58

SINGLETURN, CANopen

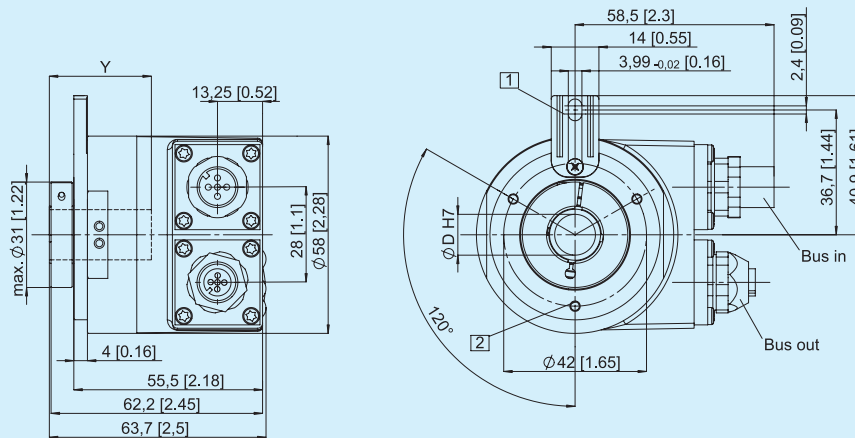
With fixed connection

Dimensioned drawing

Flange with long torque stop

Ø 58 mm

Flange type H5 and H7 (Drawing with 2 x M 12 connector)

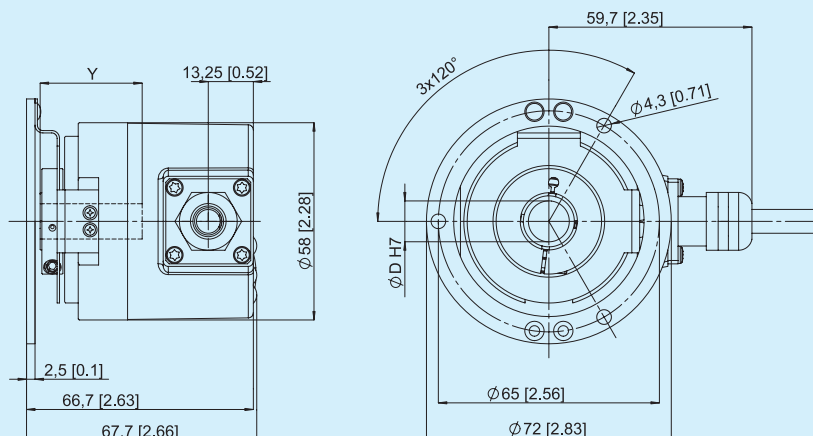


- 1 Torque stop slot, Recommendation: cyl. pin. acc. DIN 7 Ø4
- 2 3xM3, 5.5 [0.21] deep

Flange with stator coupling

Ø 58 mm

Flange type N5 and N7, pitch circle Ø 65 mm (Drawing with cable version)



Y: Depth for blind hollow shaft: 30 mm



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ABSOLUTE HOLLOW SHAFT ENCODER

BAMH58

MULTITURN, Profibus DP, CANopen, CANlift

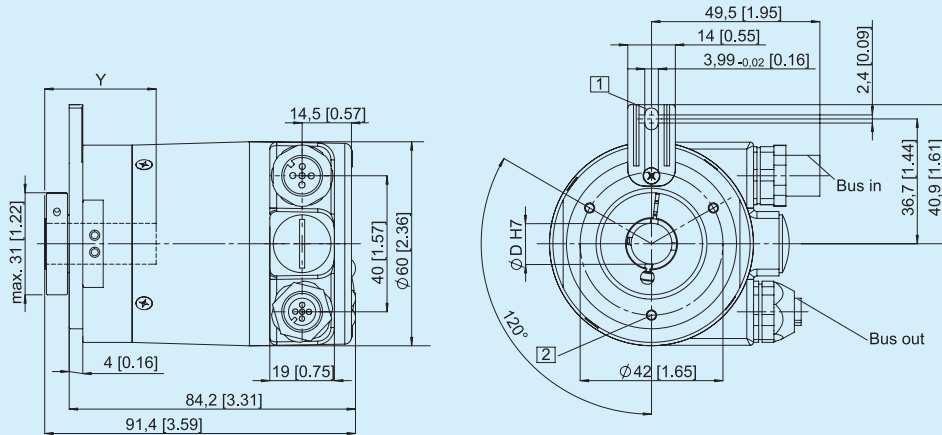
With removable bus terminal cover

Dimensioned drawing

Flange with long torque stop

Ø 58 mm

Flange type H5 and H7 (Drawing with 2 x M 12 connector)

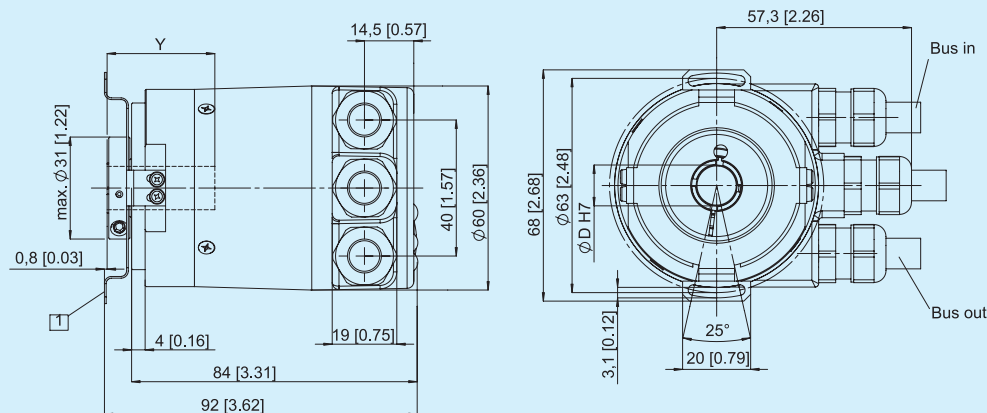


- 1 Torque stop slot,
Recommendation:
cyl. pin. acc.
DIN 7 Ø4
- 2 3xM3, 5.5 [0.21]deep

Flange with stator coupling

Ø 58 mm,

Flange type O5 and O7, pitch circle Ø 63 mm (Drawing with cable version)

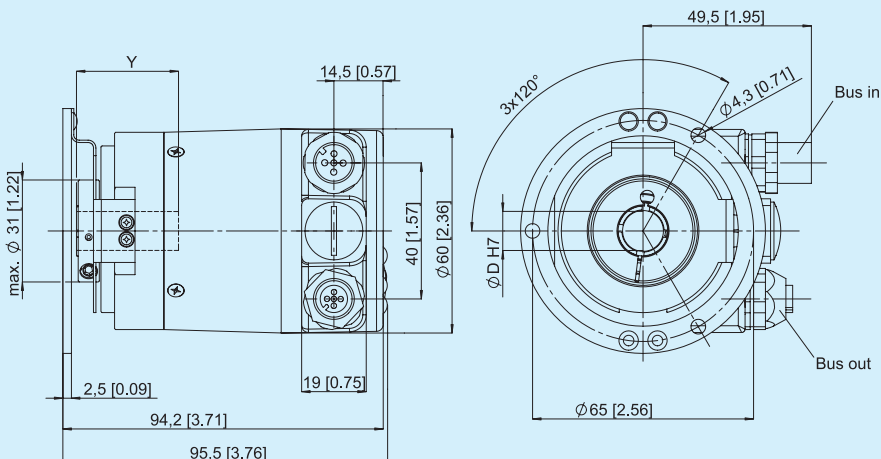


- 1 Fastening screw
DIN 912 M3 x 8,
washer included

Flange with stator coupling

Ø 58 mm

Flange type N5 and N7, pitch circle Ø 65 mm (Drawing with 2 x M 12 connector)



Y: Depth for blind
hollow shaft: 30 mm



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ABSOLUTE HOLLOW SHAFT ENCODER

BAMH58

MULTITURN, CANopen, CANlift

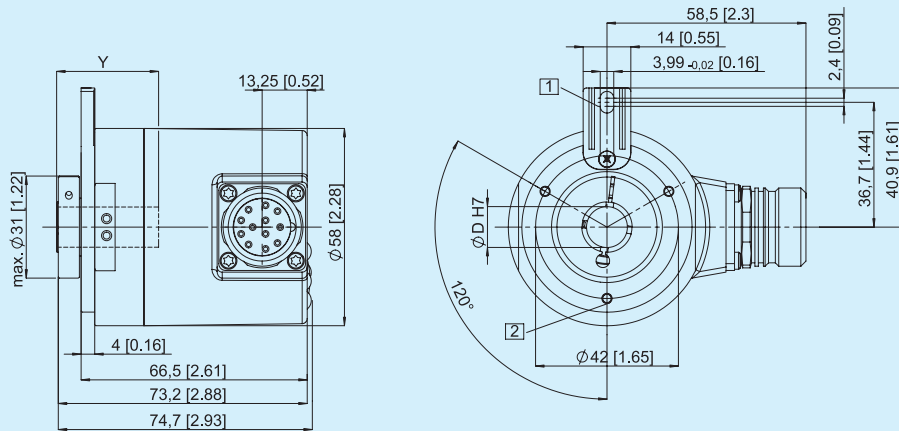
With fixed connection

Dimensioned drawing

Flange with long torque stop

Ø 58 mm

Flange type H5 and H7 (Drawing with M23 connector)

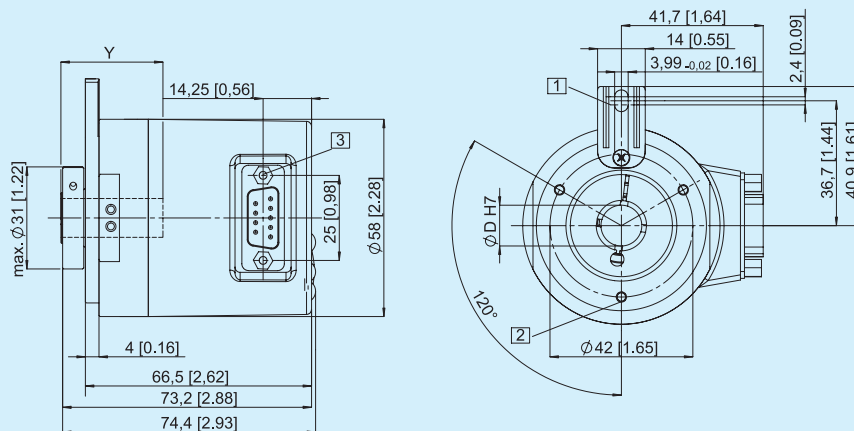


- 1 Torque stop slot,
Recommendation:
cyl. pin. acc.
DIN 7 Ø4.0
- 2 3xM3, 5.5 [0.21] deep

Flange with long torque stop

Ø 58 mm

Flange type H5 and H7 (Drawing with D-SUB connector)

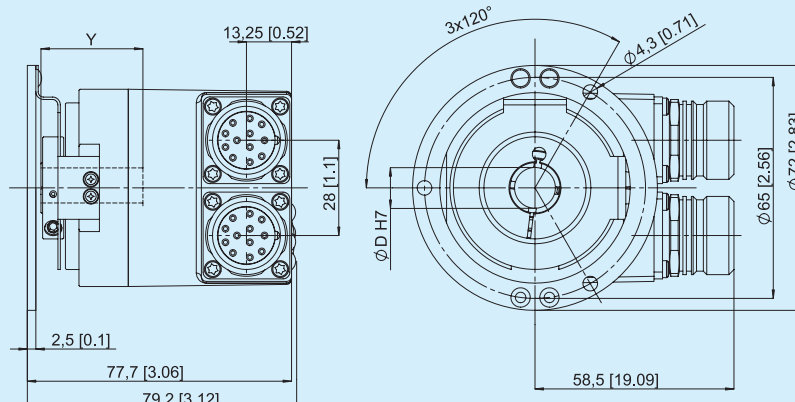


- 1 Torque stop slot,
Recommendation:
cyl. pin. acc.
DIN 7 Ø4.0
- 2 3xM3, 5.5 [0.21] deep

Flange with stator coupling

Ø 58 mm

Flange type N5 and N7, pitch circle Ø 65 mm (Drawing with 2 x M 23 connector)



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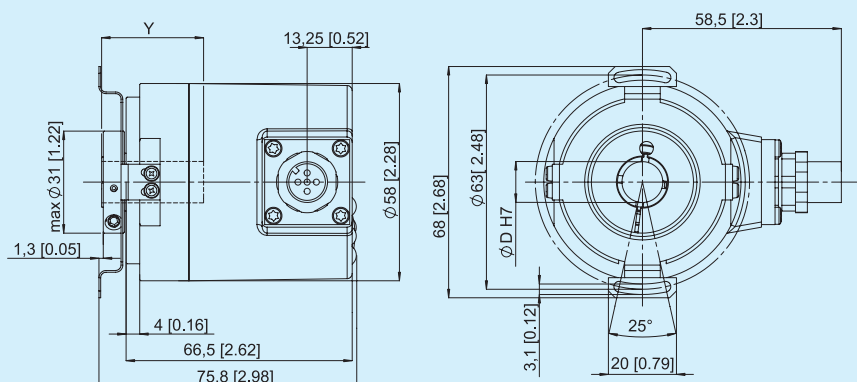
BAMH58

With fixed connection

Flange with stator coupling

Ø 58 mm

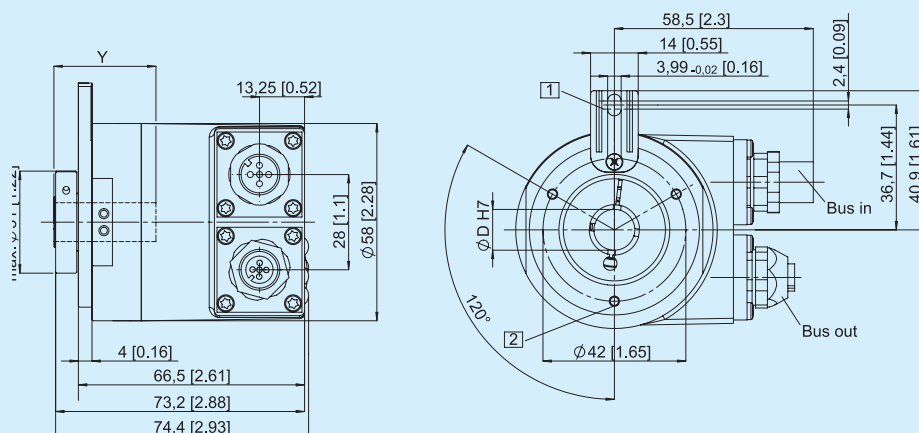
Flange type O5 and O7, pitch circle Ø 63 mm (Drawing with M 12 connector)



Y: Depth for blind
hollow shaft: 30 mm

Ø 58 mm,

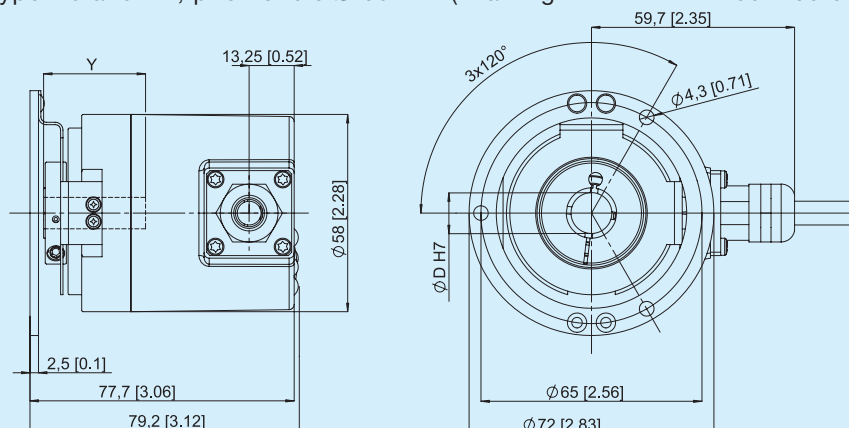
Flange type H5 and H7 (Drawing with 2 x M 12 connector)



- 1 Torque stop slot,
Recommendation:
cyl. pin. acc.
DIN 7 Ø4.0
- 2 3xM3, 5.5 [0.21] deep

Ø 58 mm

Flange type N5 and N7, pitch circle Ø 65 mm (Drawing with 2 x M 12 connector)



Y: Depth for blind hollow shaft: 30 mm

SSI, BiSS

Terminal assignment

for supply voltage A or E and type of connection A, B, G or H (2 control inputs, 1 status output)

Signal:	GND	+V	+C	-C	+D	-D	SET	DIR	Stat	N/C	N/C	N/C	PE
Cable colour:	WH	BN	GN	YE	GY	PK	BU	RD	BK	-	-	-	Shield
M23 PIN out:	1	2	3	4	5	6	7	8	9	10	11	12	PH

for supply voltage H or K and type of connection A, B, G or H (2 control inputs, sine/cosine)

Signal:	GND	+V	+C	-C	+D	-D	SET	DIR	A	A ^{inv}	B	B ^{inv}	PE
Cable colour:	WH	BN	GN	YE	GY	PK	BU	RD	BK	VT	GY-PK	RD-BU	Shield
M23 PIN out:	1	2	3	4	5	6	7	8	9	10	11	12	PH

for supply voltage A or E and type of connection 7 or 8 (2 control inputs)

Signal:	GND	+V	+C	-C	+D	-D	SET	DIR	Shield/PE
M12 PIN out:	1	2	3	4	5	6	7	8	PH

+V: Encoder Power Supply +VDC
 GND: Encoder Power Supply Ground (0V)
 +C, -C: Clock signal
 +D, -D: Data signal
 SET: Set input. The current position becomes defined as zero position
 DIR: Direction input: If this input is active, output values are decreasing when shaft is turned clockwise.

Stat: Status output, active at low
 PE: Protective earth
 PH: Plug housing (shield)
 A, A^{inv}: Sine output (incremental)
 B, B^{inv}: Cosine output (incremental)

Profibus DP

Terminal assignment

Bus terminal cover with terminal box (type of connection Z)

Signal:	BUS IN				BUS OUT			
	B	A	0 V	+V	0 V	+V	B	A
Terminal:	1	2	3	4	5	6	7	8

Shield must be connected to the cable gland (with the contact surface as large as possible)

Bus terminal cover with 3 x M12 connector (type of connection S)

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

Power supply:

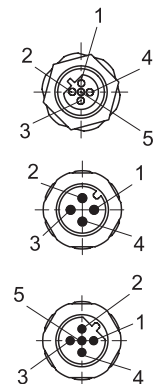
Signal:	U _b	-	0 V	-
Pin:	1	2	3	4

Bus out:

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

¹⁾to supply the external Profibus-DP terminating resistor

Pin Identification



CANopen, CANlift

Terminal assignment

Bus terminal cover with terminal box (type of connection Z)

Direction:	OUT					IN				
Signal:	CAN Ground	CAN_Low (-)	CAN_High (+)	0 Volt power supply	+UB power supply	0 Volt power supply	+UB power supply	CAN_Low (-)	CAN_High (+)	CAN Ground
Abbreviation:	CG	CL	CH	0 V	+V	0 V	+V	CL	CH	CG

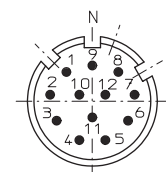
Cable connection (type of connection R)

Direction:	IN				
Signal:	0 Volt power supply	+UB power supply	CAN_Low (-)	CAN_High (+)	CAN Ground
Abbreviation:	0 V	+V	CL	CH	CG
Cable Color	BK	RD	BL	WH	GY

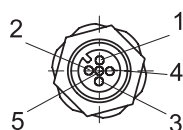
Bus terminal cover with 2 x M12 connector (type of connection R, O or M)

Direction:	OUT					IN				
Signal:	CAN Ground	CAN_Low (-)	CAN_High (+)	0 Volt power supply	+UB power supply	0 Volt power supply	+UB power supply	CAN_Low (-)	CAN_High (+)	CAN Ground
Abbreviation:	CG	CL	CH	0 V	+V	0 V	+V	CL	CH	CG
M23 PIN assignment:	3	2	7	10	12	10	12	2	7	3
M12 PIN assignment:	1	5	4	3	2	3	2	5	4	1

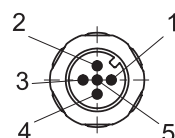
Pin Identification



Bus in and out M23



Bus out

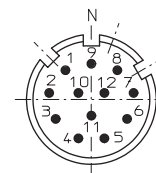


Bus in

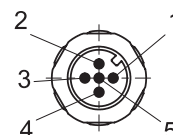
M23 (type of connection N) or M12 (type of connection P) connector

Direction:	IN				
Signal:	0 Volt power supply	+UB power supply	CAN_Low (-)	CAN_High (+)	CAN Ground
Abbreviation:	0 V	+V	CL	CH	CG
M23 PIN assignment:	10	12	2	7	3
M12 PIN assignment:	3	2	5	4	1

Pin Identification

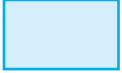
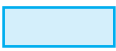
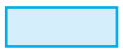


Bus in M23

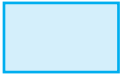
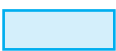
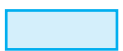


Bus in M12

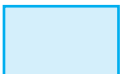
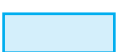
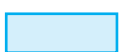
ORDERING CODE SSI, BiSS

						
BASS58 Absolute singleturn shaft encoder	Resolution 0010 = 10 Bit ST 0011 = 11 Bit ST 0012 = 12 Bit ST 0013 = 13 Bit ST 0014 = 14 Bit ST 0017 = 17 Bit ST 1210 = 12 Bit MT + 10 Bit ST 1211 = 12 Bit MT + 11 Bit ST 1212 = 12 Bit MT + 12 Bit ST 1213 = 12 Bit MT + 13 Bit ST 1214 = 12 Bit MT + 14 Bit ST 1217 = 12 Bit MT + 17 Bit ST	Supply voltage A = 5 VDC E = 10–30 VDC H = 5 VDC K = 10–30 VDC + SinCos 2048 ppr + SinCos 2048 ppr	Flange, Protection S5 = Synchro, IP 65 (shaft) S7 = Synchro, IP 67 (shaft) K5 = Clamping, IP 65 (shaft) K7 = Clamping, IP 67 (shaft) Q5 = Square, IP 65, 63,5 mm Q7 = Square, IP 67, 63,5 mm H5 = Torque stop, IP 65 (hollow shaft) H7 = Torque stop, IP 67 (hollow shaft) N5 = Stator coupling pcd 65 mm, IP 65 (hollow shaft) N7 = Stator coupling pcd 65 mm, IP 67 (hollow shaft) O5 = Stator coupling pcd 63 mm, IP 65 (hollow shaft) O7 = Stator coupling pcd 63 mm, IP 67 (hollow shaft)	Shaft-Ø 06 = 6 mm shaft 10 = 10 mm shaft/hollow shaft 12 = 12 mm hollow shaft 14 = 14 mm hollow shaft 15 = 15 mm blind shaft	Interface SB = SSI Binary SG = SSI Gray BB = BiSS Binary	Connection A = cable axial, 1 m PVC B = cable radial, 1 m PVC G = Conin 12 pol. axial ccw H = Conin 12 pol. radial ccw 7 = M 12, 8 pol. axial 8 = M 12, 8 pol. radial
BAMS58 Absolute multiturn shaft encoder						
BASH58 Absolute singleturn hollow shaft encoder						
BAMH58 Absolute multiturn hollow shaft encoder						

ORDERING CODE Profibus DP

						
BASS58 Absolute singleturn shaft encoder	Resolution 0016 = 16 Bit ST (scalable) 1216 = 12 Bit MT + 16 Bit ST (ST scalable)	Supply voltage E = 10–30 VDC	Flange, Protection S5 = Synchro, IP 65 (shaft) S7 = Synchro, IP 67 (shaft) K5 = Clamping, IP 65 (shaft) K7 = Clamping, IP 67 (shaft) Q5 = Square, IP 65, 63,5 mm Q7 = Square, IP 67, 63,5 mm H5 = Torque stop, IP 65 (blind shaft) H7 = Torque stop, IP 67 (blind shaft) N5 = Stator coupling pcd 65 mm, IP 65 (blind shaft) N7 = Stator coupling pcd 65 mm, IP 67 (blind shaft) O5 = Stator coupling pcd 63 mm, IP 65 (blind shaft) O7 = Stator coupling pcd 63 mm, IP 67 (blind shaft)	Shaft-Ø 06 = 6 mm shaft 10 = 10 mm shaft/blind shaft 12 = 12 mm blind shaft 14 = 14 mm blind shaft 15 = 15 mm blind shaft	Interface DP = Profibus DP Class 2	Connection Z = Removable bus cover, 3 x cable gland S = Removable bus cover, 3 x 4pol. M 12
BAMS58 Absolute multiturn shaft encoder						
BASH58 Absolute singleturn hollow shaft encoder						
BAMH58 Absolute multiturn hollow shaft encoder						

ORDERING CODE CANopen/CANlift

						
BASS58 Absolute singleturn shaft encoder	Resolution 0016 = 16 Bit ST (scalable) 1216 = 12 Bit MT + 16 Bit ST (ST scalable)	Supply voltage E = 10–30 VDC	Flange, Protection S5 = Synchro, IP 65 (shaft) S7 = Synchro, IP 67 (shaft) K5 = Clamping, IP 65 (shaft) K7 = Clamping, IP 67 (shaft) Q5 = Square, IP 65, 63,5 mm Q7 = Square, IP 67, 63,5 mm H5 = Torque stop, IP 65 (blind shaft) H7 = Torque stop, IP 67 (blind shaft) N5 = Stator coupling pcd 65 mm, IP 65 (blind shaft) N7 = Stator coupling pcd 65 mm, IP 67 (blind shaft) O5 = Stator coupling pcd 63 mm, IP 65 (blind shaft) O7 = Stator coupling pcd 63 mm, IP 67 (blind shaft)	Shaft-Ø 06 = 6 mm shaft 10 = 10 mm shaft/blind shaft 12 = 12 mm blind shaft 14 = 14 mm blind shaft 15 = 15 mm blind shaft	Interface CO = CANopen Profile DS406 V.3.1 CL = CANlift Profile DS417 V1.01	Connection Z = Removable bus cover, 3 x cable gland R = Removable bus cover 2 x 4pol. M 12 B = cable radial, 2 m PVC w/o bus cover P = Connector 1 x M 12, radial, w/o bus cover O = Connector 2 x M 12, radial, w/o bus cover N = Connector 1 x M 23, radial, w/o bus cover M = Connector 2 x M 23, radial, w/o bus cover L = 1 x D-SUB, 9pin connector w/o bus cover
BAMS58 Absolute multiturn shaft encoder						
BASH58 Absolute singleturn hollow shaft encoder						
BAMH58 Absolute multiturn hollow shaft encoder						

- Compact design: 50 mm length for singleturn or multiturn versions
- Startup and operating aids:
Diagnostics LED, preset key with optical feedback, status message
- Interfaces: Standard SSI, extended SSI mode, parallel interface or BiSS
- Sine/cosine signals available for dynamic control loops
- Max. 29 Bit

Fieldbus Versions

- Overall length: 63 mm (singleturn), 73 mm (multiturn) including bus cover
- Availability of all common field bus interfaces
- The complete bus-specific electronics is accommodated in the bus cover
- Versions: Profibus DP, DeviceNet, CAN, CANopen and Interbus



Electrical Data:

SSI, BiSS

Parallel

Profibus/DeviceNet other Bus Interfaces on request

Supply voltage	5 V, -5 %/+10 % or 10–30 V	10–30 V	10–30 V
Intrinsic current consumption ST/MT	50 mA/100 mA	200 mA/300 mA	220 mA/250 mA
Interface	Standard SSI or BiSS	Parallel	Profibus-DP, Encoder Profile CAN Highspeed acc. ISO/DIS 11898, CAN Spec. 2.0 B, protocol based on encoder profile draft DeviceNet
Lines/Drivers	Clock and data/RS422		
Output code	Binary Gray;	Binary, Gray, Gray Excess	Binary
Singleturn resolution	10–17 Bits depending on version; max: 13 Bit in SSI-MT Gray Excess: 360, 720 steps	10–14 Bit depending on version 12 Bit in MT version Gray Excess: 360, 720 steps	10–14 Bit depending on version
Multiturn resolution	12 Bit	12 Bit	12 Bit
Incremental signals, optional	Sine – cosine 1 Vpp		
Number of increments	2,048		
3 dB limiting frequency	500 kHz		
Absolute accuracy	± 35"		
Repeatability	± 7"		
Connection	Cable or flange-connector (Conin, axial or radial)	Cable or flange-connector (Conin 17-pole), axial or radial, Sub-D 37-pin	Bus cover with T-manifold
Parameterization	Resolution, code type, sense of rotation, warning, alarm		According to Class 2: Resolution, Preset, Direction 9,6 kBaud–12 MBaud
Linearity		± 1/2 LSB	
Output current		30 mA per Bit, short circuit proof	
Alarm output	Alarm Bit (SSI option), warning Bit and alarm Bit (BiSS)	NPN o.c. max. 5 mA	
Control input	Direction	Latch, Direction, Tristate	
Reset Key	Latch via parameterization		
Status LED	Green = ok.; Red = Alarm		
Integrated Special functions			Speed, Acceleration, Operating Time



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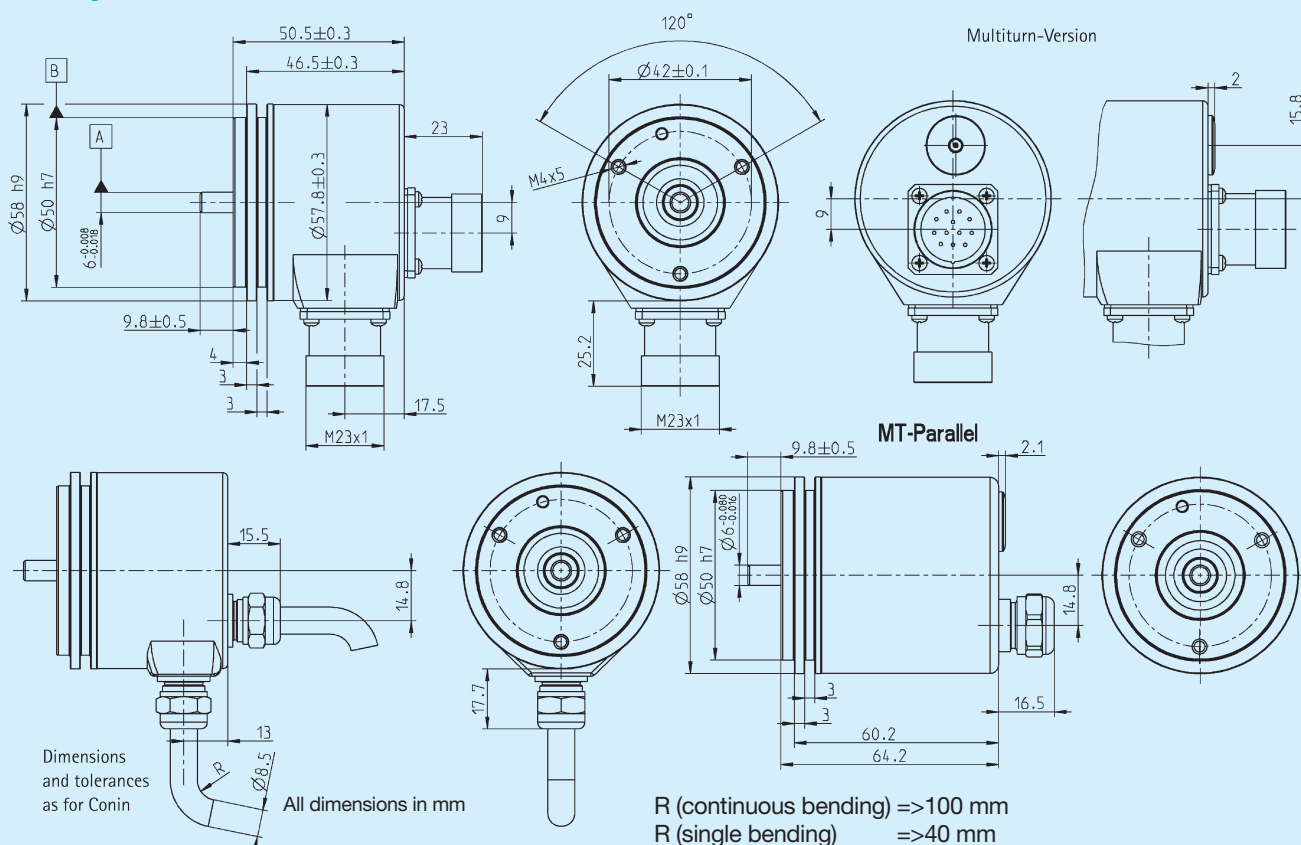
Carl-Bosch-Straße 8 Tel.: +49 54 81-93 85-0 Internet: www.meyle.de
49525 Lengerich/Germany Fax: +49 54 81-93 85-12 E-Mail: sales@meyle.de

Mechanical Data:

	SSI, BiSS	Parallel	Profibus
Housing diameter	58 mm	58 mm	58 mm
Protection, shaft input	IP 64 or IP 67	IP 64 or IP 67	IP 64 or IP 67
IP Protection class, housing	IP 67	IP 67	IP 67
Flange types	Synchro-flange, clamping flange, spring tether	Synchro-flange, clamping flange, spring tether	Synchro-flange, clamping flange, spring tether
Shaft diameter	Solid shaft 6 mm, 10 mm; Hub shaft 10 mm, 12 mm	Solid shaft 6 mm, 10 mm; Hub shaft 10 mm, 12 mm	Solid shaft 6 mm, 10 mm; Hub shaft 10 mm, 12 mm
Max. speed	Continuous operation 10,000 min ⁻¹ short-term 12,000 min ⁻¹	Continuous operation 10,000 min ⁻¹ short-term 12,000 min ⁻¹	Continuous operation 10,000 min ⁻¹ short-term 12,000 min ⁻¹
Starting Torque	≤ 0,01 Nm	≤ 0,01 Nm	≤ 0,01 Nm
Moment of inertia, rotor	3.8 x 10 ⁻⁶ kgm ²	3.8 x 10 ⁻⁶ kgm ²	3.8 x 10 ⁻⁶ kgm ²
Tolerance axial (blind shaft)	± 1.5 mm	± 1.5 mm	± 1.5 mm
Tolerance radial (blind shaft)	± 0.2 mm	± 0.2 mm	± 0.2 mm
Absolute max. shaft load	axial 40 N radial 60 N	axial 40 N radial 60 N	axial 40 N radial 60 N
Shock resistance DIN EN 60068-2-27	1,000 m/s ² (6 ms)	1,000 m/s ² (6 ms)	1,000 m/s ² (6 ms)
Vibration resistance DIN EN 60068-2-6	100 m/s ² (10 ... 2,000 Hz)	100 m/s ² (10 ... 2,000 Hz)	100 m/s ² (10 ... 2,000 Hz)
Working temperature	-40...+100 °C	-40...+100 °C	-40 °C... +85 °C
Storage temperature	-40...+85 °C (due to packaging)	-40...+85 °C (due to packaging)	-40...+85 °C (due to packaging)
Weight, approx. (ST/MT)	260 g/310 g	350 g/400 g	350 g/400 g

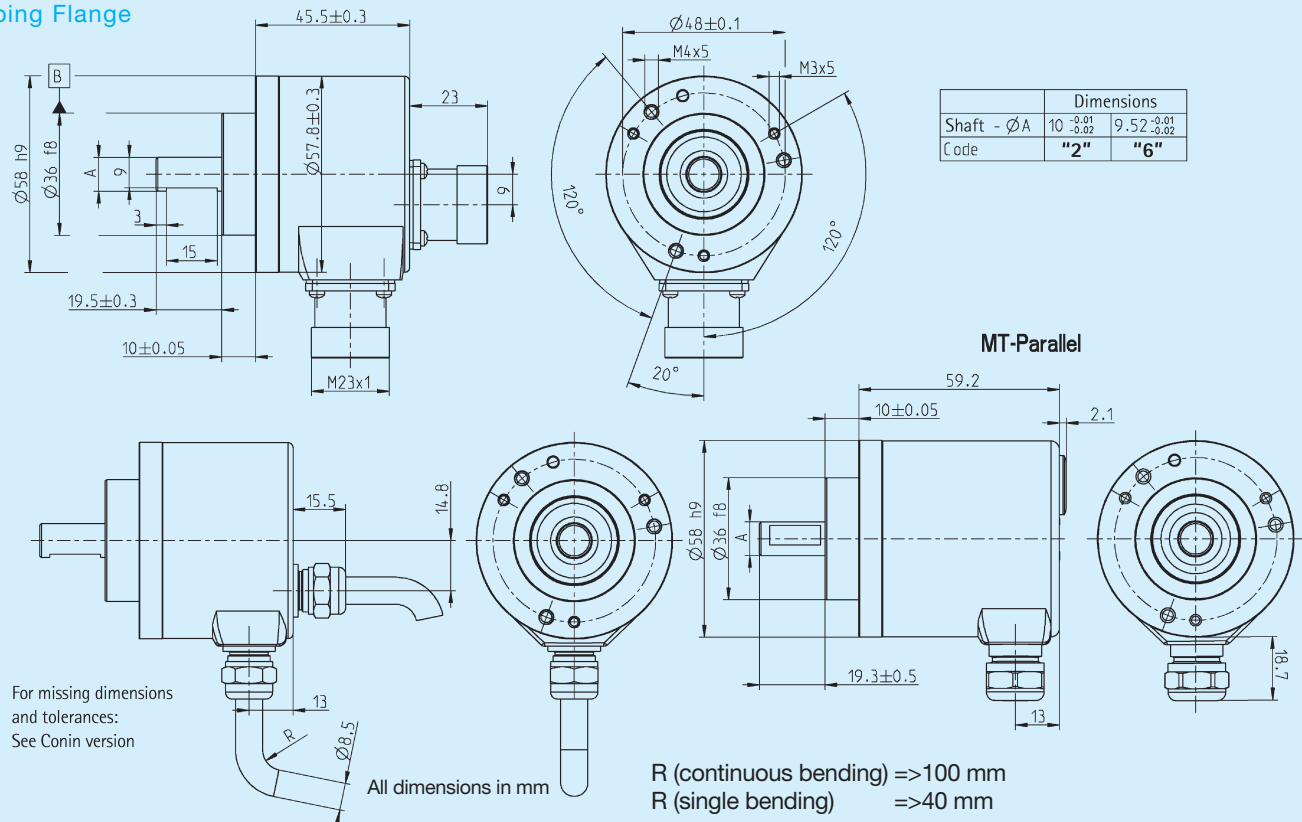
Dimensioned drawing

Synchro Flange

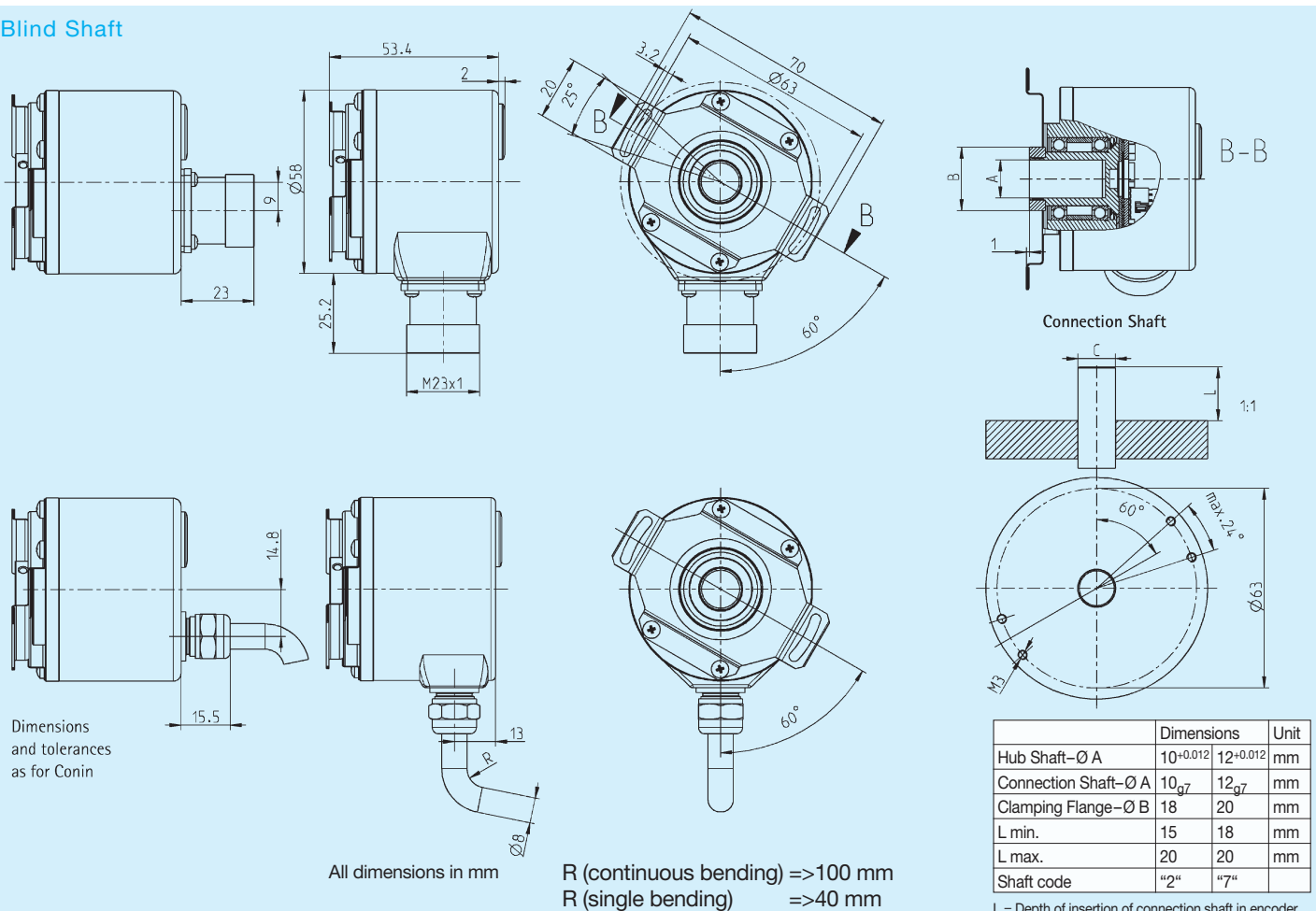


Dimensioned drawing

Clamping Flange



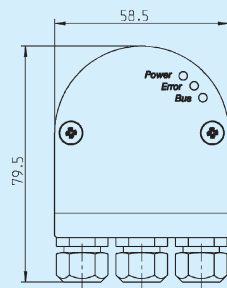
Blind Shaft



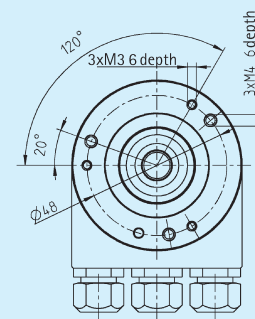
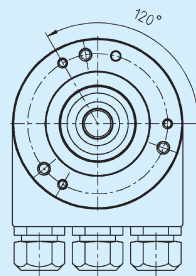
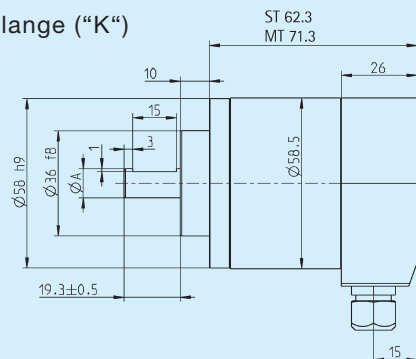
Bus Covers

Bus Covers

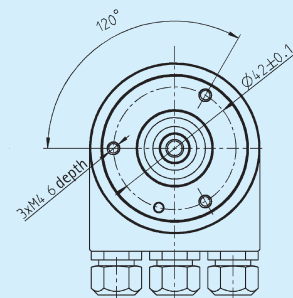
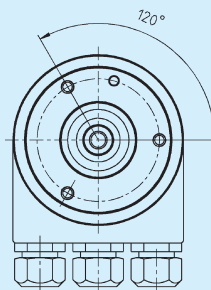
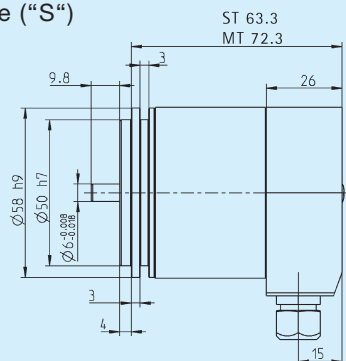
Connection "Z"



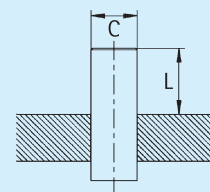
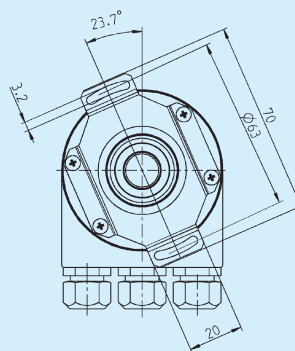
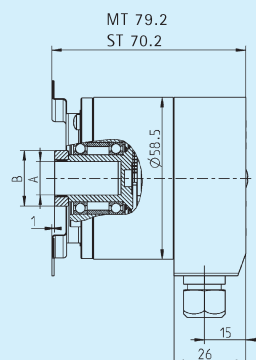
Clamping Flange ("K")



Synchro Flange ("S")



Hub Shaft ("F")

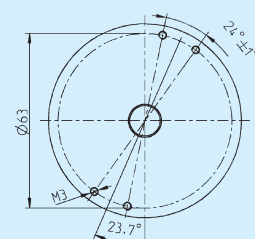


Dimensions

	Dimensions		Unit
Hub Shaft-Ø A	10 ^{+0.012}	12 ^{+0.012}	mm
Connection Shaft-Ø A	10 _{g7}	12 _{g7}	mm
Clamping Flange-Ø B	18	20	mm
L min.	15	18	mm
L max.	20	20	mm
Shaft code	"2"	"7"	

L = Depth of insertion of connection shaft in encoder

Connection Shaft



ST=Singleturn
MT=Multiturn

SSI, BiSS

Terminal assignment

for supply voltage A or E

Signal:	GND	+V	+C	-C	+D	-D	D GND	-DIR	N/C	N/C	N/C	N/C	
Cable colour:	BN	WH	YE	GN	PK	GY	BK	BU	–	–	–	–	
M23 PIN out:	1	8	3	11	2	10	12	5	4	6	7	9	

for supply voltage A or E

Signal:	GND	+V	+C	-C	+D	-D	-DIR	N/C	
M12 PIN out:	2	1	6	4	5	8	7	3	

+V: Encoder Power Supply +VDC

GND: Encoder Power Supply Ground (0V)

+C, -C: Clock signal

+D, -D: Data signal

D GND: Data ground

-DIR: Direction input: If this input is active, output values are increasing when shaft is turned cw.

Parallel

Terminal assignment

for supply voltage E, singleturn 9 Bit/360 ppr

Signal:	S0	S1	S2	S3	S4	S5	S6	S7	S8	-TRI	-LAT ¹⁾	-DIR	GND	+V	-ALM	N/C	N/C
Cable colour:	WH/BN	WH/GN	WH/YE	WH/GY	WH/PK	WH/BU	WH/RD	WH/BK	BN/GN	YE	PK	GN	BK	RD	BN	–	–
Conin 17pol.:	1	2	3	4	5	6	7	8	9	12	13	14	15	16	17	10	11

¹⁾ binary only

for supply voltage E, singleturn 10 Bit/720 ppr

Signal:	S0	S1	S2	S3	S4	S5	S6	S7	S8	S9	-TRI	-LAT ¹⁾	-DIR	GND	+V	-ALM	N/C
Cable colour:	VT	WH/BN	WH/GN	WH/YE	WH/GY	WH/PK	WH/BU	WH/RD	WH/BK	BN/GN	YE	PK	GN	BK	RD	BN	–
Conin 17pol.:	1	2	3	4	5	6	7	8	9	10	12	13	14	15	16	17	11

¹⁾ binary only

for supply voltage E, singleturn 12 Bit

Signal:	S0	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	-TRI	-LAT ¹⁾	-DIR	GND	+V	-ALM
Cable colour:	BN/GY	RD/BU	VT	WH/BN	WH/GN	WH/YE	WH/GY	WH/PK	WH/BU	WH/RD	WH/BK	BN/GN	YE	PK	GN	BK	RD	BN
Conin 17pol.:	1	2	3	4	5	6	7	8	9	10	11	12	–	13	14	15	16	17

¹⁾ binary only

for supply voltage E, singleturn 13 Bit

Signal:	S0	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	-TRI	-LAT ¹⁾	-DIR	GND	+V	-ALM
Cable colour:	BN/YE	BN/GY	RD/BU	VT	WH/BN	WH/GN	WH/YE	WH/GY	WH/PK	WH/BU	WH/RD	WH/BK	BN/GN	YE	PK	GN	BK	RD	BN
Conin 17pol.:	13	12	11	10	9	8	7	6	5	4	3	2	1	–	17 ¹⁾	14	15	16	17 ²⁾

¹⁾ binary only

²⁾ gray only

for supply voltage E, singleturn 14 Bit

Signal:	S0	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13	-TRI	-LAT ¹⁾	-DIR	GND	+V	-ALM
Cable colour:	GY/PK	BN/YE	BN/GY	RD/BU	VT	WH/BN	WH/GN	WH/YE	WH/GY	WH/PK	WH/BU	WH/RD	WH/BK	BN/GN	YE	PK	GN	BK	RD	BN
Conin 17pol.:	14	13	12	11	10	9	8	7	6	5	4	3	2	1	–	17 ¹⁾	–	15	16	17 ²⁾

¹⁾ binary only

²⁾ gray only

for supply voltage E, multiturn 12-12 Bit

Signal:	S0	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11
Cable colour:	BN	GN	YE	GY	PK	VT	GY/PK	RD/BU	WH/GN	BN/GN	WH/YE	YE/BN
Sub-D 37pol.	2	21	3	22	4	23	5	24	6	25	7	26

Signal:	M0	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11
Cable colour:	WH/GY	GY/BN	WH/PK	PK/BN	WH/BU	BN/BU	WH/RD	BN/RD	WH/BK	BN/BK	GY/GN	YE/GY
Sub-D 37pol.	8	27	9	28	14	33	15	34	16	35	17	36

Signal:	-ALM	-DIR	-LAT	TRI	GND	GND	+V	+V				
Cable colour:	PK/GN	YE/PK	GN/BU	YE/BU	RD	WH	BU	BK				
Sub-D 37pol.	18	10	30	12	15	31	1	20				

+V: Encoder Power Supply +VDC

GND: Encoder Power Supply Ground (0V)

-TRI: Tristate input: if this input is active, outputs are active

TRI: Tristate input: if this input is active, outputs at high impedance (Tristate mode)

-LAT: Latch input: if this input is active, encoder data continuously changing at output

-DIR: Direction input: if this input is active, output values are increasing when shaft is turned cw

S0, S1, ...: Data bits for resolution per turn

M0, M1, ...: Data bits for number of turns

-ALM: Alarm output: NPN open collector

Profibus DP

Terminal assignment

Bus terminal cover with terminal box (type of connection Z)

Signal:	BUS IN				BUS OUT			
	B	A	0 V	+V	0 V	+V	B	A
Terminal:	5	6	2	1	4	3	7	8

Shield must be connected to the cable gland (with the contact surface as large as possible)



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49525 Lengerich/Germany

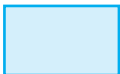
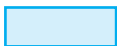
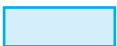
Tel.: +49 54 81-93 85-0

Fax: +49 54 81-93 85-12

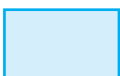
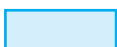
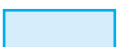
Internet: www.meyle.de

E-Mail: sales@meyle.de

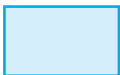
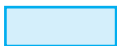
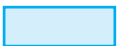
ORDERING CODE SSI

					
CASS58 Absolute singleturn shaft encoder	Resolution 0010 = 10 Bit ST 0012 = 12 Bit ST 0013 = 13 Bit ST 0014 = 14 Bit ST 0017 = 17 Bit ST 1212 = 12 Bit MT + 12 Bit ST 1213 = 12 Bit MT + 13 Bit ST	Supply voltage A = 5 V E = 10–30 V	Flange, Protection, Shaft-Ø S41 = Synchro, IP 64, 6 mm S71 = Synchro, IP 67, 6 mm K42 = Clamping, IP 64, 10 mm K72 = Clamping, IP 67, 10 mm F42 = Spring tether, IP 64, 10 mm Blind shaft F47 = Spring tether, IP 64, 12 mm Blind shaft	Interface SB = SSI Binary SG = SSI Gray	Connection A = cable axial B = cable radial C = Conin 12 pol. axial cw D = Conin 12 pol. radial cw G = Conin 12 pol. axial ccw H = Conin 12 pol. radial ccw 7 = M12, 8 pol. axial 8 = M12, 8 pol. radial
CAMS58 Absolute multiturn shaft encoder					
CASB58 Absolute singleturn blind shaft encoder					
CAMB58 Absolute multiturn blind shaft encoder					

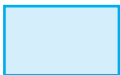
ORDERING CODE BiSS

					
CASS58 Absolute singleturn shaft encoder	Resolution 0010 = 10 Bit ST 0012 = 12 Bit ST 0013 = 13 Bit ST 0014 = 14 Bit ST 0017 = 17 Bit ST 0360 = 360 increments ST 0720 = 720 increments ST 1212 = 12 Bit MT + 12 Bit ST 1213 = 12 Bit MT + 13 Bit ST 1214 = 12 Bit MT + 14 Bit ST 1217 = 12 Bit MT + 17 Bit ST	Supply voltage A = 5 V E = 10–30 V	Flange, Protection, Shaft-Ø S41 = Synchro, IP 64, 6 mm S71 = Synchro, IP 67, 6 mm K42 = Clamping, IP 64, 10 mm K72 = Clamping, IP 67, 10 mm F42 = Spring tether, IP 64, 10 mm Blind shaft F47 = Spring tether, IP 64, 12 mm Blind shaft	Interface BI = BiSS (Digital) BC = BiSS (+SinCos 1VPP)	Connection A = cable axial B = cable radial C = Conin 12 pol. axial cw D = Conin 12 pol. radial cw G = Conin 12 pol. axial ccw H = Conin 12 pol. radial ccw 7 = M12, 8 pol. axial 8 = M12, 8 pol. radial
CAMS58 Absolute multiturn shaft encoder					
CASB58 Absolute singleturn blind shaft encoder					
CAMB58 Absolute multiturn blind shaft encoder					

ORDERING CODE PARALLEL INTERFACE

					
CASS58 Absolute singleturn shaft encoder	Resolution 0010 = 10 Bit ST 0012 = 12 Bit ST 0013 = 13 Bit ST 0014 = 14 Bit ST 0360 = 360 increments ST 0720 = 720 increments ST 1212 = 12 Bit MT + 12 Bit ST	Supply voltage E = 10–30 V	Flange, Protection, Shaft-Ø S41 = Synchro, IP 64, 6 mm S71 = Synchro, IP 67, 6 mm K42 = Clamping, IP 64, 10 mm K72 = Clamping, IP 67, 10 mm F42 = Spring tether, IP 64, 10 mm Blind shaft F47 = Spring tether, IP 64, 12 mm Blind shaft	Interface PB = Parallel Binary PG = Parallel Gray	Connection A = cable axial (ST, MT) B = cable radial (ST, MT) U = Conin 17 pol. axial ccw (ST) V = Conin 17 pol. radial ccw (ST) W = Conin 17 pol. axial cw (ST) Y = Conin 17 pol. radial cw (ST) A-A1-F = 0,1 m cable axial + 37 pol. Sub-D (MT) B-A1-F = 0,1 m cable radial + 37 pol. Sub-D (MT)
CAMS58 Absolute multiturn shaft encoder					
CASB58 Absolute singleturn blind shaft encoder					
CAMB58 Absolute multiturn blind shaft encoder					

ORDERING CODE PROFIBUS-DP/DEVICENET

					
CASS58 Absolute singleturn shaft encoder	Resolution 0010 = 10 Bit ST 0012 = 12 Bit ST 0013 = 13 Bit ST 0014 = 14 Bit ST 1212 = 12 Bit MT + 12 Bit ST 1213 = 12 Bit MT + 13 Bit ST 1214 = 12 Bit MT + 14 Bit ST	Supply voltage E = 10–30 V	Flange, Protection, Shaft-Ø S41 = Synchro, IP 64, 6 mm S71 = Synchro, IP 67, 6 mm K42 = Clamping, IP 64, 10 mm K72 = Clamping, IP 67, 10 mm F42 = Spring tether, IP 64, 10 mm Blind shaft F47 = Spring tether, IP 64, 12 mm Blind shaft	Interface DP = Profibus DP VD = DeviceNet	Connection Profibus: Z = Bus cover 3x cable gland DeviceNet: Z = Bus cover 2 x cable gland
CAMS58 Absolute multiturn shaft encoder					
CASB58 Absolute singleturn blind shaft encoder					
CAMB58 Absolute multiturn blind shaft encoder					

Note: Bus Connections radial/axial via connector and cable, optional on request.

- Heavy duty absolute single- and multiturn encoders with SSI, Profibus, CANopen outputs. Parallel output for most versions on request
- Shaft and hollow shaft versions with Ø 90 mm
- Applications:
 - Steel industry
 - Paper industry
 - Cranes
- Shaft Ø 11 or 12 mm
- Through hollow shaft Ø 12, 20, 25, 30 mm (others on request)

- Easy mounting of the hollow shaft version. The encoder is mounted directly on the drive shaft without coupling



SSI

CANopen

PROFI[®]
PROCESS FIELD BUS
BUS



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 Carl-Bosch-Straße 8 Tel.: +49 54 81-93 85-0 Internet: www.meyle.de
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Electrical Data:	SSI ¹⁾	Profibus (MT)	CANopen (MT)
Supply voltage	11–30 VDC (ST) 5–30 VDC (MT)	11–30 VDC	11–30 VDC
Intrinsic current consumption (without load)	100 mA max.	24 VDC: max. 170 mA	24 VDC: max. 120 mA
Interface	Standard SSI	Specification according Profibus DP2.0 Standard (DIN 19245 part 3) RS485 driver galvanically isolated	CAN high speed according ISO 11898, Basic- and full CAN CAN specification 2.0A
Protocol		Profibus encoder profile V1.1 Class 1 and Class 2	CAN open profile DS406 V1.0
Lines/Drivers	RS422		
Output code	SSI: Binary or Gray	Binary	Binary
Singleturn resolution	13 Bit	13 Bit	13 Bit
Multiturn resolution	12 Bit	16 Bit	16 Bit
Incremental signals	optional		
Number of increments	2048		
Clock frequency	ST 100 kHz–1 MHz MT 100 kHz–500 kHz		
Connection	Cable or flange-connector	Cable	
Parameterization		According to Profibus profile	According to CANopen profile
Control input	Direction		

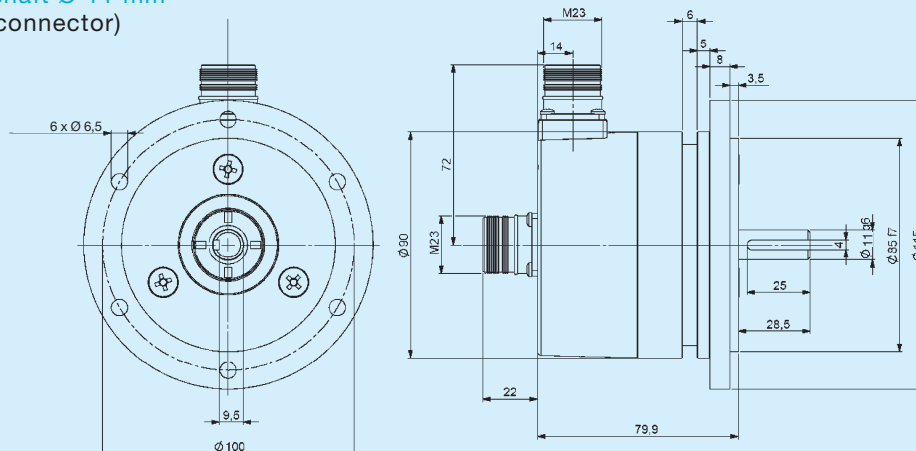
Mechanical Data:	SSI ¹⁾	Profibus (MT)	CANopen (MT)
Housing diameter	90 mm	90 mm	90 mm
Protection	FAXS90: IP 66 FAXH90: IP 65	FAMS90: IP 67 FAMH90: IP 65	FAMS90: IP 67 FAMH90: IP 65
Flange types	Synchro-flange Spring tether	Synchro-flange Spring tether	Synchro-flange Spring tether
Shaft diameter	Solid shaft: 11, 12 mm Hollow shaft: 12, 20, 25, 30 mm	Solid shaft: 11, 12 mm Hollow shaft: 12, 20, 25, 30 mm	Solid shaft: 11, 12 mm Hollow shaft: 12, 20, 25, 30 mm
Max. speed at 70 °C	FAXS90: continuous 6000 min ⁻¹ short-term 9000 min ⁻¹ (ST) 6000 min ⁻¹ (MT) FAXH90: continuous 3600 min ⁻¹ short-term 6000 min ⁻¹	FAMS90: continuous 6000 min ⁻¹ short-term 6000 min ⁻¹ FAMH90: continuous 3600 min ⁻¹ short-term 6000 min ⁻¹	FAMS90: continuous 6000 min ⁻¹ short-term 6000 min ⁻¹ FAMH90: continuous 3600 min ⁻¹ short-term 6000 min ⁻¹
Starting Torque	< 0,025 Nm	< 0,025 Nm	< 0,025 Nm
Moment of inertia, rotor	15 ... 55 x 10 ⁻⁶ kgm ²	15 ... 55 x 10 ⁻⁶ kgm ²	15 ... 55 x 10 ⁻⁶ kgm ²
Absolute max. shaft load	FAXS90: axial 100 N, radial 200 N FAXH90: axial 50 N, radial 80 N	FAXS90: axial 100 N, radial 200 N FAXH90: axial 50 N, radial 80 N	FAXS90: axial 100 N, radial 200 N FAXH90: axial 50 N, radial 80 N
Shock resistance IEC 68-2-27	500 m/s ² (6 ms)	300 m/s ² (6 ms)	300 m/s ² (6 ms)
Vibration resistance IEC 68-2-6	ST 200 m/s ² (10 ... 1000 Hz) MT 100 m/s ² (10 ... 2000 Hz)	100 m/s ² (10 ... 500 Hz)	100 m/s ² (10 ... 500 Hz)
Working temperature	ST -20 ... +90 °C MT -20 ... +85 °C	-10 ... +70 °C	-10 ... +70 °C
Weight, approx. (ST/MT)	FAXS90: 1100 g/1600 g FAXH90: 700 g/700 g	FAMS90: 1100 g FAMH90: 900 g	FAMS90: 1100 g FAMH90: 900 g

¹⁾ Parallel output on request

SINGLETURN, SSI

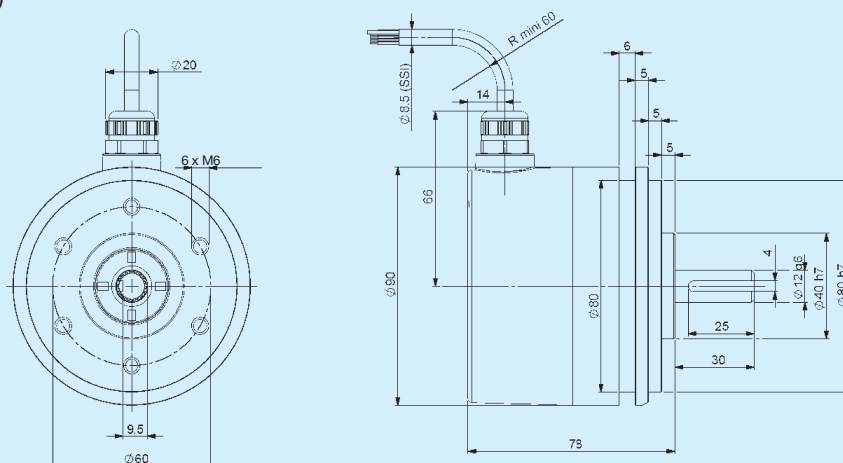
Dimensioned drawing

Flange Ø 115 mm, shaft Ø 11 mm
(Drawing with M23 connector)



Synchro flange

(Drawing with cable version)

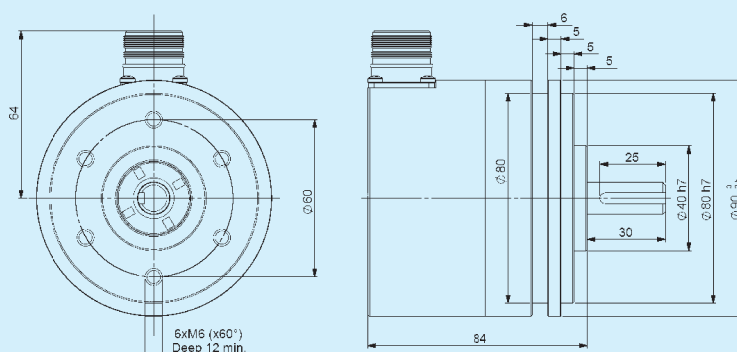


MULTITURN, SSI

Dimensioned drawing

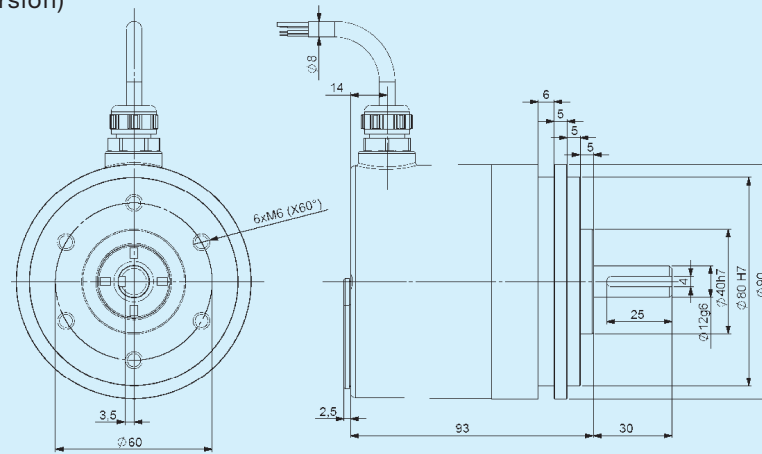
Synchro flange

(Drawing with M23 connector)



Synchro flange

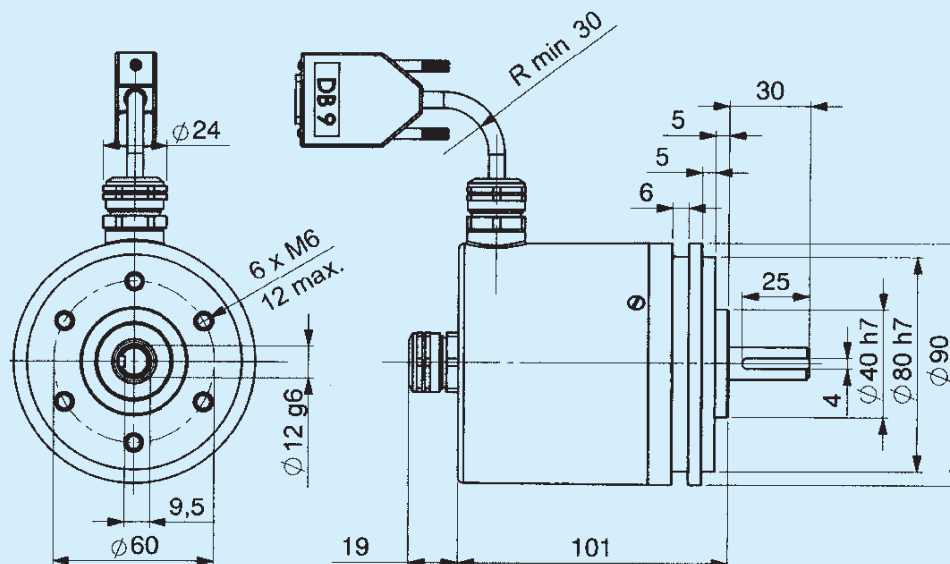
(Drawing with cable version)



MULTITURN, CANopen

Synchro flange

(Drawing with cable + D-SUB connector)



ABSOLUTE HOLLOW SHAFT ENCODER

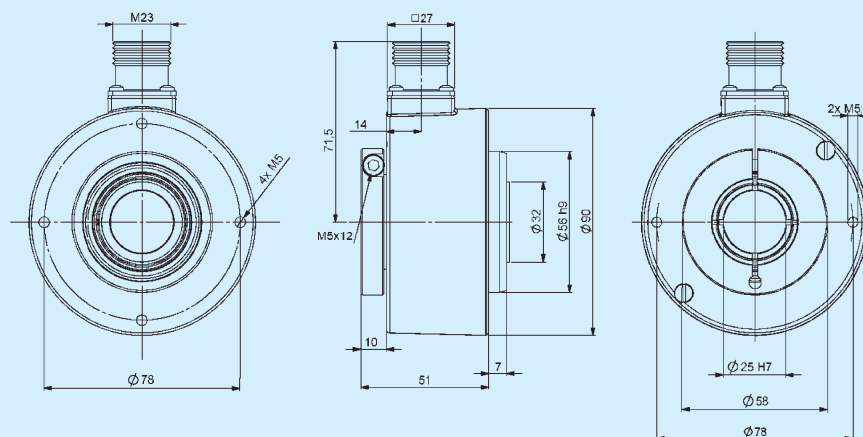
FAxH90

SINGLETURN, SSI

Dimensioned drawing

Hollow shaft

(Drawing with M23 connector)

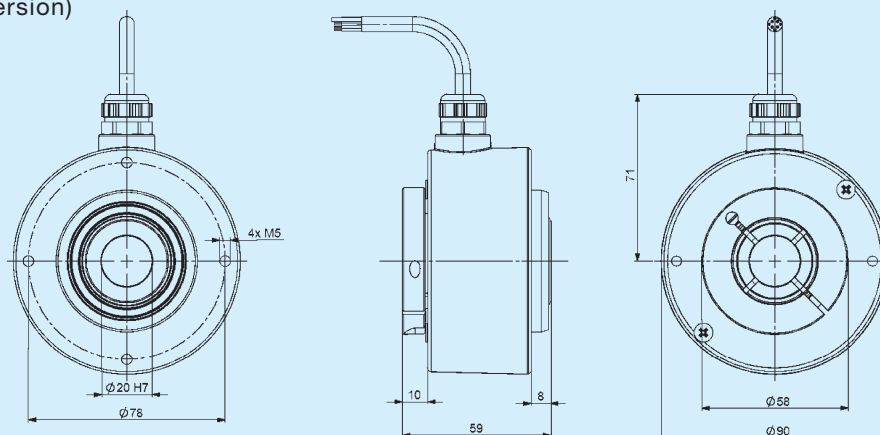


MULTITURN, SSI

Dimensioned drawing

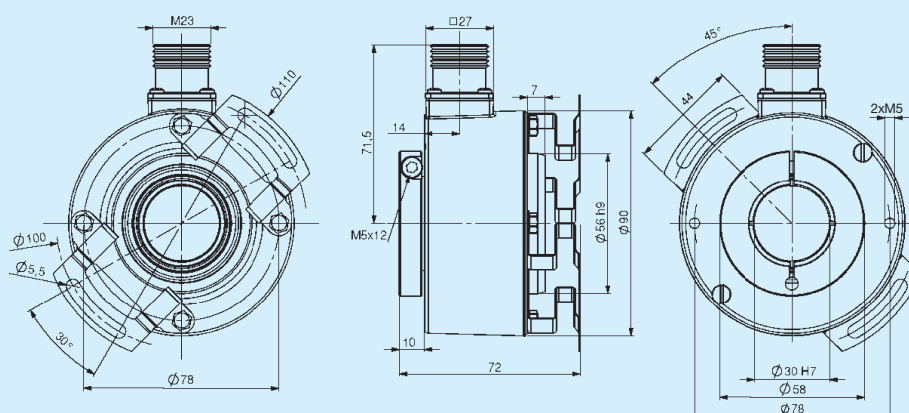
Hollow shaft

(Drawing with cable version)



Hollow shaft

(Drawing with M23 connector and Anti-rotation device 9445/009)



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E-Mail: sales@meyle.de

ABSOLUTE HOLLOW SHAFT ENCODER

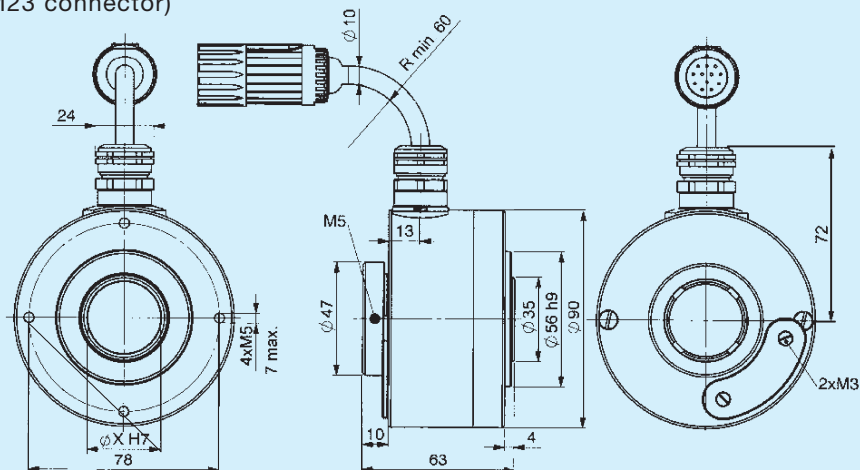
FAMH90

MULTITURN, PROFIBUS DP

Dimensioned drawing

Hollow shaft

(Drawing with cable + M23 connector)

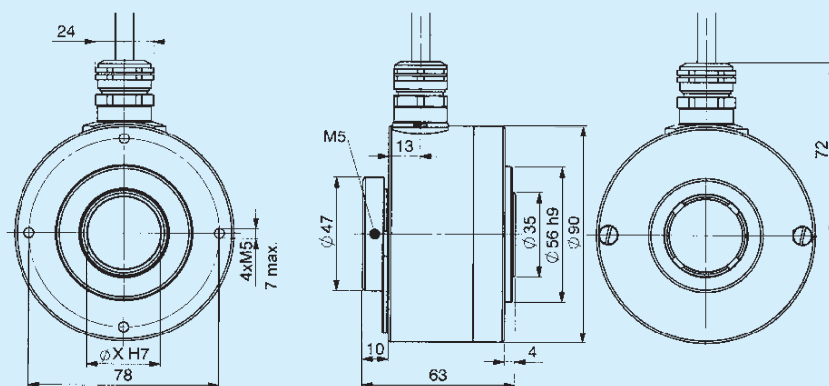


MULTITURN, CANopen

Dimensioned drawing

Hollow shaft

(Drawing with cable version)



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E-Mail: sales@meyle.de

SSI

Terminal assignment

Signal:	GND	+V	+C	-C	+D	-D	RES ¹⁾	DIR
Cable colour:	WH	BN	GN	YE	GY	PK	BU	RD
M23 PIN out cw:	2	1	3	7	4	6	5	9
M23 PIN out ccw:	1	8	3	11	2	10	6	5

+V: Encoder Power Supply +VDC

GND: Encoder Power Supply Ground (0V)

+C, -C: Clock signal

+D, -D: Data signal

DIR: Direction input: If this input is active, output values are decreasing when shaft is turned clockwise.

RES: Reset to zero

¹⁾ MT only

Profibus DP

Terminal assignment

Signal:	A	B	+V	0V	N/C
Cable color:	GN	YE	BR	WH	
M23 PIN out cw:	2	4	7	8	1, 3, 5, 6, 9, 10, 11, 12

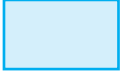
CANopen

Terminal assignment

Signal:	CAN Ground	CAN_Low (-)	CAN_High (+)	GND power supply	+V power supply	DEF	N/C
D-SUB 9pin:	3	2	7	6	9	1	4, 5, 8

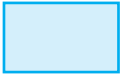
DEF: Set to: 20 k Baud, Address = 1, cw, MT 13 Bit

ORDERING CODE SSI¹⁾

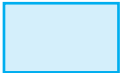
						
FASS90 Absolute singleturn shaft encoder	Resolution 0010 = 10 Bit ST 0011 = 11 Bit ST 0012 = 12 Bit ST 0013 = 13 Bit ST	Supply voltage E = 11-30 VDC (ST) E = 5-30 VDC (MT)	Flange, Protection S6 = Synchro, IP 66 (shaft) C5 = Hollow shaft, IP 65	Shaft-Ø 11 = 11 mm shaft, flange Ø 115 mm 12 = 12 mm shaft/hollow shaft (with hub) 20 = 20 mm hollow shaft (with hub) 25 = 25 mm hollow shaft (with hub) 30 = 30 mm hollow shaft	Interface SB = SSI Binary SG = SSI Gray	Connection A = cable axial, 1 m PVC B = cable radial, 1 m PVC C = Conin 12pol. axial cw D = Conin 12pol. radial cw G = Conin 12 pol. axial ccw H = Conin 12 pol. radial ccw
FAMS90 Absolute multiturn shaft encoder	1210 = 12 Bit MT + 10 Bit ST 1211 = 12 Bit MT + 11 Bit ST 1212 = 12 Bit MT + 12 Bit ST 1213 = 12 Bit MT + 13 Bit ST					
FASH90 Absolute singleturn hollow shaft encoder						
FAMH90 Absolute multiturn hollow shaft encoder						

¹⁾ Parallel output on request

ORDERING CODE Profibus DP

						
FAMS90 Absolute multiturn shaft encoder	Resolution 1210 = 12 Bit MT + 10 Bit ST 1211 = 12 Bit MT + 11 Bit ST 1212 = 12 Bit MT + 12 Bit ST 1213 = 12 Bit MT + 13 Bit ST	Supply voltage E = 11-30 V	Flange, Protection S7 = Synchro, IP 67 (shaft) C5 = Hollow shaft, IP 65	Shaft-Ø 11 = 11 mm shaft, flange Ø 115 mm 12 = 12 mm shaft/hollow shaft (with hub) 20 = 20 mm hollow shaft (with hub) 25 = 25 mm hollow shaft (with hub) 30 = 30 mm hollow shaft	Interface DP = Profibus DP Class 2	Connection B = Cable radial, 4wire, 1 m, w/o bus cover D = Cable radial, 1 m with conin 12pol. cw
FAMH90 Absolute multiturn hollow shaft encoder	1610 = 16 Bit MT + 10 Bit ST 1611 = 16 Bit MT + 11 Bit ST 1612 = 16 Bit MT + 12 Bit ST 1613 = 16 Bit MT + 13 Bit ST					

ORDERING CODE CANopen

						
FAMS90 Absolute multiturn shaft encoder	Resolution 1210 = 12 Bit MT + 10 Bit ST 1211 = 12 Bit MT + 11 Bit ST 1212 = 12 Bit MT + 12 Bit ST 1213 = 12 Bit MT + 13 Bit ST	Supply voltage E = 11-30 V	Flange, Protection S7 = Synchro, IP 67 (shaft) C5 = Hollow shaft, IP 65	Shaft-Ø 11 = 11 mm shaft, flange Ø 115 mm 12 = 12 mm shaft/hollow shaft (with hub) 20 = 20 mm hollow shaft (with hub) 25 = 25 mm hollow shaft (with hub) 30 = 30 mm hollow shaft	Interface CO = CANopen Profile DS406 V.1.0	Connection L = Cable radial, 1 m with D-SUB, 9pin connector w/o bus cover
FAMH90 Absolute multiturn hollow shaft encoder	1610 = 16 Bit MT + 10 Bit ST 1611 = 16 Bit MT + 11 Bit ST 1612 = 16 Bit MT + 12 Bit ST 1613 = 16 Bit MT + 13 Bit ST					

MOUNTING ACCESSORIES

Anti-rotation devices for all
type of hollow-shaft and
through hollow shaft encoders

DAC

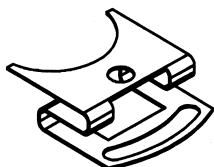
MEFLEX



Anti-rotation devices For hollow shaft encoder without torque stop slot

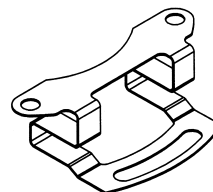
Ref. 9445/006

Ø 40 mm



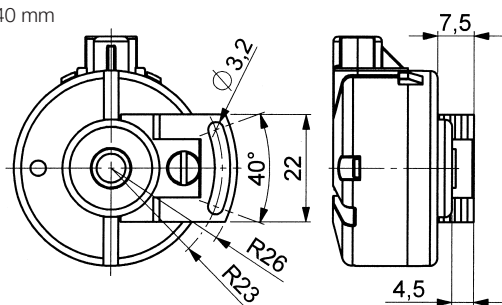
Ref. 9445/009

Ø 90 mm



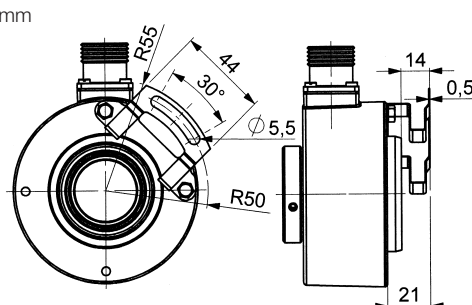
Ref. 9445/006

Ø 40 mm



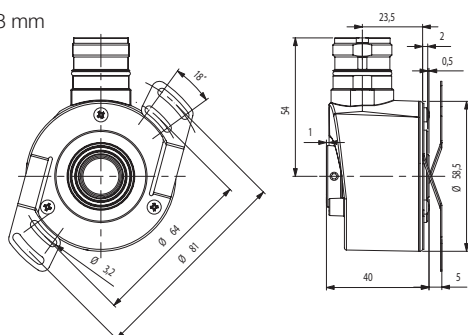
Ref. 9445/009

Ø 90 mm



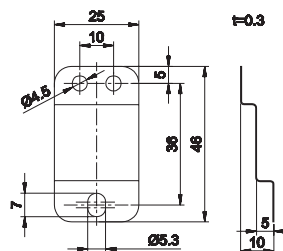
Ref. 9445/015

Ø 58 mm



Ref. 9445/019

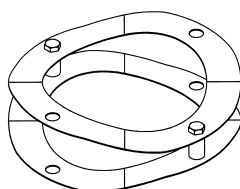
Ø 100 mm und 145 mm



Anti-rotation devices For hollow shaft encoder without torque stop slot

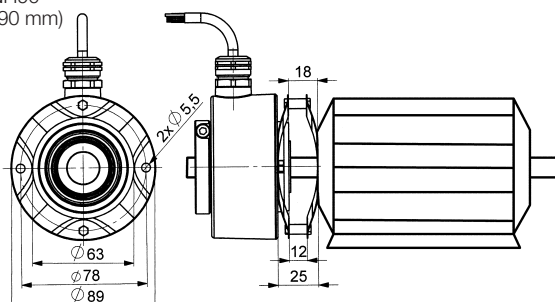
Ref. 9445/004

Ø 90 mm



Ref. 9445/004

AINH90
(Ø 90 mm)



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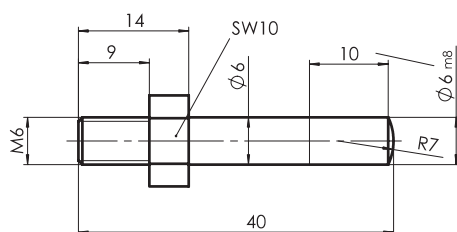
MOUNTING ACCESSORIES

Anti-rotation devices For large hollow shaft encoder with torque stop slot

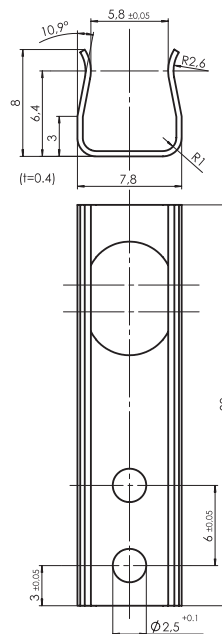
Ref. 9475/005

Complete set, consisting of:

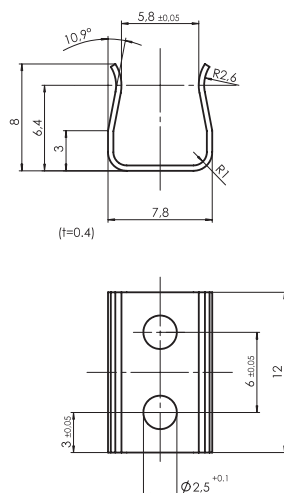
1 x cylindric pin
long with thread



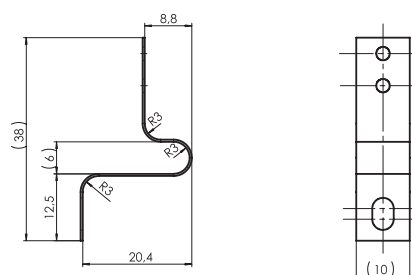
1 x spring long



1 x spring short



bracket



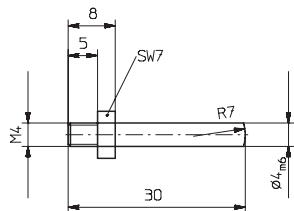
MOUNTING ACCESSORIES

Anti-rotation devices For hollow shaft encoder Ø 58 mm with torque stop slot

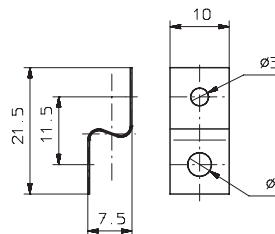
Ref. 9475/001

Complete set, consisting of:

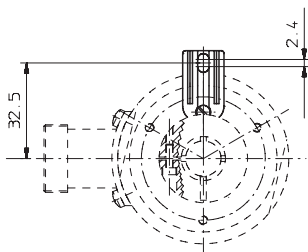
1 x cylindric pin
with thread



1 x mounting bracket
incl. screw M3x5



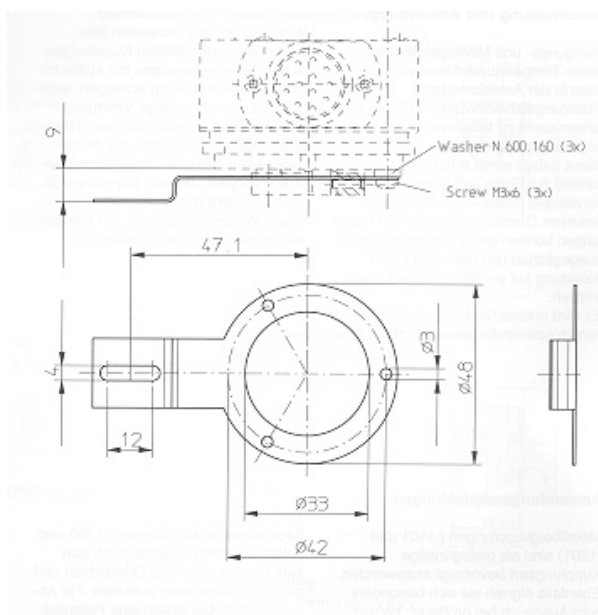
1 x long torque
support slot



Flexible mounting bracket for hollow shaft encoders Ø 58 mm, screw hole circuit Ø 42 mm

Ref. 9475/010

Delivery includes:
1 x flexible mounting sheet
3 x washer
3 x screw M3x6



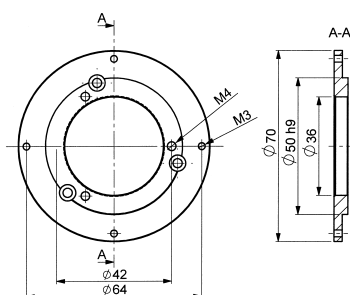
MOUNTING ACCESSORIES

Large choice of mountings
for all encoder standards

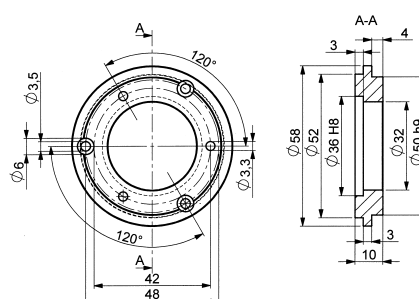


Mountings for Ø 58 mm encoders

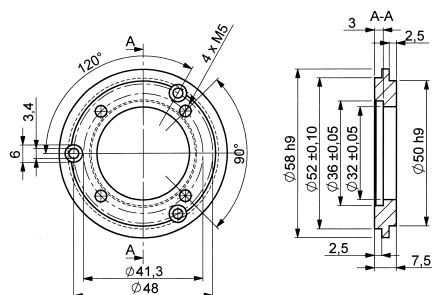
Ref. 9500/002 Aluminium



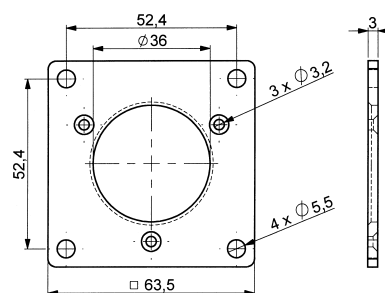
Ref. 9500/003 Aluminium



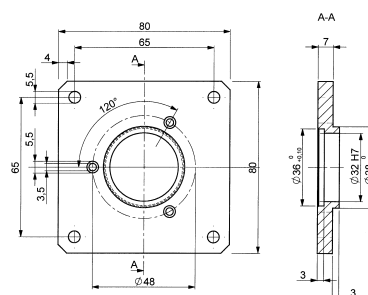
Ref. 9500/004 Aluminium



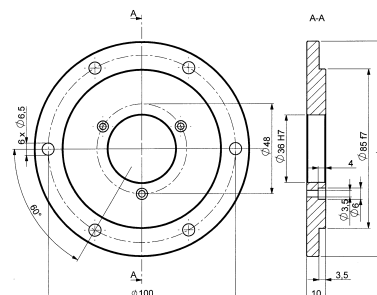
Ref. 9500/005 Aluminium



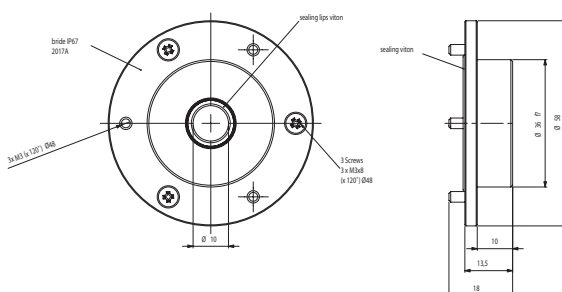
Ref. 9500/006 Aluminium



Ref. 9500/030 Aluminium



Ref. 9500/049 Sealing flange IP 67



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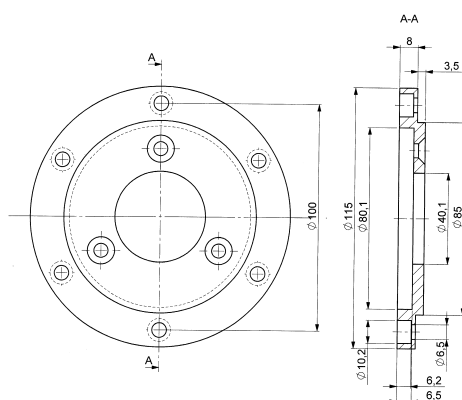
MOUNTING ACCESSORIES

Large choice of mountings for
all encoder standards

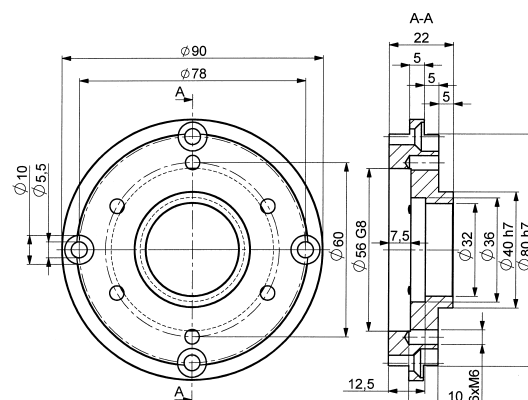


Mountings for Ø 90 mm encoders

Ref. 9500/007 Aluminium

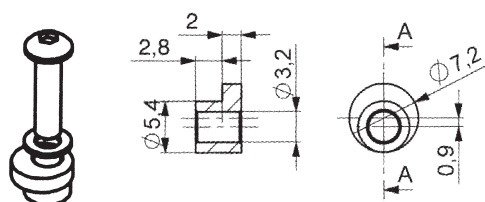


Ref. 9500/028 Aluminium

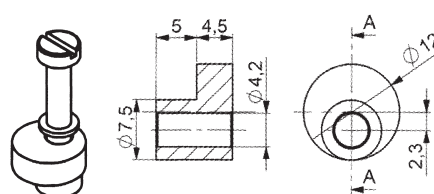


Excentric mounting

Ref. 9500/014 Nickel-coated brass



Ref. 9500/015 Stainless steel



COUPLING

Large choice of couplings
with adaptation for all types
of encoders



Ref. 9400

Flexible washer coupling

(mm)	Ø X1 H7	Ø 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
9400/10-12	10	12
9400/08-08	8	8
9400/08-06	8	6
9400/08-10	8	10
9400/08-12	8	12

Possibilities for boring between 6 and 12 mm

Ref. 9401

Spring coupling

(mm)	Ø X1 H7	Ø 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
9401/10-12	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
9401/14-14	14	14

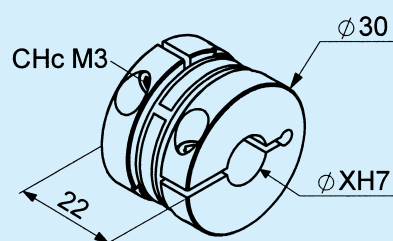
Possibilities for boring between 6 and 14 mm

Ref. 9402

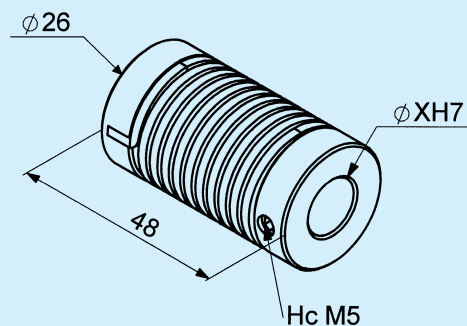
Small spring coupling

(mm)	Ø X1 H7	Ø X2 H7
9402/10-10	10	10
9402/06-06	6	6

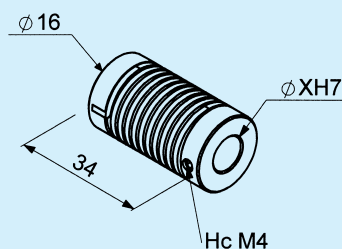
Réf. 9400



Réf. 9401



Réf. 9402



Ref. 9403

Precision bellow coupling without insulation

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

Possibilities for boring between 4 and 10 mm

Ref. 9404

Precision bellow coupling

(mm)	Ø X1 H7	Ø 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
9404/10-12	10	12
9404/08-08	8	8
9404/08-06	8	6
9404/08-10	8	10
9404/08-12	8	12

Possibilities for boring between 6 and 14 mm

Ref. 9410

«OLDHAM» coupling

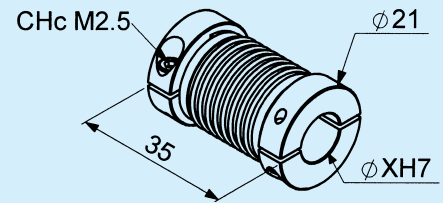
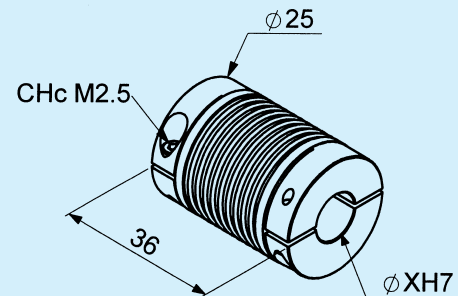
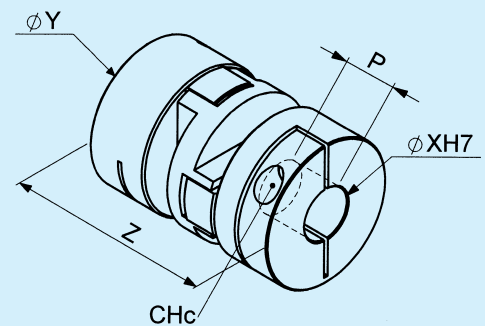
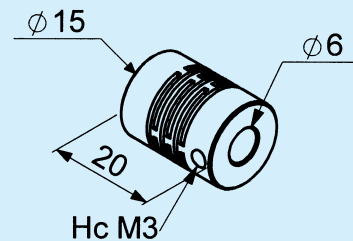
(mm)	Ø X1 H7	Ø X2 H7	Ø Y	Z	P
9410/C06-06	6	6	25.4	28.4	8.6
9410/C06-10	6	10	25.4	28.4	8.6
9410/C10-10	10	10	25.4	28.4	8.6
9410/A06-06	6	6	33.3	48	13
9410/A06-10	6	10	33.3	48	13
9410/A08-08	8	8	33.3	48	13
9410/A08-12	8	12	33.3	48	13
9410/A10-10	10	10	33.3	48	13
9410/A12-12	12	12	33.3	48	13
9410/B10-10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

Possible borings from 6 to 14 mm (except for 9410/C de 4 à 10)

Ref. 9417

Plastic coupling

(mm)	Ø X1 H7	Ø X2 H7
9417/06-06	6	6

Réf. 9403**Réf. 9404****Réf. 9410****Réf. 9417**

CONNECTION ACCESSORIES

Large choice of sockets and other connection accessories for all encoder standards



SOCKETS

Type 1 - Ref. 9412/F

Female socket 4 pins (CNOMO)

Type 2 - Ref. 9414_F5

Female socket DIN 5 pins

Type 5, 6 & H - Ref. 9416/...

Female sockets M23 clockwise

	12 pins	16 pins	Note
Ref.	9416/004	9416/006	Shield not linked to connector

Ref.	9416/004P	9416/006P	Shield linked to connector (EMI)
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Type 8 - Ref. 9416/...

Female sockets M23 counter-clockwise

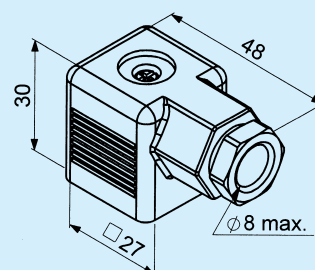
	12 pins	16 pins	Note
Ref.	9416/014	9416/037	Shield not linked to connector

Ref.	9416/055	9416/060	Shield linked to connector (EMI)
------	----------	----------	----------------------------------

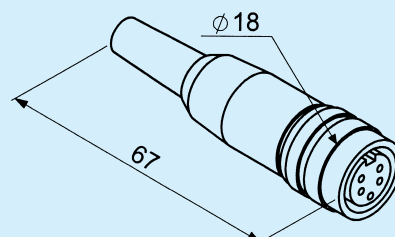
Type 9 - Ref. 8213/011 + Ref. 8212/065

Female sockets DB9 + cover

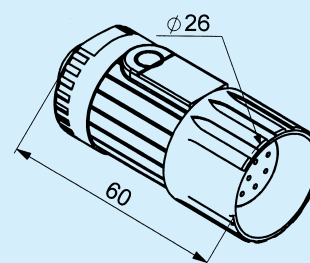
Ref. 9412



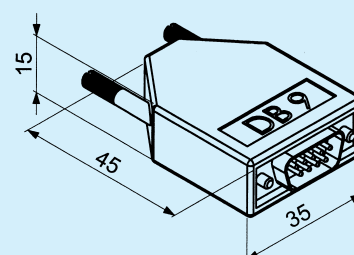
Ref. 9414



Ref. 9416



Ref. 8213



EXTENSION CABLE

Type M23 – Ref. 9416/013

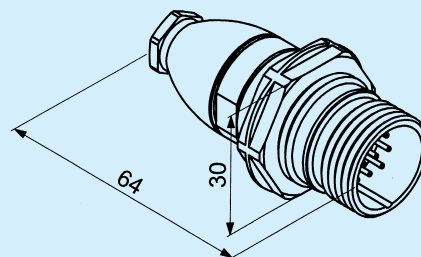
Extension M23 clockwise

Type M23 – Ref. EJ/9416-004B/ xxx*

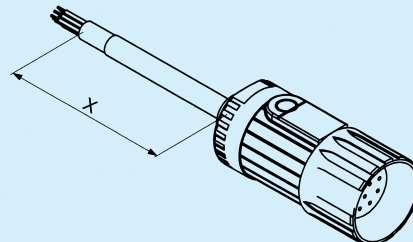
Extension cable M23 female clockwise

*xxx = length

Ref. 9416/013



Ref. EJ/9416



MEASURING ACCESSORIES

Mesuring wheels
Pinion-Rack
Slave-bearing modules



Measuring wheel, circumference 200 mm

Ref.	Ø X H7 (mm)	Coating
9108/06	6	Polyurethan
9108/08	8	
9108/10	10	
9109/06	6	knobbled rubber
9109/08	8	
9109/10	10	
9110/06	6	Knurled aluminium

Mainly for Ø 58 mm encoders

Measuring wheel, circumference 500 mm

Ref.	Ø X H7 (mm)	Coating
9101/08	8	Polyurethan
9101/10	10	
9101/12	12	
9102/08	8	knobbled rubber
9102/10	10	
9102/12	12	
9103/12	12	Knurled aluminium

Mainly for Ø 90 and 102 mm encoders

Racks

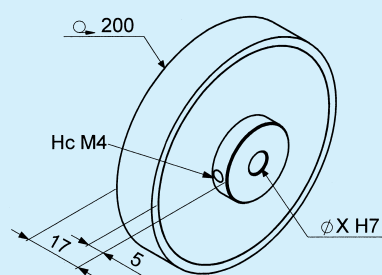
Ref.	Y (mm)	Module
9514 / 002	1000	1,591
9514 / 003	2000	1,591

Pinions

Ref.	Ø X H7 (mm)	Nbr of teeth	Module
9215 / 002	8	20	1,591
9215 / 004	10	20	1,591
9215 / 005	12	20	1,591

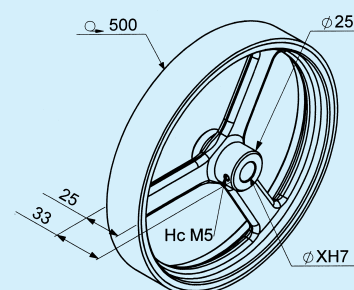
Ref. 9108/9109/9110

Aluminium



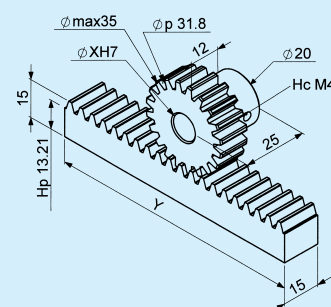
Ref. 9101/9102/9103

Aluminium



Ref. 9212/9215

Steel C 45



MOUNTING ACCESSORIES

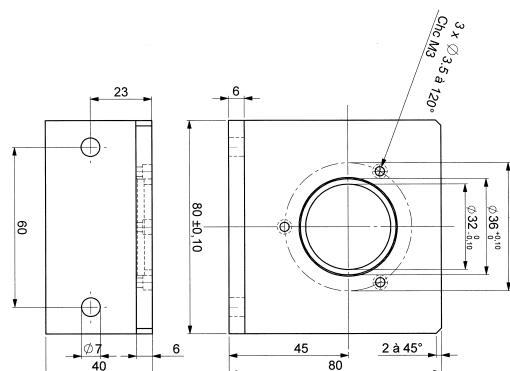
Aluminium mounting brackets
Aluminium spring: adjustable
compensating brackets
for linear measuring



Mounting brackets

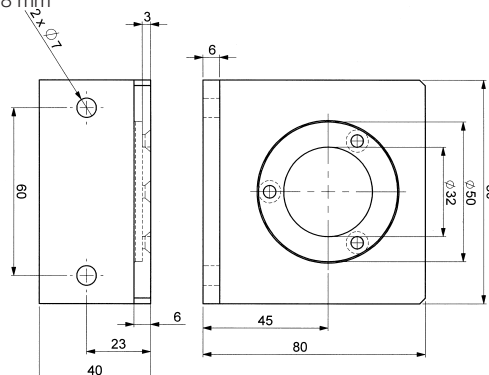
Ref. 9202

Ø 58 mm



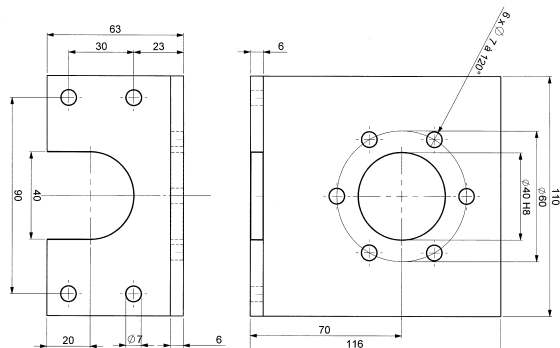
Ref. 9204

Ø 58 mm



Ref. 9302

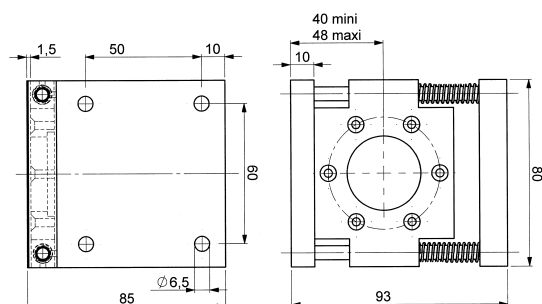
Ø 90 mm



Adjustable spring brackets

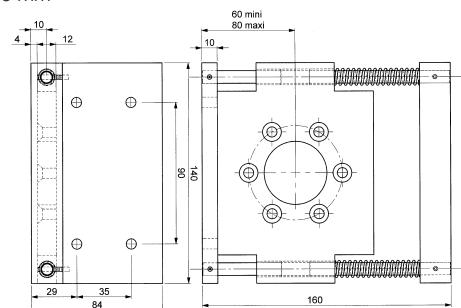
Ref. 9212

Ø 58 mm



Ref. 9213

Ø 90 mm



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E-Mail: sales@meyle.de

INSTALLATION INSTRUCTIONS

If possible, mount the encoder shaft horizontal or facing downward, with the cable glands on the connector facing downward.

Solid shaft:

- 1: Mount encoder to a rigid bracket
- 2: Mount a flexible coupling (loose assembly) to the encoder shaft
- 3: Align carefully encoder and driving shaft
- 4: Tighten all screws

Hollow or through-in shaft:

- 1: Mount in a rigid assembly the driving shaft into the encoder hollow or through shaft
- 2: Mount the flexible anti-rotation device onto the frame – tighten the assembly
- 3: Respect the encoder-frame mounting distance of the flexible anti-rotation device.

Example:

A 30 mm hollow shaft, (g6) can only be used on a motor shaft of 30 mm, unless you add on the shaft one of our accessories, reduction hub.

PROTECTION DEGREE

(explanation on the figures)

1st figure

Protection against the penetration of solid bodies. According to IEC, NFC, DIN

0	Non protected.
1	Protection against solid bodies of more than 50 mm.
2	Protection against solid bodies of more than 12 mm.
3	Protection against solid bodies of more than 2,5 mm.
4	Protection against solid bodies of more than 1 mm.
5	Protected against dust.
6	Completely protected against dust.

2nd figure

Protection against the penetration of liquids. According to IEC, NFC, DIN

0	Non protected.
1	Protected against vertical fall of water spot
2	Protected against vertical fall of water spot (max inclination 15°)
3	Protected against water in „rain“
4	Protected against water projection
5	Protected against water nozzle
6	Protected against sea waves
7	Protected in immersion

INFORMATION ON THE STANDARDS

Ex CENELEC: Organisation that certifies encoders with intrinsic security and those which can be mounted where explosive atmosphere can be found.

Ex INTRINSIC SECURITY: Encoders with intrinsic security can be installed where explosive atmosphere can be found without special conditioning or wiring. These encoders mounted with intrinsic security barriers limit the power supply and the tension allowed in risky atmospheres.

CE EUROPEAN UNION: The European Union defines the electrical standards against electromagnetic constraint. Since January 1st, 1996, all the electronic devices in Europe have to respect the CE standard. Our encoders have been tested according to the „heavy industry“ standards, this certification have been obtained from an agreed organism.

CONNECTING CAUTIONS

Never leave wires unconnected! Never connect output together! Never connect idle outputs to a potential! Connect idle differential outputs with a resistor so as to draw a current of approximately 10 mA!

SWITCH ON AND POWER SUPPLY

Warning! Never connect or disconnect a powered encoder!

At the first switch-on: check on the corresponding pins of the unconnected encoder the correct 5 V or 24 V supplying voltage with the correct polarity. The encoder supply line must be protected against excessive voltage and current.

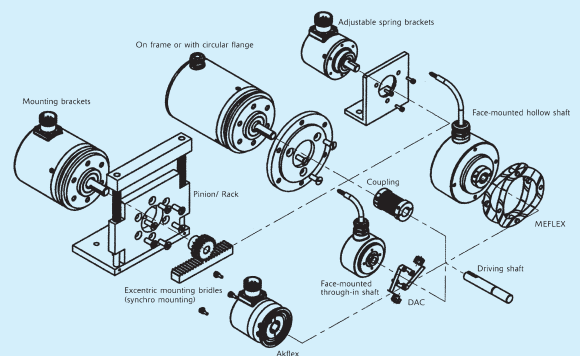
Voltage supply cautions: use a stabilised power supply dedicated to the encoder. The encoder must be powered through the PLC cabinet (e.g stabilised supply switch). To avoid destruction or slow deterioration do not exceed the voltage limits specified on the labels (ondulation included).

The wiring in the PLC cabinet must be as short as possible.

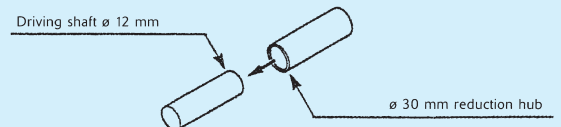
Use connexion boxes with metallic protection.

Never connect the encoder in the 220 V (or 125 V) electric network.

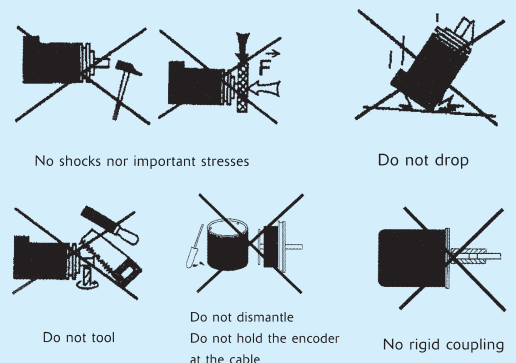
Installation instructions



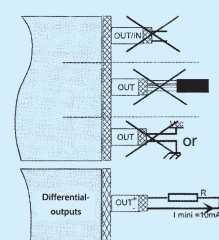
Example



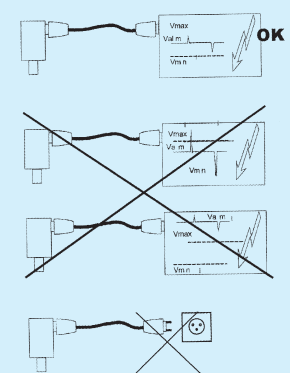
Caution!



Connecting cautions



Switch on and power supply



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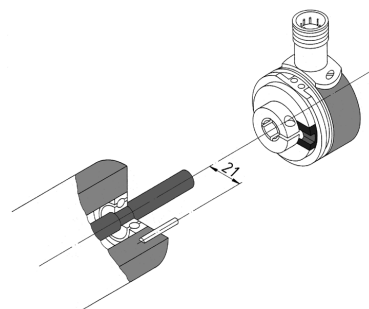
INSTALLATION INSTRUCTIONS

Mounting examples for hollow shaft encoders:

Mounting of a hollow shaft encoder with torque stop and pin (easiest and fastest mounting). Standard hollow shaft encoders are equipped with the torque stop.

Application:

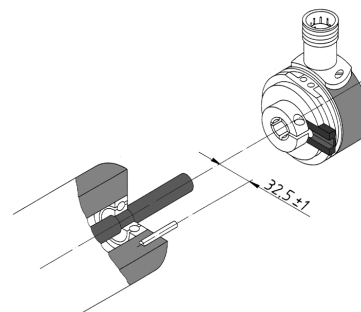
If axial play is less than 0.5 mm. Resolution up to 2500 ppr (If no pulse doubling is used)



Mounting of a hollow shaft encoder with extended torque stop and long pin.

Application:

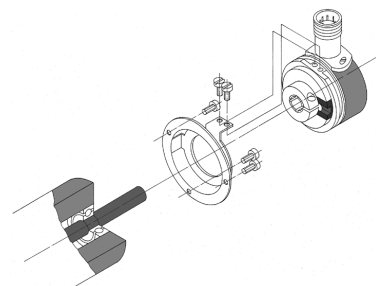
Specially recommended, if there is a large axial play. Due to the bigger mounting radius of the pin, the resolution can be higher (up to 3600 ppr, if no pulse doubling is used)



Mounting of a hollow shaft encoder with a stator coupling

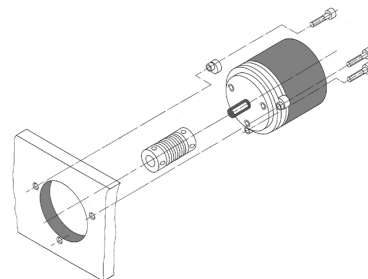
Application:

For higher resolution or if no pin can be used, due to mechanical restrictions.
No restrictions to resolution

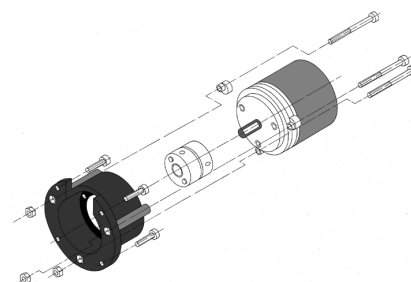


Mounting examples for shaft encoders with synchronous flange:

Mounting with fastening eccentrics and coupling (to reduce shaft overload)



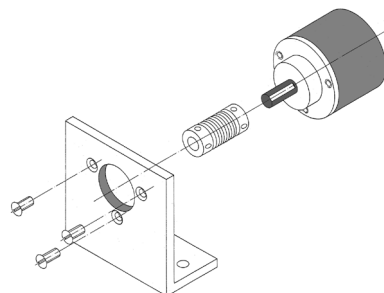
Mounting with assembly bell, fastening eccentrics and coupling (to prevent shaft overload and to insulate the encoder thermally and electrically)



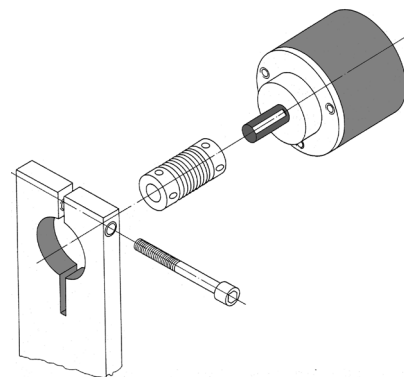
INSTALLATION INSTRUCTIONS

Mounting examples for shaft encoders with clamping flange:

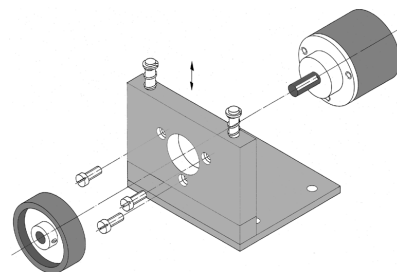
Mounting with an angular bracket and coupling (to reduce shaft overload)



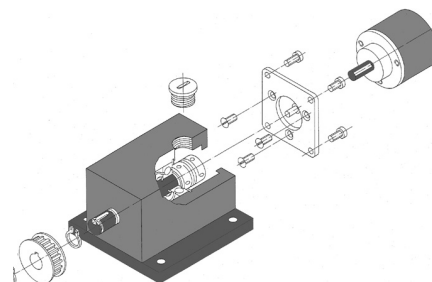
Mounting with a commonly used clamping device and coupling (to reduce shaft overload)



Mounting an encoder, using a displacement measuring device and a measuring wheel, e.g. for length measuring of foils, fabrics, metal sheets etc. The displacement measuring device ensures a constant slight pressure for a safe and precise measurement and also prevents overload to the encoder ball bearing.



Mounting with a bearing box, if shaft load is very high, e.g. belt-drives etc.



NOTES



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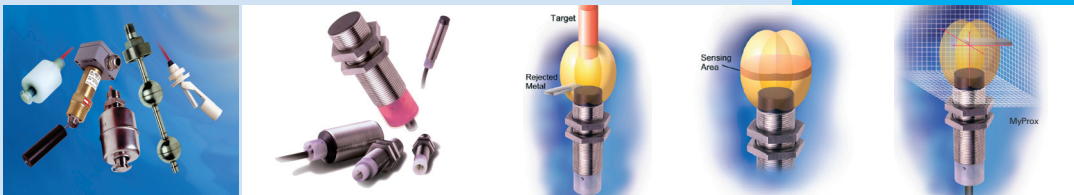
Engineering, distribution and manufacturing of systems and components for the automation, process control, machine building and measuring & controlling industries.

- Incremental, absolute and bus encoders MyInc / MyAbs
- Programmable inductive proximity sensors MyProx
- Industrial, miniature, signal, PCB, latching and safety relays MyRel
- Inductive, capacitive and optoelectric sensors
- Identification systems MyIdent
- Flow, level and pressure switches and sensors
- Infrared sensors for steelworks
- Cam switches, overspeed switches, overcurrent relays, pressure switches from former Siemens production
- Safety switches and components for conveyor belt safety from former AEG production



Incremental, Absolute and Bus Encoders

- Incremental encoders: outer $\varnothing$ 24 to 145 mm
- Hollow shaft encoders: shaft $\varnothing$ 4 to 72 mm
- Absolute multi- and singleturn encoders: outer $\varnothing$ 36 to 200 mm
- Absolute encoder from length 43 mm ($\varnothing$ 58 mm)
- Bus encoders for Profi-, CAN-, Interbus, DeviceNet, Ethernet, SSI, parallel, BiSS
- Incremental encoders up to 80.000 cpt
- Incremental encoders up to IP 68



Level-, Flow- and Pressure Sensors

- Float level switches, electro optic level switches
- Multi-point level switches
- Flow switches and indicators switch points as low as 0.2 l/min.
- Pressure switches 0.5 to 400 bar and hazardous area versions
- Hydraulics and high pressure applications from 40–700 bar

Programmable Inductive Proximity Sensors

- Software programmable, application learning
- Background metal rejection, Band sensing, and Position sensing
- Inductive sensors M12, M18, M30, (AC+DC)
- Sensing range up to 29 mm (M30)
- Senses an object at a selectable distance
- Solves the unsolvable applications



Meyle Safety and Control Components for conveyor belts, steel and cement industries

- Rotation speed monitors for braking and conveyor speed control
- Conveyor belt speed monitors and material flow control switches
- Rope and push button operated emergency STOP switches
- Pull rope emergency switches according to DIN/VDE 0660 T200/T210, EN 218
- Off track belt switches according to VDE
- Pull rope and emergency switches with Ex protected contacts according to ATEX guideline for use in zone 21 and 1
- Unlocking devices for supervisory control of drives
- Infrared sensors for steel factories, smelting works and rolling mills
- High temperature proximity sensors

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