

## Series MAB22H / Hall Effect Absolute Encoder

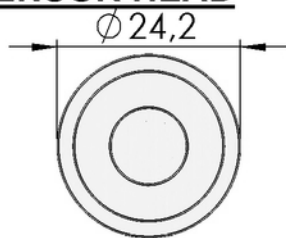
- Microcontroller Interface (SER)
- Synchronous Serial Interface (SSI)
- Serial Peripheral Interface (SPI)
- Angle range 360°
- Protection class IP67
- Wear- and frictionless by separate magnet holder
- Fine adjustment by a free rotatable clamp ring

The MAB22H is suited for applications in rough environs. It's space-saving and used for applications with a high demand on lifetime.

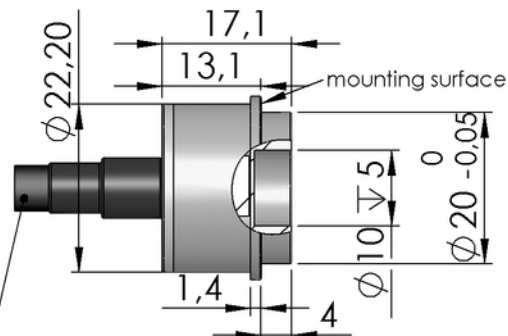


### Drawing

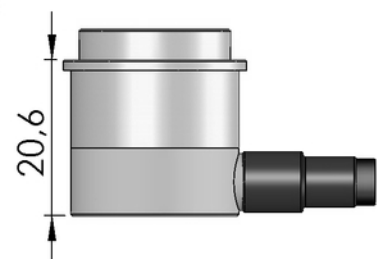
#### SENSOR HEAD



cable length  $1 \pm 0,05$  m

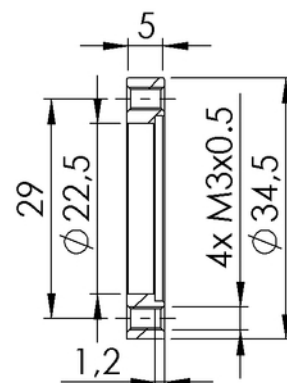
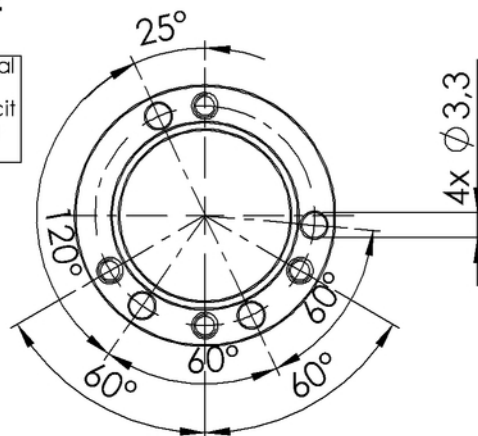


#### Option radial cable



#### MOUNTING RING (included in delivery)

Notice concerning the option radial cable. The mounting ring is not removable. Please mention it explicit if mounting without mounting ring is required.



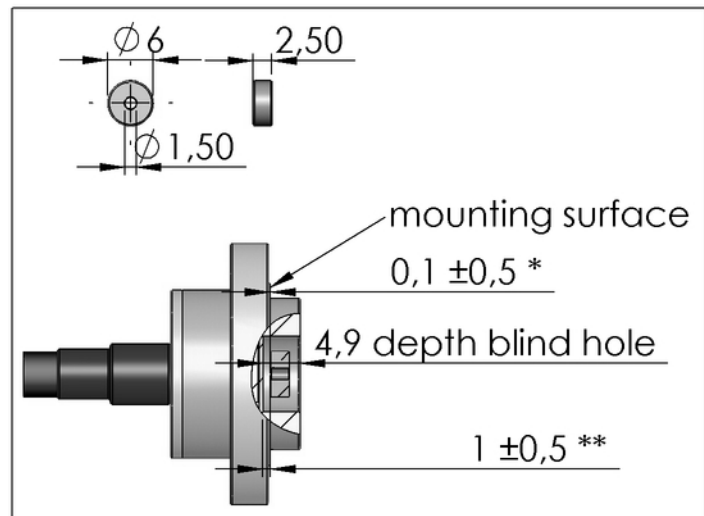
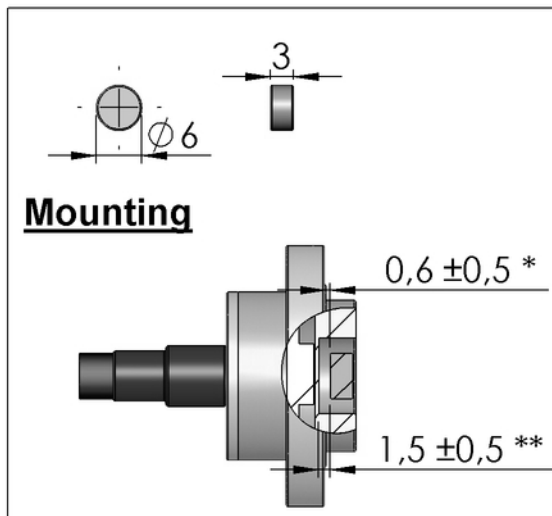
# Series MAB22H / Hall Effect Absolute Encoder

Interface	black	red	green	orange	yellow	brown	blue	violet	grey	white
SER	GND	VSUP	CS	not connected	CLK	DO	-	-	-	-
SSI	GND	VSUP	DATA -	CLK -	DATA +	CLK +	-	-	-	-
SPI	GND	VSUP	not connected	CLK	SS	DATA	-	-	-	-
SPI redundant	GND 1	VSUP 1	DATA 1	CLK 1	SS 1	DATA 2	CLK 2	SS 2	GND 2	VSUP 2

## MAGNET (included in delivery)

standard sensor

redundant sensor



\* ..related to mounting surface

\*\* ..related to bottom of blind hole

*If the shaft is magnetical, the distance between shaft and magnet has to be  $\geq 1$  mm.*

Electrical Data	SER Interface	SPI Interface	SSI Interface
Electrical angle		360°	
Independent linearity tolerance		$\pm 0,2$ %	
Resolution	1024 Steps (10 Bit) 4096 Steps (12 Bit)	16384 Steps (14 Bit)	4096 Steps (12 Bit)
Update rate	0,38 ms / 0,1 ms (HS)	2,5 ms / 0,6 ms (HS)	0,1 ms
Initial response	< 50 ms	< 16 ms	
Supply voltage	3,3 VDC $\pm 10$ % 5 VDC $\pm 10$ %	5 VDC $\pm 10$ %	5 VDC $\pm 10$ % 15-30 VDC
Supply current (no load)	< 20 mA	< 0 mA / < 20 mA (HS)	< 20 mA

## Mechanical data

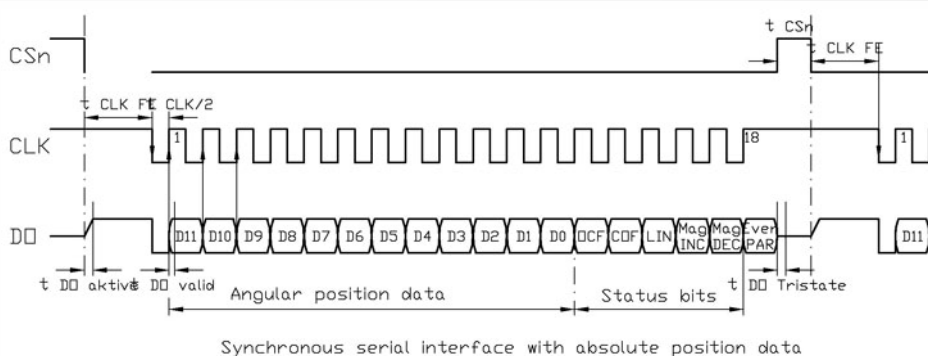
Maximum rotational speed 10.000 rpm

# Series MAB22H / Hall Effect Absolute Encoder

## Other Data

Protection class	IP67
Operating temperature	-30 ... +80 °C
Storage temperature	-40 ... +80 °C
Bearing	none
Housing material	chromed aluminium
Magent holder material	brass
Weighth	approx. 35 g

## Timing Diagramm SER-Bus



Falling edge of CS triggers a measurement value

Signal timing:

$t_{CSn} > 500ns$

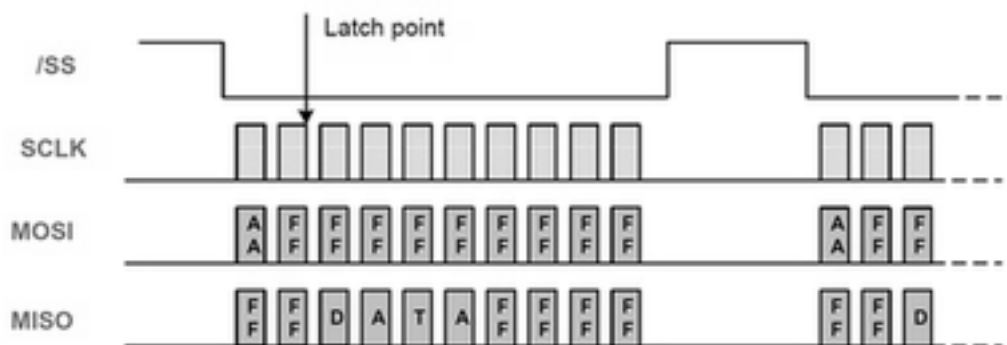
$t_{CLKFE} > 500ns$

$CLK < 1MHz$

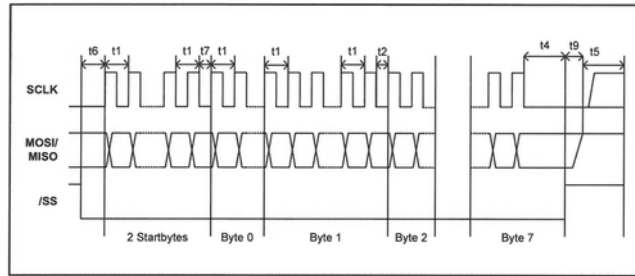
Remark: Above signal timing apply to 10 Bit and 12 Bit version.

Please find the exact specifications of the output signals in the datasheets and applications notes (AS5040 and AS5045) of Austria Microsystems. [www.austriamicrosystems.com](http://www.austriamicrosystems.com)

## Timing SPI- Bus



## Timing SPI- Bus



$t1 > 6,9 \mu s / 2,3 \mu s$  (HS) = Minimum clock period for any bits within a byte

$t2 > 37,5 \mu s / 12,5 \mu s$  (HS) = Minimum time between any other byte

$t4 > 6,9 \mu s / 2,3 \mu s$  (HS) = Time between last clock and /SS=high = chip de-selection

$t5 > 1500 \mu s / 300 \mu s$  (HS) = Minimum /SS=high time where it's guaranteed that a frame resynchronisation will be started.

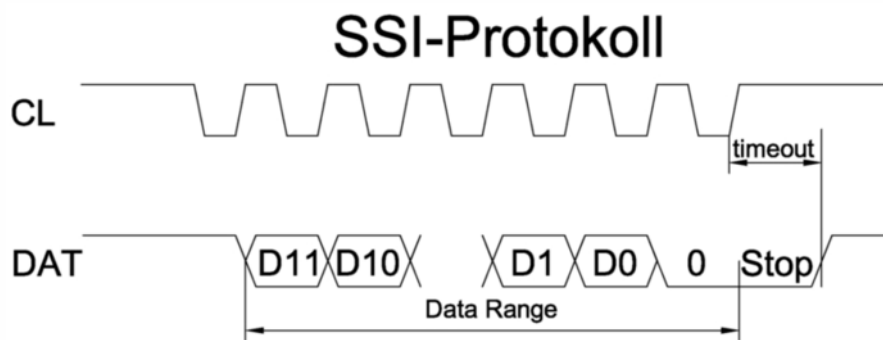
$t6 > 6,9 \mu s / 2,3 \mu s$  (HS) = Minimum time between /SS=low and the first clock edge

$t7 > 45 \mu s / 15 \mu s$  (HS) Minimum time between the StartByte and the Byte 0

$t9 < 1 \mu s$  = Maximum time between /SS=high and MISO Bus High-Impedance

Please find the exact specifications of the output signals in the datasheets and application notes of Melexis (MLX90316): [www.melexis.com](http://www.melexis.com)

## Timing SSI- Interface



Please find the exact specifications of the output signals in the datasheets and application notes of iC-Haus (iC-MH): [www.ichaus.de](http://www.ichaus.de)

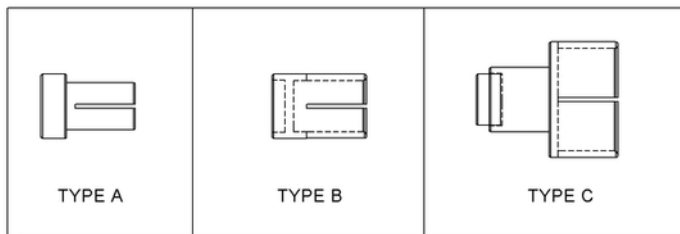
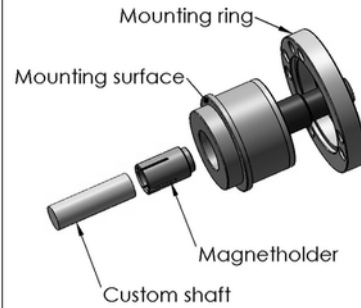
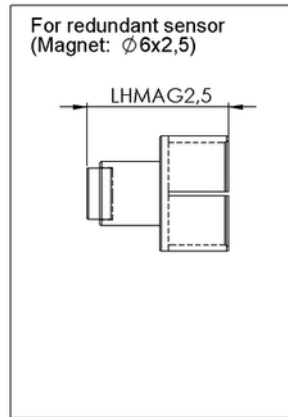
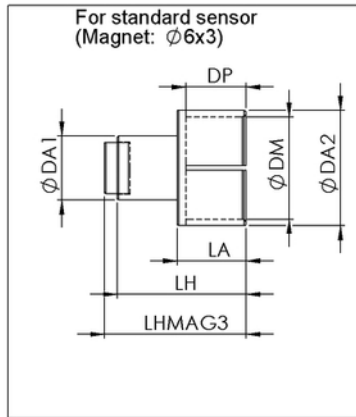
# Series MAB22H / Hall Effect Absolute Encoder

## Order description and Options

Description	Series	Options			
Infiniturn with 22mm housing	MAB22H				
Infiniturn with 22mm housing, redandant	MAB22HX				
<b>Available resolutions for SER- interface (with 3,3V or 5V supply voltage)</b>					
10 bit		10			
12 bit		12			
10 bit high speed		10HS			
12 bit high speed		12HS			
<b>Available resolutions for SSI- Interface (with 5V or 24V supply voltage)</b>					
12 bit		12			
12 bit high speed		12HS			
<b>Available resolutions for SPI- Interface (with 5V supply voltage)</b>					
14 bit		14			
14 bit high speed		14HS			
<b>Available resolutions for redundant SPI- Interface (with 5V supply voltage)</b>					
14 bit		14			
<b>Supply voltage/output signal</b>					
3,3 V ± 9% / SER		3,3 SER			
5 V ± 10% / SER		5 SER			
5 V ± 10% / SSI		5 SSI			
15-30 V / SSI		24 SSI			
5 V ± 10% / SPI		5 SPI			
<b>Optional direction (elec. Anlge 360°)</b>					
					CW360
Standard = CW360, no description necessary					CCW360
Redundant version					C(C)W360/C(C)W360
<b>Cable</b>					
Axial cable outlet (CV) or radial cable outlet (CVR), cable length [m], max. 1m for SER- and SPI- interface (Standard CV 1 m, no description necessary)					CVxx CVRxx
Example standard version:	MAB22H	12	5 SSI		
Infiniturn with 22 mm housing, 12 bit resolution, 5V supply voltage, SSI- interface, direction CW, electrical angle 360°					
Example with options:	MAB22HX	14	5 SPI	CW360/CCW360	CV0,5
Infiniturn with 22 mm housing, redandant output ´s, 14 bit resolution, 5V supply voltage, SPI-interface, section 1: direction CW, electrical angle 360°, Section 2: direction CCW, electrical angle 360°, cable length 0,5 m					

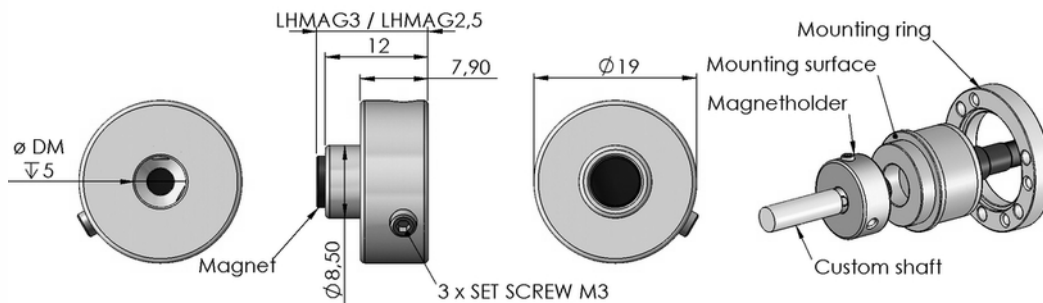
## Accessory (please order separately)

### ACCESSORY PUSH-ON-MAGNETHOLDER



TYPE	DM	DA1	DA2	LH	LA	DP	LHMAG3 analog standard	LHMAG 2,5 analog redundant	shaft diameter =DM (h9)
A	3	7,5	4,5	11	---	8,5	12,5	12	3 +0/-0,030
	3,175	7,5	4,5	11	---	8,5	12,5	12	3,175 +0/-0,030
	4	7,5	5,5	11	---	8,5	12,5	12	4 +0/-0,030
B	6	7,5	7,5	11	---	8,5	12,5	12	6 +0/-0,030
	6,35	7,5	7,5	11	---	8,5	12,5	12	6,35 +0/-0,036
	8	9,5	9,5	11	---	8,5	12,5	12	8 +0/-0,036
	10	11,5	11,5	11	---	8,5	12,5	12	10 +0/-0,036
C	12	7,5	13,5	15	8	7	16,5	12	12 +0/-0,043

### ACCESSORY MAGNETHOLDER WITH SET SCREWS



DM	LHMAG3 standard	LHMAG2,5 redundant	shaft diameter = DM (h9)
4	13	12,5	3 +0/-0,030
6	13	12,5	4 +0/-0,030
6,35	13	12,5	5 +0/-0,036
8	13	12,5	6 +0/-0,036

## Series MAB22H / Hall Effect Absolute Encoder

### Order description

Type	Shaft Ø	Magnet	Comment
Push on magnet holder	3 / 3,175 / 4 / 6 / 6,35 / 8 / 10 / 12	MAG6x3	Standard
Push on magnet holder	3 / 3,175 / 4 / 6 / 6,35 / 8 / 10 / 12	MAG6x2,5x1,5	Redundant Sensor
Magnet holder with set screws	3 / 3,175 / 4 / 6 / 6,35 / 8 / 10 / 12	MAG6x3	Standard
Magnet holder with set screws	3 / 3,175 / 4 / 6 / 6,35 / 8 / 10 / 12	MAG6x2,5x1,5	Redundant Sensor

### Our speciality are customs solutions, economically priced on small series.

On serial demand we offer:

Special magnet holder and other mechanical parts, assembling of cables and connectors and more. Please contact us.

The specifications and information in this data sheet cannot consider all special demands that are caused by the application. Because of this, they are no general description of the properties of the product.

07. August 2012. All specifications are subject to change without notice.