

# Magnetic absolute single-turn encoder BMSH – MAGRES parallel

## features

- robust single-turn encoder up to 12 bit
- parallel interface
- zero-point programmable

## general data

voltage supply	10 - 30 VDC
max. supply current no load	typ. 50 mA (at 24 VDC)
output circuit	parallel 10 - 30 VDC
max. resolution	12 bit (1 step = 5' 16'')
max error limit	±1°
repeatability	0,3°
max. switching frequency	51,2 kHz
input signal	zero (zero setting: < 0,4 V, > 2 ms off state: 3,3 V or open)
direction of rotation	looking at the <b>MAGRES</b> -flange, position counts up as the shaft rotates clockwise (CW)

## mechanical data

max. revolutions	12'000 rpm (mechanical) 6'000 rpm (electrical)
moment of inertia	typ. $12 \times 10^{-7}$ kgm <sup>2</sup>
torque	typ. 0,93 cNm (3'000 rpm / 20 °C / IP 42)
product life	depending on ambient conditions (typ. 10 <sup>9</sup> revolutions)
max. protection class	shaft: IP 65 housing: IP 65
material	housing: steel/aluminum flange: aluminum
weight	approx. 300 g

## ambient conditions

temperature range	-20...+85 °C
relative humidity	max. 95%
vibration	IEC 60068-2-6 (≤ 300 m/s <sup>2</sup> / 10 - 2'000 Hz)
shock	IEC 60068-2-27 (≤ 1'000 m/s <sup>2</sup> / 6 ms)
noise immunity	EN 61000-6-2
emitted interference	EN 61000-6-3



## order designation

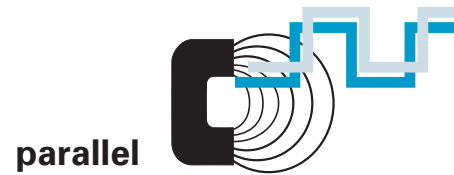
**BMSH 58S1**   **24K12/00**   **5**

  connection  
**5** cable 2 m radial  
 hollowshaft  
**B2** end shaft 12 mm IP 42  
 with clamping ring  
**P2** end shaft 12 mm IP 65  
 with clamping ring  
 resolution  
**12** 12 bit  
 voltage supply/output  
**24K** 10 - 30 VDC push-pull short-circuit  
 protection  
 signal code  
**N** binary code  
**G** Gray code

## accessories

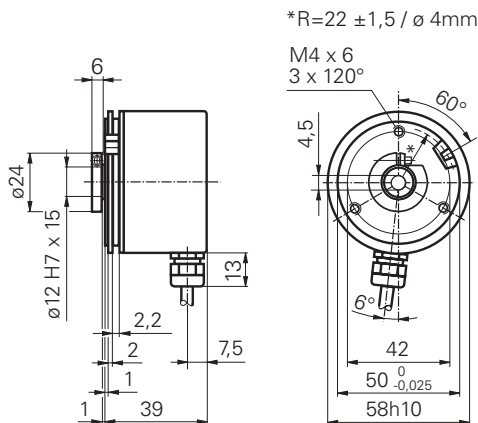
clamp set	part nr. 110616
torque pin	part nr. 107540
torque spring <sup>1)</sup>	part nr. 109520
spring plate	part nr. 136635
coupling and shaft adapter	see chapter accessories
clamping ring set 12 mm hollow shaft	part nr. 142556

<sup>1)</sup> torque spring included



**dimensions**

**-5**



**Note**

Mounting drawings see end of chapter.

**assignment cable**

for connection reference **-5**

cable color	signal	description
brown	+Vs	voltage supply
white	0 V	voltage supply
green	bit 1 LSB	data
yellow	bit 2	data
grey	bit 3	data
pink	bit 4	data
blue	bit 5	data
red	bit 6	data
black	bit 7	data
purple	bit 8	data
grey/pink	bit 9	data
white/green	bit 10	data
brown/green	bit 11	data
yellow/brown	bit 12 MSB	data
white/yellow	<sup>1)</sup> bit 12 MSB inv.	(only Gray code)
red/blue	zero	zero setting input
screen		housing
cable data		16 x 0,14 mm <sup>2</sup>

**direction of rotation**

<sup>1)</sup>The direction of rotation from encoders using a Gray code can be defined by connecting the MSB or inverted MSB. Both signals are available as an output. If the MSB is connected, the encoder counts up as the shaft rotates clockwise. If the MSB inv. is connected, the encoder counts up if the shaft rotates counter clockwise.

# Magnetic absolute single-turn encoder BMSH – MAGRES SSI

## features

- robust single-turn encoder up to 12 bit
- SSI interface
- zero-point programmable

## general data

voltage supply	5 VDC ±10% <b>(05C)</b> 10 - 30 VDC <b>(24C)</b>
max. supply current no load	typ. 100 mA <b>(05C)</b> typ. 50 mA <b>(24C)</b>
output circuit	SSI, RS 422
max. resolution	12 bit (1 steps = 5' 16")
max error limit	±1°
repeatability	0,3°
max. clock frequency	1 MHz
input signal	clock input, zero (zero setting: < 0,4 V, > 2 ms off state: 3,3 V or open)
direction of rotation	looking at the <b>MAGRES</b> -flange, position counts up as the shaft rotates clockwise (CW)

## mechanical data

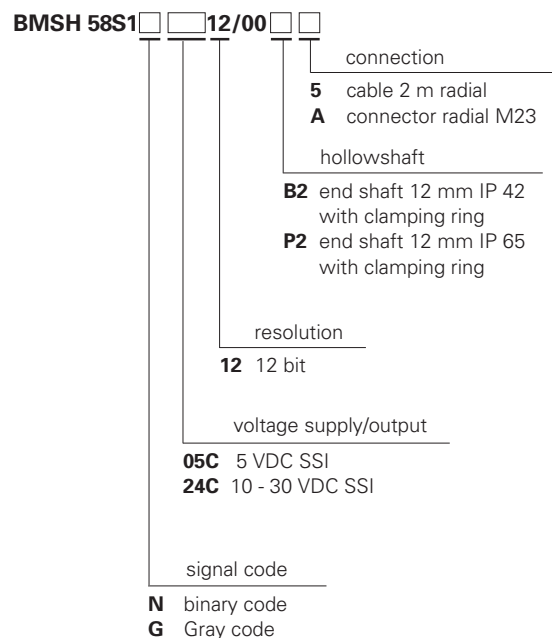
max. revolutions	12'000 rpm (mechanical) 6'000 rpm (electrical)
moment of inertia	typ. 12 x 10 <sup>-7</sup> kgm <sup>2</sup>
torque	typ. 0,93 cNm (3'000 rpm / 20 °C / IP 42)
product life	depending on ambient conditions (typ. 10 <sup>9</sup> revolutions)
max. protection class	shaft: IP 65 housing: IP 65
material	housing: steel/aluminum flange: aluminum
weight	approx. 300 g

## ambient conditions

temperature range	-20...+85 °C
relative humidity	max. 95%
vibration	IEC 60068-2-6 (≤ 300 m/s <sup>2</sup> / 10 - 2'000 Hz)
shock	IEC 60068-2-27 (≤ 1'000 m/s <sup>2</sup> / 6 ms)
noise immunity	EN 61000-6-2
emitted interference	EN 61000-6-3



## order designation



## accessories

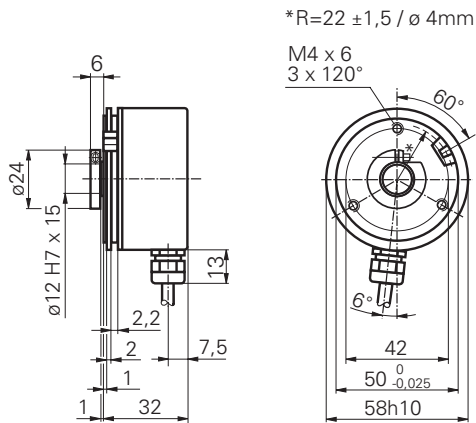
connector M23 female 12-pin reference <b>-A</b>	part nr. 116717
cable with connector M23 female (pre-assembled) ref. <b>-A</b>	
2 m	part nr. 153334
5 m	part nr. 153335
clamp set	part nr. 110616
torque pin	part nr. 107540
torque spring <sup>1)</sup>	part nr. 109520
spring plate	part nr. 136635
coupling and shaft adapter	see chapter accessories
clamping ring set 12 mm hollow shaft	part nr. 142556

<sup>1)</sup> torque spring included



**dimensions and connection dimensions**

**-5**



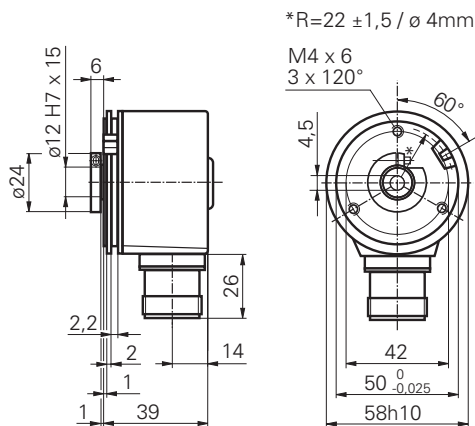
**assignment cable/connector M23 male**

for connection reference **-5**



pin	cable color	signals	description
1	yellow	clock-	clock signal
2	green	clock+	clock signal
3	grey	data+	data signal
4	pink	data-	data signal
5	blue	zero	zero setting
6	-	n.c.	-
7	-	n.c.	-
8	-	n.c.	-
9	red	d.u.	do not use
10	-	n.c.	-
11	brown	+Vs	voltage supply
12	white	0 V	voltage supply
cable data		8 x 0,14 mm <sup>2</sup>	

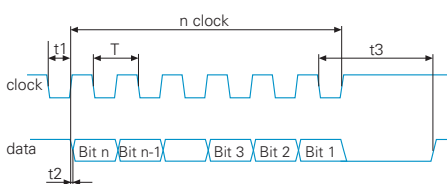
**-A**



**Note**

Mounting drawings see end of chapter.

**read out of position values**



pulse times:

T = 1 µs to 10 µs / t1 = 0,5 to 5 µs

t2 < 0,2 µs / t3 > 12 µs to 25 µs

# Magnetic absolute single-turn encoder BMSH – MAGRES CANopen

## features

- robust single-turn encoder up to 12 bit
- CANopen interface integrated
- programmable resolution and preset values



## general data

voltage supply	10 - 30 V ( <b>24B</b> )
max. supply current no load	typ. 100 mA (at 24 VDC)
output circuit	CAN-Bus, standard ISO/DIS 11898
specification	CAN 2.0B
protocol/profile	CANopen/CIA, DS-301 V4.01, DSP-305 V1.0, DS-406 V3.0
signal code	natural binary-code
resolution	12 bit (1 = 5' 16'')
max error limit	±1°
repeatability	0.3°
max. baud rate	1 Mbit/s
direction of rotation	looking at the flange, position counts up as the shaft rotates clockwise (CW), programmable

## mechanical data

max. revolutions	12'000 rpm (mechanical) 6'000 rpm (electrical)
hollow shaft	∅ 12 mm H7 x 15
moment of inertia	typ. $12 \times 10^{-7}$ kgm <sup>2</sup>
torque	typ. 0,93 cNm (3'000 rpm / 20°C / IP 42)
product life conditions	depending on ambient (typ. 10 <sup>9</sup> rev.)
max. protection class	shaft: IP 65 housing: IP 65
material	housing: steel flange: aluminum
weight	approx. 300 g

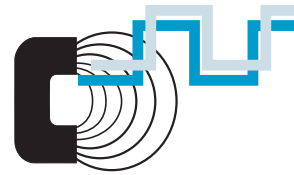
## order designation

**BMSH 58S1N 24B12/00**   **F**

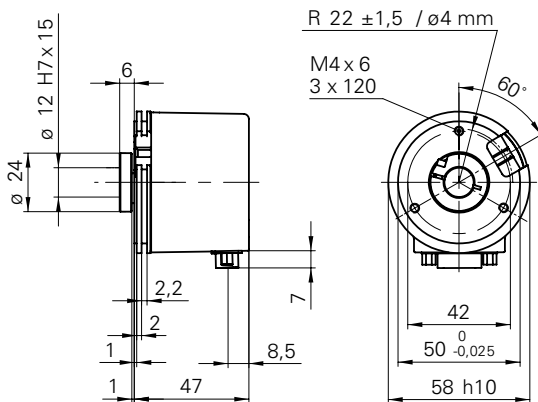
	connection
	<b>F</b> D-Sub connector
	shaft
	<b>B2</b> end shaft 12 mm IP 42 with clamping ring
	<b>P2</b> end shaft 12 mm IP 65 with clamping ring
	resolution
	<b>12</b> 12 bit
	voltage range, output signals
	<b>24B</b> 10 - 30 VDC CANopen
	signal code
	<b>N</b> binary code

## ambient conditions

temperature range	-20...+85 °C
relative humidity	max. 95% non condensing
vibration	IEC 60068-2-6 (≤ 300 m/s <sup>2</sup> / 10 - 2'000 Hz)
shock	IEC 60068-2-27 (≤ 1'000 m/s <sup>2</sup> / 6 ms)
noise immunity	EN 61000-6-2
emitted interference	EN 61000-6-3



**dimensions and connection dimensions**



**assignment connector D-Sub male**

pin	signal	description
1	n.c.	-
2	CAN_L	bus line (dominant LOW)
3	CAN_GND	CAN ground
4	d.u.	do not use RxD
5	d.u.	do not use TxD
6	GND	voltage supply
7	CAN_H	bus line (dominant HIGH)
8	n.c.	-
9	+Vs	voltage supply

**accessories**

clamp set	part nr. 110616
torque pin	part nr. 107540
torque spring <sup>1)</sup>	part nr. 109520
spring plate	part nr. 136635
coupling and shaft adapter	see chapter accessories
CD-ROM with GSD-/EDS-/XML-files and manuals	part nr. 147362
clamping ring set	
12 mm hollow shaft	part nr. 142556

<sup>1)</sup> torque spring included

# Magnetic absolute single-turn encoder BMSH – MAGRES DeviceNet

## features

- robust single-turn encoder up to 12 bit
- DeviceNet interface integrated
- programmable resolution and preset values



## general data

voltage supply	10 - 30 V
max. supply current no load	typ. 100 mA (at 24 VDC)
output circuit	CAN-Bus, standard ISO/DIS 11898
protocol/profile	DeviceNet, Device Profile for Encoders V1.0
signal code	natural binary-code
resolution	12 bit (1 = 5' 16'')
max error limit	±1°
repeatability	0.3°
max. baud rate	500 kbit/s
direction of rotation	looking at the flange, position counts up as the shaft rotates clockwise (CW), programmable

## order designation

**BMSH 58S1N 24D12/00**   **F**

	connection
	<b>F</b> D-Sub connector
	shaft
	<b>B2</b> end shaft 12 mm IP 42 with clamping ring
	<b>P2</b> end shaft 12 mm IP 65 with clamping ring
	resolution
	<b>12</b> 12 bit
	voltage range, output signals
	<b>24D</b> 10 - 30 VDC DeviceNet
	signal code
	<b>N</b> binary code

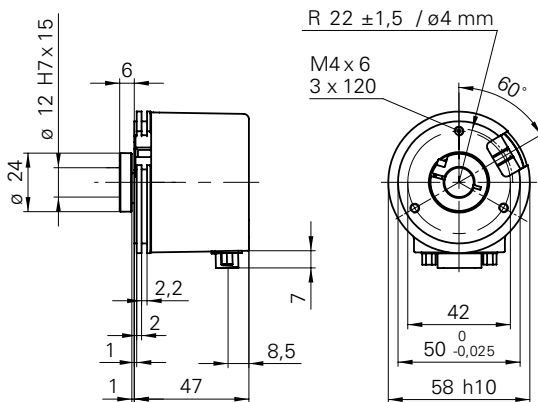
## mechanical data

max. revolutions	12'000 rpm (mechanical) 6'000 rpm (electrical)
hollow shaft	ø 12 mm H7 x 15
moment of inertia	typ. 12 x 10 <sup>-7</sup> kgm <sup>2</sup>
torque	typ. 0,93 cNm (3'000 rpm / 20°C / IP 42)
product life conditions	depending on ambient (typ. 10 <sup>9</sup> rev.)
max. protection class	shaft: IP 65 housing: IP 65
material	housing: steel flange: aluminum
weight	approx. 300 g

## ambient conditions

temperature range	-20...+85 °C
relative humidity	max. 95% non condensing
vibration	IEC 60068-2-6 (≤ 300 m/s <sup>2</sup> / 10 - 2'000 Hz)
shock	IEC 60068-2-27 (≤ 1'000 m/s <sup>2</sup> / 6 ms)
noise immunity	EN 61000-6-2
emitted interference	EN 61000-6-3

**dimensions and connection dimensions**



**assignment connector D-Sub male**

pin	signal	description
1	d.u.	do not use
2	CAN_L	bus line (dominant LOW)
3	CAN_GND	CAN Ground
4	d.u.	do not use
5	CAN_SHLD	CAN shield
6	0 V	voltage supply
7	CAN_H	bus line (dominant HIGH)
8	n.c.	-
9	+Vs	voltage supply

**accessories**

clamp set	part nr. 110616
torque pin	part nr. 107540
torque spring <sup>1)</sup>	part nr. 109520
spring plate	part nr. 136635
coupling and shaft adapter	see chapter accessories
CD-ROM with GSD-/EDS-/XML-files and manuals	part nr. 147362
clamping ring set	
12 mm hollow shaft	part nr. 142556

<sup>1)</sup> torque spring included



# Magnetic absolute single-turn encoder BMSH flexible – *MAGRES* Profibus-DP, CANopen, DeviceNet, EtherCAT

## features

- robust single-turn encoder up to 12 bit
- modular bus cover
- simple mounting via servo flange
- selectable bus parameters
- programmable resolution and preset values

## general data

voltage supply	10 - 30 VDC
max. supply current no load	100 mA (at 24 VDC)
available bus support	CANopen, DeviceNet, Profibus-DP
max. resolution	12 bit (1 step = 5' 16")
max. error limit	±1°
repeatability	0,3°
preset	value programmable within resolution range
address	selectable via dip switches
baud rate	selectable via dip switches
direction of rotation	looking at the <i>MAGRES</i> -flange, position counts up as the shaft rotates clockwise (CW), programmable

## mechanical data

max. revolutions	12'000 rpm (mechanical) 6'000 rpm (electrical)
hollow shaft	ø 12 mm H7 x 20
moment of inertia	12 x 10 <sup>-7</sup> kgm <sup>2</sup>
torque	0,93 cNm rpm (3'000 rpm / 20 °C / IP 42)
product life	dependening on ambient conditions (typ. 10 <sup>9</sup> revolutions)
max. protection class	shaft: IP 65 housing: IP 65
material	housing: steel bus cover: zinc die cast flange: aluminum
weight	approx. 480 g



## order designation

**BMSH 58S1N 24C12/00**  **G** base encoder  
(no bus cover)

**BMSH 58S1N 24**  **12/00**   complete encoder

connection

**D** bus cover with PG radial  
(for Interface **B,D,P**)

**E** bus cover with  
connector M12 radial  
(for Interface **E**)

hollow shaft

**B2** 12 mm IP 42  
with clamping ring

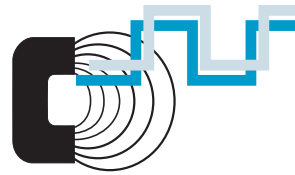
**P2** 12 mm IP 65  
with clamping ring

interface

**B** CANopen  
**D** DeviceNet  
**P** Profibus-DP  
**E** EtherCAT

## ambient conditions

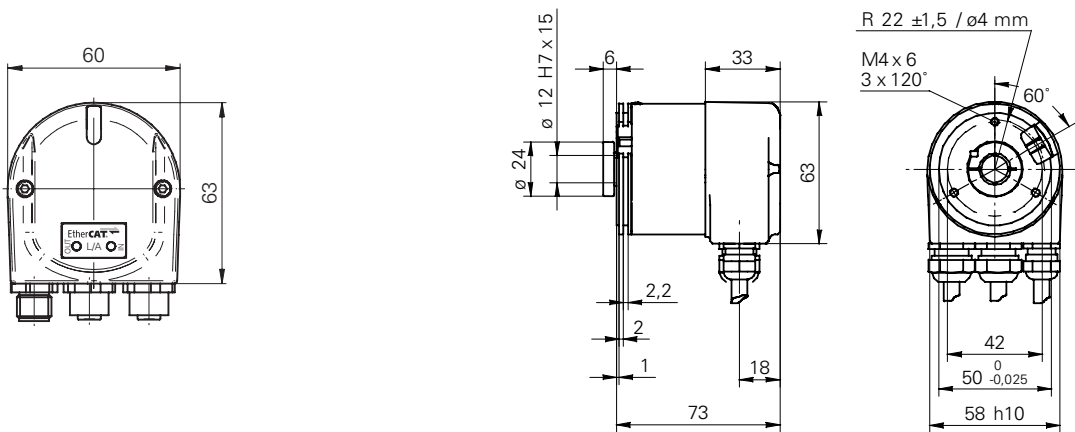
temperature range	-20° to +85 °C
relative humidity	max. 95% non condensing
vibration	IEC 60068-2-6 (≤ 100 m/s <sup>2</sup> / 10 - 2'000 Hz)
shock	IEC 60088-2-27 (≤ 500 m/s <sup>2</sup> / 11 ms)
noise immunity	EN 61000-6-2
emitted interference	EN 61000-6-3



**Profibus-DP, CANopen, DeviceNet, EtherCAT**

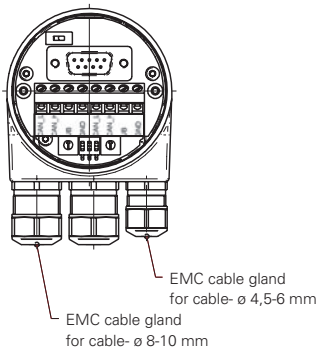
**dimensions**

**-E** bus cover

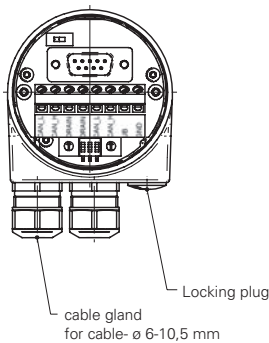


**2**

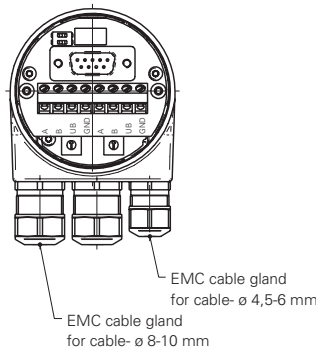
**-B** bus cover



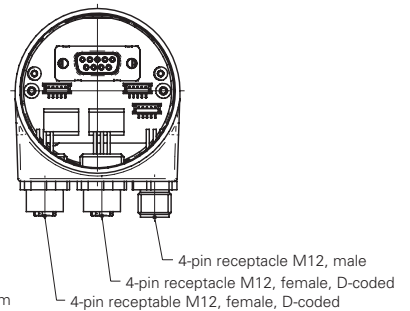
**-D** bus cover



**-P** bus cover



**-E** bus cover



**accessories**

clamp set	part nr. 110616
torque pin	part nr. 107540
torque spring <sup>1)</sup>	part nr. 109520
spring plate	part nr. 136635
bus cover Profibus-DP	see chapter accessories
CANopen	part nr. 140831
DeviceNet	part nr. 140832
EthernetCAT	part nr. 140833
	part nr. 159110

cable EtherCAT M12 male-male, d-coded	
M12 straight, 5 m	part nr. 160565
couplings and shaft adapters	see chapter accessories
CD-ROM with GSD-/EDS-/XML-files and manuals	part nr. 147362
clamping ring set	part nr. 142556
12 mm hollow shaft	

<sup>1)</sup> torque spring included