

## HMG10P-B - SSI

Blind hollow shaft or cone shaft (1:10) / ST and MT 20 bit

Speed switch, SSI absolut value, number of pulses and switching speed freely programmable

### Overview

- Magnetic sensing method
- Singleturn/multiturn 20 bit programmable
- Function display via LEDs
- Multiturn sensing with Energy Harvesting technology "MicroGen", without gear or battery
- Two-sided bearing system with hybrid bearings
- Special protection against corrosion CX (C5-M)



Picture similar

**HUBNER**  
BERLIN  
A Baumer Brand

**microGen**  
Energy Harvesting

### Technical data

#### Technical data - electrical ratings

Voltage supply	4.75...30 VDC
Short-circuit proof	Yes
Consumption w/o load	≤100 mA (SSI)
Initializing time	≤ 500 ms after power on
Interface	SSI
Steps per revolution	1048576 / 20 bit
Number of revolutions	1048576 / 20 bit
Additional outputs	Square-wave TTL/HTL, TTL/RS422
Sensing method	Magnetic
Code	Gray (fact. setting) or binary
Code sequence	CW (fact. setting), programmable
Input signals	SSI clock, PRESET, rotating direction
Interference immunity	EN 61000-6-2
Emitted interference	EN 61000-6-3
Programming interface	RS485 (≤600 m)
Programmable parameters	Resolution singleturn and multiturn (SSI), binary or gray code (SSI), additional output (no. of pulses), switch-off and switch-on speeds
Diagnostic function	Function control
Status indicator	4 LEDs in device back side
Approval	CE UL approval / E217823 EAC

#### Technical data - electrical ratings (speed switch)

Switching accuracy	± 2 % (or 1 Digit)
Switching outputs	1 output (Open collector, solid state relay on request)

#### Technical data - electrical ratings (speed switch)

Output switching capacity	30 VDC; ≤100 mA
Switching delay time	≤20 ms

#### Technical data - mechanical design

Size (flange)	ø105 mm
Shaft type	ø16...20 mm (blind hollow shaft) ø17 mm (cone shaft 1:10)
Flange	Support plate, 360° freely positionable
Protection EN 60529	IP 66/IP 67
Operating speed	≤12000 rpm
Range of switching speed	ns (off) = ±2...12000 rpm, factory setting 6000 rpm
Operating torque typ.	10 Ncm
Rotor moment of inertia	950 gcm <sup>2</sup>
Admitted shaft load	≤450 N axial ≤650 N radial
Material	Housing: aluminium alloy Shaft: stainless steel
Corrosion protection	IEC 60068-2-52 Salt mist for ambient conditions CX (C5-M) according to ISO 12944-2
Operating temperature	-40...+95 °C
Relative humidity	95 % non-condensing
Resistance	IEC 60068-2-6 Vibration 30 g, 10-2000 Hz IEC 60068-2-27 Shock 400 g, 1 ms
Weight approx.	1.6 kg (depending on version)
Connection	Terminal box Flange connector M23

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### Optional

- Integrated speed switch programmable
- Additional outputs incremental programmable

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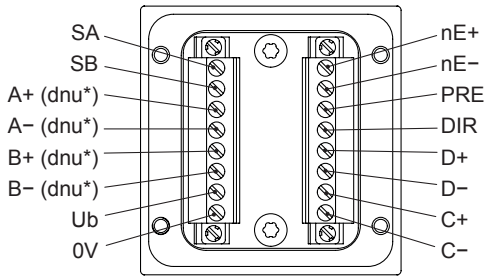
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## Terminal assignment

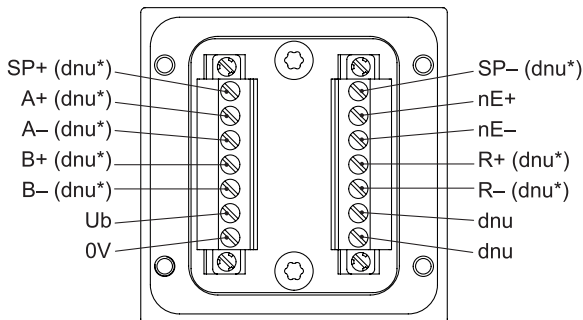
### View A (see dimension)

Connecting terminal terminal box  
SSI / programming interface / additional output I (HTL, TTL)  
\* Assignment depends on encoder version



### View B (see dimension)

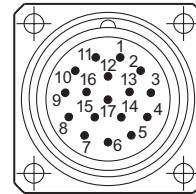
Connecting terminal terminal box  
Speed switch / additional output II (HTL, TTL)  
\* Assignment depends on encoder version



## Terminal assignment

### View C (see dimension)

Assignment flange connector  
SSI / programming interface / additional output I (HTL, TTL)  
\* Assignment depends on encoder version



Flange socket M23  
(male, 17-pin),  
CW

Pin	Assignment
1	nE-
2	DIR
3	SB
4	nE+
5	PRE
6	SA
7	Ub
8	C+
9	C-
10	0V
11	Internal shield
12	B+ (dnu*)
13	B- (dnu*)
14	D+
15	A+ (dnu*)
16	A- (dnu*)
17	D-

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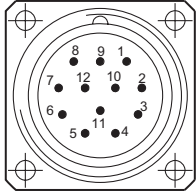
## Terminal assignment

**View D** (see dimension)

Assignment flange connector

Speed switch / additional output II (HTL, TTL)

\* Assignment depends on encoder version



Flange socket M23  
(male, 12-pin),  
CW

Pin	Assignment
1	B- (dnu*)
2	nE-
3	R+ (dnu*)
4	R- (dnu*)
5	A+ (dnu*)
6	A- (dnu*)
7	SP+ (dnu*)
8	B+ (dnu*)
9	SP- (dnu*)
10	0V
11	nE+
12	Ub

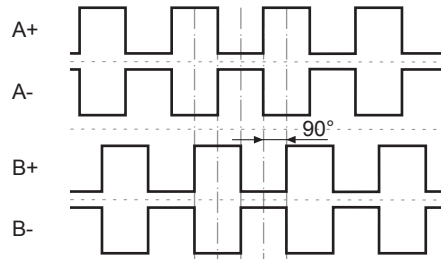
## Terminal significance

Ub	Voltage supply
0V	Ground
A+	Output signal channel 1
A-	Output signal channel 1 inverted
B+	Output signal channel 2 (offset by 90° to channel 1)
B-	Output signal channel 2 inverted
R+	Zero pulse (reference signal)
R-	Zero pulse inverted
nE+	System OK+ / error output
nE-	System OK_ / error output inverted
PRE	PRESET/RESET
DIR	Rotating direction
SP+	DSL_OUT1 / speed switch (Open collector, solid state relay on request)
SP-	DSL_OUT2 / speed switch (0V, solid state relay on request)
SA	RS485+ / programming interface
SB	RS485- / programming interface
D+	SSI data+
D-	SSI data-
C+	SSI clock+
C-	SSI clock-
dnu	Do not use

## Output signals

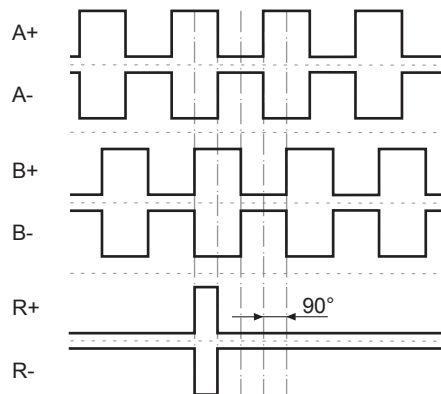
### Additional output I (HTL/TTL)

At positive rotating direction (see dimension)



### Additional output II (HTL/TTL)

At positive rotating direction (see dimension)



## Trigger level

### Incremental HTL/TTL

Electrically isolated:

The output TTL/HTL ( $V_{in} = V_{out}$ ) at the additional output II is electrically isolated and requires a separate power supply.

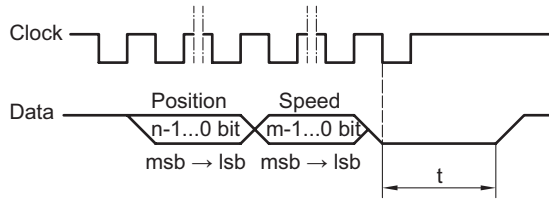
Trigger level	TTL/RS422
High / Low	$\geq 2.5 \text{ V} / \leq 0.5 \text{ V}$
Transmission length	$\leq 550 \text{ m @ } 100 \text{ kHz}$
Output frequency	$\leq 600 \text{ kHz}$
Trigger level	TTL/HTL ( $V_{in} = V_{out}$ )
High / Low	$\geq 2.5 \text{ V} / \leq 0.5 \text{ V (TTL)}$ $\geq U_b - 3 \text{ V} / \leq 1.5 \text{ V (HTL)}$
Transmission length	$\leq 550 \text{ m @ } 100 \text{ kHz (TTL)}$ $\leq 350 \text{ m @ } 100 \text{ kHz (HTL)}$
Output frequency	$\leq 600 \text{ kHz (TTL); } \leq 350 \text{ kHz (HTL)}$

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## Data transfer



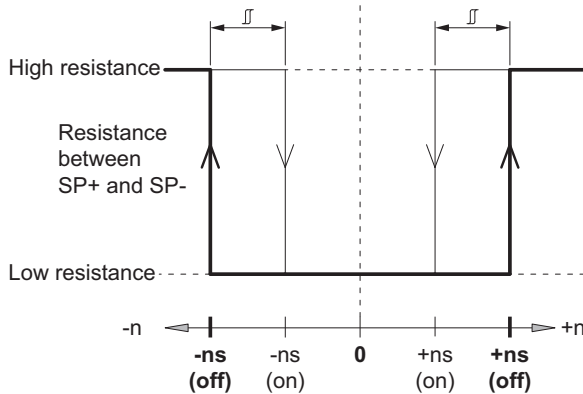
Clock frequency 100 kHz...2 MHz

Monoflop time (t) 20  $\mu$ s (internal)

n, m Number of bits

For continuous clocking, the SSI word is transmitted only once followed by zero values (no ring register operation).

## Switching characteristics speed switch



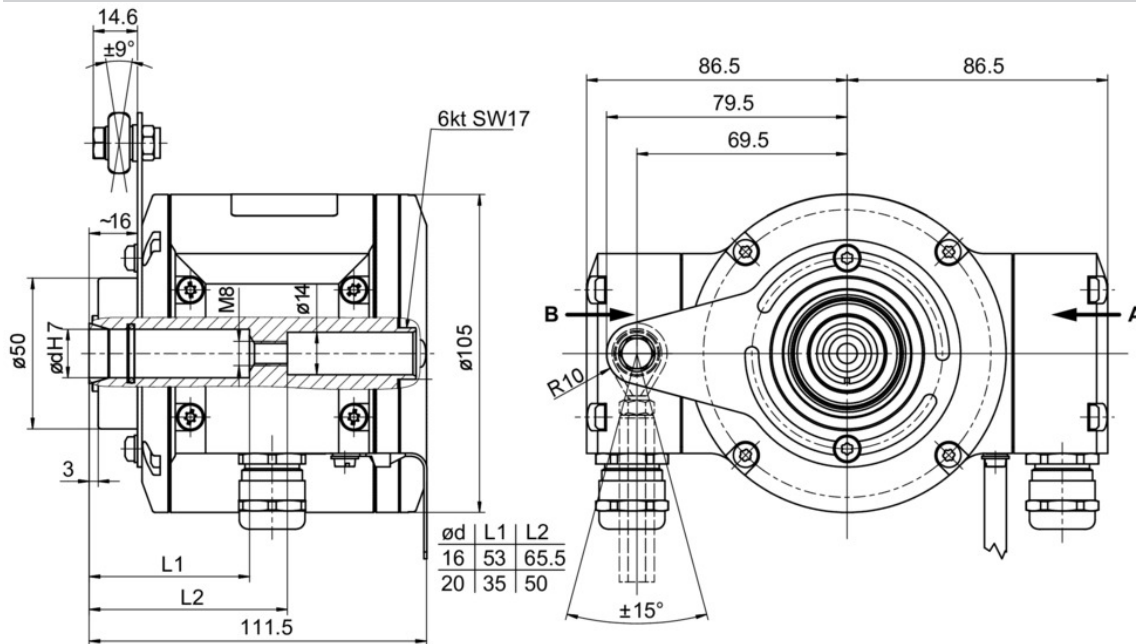
n	Speed
<b>+ns (off)</b>	Switch-off speed at shaft rotation in positive rotating direction ( <i>see dimension</i> ).
<b>-ns (off)</b>	Switch-off speed at shaft rotation in negative rotating direction ( <i>see dimension</i> ).
	Switching hysteresis $\Delta$ : 10...100 % (factory setting = 10 % min. 1 Digit)
<b>+ns (on)</b>	Switch-on speed at shaft rotation in positive rotating direction ( <i>see dimension</i> ).
<b>-ns (on)</b>	Switch-on speed at shaft rotation in negative rotating direction ( <i>see dimension</i> ).

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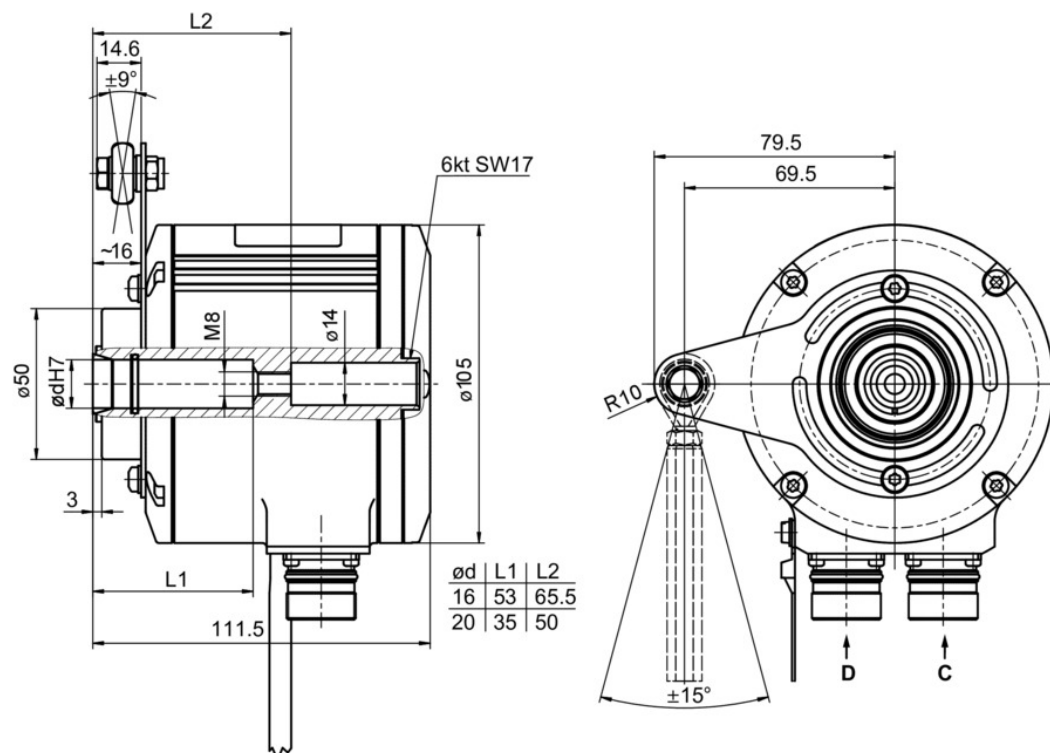
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## Dimensions



Blind hollow shaft with terminal box



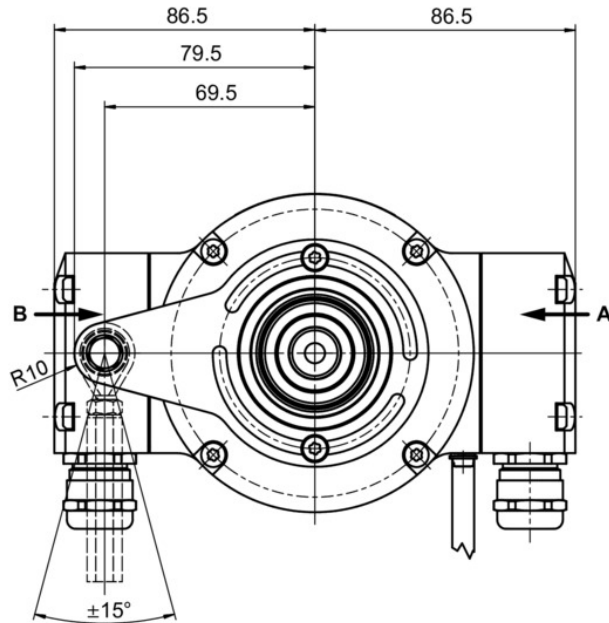
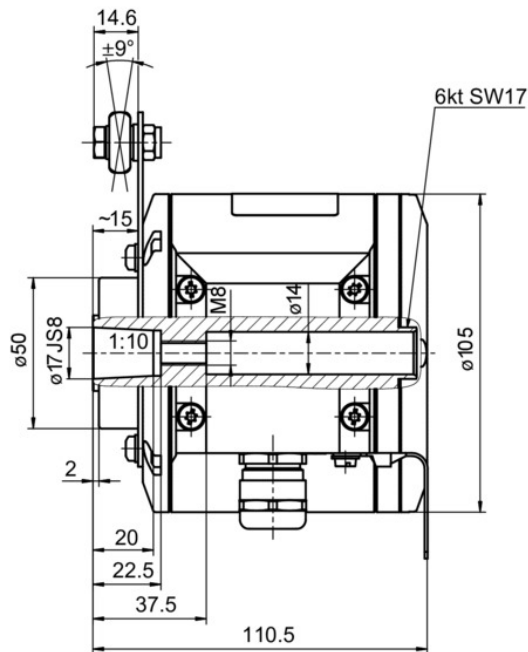
Blind hollow shaft with connector M23

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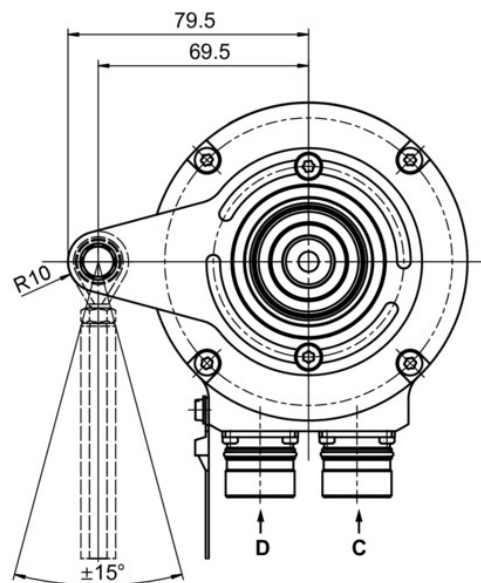
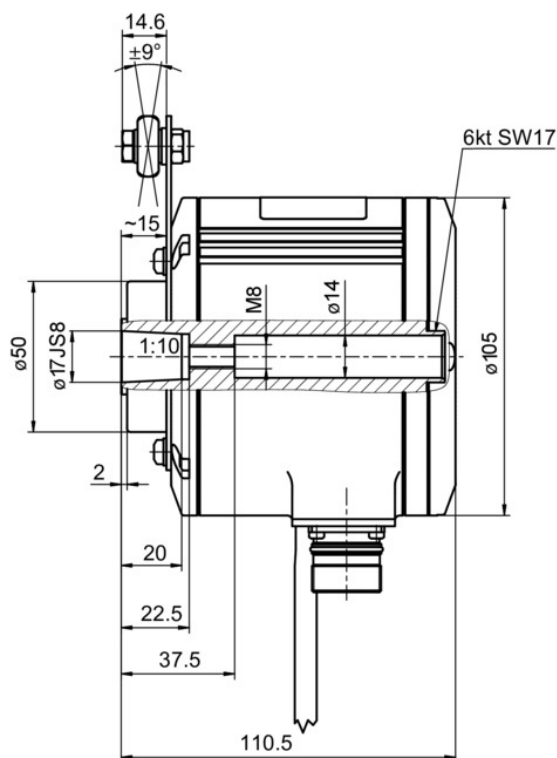
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## Dimensions



Cone shaft with terminal box



Cone shaft with connector M23

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**Ordering reference**

	HMG10P	#	-	B	H	#	.	#	#	UG	#	.	#	0	#	#	#
<b>Product</b>	HMG10P																
Absolute encoder	HMG10P																
<b>Digital speed switch</b>																	
With <sup>(1)</sup>				D													
Without				-													
<b>Shaft type</b>																	
Blind hollow shaft					B												
<b>Flange (Hollow shaft)</b>																	
Support (Support plate) for torque arm, hybrid bearings						H											
<b>Protection class</b>																	
IP 66 and IP 67, optimized for dusty, abrasive environment																	D
IP 66 and IP 67, optimized for oily, wet environment																	L
<b>Blind hollow shaft</b>																	
Ø16 mm, central screw																	6
Ø17 mm cone 1:10, central screw																	7
Ø20 mm, central screw																	Z
<b>Connection</b>																	
Terminal box radial, cable gland M20																	2
Terminal box 2x radial, cable gland M20																	M
Flange socket radial, M23, 17 pin, male, CW																	G
Flange socket radial, 1x M23, 17 pin, male, CW + 1x M23, 12 pin, male, CW																	S
Flange socket radial, 1x M23, 17 pin, male, CW + 1x M23, 12 pin, male, CCW																	V
<b>Supply voltage</b>																	
4,75...30 VDC, SSI Gray <sup>(2)</sup>																	UG
<b>Resolution singleturn position</b>																	
No position signal																	0
13 Bit <sup>(2)</sup>																	3
<b>Resolution multiturn position</b>																	
No multiturn signal																	0
16 Bit <sup>(2)</sup>																	6
<b>Resolution speed</b>																	
No speed signal <sup>(2)</sup>																	0
<b>Resolution supplement I</b>																	
No additional output I																	0
1024 ppr TTL/HTL push-pull (Vin=Vout), 4 channels <sup>(2)</sup>																	5
1024 ppr TTL (RS422), 4 channels <sup>(2)</sup>																	6
<b>Resolution supplement II</b>																	
No additional output II																	0
1024 ppr TTL/HTL push-pull (Vin=Vout), 6 channels, electrically isolated <sup>(2)</sup>																	5
1024 ppr TTL (RS422), 6 channels <sup>(2)</sup>																	6
<b>Operating temperature</b>																	
-40...+85 °C																	A
-40...+95 °C																	G

(1) Switching speed 6000 rpm / factory setting, programmable

(2) Factory setting, programmable

 It may happen that not all variants of the type code can be combined. Any restrictions can be found in the web configurator at [www.baumer.com](http://www.baumer.com) or on request.



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### Accessories

#### Mounting accessories

11043628	Torque arm M6, length 67...70 mm
11004078	Torque arm M6, length 120...130 mm ( $\geq 71$ mm)
11002915	Torque arm M6, length 425...460 mm ( $\geq 131$ mm)
11054917	Torque arm M6 insulated, length 67...70 mm
11072795	Torque arm M6 insulated, length 120...130 mm ( $\geq 71$ mm)
11082677	Torque arm M6 insulated, length 425...460 mm ( $\geq 131$ mm)
11077197	Mounting kit for torque arm size M6 and earthing strap
11077087	Mounting and dismounting set

#### Connectors and cables

	Sensor cable for encoders HEK 8
	Sensor cable for encoders HEK 17
11068577	Mating connector M23, solder version, 12-pin, CCW
11068551	Mating connector M23, solder version, 17-pin, CCW
11172482	Mating connector M23 (11 pins assigned) 17-pin, CCW with sensor cable HEK 17, length 1 m
11172481	Mating connector M23 (11 pins assigned) 17-pin, CCW with sensor cable HEK 17, length 3 m
11172499	Mating connector M23 (11 pins assigned) 17-pin, CCW with sensor cable HEK 17, length 5 m
11172580	Mating connector M23 (11 pins assigned) 17-pin, CCW with sensor cable HEK 17, length 10 m
11172463	Mating connector M23 (17 pins assigned) 17-pin, CCW with sensor cable HEK 17, length 3 m
11191143	Programming cable for the HMG10P/PMG10P SSI series with flange connector/s
11191144	Programming cable for HMG10P/PMG10P (SSI) with terminal box

#### Programming accessories

11190106	Z-PA.SDL.1 - WLAN-Adapter
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