

HMG10P-B - CANopen®

Blind hollow shaft or cone shaft (1:10) / CANopen® / 13 bit ST / 16 bit MT
Speed switch, number of pulses and switching speed freely programmable

Overview

- Interface CANopen®
- Magnetic sensing method
- Resolution: singleturn 13 bit, multiturn 16 bit
- 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 | 10...30 VDC |
| Short-circuit proof | Yes |
| Consumption w/o load | ≤200 mA |
| Initializing time | ≤ 500 ms after power on |
| Interface | CANopen® |
| Function | Multiturn |
| Transmission rate | 10 ... 1000 kBaud |
| Device address | Rotary switches in bus connecting box |
| Steps per revolution | 8192 / 13 bit |
| Number of revolutions | 65536 / 16 bit |
| Additional outputs | Square-wave TTL/HTL, TTL/RS422 |
| Sensing method | Magnetic |
| Interference immunity | EN 61000-6-2 |
| Emitted interference | EN 61000-6-3 |
| Programming interface | RS485 (≤600 m) |
| Programmable parameters | Bus system: see bus features Additional output (number of pulses), switch-off and switch-on speeds |
| Diagnostic function | Position or parameter error |
| Status indicator | DUO-LED (bus connecting box) 4 LEDs in device back side |
| Approval | CE UL approval / E217823 |

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 | ≤6000 rpm |
| Range of switching speed | ns (off) = ±2...6000 rpm, factory setting 6000 rpm |
| Operating torque typ. | 10 Ncm |
| Rotor moment of inertia | 950 gcm ² |
| 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) accord- ing to ISO 12944-2 |
| Operating temperature | -40...+85 °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. | 2.2 kg (depending on version) |
| Connection | Bus connecting box Terminal box incremental |

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Optional

- Integrated speed switch programmable
- Additional output incremental programmable

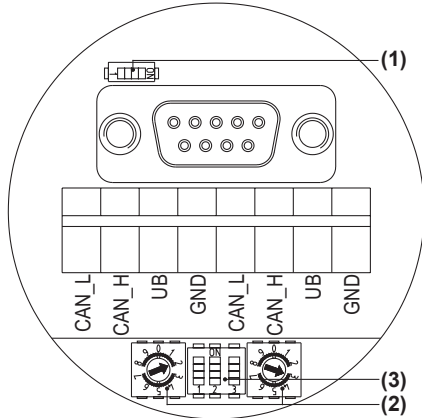
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Terminal assignment

CANopen - View A (see dimension)

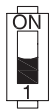
View inside bus connecting box CANopen®



Terminals of the same significance are internally connected and identical in their functions. Max. load on the internal terminal connections UB-UB and GND-GND is 1 A each.

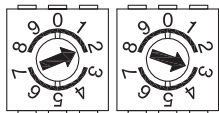
Terminating resistor (1)

ON = Last user
OFF = User x

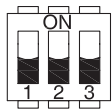


User address (2)

Defined by rotary switch.
Example: User address 23



CANopen - Transmission rate (3)



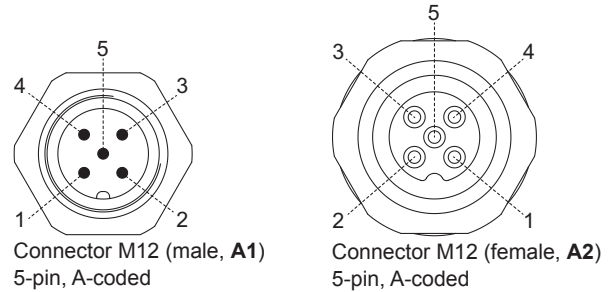
| Transmission rate | Setting DIP switches | | |
|-------------------|----------------------|-----|-----|
| | 1 | 2 | 3 |
| 10 kBaud | OFF | OFF | OFF |
| 20 kBaud | OFF | OFF | ON |
| 50 kBaud* | OFF | ON | OFF |
| 125 kBaud | OFF | ON | ON |
| 250 kBaud | ON | OFF | OFF |
| 500 kBaud | ON | OFF | ON |
| 800 kBaud | ON | ON | OFF |
| 1000 kBaud | ON | ON | ON |

* Factory setting

Terminal assignment

CANopen - View A1 and A2 (see dimension)

View into connector



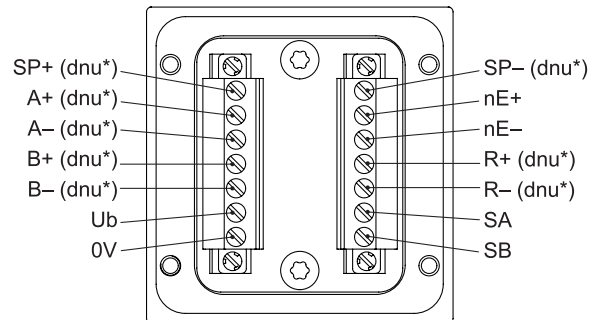
| Pin | Connection |
|-----|------------|
| 1 | GND |
| 2 | UB |
| 3 | GND |
| 4 | CAN_H |
| 5 | CAN_L |

Terminals of the same significance are internally connected and identical in their functions. Max. load on the internal terminal connections GND-GND is 1 A each.

View B (see dimension)

Connecting terminal terminal box
Programming interface / speed switch /
additional output II (HTL, TTL)

* Assignment depends on encoder version



Terminal significance

CANopen®

| Connection | Description |
|------------|--------------------------------|
| GND | Ground for UB |
| UB | Voltage supply 10...30 VDC |
| CAN_H | CAN Bus signal (dominant HIGH) |
| CAN_L | CAN Bus signal (dominant LOW) |

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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 |
| 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 |
| dnu | Do not use |

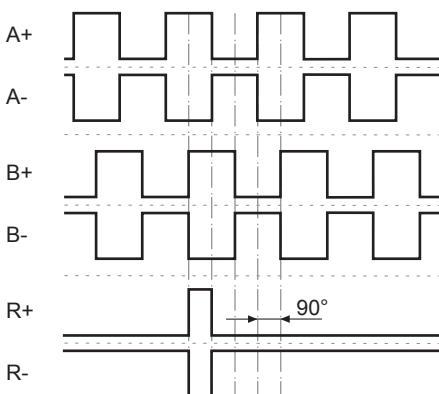
CANopen® features

| | |
|-----------------|--|
| Bus protocol | CANopen® |
| Features | Device Class 2 CAN 2.0B |
| Device profile | CANopen® CiA DSP 406, V 3.0 |
| Operating modes | <ul style="list-style-type: none"> ■ Polling mode (asynch, via SDO) ■ Cyclic mode (asynch-cyclic) ■ Synch mode (synch-cyclic) ■ Acyclic mode (synch-acyclic) |
| Diagnosis | The encoder supports the following error warnings: <ul style="list-style-type: none"> ■ Position error |
| Factory setting | User address 00 |

Output signals

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 | $\leq 600 \text{ kHz}$ |

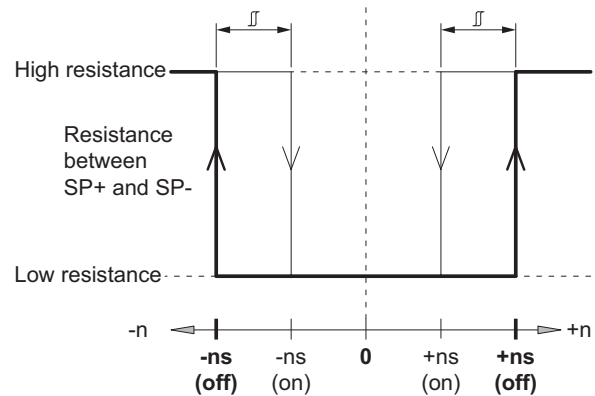
| | |
|----------------------|--|
| Trigger level | TTL/HTL ($V_{in} = V_{out}$) |
| High / Low | $\geq 2.5 \text{ V} / \leq 0.5 \text{ V}$ (TTL) $\geq U_b - 3 \text{ V} / \leq 1.5 \text{ V}$ (HTL) |

| | |
|---------------------|--|
| 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) |
|------------------|--|

Switching characteristics

Speed switch

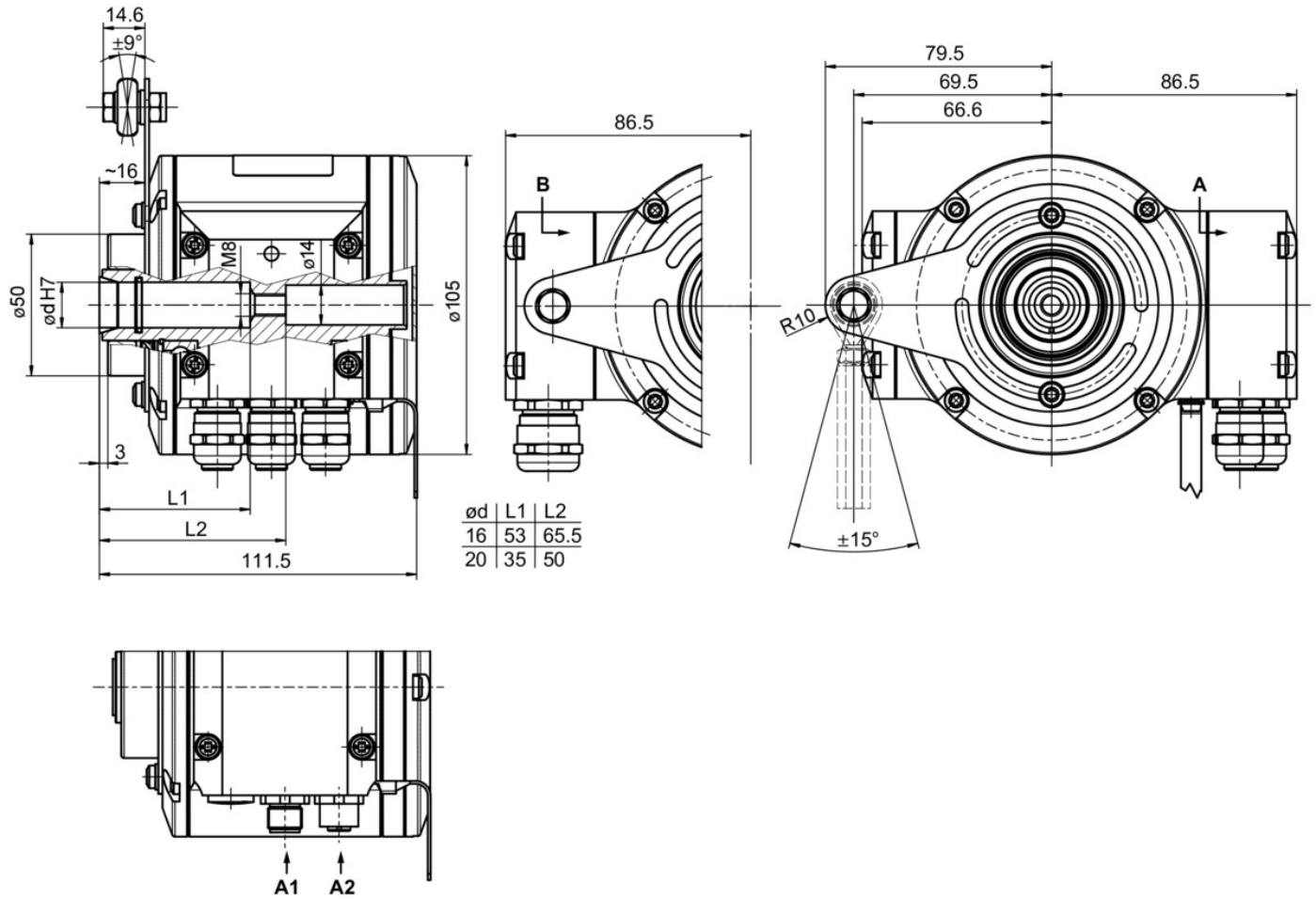


| | |
|-----------|--|
| n | Speed |
| +ns (off) | Switch-off speed at shaft rotation in positive rotating direction (see dimension). |
| -ns (off) | Switch-off speed at shaft rotation in negative rotating direction (see dimension). |
| | Switching hysteresis Δ : 10...100 % (factory setting = 10 % min. 1 Digit) |
| +ns (on) | Switch-on speed at shaft rotation in positive rotating direction (see dimension). |
| -ns (on) | Switch-on speed at shaft rotation in negative rotating direction (see dimension). |

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Dimensions

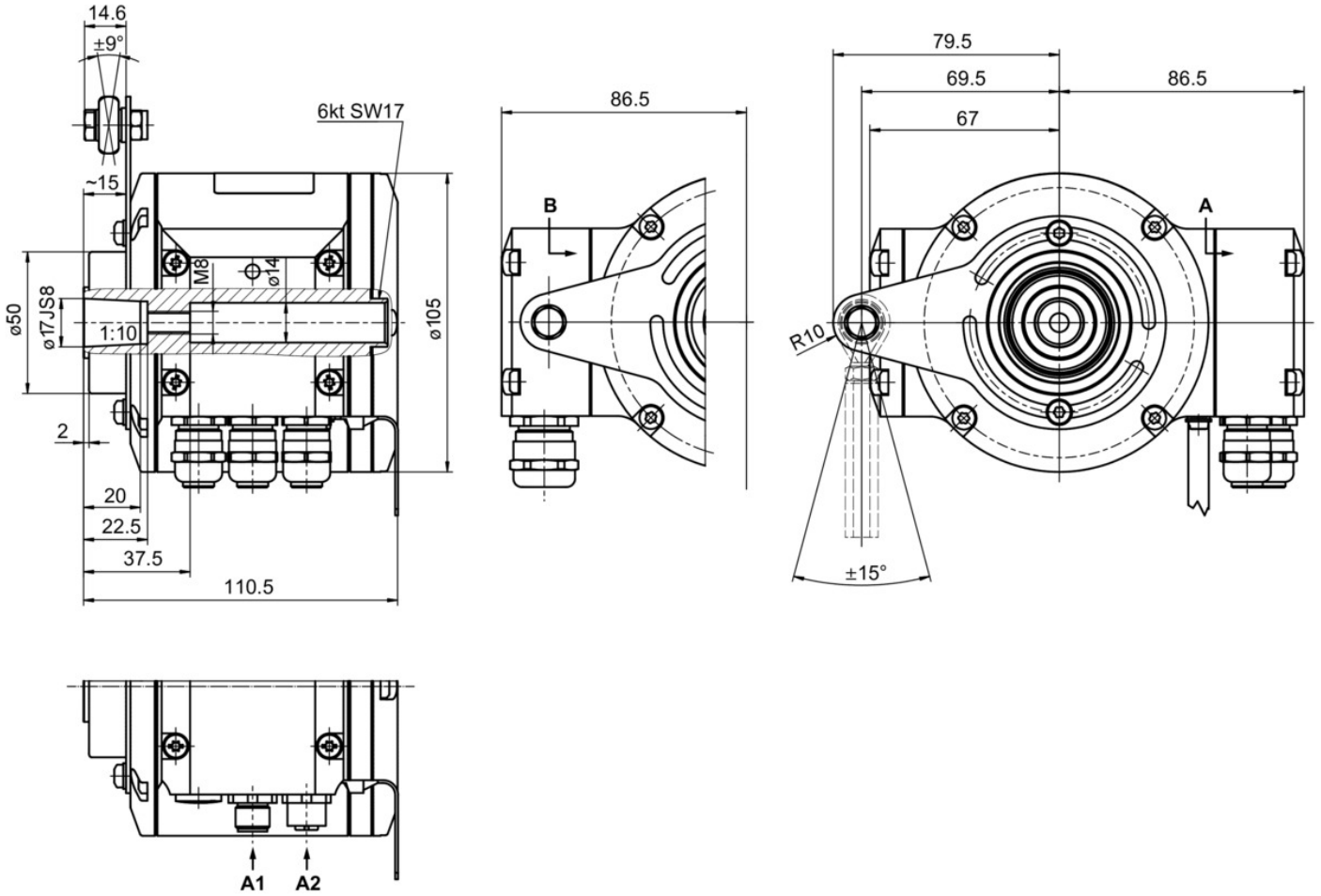


Blind hollow shaft with terminal box

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Dimensions



Cone shaft with terminal box

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Speed switch, number of pulses and switching speed freely programmable

Ordering reference

| | HMG10P | # | - | B | H | # | . | # | # | C6 | 3 | . | # | 0 | 0 | # | A |
|--|--------|---|---|---|---|---|---|---|---|----|---|---|---|---|---|---|---|
| Product | HMG10P | | | | | | | | | | | | | | | | |
| Absolute encoder | HMG10P | | | | | | | | | | | | | | | | |
| Digital speed switch | | | | | | | | | | | | | | | | | |
| Without | | | - | | | | | | | | | | | | | | |
| With | | | D | | | | | | | | | | | | | | |
| Shaft type | | | | | | | | | | | | | | | | | |
| Blind hollow shaft | | | | B | | | | | | | | | | | | | |
| Flange (Hollow shaft) | | | | | | | | | | | | | | | | | |
| Support (Support plate) for torque arm, hybrid bearings | | | | | H | | | | | | | | | | | | |
| Protection class | | | | | | | | | | | | | | | | | |
| IP 66 and IP 67, optimized for dusty, abrasive environment | | | | | | D | | | | | | | | | | | |
| IP 66 and IP 67, optimized for oily, wet environment | | | | | | L | | | | | | | | | | | |
| Blind hollow shaft | | | | | | | | | | | | | | | | | |
| Ø16 mm, central screw | | | | | | | | 6 | | | | | | | | | |
| Ø17 mm cone 1:10, central screw | | | | | | | | 7 | | | | | | | | | |
| Ø20 mm, central screw | | | | | | | | Z | | | | | | | | | |
| Connection | | | | | | | | | | | | | | | | | |
| Bus connecting box with 3 cable glands M16, radial + terminal box with 1 cable gland M20, radial | | | | | | | | | F | | | | | | | | |
| Bus connecting box with 2 connectors M12, radial + terminal box with 1 cable gland M20, radial | | | | | | | | | Z | | | | | | | | |
| Supply voltage (field bus) | | | | | | | | | | | | | | | | | |
| 10...30 VDC, CANopen (DS 406) | | | | | | | | | | C6 | | | | | | | |
| Resolution singleturn position | | | | | | | | | | | | | | | | | |
| 13 Bit | | | | | | | | | | | 3 | | | | | | |
| Resolution multiturn position | | | | | | | | | | | | | | | | | |
| No multiturn signal | | | | | | | | | | | | | 0 | | | | |
| 16 Bit | | | | | | | | | | | | | 6 | | | | |
| Resolution speed | | | | | | | | | | | | | | | | | |
| No speed signal | | | | | | | | | | | | | | 0 | | | |
| Resolution supplement I | | | | | | | | | | | | | | | | | |
| No additional output I | | | | | | | | | | | | | | | | 0 | |
| Resolution supplement II | | | | | | | | | | | | | | | | | |
| No additional output II | | | | | | | | | | | | | | | | | 0 |
| 1024 ppr TTL/HTL push-pull (Vin=Vout), 6 channels, electrically isolated | | | | | | | | | | | | | | | | | 5 |
| 1024 ppr TTL (RS422), 6 channels | | | | | | | | | | | | | | | | | 6 |
| Operating temperature | | | | | | | | | | | | | | | | | |
| -40...+85 °C | | | | | | | | | | | | | | | | | A |

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

(2) Factory setting, programmable

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Accessories

Mounting accessories

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

Programming accessories

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