SeGMo-Positioning
Compact positioning drive for installation situations with little space

Technical information

General
The SeGMo-Positioning forms a compact mechatronic unit comprising a brushless DC motor, a 32-bit microprocessor, a compact power amplifier and a powerful gear, as well as a magnetic multiturn encoder. Active system protection against thermal overload and comprehensive system software allow load-dependent duty cycles well above 25 %. The rigid aluminium housing with its high degree of protection (IP 67) is suitable for a wide range of applications in various industrial areas.

Features
- Nominal torque
  - Housing size K 2.5 Nm at 70 min⁻¹ (Duty cycle 25 %)
  - Housing size L 5 Nm at 70 min⁻¹ (Duty cycle 25 %)
- Aluminium housing, anodised
- Operating temperature -10 °C to +60 °C
- BLDC motor
- Magnetic multiturn encoder
  - Detection range: 342 turns, also in de-energised state
- Degree of protection IP 67
- CANopen (CiA 402), further interfaces via SeGMo-Box
- Optionally with cULus component recognition

Advantages
- Extremely compact for installation situations with little space
- Monitoring of important system parameters ensures reliable operation (overload protection)
- Ready for use immediately after power on due to absolute multiturn position detection
- Maintenance-free due to sealed-for-life lubrication

Fields of application
- Packaging machines
- Food and bottling plants
- Wood and plastic working machines
- General mechanical and plant engineering
Description

System concept
The positioning drives belong to the product group SeGMo-Positioning and are a component of the SeGMo-System.
Each positioning drive in the GEL 6109 series is an intelligent adjustment unit for pushing onto the end of a shaft or for attachment to a shaft or spindle.
The positioning drive is designed for usage with the SeGMo-Box and can therefore be integrated into a plant control system.

SeGMo-System
The SeGMo-System is suitable for the efficient integration of several positioning drives in a machine or plant. The system consists of the following components:

- SeGMo-Positioning: Positioning drive for fully automatic format adjustment
- SeGMo-Motion: Positioning drive for cyclic operation
- SeGMo-Box: Decentral control unit for up to 5 drives
- SeGMo-Connect: Single cable concept (hybrid cable suitable for drag chain)
- SeGMo-Lib: Ready-made function blocks for integration in the machine control system
- SeGMo-Support Tool: Software for advanced commissioning and configuration

The usage of SeGMo-Box and SeGMo-Connect significantly reduces the cabling effort for the positioning drives. Instead of the usual two separate cables for internal bus communication and a third cable to supply power to the positioning drives, only ONE hybrid cable suitable for use in drag chains is connected. In the maximum configuration with 5 positioning drives connected, the number of cables typically reduces from 15 to 5 due to SeGMo-Connect.
With the aid of the SeGMo-Box the overall system offers a high degree of flexibility during integration, as it supports all common communication interfaces.
Construction
The positioning drive is operated with a supply voltage of 24 V DC and is connected using the hybrid cable SeGMo-Connect. The hybrid cable SeGMo-Connect provides the bus communication and the power supply to the positioning drive. The positioning drive communicates with the SeGMo-Box via the system-internal fieldbus profile. The rigid housing made of anodised aluminium is particularly robust and achieves the degree of protection IP 67 due to the Viton shaft sealing ring.

For manufacturing reasons there are two blanking plugs on the top of the unit: a USB service connector is accessible behind one of these plugs.

Integrated absolute rotary encoder
A magnetic-absolute multiturn rotary encoder makes reference search routines after a power failure or emergency stop unnecessary. Due to the batteryless encoder, the positioning drive detects its position after power on and is immediately ready for use.

In the switched off state the drive shaft can be moved by ±171 turns without loss of the absolute position. The absolute rotary encoder withstands high shock/vibration loads.

General information on SeGMo-Connect
The hybrid cable SeGMo-Connect is designed for flexible application in drag chains. It is available in the foodgrade, halogen-free and cULus recognised variants. The hybrid cable is screened under the outer sheath. The internal communication cores are fully insulated and multiply screened.

All positioning drives are available with hybrid cable and connectors and can be connected quickly and straightforwardly to the SeGMo-Box via the pre-assembled hybrid connecting cables that can be configured as required. Connectors with a quick-release coupling permit quick connection and disconnection. The positioning drive is therefore reliably and quickly disconnected from the power supply for maintenance and service work in a matter of seconds. Pre-assembled connection cables are available for the connection, see “Technical information BZK”.

Assembly
The mounting concept comprises a fixed-moving bearing. The machine shaft supports the weight of the positioning drive via the fixed bearing. For this purpose the positioning drive is mounted directly on the machine shaft using a clamped connection with a shaped fit, for example over a hollow shaft with a clamping ring. The torque support prevents the positioning drive rotating and, as the moving bearing, compensates for any movements that occur on the output axle due to imbalance, if necessary. The shape and design of the torque support are order-specific. Various accessories are available for mounting.

Compensation of movements due to imbalance

Modes of operation
The drive is designed for positioning at nominal torque. The following intervals are valid for a duty cycle (ED) of:

- Duty cycle = 25 % at 100 % load torque, positioning mode S2 (base time 4 minutes: ED = 1 minute, PD = 3 minutes)
- Duty cycle ≤ 50 % with reduced load torque, dependent on ambient parameters and application

Other methods of operation are protected by $I^2t$ and temperature monitoring as well as an adjustable current limit. This protection permits a briefly increased breakaway torque.

Reliability
Important parameters such as motor power and device temperature are monitored and in this way the positioning drive actively protected against overload. The following monitoring devices ensure trouble-free operation:

- Soft start and shutdown via acceleration and deceleration ramps
- Over/undervoltage detection on the power circuit supply and logic circuit supply
- Lag error detection (drive shaft in relation to motor shaft)
- Temperature monitoring on the power amplifier and inside the housing
- Motor and power amplifier overload protection via $I^2t$ monitoring and in combination with the box by means of the maximum current.
## Technical data

<table>
<thead>
<tr>
<th>Nominal torque (housing size)</th>
<th>02 (K)</th>
<th>05 (L)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Electrical data</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nominal voltage logic circuits</td>
<td>24 V DC -5% / +25%</td>
<td></td>
</tr>
<tr>
<td>Nominal voltage power circuits</td>
<td>24 V DC -5% / +25%</td>
<td></td>
</tr>
<tr>
<td>(Attention: max. motor speed is voltage dependent!)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nominal current logic circuits</td>
<td>Max. 400 mA</td>
<td></td>
</tr>
<tr>
<td>Nominal current power circuits</td>
<td>1.8 A (max. 4 A)</td>
<td>2.6 A (max. 5 A)</td>
</tr>
<tr>
<td>Duty cycle in % (load-dependent)</td>
<td>Duty cycle = 25% at 100% load torque, positioning mode S2 (base time 4 minutes: ED = 1 minute, PD(1) = 3 minutes) Duty cycle ≤ 50% with reduced load torque, dependent on ambient parameters and application</td>
<td></td>
</tr>
<tr>
<td>Positioning range</td>
<td>Unlimited (2)</td>
<td></td>
</tr>
<tr>
<td>System interface</td>
<td>CANopen (CiA 402)</td>
<td></td>
</tr>
<tr>
<td>Communication interfaces via SeGMo-Box GEL 6505</td>
<td>CANopen, PROFiBUS-DP, PROFINET IO / RT, EtherCAT, EtherNet/IP, Sercos III, POWERLINK</td>
<td></td>
</tr>
<tr>
<td>Dielectric strength</td>
<td>$\sqrt{2} \times 500$ V DC; as per DIN EN 61439-1:2012-06</td>
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<tr>
<td><strong>EMC (3)</strong></td>
<td>Electromagnetic immunity EN 61000-6-1:2007-10 / EN 61000-6-2:2006-03 Electromagnetic emissions EN 61000-6-3:2011-09 / EN 61000-6-4:2011-09</td>
<td></td>
</tr>
<tr>
<td><strong>Encoder data</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Resolution</td>
<td>1000 increments per 360°</td>
<td></td>
</tr>
<tr>
<td>Detection range of the measuring system</td>
<td>342 turns, also in de-energised state</td>
<td></td>
</tr>
<tr>
<td><strong>Mechanical data</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nominal torque drive shaft</td>
<td>2.5 Nm at 70 min⁻¹</td>
<td>5 Nm at 70 min⁻¹</td>
</tr>
<tr>
<td>Drive shaft</td>
<td>Semi hollow shaft (solid shaft Ø d_w = 8...14 mm); solid shaft Ø d_w = 10 mm; customised shafts upon request</td>
<td></td>
</tr>
<tr>
<td>Housing material</td>
<td>Aluminium AlMgSi</td>
<td></td>
</tr>
<tr>
<td>Weight (4)</td>
<td>1.0 kg</td>
<td>1.25 kg</td>
</tr>
<tr>
<td>Degree of protection</td>
<td>IP 67, EN 60529:2014-09, shaft sealing ring made of Viton</td>
<td></td>
</tr>
<tr>
<td>Shock resistance</td>
<td>150 m/s² (approx. 15 g); as per DIN EN 60068-2-27:2010-02</td>
<td></td>
</tr>
<tr>
<td>Vibration resistance</td>
<td>50 m/s² (approx. 5 g), 10 to 50 Hz; as per DIN EN 60068-2-6:2008-10</td>
<td></td>
</tr>
<tr>
<td><strong>Ambient data</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assured operating temperature range</td>
<td>0 °C to +60 °C</td>
<td></td>
</tr>
<tr>
<td>Operating temperature range</td>
<td>-10 °C to +60 °C</td>
<td></td>
</tr>
<tr>
<td>Storage temperature range</td>
<td>-20 °C to +85 °C</td>
<td></td>
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<tr>
<td>Max. relative humidity of air</td>
<td>95%</td>
<td></td>
</tr>
<tr>
<td>Condensation</td>
<td>Not permitted (condensation protection upon request)</td>
<td></td>
</tr>
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</table>

(1) PD length of space
(2) If the supply voltage is present, an electronic counter measures the positioning range over the detection range of the measuring system.
(3) Use only screened cables.
(4) Depending on the type of connection and the type of construction.
### Technical data

<table>
<thead>
<tr>
<th>Nominal torque (housing size)</th>
<th>02 (K)</th>
<th>05 (L)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>UL data (design C)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>cULus recognised component, E196161</td>
<td>UL 61800-5-1</td>
<td>CSA C22.2 No. 274-13</td>
</tr>
<tr>
<td>Input voltage (power circuits)</td>
<td>24 V to 30 V DC</td>
<td></td>
</tr>
<tr>
<td>Input power (power circuits), continuous operation</td>
<td>25 VA</td>
<td>45 VA</td>
</tr>
<tr>
<td>Input power (power circuits), ED = 1 minute, PD(^{(1)}) = 3 minutes</td>
<td>35 VA</td>
<td>60 VA</td>
</tr>
<tr>
<td>Protection class</td>
<td>Type 1</td>
<td></td>
</tr>
<tr>
<td>Assured operating temperature range</td>
<td>0 °C to +55 °C</td>
<td></td>
</tr>
<tr>
<td>Operating temperature range</td>
<td>-10 °C to +55 °C</td>
<td></td>
</tr>
</tbody>
</table>

\(^{(1)}\) PD length of space
## Technical data

### Connector M23

**Type of connection H1 / H2 / H3**

<table>
<thead>
<tr>
<th>Technical data – coupling / connector (connector size M23)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated voltage</td>
<td>Max. 30 V AC / DC</td>
</tr>
<tr>
<td>Current carrying capacity</td>
<td>According to DIN EN 60512</td>
</tr>
<tr>
<td>Contact type (coupling / connector)</td>
<td>Male / female</td>
</tr>
<tr>
<td>Housing material coupling / connector</td>
<td>Nickel-plated brass (others upon request)</td>
</tr>
<tr>
<td>Union nut material</td>
<td>Nickel-plated brass</td>
</tr>
<tr>
<td>Ambient temperature</td>
<td>-20 °C to +130 °C</td>
</tr>
<tr>
<td>Degree of protection(1)</td>
<td>IP 66 / IP 67</td>
</tr>
<tr>
<td>Mating cycles</td>
<td>&gt; 500</td>
</tr>
<tr>
<td>Vibration resistance</td>
<td>≤ 200 m/s²</td>
</tr>
<tr>
<td>Approval</td>
<td>cULus recognised component (no. E247738)</td>
</tr>
</tbody>
</table>

### Connector M17

**Type of connection HS / S1 / S2 / S3**

<table>
<thead>
<tr>
<th>Technical data – coupling / connector (connector size M17)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated voltage</td>
<td>Max. 30 V AC / DC</td>
</tr>
<tr>
<td>Current carrying capacity</td>
<td>According to DIN EN 60512</td>
</tr>
<tr>
<td>Contact type (coupling / connector)</td>
<td>Male / female</td>
</tr>
<tr>
<td>Housing material coupling / connector</td>
<td>Brass, die-cast zinc and encapsulated in plastic</td>
</tr>
<tr>
<td>Ambient temperature</td>
<td>-20 °C to +130 °C</td>
</tr>
<tr>
<td>Degree of protection(1)</td>
<td>IP 66 / IP 67</td>
</tr>
<tr>
<td>Mating cycles</td>
<td>&gt; 500</td>
</tr>
<tr>
<td>Approval</td>
<td>cULus recognised component (no. E247738)</td>
</tr>
</tbody>
</table>

### Technical data, cables

<table>
<thead>
<tr>
<th>Hybrid cable</th>
<th>Design 0 (standard)</th>
<th>Design 1 (separate fuse protection)</th>
<th>Design C (cULus recognised component)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sheath material</td>
<td>PUR, black, glossy</td>
<td>PUR, black, matt</td>
<td>PUR, black, matt</td>
</tr>
<tr>
<td>Cable properties</td>
<td>Screened</td>
<td>Screened</td>
<td>Screened</td>
</tr>
<tr>
<td>Suitable for drag chains</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Food grade</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Halogen-free</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Cable diameter (d)</td>
<td>9.5 mm</td>
<td>9.5 mm</td>
<td>9.5 mm</td>
</tr>
<tr>
<td>Peak operating voltage</td>
<td>Max. 350 V CAN bus Max. 30 V DC (logic / power)</td>
<td>Max. 300 V CAN bus Max. 30 V DC (logic / power)</td>
<td>Max. 300 V CAN bus Max. 30 V DC (logic / power)</td>
</tr>
<tr>
<td>Temperature range</td>
<td>-40 °C to +80 °C</td>
<td>-40 °C to +80 °C</td>
<td>-40 °C to +80 °C</td>
</tr>
</tbody>
</table>

(1) In the screwed-in state, according to DIN EN 60529 / DIN 40050
### Device overview — types of connection

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>H1</strong>: Cable length 30 cm</td>
<td><strong>S1</strong>: Cable length 30 cm</td>
<td><strong>HS</strong></td>
</tr>
<tr>
<td><strong>H2</strong>: Cable length 50 cm</td>
<td><strong>S2</strong>: Cable length 50 cm</td>
<td></td>
</tr>
<tr>
<td><strong>H3</strong>: Cable length 100 cm</td>
<td><strong>S3</strong>: Cable length 100 cm</td>
<td></td>
</tr>
<tr>
<td>Cable with M23 connector (coupling with pin contacts)</td>
<td>Cable with M17 connector (coupling with pin contacts)</td>
<td>M17 panel-mounting socket (pin contacts)</td>
</tr>
</tbody>
</table>

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>xx</strong>: Cable length can be selected (1 m to 20 m)</td>
<td><strong>Vx</strong>: Cable length can be selected (1 m to 20 m)</td>
<td><strong>Vx</strong>: Cable length can be selected (1 m to 20 m)</td>
</tr>
<tr>
<td>Flying lead</td>
<td>Design 0/1: Cable with spring-cage terminals for the SeGMo-Box connection (Box in design N/U)</td>
<td>Design C: Cable with spring-cage terminals for the SeGMo-Box connection (Box in design C)</td>
</tr>
</tbody>
</table>
### Terminal assignments and accessories

#### Terminal assignment xx / Vx

<table>
<thead>
<tr>
<th>Core colour/ core no.</th>
<th>cross-section Design 0</th>
<th>cross-section Design 1</th>
<th>cross-section Design C</th>
<th>Type of connection xx: flying lead</th>
<th>Type of connection Vx: pre-assembled for the box connection</th>
<th>Signal identifier</th>
</tr>
</thead>
<tbody>
<tr>
<td>red/1</td>
<td>0.5 mm²</td>
<td>0.5 mm²</td>
<td>0.5 mm²</td>
<td>–</td>
<td>4-pole spring-cage terminal (internal positioning drive communication) pin identifier</td>
<td>+24 V logic circuits</td>
</tr>
<tr>
<td>red/2</td>
<td>1.5 mm²</td>
<td>1.5 mm²</td>
<td>2.5 mm²</td>
<td>–</td>
<td>4-pole spring-cage terminal (positioning drive power supply) pin identifier</td>
<td>+24 V power circuits</td>
</tr>
<tr>
<td>black/2</td>
<td>1.5 mm²</td>
<td>1.5 mm²</td>
<td>2.5 mm²</td>
<td>–</td>
<td></td>
<td>GND power circuits</td>
</tr>
<tr>
<td>black/1</td>
<td>0.5 mm²</td>
<td>0.5 mm²</td>
<td>0.5 mm²</td>
<td>–</td>
<td></td>
<td>GND logic circuits</td>
</tr>
<tr>
<td>black</td>
<td>0.14 mm²</td>
<td>0.14 mm²</td>
<td>0.14 mm²</td>
<td>1</td>
<td></td>
<td>CAN GND</td>
</tr>
<tr>
<td>green</td>
<td>0.25 mm²</td>
<td>0.25 mm²</td>
<td>0.25 mm²</td>
<td>3</td>
<td></td>
<td>CAN low</td>
</tr>
<tr>
<td>yellow</td>
<td>0.25 mm²</td>
<td>0.25 mm²</td>
<td>0.25 mm²</td>
<td>2</td>
<td></td>
<td>CAN high</td>
</tr>
</tbody>
</table>
Terminal assignments and accessories

Pin layout H1 / H2 / H3

<table>
<thead>
<tr>
<th>Coupling with pin contacts</th>
<th>Pin identifier</th>
<th>Signal identifier</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
<td>+24 V logic circuits</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>GND logic circuits</td>
</tr>
<tr>
<td></td>
<td>C</td>
<td>GND power circuits</td>
</tr>
<tr>
<td></td>
<td>D</td>
<td>+24 V power circuits</td>
</tr>
<tr>
<td></td>
<td>E</td>
<td>Cable screen</td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>CAN high</td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>CAN GND</td>
</tr>
<tr>
<td></td>
<td>9</td>
<td>CAN low</td>
</tr>
<tr>
<td></td>
<td>S</td>
<td>CAN screen</td>
</tr>
</tbody>
</table>

Connection accessories H1 / H2 / H3 (see Technical information BZK)

H1: 30 cm
H2: 50 cm
H3: 100 cm

Optional:
- BZK23S0NxxK
- BZK23S0UxxK
- BZK23S0CxxK

- BZK23S0NxxL
- BZK23S0UxxL
- BZK23S0CxxL

- BZK23S0NxxV
- BZK23S0UxxV

- BZK23S0CxxV
Terminal assignments and accessories

Pin layout S1 / S2 / S3

<table>
<thead>
<tr>
<th>Coupling with pin contacts</th>
<th>Pin identifier</th>
<th>Signal identifier</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
<td>+24 V logic circuits</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>+24 V power circuits</td>
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<tr>
<td></td>
<td>C</td>
<td>GND power circuits</td>
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<tr>
<td></td>
<td>1</td>
<td>GND logic circuits</td>
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<tr>
<td></td>
<td>2</td>
<td>CAN GND</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>CAN low</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>CAN high</td>
</tr>
</tbody>
</table>

Connection accessories S1 / S2 / S3 (see Technical information BZK)

S1: 30 cm  
S2: 50 cm  
S3: 100 cm

M17 connector

<table>
<thead>
<tr>
<th>Coupling with pin contacts</th>
<th>Pin identifier</th>
<th>Signal identifier</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
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<tr>
<td></td>
<td>B</td>
<td>+24 V power circuits</td>
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<td>C</td>
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<tr>
<td></td>
<td>3</td>
<td>CAN low</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>CAN high</td>
</tr>
</tbody>
</table>

Optional

- BZK17S0NxxK
- BZK17S0UxxK
- BZK17S0CxxK

- BZK17S0NxxL
- BZK17S0UxxL
- BZK17S0CxxL

- BZK17S0NxxV
- BZK17S0UxxV

- BZK17S0CxxV

SeGMo-Box

BZK17S0NxxK

SeGMo-Box

BZK17S0UxxK

SeGMo-Box

BZK17S0CxxK

SeGMo-Box

BZK17S0NxxL

SeGMo-Box

BZK17S0UxxL

SeGMo-Box

BZK17S0CxxL

SeGMo-Box

BZK17S0NxxV

SeGMo-Box

BZK17S0UxxV

SeGMo-Box

BZK17S0CxxV

SeGMo-Box
## Terminal assignments and accessories

### Pin layout HS

<table>
<thead>
<tr>
<th>Panel-mounting socket with pin contacts</th>
<th>Pin identifier</th>
<th>Signal identifier</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
<td>+24 V logic circuits</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>+24 V power circuits</td>
</tr>
<tr>
<td></td>
<td>C</td>
<td>GND power circuits</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>GND logic circuits</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>CAN GND</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>CAN low</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>CAN high</td>
</tr>
</tbody>
</table>

### Connection accessories HS (see Technical information BZK)

- BZK17S0NxxL
- BZK17S0UxxL
- BZK17S0CxxL
- BZK17S0NxxV
- BZK17S0UxxV
- BZK17S0CxxV
## Accessories

### Mechanical accessories (not included in the scope of supply)

<table>
<thead>
<tr>
<th>Identifier:</th>
<th>Item no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clamping ring for shaft:</td>
<td></td>
</tr>
<tr>
<td>— A / B / C / D</td>
<td>MZ1380</td>
</tr>
<tr>
<td>— 8 / 9 / E</td>
<td>MZ1379</td>
</tr>
<tr>
<td><strong>Accessories kit for GEL 6110 / GEL 6109</strong>, comprising:</td>
<td>ZB6100</td>
</tr>
<tr>
<td>▪ 1 pc. torque support including plain bearing, item no. BG5012</td>
<td></td>
</tr>
<tr>
<td>▪ 2 pcs. screw M5×8, item no. VS2107</td>
<td></td>
</tr>
<tr>
<td>▪ 1 pc. headless screw M5×20, item no. VS3412</td>
<td></td>
</tr>
<tr>
<td>Plain bearing accessories package (Contents: 5 pcs. plain bearing, item no. OG0001)</td>
<td>ZB61X01</td>
</tr>
<tr>
<td>Headless screws accessories package (Contents: 5 pcs. headless screw M5 × 20, item no. VS3412)</td>
<td>ZB61X02</td>
</tr>
<tr>
<td>Torque support screws accessories package (Contents: 10 pcs. screw M5 × 8, item no. VS2107)</td>
<td>ZB61X03</td>
</tr>
</tbody>
</table>
Dimensional drawing – GEL 6109 (type of connection H1 / H2 / H3 / S1 / S2 / S3 / Vx / xx)

- Inside diameter as per type code
- All dimensions stated in mm (≈ approximate dimension)
- General tolerance DIN ISO 2768 medium

<table>
<thead>
<tr>
<th>Housing size</th>
<th>Dimension L</th>
</tr>
</thead>
<tbody>
<tr>
<td>Short</td>
<td>K  76</td>
</tr>
<tr>
<td>Long</td>
<td>L   96</td>
</tr>
</tbody>
</table>
All dimensions stated in mm (≈ approximate dimension); General tolerance DIN ISO 2768 medium

**Accessories kit ZB6100**

Torque support
- Metal bracket with plain bearing fitted
- 2 fastening screws M5×8
- Headless screw M5x20

**Clamping ring**

<table>
<thead>
<tr>
<th>Dimensions / Item no. clamping ring</th>
<th>MZ1379</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shaft Ø dₚ, H7 d[mm] (type code)</td>
<td>10 / 9 / 8 (E / 9 / 8)</td>
</tr>
<tr>
<td>D [mm]</td>
<td>28</td>
</tr>
<tr>
<td>b [mm]</td>
<td>11</td>
</tr>
<tr>
<td>Screw DIN 912</td>
<td>M4</td>
</tr>
</tbody>
</table>

**Clamping ring**

<table>
<thead>
<tr>
<th>Dimensions / Item no. clamping ring</th>
<th>MZ1380</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shaft Ø dₚ, H7 [mm] (type code)</td>
<td>11 / 12 / 13 / 14 (D / C / B / A)</td>
</tr>
<tr>
<td>D [mm]</td>
<td>34.5</td>
</tr>
<tr>
<td>b [mm]</td>
<td>13</td>
</tr>
<tr>
<td>Screw DIN 912</td>
<td>M4</td>
</tr>
</tbody>
</table>

**Plain bearing OG0001**

Section A-A
**Type code GEL 6109**

### Communication interface

**CO** CANopen CiA 402 (system-internal communication, further interfaces via SeGMo-Box)

### Nominal torque

<table>
<thead>
<tr>
<th>Code</th>
<th>Torque</th>
<th>Duty Cycle</th>
<th>Construction</th>
</tr>
</thead>
<tbody>
<tr>
<td>02</td>
<td>2.5 Nm</td>
<td>70 min⁻¹</td>
<td>25% K</td>
</tr>
<tr>
<td>05</td>
<td>5 Nm</td>
<td>70 min⁻¹</td>
<td>25% L</td>
</tr>
</tbody>
</table>

### Shaft [dₘ in mm]

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Semi hollow shaft, inside diameter 14 H7</td>
</tr>
<tr>
<td>B</td>
<td>Semi hollow shaft, inside diameter 13 H7</td>
</tr>
<tr>
<td>C</td>
<td>Semi hollow shaft, inside diameter 12 H7</td>
</tr>
<tr>
<td>D</td>
<td>Semi hollow shaft, inside diameter 11 H7</td>
</tr>
<tr>
<td>E</td>
<td>Semi hollow shaft, inside diameter 10 H7</td>
</tr>
<tr>
<td>9</td>
<td>Semi hollow shaft, inside diameter 9 H7</td>
</tr>
<tr>
<td>8</td>
<td>Semi hollow shaft, inside diameter 8 H7</td>
</tr>
<tr>
<td>M</td>
<td>Solid shaft, diameter 10 h7 (1)</td>
</tr>
</tbody>
</table>

### Housing material

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Aluminium AlMgSi, anodised</td>
</tr>
</tbody>
</table>

### Housing size

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>K</td>
<td>Short</td>
</tr>
<tr>
<td>L</td>
<td>Long</td>
</tr>
</tbody>
</table>

### Type of connection

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>HS</td>
<td>M17 panel-mounting socket with pin contacts (only available with shaft A)</td>
</tr>
<tr>
<td>S1</td>
<td>30 cm hybrid cable and M17 coupling with pin contacts</td>
</tr>
<tr>
<td>S2</td>
<td>50 cm hybrid cable and M17 coupling with pin contacts</td>
</tr>
<tr>
<td>S3</td>
<td>100 cm hybrid cable and M17 coupling with pin contacts</td>
</tr>
<tr>
<td>H1</td>
<td>30 cm hybrid cable and M23 coupling with pin contacts</td>
</tr>
<tr>
<td>H2</td>
<td>50 cm hybrid cable and M23 coupling with pin contacts</td>
</tr>
<tr>
<td>H3</td>
<td>100 cm hybrid cable and M23 coupling with pin contacts</td>
</tr>
<tr>
<td>Vx</td>
<td>Hybrid cable pre-assembled with connection terminals for SeGMo-Box, cable length V1 = 1 m; V2 = 3 m; V3 = 5 m; V4 = 8 m; V5 = 10 m; V6 = 13 m; V7 = 15 m; V8 = 18 m; V9 = 20 m</td>
</tr>
<tr>
<td>xx</td>
<td>xx m hybrid cable with flying lead, length in m (xx = 01…20; standard: 3 m)</td>
</tr>
</tbody>
</table>

### Sensor

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>Magnetic multiturn encoder (342 turns)</td>
</tr>
</tbody>
</table>

### Design

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Standard</td>
</tr>
<tr>
<td>1</td>
<td>Separate fuse protection</td>
</tr>
<tr>
<td>C</td>
<td>cULus recognised component</td>
</tr>
</tbody>
</table>

### Degree of protection

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>IP 67 (with shaft sealing ring made of Viton and protection against humidity), design C: additionally UL protection class type 1</td>
</tr>
</tbody>
</table>

---

(1) Clamp coupling upon request

---

DS22-6109 / (2019-08) 15
Type code GEL 6109

Information on the type of connection
Type of connection HS / H1 / H2 / H3 / S1 / S2 / S3 / xx / Vx
The positioning drive is supplied with SeGMo-Connect (hybrid cable) and connected via the SeGMo-Box with the plant control system.

Information on the design
The cULus component recognition (E196161) requires for the usage of the positioning drives in design C the usage of the SeGMo-Box (E483619) GEL6505A________C or GEL6505B________C in combination with SeGMo-Connect BZK________. Usage is also limited to the application area in "NFPA 79 - Electrical Standard for Industrial Machinery".

Nominal torque / Housing size

<table>
<thead>
<tr>
<th>Nominal torque</th>
<th>Housing size (length of housing)</th>
</tr>
</thead>
<tbody>
<tr>
<td>02 2.5 Nm at 70 min⁻¹</td>
<td>K (76 mm)</td>
</tr>
<tr>
<td>05 5 Nm at 70 min⁻¹</td>
<td>L (96 mm)</td>
</tr>
</tbody>
</table>

Right to technical changes and errors reserved.