SeGMo-Positioning

Positioning drives with through hollow shaft

GEL 6113

Technical information

Version 2023-10-10

General

The SeGMo-Positioning is a compact mechatronic unit consisting of a brushless DC motor, a 32-bit microprocessor, a compact power amplifier, a powerful gear and a magnetic-absolute multiturn encoder.
Active system protection against thermal overload and comprehensive system software allow load-dependent duty cycles well beyond 25 %.
With its high degree of protection (IP 67), the rigid aluminum housing offers versatile application possibilities in various industrial sectors.

Variable in connection technology and communication interface

Features

- Nominal torques 5 Nm, 7 Nm, 10 Nm
- Aluminum housing
- Operating temperature range -10 °C to +60 °C
- Brushless DCmotor
- Magnetic-absolute multiturn encoder
  - Detection range: 114 revolutions, also in de-energized state
- Degree of protection IP 67
- Integrated communication interfaces
  CANopen (CiA 402); PROFIBUS-DP (V0/V1); Sercos III; POWERLINK; PROFINET IO/RT; EtherCAT; EtherNet/IP; Modbus/TCP
- Optional with cULus Component Recognition

Advantages

- Either hybrid cable or connector outlet
- Onboard joystick for simple commissioning
- Monitoring equipment to aid trouble-free operation
- Ready for use directly after switching on the power supply due to absolute position detection of the magnetic-absolute multiturn encoder
- Maintenance-free electrical parts
- Maintenance-free gear due to sealed-for-life lubrication

Fields of application

- Packaging machines
- Food and bottling lines
- Wood and plastic processing machines
- Printing and bookbinding machines
- Large production facilities

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SeGMo-System

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

- SeGMo-Positioning:
  Positioning drive for fully automatic format setting
- SeGMo-Motion:
  Positioning drive for cyclic operation
- SeGMo-Box:
  Decentral control unit for up to 5 positioning drives
- Modular SeGMo-Box:
  decentral control unit for up to 17 positioning drives or up to 48 positioning displays
- SeGMo-Assist:
  Position display for manual adjustment procedures
- SeGMo-Connect:
  Single cable concept (hybrid cable suitable for drag chain)
- SeGMo-Lib:
  Prefabricated function blocks for integration in the higher level control system
- SeGMo-Support Tool:
  Software for extended commissioning and configuration
- SeGMo-Web:
  Software for real-time transmission of the modular SeGMo-Box
- SeGMo-ImgConv Tool:
  Tool for converting image files into pictograms for SeGMo-Assist

SeGMo-Positioning:

The positioning drives are complete mechatronic systems with a batteryless multiturn encoder, gear and motor as well as integrated power and control electronics. We also offer these items for standalone use. With nominal torques of up to 15 Nm, they cover the typical power range for secondary axes.

SeGMo-Motion:

The positioning drives are complete mechatronic systems with gear and motor as well as integrated power and control electronics for cyclic operation.

SeGMo-Box:

Up to 5 positioning drives can be connected to the SeGMo-Box. The connection of position displays is not provided. The SeGMo-Box supports all common fieldbus and Industrial Ethernet communication interfaces.

Modular SeGMo-Box:

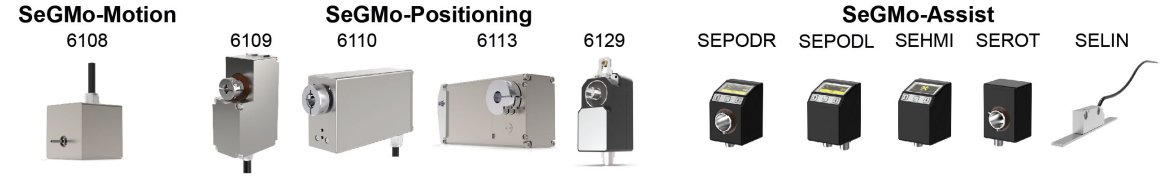
Every modular SeGMo-Box comprises a basic housing with individually equippable plug-in modules. By combining basic housings, up to 17 positioning drives or up to 48 position displays can be connected. A combination of positioning drives and position displays on a modular SeGMo-Box is possible. The power supply can be provided separately for each equipped plug-in module. The modular SeGMo-Box supports all common Industrial Ethernet communication interfaces.

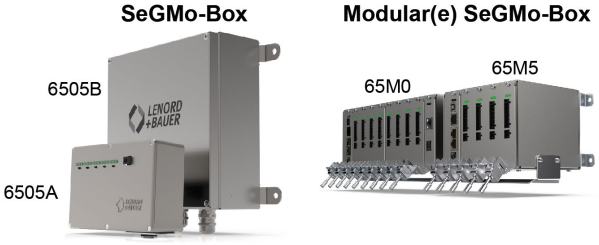
SeGMo-Assist:

The position displays facilitate manual adjustment procedures by displaying nominal and actual positions. Variants are available for rotary and linear applications. Another variant without a measuring system supports the operator, for example, when changing format parts or tools.

SeGMo-Connect:

By using the positioning drives with a SeGMo-Box the cabling effort is considerably reduced by SeGMo-Connect. Instead of the usual two separate cables for internal bus communication and a third cable for power supply to the positioning drives, only **ONE** hybrid cable is connected. In combination with the SeGMo-Box and 5 connected positioning drives, the SeGMo-Connect typically reduces the number of cables from 15 to 5.
The hybrid cable is designed for moveable use in drag chains. Its variants are food grade quality, halogen-free and available as a cULus recognized component.





General description

The positioning drive belongs to the SeGMo-Positioning product group and is a component of the SeGMo system. It is an intelligent adjustment unit for mounting on a machine shaft end or for attachment to a machine shaft or spindle.
The positioning drive converts the movement commands into a mechanical rotary motion and actuates a machine shaft. Rotation of the positioning drive with the machine shaft is prevented by mounting a torque support.

Product construction

The positioning drive requires two supply voltages of 24 V to 30 V DC. The logic circuit supply voltage supplies the control electronics and the power circuit supply voltage supplies the power electronics for the motor.
The positioning drive is equipped with a mechanical manual emergency adjustment to operate the positioning drive in the event of a malfunction, for example power failure.
The mechanical manual emergency adjustment must not be activated on positioning drives with the holding brake option. This will damage the positioning drive.
The optional holding brake guarantees a reliable hold even under shock and vibration loads, especially in the case of vertical machine shafts.
The positioning drive can be configured with the SeGMo-Support Tool via the service connector (mini-USB).
The rigid housing made of anodized aluminum is particularly robust and achieves the degree of protection IP 67 thanks to the shaft sealing ring.
The positioning drive requires a functional ground cable to be connected. Connection is via a setscrew (M4). We recommend a wire cross section of 4 mm^2 [12 AWG].

Direct connection to a higher level control system

The positioning drive with **ST** connection technology is intended for stand-alone use and is connected directly to a higher level control system. It supports Fieldbus profiles and Industrial Ethernet protocols.
Positioning drives with integrated fieldbus have rotary switches for setting the bus address and baud rate as well as a joystick. During commissioning, the positioning drive can be operated using the joystick without previous programming of the higher level control system. Jog mode using the joystick is only possible in service mode. All elements are accessible from the rear.

Indirect connection to a higher level control system

The positioning drive is connected to a SeGMo-Box or a modular SeGMo-Box using SeGMo-Connect. The hybrid cable SeGMo-Connect handles bus communication and the power supply of the positioning drive. The positioning drive communicates with the SeGMo-Box via the system-internal fieldbus profile (communication interface **CO**). It is available as an option with a hybrid cable (connection technology **H1, H2, H3, S1, S2, S3, xx, Vx**) or plug connection (connection technology **HS**).
The positioning drive with **Vx** connection technology is preassembled and can be connected directly to SeGMo-Box GEL 6505.

Magnetic-absolute multiturn encoder

A magnetic-absolute multiturn encoder makes reference search routines superfluous after a power failure or “EMERGENCY STOP”. After the power supply is switched on, the positioning drive detects its position via the batteryless multiturn encoder and is ready for operation directly. When switched off, the output shaft can be adjusted by ±57 revolutions without losing the absolute position.
The multiturn encoder withstands high shock/vibration loads.

General information about SeGMo-Connect

Accessories for connecting to the SeGMo-Box

The SeGMo-Connect hybrid cable is designed for moveable use in drag chains. Its variants are food grade quality, halogen-free and available as a cULus recognized component. The hybrid cable screen is under the outer sheath. The internal communication line is completely insulated and has multiple screening.
All positioning drives are available with hybrid cables and connectors and can be quickly and easily connected to the SeGMo-Box via the freely configurable and preassembled hybrid cables.
Quick disconnect connectors allow safe and quick disconnection from the power supply during maintenance and service work. Preassembled hybrid cables are available for connection.

Connection accessories for stand-alone use

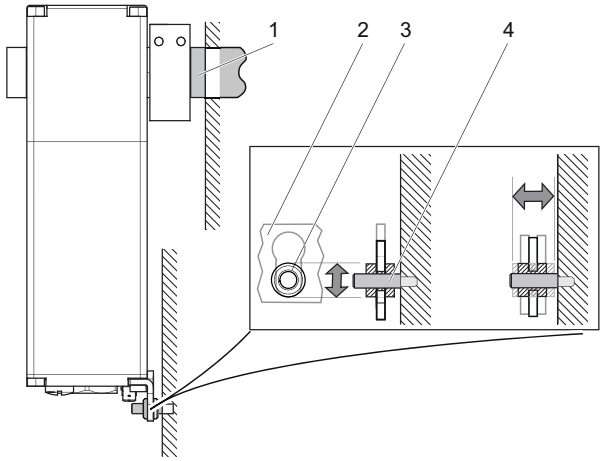
Mating connectors and cables for power supply are available for stand-alone use of positioning drives.

For more information on SeGMo-Connect connection accessories, please refer to “Technical Information BZK.”

Description of positioning drive

Assembly

The mounting concept provides for fixed-moving bearings. The machine shaft bears the weight of the position display via the fixed bearing. The positioning drive is mounted directly onto the machine shaft via a force-fit connection, for example with a semi-hollow shaft and clamping ring. The torque support prevents the positioning drive from rotating and compensates as a moving bearing for any imbalance movements occurring at the output shaft. The form and design of the torque support depend on the application. Various accessories are available for mounting.



Imbalance movements are absorbed at the moving bearing
(example with standard torque support from Lenord+Bauer)

1 Machine shaft
2 Torque support
3 Plain bearing
4 Headless screw

Operating modes

The positioning drive is **not** designed for continuous operation at nominal torque.
The positioning drive is designed for control operation at nominal torque. The following intervals are applicable for a duty cycle (DuCy) of

- DuCy = 25 % at 100 % load torque, duty type S2 (base time 4 minutes: DuCy = 1 minute, BD = 3 minutes)
- DuCy ≤ 50 % at reduced load torque, depending on environmental parameters and application

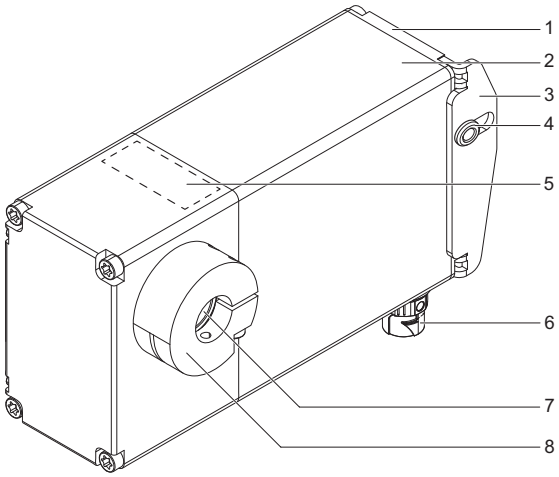
Other operating modes are secured by I^2t- and temperature monitoring and an adjustable current limitation. A briefly increased breakaway torque is permitted within the scope of this protection.

Reliability

Important parameters are monitored, thus actively protecting the positioning drive from overload. The following monitoring devices support trouble-free operation:

- Soft start and stop via acceleration and deceleration ramp
- Over/undervoltage detection of supply voltage (power circuit and logic circuit)
- Lag error detection (output to motor shaft)
- Temperature monitoring of power amplifier and housing interior
- Overload protection of motor and power amplifier by I^2t monitoring and in combination with the SeGMo-Box by the maximum current

Parts named



Positioning drive with connection technology HS, torque support left and clamp coupling

1 Connection and adjustment panel (rear side)
2 Housing
3 Torque support (optional)
4 Plain bearing (optional)
5 Zone for warning stickers
6 Connection SeGMo-Connect (optional), connection technology **HS/H1/H2/H3/S1/S2/S3/xx/Vx**
7 Output shaft: Through hollow shaft
8 Clamp coupling (assembly accessories)

Nominal torque (construction type)	05 (K)	07 (K)	10 (L)
Electrical data			
Supply voltage logic circuit	24 V to 30 V DC (nominal supply voltage: 24 V DC)		
Power circuit supply voltage	24 V to 30 V DC (nominal supply voltage: 24 V DC) (❗ Maximum motor speed depends on voltage!)		
Maximum current consumption Logic circuit(1)	400 mA, external breaker required		
Current consumption Power circuit(1) (maximum current consumption power circuit)(2)	2.0 A (7.0 A)	2.8 A (7.5 A)	4.1 A (10 A)
Duty cycle DuCy in % (load-dependent)(1)	DuCy = 25 % at 100 % load torque, duty type S2 (base time 4 minutes: DuCy = 1 minute, BD(3) = 3 minutes) DuCy ≤ 50 % at reduced load torque, depending on environmental parameters and application		
Communication interfaces: Fieldbus	CANopen (CiA 402); PROFIBUS-DP (V0/V1)		
Communication interfaces: Industrial Ethernet	Sercos III; POWERLINK; PROFINET IO/RT; EtherCAT; EtherNet/IP; Modbus/TCP		
Mechanical data			
Nominal torque output shaft(1)	5 Nm at 55 min^{-1}	7 Nm at 55 min^{-1}	10 Nm at 55 min^{-1}
Output shaft	Through hollow shaft d_w = 20.2 mm		
Housing material	**A**: Aluminum AlMgSi, anodized		
Weight	At least 2.33 kg (4)		
Encoder data			
Resolution	1,000 increments per 360°		
Detection range	114 revolutions, also in de-energized state		
Positioning range	Not limited (5)		
Ambient data			
Working temperature range	0 °C to +60 °C		
Operating temperature range	-10 °C to +60 °C		
Storage temperature range	-20 °C to +85 °C		
Maximum relative air humidity	95 %		
Condensation	Not permitted (condensation protection upon request)		
Degree of protection(6)	IP 67, EN 60529:2014-09, shaft sealing ring (material: FKM)		
Dielectric strength	√2× 500 V AC; as per DIN EN 61439-1:2012-06		
EMC (7)	Electromagnetic immunity DIN EN 61000-6-1:2007-10, EN 61000-6-1:2007 DIN EN 61000-6-2:2006-03, EN 61000-6-2:2005 Electromagnetic emission DIN EN 61000-6-3:2011-09, EN 61000-6-3:2007 + A1:2011 DIN EN 61000-6-4:2011-09, EN 61000-6-4:2007 + A1:2011		
Vibration resistance	50 m/s^2 (≈ 5g), 10 to 50 Hz; according to DIN EN 60068-2-6:2008-10		
Shock resistance	150 m/s^2 (≈15 g); according to DIN EN 60068-2-27:2010-02		

(1) At nominal supply voltage
(2) External breaker required
(3) BD break duration
(4) Depending on type of connection and construction
(5) When the logic circuit supply voltage is applied, an electronic counter detects the positioning range beyond the measuring system detection range.
(6) The degree of protection is only maintained if all blanking plugs are screwed in and all unused connectors (connection technology **ST**) are covered.
(7) Use only screened cables.

Technical data

Nominal torque (construction type)	**05 (K)**	**07 (K)**	**10 (L)**
UL data (version C)			
cULus recognized Component, E196161	UL 61800-5-1 CSA C22.2 number 274-13		
Input voltage (power circuit) U_{IN} (1)	24 V to 30 V DC		
Input voltage (power circuit), continuous operation	65 VA		80 VA
Input voltage (power circuit), DuCy = 1 minute, BD(2) = 3 minutes	80 VA		100 VA
Enclosure type	Type 1		
UL data (version C): Ambient temperatures			
Working temperature range	0 °C to +55 °C		
Operating temperature range	-10 °C to +55 °C		
Approvals			
European Economic Area	Conformity in accordance with ▪ EMC Directive 2014/30/EU ▪ Machinery Directive 2006/42/EC CE		
USA and Canada	**Design C:** (Certification as cULus recognized component) c UL us		

(1) Corresponds to the supply voltage Power circuit
(2) BD break duration

Connector M23

Connection Technology **H1/H2/H3**

Technical data – Coupling/connector (connector size M23)	
Rated voltage	Maximum 30 V AC/DC
Current carrying capacity	as per DIN EN 60512
Contact type (coupling/connector)	Male contact/female contact
Housing material coupling/connector	Brass nickel-plated (others upon request)
Union nut material	Brass nickel-plated
Ambient temperature	-20 °C to +130 °C
Degree of protection (1)	IP 66/IP 67
Mating cycles	> 500
Vibration resistance	≤ 200 m/s^2
Certification	cULus recognized component (no. E247738)

Connector M17

Connection Technology **HS/S1/S2/S3**

Technical data – Coupling/connector (connector size M17)	
Rated voltage	Maximum 30 V AC/DC
Current carrying capacity	as per DIN EN 60512
Contact type (coupling/connector)	Male contact/female contact
Housing material coupling/connector	Brass, zinc die casting and plastic coated
Ambient temperature	-20 °C to +130 °C
Degree of protection (1)	IP 66/IP 67
Mating cycles	> 500
Certification	cULus recognized component (no. E247738)

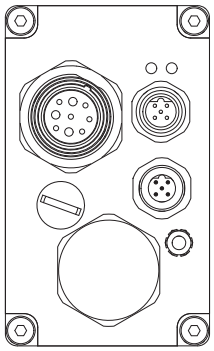
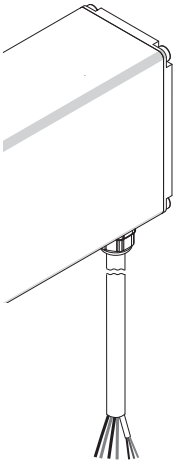
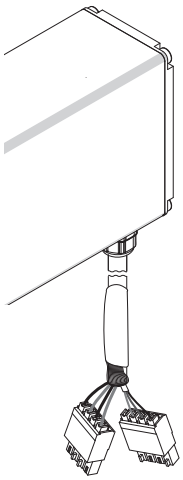
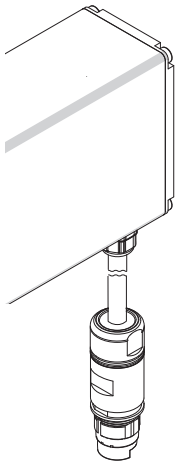
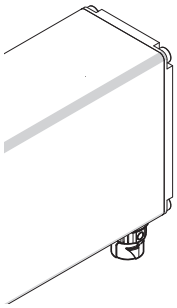
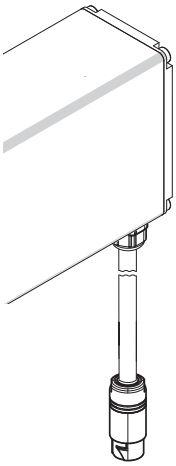
Technical data hybrid cable

Connection technology H1/H2/H3/S1/S2/S3/Vx/xx

Hybrid cable	Design **0** (standard)	Design **1** (individual protection)	Design **C** (cULus recognized component)
Sheath material	PUR, black, glossy	PUR, black, matte	PUR, black, matte
Cable properties	screened	screened	screened
Suitable for drag chain	yes	yes	yes
Food grade quality	yes	no	no
Halogen-free	no	yes	yes
Cable diameter (d)	9.5 mm	9.5 mm	9.5 mm
Bending radius	permanently flexible: 10 × d fixed: 5 × d	permanently flexible: 15 × d free-moving: 10 × d fixed: 5 × d	permanently flexible: 15 × d free-moving: 10 × d fixed: 5 × d
Maximum peak operating voltage	350 V CAN-Bus 30 V DC (logic/power)	350 V CAN-Bus 30 V DC (logic/power)	300 V CAN-Bus 30 V DC (logic/power)
Temperature range	-40 °C to +80 °C	-40 °C to +80 °C	-40 °C to +80 °C

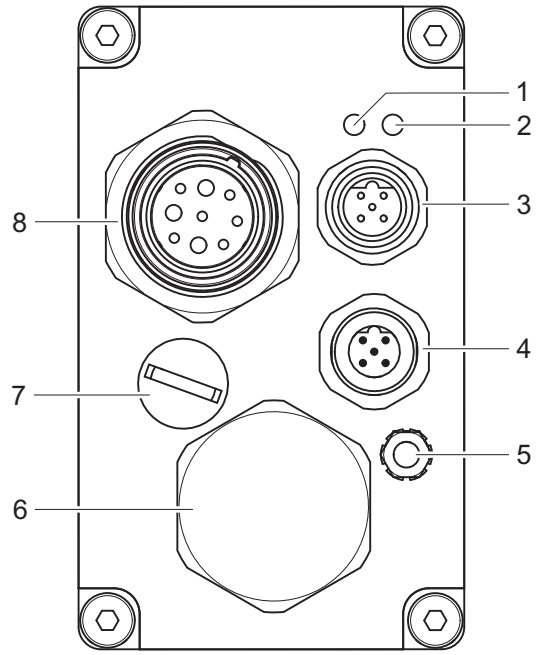
(1) in screwed state, as per DIN EN 60529/DIN 40050

Overview — Connection Technologies

Connection Technology		
ST	**xx** Selectable cable length (1 m to 20 m)	**Vx**: Selectable cable length (maximum 20 m)
Direct connection to a higher level control system	Connection to SeGMo-Box **GEL 6505** or **GEL 65M**	Connection to SeGMo-Box **GEL 6505**
Connector outlet	Hybrid cable with flying lead	Hybrid cable with spring-cage terminals for SeGMo-Box connection
		
Communication interfaces: **CO** (CANopen) **DP** (PROFIBUS-DP) **EC** (EtherCAT) **IP** (EtherNet/IP) **MB** (Modbus/TCP) **PL** (POWERLINK) **RT** (PROFINET IO / RT) **SC** (SERCOS III)	**Communication interface CO** (CANopen)	**Communication interface CO** (CANopen)
Connection Technology		
H1: Cable length 30 cm **H2**: Cable length 50 cm **H3**: Cable length 100 cm	**HS**	**S1**: Cable length 30 cm **S2**: Cable length 50 cm **S3**: Cable length 100 cm
Connection to SeGMo-Box **GEL 6505** or **GEL 65M** via SeGMo-Connect (hybrid cable **BZK**)		
Hybrid cable with M23 connector (coupling with male contacts)	M17 panel-mounting socket with male contacts	Hybrid cable with M17 connector (coupling with male contacts)
		
Communication interface CO (CANopen)	**Communication interface CO** (CANopen)	**Communication interface CO** (CANopen)

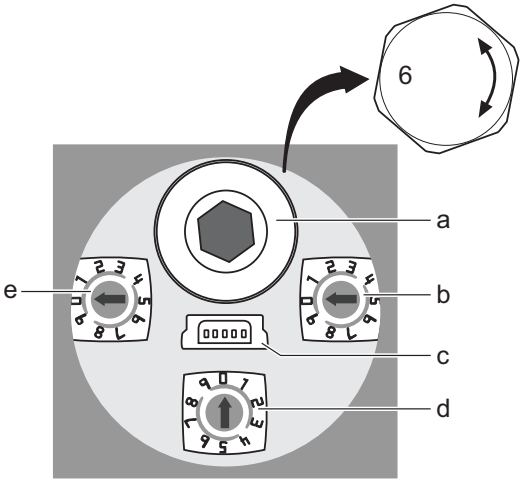
Rear side

Connection technology **ST** (here for PROFIBUS-DP)



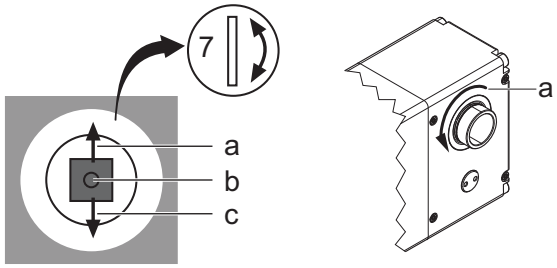
1 Status display — Device (LED1)
2 Status display — Communication (LED2)
3 Communication interface (IN)
4 Communication interface (OUT)
5 Functional ground (setscrew M4)
6 Removable blanking plug for the setting elements
7 Removable blanking plug for manual adjustment
8 Power supply connector: Power supply

Setting elements fieldbus variants (communication interfaces CO and DO)



a Manual emergency adjustment
b Rotary switch bus address unit decimal place
c Service connector (mini USB)
d Rotary switch configuration
  0 to 8 Baud rate
  9 Service mode
  (no bus operation; jog mode possible using joystick)
e Rotary switch bus address ten decimal place

Manual adjustment fieldbus variants (communication interfaces CO and DO)

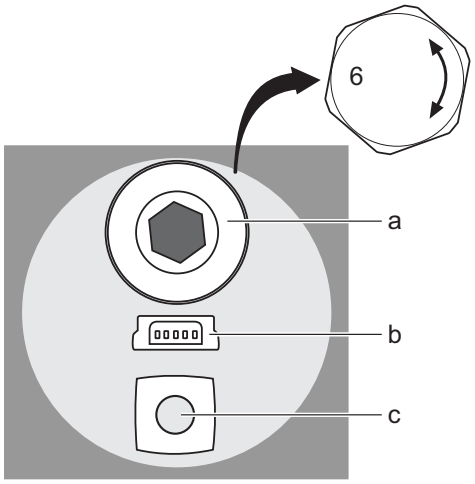


Joystick[1)]
a Jog mode[2)] counterclockwise rotation
b Acknowledge error (push)
c Jog mode[2)] clockwise rotation

[1)] The joystick can only be used in service mode.
[2)] Jog mode: Move the joystick in the indicated arrow direction.

Connection technology ST

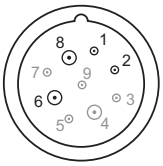
Setting elements for Industrial Ethernet variants (communication interfaces EC/MB/SC/PL/RT/IP)



a Manual emergency adjustment
b Service connector (mini USB)
c Push-button (for service purposes)[1)]

[1)] The push-button may only be activated by Lenord+Bauer.

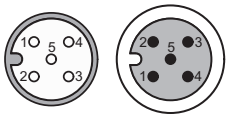
Assignment – Power supply connector

Power supply connector (plug-in view)	Pin designation	Signal identifier
M23  Male contact	1	+24 V DC logic
	2	GND logic
	6	+24 V DC power
	8	GND power
	GND signals connected internally.	

Assignment – Communication interfaces

CANopen

M12 A-coded



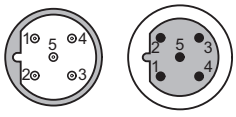
IN OUT

Male contact Female contact (plug-in view)

Pin	IN/OUT
1	Cable screen
2	unallocated
3	CAN-GND
4	CAN-High
5	CAN-Low

PROFIBUS-DP

M12 B-coded



IN OUT

Male contact Female contact (plug-in view)

Pin	IN	OUT
1	unallocated	5 V bus voltage
2	A cable	A cable
3	unallocated	GND bus
4	B cable	B cable
5	Cable screen	Cable screen

Industrial Ethernet Sercos III; POWERLINK; PROFINET IO/RT; EtherCAT; EtherNet/IP; Modbus/TCP

2 × M12 D-coded

Switch sockets (plug-in view)

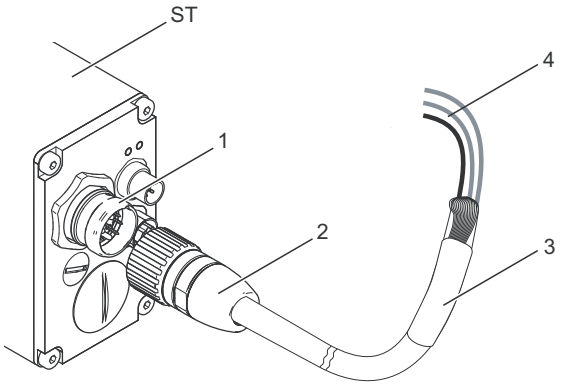
Pin	IN/OUT
1	Transmission Data+
2	Receive Data+
3	Transmission Data-
4	Receive Data-

Connection accessories for ST connection technology[1]

Designation	Item number
PROFIBUS-DP mating connector, M12, B-coded input (female contact)[2]	FS3016
PROFIBUS-DP mating connector, M12, B-coded output (male contact)[2]	FS3017
PROFIBUS-DP terminating resistor, M12, B-coded (male contact)[2]	FS3041
CANopen mating connector, M12, A-coded input (female contact)[2]	FS3020
CANopen mating connector, M12, A-coded output (male contact)[2]	FS3021
CANopen terminating resistor, M12, A-coded (male contact)[2]	FS3040
Industrial Ethernet mating connector input/output, M12, D-coded (male contact)[2]	FS3039
PROFIBUS-DP, 1 connector, male contact, 10 m cable[2]	FS3024
PROFIBUS-DP, 1 connector, female contact, 10 m cable[2]	FS3025
PROFIBUS-DP, 1 connector, male contact, 2 m cable[2]	FS3026
PROFIBUS-DP, 1 connector, female contact, 2 m cable[2]	FS3027
PROFIBUS-DP, 2 connectors, female/male contact, 2 m cable[2]	FS3028
Ethernet network cable, M12 D-coded (male contact) on RJ45, 3 m cable[2]	BK6921
“Mating connector Power supply” M23 (female contact)	FS3038
“Mating connector Power supply” M23 (female contact, 90° offset)	FS3067
Power supply cable M23 (female contact) and flying lead (SeGMo-Connect)	BZK23S1A_ _ L[a]
Power supply cable M23 (female contact, 90° offset) and flying lead (SeGMo-Connect)	BZK23S2A_ _ L[a]
[a] for _ _ cable length specify in meters (minimum 3 m/maximum 20 m)	

Connection accessories power supply cable (SeGMo-Connect, see BZK Technical Information)

Example power supply cable BZK23S1AxxL
(xx = length in meters)



Power supply cable for the positioning drive with ST connection technology

Positioning drive with ST connection technology
- ST Positioning drive
- 1 Power supply connector

Hybrid cable BZK23
- 2 Connector 1/Connector construction type **S1** (“mating connector power supply”, straight - with female contacts)
- 3 Design
  A 16 AWG cULus Listed
- 4 Connector 2: **L**
  (flying lead)

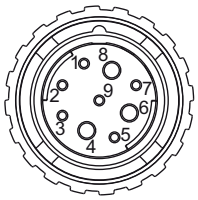
(1) Further accessories (for example fieldbus cables or couplings) upon request
(2) Not suitable for design **C**

Connection accessories: Mating connector power supply (M23 female)

Technical data

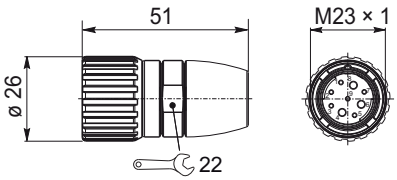
Technical data – Mating connector power supply (connector size M23)	
Rated voltage	150 V
Maximum connection cross section	6 × 1.0 mm^2 [18 AWG]/3 × 2.5 mm^2 [14 AWG]
Contact type	Female contact
Housing material	Metal (GD-Zn/ CuZn Ni)
Ambient temperature	-40 °C to +100 °C
Degree of protection (1)	IP 67
Mating cycles	50
Certification	cULus recognized component (no. E153698)

Assignment

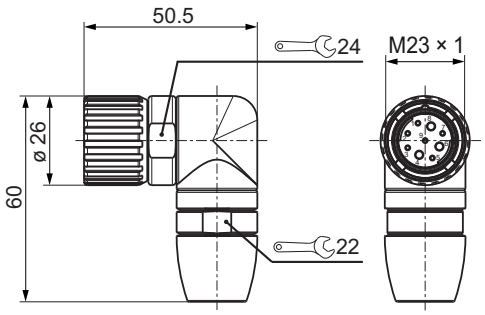
Mating connector Power supply (plug-in view)	Pin designation	Signal identifier
M23  Female contact	1	+ 24 V logic
	6	+ 24 V power
	8	GND logic and GND power
	GND signals connected internally in the positioning drive.	

Dimensional drawings

Item number FS3038



Item number FS3067



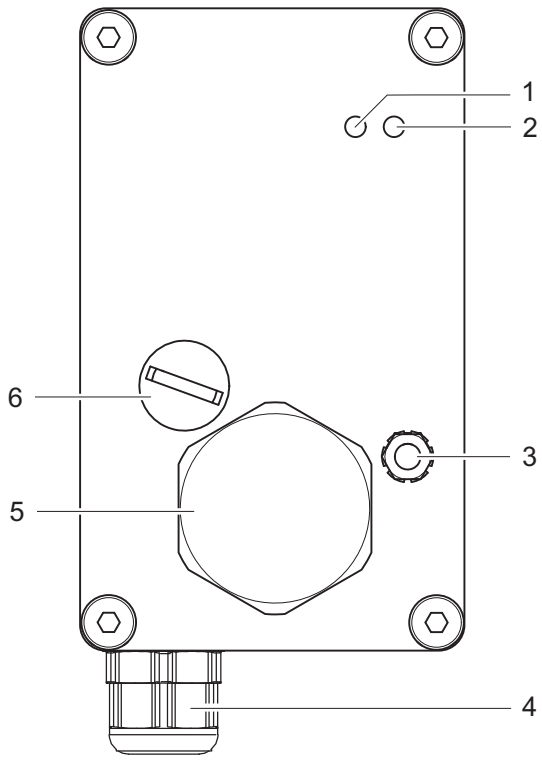
All dimensions in millimeters

(1) in screwed state, as per DIN EN 60529/DIN 40050

Connection technology H1/H2/H3/S1/S2/S3/xx/Vx

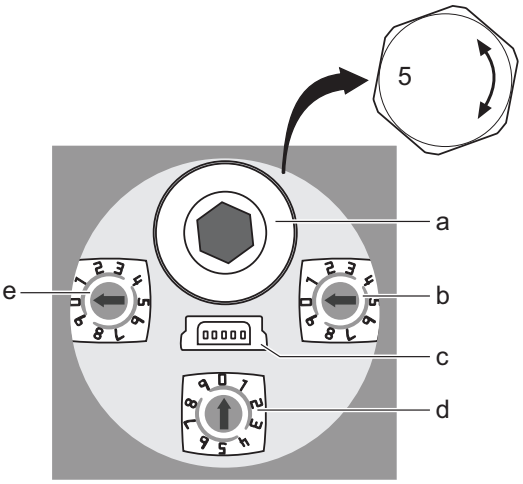
Rear side

Connection technology **H1/H2/H3/S1/S2/S3/xx/Vx**



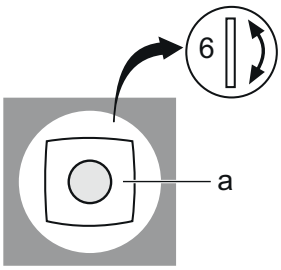
1 Status display — Device (LED1)
2 Status display — Communication (LED2)
3 Functional ground (setscrew M4)
4 M16 cable gland
5 Removable blanking plug for the setting elements
6 Removable blanking plug for service purposes

CANopen setting elements (communication interface CO)



a Manual emergency adjustment
b Rotary switch bus address unit decimal place
c Service connector (mini USB)
d Rotary switch configuration
  0 to 8 Baud rate
  9 Service mode
  (no bus operation; jog mode possible using joystick)
e Rotary switch bus address ten decimal place

CANopen service purposes (communication interface CO)



a Push-button (for service purposes)[1)]

[1)] The push-button may only be activated by Lenord+Bauer.

Connection technology H1/H2/H3/S1/S2/S3/xx/Vx

Assignment for xx/Vx connection technology

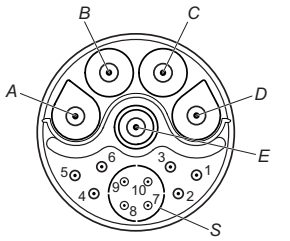
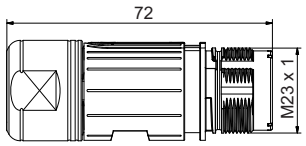
Connection technology **xx**: flying lead				Connection technology **Vx**: preassembled for GEL 6505		Signal identifier
Core color/ Core Number	Cross section Design **0**	Cross section Design **1**	Cross section Design **C**	4-pin spring-cage terminal (internal communi-cation positioning drives) pin designation	4-pin spring-cage terminal (voltage supply positioning drives) pin designation	
red/1	0.5 mm^2 [20 AWG]	0.5 mm^2 [20 AWG]	0.5 mm^2 [20 AWG]	–	3	+24 V logic
red/2	1.5 mm^2 [16 AWG]	1.5 mm^2 [16 AWG]	2.5 mm^2 [14 AWG]	–	1	+24 V power
black/2	1.5 mm^2 [16 AWG]	1.5 mm^2 [16 AWG]	2.5 mm^2 [14 AWG]	–	2	GND power
black/1	0.5 mm^2 [20 AWG]	0.5 mm^2 [20 AWG]	0.5 mm^2 [20 AWG]	–	4	GND logic
black	0.14 mm^2 [26 AWG]	0.14 mm^2 [26 AWG]	0.14 mm^2 [26 AWG]	1	–	CAN-GND
green	0.25 mm^2 [24 AWG]	0.25 mm^2 [24 AWG]	0.25 mm^2 [24 AWG]	3	–	CAN-Low
yellow	0.25 mm^2 [24 AWG]	0.25 mm^2 [24 AWG]	0.25 mm^2 [24 AWG]	2	–	CAN-High

Connection accessories for xx connection technology

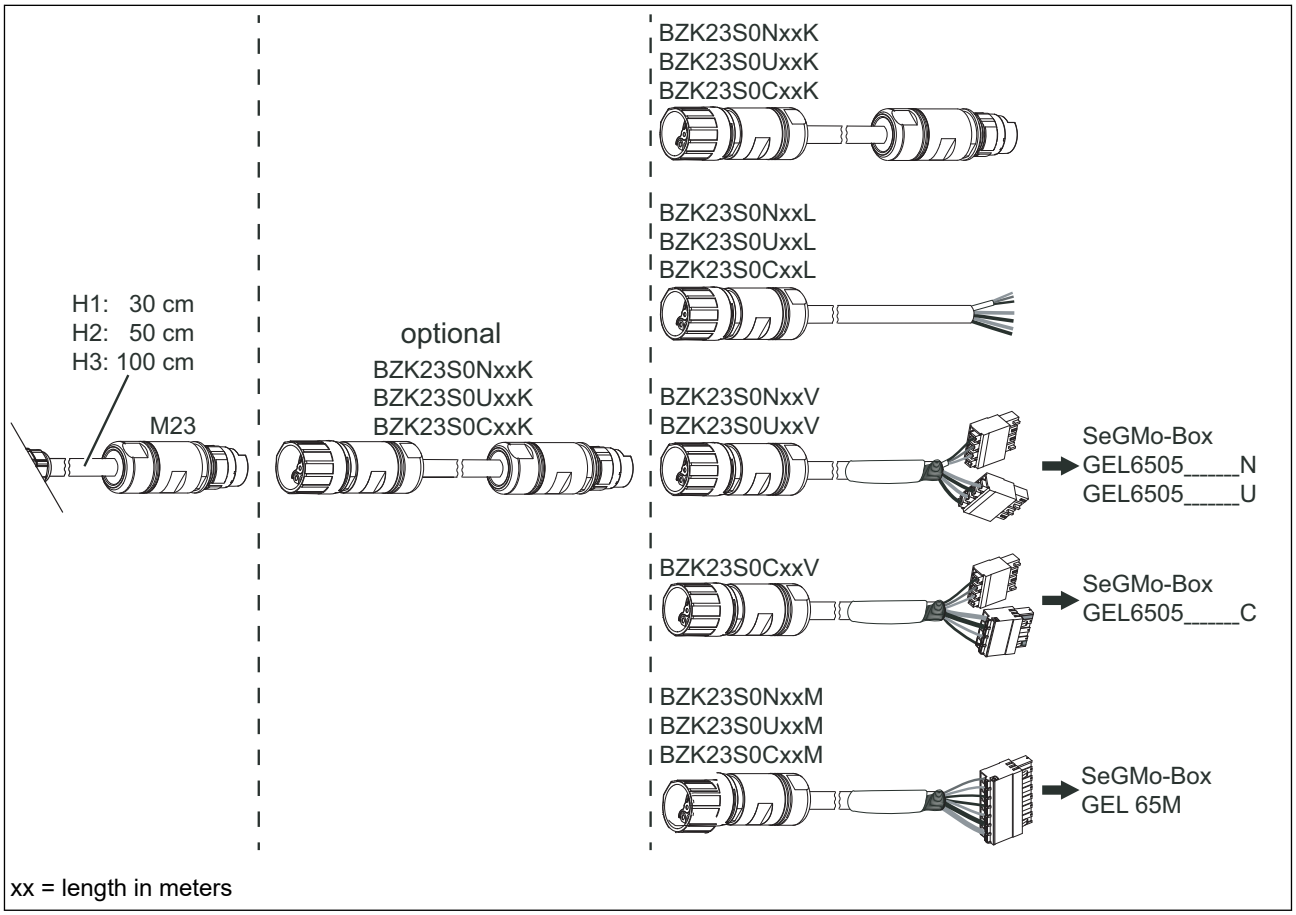
Designation	**Item number:**
Hybrid cable assembly for	
SeGMo-Box GEL 6505 in design N/U	89070
SeGMo-Box GEL 6505 in design C	ZB6505UL01
Modular SeGMo-Box GEL 65M, design N	ZB65MX01

Connection technology H1/H2/H3/S1/S2/S3/xx/Vx

Assignment for H1/H2/H3 connection technology

M23 connector		
Coupling with male contacts (plug-in view)	**Pin designation**	**Signal identifier**
	*A*	+24 V logic
	B	GND logic
	C	GND power
	D	+24 V power
	E	Cable screen
	7	CAN-High
	8	CAN-GND
	9	CAN-Low
	S	CAN screen
		

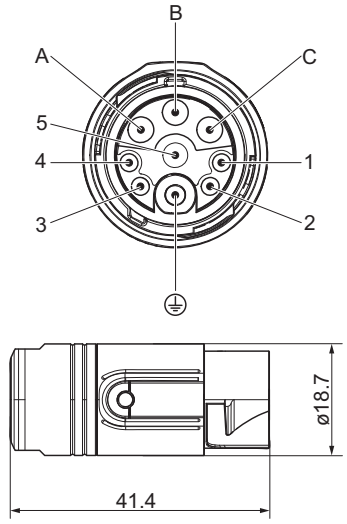
Connection accessories for H1/H2/H3 connection technology (SeGMo-Connect, see BZK Technical Information)



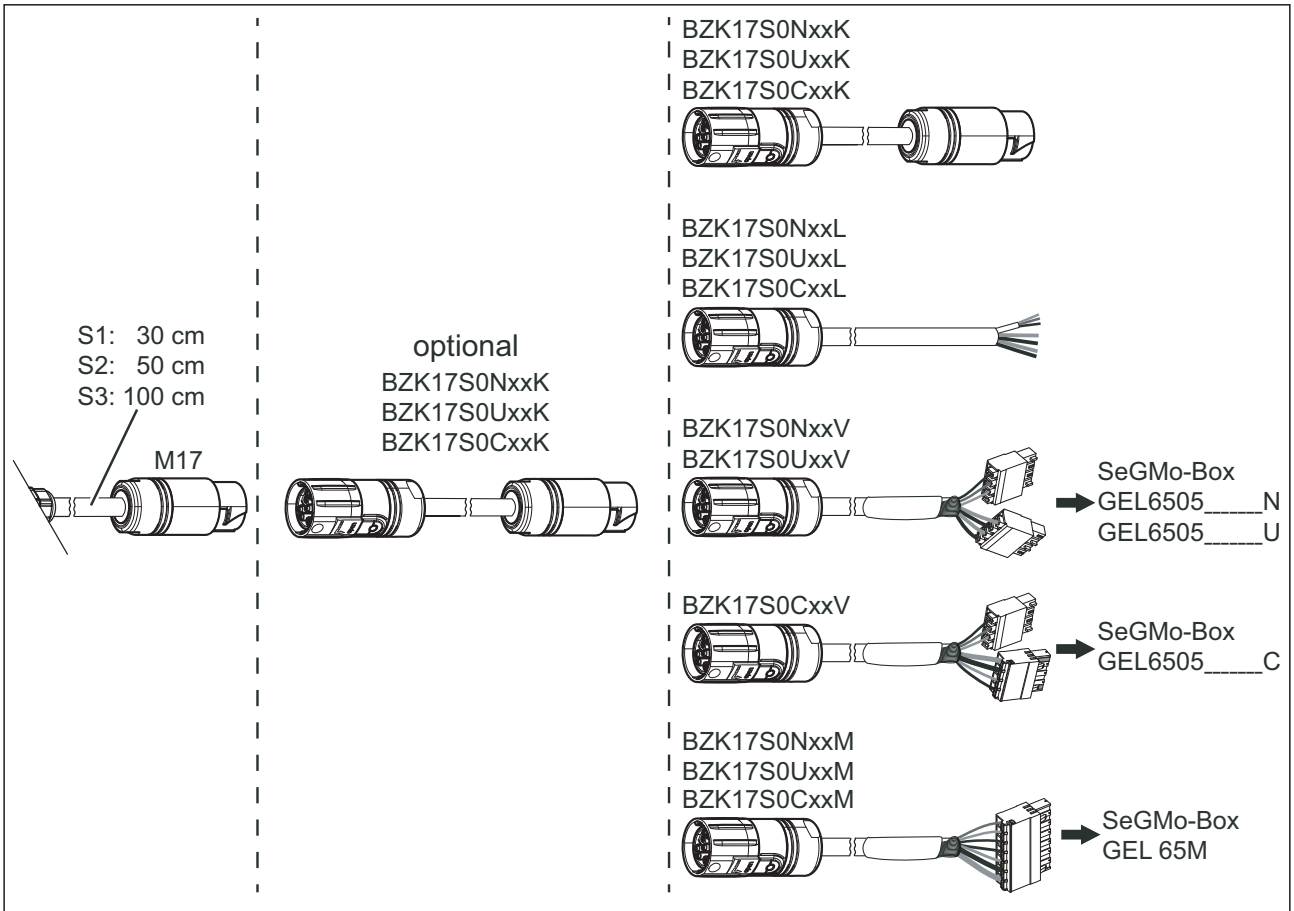
xx = length in meters

Connection technology H1/H2/H3/S1/S2/S3/xx/Vx

Assignment for S1/S2/S3 connection technology

M17 connector		
Coupling with male contacts (plug-in view)	**Pin designation**	**Signal identifier**
	*A*	+24 V logic
	B	+24 V power
	C	GND power
	1	GND logic
	2	CAN-GND
	3	CAN-Low
	4	CAN-High
Cable screen and CAN screen are connected to the metallic coupling housing and to the pin ⏚ .		

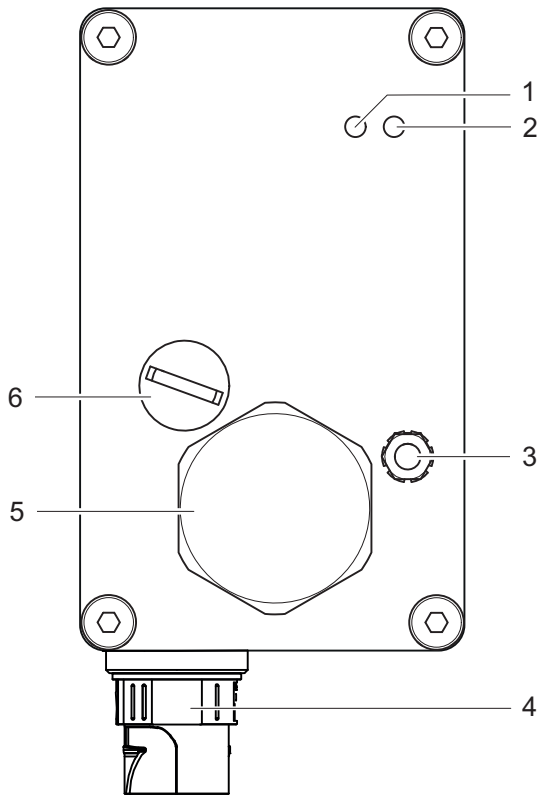
Connection accessories for S1/S2/S3 connection technology (SeGMo-Connect, see BZK Technical Information)



xx = length in meters

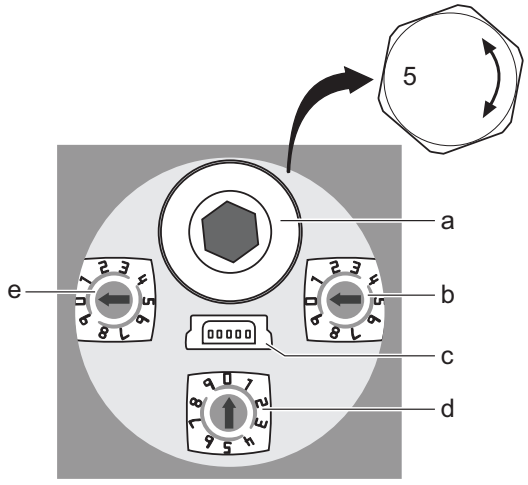
Rear side

Connection technology **HS**



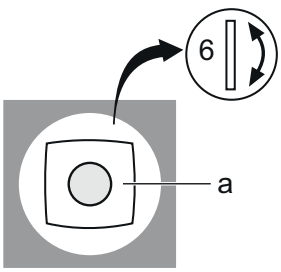
1 Status display — Device (LED1)
2 Status display — Communication (LED2)
3 Functional ground (setscrew M4)
4 M17 panel-mounting socket with male contacts
5 Removable blanking plug for the setting elements
6 Removable blanking plug for service purposes

CANopen setting elements (communication interface CO)



a Manual emergency adjustment
b Rotary switch bus address unit decimal place
c Service connector (mini USB)
d Rotary switch configuration
  0 to 8 Baud rate
  9 Service mode
  (no bus operation; jog mode possible using joystick)
e Rotary switch bus address ten decimal place

CANopen service purposes (communication interface CO)

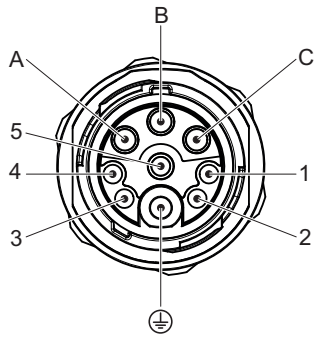


a Push-button (for service purposes)[1)]

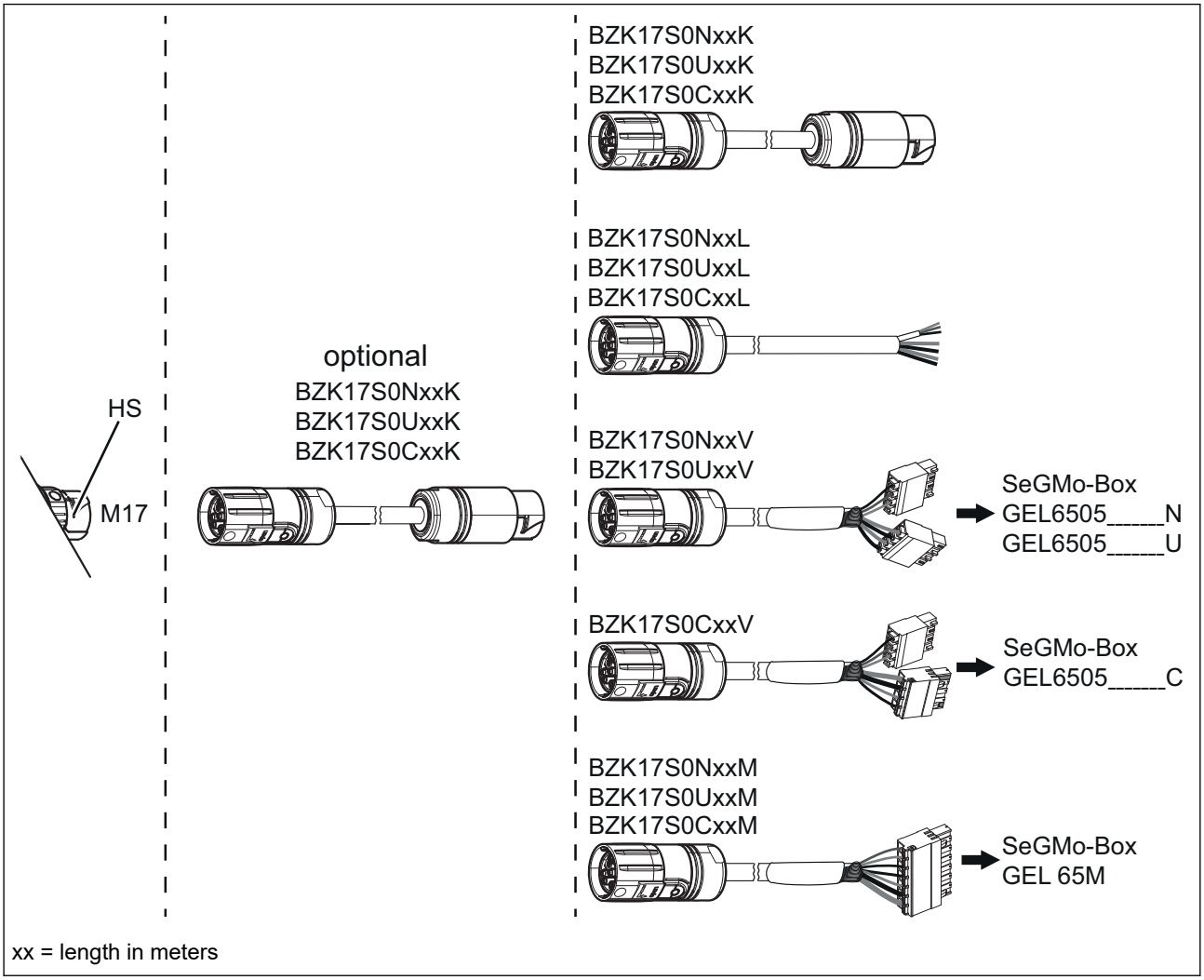
[1)] The push-button may only be activated by Lenord+Bauer.

Connection technology HS

Assignment for HS connection technology

M17 connector		
Panel-mounting socket with male contacts (plug-in view)	**Pin designation**	**Signal identifier**
	*A*	+24 V logic
	B	+24 V power
	C	GND power
	1	GND logic
	2	CAN-GND
	3	CAN-Low
	4	CAN-High

Connection accessories for HS connection technology (SeGMo-Connect, see BZK Technical Information)



xx = length in meters

Accessories for mounting and spare parts

Assembly accessories

Accessories for mounting (not included in the scope of supply)

Designation	Item number
Clamp coupling for machine shaft with diameter: — 15 mm — 16 mm — 17 mm — 18 mm — 19 mm — 20 mm	 MZ1351 MZ1335 MZ1354 MZ1356 MZ1355 MZ1339
Accessories kit plain bearings, comprising: 5 pc. plain bearings, item number: OG0001	ZB61X01
Accessories kit headless screws, comprising: 5 pc. headless screws M5×20, item number: VS3412	ZB61X02
Accessories kit screws torque support, comprising: 10 pc. screws M5×8, item number: VS2107	ZB61X03
Accessory set for options **0** and **1**, comprising: ▪ 1 pc. torque support left, item number: GZ1168 ▪ 1 pc. plain bearing, item number: OG0001 ▪ 2 pc. screw M5×8, item number: VS2107 ▪ 1 pc. headless screw M5×20, item number: VS3412 ▪ 1 pc. assembly note, item number: D-53H-6113_01	ZB6113L01
Accessory set for options **0** and **1**, comprising: ▪ 1 pc. torque support right, item number: GZ1167 ▪ 1 pc. plain bearing, item number: OG0001 ▪ 2 pc. screw M5×8, item number: VS2107 ▪ 1 pc. headless screw M5×20, item number: VS3412 ▪ 1 pc. assembly note, item number: D-53H-6113_01	ZB6113R01
Accessory set for options **0** and **1**, comprising: ▪ 1 pc. torque support left and right, item number: GZ1169 ▪ 1 pc. plain bearing, item number: OG0001 ▪ 2 pc. screw M5×8, item number: VS2107 ▪ 1 pc. headless screw M5×20, item number: VS3412 ▪ 1 pc. assembly note, item number: D-53H-6113_01	ZB6113LR1

Spare parts

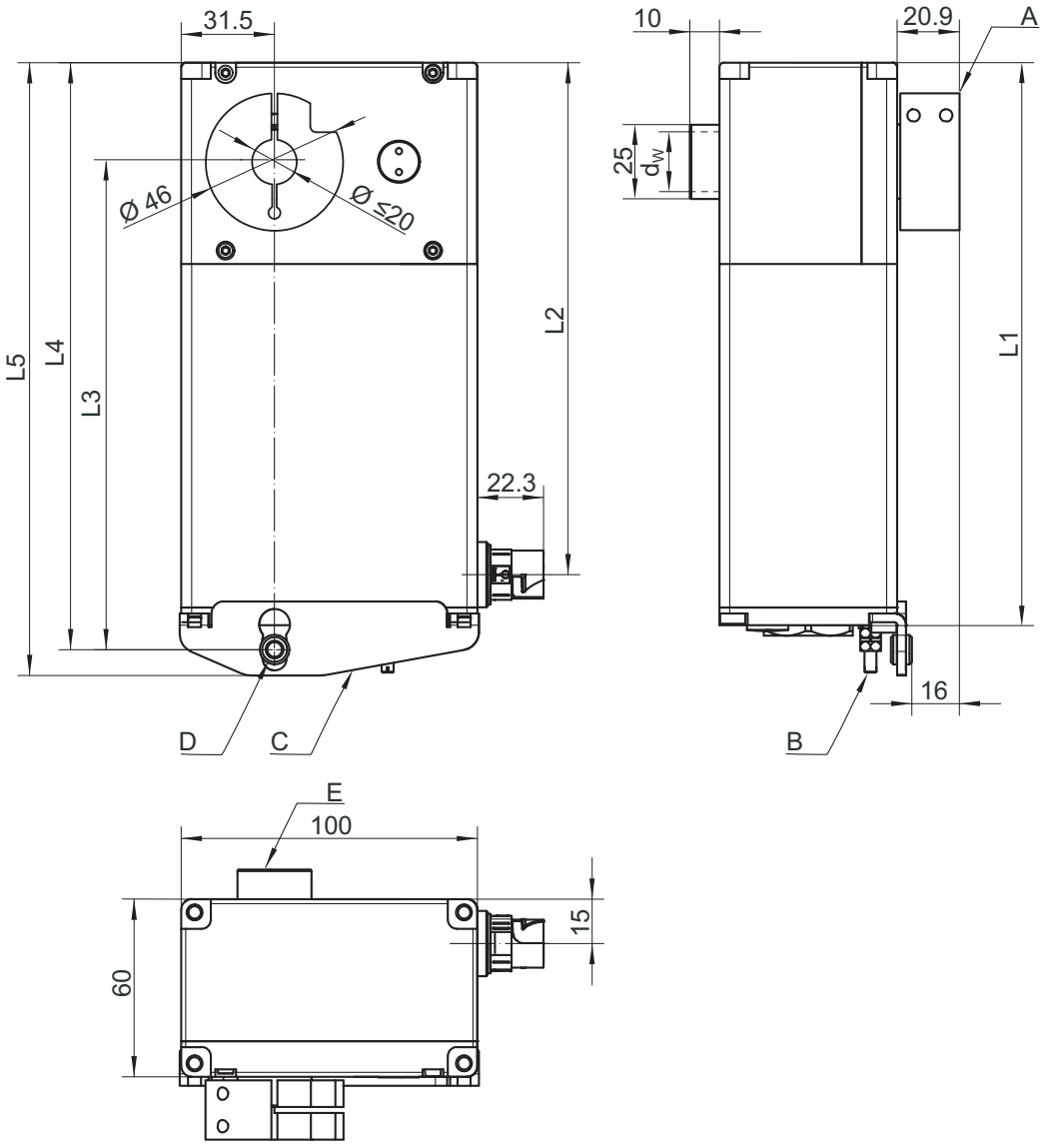
Warning stickers

Designation
Warning sign “Warning automatic start-up”, lateral length 25 mm, ASR A1.3 / ISO 7010, Warning sign W018
Warning sign “Warning for hot surface”, lateral length 25 mm, ASR A1.3 / ISO 7010, Warning sign W017

Dimensional drawings

All dimensions in millimeters; general tolerance DIN ISO 2768 – mK

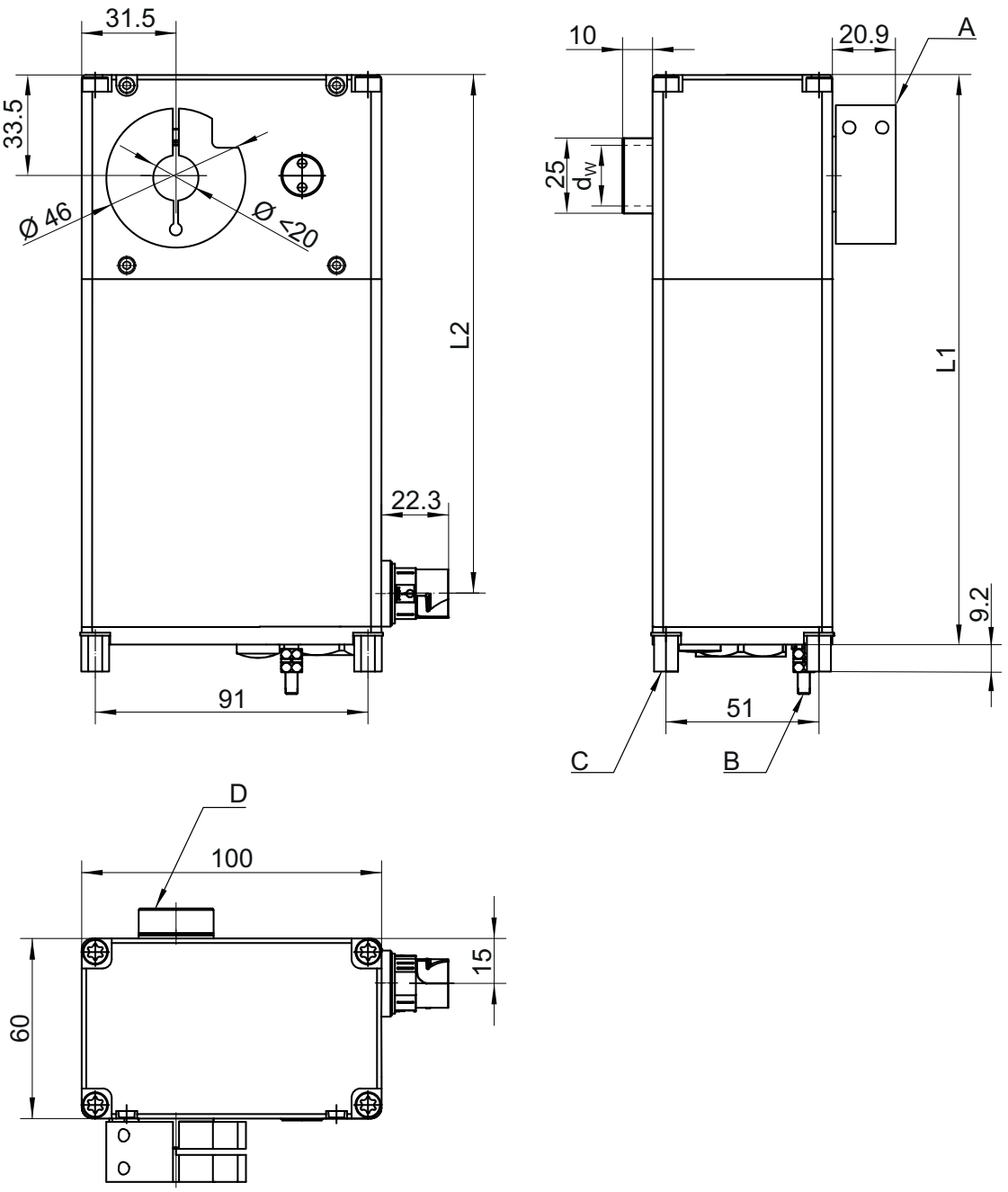
SeGMo-Positioning GEL 6113, connection technology HS, option R



A Clamp coupling can be mounted on both sides
B Functional ground (setscrew M4)
C Torque support right, GZ1167
D Plain bearing OG0001
E Output shaft
d_W Inside diameter output shaft

Note: Torque support and clamp coupling must be mounted on the same side of the positioning drive.

GEL 6113, HS connection technology, option 0 or 1

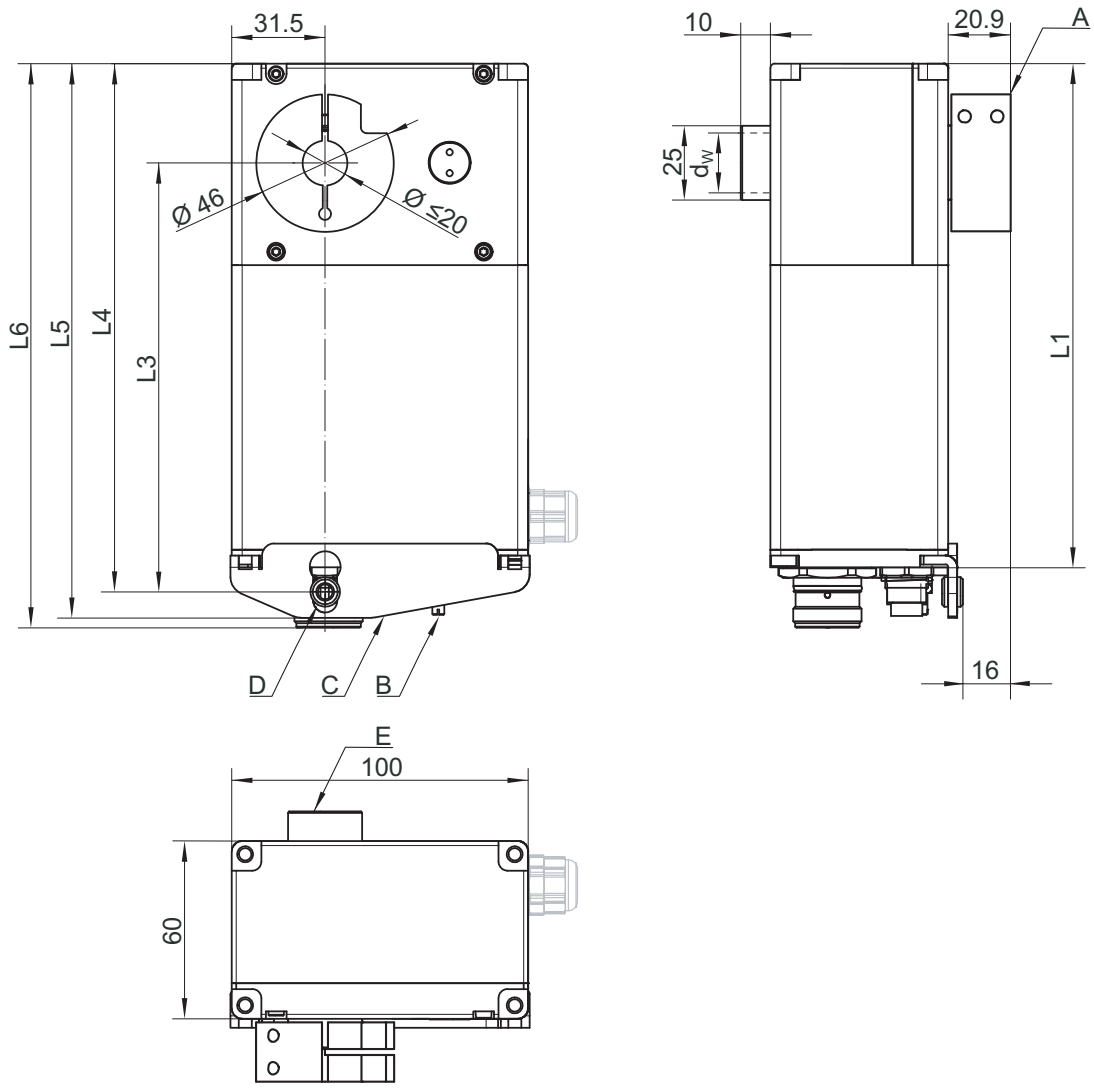


A Clamp coupling can be mounted on both sides
B Functional ground (setscrew M4)
C 4 spacing bolts (M5, 7 mm deep) to fasten a torque support
D Output shaft
d_W Inside diameter output shaft

Note: Torque support and clamp coupling must be mounted on the same side of the positioning drive.

Dimensional drawings

SeGMo-Positioning GEL 6113, connection technology ST, option R



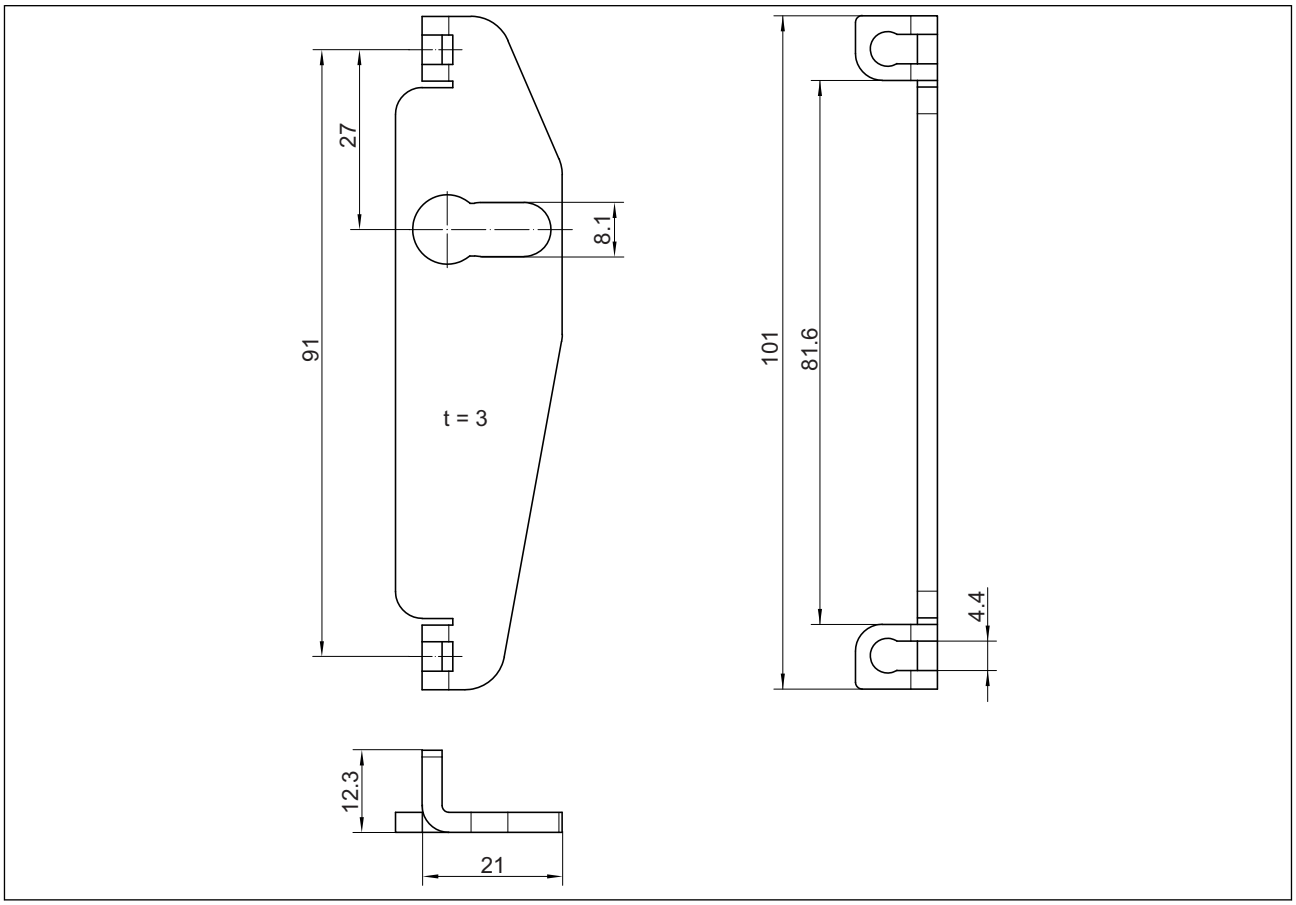
A Clamp coupling can be mounted on both sides
B Functional ground (setscrew M4)
C Torque support right, GZ1167
D Plain bearing OG0001
E Output shaft
d_W Inside diameter output shaft

gray: Hybrid cable
Connection technology **H1/H2/H3/S1/S2/S3/Vx/xx**

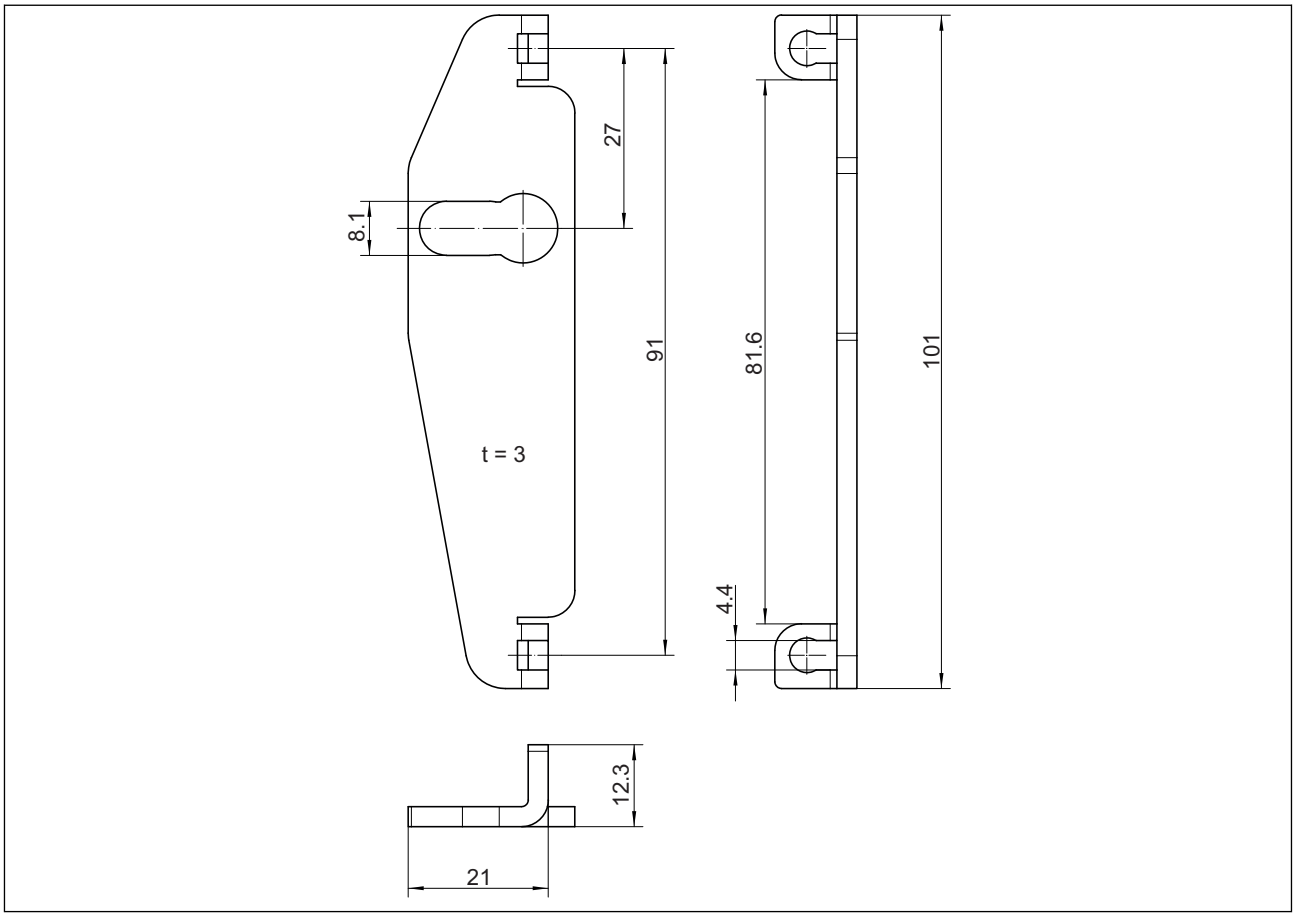
Note: Torque support and clamp coupling must be mounted on the same side of the positioning drive.

Nominal torque	**Construction type**	**Option torque support**	**Dimensions**					
			L1	**L2**	**L6**	**L3**	**L4**	**L5**
05, **07**	**K**	**L, R**	170	153	190.3	145	178.5	187
10	**L**	**L, R**	190	173	210.3	165	198.5	207
Nominal torque	**Construction type**	**Option** Spacing bolt				**Dimensions with accessory set**		
			L1	**L2**	**L6**	**L3**	**L4**	**L5**
05, **07**	**K**	**0**	170	153	190.3	158.5	192	200.5
10	**L**	**0**	190	173	210.3	178.5	212	220.5
05, **07**	**K**	**1** (with holding brake)	195	178	215.3	183.5	217	225.5
10	**L**	**1** (with holding brake)	215	198	235.3	203.5	237	245.5

Torque support left, GZ1168 (part of option L and accessory set ZB6113L01)

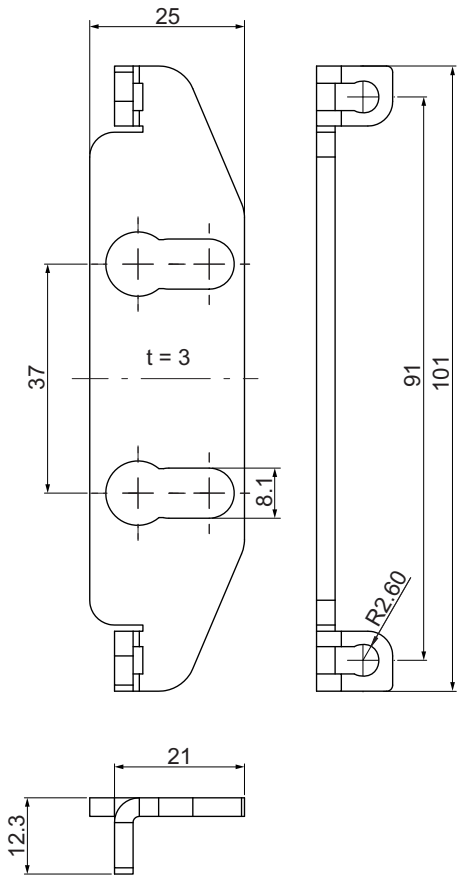


Torque support right, GZ1167 (part of option R and accessory set ZB6113R01)

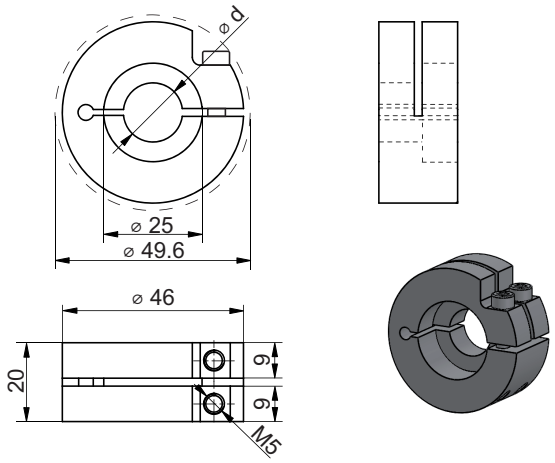


Dimensional drawings

Torque support left and right, GZ1169 (part of accessory set ZB6113LR1)



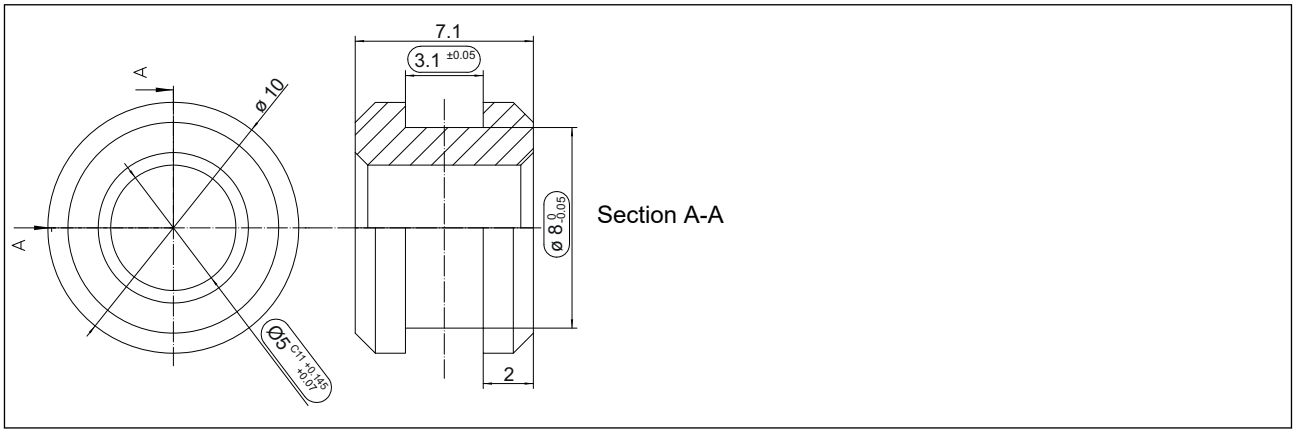
Clamp coupling (assembly accessories)



for machine shafts with diameters from 15 mm to 20 mm

Dimensions/item number clamp coupling	MZ1351	MZ1335	MZ1354	MZ1356	MZ1355	MZ1339
⌀ d [mm]	15^{H9}	16^{H9}	17^{H9}	18^{H9}	19^{H9}	20^{H9}
Screws ISO 14579 Torx	M5	M5	M5	M5	M5	M5

Plain bearings OG0001 (part of options L and R and accessory sets ZB6113L01, ZB6113R01 and ZB6113LR1)



Section A-A

Type code

Type code GEL 6113

	Communication interface								
	CO CANopen CiA 402								
	DP PROFIBUS-DP V0/V1								
	EC EtherCAT								
	IP EtherNet/IP								
	MB Modbus/TCP								
	PL POWERLINK								
	RT PROFINET IO/RT								
	SC Sercos III								
		Nominal torque							
		05 5 Nm							
		07 7 Nm							
		10 10 Nm							
			Output shaft [d_w in millimeter]						
			U 20.2 mm through hollow shaft						
				Housing material					
				A Aluminum AlMgSi, anodized					
					Construction type				
					K short				
					L long				
						Connection Technology			
						ST Connector (standard): M12 fieldbus, M23 power supply)			
						HS M17 panel-mounting socket with male contacts			
						S1 30 cm hybrid cable and M17 coupling with male contacts			
						S2 50 cm hybrid cable and M17 coupling with male contacts			
						S3 100 cm hybrid cable and M17 coupling with male contacts			
						H1 30 cm hybrid cable and M23 coupling with male contacts			
						H2 50 cm hybrid cable and M23 coupling with male contacts			
						H3 100 cm hybrid cable and M23 coupling with male contacts			
						Vx Hybrid cables pre-assembled with spring-cage terminals for SeGMo-Box GEL 6505, Cable length V**1** = 1 m; V**2** = 3 m; V**3** = 5 m; V**4** = 8 m; V**5** = 10 m; V**6** = 13 m; V**7** = 15 m; V**8** = 18 m; V**9** = 20 m			
						xx xx m hybrid cable with flying lead, length in meters (xx = 01 to 20; standard: 3 m)			
							Design		
							0 Standard		
							1 Individual protection		
							C cULus recognized component		
								Option	
								0 without torque support, with spacing bolt, without holding brake	
								1 without torque support, with spacing bolt, with holding brake	
								L Torque support standard left **(GZ1168 and plain bearing OG0001)**, without holding brake	
								R Torque support standard right **(GZ1167 and plain bearing OG0001)**, without holding brake	
									Degree of protection
									3 IP 67 (with shaft sealing ring and protection against humidity), version **C**: additionally protection class type 1
6113	_ _	_ _	_	_	_	_ _	_	_	_

Restrictions

Connection Technology

The connection technologies **HS/H1/H2/H3/S1/S2/S3/xx/Vx** are only available with communication interface **CO** (CANopen).
The communication interface **DP** with **ST** connection technology is only available in version **0** lieferbar.

Nominal torque/type of construction/option

Nominal torque		Construction type	Length of housing (dimension L1)	
			Option 0, L, R (without holding brake)	**Option 1 (with holding brake)**
05	5 Nm at 55 min^{-1}	**K**	170 mm	195 mm
07	7 Nm at 55 min^{-1}	**K**	170 mm	195 mm
10	10 Nm at 55 min^{-1}	**L**	190 mm	215 mm

Customized modifications

Customized special housings and customized shafts are available upon request as per approval drawing.

Customized special designs are assigned a Y-number. A positioning drive marked with Y (example: A 6113Yxxx) is a customized design with a special assembly and/or modified technical specifications. Depending on the customized modification, more or other documents may apply.

Notes for USA and Canada (design C)

Certification: cULus recognized component (document E196161)

General

- The positioning drives were only examined for the application area of NFPA 79 (Electrical Standard for Industrial Machinery).
- Mechanical hazards caused by moving parts must be evaluated as part of the final application.
- Suitability of connection cables and connectors must be evaluated as part of the final application.
- Protecting the motor against overload was not taken into account as part of the certification process and must be evaluated as part of the final application.
- Protecting the motor against excessive temperature was not taken into account as part of the certification process and must be evaluated as part of the final application.
- Protecting the motor against a blocked machine shaft was not taken into account as part of the certification process and must be evaluated as part of the final application.

Connection technologies **H1/H2/H3/HS/S1/S2/S3/Vx/xx**

- The positioning drives were examined and tested as an integral part of the SeGMo system for the "Factory Automation" area. The application is permissible only in combination with SeGMo-Boxes, types GEL6505B␣␣␣␣␣␣C (GPNY) and GEL6505A␣␣␣␣␣␣C (GPNY2) (document E483619).
- The positioning drives are only intended for use with SeGMo-Box GEL6505A␣␣␣␣␣␣C or GEL6505B␣␣␣␣␣␣C in combination with SeGMo-Connect BZK␣␣␣␣C␣␣␣.

Connection technology **ST**

- The positioning drives are not intended for direct connection to the power grid. Power supply must be provided by a power supply unit with UL listing as per UL 61010 or UL 508. The power supply unit must ensure electrical isolation to the main power supply. A breaker compliant with UL 248 must be fitted in the supply cable between the power supply unit and the positioning drive. Irrespective of the input voltage, the breaker must have a nominal value of $100W/U_{IN}$ (input voltage U_{IN}: 24 V to 30 V DC).
- The positioning drives have been only evaluated for use in overvoltage category II.
- The positioning drives have been only evaluated for use in the "Factory Automation" area (GPNY).

Your notes

Your notes

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