

Commissioning instructions EGU/EGK/EZU for Kassow Robots (KR Series Gen2, Edge Edition)

Translation of original commissioning
instructions

Imprint

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Technical changes:

We reserve the right to make alterations for the purpose of technical improvement.

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Dear Customer,

Thank you for trusting our products and our family-owned company, the leading technology supplier of robots and production machines.

Our team is always available to answer any questions on this product and other solutions. Ask us questions and challenge us. We will find a solution!

Best regards,

Your SCHUNK team

Customer Management

Tel. +49-7133-103-2503

Fax +49-7133-103-2189

cmg@de.schunk.com



Please read the operating manual in full and keep it close to the product.

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1 General

1.1 About this manual

This manual contains information about how to mechanically mount and electrically connect the gripper to a Kassow Robots (KR) robot. For the software integration, a **CBun** is available by Kassow Robots and can be found under <https://kassowrobots.com>.

The software is used to easily integrate the following products in applications with KR robots:

- EGU MB: with Modbus RTU interface
- EGK MB: with Modbus RTU interface
- EZU MB: with Modbus RTU interface

NOTE

The compatibility of the product with the robot depends on the current carrying capacity, for compatibility overview see ▶ 8.2 [21].

Definition of terms "Product"

The term "product" replaces the product names listed above in this manual.

NOTE: The illustrations in this manual are intended to provide a basic understanding and may deviate from the real robot version. Follow the instructions for the robot.

In addition to these instructions, the documents listed under ▶ 1.5 [6] are applicable.

Abbreviations

The following abbreviations are used:

- GPE: Gripping force and position maintenance Variant "M" products are equipped with gripping force and position maintenance (GPE). When sending control commands with these products, you can specify whether workpieces and positions are to be maintained by the drive control or GPE.
- SG: Single Gripper
- DG: Double Gripper
- TCP: Tool Center Point
- COM: Center of Mass (center of gravity)

1.2 Target group

This manual is intended for robot integrators who have basic mechanical and electrical training skills and who are also familiar with elementary programming concepts.

Commissioning and troubleshooting may only be performed by qualified personnel with appropriate training.

The following knowledge is required:

- Basic knowledge of robotics
- Knowledge in handling KR robots

Electrical installations may only be carried out by a suitably trained electrician.

1.3 Symbol definition

The following symbols are used in this manual:

■ Prerequisite for an action

1. Action 1

2. Action 2

⇒ Intermediate results

⇒ Final results

▶ 1.3 [5]: chapter number and [page number] in hyperlinks

1.4 Presentation of Warning Labels

To make risks clear, the following signal words and symbols are used for safety notes.



⚠ DANGER

Dangers for persons!

Non-observance will inevitably cause irreversible injury or death.



⚠ WARNING

Dangers for persons!

Non-observance can lead to irreversible injury and even death.



⚠ CAUTION

Dangers for persons!

Non-observance can cause minor injuries.

NOTICE

Material damage!

Information about avoiding material damage.

1.5 Applicable documents

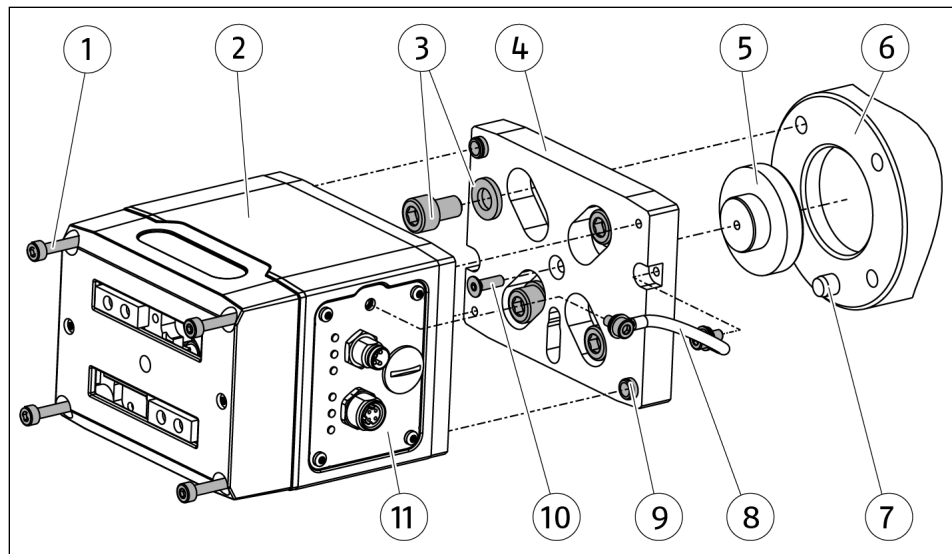
- Assembly and operating manual for the product:
 - Electric universal gripper EGU *
 - Electric gripper for small components EGK *
 - Electric centric gripper EZU *
- Commissioning instructions:
 - EGU with Modbus RTU interface *
 - EGK with Modbus RTU interface *
 - EZU with Modbus RTU interface *
- Operating manual for the KR robot
- Documentation for the EGU, EGK and EZU CBun provided by KR

The documents labeled with an asterisk (*) can be downloaded from schunk.com/downloads.

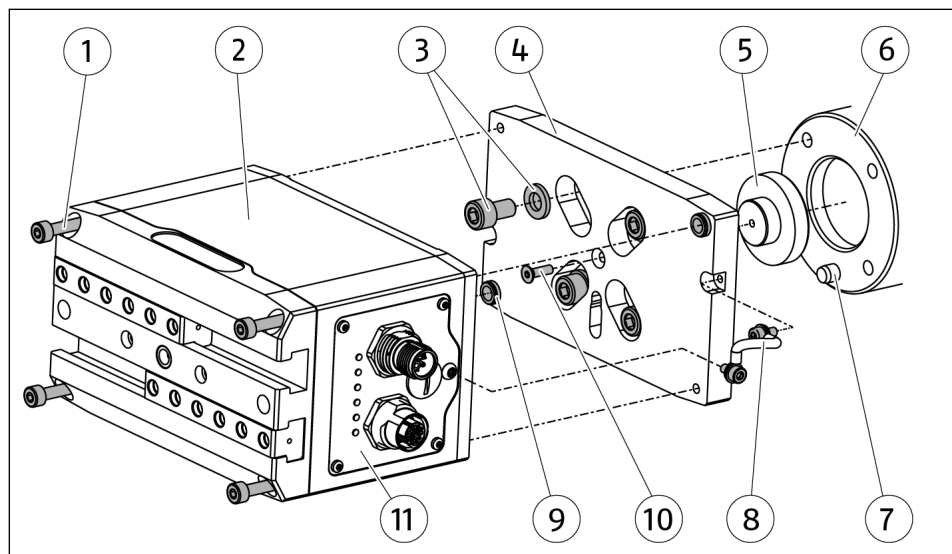
2 Mounting the product to the robot

SCHUNK provides robot adaptation packages as accessories for mounting the product on robots. These packages include matching screws, centering pins and centering collar for fastening to the desired robot flange. For more information, see the catalog data sheet at schunk.com.

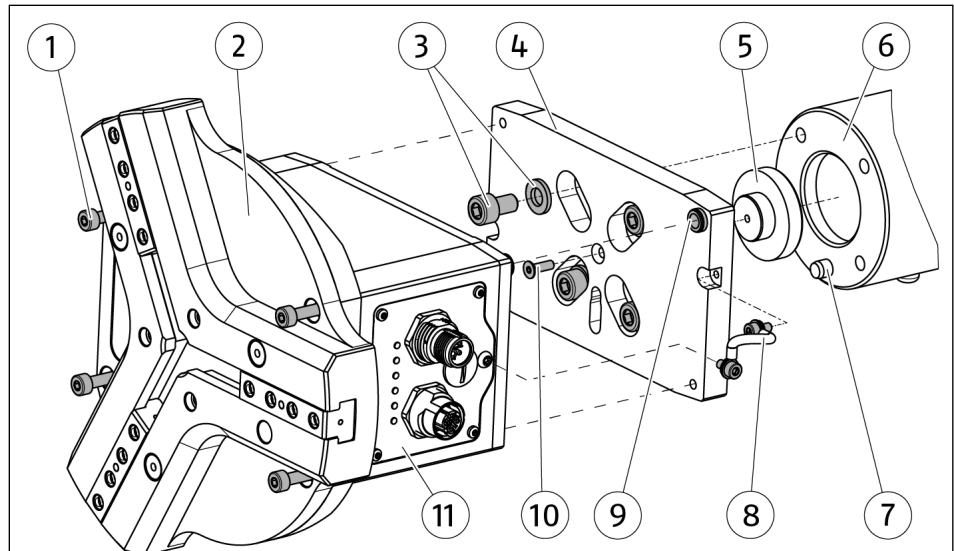
Single gripper (SG)



EGK-SG: Mounting on the robot



EGU-SG: Mounting on the robot



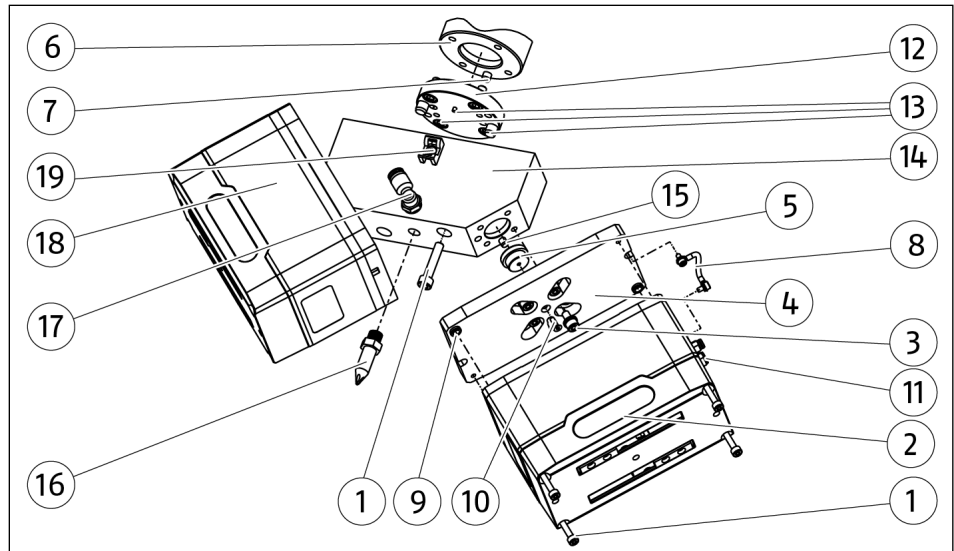
EZU-SG: Mounting on the robot

1. Insert centering pin (7) in robot flange (6).
2. Mount centering collar (5) with screw (10) on adapter plate (4).
3. Fasten adapter plate (4) to robot flange (6) with screws (3) and, if necessary, with washers.
4. Mount the functional earth (8) cable to the adapter plate (4) with screw and toothed lock washer.
5. Insert centering sleeves (9) into adapter plate (4).
6. Fasten the product (2) to the adapter plate (4) with screws (1).
Note: Circuit board (11) and functional earth cable (8) must be on the same side.
7. Connect the functional earth cable (8) to the equipotential bonding of the product using a screw and toothed lock washer.

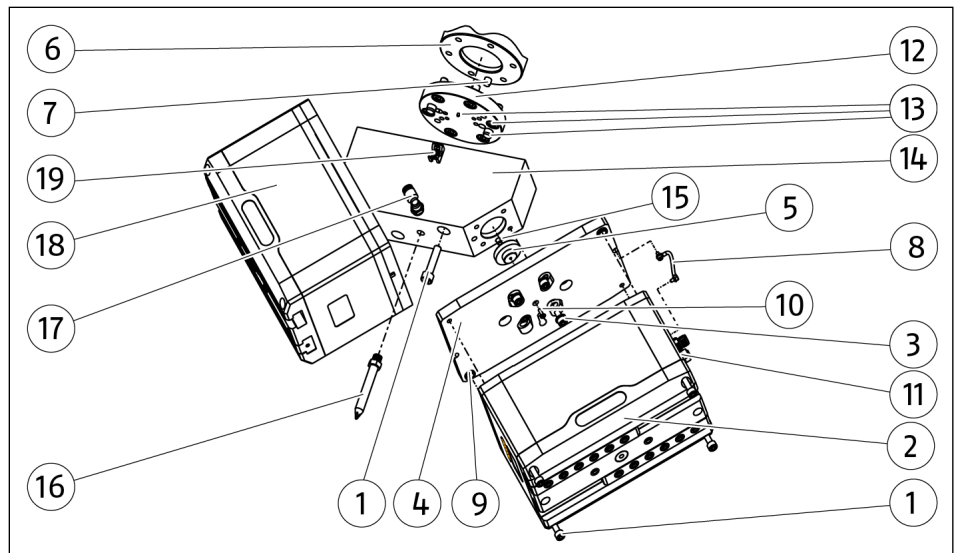
Double gripper (DG)

Note: When used as a double gripper, a blow-off nozzle can be mounted. In the process, the outgoing air from the blow-off nozzle cleans the workpiece of chips or other impurities.

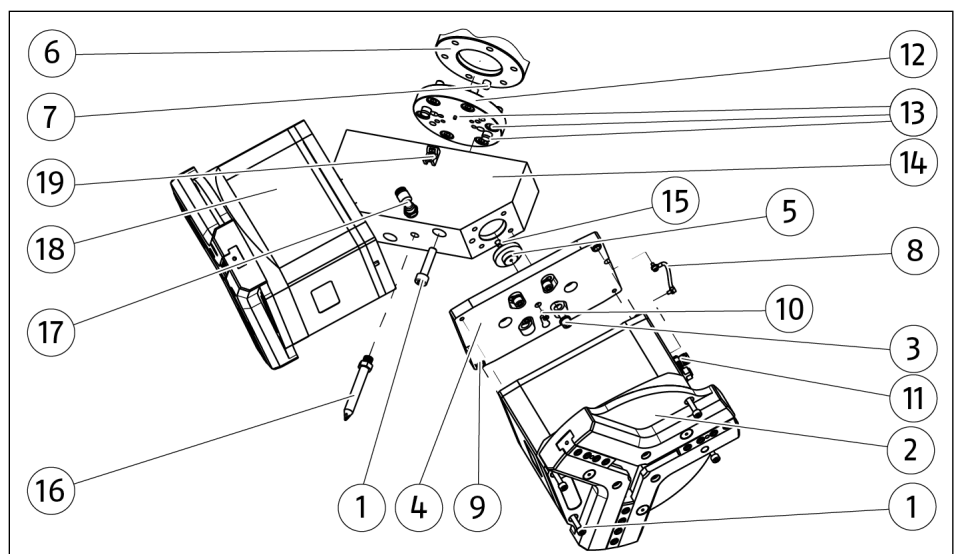
Blow-off nozzle and cable holder are available as accessories from SCHUNK, see catalog data sheet at [schunk.com](https://www.schunk.com).



EGK-DG: Mounting on the robot



EGU-DG: Mounting on the robot



EZU-DG: Mounting on the robot

1. Insert centering pin (7) in robot flange (6).
2. Fasten ISO flange (12) to the robot flange (6) using screws (13).

- 3.** Insert centering pins (13) in ISO flange (12).
- 4.** Fasten elbow adapter (14) with screws (1) to ISO flange (12) in correct position.
- 5.** Insert centering pin (15) into elbow adapter (14).
- 6.** Mount centering collar (5) with screw (10) on adapter plate (4).
- 7.** Fasten the adapter plate (4) with screws (3) and if necessary with washers to the elbow adapter (14).
- 8.** Mount the functional earth (8) cable to the adapter plate (4) with screw and toothed lock washer. Make sure that the functional earth cable (8) points outwards.
- 9.** Insert centering sleeves (9) into adapter plate (4).
- 10.** Fasten the product (2) to the adapter plate (4) with screws (1).
Note: Circuit board (11) and functional earth cable (8) must be on the same side.
- 11.** Connect the functional earth cable (8) to the equipotential bonding of the product using a screw and toothed lock washer.
- 12.** Mount the second gripper (18) to the elbow adapter (14) in the same way.
- 13.** Optional: Glue the blow-off nozzle (16) with the enclosed O-ring into the Z-axis of the elbow adapter (14) with liquid, medium-strength threadlocker (tightening torque 1 Nm). Screw the elbow fitting (17) into the elbow adapter (14).
- 14.** Optional: Fasten cable holder (19) to elbow adapter (14) with enclosed screw.

3 Connecting the product to the robot control system

Before connecting or commissioning the product, read the operating manual of the robot and observe the instructions in this manual!



⚠ WARNING

Risk of injury due to unexpected movements!

If the power supply is switched on or residual energy remains in the system, components can move unexpectedly and cause serious injuries.

- Before starting any work on the product: Switch off the power supply and secure against restarting.
- Make sure, that no residual energy remains in the system.



⚠ CAUTION

Risk of injury from electric shock due to contact with live parts!

- Follow the operating manual for the robot.
- Before starting any work on the product: Switch off the energy supply and secure against re-connection.

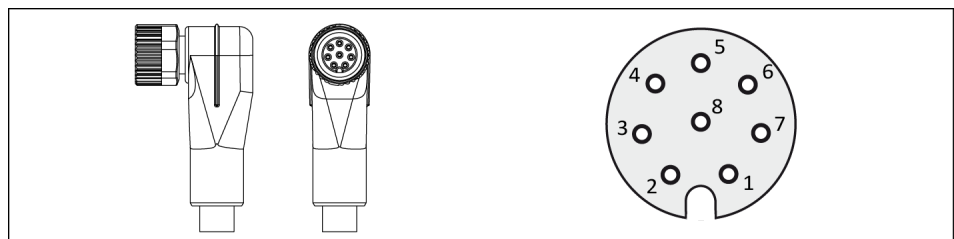
NOTE

Safety-relevant signals (e.g. emergency stop) must be wired externally, e.g. via safety relays, thus completely disconnecting the product from the power supply.

- Perform a risk assessment for the entire robotic application based on legal requirements to evaluate all safety-related aspects of the application.
- To increase the power of the robots Male connector, the multi-purpose outs have to be configured correctly before connecting the gripper the first time with the robot. Please make sure that if the max. available power is used by the Male connector, no other devices can be connected to the Female connector.

Pin 5: 24 V output, Pin 6: 0V, Pin 7: 24 V output

Connection assignment



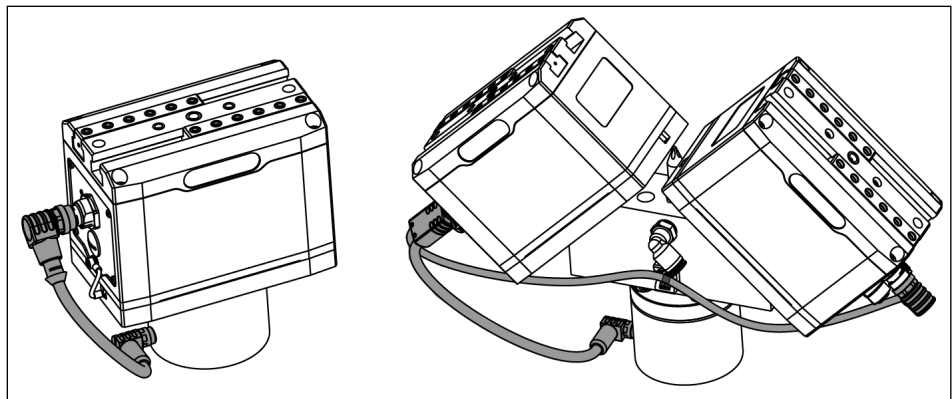
Pin allocation of connecting plug EGU/EGK/EZU on KR robot

Signal	Gripper	Robot
	Pin	Pin
V+	1	5, 7
Bus_A	2	1
GND	3	6, 8
Bus_B	4	2
n.c.	5	3, 4

Tab.: Connection assignment EGU/EGK/EZU on KR robot

Connecting the product

- There is **no** energy supply.
 - Product is mounted on the robot.
 - Gripper fingers are mounted. Cable is connected to the product (see product assembly and operating manual).
1. Connect the cable to the robots male connector (connector 2).
 2. When using 2 products: Fix the cable to the elbow adapter with a cable tie.



Connecting cables, shown as an example on the EGU

4 Installing and usage of the CBun

The CBun for EGU, EGK and EZU can be downloaded via <https://docs.kassowrobots.com>. There is also an online documentation available, which describes the necessary steps for installation and usage. For accessing the website a registration might be required.

5 Parameterizing and testing products



⚠ CAUTION

Risk of injury due to sudden movements!

Components could move unexpectedly and result in serious injuries.

- Observe the safety notes for the grippers.
 - Configure safety-relevant signals (such as emergency stop) for the system's safety system.
 - Only switch on the power supply when the gripper is attached to the robot and nobody is in the danger zone.
-

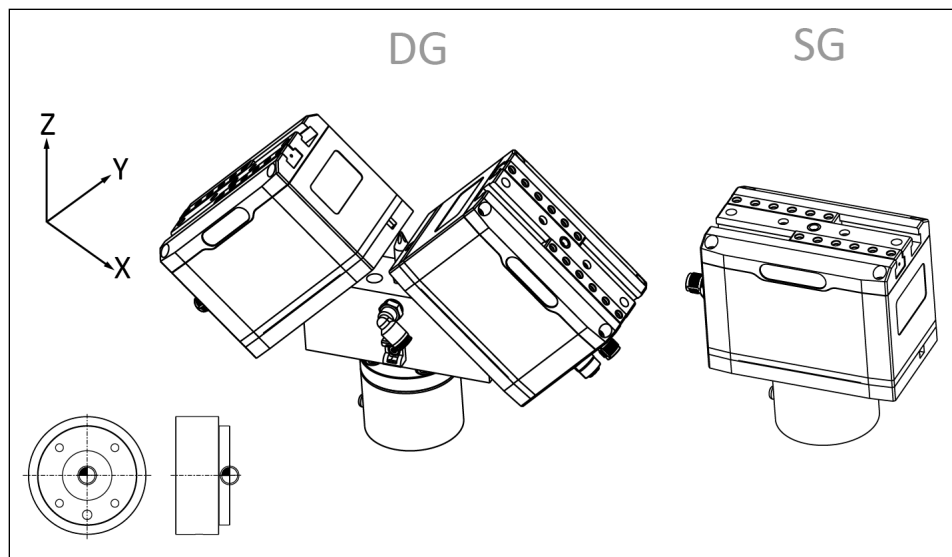
6 Tool Center Point (TCP) and gripper weight

For proper use of the gripper on a KR robot, it is recommended to store the Tool Center Point (TCP) and the gripper weight in the robot settings.

NOTE

If a workpiece with a certain weight is gripped, the total useful load can be dynamically adjusted.

6.1 Values for EGU



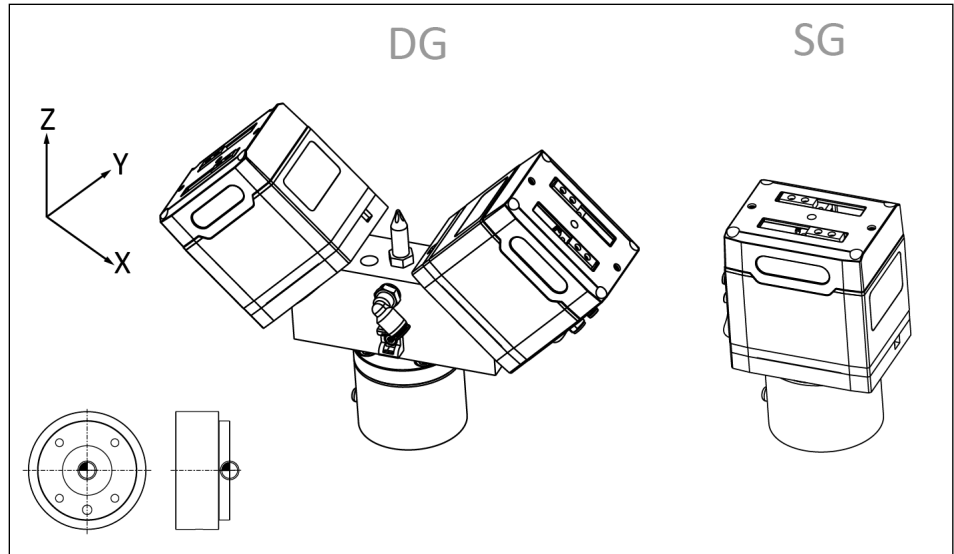
EGU: Tool Center Point, DG: two products mounted, SG: one product mounted

ISO 50

Size	TCP				Center of gravity			Weight [kg]
	X [mm]	Y [mm]	Z [mm]	RY [deg]	CX [mm]	CY [mm]	CZ [mm]	
SG: one mounted product								
EGU 50	-	-	93.5	-	-0.3	-0.3	47.9	1.8
EGU 60	-	-	119	-	1.6	-0.7	61.3	3.3
DG: two mounted products								
EGU 50	±114.1	-	116.9	±45°	0	0	75.2	4.2
EGU 60	±143.6	-	149.9	±45°	0	0	99.7	7.7

Tab.: EGU: TCP, center of gravity and weight with ISO flange 50

6.2 Values for EGK



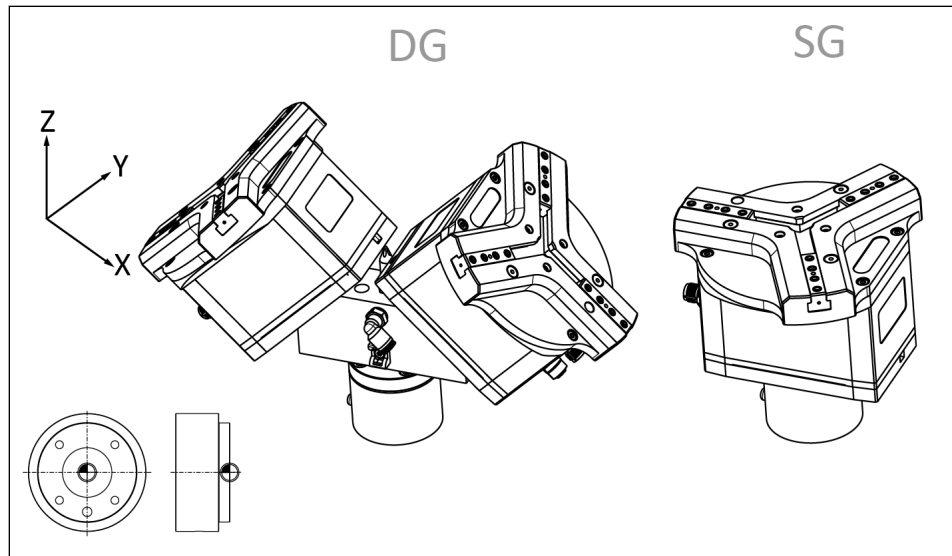
EGK: Tool Center Point, DG: two products mounted, SG: one product mounted

ISO 50

Size	TCP				Center of gravity			Weight [kg]
	X [mm]	Y [mm]	Z [mm]	RY [deg]	CX [mm]	CY [mm]	CZ [mm]	
SG: one mounted product								
EGK 25	-	-	90.2	-	-1.5	-0.1	42.7	0.8
EGK 40	-	-	94.5	-	-0.5	-0.3	44.9	1.3
EGK 50	-	-	102	-	0.5	-0.2	49.1	2.1
DG: two mounted products								
EGK 25	±111.8	-	114.6	±45°	0	0	64.7	2.3
EGK 40	±114.8	-	117.6	±45°	0	0	71	3.3
EGK 50	±131.6	-	137.9	±45°	0	0	87.3	5.3

Tab.: EGK: TCP, center of gravity and weight with ISO flange 50

6.3 Values for EZU



EZU: Tool Center Point, DG: two products mounted, SG: one product mounted

ISO 50

Size	TCP				Center of gravity			Weight [kg]
	X [mm]	Y [mm]	Z [mm]	RY [deg]	CX [mm]	CY [mm]	CZ [mm]	
SG: one mounted product								
EZU 30	-	-	107	-	-0.9	-0.3	62	2.6
EZU 35	-	-	135.5	-	0.5	-0.7	79.2	4.9
EZU 40	-	-	156.9	-	0	-0.8	94.3	8.2
DG: two mounted products								
EZU 30	±123.7	-	126.5	±45°	0	0	86.3	5.9
EZU 35	±155.3	-	161.6	±45°	0	0	113.4	10.9

Tab.: EZU: TCP, center of gravity and weight with ISO flange 50

7 Troubleshooting

7.1 Error messages

Error	Possible cause	Corrective action
"Workpiece lost"	The gripping force was not sufficient to hold the workpiece.	Increase the gripping force. If necessary, check the gripper design.
"Blocked"	The base jaws of the gripper cannot reach the target.	Check if the guide of the base jaws is blocked or inspect the working environment for objects that obstruct the movement of the fingers.
"Workpiece not detected: Gripping an item outside of the workpiece tolerance "	The gripper holds a workpiece that is too large or too small	Check whether the correct workpiece is located between the gripper fingers. Otherwise, check and correct the workpiece tolerance settings in the installation screen.
"Command not feasible"	The gripper cannot execute the command.	Adjust the command parameters or check the gripper status.

7.2 FAQ

Question/Problem	Answer/Solution
Connection fails	<ul style="list-style-type: none"> • If there is a problem with the connection between the gripper and the robot arm, the cable and the connector on the joint should be checked first. <ol style="list-style-type: none"> 1. Visually check cables for damage. The cable insulation must not have any cracks. 2. Remove the gripper connector from the tool connection on the joint. When removing the cable, be careful not to unscrew the connector at an angle, as this may bend the pins and cause connection problems. 3. Check that the pins are straight and not dirty. 4. Reconnect the cable and tighten according to the robot manufacturer's specifications. 5. Add a gripping command to a new program and observe whether warnings or errors are displayed in the status bar. 6. If no warnings or errors are displayed, execute a test gripping process in the status bar and observe the result. 7. If the gripper still does not respond, there may be a connection problem in the cable or robot arm. In this case, contact SCHUNK Service.

8 Appendix

8.1 Definition of gripping force mode

BasicGrip

This gripping mode is available for all variants of the product. In BasicGrip, the workpiece is gripped with the nominal gripping force or less. The motor is permanently energized, which allows the workpieces to be continuously re-gripped.

Note: The gripping velocity changes depending on the set gripping force.

SoftGrip

This gripping mode is available for all EGK variants.

The SoftGrip mode can be used to gently grip delicate, fragile or fracture-sensitive workpieces such as electronics, glass and ceramics.

To influence the force pulse at SoftGrip, a gripping velocity value must be transferred. This gripping velocity value must be between the minimum gripping velocity <min_vel> and the calculated gripping velocity used in BasicGrip mode with the same gripping force.

Note: The gripping force changes depending on the set gripping velocity.

StrongGrip

This gripping mode is only available for the "M" variant with the EGU and EZU.

In StrongGrip mode, the workpiece is gripped with a gripping force greater than 100 percent, which makes it possible to grip heavy workpieces.

In this mode, the motor briefly activates a higher power level, and an elastomer stores the high gripping force. After an adjustable time, the motor brake engages and the workpiece is held.

8.2 Compatibility overview regarding current carrying capacity

The following tables show the compatibility of the grippers with the robot. The maximum power consumption of the gripper and the maximum power output of the robot are considered. The payload and the dead weight of the gripper unit are not balanced. SCHUNK recommends that the payload of the robot will be considered in detail.

NOTE

Due to technical changes, the compatibility overviews may be outdated. Therefore, SCHUNK recommends performing a detailed comparison with the current data sheets of the robot model. For further questions please contact SCHUNK!

Compatibility overview: EGK with KR Robotern

Size	Gripping force mode/ Nominal gripping force	KR				
		810	1018	1205	1410	1805
SG: one mounted product						
EGK 25	BasicGrip/100%	✓	✓	✓	✓	✓
EGK 40	BasicGrip/100%	✓	✓	✓	✓	✓
EGK 50	BasicGrip/100%	✓	✓	✓	✓	✓
DG: two mounted products						
EGK 25	BasicGrip / 100%	✓	✓	✓	✓	✓
EGK 40	BasicGrip / 100%	✓	✓	✓	✓	✓
EGK 50	BasicGrip / 100%	✓	✓	✓	✓	✓

Legend:

- ✓ The power consumption of the gripper is within the range of the power delivered by the robot.
- ! The power consumption of the gripper exceeds the power delivered by the robot. Compatibility could be possible through restrictions of gripping parameters, e.g. by reducing the gripping force.
- ✗ The power consumption of the gripper exceeds the power delivered by the robot. Gripper and robot are not compatible.

Compatibility overview: EGU with KR Robotern

Size	Gripping force mode/ Nominal gripping force	KR				
		810	1018	1205	1410	1805
SG: one mounted product						
EGU 50	BasicGrip/100%	✓	✓	✓	✓	✓
EGU 50	StrongGrip / 200%	✓	✓	✓	✓	✓
EGU 60	BasicGrip / 100%	✓	✓	✓	✓	✓
EGU 60	StrongGrip / 200%	✓	✓	✓	✓	✓
EGU 70	BasicGrip / 100%	✓	✓	✓	✓	✓
EGU 70	StrongGrip / 150%	✓	✓	✓	✓	✓
EGU 80	BasicGrip / 100%	!	!	!	!	!
EGU 80	StrongGrip / 200%	!	!	!	!	!
DG: two mounted products						
EGU 50	BasicGrip / 100%	✓	✓	✓	✓	✓
EGU 50	StrongGrip / 200%	✓	✓	✓	✓	✓
EGU 60	BasicGrip / 100%	✓	✓	✓	✓	✓
EGU 60	StrongGrip/200%	✗	✗	✗	✗	✗
EGU 70	BasicGrip / 100%	!	!	!	!	!
EGU 70	StrongGrip/150%	✗	✗	✗	✗	✗
EGU 80	BasicGrip / 100%	!	!	!	!	!
EGU 80	StrongGrip/200%	✗	✗	✗	✗	✗

Legend:

- ✓ The power consumption of the gripper is within the range of the power delivered by the robot.
- ! The power consumption of the gripper exceeds the power delivered by the robot. Compatibility could be possible through restrictions of gripping parameters, e.g. by reducing the gripping force.
- ✗ The power consumption of the gripper exceeds the power delivered by the robot. Gripper and robot are not compatible.

Compatibility overview: EZU with KR Robotern

Size	Gripping force mode/ Nominal gripping force	KR				
		810	1018	1205	1410	1805
SG: one mounted product						
EZU 30	BasicGrip/100%	✓	✓	✓	✓	✓
EZU 30	StrongGrip / 200%	✓	✓	✓	✓	✓
EZU 35	BasicGrip / 100%	✓	✓	✓	✓	✓
EZU 35	StrongGrip / 200%	!	!	!	!	!
EZU 40	BasicGrip / 100%	✓	✓	✓	✓	✓
EZU 40	StrongGrip / 200%	!	!	!	!	!
DG: two mounted products						
EZU 30	BasicGrip / 100%	✓	✓	✓	✓	✓
EZU 30	StrongGrip / 200%	✓	✓	✓	✓	✓
EZU 35	BasicGrip / 100%	✓	✓	✓	✓	✓
EZU 35	StrongGrip/200%	✗	✗	✗	✗	✗
EZU 40	BasicGrip / 100%	!	!	!	!	!
EZU 40	StrongGrip/200%	✗	✗	✗	✗	✗

Legend:

- ✓ The power consumption of the gripper is within the range of the power delivered by the robot.
- ! The power consumption of the gripper exceeds the power delivered by the robot. Compatibility could be possible through restrictions of gripping parameters, e.g. by reducing the gripping force.
- ✗ The power consumption of the gripper exceeds the power delivered by the robot. Gripper and robot are not compatible.



SCHUNK SE & Co. KG
Spanntechnik | Greiftechnik | Automatisierungstechnik

Bahnhofstr. 106 - 134
D-74348 Lauffen/Neckar
Tel. +49-7133-103-0
info@de.schunk.com
schunk.com

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