



Assembly and Operating Manual

EGK

Gripper for small components, electric

Translation of Original Operating
Manual

Hand in hand for tomorrow

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

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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 important information for a safe and appropriate use of the product.

This manual is an integral part of the product and must be kept accessible for the personnel at all times.

Before starting work, the personnel must have read and understood this operating manual. Prerequisite for safe working is the observance of all safety instructions in this manual.

In addition to these instructions, the documents listed under ▶ 1.1.5 [📄 7] are applicable.

NOTE: The illustrations in this manual are intended to provide a basic understanding and may deviate from the actual version.

1.1.1 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.

1.1.2 Definition of Terms

The term "product" or "module" replaces the product name on the title page in this manual.

1.1.3 Symbol definition

The following symbols are used in this manual:

■ Prerequisite for an action

1. Action 1

2. Action 2

⇒ Intermediate results

⇒ Final results

▶ 1.1.3 [6]: chapter number and [page number] in hyperlinks

1.1.4 Trademarks

PROFINET is a brand of PROFIBUS and PROFINET user organization (PI).



EtherCAT® is a registered trademark and patented technology licensed by Beckhoff Automation GmbH, Germany.



EtherNet/IP™ is a trademark of ODVA, Inc.



IO-Link® is a brand of IO-Link-Community.



Modbus RTU is a brand of the Modbus Organization.



1.1.5 Applicable documents

- General terms of business *
- Catalog data sheet of the purchased product *
- Assembly and operating manuals of the accessories *
- Commissioning instructions:
 - EGK with PROFINET interface **
 - EGK with EtherCAT interface **
 - EGK with EtherNet/IP™ interface **
 - EGK with IO-Link interface **
 - EGK with Modbus RTU interface **
- Commissioning instructions for robots:
 - EGK for Universal Robots e-series **
 - EGK for FANUC CRX series **
 - EGK for YASKAWA YRC 1000micro series **

The documents labeled with an asterisk (*) can be downloaded from [schunk.com](https://www.schunk.com).

The documents labeled with asterisks (**) can be downloaded from [schunk.com/egk-downloads](https://www.schunk.com/egk-downloads).

1.1.6 Sizes

This operating manual applies to the following sizes:

- EGK 25
- EGK 40
- EGK 50

1.1.7 Variants

This operating manual applies to the following variations:

- EGK B: Basic variant
- EGK M: with Gripping force and position maintenance (GPE)
- EGK N: without Gripping force and position maintenance (GPE)
- EGK PN: PROFINET
- EGK EI: EtherNet/IP™
- EGK EC: EtherCAT
- EGK IL: IO-Link
- EGK MB: Modbus RTU

1.2 Warranty

The warranty is 24 months or a maximum of 5 million cycles * from the date of delivery from the production facility if used as intended under the following conditions:

- Observe the ambient conditions and operating conditions, ▶ 2.5 [📄 11]
- Observe the specified maintenance and lubrication intervals, ▶ 9 [📄 47]

Parts touching the workpiece and wear parts are not included in the warranty.

* A cycle consists of a complete gripping process: "Open gripper" and "Close gripper".

1.3 Scope of delivery

The scope of delivery includes

- Gripper for small components, electric EGK in the ordered variant with current firmware
- Assembly instructions
- Centering sleeves for gripper assembly
- Centering sleeves for mounting fingers

1.4 Accessories

The following optional accessories can be used for the product, and must be ordered separately:

- Connection cable for logic/power voltage supply
- Connection cable for communication
- Robot-specific adapter plates
- Intermediate jaw with compensating base jaw offset
- Finger blanks in aluminum or steel
- Configurable gripper fingers FGR
- Jaw quick-change system BSWS-M

A wide range of accessories are available for this product

For information regarding which accessory articles can be used with the corresponding product variants, see catalog data sheet.

2 Basic safety notes

2.1 Intended use

The product is designed exclusively for gripping and temporarily holding workpieces or objects.

- The product may only be used within the scope of its technical data, ▶ 3 [16].
- The product is intended for installation in a machine/ automated system. The applicable guidelines for the machine/ automated system must be observed and complied with.
- The product is intended for industrial and industry-oriented use. Its use outside enclosed spaces is only permitted if suitable protective measures are taken against outdoor exposure. The product is not suitable for use in salty air.
- The product can be used within the permissible load limits and technical data for holding workpieces during simple machining operations, but is not a clamping device according to EN 1550:1997+A1:2008.
- Using the product behind separating protective equipment and on manually operated manipulators is permitted, but using the product above head height is prohibited.
- Use of the product in the direct vicinity of a welding process is only permitted with additional protective measures.
- Appropriate use of the product includes compliance with all instructions in this manual.
- Any utilization that exceeds or differs from the appropriate use is regarded as misuse.

2.2 Notes for the operator/integrator

- When implementing and operating components in safety-related parts of the control systems, the basic safety principles in accordance with DIN EN ISO 13849-2 apply. The proven safety principles in accordance with DIN EN ISO 13849-2 also apply to categories 1, 2, 3 and 4.
- A suitable technical protective measure, e.g. protective fence, is required for the operation of the product. The technical protective measure must prevent people from accessing the product working area.
- During troubleshooting and maintenance, measures must be taken against unintentional startup.
- SCHUNK recommends the use of electrical components e.g. sensors, controllers etc. according to EN 61000-5-7.

Requirements of gripper fingers

- Make sure that the product and the top jaws are a sufficient size for the application.
- SCHUNK recommends the use of form-fit gripper fingers to prevent workpiece loss.

2.3 Constructional changes

Implementation of structural changes

By conversions, changes, and reworking, e.g. additional threads, holes, or safety devices can impair the functioning or safety of the product or damage it.

- Structural changes should only be made with the written approval of SCHUNK.

2.4 Spare parts

Use of unauthorized spare parts

Using unauthorized spare parts can endanger personnel and damage the product or cause it to malfunction.

- Use only original spare parts or spares authorized by SCHUNK.

2.5 Ambient conditions and operating conditions

Required ambient conditions and operating conditions

Incorrect ambient and operating conditions can make the product unsafe, leading to the risk of serious injuries, considerable material damage and/or a significant reduction to the product's life span.

- Make sure that the product is used only in the context of its defined application parameters, ▶ 3 [16].

2.5.1 Environmental conditions

Transport and storage requirements

For transport and storage of product in original packaging, the following requirements apply:

- Loading and unloading with mechanical aids
- Ambient temperature from -40 °C to $+70\text{ °C}$
- Air humidity up to max. 85%

Operational requirements

The following requirements apply for operation of the product:

- Ambient temperature from $+5\text{ °C}$ to $+55\text{ °C}$
- Air humidity up to max. 65%

According to DIN EN 60068-2-6 and DIN EN 60068-2-27, in accordance with EN 60721-3-2 and EN 60721-3-3, the product was subjected to a vibration and shock inspection during transport and in operation with respect to the ambient influences and withstands the required loads.

The product may only be used in the following locations if additional measures are taken:

- In locations with a high level of ionizing radiation
- In locations with difficult operating conditions, e.g. due to acrid fumes, gases or chemicals
- In facilities requiring special monitoring, e.g. in particularly at-risk areas
- In applications during which the product is exposed to unacceptably severe knocking or vibrations Suitable measures must be taken to reduce the amplitude or acceleration of such disturbances. Vibration-damping or vibration-absorbing systems are to be used in such cases.

In addition, the product may not be used in potentially explosive zones.

2.5.2 Insulation resistance and voltage resistance in accordance with EN 60204-1

When measuring the insulation resistance and inspecting the voltage resistance of the machine/automated system, observe the following information in order to protect the product from damage:

- The electronics are connected to the housing ground, in order to protect against overvoltage.
- For measurements of the insulation resistance in accordance with EN 60204-1, no voltage levels above the permitted operating voltage range may be used. In addition, the maximum measuring current must be safely limited to values below 10mA.
- Before testing the voltage resistance of the machine/automated system in accordance with EN 60204-1, disconnect the product from the electric circuits to be tested. This applies to all connections on the product:
 - positive and negative connections of the power and logic supply
 - Fieldbus connections

2.6 Personnel qualification

Inadequate qualifications of the personnel

If the personnel working with the product is not sufficiently qualified, the result may be serious injuries and significant property damage.

- All work may only be performed by qualified personnel.
- Before working with the product, the personnel must have read and understood the complete assembly and operating manual.
- Observe the national safety regulations and rules and general safety instructions.

The following personal qualifications are necessary for the various activities related to the product:

Trained electrician

Due to their technical training, knowledge and experience, trained electricians are able to work on electrical systems, recognize and avoid possible dangers and know the relevant standards and regulations.

Qualified personnel	Due to its technical training, knowledge and experience, qualified personnel is able to perform the delegated tasks, recognize and avoid possible dangers and knows the relevant standards and regulations.
Instructed person	Instructed persons were instructed by the operator about the delegated tasks and possible dangers due to improper behaviour.
Service personnel of the manufacturer	Due to its technical training, knowledge and experience, service personnel of the manufacturer is able to perform the delegated tasks and to recognize and avoid possible dangers.

2.7 Personal protective equipment

Use of personal protective equipment

Personal protective equipment serves to protect staff against danger which may interfere with their health or safety at work.

- When working on and with the product, observe the occupational health and safety regulations and wear the required personal protective equipment.
- Observe the valid safety and accident prevention regulations.
- Wear protective gloves to guard against sharp edges and corners or rough surfaces.
- Wear heat-resistant protective gloves when handling hot surfaces.
- Wear protective gloves and safety goggles when handling hazardous substances.
- Wear close-fitting protective clothing and also wear long hair in a hairnet when dealing with moving components.

2.8 Notes on safe operation

An incorrect manner of working can make the product unsafe and risks serious injuries and considerable material damage.

- Avoid any manner of working that may interfere with the function and operational safety of the product.
- Use the product as intended.
- Observe the safety notes and assembly instructions.
- Do not expose the product to any corrosive media. Products for special ambient conditions are excluded.
- Rectify malfunctions as soon as they occur.
- Observe the care and maintenance instructions.
- Observe the information on the safety data sheets of the additives and lubricants.
- Observe the current safety, accident prevention, and environmental protection regulations for the application field of the product.

2.9 Transport

Handling during transport

Incorrect handling during transport may impair the product's safety and cause serious injuries and considerable material damage.

- When handling heavy weights, use lifting equipment to lift the product and transport it by appropriate means.
- Secure the product against falling during transportation and handling.
- Stand clear of suspended loads.

2.10 Malfunctions

Behavior in case of malfunctions

- Immediately remove the product from operation and report the malfunction to the responsible departments/persons.
- Order appropriately trained personnel to rectify the malfunction.
- Do not recommission the product until the malfunction has been rectified.
- Test the product after a malfunction to establish whether it still functions properly and no increased risks have arisen.

2.11 Fundamental dangers

General

- Observe safety distances.
- Never deactivate safety devices.
- Before commissioning the product, take appropriate protective measures to secure the danger zone.
- Disconnect power sources before installation, modification, maintenance, or calibration. Ensure that no residual energy remains in the system.
- If the energy supply is connected, do not move any parts by hand.
- Do not reach into the open mechanism or movement area of the product during operation.

2.11.1 Protection during handling and assembly

Incorrect handling and assembly

Incorrect handling and assembly may impair the product's safety and cause serious injuries and considerable material damage.

- Have all work carried out by appropriately qualified personnel.
- For all work, secure the product against accidental operation.
- Observe the relevant accident prevention rules.
- Use suitable assembly and transport equipment and take precautions to prevent jamming and crushing.

Incorrect lifting of loads

Falling loads may cause serious injuries and even death.

- Stand clear of suspended loads and do not step into their swiveling range.
- Never move loads without supervision.
- Do not leave suspended loads unattended.

2.11.2 Protection during commissioning and operation

Falling or violently ejected components

Falling and violently ejected components can cause serious injuries and even death.

- Take appropriate protective measures to secure the danger zone.
- Never step into the danger zone during operation.

3 Technical data

3.1 Basic data

Designation	EGK		
	25	40	50
Mechanical operating data			
Weight [kg]			
– Variant: N	0.58	0.97	1.59
– Variant: M	0.62	1.02	1.63
Gripping force			
– Nominal gripping force [N]	50	150	300
– Min. [N]	20	55	140
– Max. [N]	50	150	300
Point P [mm]	20	25	30
Max. permissible finger length [mm]	70	100	130
Electrical operating data			
Nominal voltage [VDC]	24 +/- 10%		
Rated current logic [A]	0.16		
Max. logic current input [A]	0.20		
Power nominal current [A]			
– Variant: N	0.23	0.19	0.22
– Variant: M	0.23	0.25	0.35
Max. power current input [A]			
– Variant: N	0.54	0.38	0.82
– Variant: M	0.54	0.56	0.96

More technical data is included in the catalog data sheet. Whichever is the latest version.

3.2 Communication Interfaces

Designation	EGK
PROFINET [100 MBit/s]	IRT Class C
EtherCAT [100 MBit/s]	1 port EtherCAT with EoE, FoE and CoE – EoE: Ethernet over EtherCAT – FoE: File over EtherCAT – CoE: CANopen over EtherCAT
EtherNet/IP™ [10/100 MBit/s]	1 Port EtherNet/IP™
IO-Link [COM2]	IO-Link (V1.1, Class B)
Modbus RTU [9.6 – 921.6 kbit/s]	Modbus RTU via EIA/TIA-485-A

3.3 Ambient conditions and operating conditions

Designation	EGK		
	25	40	50
Noise emission [dB(A)]		≤ 70	
IP rating Electronics		67 *	
IP rating Guide		20	
Ambient temperature [°C]			
– Min.		5	
– Max.		55	

* The IP protection of the electronics is only given if all the plug connectors have been mounted properly.

3.4 Gripping modes

The following gripping modes are available:

- BasicGrip – Operation from minimum gripping force to nominal gripping force
- SoftGrip – Operation up to maximum gripping force

BasicGrip

This gripping mode is available for all variants of the product.

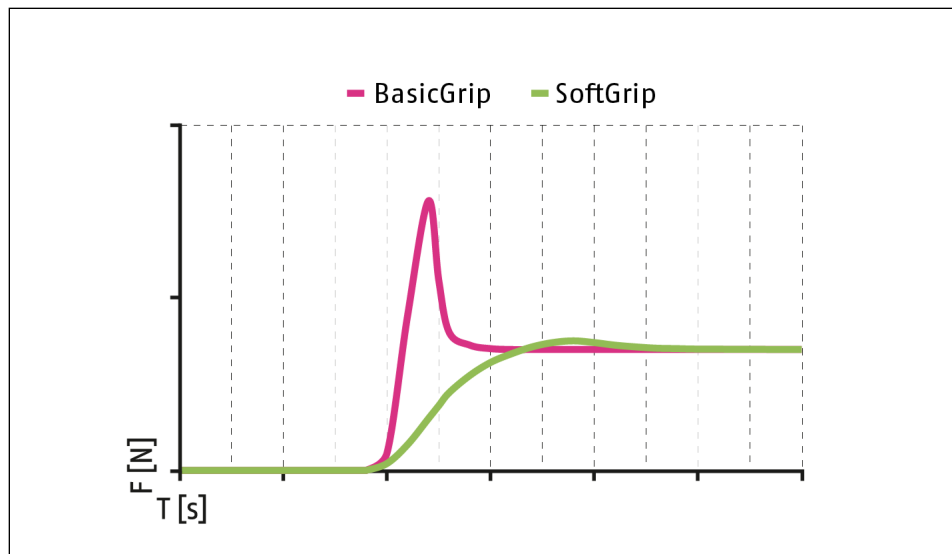
In BasicGrip mode, the workpiece is gripped with the nominal gripping force or less. The motor is permanently energized, which allows the workpieces to be continuously re-gripped.

Note: The gripping velocity changes depending on the set gripping force, ▶ 3.5 [21].

SoftGrip

This gripping mode is available for all variants of the product.

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



Force progression with BasicGrip and SoftGrip

F [N]	Gripping force	T [s]	Time
-------	----------------	-------	------

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, ▶ 3.5 [21].

3.5 Diagrams

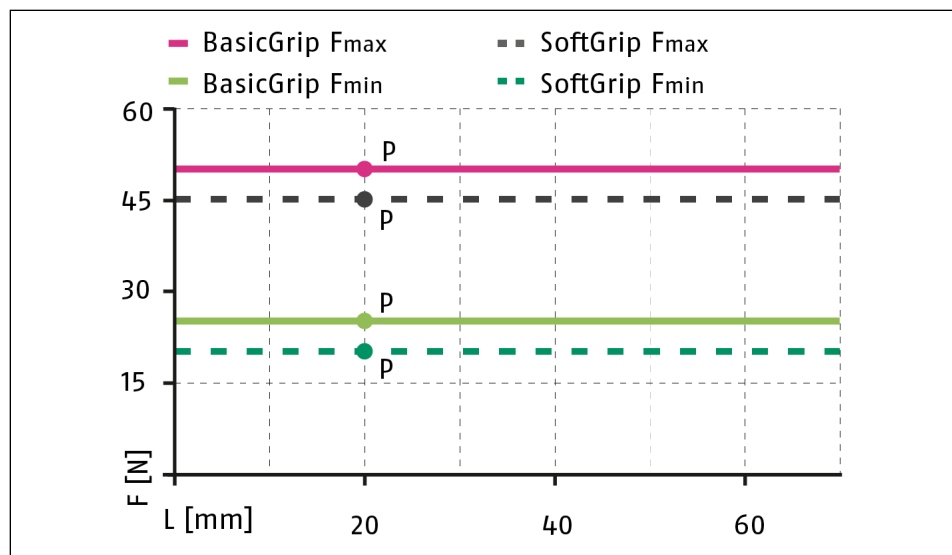
NOTE

The dependency of gripping force on finger length is shown in the diagrams below. The range shown has been determined with a standardized SCHUNK test finger. The gripping force attainable for a specific workpiece depends on the design of the gripper finger.

The gripping force diagrams show the achievable gripping force range with a selected finger length. The gripping force can be specified as a percentage between F_{min} and F_{max} . For further information, see the commissioning instructions for the various interfaces, ▶ 1.1.5 [7].

The specified gripping force is the force that the gripper applies at point P and that it can hold continuously. The position of point P is indicated in the main view in the catalog data sheet. To determine the nominal gripping force, the product is installed with a positive locking on an aluminum plate (200x200x20 mm³). The product can hold this nominal gripping force up to an ambient temperature of 55 °C. A temperature malfunction may occur if the product reaches excessively high temperatures. For measures to avoid an excess temperature fault, see chapter ▶ 5 [30].

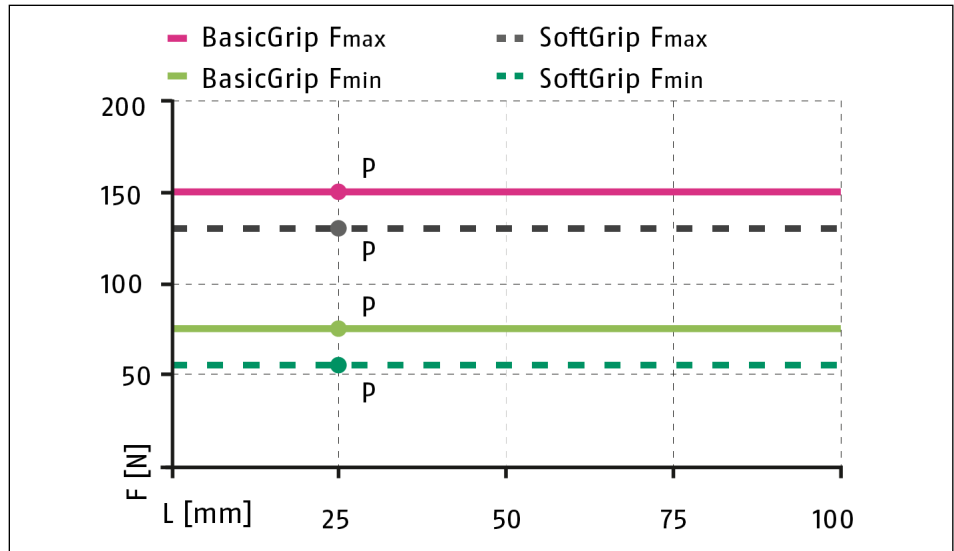
EGK 25



Gripping force diagram EGK 25

F [N]	Gripping force	L [mm]	Finger length
-------	----------------	--------	---------------

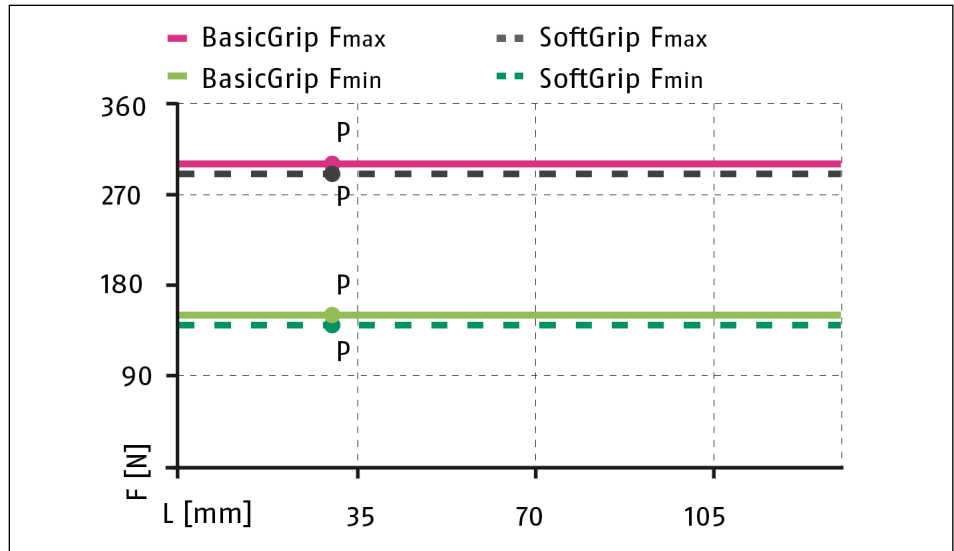
EGK 40



Gripping force diagram EGK 40

F [N] Gripping force L [mm] Finger length

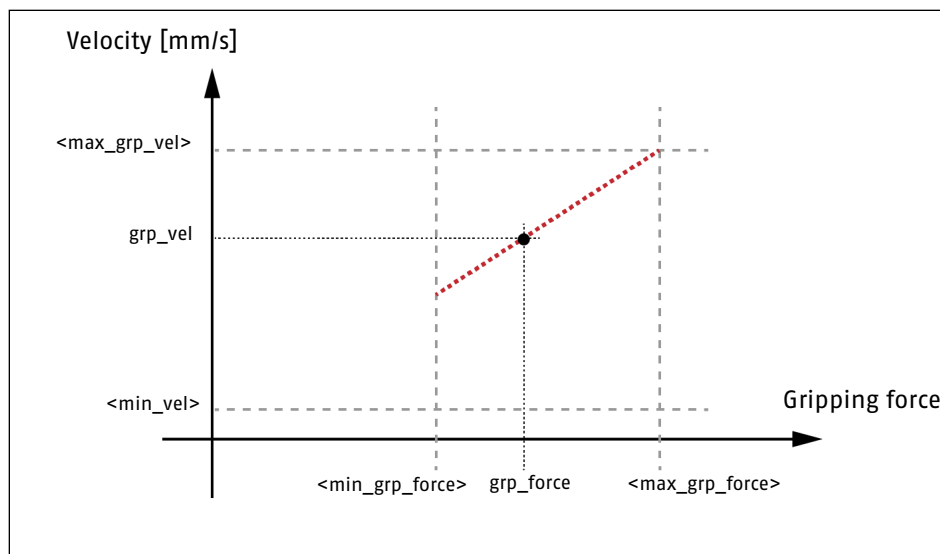
EGK 50



Gripping force diagram EGK 50

F [N] Gripping force L [mm] Finger length

Gripping velocity (grp_vel) as a function of gripping force (grp_force)



Gripping force-velocity diagram EGK

Designation	EGK		
	25	40	50
Min. Gripping velocity BasicGrip [mm/s]	5	5.5	6.25
Max. Gripping velocity [mm/s]	20	22	25

3.6 Auxiliary materials and lubricants

Component	Manufacturer	Designation Lubricant/ Auxiliary materials
Guides	Klüber Lubrication München SE & Co. KG Geisenhausenerstr. 7 D-81379 Munich	Klübersynth
Gears		UH1 14-151 *

* The product contains food-compliant lubricants. **The requirements of standard EN 1672-2:2020 are not fully met.**

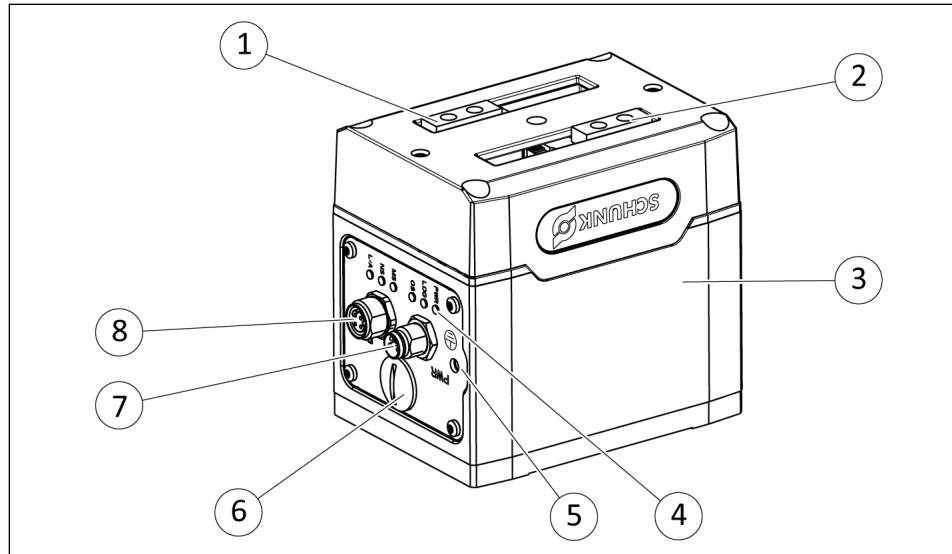
The product contains the following components, the lubricants/foreign substances of which are **not** food compliant:

Greasing area	Lubricant
Deep groove ball bearing	Commercially available bearing grease

Observe the manufacturer's safety data sheets!

4 Design and description

4.1 Design



Gripper for small components, electric EGK, example variant PROFINET

1	Base jaw
2	Hole for centering sleeve, gripper finger connection
3	Housing
4	LED status display
5	Connection for functional ground
6	Service interface (only for SCHUNK service technicians)
7	Connection cable for logic/power voltage supply PWR
8	Connection for communication P1

4.2 Description

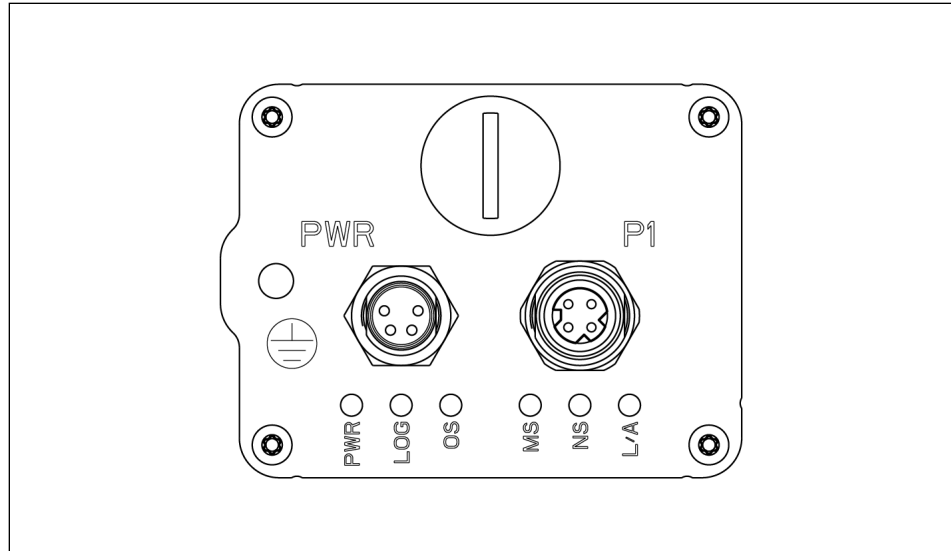
Versatile 2-finger gripper for small components for the highest level of workpiece variety with maximum process reliability

- The product is controlled via one of the following interfaces: PROFINET, EtherCAT, EtherNet/IP™, IO-Link or Modbus RTU
- The "M" variant has a system for gripping force and position maintenance.
- Only SCHUNK service engineers may access the service interface. The cover must not be removed.

4.3 Displays and control elements

4.3.1 LED status display PROFINET

The status values of the product are displayed via the LED status display.



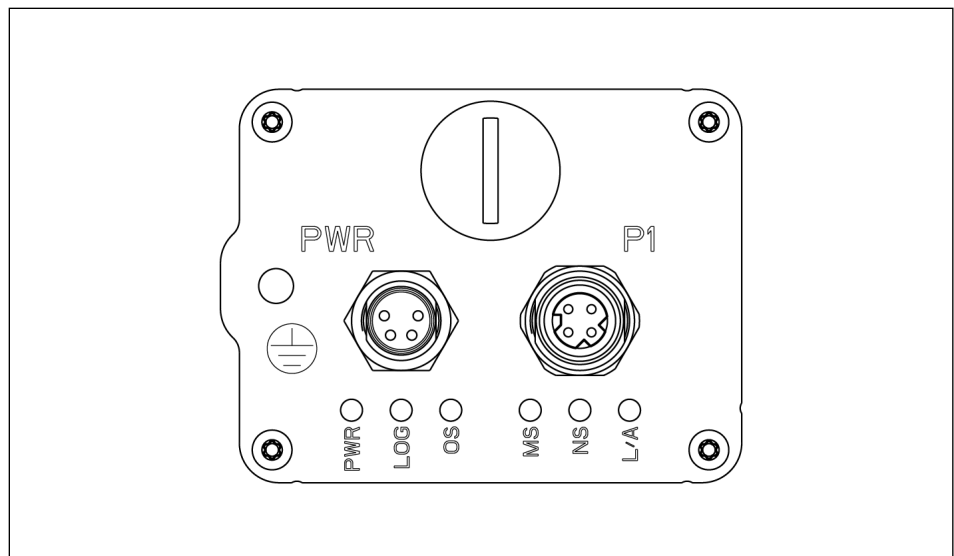
LED, PROFINET

LED	Designation	Color	Function
PWR	Supply power	Green	<p>LED off: No supply voltage is present on the power section.</p> <p>LED lights up green: Supply voltage is present on the power section.</p>
LOG	Supply logic	Green	<p>LED off: No supply voltage present on the logic section.</p> <p>LED lights up green: Supply voltage is present on the logic section.</p>
OS	Operation status	Red/ Green	<p>LED off: No feedback from the product.</p> <p>LED lights up green: The product is ready for operation.</p> <p>LED lights up red: The product is in an error state.</p>
MS	Module status	Red/ Green	<p>LED off: The product is in setup or NW_Init status (NW_Init Status = initialization state).</p> <p>LED lights up green: The product is in normal operating mode.</p> <p>LED flashes green x1: The product is currently processing diagnostics processes.</p> <p>LED lights up red: Serious error. The product is not ready for operation.</p>
NS	Network status	Red/ Green	<p>LED off: No connection to the control system available.</p> <p>LED lights up green: Connection to the control system present and control system is in "Run" mode.</p>

LED	Designation	Color	Function
			<p>LED flashes green x1: Connection to the control system present and control system is in "Stop" mode. The IRT synchronization is not yet finished.</p> <p>LED flashes green continuously: The network participant is in identification mode.</p> <p>LED lights up red: Serious network error present.</p> <p>LED lights up red x1: The station name is not known.</p> <p>LED lights up red x2: The IP address is not known.</p> <p>LED lights up red x3: A configuration error is present.</p>
L/A	Link/Activity	Green	<p>LED off: Connection inactive, communication inactive</p> <p>LED lights up green: Connection active, communication inactive</p> <p>LED flashes quickly: Connection active, communication active</p>

4.3.2 LED status display EtherNet/IP™

The status values of the product are displayed via the LED status display.



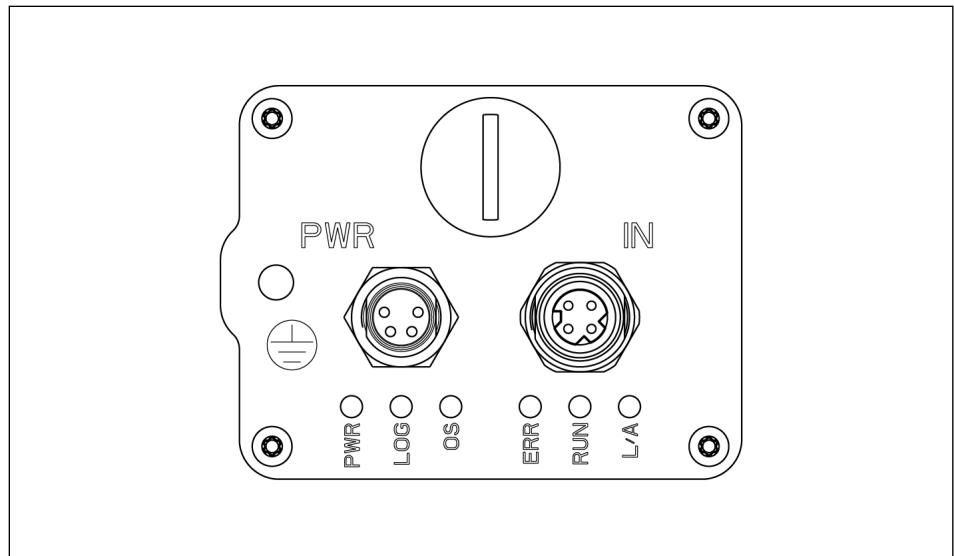
LED, EtherNet/IP™

LED	Designation	Color	Function
PWR	Supply power	Green	<p>LED off: No supply voltage is present on the power section.</p> <p>LED lights up green: Supply voltage is present on the power section.</p>
LOG	Supply logic	Green	<p>LED off: No supply voltage present on the logic section.</p> <p>LED lights up green: Supply voltage is present on the logic section.</p>
OS	Operation status	Red/ Green	<p>LED off: No feedback from the product.</p> <p>LED lights up green: The product is ready for operation.</p>

LED	Designation	Color	Function
MS	Module status	Red/ Green	LED lights up red: The product is in an error state.
			LED off: No supply voltage present.
			LED lights up green: Controlled by a scanner in operating mode.
			LED flashes green: The product is not configured, scanner in sleep mode.
			LED lights up red: Serious error. The product is not ready for operation.
NS	Network status	Red/ Green	LED off: No supply voltage present and/or no IP address.
			LED lights up green: Product is online. One or more connections are/have been established (CIP™ Class 1 or 3)
			LED flashes green: Product is online, but has not yet established a connection.
			LED lights up red: Duplicate network address present. Serious network error present.
L/A	Link/Activity	Green	LED off: Connection inactive, communication inactive
			LED lights up green: Connection active, communication inactive
			LED flashes quickly: Connection active, communication active

4.3.3 LED status display EtherCAT

The status values of the product are displayed via the LED status display.



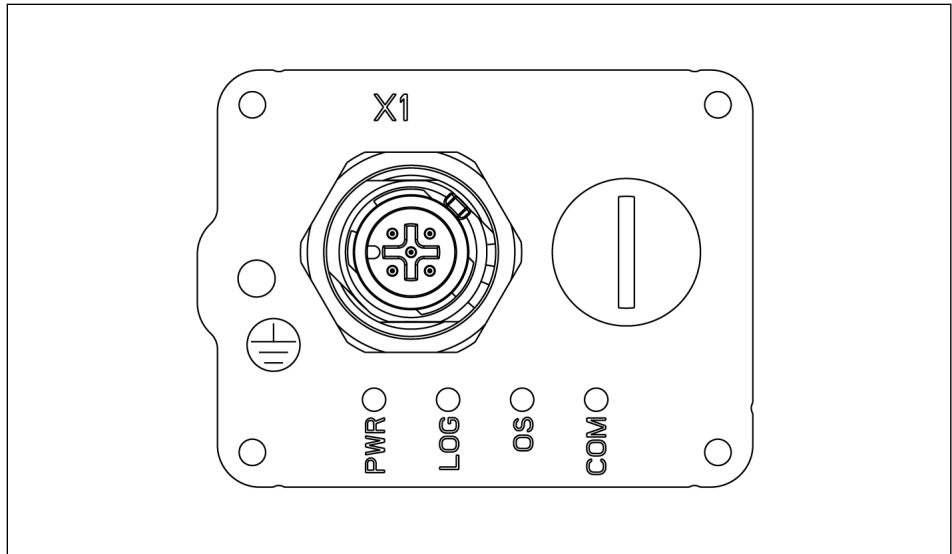
LED, EtherCAT

LED	Designation	Color	Function
PWR	Supply power	Green	<p>LED off: No supply voltage is present on the power section.</p> <p>LED lights up green: Supply voltage is present on the power section.</p>
LOG	Supply logic	Green	<p>LED off: No supply voltage present on the logic section.</p> <p>LED lights up green: Supply voltage is present on the logic section.</p>
OS	Operation status	Red/ Green	<p>LED off: No feedback from the product.</p> <p>LED lights up green: The product is ready for operation.</p> <p>LED lights up red: The product is in an error state.</p>
ERR	Error LED	Red	<p>LED off: No supply voltage present and/or no error.</p> <p>LED flashes red: Invalid configuration. The status change requested by the master is not possible due to invalid register or object settings.</p> <p>LED flashes single red: Unrequested status change. Device has changed the EtherCAT-status independently.</p> <p>LED flashes double red: Timeout of the Sync Manager Watchdog</p> <p>LED lights up red: A serious fault is present. The bus interface has been put into a physically passive state. Contact SCHUNK Service.</p> <p>LED flickers: Boot error, e.g. due to a failed firmware download</p>
RUN	Run LED	Red/ Green	<p>LED off: No supply voltage on and/or EtherCAT device in 'INIT' state.</p>

LED	Designation	Color	Function
			<p>LED lights up green: EtherCAT-Device is in 'OPERATIONAL' state.</p> <hr/> <p>LED flashes green: EtherCAT-Device is in 'PRE-OPERATIONAL' state.</p> <hr/> <p>LED flashes single green: EtherCAT-Device is in 'OPERATIONAL' state.</p> <hr/> <p>LED flickers: EtherCAT-Device is in 'BOOT' state.</p> <hr/> <p>LED lights up red: A serious fault is present. The bus interface has been put into a physically passive state. Contact SCHUNK Service.</p>
L/A	Link/Activity	Green	<p>LED off: Connection inactive, communication inactive</p> <hr/> <p>LED lights up green: Connection active, communication inactive</p> <hr/> <p>LED flashes quickly: Connection active, communication active</p>

4.3.4 LED status display IO-Link

The status values of the product are displayed via the LED status display.

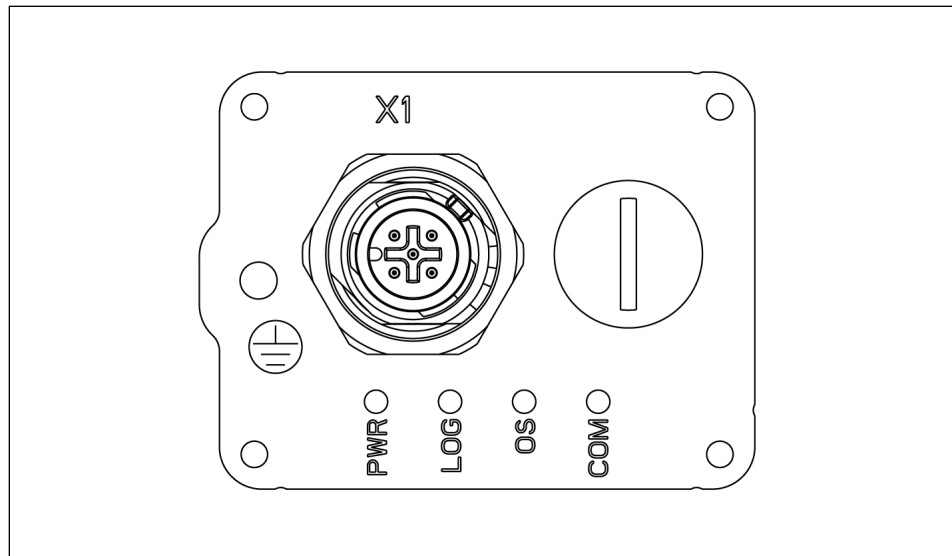


LED IO-Link

LED	Designation	Color	Function
PWR	Supply power	Green	<p>LED off: No supply voltage is present on the power section.</p> <p>LED lights up green: Supply voltage is present on the power section.</p>
LOG	Supply logic	Green	<p>LED off: No supply voltage present on the logic section.</p> <p>LED lights up green: Supply voltage is present on the logic section.</p>
OS	Operation status	Red/ Green	<p>LED off: No feedback from the product.</p> <p>LED lights up green: The product is ready for operation.</p> <p>LED lights up red: The product is in an error state.</p>
COM	Communication status	Green	<p>LED off: Connection inactive, communication inactive.</p> <p>LED lights up green: Connection active, communication inactive.</p> <p>LED flashes green: Connection active, communication active.</p>

4.3.5 LED status display Modbus RTU

The status values of the product are displayed via the LED status display.



LED Modbus RTU

LED	Designation	Color	Function
PWR	Supply power	Green	<p>LED off: No supply voltage is present on the power section.</p> <p>LED lights up green: Supply voltage is present on the power section.</p>
LOG	Supply logic	Green	<p>LED off: No supply voltage present on the logic section.</p> <p>LED lights up green: Supply voltage is present on the logic section.</p>
OS	Operation status	Red/ Green	<p>LED off: No feedback from the product.</p> <p>LED lights up green: The product is ready for operation.</p> <p>LED lights up red: The product is in an error state.</p>
COM	Communication status	Green	<p>LED off: Connection inactive, communication inactive.</p> <p>LED lights up green: Connection active, communication inactive.</p> <p>LED flashes green: Connection active, communication active.</p>

5 Assembly and settings

5.1 Safety



⚠ 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.

5.2 Assembling and connecting

NOTE

A temperature malfunction may occur if the product reaches excessively high temperatures.

- Ensure sufficient heat dissipation via the customer's mounting surface.
- Mount the product so that sufficient cooling is guaranteed.
- The size of the cooling surface depends on the application. Avoid exposure to additional heat e.g. caused by attachments or by the attached axles.

Overview

1. Check the evenness of the mounting surface, ▶ 5.3 [31].
2. Choose the installation position so that connection cables are not damaged or cannot wrap around the product when swiveling.
3. Screw the product to the machine/system, ▶ 5.3 [31].
 - ⇒ Use suitable connecting elements (adapter plates) if necessary.
If required, adapter plates can be requested from SCHUNK.
 - ⇒ Observe the maximal tightening torque, admissible screw-in depth and, if necessary, strength class.
4. If necessary, secure intermediate jaws to the base jaws, ▶ 5.3 [34].
Note: The intermediate jaws compensate the side offset of the base jaws in the Y direction and enable an aligned connection.
5. Secure the gripper fingers to the intermediate jaws or base jaws, ▶ 5.3 [31].

- ⇒ Observe the maximal tightening torque, admissible screw-in depth and, if necessary, strength class.
- 6. Connect the ground cable between the product and the machine/system, ▶ 5.4 [📄 35].
- 7. Plug the cable for communication and voltage supply into the socket and screw the threaded ring in by hand, ▶ 5.4 [📄 35]. Observe the maximum tightening torque, ▶ 5.4.2 [📄 37].
- 8. Make sure that the connections are not stressed due to tensile and pressure forces. Apply appropriate strain relief devices if required.

5.3 Mechanical connection

Evenness of the mounting surface

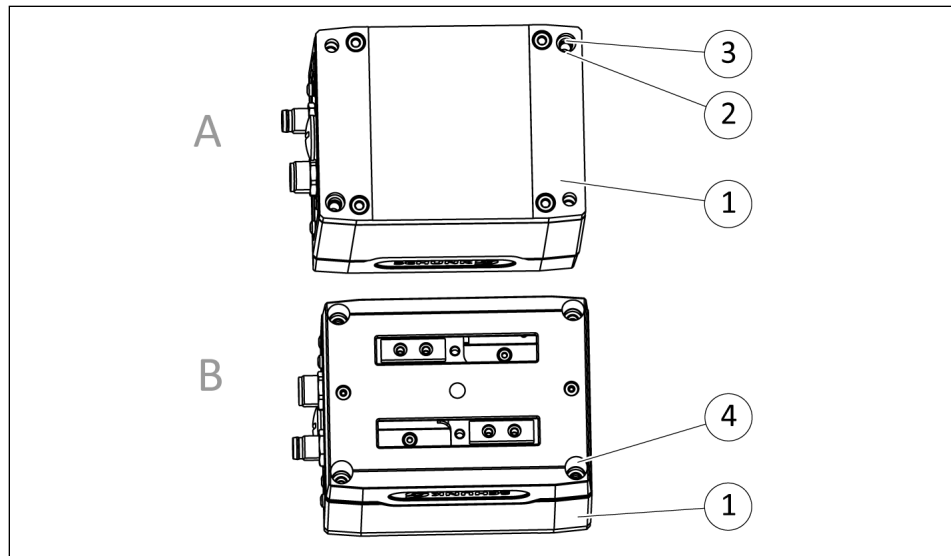
The values apply to the whole mounting surface to which the product is mounted.

Edge length	Permissible unevenness
< 100	< 0.02
> 100	< 0.05

Tab.: Requirements for evenness of the mounting surface (Dimensions in mm)

Connections at the housing

The product can be assembled from two sides.



Connections at the housing

1	Housing	3	Hole for Mounting screw
2	Hole for Centering sleeve	4	Hole for Mounting screw

Item	Designation	EGK		
		25	40	50

Side A

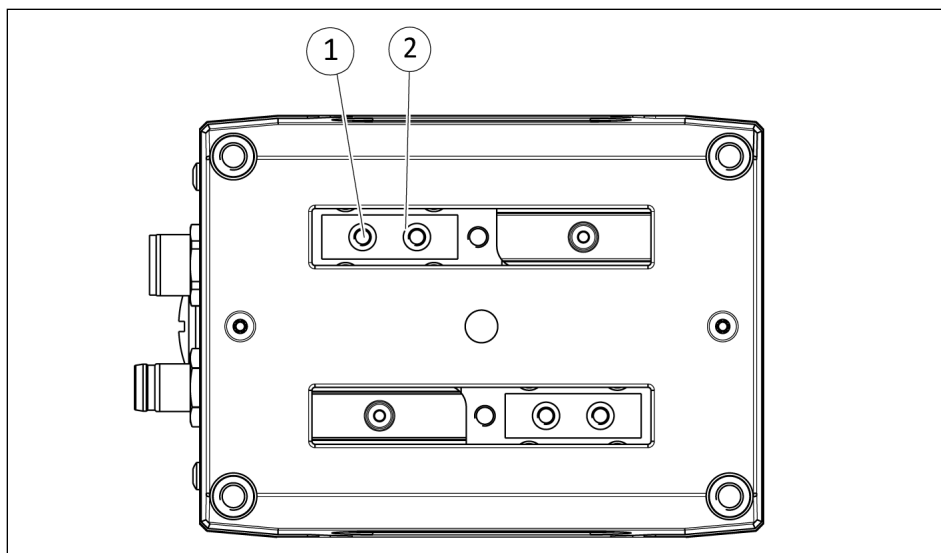
3	Mounting screw, (4 Piece)	M4	M4	M5
	Screw-in depth [mm]			
	– Min.	14.7	15.2	17.7
	– Max.	15.7	16.2	18.7
	Strength class	8.8		
	Tightening torque [Nm]	3.1	3.1	6.1
2	Centering sleeve [mm], (2 Piece)	∅ 6	∅ 6	∅ 8

Side B

4	Mounting screw, (4 Piece)	M3	M3	M4
	Empfohlene Schraubenlänge [mm]	65	65	70
	Strength class	12.9		
	Tightening torque [Nm]	2.1	2.1	5.3
2	Centering sleeve [mm], (2 Piece)	∅ 6	∅ 6	∅ 8

Tab.: Screw-in depth and tightening torque: Assembling the product

Connections at the base jaws



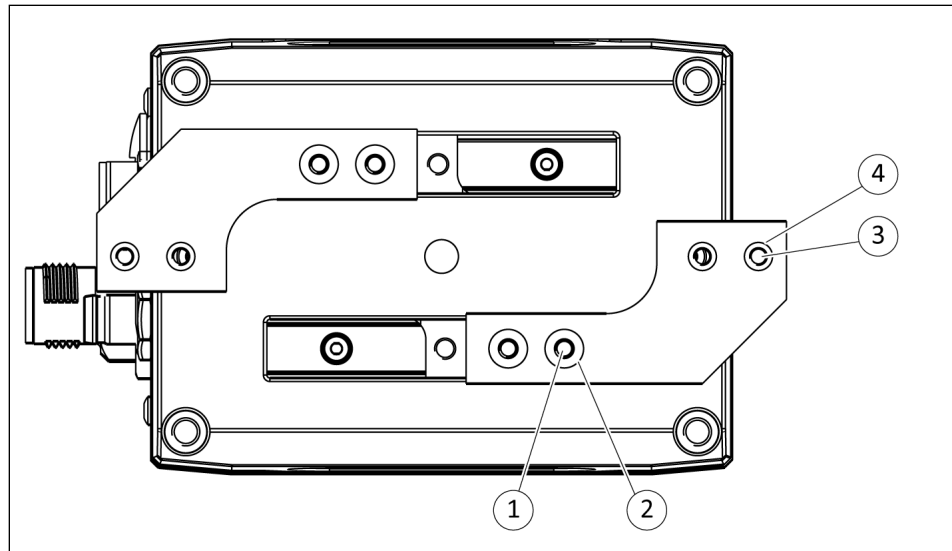
Connections at the base jaws

- 1 Thread for Mounting screw 2 Hole for Centering sleeve

Item	Designation	EGK		
		25	40	50
1	Mounting screw, (2 Piece)	M2.5	M3	M4
	Screw-in depth [mm]			
	– Min.	6	7	9
	– Max.	8.1	10.4	12.6
	Strength class	12.9		
	Tightening torque [Nm]	1.2	2.1	5.3
2	Centering sleeve [mm], (2 Piece)	∅ 4	∅ 5	∅ 6

Tab.: Screw-in depth and tightening torque: Assembling gripper fingers on base jaws

Connections on the intermediate jaws



Connections on the intermediate jaws

1	Hole for mounting the intermediate jaw	2	Hole for Centering sleeve
3	Thread for assembling the gripper fingers	4	Hole for Centering sleeve

Item	Designation	EGK		
		25	40	50
1	Mounting screw, (2 Piece)	M2.5	M3	M4
	Empfohlene Schraubenlänge [mm]	14	18	25
	Mounting screw according to standard	DIN EN ISO 4762, Strength class 12.9		
	Tightening torque [Nm]	1.2	2.1	5.3
2	Centering sleeve [mm], (2 Piece)	∅ 4	∅ 5	∅ 6
3	Mounting screw, (2 Piece)	M2.5	M3	M4
	Screw-in depth [mm]			
	– Min.	6	7	9
	– Max.	9.5	14	18
	Strength class	12.9		
	Tightening torque [Nm]	1.2	2.1	5.3
4	Centering sleeve [mm], (2 Piece)	∅ 4	∅ 5	∅ 6

Tab.: Screw-in depth and tightening torque: Assembling the intermediate jaws and gripper fingers

5.4 Electrical connection

NOTICE

Risk of damage to the electronics!

A faulty connection can cause damage to the internal electronics.

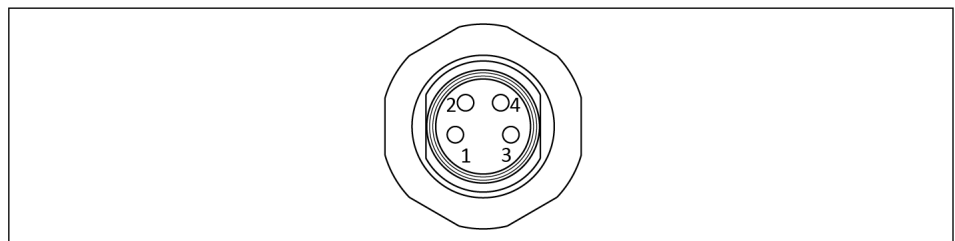
- The supply network must be a network of type "PELV" for power and logic.
- Observe the PIN assignment of the connecting terminals.
- Make sure that all components are grounded correctly.

5.4.1 PIN allocation

5.4.1.1 PROFINET, EtherNet/IP™, EtherCAT

Voltage supply

The voltage supply is realized via an M8 connector.

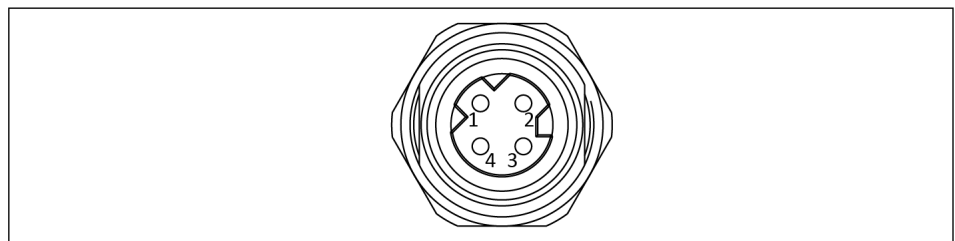


EGK - PWR PIN allocation connector, voltage supply

1	+24 V Logic
2	GND Power
3	GND Logic
4	+24 V Power

Communication

The communication interface is realized via a D-coded M8 socket.



PIN allocation socket, communication

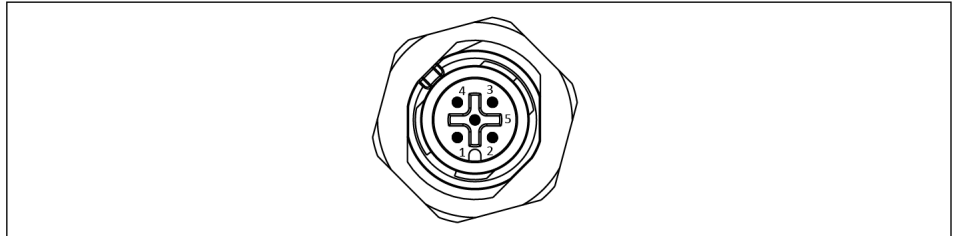
1	Tx+
2	Rx+
3	Tx-
4	Rx-

5.4.1.2 IO-Link

Voltage supply and communication

The voltage supply and communication interface is achieved via a black A-coded M12 connector.

For supply currents that the IO-Link master does not support, the product must be supplied via a separate power supply unit and a Y-distributor, ▶ 5.4.3 [39].



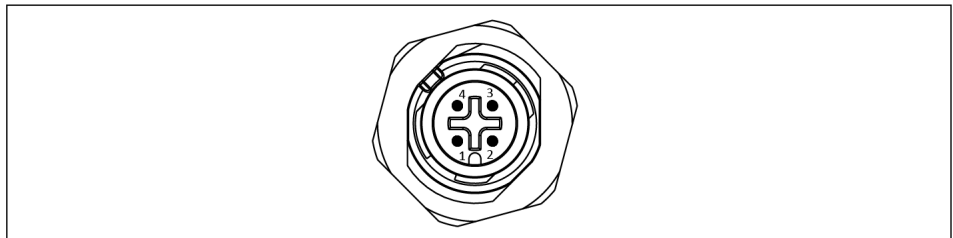
PIN allocation connector X1

1	+24 V Logic
2	+24 V Power
3	GND Logic
4	CI/Q (Communication)
5	GND Power

5.4.1.3 Modbus RTU

Voltage supply and communication

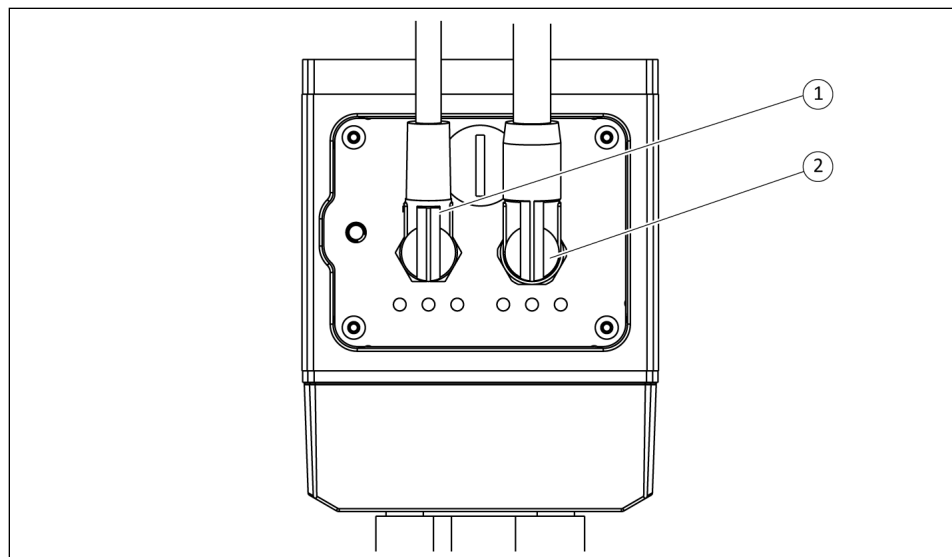
The voltage supply and communication interface is achieved via a yellow A-coded M12 connector.



PIN allocation connector X1

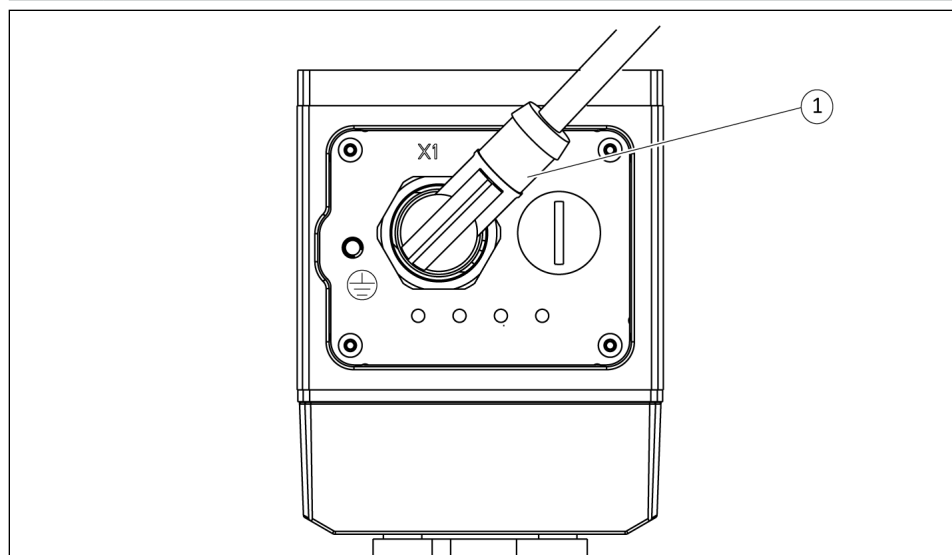
1	+ 24 V Logic, Logic
2	BUS_A
3	GND Logic, Logic
4	BUS_B

5.4.2 Cable connections



Cable outlets, example PROFINET, EtherNet/IP™, EtherCAT

- 1 Cable connector voltage supply
- 2 Cable connector communication



Cable outlet, example IO-Link, Modbus RTU

- 1 Cable connector voltage supply and communication

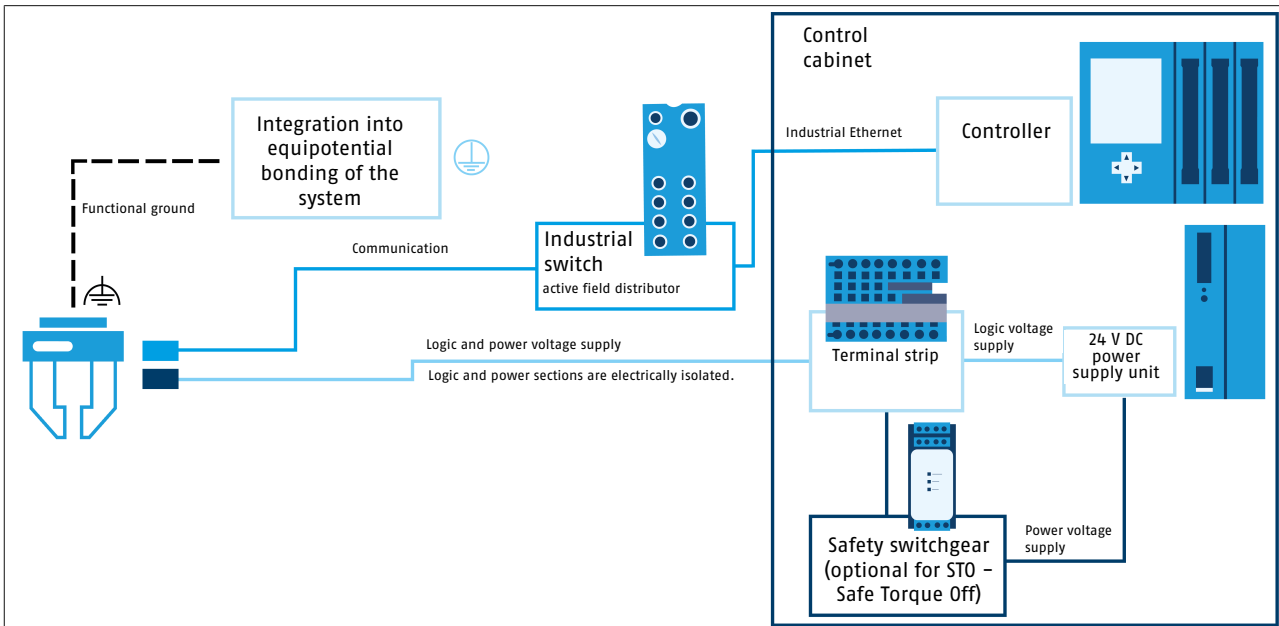
NOTICE

Material damage due to incorrect assembly!

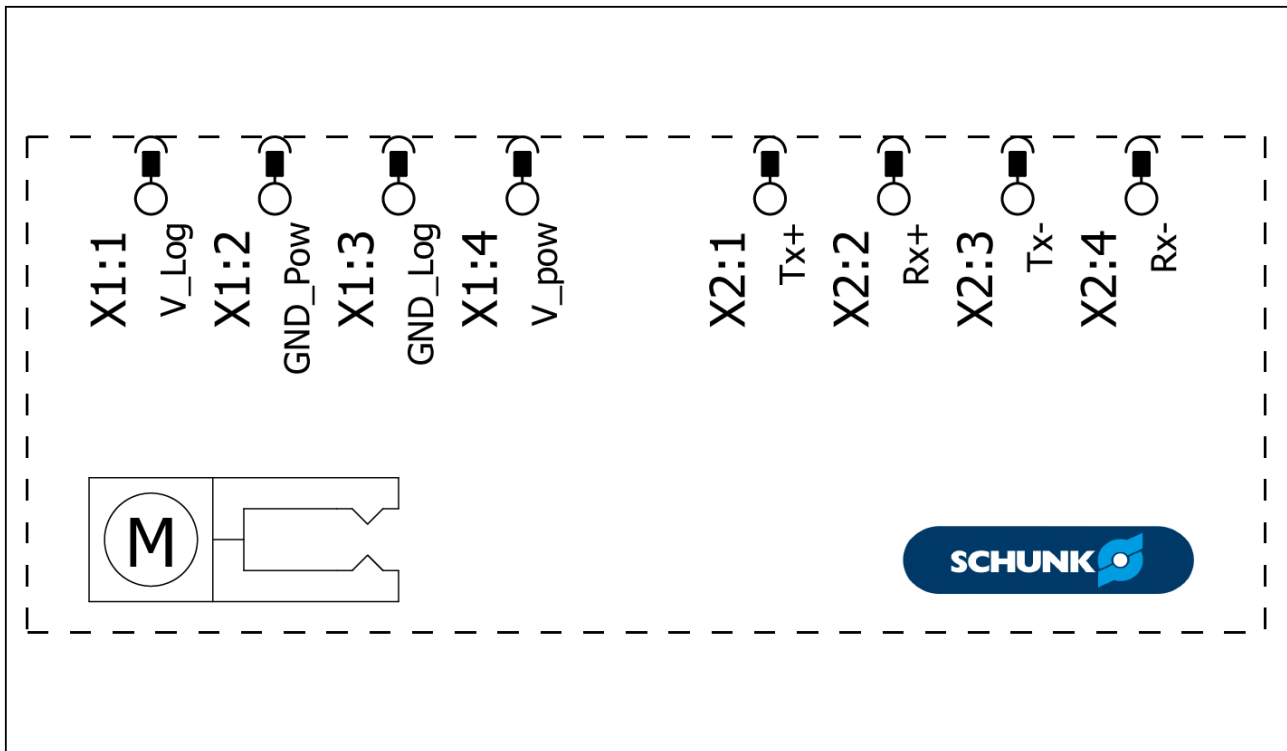
- When connecting the cable, do not exceed the maximum tightening torque of 0.8 Nm for the cable.
- Make sure that the connections are not stressed due to pulling or pressure forces or due to vibrations. Apply the corresponding strain relief devices if required.

5.4.3 Connection diagram

Connection diagram for PROFINET, EtherNet/IP™, EtherCAT



Connection diagram EGK-PN, -EI, -EC

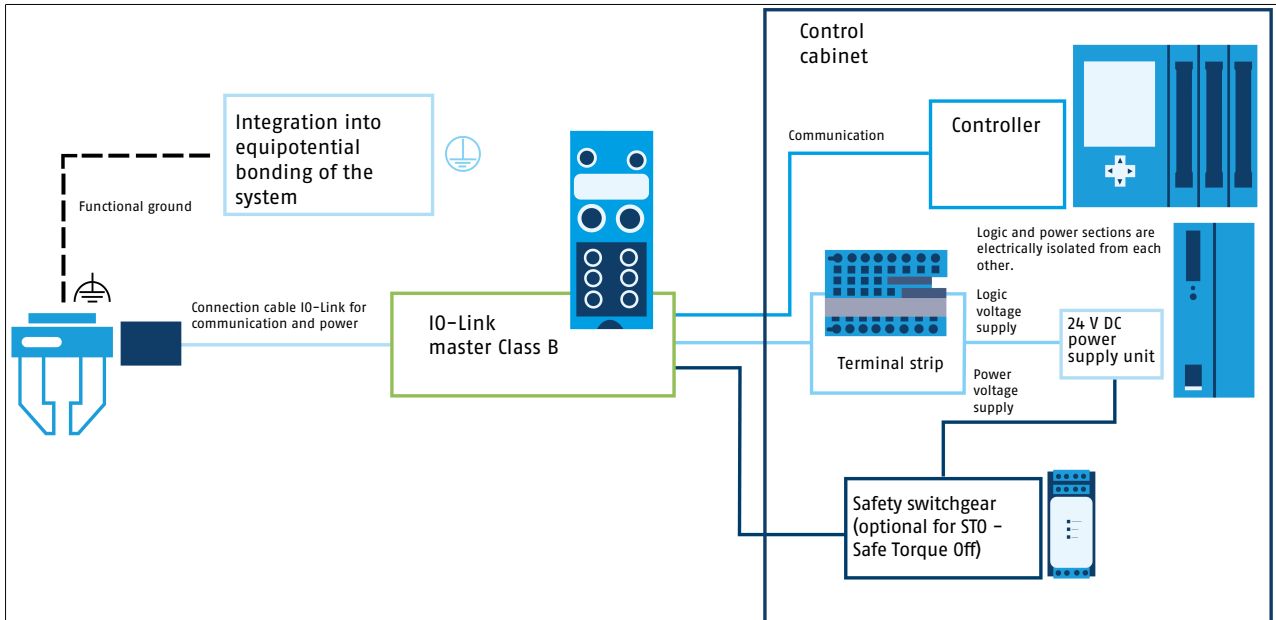


Connection diagram EPLAN, EGK-PN, -EI, -EC

Connection diagram for IO-Link

Observe the rated currents and maximum current consumption of the product, ▶ 3 [16]!

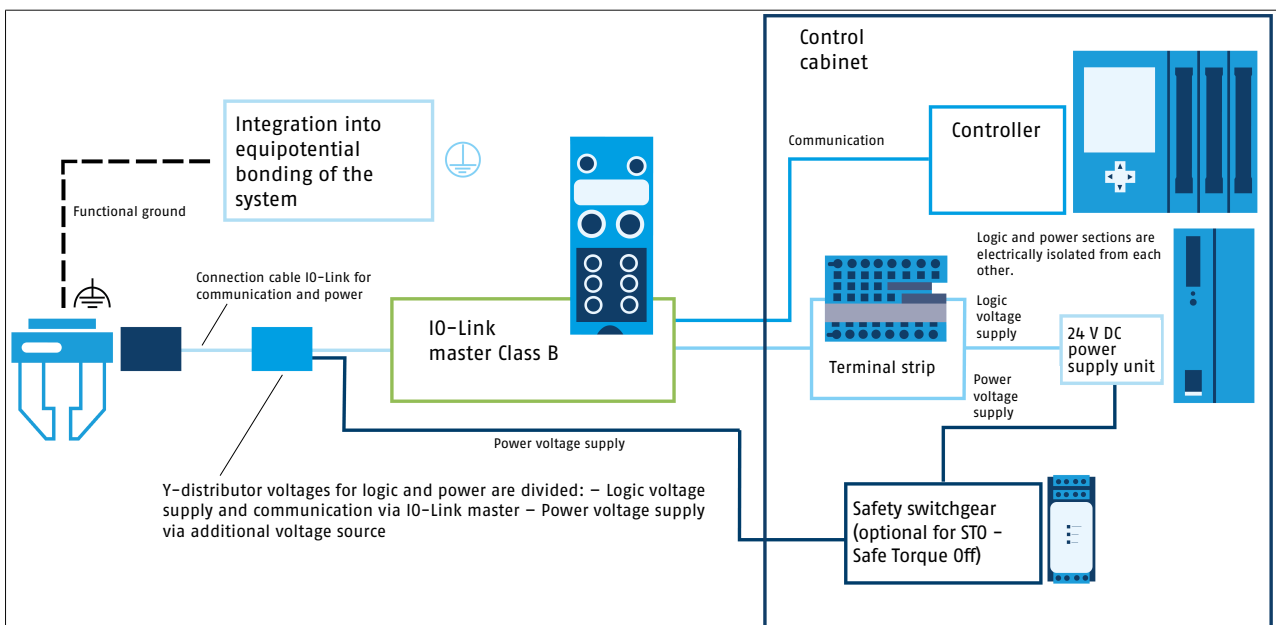
Power and logic voltage supply via Class B master:



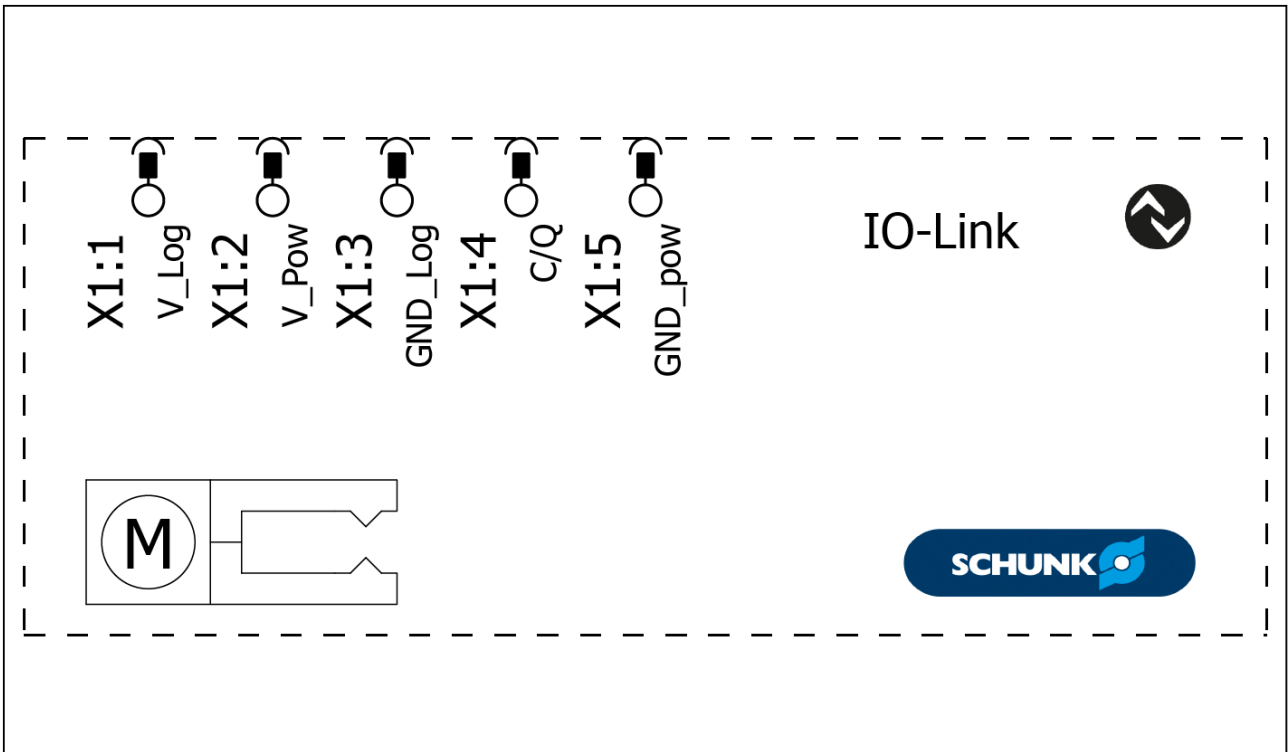
Connection diagram EGK-IL

Power voltage supply via additional voltage source:

Application: Supply currents of the product are greater than current consumption of the IO-Link master.

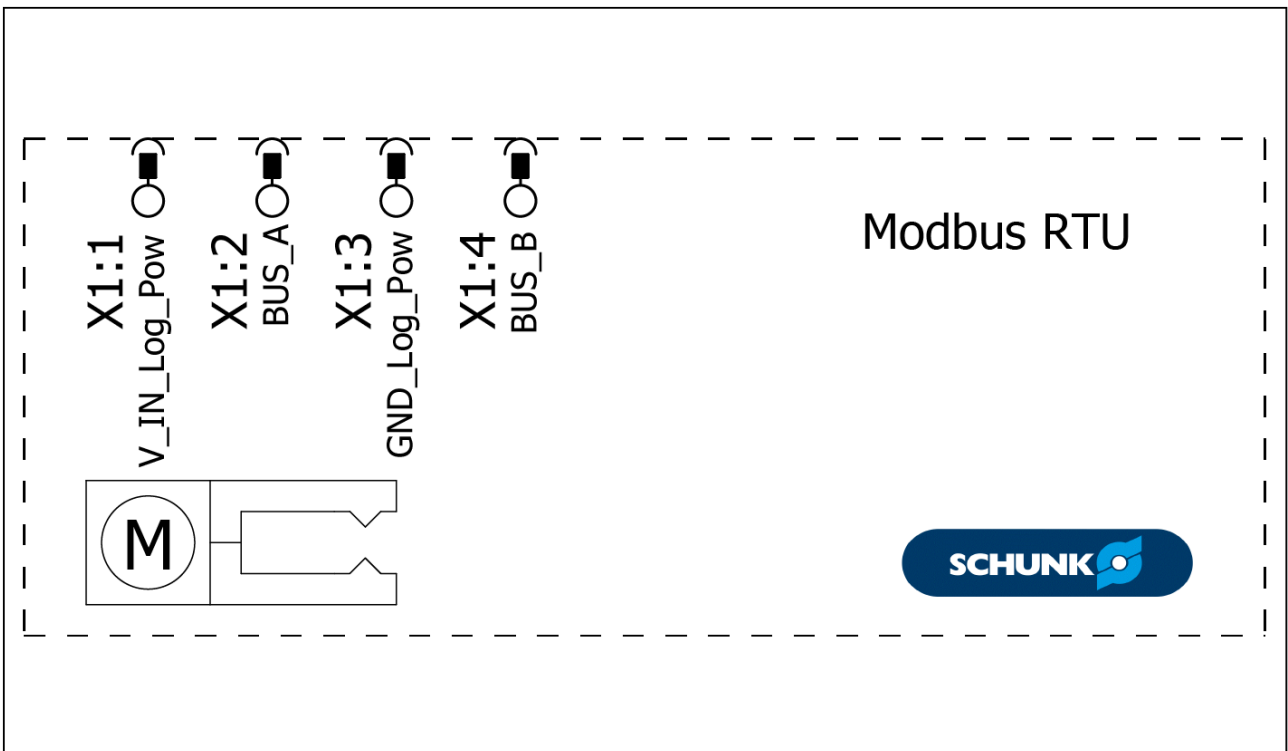


Connection diagram with Y-distributor EGK-IL



Connection diagram EPLAN, EGK-IL

Connection diagram for Modbus RTU



Connection diagram EPLAN, EGK-MB

5.4.4 Switching off the power supply by external safety switchgear

The power section of the product can be disconnected by turning off the voltage supply. This ensures that the product's motor can no longer perform any dangerous movements.

The power section is completely electrically isolated internally from the logic section (isolation voltage 500 V).

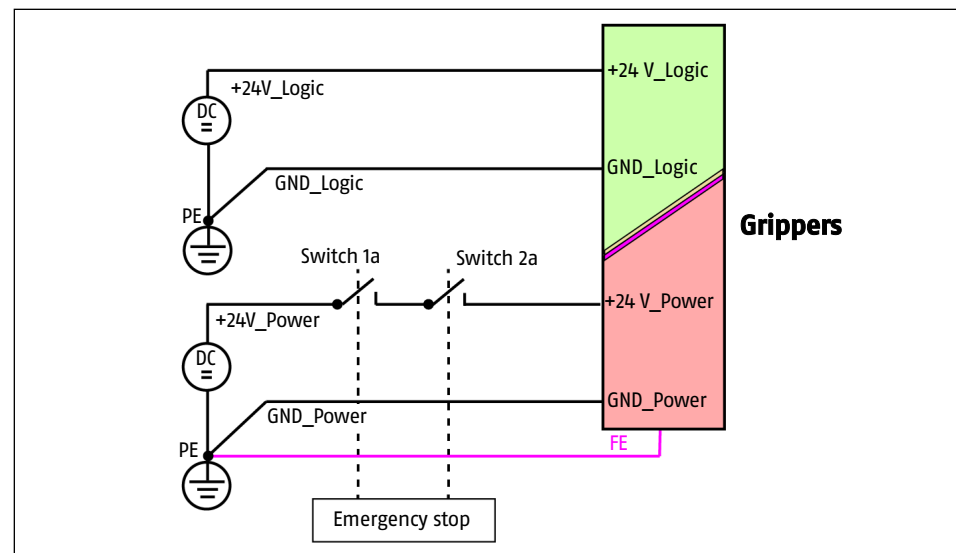
Note: This does **not** apply to the Modbus RTU variant.

Implementation of an STO (Safe Torque Off) with stop category 0 according to EN 60204 or EN ISO 13849-1

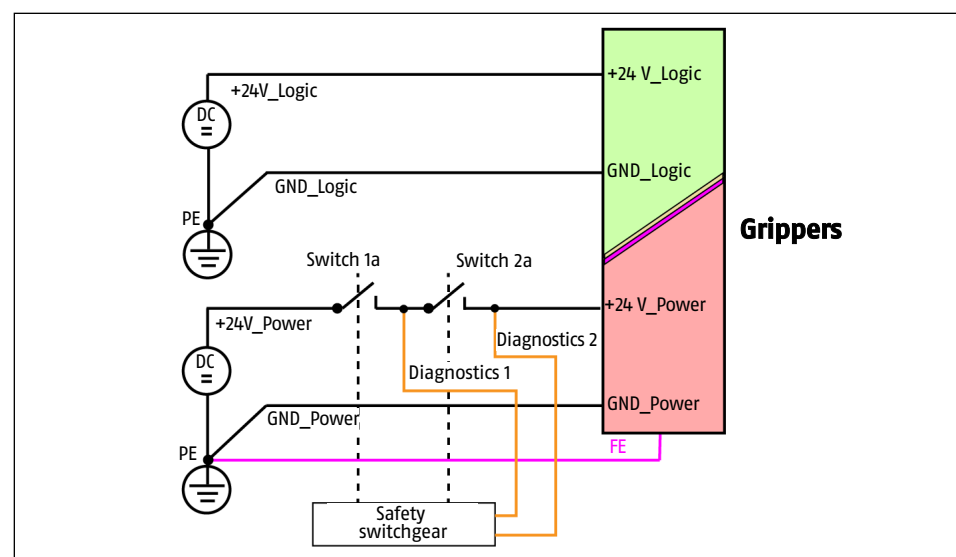
By using a safety relay with main contacts connected in series (positively driven), a stop function category 0 can be achieved. The safety shutdown can be designed as single channel or dual channel.

NOTE

The voltage supply from the actuator/motor is buffered in the product with a DC link capacity of 240 µF.



Fuse protection, single channel

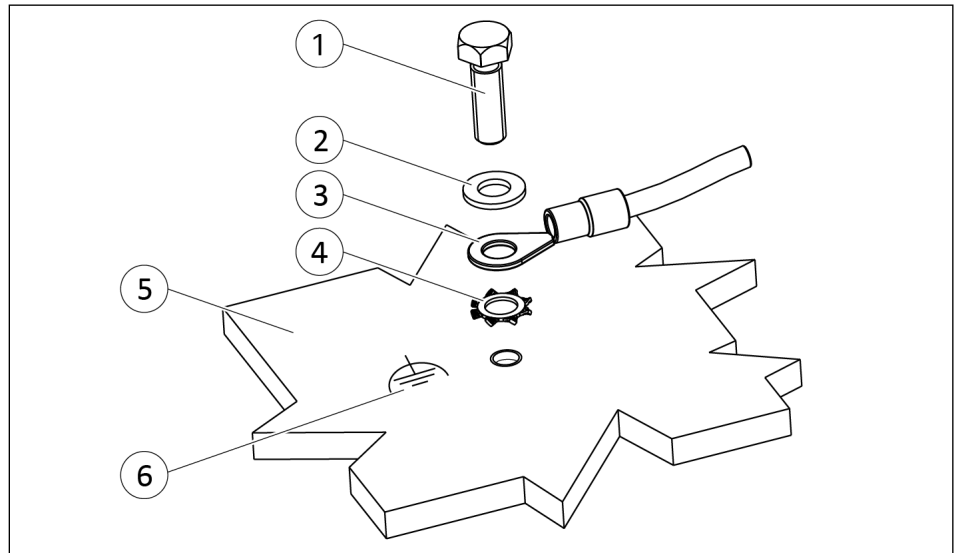


Fuse protection, dual channel

5.4.5 External protection

The power circuit for the product must be protected at the customer site by a circuit breaker, ▶ 3 [16].

5.4.6 Connecting the ground cable (functional ground)



Ground connection

1	Screw *	4	Toothed lock washer
2	Washer	5	Product
3	Cable lug	6	Ground marking

*) Tightening torque: 2 Nm



A ground connection with a sufficient cross-section must be established between the product and the machine on the customer's premises.

Mount the ground cable (functional ground) on the threaded hole marked with the ground marking.

NOTE

Only connect the ground cable (functional ground) at the location intended for this purpose.

Always mount the ground cable individually. A green-yellow wire strand color is not permitted.

Always use all components to fasten the ground cable (functional ground) and install them in this order: toothed lock washer, cable lug, washer and screw. See "Ground connection" diagram. Observe the tightening torque.

6 Start-up

NOTE

Information on commissioning the product is provided in the interface-specific and robot-specific commissioning instructions, ▶ 1.1.5 [📄 7]

7 Operation

7.1 Safety



⚠ WARNING

Risk of injury from objects falling and being ejected!

Falling and ejected objects during operation can lead to serious injury or death.

- Take appropriate protective measures to secure the danger zone.



⚠ WARNING

Risk of injury from objects falling in the event of an energy supply failure

In case of an energy supply failure, the gripping force decreases and a secure hold on the gripped workpiece cannot be guaranteed.

- Take suitable protective measures to secure the danger zone.

7.2 Operating behavior of the product

If a product is connected, the following operating behavior will be exhibited:

- **Behavior when switching on the voltage supply:**
 - After switching on the voltage supply, the product will start in the error state (ERR_FAST_STOP) and will not perform any movements.
 - The product will only perform movements if the existing error was acknowledged and the product is driven by the superordinate control system.
- **Behavior on canceling the connection between the superordinate control system and the product:**

When canceling the connection, the product will switch to the error state (ERR_FAST_STOP) and will not perform any movements.
- **With PROFINET: Behavior with IOPS=BAD:**

The superordinate control system will send data to the product periodically. The data qualifier IOPS contained there will provide information about the validity of the initial data. If this data qualifier has the value "BAD", the product switches to the error state (ERR_FAST_STOP) and will not perform any movements.

8 Troubleshooting

8.1 Safety



⚠ 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.



⚠ WARNING

Risk of injury from crushing and impacts!

Serious injury could occur during movement of the base jaw, due to breakage or loosening of the gripper fingers or if the workpiece is lost.

- Wear suitable protective equipment.
- Do not reach into the open mechanism or the movement area of the product.



⚠ CAUTION

Risk of injury due to electromagnetic interference!

Electromagnetic interference can cause malfunctions and lead to unexpected movements.

- Use electrical components, e.g. sensors, controllers, etc. according to EN 61000-5-7.

NOTE

- For information on error codes and possible troubleshooting measures, see the commissioning instructions, ▶ 1.1.5 [7].
- For information on LEDs, see chapter ▶ 4.3.1 [23].
- Contact SCHUNK Service if troubleshooting with the measures listed below was not successful.

8.2 Communication malfunction

Possible cause	Corrective action
The connection between the product and PLC was interrupted	<p>Check communication cable for correct connection.</p> <hr/> <p>Check communication cable for damage and replace if necessary.</p>

8.3 Product moves in a jerky fashion, is sluggish or blocked

Possible cause	Corrective action
Product is overloaded	<p>Check load situation, e.g. maximum permissible finger weight, maximum permissible finger length, load data of the base jaws.</p>
Voltage supply malfunction	<p>Check the power output of the power supply unit.</p> <hr/> <p>Check power cable line and cable cross sections (high loss of voltage possible with 24 VDC power supply).</p> <hr/> <p>Check power cable line for shorts and cable breakage.</p>
No voltage connected. (emergency stop chain interrupted, safety light curtain triggered.)	<p>Check the voltage supply requirements. ▶ 3 [16].</p>
Insufficient voltage.	
Dirt deposits on product (increasing sluggishness)	<p>Clean product. ▶ 9.2 [48]</p> <p>Allow dirt to fall off by changing the orientation of the product.</p>
Too little grease in the mechanical guiding areas.	<p>Reduce external influences that can cause grease to wash out.</p> <hr/> <p>Clean and lubricate product. ▶ 9.2 [48]</p>
IP protection class is not suitable for the application.	<p>Observe the permissible protection class. ▶ 3.3 [17]</p>
Tightening torque of the screw connection too high, uneven mounting surface	<p>Observe the permissible tightening torques, check the flatness of the mounting surface. ▶ 5.3 [31].</p>
Brake does not release	<p>Check the ambient temperature requirements. ▶ 3.3 [17]</p> <hr/> <p>Warm up product, e.g. by sending the command again.</p>

9 Maintenance

9.1 Safety



⚠ 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.

NOTICE

Material damage due to improper disassembly!

Incorrect works can cause damage to the mechanics and internal electronics.

- Disassembly or opening of the product is not permitted.
- Only allow SCHUNK to repair the product.

9.2 Maintenance intervals

The product is maintenance-free provided that the ambient and operating conditions are met, ▶ 3.3 [17].

Although the product is maintenance-free, it should be regularly inspected visually to ensure that it functions properly.

In the case of extended ambient and operating conditions, such as

- Contaminated environments
- High temperatures

the product must be cleaned, checked for damage and wear or relubricated as required.

In doing so, observe the following:

- Perform all maintenance work without a gripped workpiece!
- Blow all coarse dirt and chips out of the cavities in the product with compressed air.
- Clean product with a solvent-free cleaning agent.
- Apply a thin film of grease to the metallic sliding surfaces with a lint-free cloth.

Recommended grease: Klübersynth UH1 14-151

- Have all repair work on the product carried out only by SCHUNK.

This will help achieve a long service life even under more extreme ambient and operating conditions.

10 Disassembly and disposal



⚠ 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.
-
- Disconnect the entire energy supply from the product, discharge any accumulated residual energy.
 - Remove any lubricant and dispose of in an environmentally friendly manner.
 - Follow local regulations on dispatching product components for recycling or proper disposal.

11 EU-Declaration of Conformity

Hersteller/ Inverkehrbringer	SCHUNK GmbH & Co. KG Clamping and gripping technology Bahnhofstr. 106 – 134 D-74348 Lauffen/Neckar
Product designation:	Gripper for small components, electric EGK
ID number	1491748, 1491749, 1491750, 1491751, 1491752, 1491753, 1491754, 1491755, 1491756, 1491757, 1491759, 1491760, 1491762, 1491763, 1491765, 1491766, 1491767, 1491768, 1491769, 1491770, 1491771, 1491772, 1491774, 1491775, 1491776, 1491777, 1491780, 1491781, 1491784, 1491785

We hereby declare on our sole authority that the product meets the requirements of the following directives at the time of the declaration.

The declaration is rendered invalid if modifications are made to the product.

- **EMC Directive 2014/30/EU**
- **RoHS Directive 2011/65/EU**
- **REACH Regulation EC No. 1907/2006**

Applied harmonized standards, especially:

EN IEC 61000-6-2:2019	Electromagnetic compatibility (EMC) – Part 6-2: Generic standards – Immunity standard for industrial environments
EN IEC 61000-6-4:2019	Electromagnetic compatibility (EMC) – Part 6-4: Generic standards – Emission standard for industrial environments
EN IEC 61800-3:2018	Adjustable speed electrical power drive systems – Part 3: EMC requirements and specific test methods (IEC 61800-3:2017)

Signed for and on behalf of: SCHUNK GmbH & Co. KG

Signature: see original declaration

Lauffen/Neckar, March 2023

Dr.-Ing. Manuel Baumeister,
Technology & Innovation

12 UKCA Declaration of Conformity

Manufacturer/ Distributor	SCHUNK Intec Limited Clamping and gripping technology 3 Drakes Mews, Crownhill MK8 0ER Milton Keynes
Product designation:	Gripper for small components, electric EGK
ID number	1491748, 1491749, 1491750, 1491751, 1491752, 1491753, 1491754, 1491755, 1491756, 1491757, 1491759, 1491760, 1491762, 1491763, 1491765, 1491766, 1491767, 1491768, 1491769, 1491770, 1491771, 1491772, 1491774, 1491775, 1491776, 1491777, 1491780, 1491781, 1491784, 1491785

We hereby declare on our sole authority that the product meets the requirements of the following directives at the time of the declaration.

The declaration is rendered invalid if modifications are made to the product.

- **Electromagnetic Compatibility Regulations 2016**
- **RoHS Directive 2011/65/EU**
- **REACH Regulation EC No. 1907/2006**

Applied harmonized standards, especially:

EN IEC 61000-6-2:2019	Electromagnetic compatibility (EMC) – Part 6-2: Generic standards – Immunity standard for industrial environments
EN IEC 61000-6-4:2019	Electromagnetic compatibility (EMC) – Part 6-4: Generic standards – Emission standard for industrial environments
EN IEC 61800-3:2018	Adjustable speed electrical power drive systems – Part 3: EMC requirements and specific test methods (IEC 61800-3:2017)

Person authorized to compile the technical documentation:

Marcel Machado, address: refer to manufacturer's address

Signed for and on behalf of: SCHUNK GmbH & Co. KG



Dr.-Ing. Manuel Baumeister,
Technology & Innovation

Lauffen/Neckar, March 2023

13 Translation of original declaration of incorporation

in terms of the Directive 2006/42/EG, Annex II, Part 1.B of the European Parliament and of the Council on machinery.

Hersteller/ Inverkehrbringer SCHUNK GmbH & Co. KG Clamping and gripping technology
Bahnhofstr. 106 – 134
D-74348 Lauffen/Neckar

We hereby declare that on the date of the declaration the following partly completed machine complied with all basic safety and health regulations found in the directive 2006/42/EC of the European Parliament and of the Council on machinery. The declaration is rendered invalid if modifications are made to the product.

Product designation: Gripper for small components, electric / EGK / electric
ID number 1491748, 1491749, 1491750, 1491751, 1491752, 1491753, 1491754, 1491755,
1491756, 1491757, 1491759, 1491760, 1491762, 1491763, 1491765,
1491766, 1491767, 1491768, 1491769, 1491770, 1491771, 1491772, 1491774,
1491775, 1491776, 1491777, 1491780, 1491781, 1491784, 1491785

The partly completed machine may not be put into operation until conformity of the machine into which the partly completed machine is to be installed with the provisions of the Machinery Directive (2006/42/EC) is confirmed.

Applied harmonized standards, especially:

EN ISO 12100:2010 Safety of machinery – General principles for design – Risk assessment and risk reduction
EN 60204-1: 2018 Safety of machines – Electrical equipment of machines, Part 1: General requirements
EN ISO 10218-1:2011 Robots and robotic devices – Safety requirements – Part 1: Robots
EN ISO 10218-2:2011 Robots and robotic devices – Safety requirements – Part 2: Robot systems and integration

The manufacturer agrees to forward on demand the relevant technical documentation for the partly completed machinery in electronic form to national authorities.

The relevant technical documentation according to Annex VII, Part B, belonging to the partly completed machinery, has been created.

Person authorized to compile the technical documentation:
Robert Leuthner, Address: see manufacturer's address

Signature: see original declaration

Lauffen/Neckar, March 2023

Dr.-Ing. Manuel Baumeister,
Technology & Innovation

14 UKCA declaration of incorporation

in accordance with the Supply of Machinery (Safety) Regulations 2008.

Manufacturer/
Distributor SCHUNK Intec Limited
 Clamping and gripping technology
 3 Drakes Mews, Crownhill
 MK8 0ER Milton Keynes

We hereby declare that on the date of the declaration the following partly completed machine complied with all basic safety and health regulations found in the "Supply of Machinery (Safety) Regulations 2008".

The declaration shall be rendered invalid if modifications are made to the product.

Product designation: Gripper for small components, electric / EGK / electric
ID number 1491748, 1491749, 1491750, 1491751, 1491752, 1491753, 1491754, 1491755,
 1491756, 1491757, 1491759, 1491760, 1491762, 1491763, 1491765,
 1491766, 1491767, 1491768, 1491769, 1491770, 1491771, 1491772, 1491774,
 1491775, 1491776, 1491777, 1491780, 1491781, 1491784, 1491785

The partly completed machine may not be put into operation until it has been confirmed that the machine into which the partly completed machine is to be installed complies with the provisions of the "Supply of Machinery (Safety) Regulations 2008".

Applied harmonized standards, especially:

EN ISO 12100:2010	Safety of machinery – General principles for design – Risk assessment and risk reduction
EN 60204-1: 2018	Safety of machines – Electrical equipment of machines, Part 1: General requirements
EN ISO 10218-1:2011	Robots and robotic devices – Safety requirements – Part 1: Robots
EN ISO 10218-2:2011	Robots and robotic devices – Safety requirements – Part 2: Robot systems and integration

The manufacturer agrees to forward on demand the relevant technical documentation for the partly completed machinery in electronic form to national authorities.

The relevant technical documentation according to Annex VII, Part B, belonging to the partly completed machinery, has been created.

Person authorized to compile the technical documentation:
Marcel Machado, address: refer to manufacturer's address



Lauffen/Neckar, March 2023

Dr.-Ing. Manuel Baumeister,
Technology & Innovation

15 Annex to Declaration of Incorporation

in accordance with 2006/42/EC, Appendix II, no. 1 B

as well as

in accordance with the Supply of Machinery (Safety) Regulations 2008.

1. Description of the basic safety and health protection requirements, as per 2006/42/EC, Annex I and per the Supply of Machinery (Safety) Regulations 2008, that apply to and are fulfilled for the scope of the incomplete machine:

Product designation Gripper for small components, electric

Type designation EGK

ID number 1491748, 1491749, 1491750, 1491751, 1491752, 1491753, 1491754, 1491755,
1491756, 1491757, 1491759, 1491760, 1491762, 1491763, 1491765, 1491766,
1491767, 1491768, 1491769, 1491770, 1491771, 1491772, 1491774, 1491775,
1491776, 1491777, 1491780, 1491781, 1491784, 1491785

Legend:

To be provided by the System Integrator for the overall machine



Fulfilled for the scope of the partly completed machine



Not relevant



1.1 Essential Requirements

1.1.1 Definitions



1.1.2 Principles of safety integration



1.1.3 Materials and products



1.1.4 Lighting



1.1.5 Design of machinery to facilitate its handling



1.1.6 Ergonomics



1.1.7 Operating positions



1.1.8 Seating



1.2 Control Systems

1.2.1 Safety and reliability of control systems



1.2.2 Control devices



1.2.3 Starting
































1.2.4 Stopping



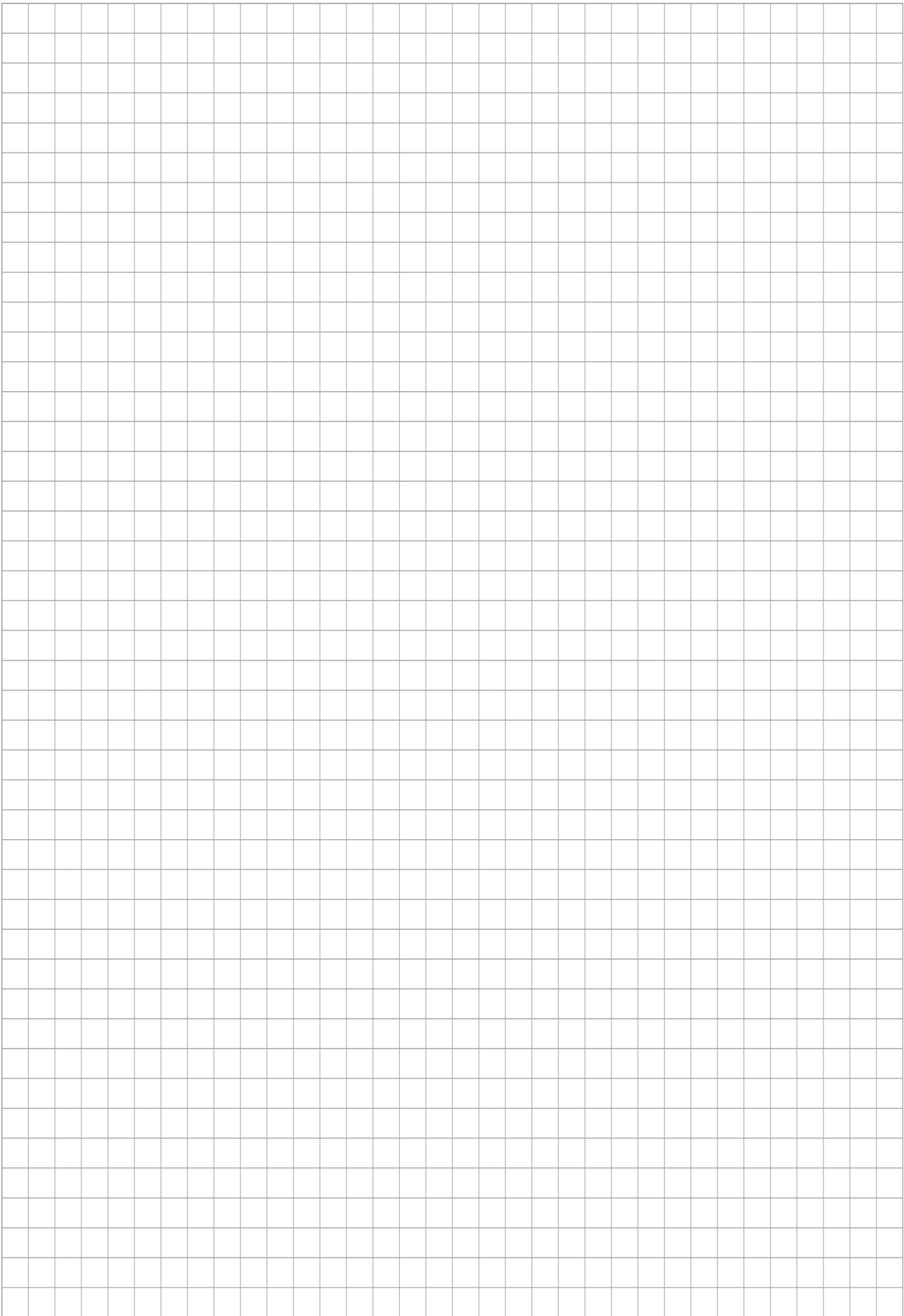
1.2.4.1 Normal stop

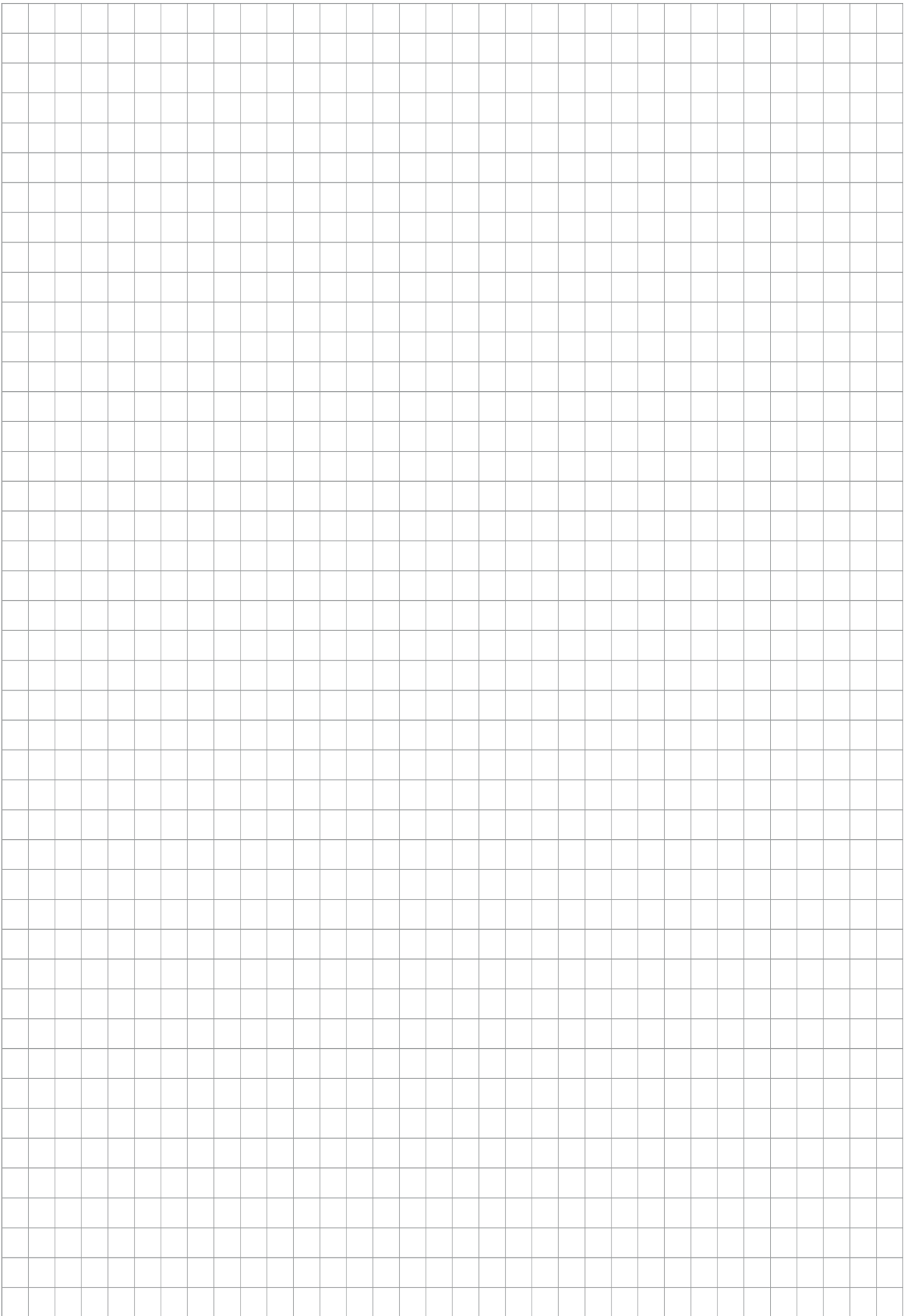


1.2	Control Systems	
1.2.4.2	Operational stop	
1.2.4.3	Emergency stop	
1.2.4.4	Assembly of machinery	
1.2.5	Selection of control or operating modes	
1.2.6	Failure of the power supply	
1.3	Protection against mechanical hazards	
1.3.1	Risk of loss of stability	
1.3.2	Risk of break-up during operation	
1.3.3	Risks due to falling or ejected objects	
1.3.4	Risks due to surfaces, edges or angles	
1.3.5	Risks related to combined machinery	
1.3.6	Risks related to variations in operating conditions	
1.3.7	Risks related to moving parts	
1.3.8	Choice of protection against risks arising from moving parts	
1.3.8.1	Moving transmission parts	
1.3.8.2	Moving parts involved in the process	
1.3.9	Risks of uncontrolled movements	
1.4	Required characteristics of guards and protective devices	
1.4.1	General requirements	
1.4.2	Special requirements for guards	
1.4.2.1	Fixed guards	
1.4.2.2	Interlocking movable guards	
1.4.2.3	Adjustable guards restricting access	
1.4.3	Special requirements for protective devices	
1.5	Risks due to other hazards	
1.5.1	Electricity supply	
1.5.2	Static electricity	
1.5.3	Energy supply other than electricity	
1.5.4	Errors of fitting	
1.5.5	Extreme temperatures	
1.5.6	Fire	
1.5.7	Explosion	

1.5	Risks due to other hazards	
1.5.8	Noise	✓
1.5.9	Vibrations	✓
1.5.10	Radiation	✓
1.5.11	External radiation	✓
1.5.12	Laser radiation	⊘
1.5.13	Emissions of hazardous materials and substances	✓
1.5.14	Risk of being trapped in a machine	⊘
1.5.15	Risk of slipping, tripping or falling	⊘
1.5.16	Lightning	✓
1.6	Maintenance	
1.6.1	Machinery maintenance	✓
1.6.2	Access to operating positions and servicing points	👤
1.6.3	Isolation of energy sources	👤
1.6.4	Operator intervention	👤
1.6.5	Cleaning of internal parts	✓
1.7	Information	
1.7.1	Information and warnings on the machinery	✓
1.7.1.1	Information and information devices	✓
1.7.1.2	Warning devices	✓
1.7.2	Warning of residual risks	✓
1.7.3	Marking of machinery	✓
1.7.4	Instructions	✓
1.7.4.1	General principles for the drafting of instructions	✓
1.7.4.2	Contents of the instructions	✓
1.7.4.3	Sales literature	✓
The classification from Annex 1 is to be supplemented from here forward.		
2	Supplementary essential health and safety requirements for certain categories of machinery	⊘
2.1	Foodstuffs machinery and machinery for cosmetics or pharmaceutical products	⊘
2.2	Portable hand-held and/or guided machinery	⊘
2.2.1	Portable fixing and other impact machinery	⊘
2.3	Machinery for working wood and material with similar physical characteristics	⊘

The classification from Annex 1 is to be supplemented from here forward.		
3	Supplementary essential health and safety requirements to offset hazards due to the mobility of machinery	⊘
4	Supplementary essential health and safety requirements to offset hazards due to lifting operations	⊘
5	Supplementary essential health and safety requirements for machinery intended for underground work	⊘
6	Supplementary essential health and safety requirements for machinery presenting particular hazards due to the lifting of persons	⊘







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Clamping and gripping technology

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