



MATCH

INSTALLATION AND OPERATING INSTRUCTIONS

2-jaw parallel gripper

LWR50L-23-00005-A

LWR50L-23-00006-A

LWR50L-23-00007-A

LWR50L-23-00008-A

I/O

DDOC01273

THE KNOW-HOW FACTORY

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1 Supporting documents

NOTICE



Read through the installation and operating instructions before installing or working with the product.

The installation and operating instructions contain important notes for your personal safety. They must be read and understood by all persons who work with or handle the product during any phase of the product lifetime.



The documents listed below are available for download on our website www.zimmer-group.com.

- Installation and operating instructions
 - Catalogs, drawings, CAD data, performance data
 - Information on accessories
 - Technical data sheets
 - General Terms and Conditions, including warranty information.
- ⇒ Only those documents currently available on the website are valid.

In these installation and operating instructions, "product" refers to the product designation on the title page!

1.1 Notices and graphics in the installation and operating instructions

DANGER



This notice warns of an imminent danger to the life and health of people. Ignoring these notices can lead to serious injury or even death.

► You absolutely must comply with the described measures for avoiding these dangers!

⇒ The warning symbols are assigned according to the type of danger.

WARNING



This notice warns of a situation that is potentially hazardous to personal health. Ignoring these notices can cause serious injury or damage to health.

► You absolutely must comply with the described measures for avoiding these dangers!

⇒ The warning symbols are assigned according to the type of danger.

CAUTION



This notice warns of a situation that is potentially hazardous to persons. Ignoring these notices can cause minor, reversible injuries.

► You absolutely must comply with the described measures for avoiding these dangers!

⇒ The warning symbols are assigned according to the type of danger.

NOTICE



This notice warns of possible material and environmental damage. Ignoring these notices can result in damage to the product or the environment.

► You absolutely must comply with the described measures for avoiding these dangers!

⇒ The warning symbols are assigned according to the type of danger.

INFORMATION



This category contains useful tips for handling the product efficiently. Failure to observe these tips will not result in damage to the product. This information does not include any information relevant to health or workplace safety.

2 Safety notices

CAUTION



Risk of injury and material damage in case of non-compliance

The product is state-of-the-art.

The following are examples of situations in which the product may cause a hazard:

- The product is not properly installed, used or maintained.
- The product is not used for its designated purpose.
- The locally applicable regulations, laws, directives or guidelines are not observed.
- ▶ The product may only be used in accordance with these installation and operating instructions and the product's technical data. Any changes or additions to the intended use of the product, as well as modifications to the product, such as those in the following examples, require the written permission of the manufacturer:
 - Use of the product under extreme conditions, such as aggressive fluids or abrasive dusts
 - Additional drilled holes or threads
- ⇒ Zimmer Group GmbH shall accept no liability for any damage caused by improper use. The operator bears sole responsibility.
- ▶ Make sure that the power supply is disconnected before you mount, adjust, modify, maintain or repair the product.
- ▶ Whenever work is carried out on the product, make sure that the product cannot be actuated by mistake.
- ▶ Perform maintenance tasks, renovation work or attachment work outside of the machine's danger zone when possible.
- ▶ Do not reach into the operational range of the product.
- ▶ Always adhere to the required maintenance intervals.
- ▶ When using the product under extreme conditions, adjust the maintenance interval according to the degree of contamination.

CAUTION



Notes and handling regulations for electrostatically sensitive components

Electrostatically sensitive components are individual components, integrated circuits or assemblies that can be damaged by electrostatic fields or electrostatic discharge.

- ▶ When handling electrostatic components, make sure that persons, the work area and packaging are all fully grounded.
- ▶ Touch electronic components only in appropriately identified areas with conductive flooring and only if:
 - You are grounded by means of special bracelets.
 - You wear shoes that are suitable and approved for the discharge of electrostatic charges.
- ▶ Do not bring electronic assemblies into contact with plastics and parts of clothing that have plastic content.
- ▶ Store electronic assemblies on conductive underlays only.
- ▶ Do not install electronic assemblies in the vicinity of data back-up devices or monitors (monitor distance > 100 mm).
- ▶ Perform measurements on electronic assemblies only if:
 - The measuring instrument is grounded (e.g. via a ground conductor).
 - The measuring head is momentarily discharged before measuring with a floating measuring instrument.

3 Proper use

NOTICE

**Material damage and malfunction in case of non-compliance**

The product is only to be used in its original state with its original accessories, with no unauthorized changes and within the stipulated parameter limits and operating conditions.

Any other or secondary use is deemed improper.

- ▶ Operate the product only in compliance with the associated installation and operating instructions.
- ▶ Operate the product only when it is in a technical condition that corresponds to the guaranteed parameters and operating conditions.
- ⇒ Zimmer Group GmbH shall accept no liability for any damage caused by improper use. The operator bears sole responsibility.

- The product is designed specifically for cooperative and collaborative use on robot systems and in combination with the MATCH tool exchange system.
- The product is designed exclusively for electric operation using a 24 V DC power supply.
- The product must always be mounted on materials that dissipate heat.
- The product is intended for industrial use.
- The product is to be used as intended in enclosed rooms for temporary gripping, handling and holding.
- The product is not suitable for clamping workpieces during a machining process.
- Direct contact with perishable goods/food is not permitted.
- The product is not suited for use in a potentially explosive atmosphere.

4 Personnel qualification

WARNING



Inadequate qualification can cause injury and material damage

If inadequately qualified personnel perform work on the product, this can cause serious injuries and significant material damage.

- ▶ All work on the product must be performed by qualified personnel.
- ▶ Before working with the product, read the document in its entirety and make sure that you have understood everything.
- ▶ Observe country-specific accident prevention regulations and the general safety notices.

The following qualifications are a prerequisite for performing various work on the product.

4.1 Electricians

Electricians are able to perform work on electrical systems, can recognize and avoid possible dangers and know the relevant standards and provisions due to their technical training, knowledge and experience.

4.2 Specialists

Specialists are able to perform the assigned work, can recognize and avoid possible dangers and know the relevant standards and provisions due to their technical training, knowledge and experience.

4.3 Instructed personnel

Instructed personnel have been trained by the operating company on the tasks and possible dangers of improper behavior.

4.4 Service personnel

Service personnel are able to perform the assigned work and can recognize and avoid possible dangers due to their technical training, knowledge and experience.

4.5 Additional qualifications

Persons who work with the product must be familiar with the valid safety regulations and laws as well as the standards, guidelines and laws listed in this document.

Personnel who work with the product must have facility-issued authorization to commission, program, configure, operate, maintain and also decommission this product.

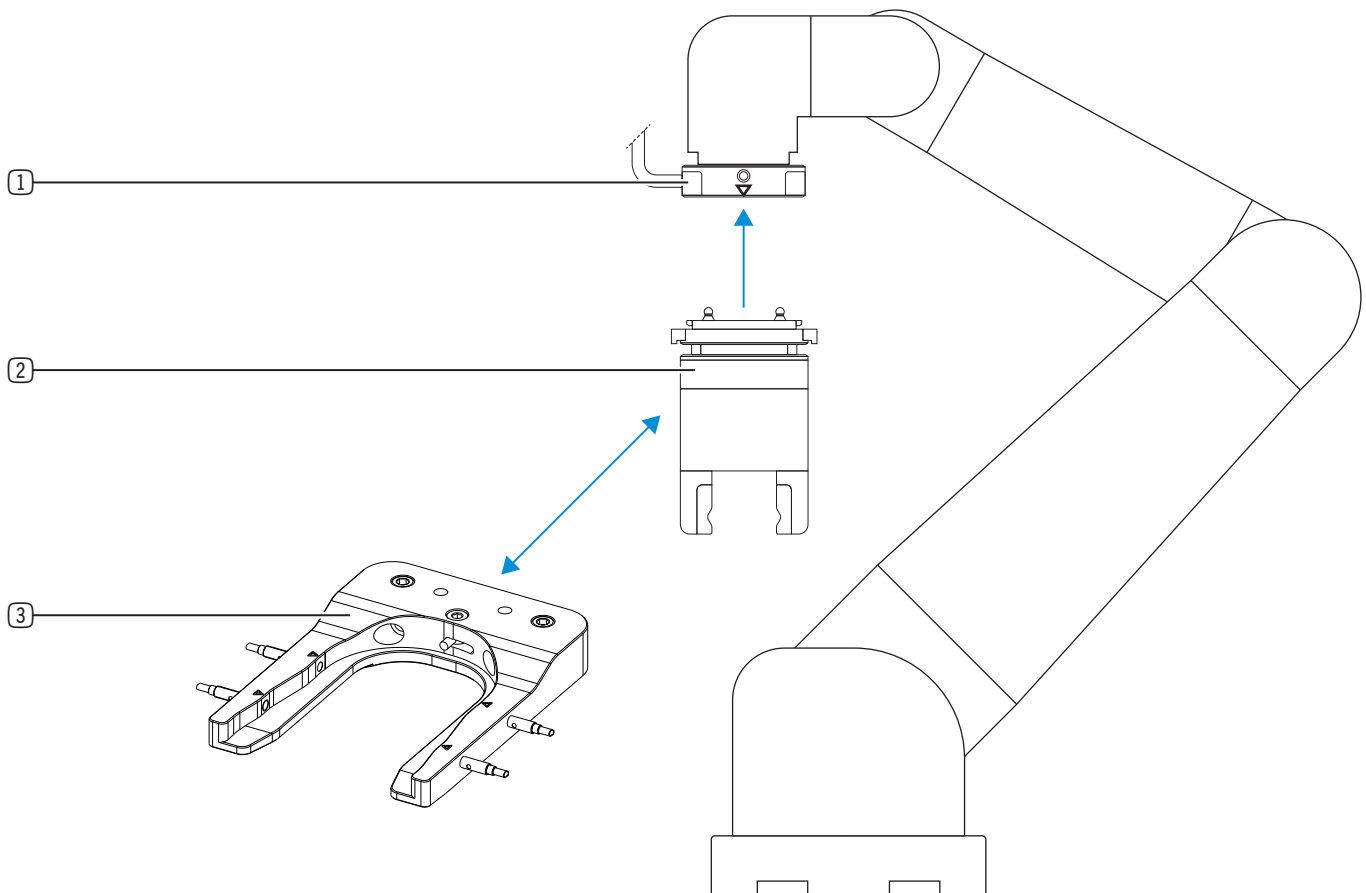
5 Product description

The MATCH End-of-Arm Ecosystem is equipped with an extensive range of functions and universal communication interfaces. MATCH is compatible with all common lightweight robots. The system can be mounted on the robot flange and set up with a few manual adjustments.

The product is a combination of a gripper and a loose part.

The original parts from Zimmer Group GmbH required for the safety principles are:

- ① MATCH robot module (LWR50F-xx)
- ② MATCH gripper (LWR50L-xx)
- ③ MATCH storage station (ALWR1-50-A)

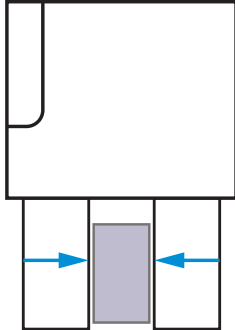


5.1 Possible applications

Outside gripping

The product can be used for outside gripping.

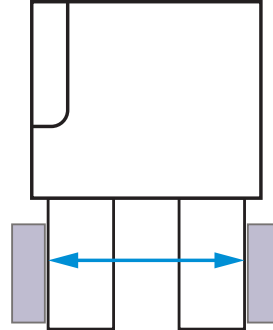
MoveToWork command



Inside gripping

The product can be used for inside gripping.

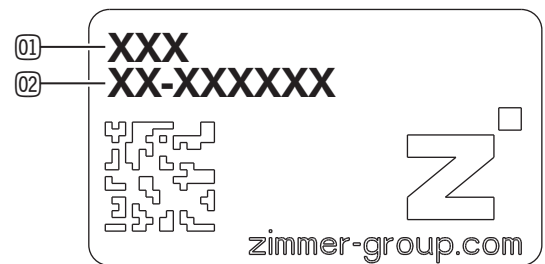
MoveToBase command



5.2 Type plate

A type plate is attached to the product.

- ① Article number
- ② Confirmation number



5.3 Product variants and compatibility

INFORMATION



- You can find information about product variants and their compatibility on our website.
- Please contact Customer Service if you have any questions.

6 Functional description

The robot module and gripper are coupled manually or automatically via a storage station. When moving out of the storage station, the gripper automatically locks with the robot module.

When they are coupled, the internal spring contacts are contacted for signal transmission.

The hot-plug function enables coupling and decoupling while electrified.

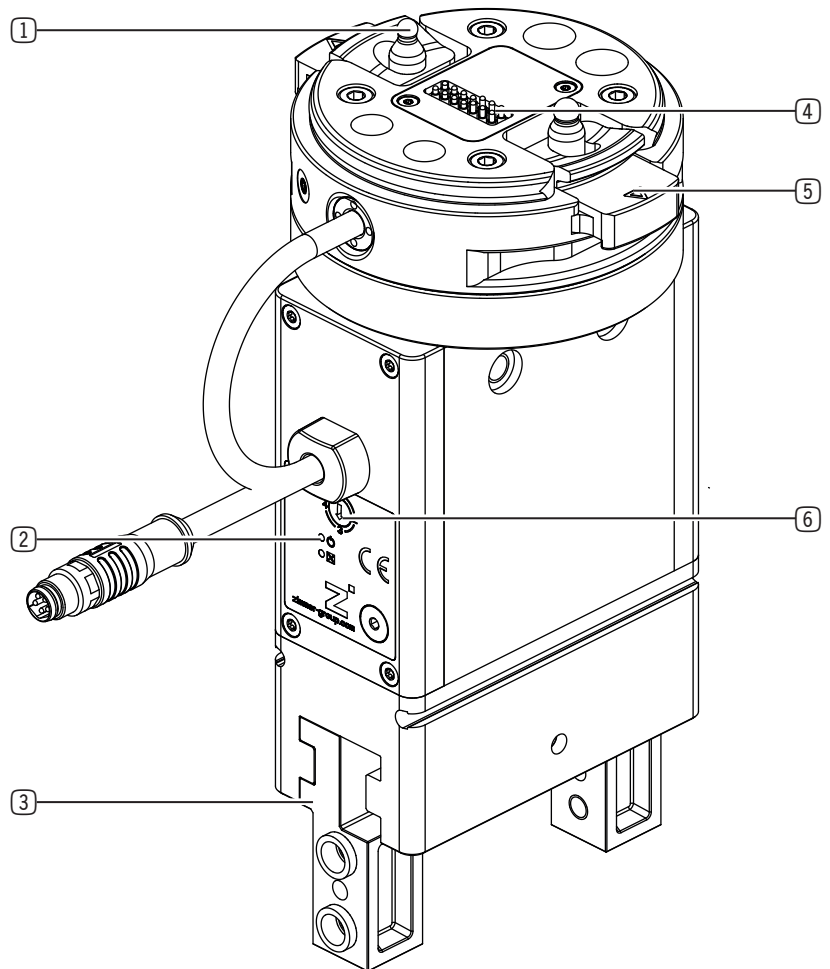
Differently sized centering pins and markings ensure that the robot module and gripper cannot be connected incorrectly. The product is also designed in such a way that it cannot be inserted incorrectly into the storage station.

The gripper jaws of the product are arranged parallel to each other on two opposing guide rails and can be moved relative to each other.

The force of the motor is transmitted over a gear to a worm gear. The movement is transferred from the worm gear to the toothed gripper jaws and a synchronized movement is generated.

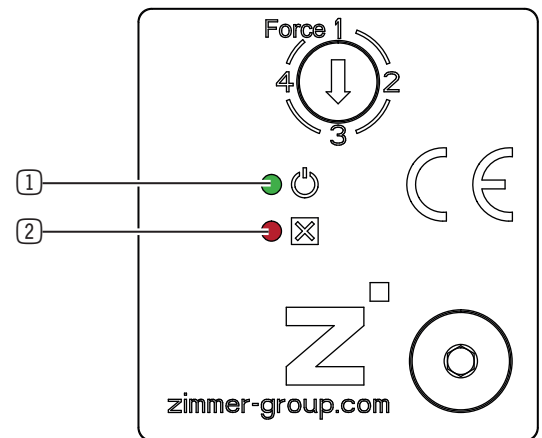
The product has a mechanical self-locking mechanism to ensure that the workpiece remains held in the event of a power supply loss.

The product can be controlled like a valve via I/O-ports.



- ① Centering pin
- ② LED display
- ③ Gripper jaw
- ④ Signal transmission
- ⑤ Locking
- ⑥ Adjustable gripping force

6.1 LED status display



- ① Power/communication
- ② Error

6.2 Functional safety

For the overall safety of the function, all three components (robot module, gripper and storage station) must be taken into account.

The safety function of the product that ensures secure locking between the robot module and gripper is implemented via a pneumatic action channel that consists of a mechanical locking and springs.

Technical supplementary safety measures (sensors) provide a high degree of diagnostic coverage.

Fault elimination in accordance with DIN EN ISO 13849-2, Annex A, Table A2 and A3 for the helical compression springs used can be given.

7 Technical data

INFORMATION



- ▶ You can find the information in the technical data sheet on our website.
- ▶ This data varies within the series, depending on the specific design.

8 Accessories/scope of delivery

INFORMATION



- ▶ If any accessories not sold or authorized by Zimmer Group GmbH are used, the function of the product cannot be guaranteed. Zimmer Group GmbH accessories are specifically tailored to the individual products.
- ▶ For optional accessories and those included in the scope of delivery, refer to our website.

9 Transportation/storage/preservation

- ▶ Transport and storage of the product must be done only with the original packaging.
- ▶ If the product has already been installed on the superordinate machine unit, care must be taken during transport to ensure that no unexpected movements can occur.
 - ▶ Before commissioning the product and after transport, check all power and communication connections as well as all mechanical connections.
- ▶ If the product is stored for an extended period, the following points are to be observed:
 - ▶ Keep the storage location as dust-free and dry as possible.
 - ▶ Avoid temperature fluctuations.
 - ▶ Avoid wind/drafts/water condensation formation.
 - ▶ Pack the product and do not expose it to direct sunlight during storage.
- ▶ Clean all components. There must be no soiling left on the components.
- ▶ Visually inspect all components.
- ▶ Remove all foreign substances.
- ▶ Properly remove potential corrosion spots.
- ▶ Close electrical connections using suitable covers.

10 Installation

WARNING



Risk of injury due to uncontrolled movements

Risk of injury in case of unexpected movement of the machine or system into which the product is to be installed.

- ▶ Switch off the energy supply of the machine before any work.
- ▶ Secure the power supply against being switched on unintentionally.
- ▶ Check the machine for any residual energy that may be present.

CAUTION



Risk of injury due to uncontrolled movements

Risk of injury in the event of uncontrolled movement of the product when the power supply is connected.

- ▶ Switch off the power supply to the machine before carrying out any work.
- ▶ Secure the power supply against being switched on unintentionally.
- ▶ Check the machine for any residual energy that may be present.

10.1 Mounting the sensors on the storage station

The figure shows a combination consisting of a robot module, gripper and storage station.

Sensors can optionally be mounted in the storage station. Check two sensors on the storage position to see whether the gripper is present in the storage station.

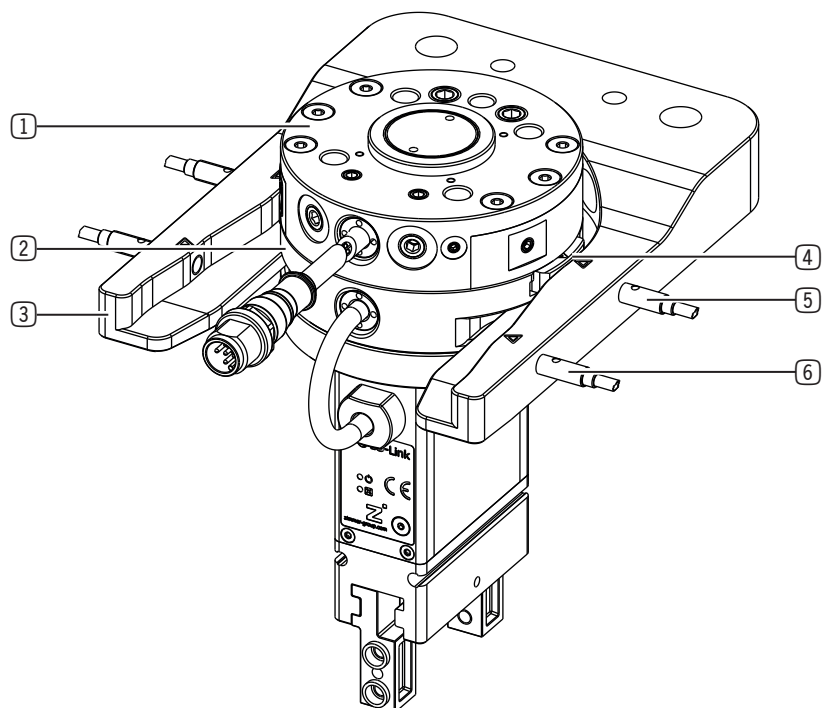
Then move the robot module onto the gripper from above. The centering pins of the gripper help with insertion.

The robot module moves from above onto the gripper in the storage station.

The robot then moves out of the storage station with the robot module and coupled gripper.

Two sensors at the test position check whether the locking mechanism is extended and the robot module and gripper are securely connected.

When the robot module and gripper come together, the internal spring-pin contacts for signal transmission are contacted. Then, the Connect LED changes color from red to green and a Connect signal (depending on the variant) is passed to the higher-level control system.



- ① Robot module
- ② Gripper
- ③ Storage station
- ④ Locking
- ⑤ Sensor in storage position
- ⑥ Sensor in inspection position

INFORMATION



The sensors are available as accessories.

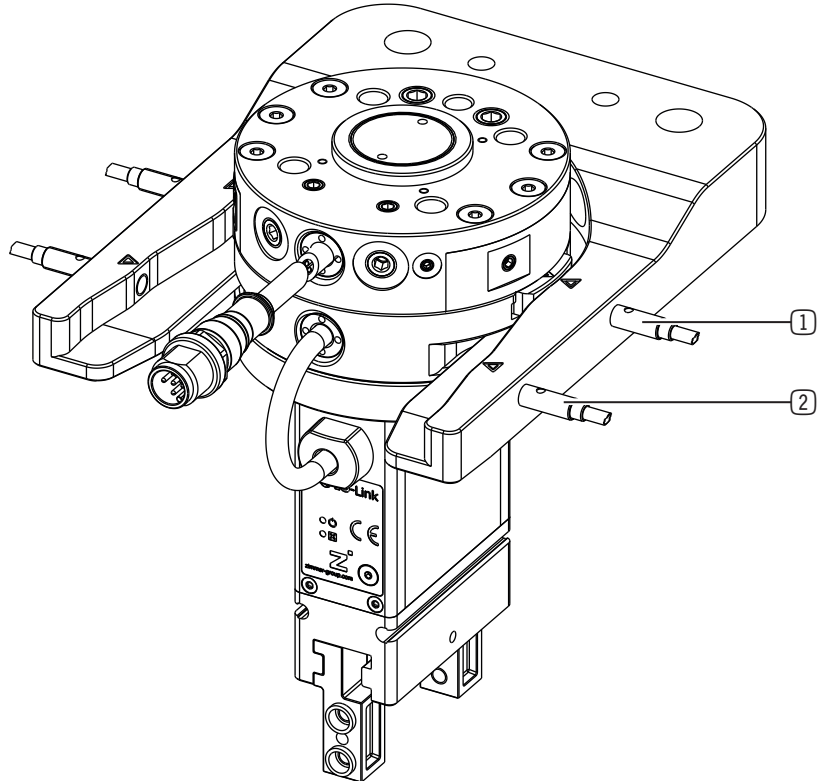
- ▶ Refer to the sensor's technical data sheet for information on the circuit diagram and pin assignment.
- ▶ More information can be found in the installation and operating instructions of the sensor.

10.1.1 Adjust the sensors in the inspection position

- ▶ Position the markings on the locking mechanism on the markings of the test position.
- ▶ Turn in the sensors until they emit a signal.
- ▶ Fasten the sensors at this position.
- ▶ Coat the sensors with sealing lacquer.

10.1.2 Adjust the sensors in the storage position

- ▶ Position the markings on the locking mechanism on the markings of the storage position.
- ▶ Turn in the sensors until they emit a signal.
- ▶ Fasten the sensors at this position.
- ▶ Coat the sensors with sealing lacquer.



① Sensor in storage position

② Sensor in inspection position

10.2 Coupling the robot module and gripper

WARNING



Suspended loads can cause injury

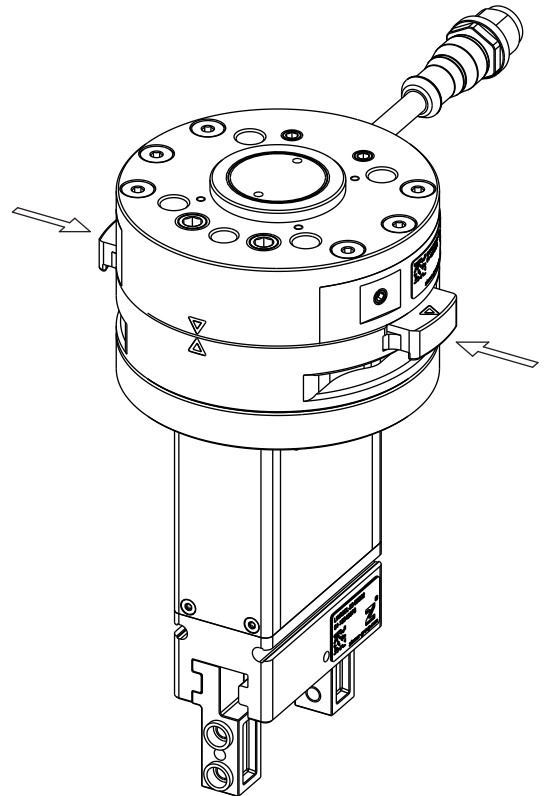
Falling loads can cause severe injuries.

- ▶ Always keep an adequate safety distance from suspended loads.
- ▶ Do not stand or walk underneath suspended loads.

Manual exchange:

The gripper can be installed on the robot module and locked manually.

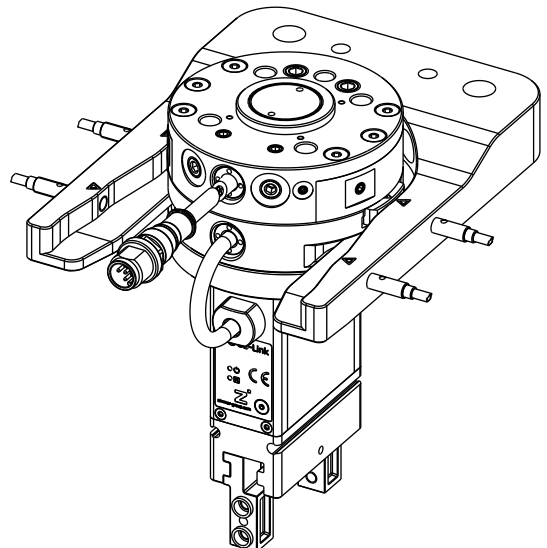
- ▶ Press the locking mechanism together.
- ▶ Position the gripper on the robot module.
- ▶ Let go of the locking mechanism.



Automatic exchange:

The gripper can be automatically locked to the robot module via the storage station.

- ▶ Place the gripper as indicated by the markings in the storage station.
 - ▶ Position the robot module above the gripper.
 - ▶ Lower the robot module.
- ⇒ The gripper automatically locks with the robot module when it extends out of the storage station.



10.3 Installing the energy supply

NOTICE

**Malfunction in case of non-compliance**

The power supply is internal. This means that the gripper is equipped with integrated contacts. These contacts transmit all signals.

- ▶ The contacts of the energy supply must be dry, clean and undamaged at all times.

10.4 Static charge

NOTICE

**Material damage from static charge**

Electrostatic voltages can occur if the product is mounted on insulating surfaces and no effective dissipation of static charges is possible.

- ▶ Please note that ESD-sensitive parts can be damaged if they come into contact with the product.
- ▶ Ground the product for applications that require high EMC resistance.

10.5 Heat dissipation

NOTICE

**Material damage from overheating of the product**

If the product is operated under a very high ambient temperature or with fast clock cycles on an ongoing basis, this can reduce its service life.

- ▶ If the product is exposed to high ambient temperatures, always install it on heat-conducting materials.
- ▶ Reduce the load with increasing temperature.

10.6 Installing accessories

NOTICE

**Non-compliance may result in material damage.**

- ▶ Before installing an accessory, make sure it is suitable for use with the selected variant.
- ▶ You can find information on our website.
- ▶ Please contact Customer Service if you have any questions.

11 Commissioning

WARNING



Suspended loads can cause injury

Falling loads can cause severe injuries.

- ▶ Always keep an adequate safety distance from suspended loads.
- ▶ Do not stand or walk underneath suspended loads.

CAUTION



Reduction of the gripping force can cause injury and material damage

When flexible components are gripped, the gripping force of the product is reduced.

Reduced gripping force can cause injuries or material damage because the components can no longer be securely gripped and transported.

- ▶ Do not stand or walk underneath suspended loads.

NOTICE



Malfunction in case of non-compliance

- ▶ Note the correct setting of the gripping force and the selection of the gripper finger length to prevent the gripper jaws from tensioning.

11.1 Restart

INFORMATION



- ▶ Make sure that there is no signal present at Pin 1 and Pin 2 when the product is restarted.
 - Requirement for a cold start: Pin 2 and Pin 4 = 0 V
- ⇒ The product is ready to operate when the green LED lights up.
- ⇒ The product can be moved a few milliseconds after voltage is supplied.

11.2 Switching sequence

A movement in the desired direction occurs when the corresponding signal is at a high level. After a high level is detected, the gripper movement occurs until the gripping process ends.

- ▶ Reset the corresponding signal after the movement is complete. The signal must be reset before a signal is emitted in the opposite direction.
- ▶ Observe a break time of 10 ms between the reset of the signal and the next command.

NOTICE



Non-compliance may result in material damage.

- ▶ The resistance between the analog output and GND must be at least 10 kΩ.

INFORMATION



The switching sequence applies to compatible robot modules only.

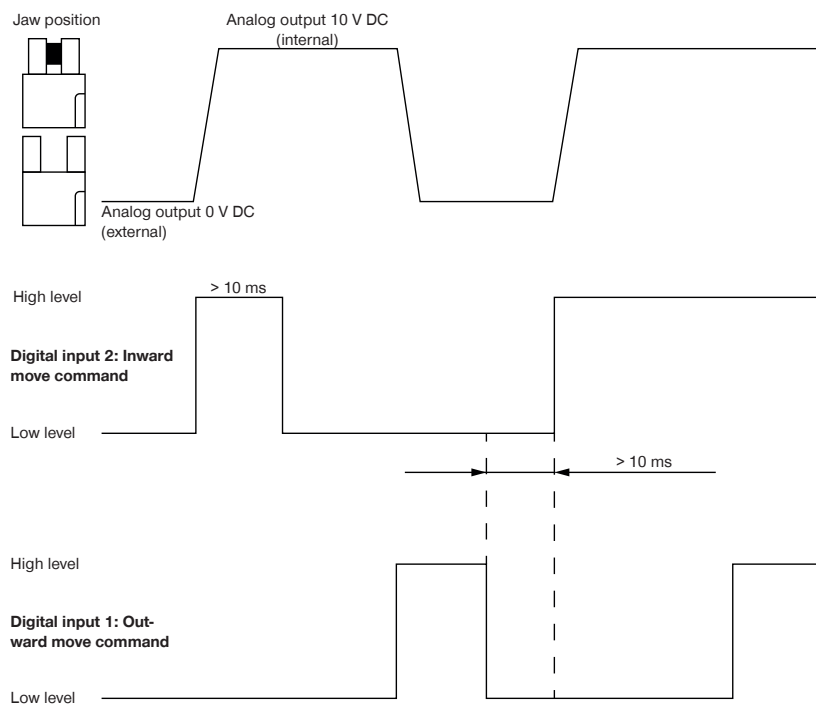
INFORMATION



The following figure shows the controller for PNP.

When controlling for NPN, the command starts at low level instead of high level.

The current jaw position is scaled from 0 V DC (external) to 10 V DC (internal) and is issued via the analog output.



11.3 Minimum positioning path

The product requires a certain minimum positioning path to reach the desired gripping force.

INFORMATION

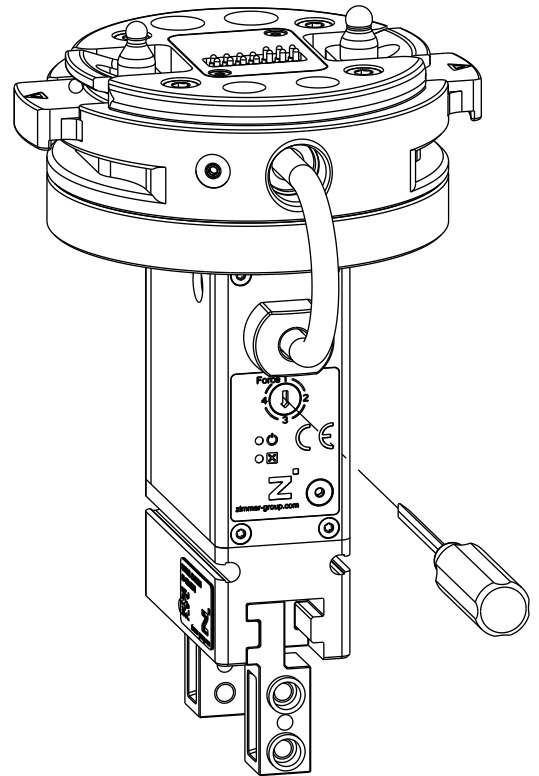


- ▶ You can find the information in the technical data sheet on our website.
- ▶ Please contact Customer Service if you have any questions.

12 Operation

12.1 Setting the gripping force

The gripping force can be adjusted in four stages using a rotary switch.



12.2 Emergency release

CAUTION



Risk of injury due to uncontrolled movements

Risk of injury in the event of uncontrolled movement of the product when the power supply is connected.

- ▶ Switch off the power supply to the machine before carrying out any work.
- ▶ Secure the power supply against being switched on unintentionally.
- ▶ Check the machine for any residual energy that may be present.

CAUTION



Risk of injury in case of non-compliance

- ▶ Disconnect the actuator voltage before pressing the emergency release.

INFORMATION



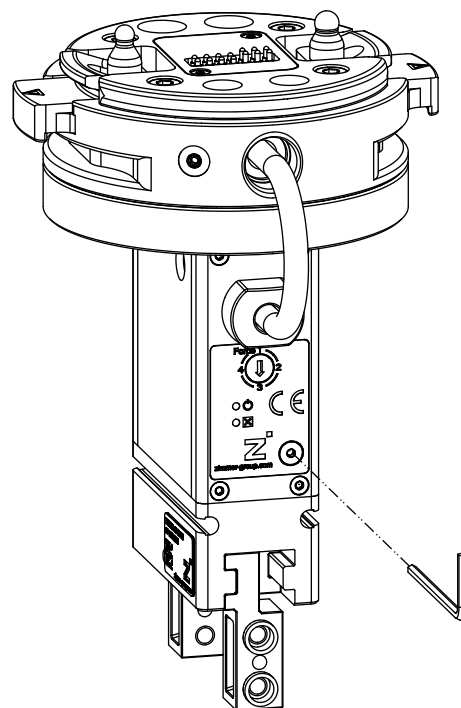
In the event of a power failure, the jaws remain in their positions and the gripping force of the product stays constant.

The product has an emergency release that can be unlocked mechanically and allows the jaws to be opened.

- ▶ Please contact Customer Service if you have any questions.

The product features an emergency release that can be mechanically opened with an Allen key in the event of a power failure.

- ▶ Actuate the emergency release with a corresponding Allen key.
- ▶ Use a wrench size of 2 mm.



13 Gripping force charts

INFORMATION



- ▶ You can find information on our website.
- ▶ Please contact Customer Service if you have any questions.

14 Error diagnosis

14.1 Status in LED display for error

Status	Meaning
 LED lights up continuously green.	No error
 LED is not lit red.	
 LED flashes red.	Loss of workpiece detected.
 LED lights up continuously green.	
 LED lights up continuously red.	Actuator supply not OK
 LED is not lit green.	
 LED flashes red.	Internal error
 LED is not lit green.	
 LED flashes red.	- No reference position - A reference run must be performed.
 LED flashes (simultaneously) green.	
 LED flashes red.	A reference run is performed.
 LED flashes (alternatingly) green.	

15 Maintenance

NOTICE



Material damage resulting from blowing out with compressed air

Blowing out the product with compressed air can cause malfunctions.

- ▶ Never purge the product with compressed air.

NOTICE



Material damage caused by unsuitable cleaning materials

Liquid and solvent-based cleaning agents can cause malfunctions.

- ▶ Do not clean the product with any cleaning agents that are liquid or contain solvents.

NOTICE



Contamination of the environment due to escaping lubricants

Lubricants can escape through moving machine parts. This can lead to contamination of the machine, the workpiece and the environment.

- ▶ Remove leaking lubricant immediately and thoroughly.

Maintenance-free operation of the product is guaranteed for up to **100,000 change cycles** and **5 million gripping cycles**.

- ▶ Note that the product could become damaged under the following circumstances:

- Dirty environment
- Improper use and use that does not comply with the performance data
- Permissible temperature range not observed

- ▶ Even though the product is maintenance-free as mentioned above, perform a regular visual inspection to check for any damage or contamination.

- ▶ Have maintenance work that requires disassembly of the product performed by customer service only.

⇒ Dismantling and reassembling the product without authorization may result in complications, as special installation equipment is required in some cases. Zimmer Group GmbH accepts no liability for any resulting malfunctions or damage.

16 Decommissioning/disposal

INFORMATION



When the product reaches the end of its operational phase, it can be completely disassembled and disposed of.

- ▶ Disconnect the product completely from the power supply.
- ▶ Dispose of the components properly according to the material groups.
- ▶ Comply with the locally applicable environmental and disposal regulations.

17 RoHS declaration

in terms of the EU Regulation 2011/65/EU

Name and address of the manufacturer:

Zimmer Group GmbH



Am Glockenloch 2

77866 Rheinau, Germany



+49 7844 9138 0



info@zimmer-group.com



www.zimmer-group.com

We hereby declare that the incomplete machine described below

Product designation: 2-jaw parallel gripper

Type designation: LWR50L-23

conforms to the requirements of the directive in its design and the version we put on the market.

Michael Hoch

Authorized representative for the
compilation of relevant technical
documents

Rheinau, Germany, 2021-04-01

(Place and date of issuance)

Martin Zimmer
(Legally binding signature)
Managing Partner

18 Declaration of Incorporation

In terms of the EU Machinery Directive 2006/42/EC (Annex II 1 B)

Name and address of the manufacturer:

Zimmer Group GmbH



Am Glockenloch 2

77866 Rheinau, Germany



+49 7844 9138 0



info@zimmer-group.com



www.zimmer-group.com

We hereby declare that the incomplete machine described below

Product designation: 2-jaw parallel gripper

Type designation: LWR50L-23

conforms to the requirements of the Machinery Directive, 2006/42/EC, Article 2g, Annex VII, b – Annex II, b, in its design and the version we put on the market.

We hereby confirm that all the relevant basic health and safety requirements for the product have been observed and implemented.

A full list of applied standards can be obtained from the manufacturer.

We also declare that the specific technical documents were produced in accordance with Annex VII Part B of this Directive. We undertake to provide the market supervisory bodies with electronic versions of special documents for the incomplete machine through our documentation department, should they have reason to request them.

The incomplete machine may only be commissioned if it has been ascertained, if applicable, that the machine or system in which the incomplete machine is to be installed satisfies the requirements of Directive 2006/42/EC on Machinery and an EC Declaration of Conformity has been drawn up in accordance with Annex II 1 A.

Kurt Ross

Authorized representative for the
compilation of relevant technical
documents

Rheinau, Germany, 2021-04-01

(Place and date of issuance)

Martin Zimmer
(Legally binding signature)
Managing Partner

19 Declaration of Conformity

As defined by the EC Directive 2014/30/EU on electromagnetic compatibility

Name and address of the manufacturer:

Zimmer Group GmbH



Am Glockenloch 2

77866 Rheinau, Germany



+49 7844 9138 0



info@zimmer-group.com



www.zimmer-group.com

We hereby declare that the product described below

Product designation: 2-jaw parallel gripper

Type designation: LWR50L-23

conforms to the requirements of the Electromagnetic Compatibility Directive 2014/30/EU in its design and the version we put on the market.

The following harmonized standards have been used:

DIN EN ISO 12100	Safety of machinery - General principles for design - Risk assessment and risk reduction
DIN EN 61000-6-3	EMC Generic standard, Emission standard for residential, commercial and light-industrial
DIN EN 61000-6-2	EMC Generic standard, Emission standard for industrial environments
DIN EN 61000-6-4	EMC Generic standard, Immunity for industrial environments

A full list of applied standards can be obtained from the manufacturer.

Kurt Ross

Authorized representative for the compilation of relevant technical documents

Rheinau, Germany, 2021-04-01

(Place and date of issuance)

Martin Zimmer
(Legally binding signature)
Managing Partner