



INSTALLATION AND OPERATING INSTRUCTIONS

HRC-01/-02 series
Gripper, electric

DDOC00416

THE KNOW-HOW FACTORY

Parameter explanation (glossary)

Parameter	Explanation
ControlWord	The gripper is controlled using the "ControlWord." The "ControlWord" is bit-exclusive, which means that only one bit at a time can be active in the "Word." The value "ZERO" is also permitted.
DeviceMode	The "DeviceMode" is used to select gripping profiles as well as the additional help modes in the gripper.
Workpiece No.	You can use this parameter to select or save the workpiece recipes stored in the gripper.
TeachPosition	The "TeachPosition" is the actual workpiece position.
WorkPosition	The "WorkPosition" is the inner jaw position on the gripper. Depending on the application, for example with internal grippers, this can also be the standby position.
GripForce	The "GripForce" parameter is used to configure the gripping force.
PositionTolerance	This is the tolerance window for the "TeachPosition," "BasePosition" and "WorkPosition." The value of the parameter acts in both directions.
BasePosition	The "BasePosition" is the outer "JawPosition." Depending on the gripper profile, this can also be a work position!
ShiftPosition	The "ShiftPosition" is a switching position between pre-positioning and gripper movement.
StatusWord	In its bits, the "StatusWord" returns the most important information about the status of the gripper to the control system.
Diagnosis	If an error should occur, the "Diagnosis" outputs a diagnostic code that can be compared with the error list.
ActualPosition	The value of the current position of the gripper [1/100 mm].
Error	Fault, error message
DIR	Direction/24 V cable connection - Depending on the gripper, this signal is used to move the gripper.
Teach/Adjust	Program/Configure Using this signal, depending on the gripper type, the current position of the gripper jaws can be taught in as the new workpiece position. "Adjust" is used as a command to define the reachable end positions of the gripper jaws.
GND	Abbreviation for ground connection
Offset	Correction value
Traversing routine	Defined procedure for movement of the gripper jaws
Travel path	Path on which the gripper jaws travel

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1 Supporting documents

NOTICE



Read through the installation and operating instructions carefully before installing 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 life cycle.



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

Only those documents currently available on the website are valid.

- Installation and operating instructions
- Catalogs, drawings, CAD data, performance data
- Information on accessories
- Technical data sheets
- General Terms and Conditions of Business with specifications for the warranty entitlement

1.1 Notices and graphics in the installation and operating instructions

The individual hazard levels, notices and warnings are marked with signal words.

1.2 Hazard levels of warning notices

DANGER



This notice warns of an imminent danger to the life and health of people. Ignoring these notices can result in serious injury or 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 result in 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 for personnel or that may result in material or environmental damage. Ignoring these notices may result in slight, temporary injuries or damage to the product or to 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.

NOTICE



General notices contain usage tips and valuable information, but no warnings of dangers to health.

INFORMATION



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

2 Safety notes

CAUTION



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

Installation, commissioning, maintenance and repairs may only be performed by qualified specialists in accordance with these installation and operating instructions.

The product is state-of-the-art. It is mounted to industrial machines and is used to hold tools.

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 its intended use and technical data. Zimmer GmbH shall accept no liability for any damage caused by improper use.

Any use other than the intended use requires written approval from Zimmer GmbH.

Make sure that the power supply is disconnected before you install, retool or service the product.

Zimmer GmbH recommends performing maintenance tasks, renovation work or attachment work outside of the machine's danger zone when possible.

When commissioning or testing, make sure that the product cannot be actuated by mistake.

Modifications to the product, such as adding drilled holes or threads, may be made only with prior approval from Zimmer GmbH.

The specified maintenance intervals are to be observed; also refer to the "Maintenance" section. When the product is used under extreme conditions, the maintenance interval must be adapted.

Use of the product under extreme conditions, such as aggressive liquids and abrasive dusts, is subject to prior approval from Zimmer GmbH.

Do not reach into the operational range of the product!

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!
- ⇒ Electronic components may only be touched by persons in appropriately identified areas with conductive flooring and only if:
 - These persons are grounded by means of special bracelets.
 - These persons wear shoes that are suitable and approved for the discharge of electrostatic charges.
- ⇒ Electronic assemblies must not be brought into contact with plastics and parts of clothing that have plastic content.
- ⇒ Electronic assemblies may only be stored on conductive underlays.
- ⇒ Electronic assemblies must not be installed in the vicinity of data back-up devices or monitors (monitor distance > 100 mm).
- ⇒ Measurements may only be performed on electronic assemblies 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



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 more extensive use is 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 GmbH shall accept no liability for any damage caused by improper use. The operator bears sole responsibility.

The product is designed exclusively for electrical operation within the stipulated parameter limits and operating conditions at 24 V DC.

The product is designated for use in enclosed rooms for temporary gripping, handling and holding.

It is not suitable for clamping workpieces during a machining process or for direct contact with perishable goods.

Direct contact with perishable goods/food is not permitted.

4 Personnel qualification

DANGER



Intervention is not permitted and can lead to serious injuries!

⇒ Exclusion of liability

Installation, commissioning and maintenance may only be performed by qualified personnel.

These personnel must have read and understood the installation and operating instructions in full.

5 Product description

CAUTION



Reduction of gripping force

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

A reduced gripping force can lead to personal injury or material damage, because the components that are being gripped can no longer be securely gripped and transported.

NOTICE



To ensure that the gripper jaws do not get deformed, make sure that the configuration of the gripping force and the selection of the gripper finger length is correct.

An incorrect configuration or selection can lead to malfunction.

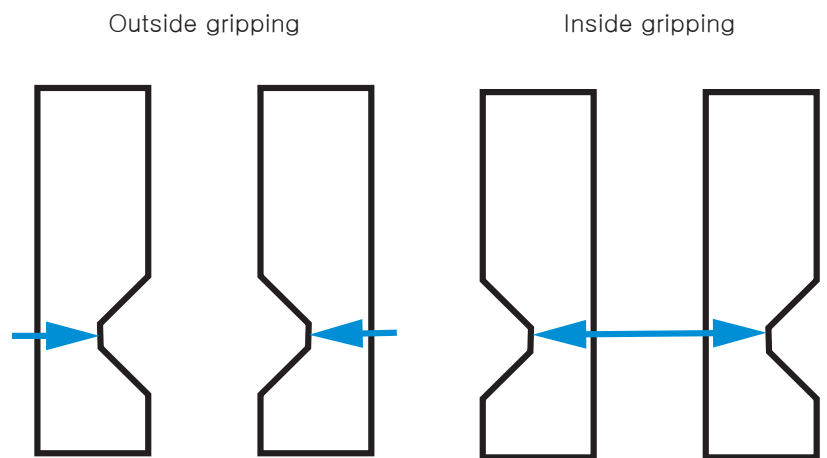
5.1 Possible applications

Inside gripping:

The gripper can be used for inside gripping.

Outside gripping:

The gripper can be used for outside gripping.



5.2 Forces and torques

INFORMATION



For information on forces and torques, please visit our website.

Zimmer Customer Service is available to provide you with assistance if you have any further questions.

5.3 Type plate

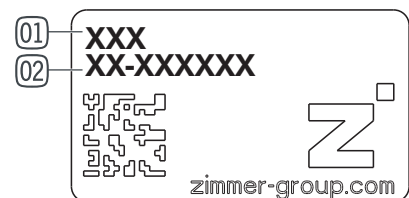
A type plate is attached to the housing of the product.

The part number and the serial number are shown on the type plate.

► The serial number should be assigned to the project.

⇒ Article number: 01

⇒ Serial number: 02



INFORMATION



Please state the serial number in the event of damage or a complaint.

Please contact Zimmer Customer Service if you have any questions.

5.4 Criteria for use in collaborative applications

The criteria listed below justify the suitability of the gripper for use in collaborative applications:

See adjacent illustration, figure ③ and ④.

The gripper has been designed in accordance with the specifications of ISO/TS 15066.

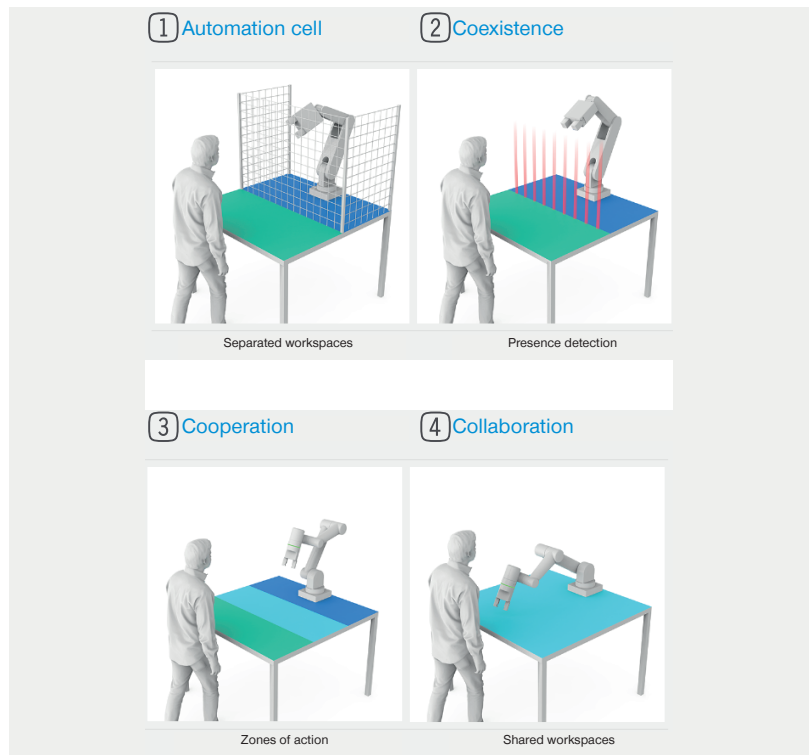
The power of the motor in combination with the transmission design and the pre-assembled gripper jaws is not sufficient to generate a gripping force > 140 N upon vulnerable areas of the body.

⇒ This only applies to the HRC-02 series.

⇒ The HRC-01 series has a higher gripping force.

The gripping forces generated when gripping soft objects are significantly reduced, since the amount of dynamic force is lowered. Compliance with the maximum permitted gripping force has been verified using a suitable measuring instrument.

The gripper is engineered to be inherently safe and is designed with rounded edges and shapes that prevent crushing and shearing points from being created.



6 Function

The torque generated by the electric motor is transformed via a drive to the gripper jaws. This causes the gripper jaws to move and increases the gripping force.

- Simple data exchange with the superordinate control system via IO-Link
- Brushless DC servomotor with an absolute encoder system
- The gripper jaws run on parallel guide rails arranged side by side
- The gripper jaws are mechanically coupled to each other

6.1 HRC-01

①	Control
②	Adapter flange
③	Mounting and positioning
④	LED display
⑤	HRC housing
⑥	Emergency release

Fig. 1: HRC-01 series gripper from above

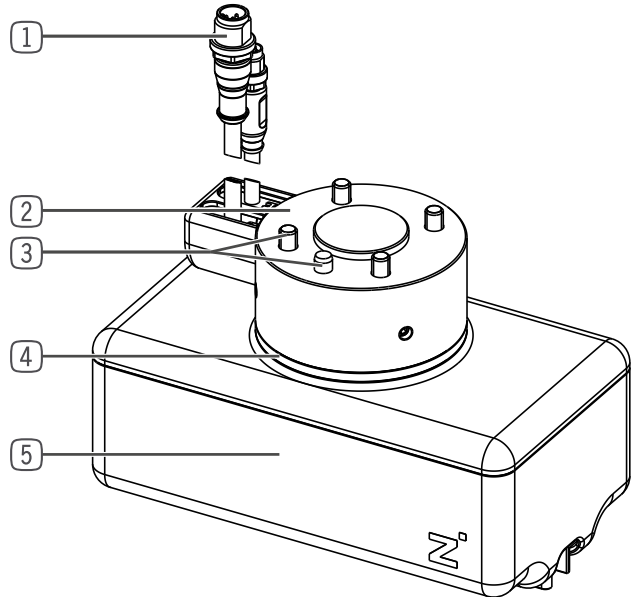
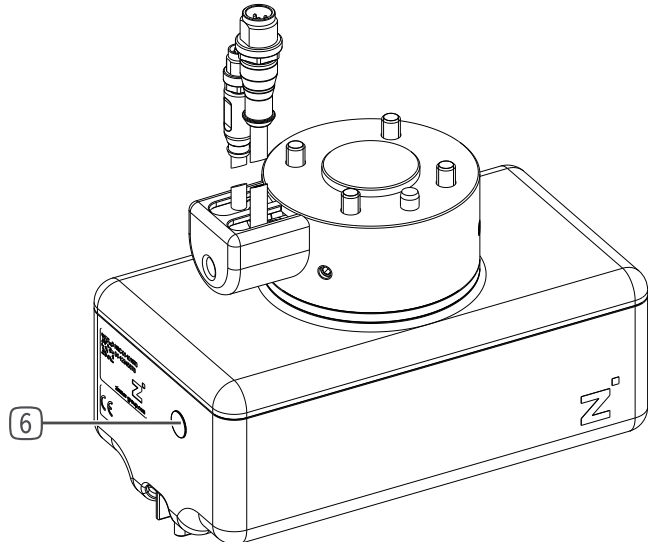


Fig. 2: HRC-01 series gripper, emergency release



6.2 HRC-02

The gripper is equipped with a safety fuse that interrupts the power supply to the motor in the event of overcurrent, thereby, in accordance with ISO TS 15066, preventing the permitted gripping force from being exceeded.

①	IO-Link connection
②	Adapter flange
③	Mounting and positioning
④	LED display
⑤	HRC housing
⑥	Emergency release
⑦	Gripper fingers
⑧	Safety fuse
⑨	HRC housing attachment
⑩	HRC housing mounting screws

Fig. 1: HRC-02 series gripper from above

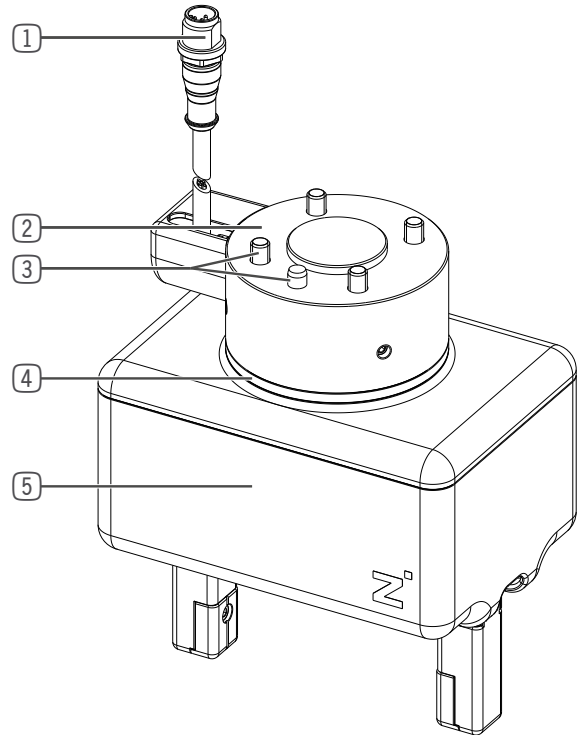


Fig. 3: HRC-02 series gripper, Molex connector

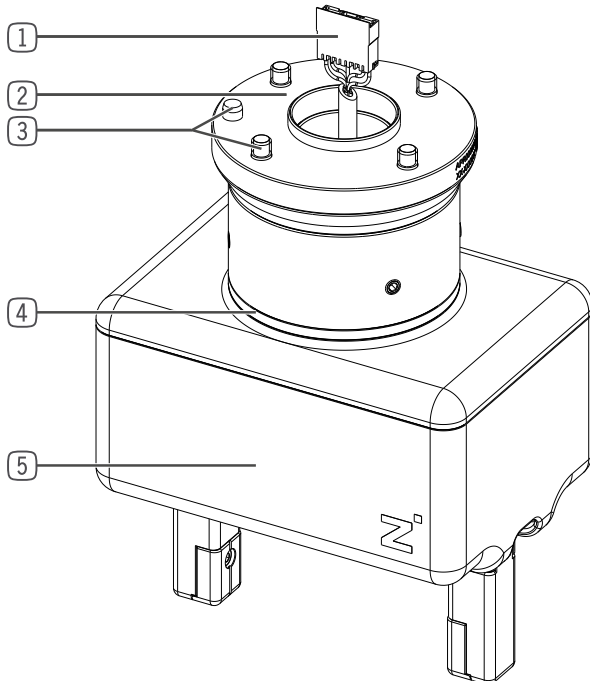


Fig. 2: HRC-02 series gripper, emergency release

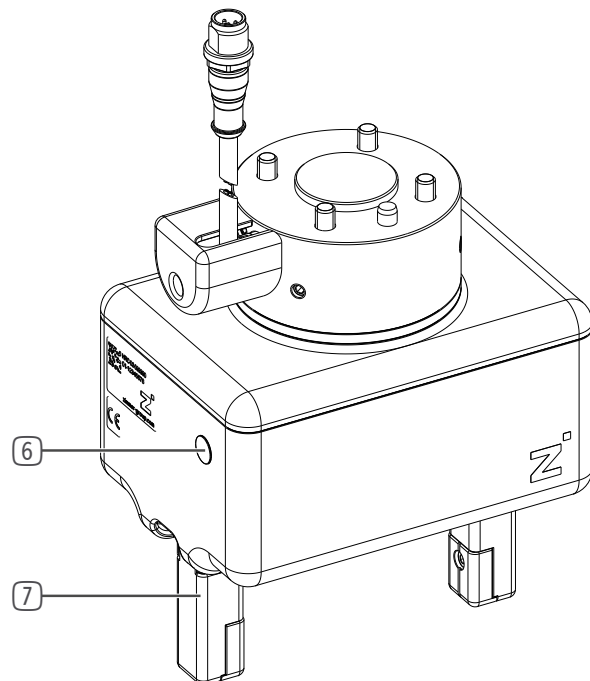
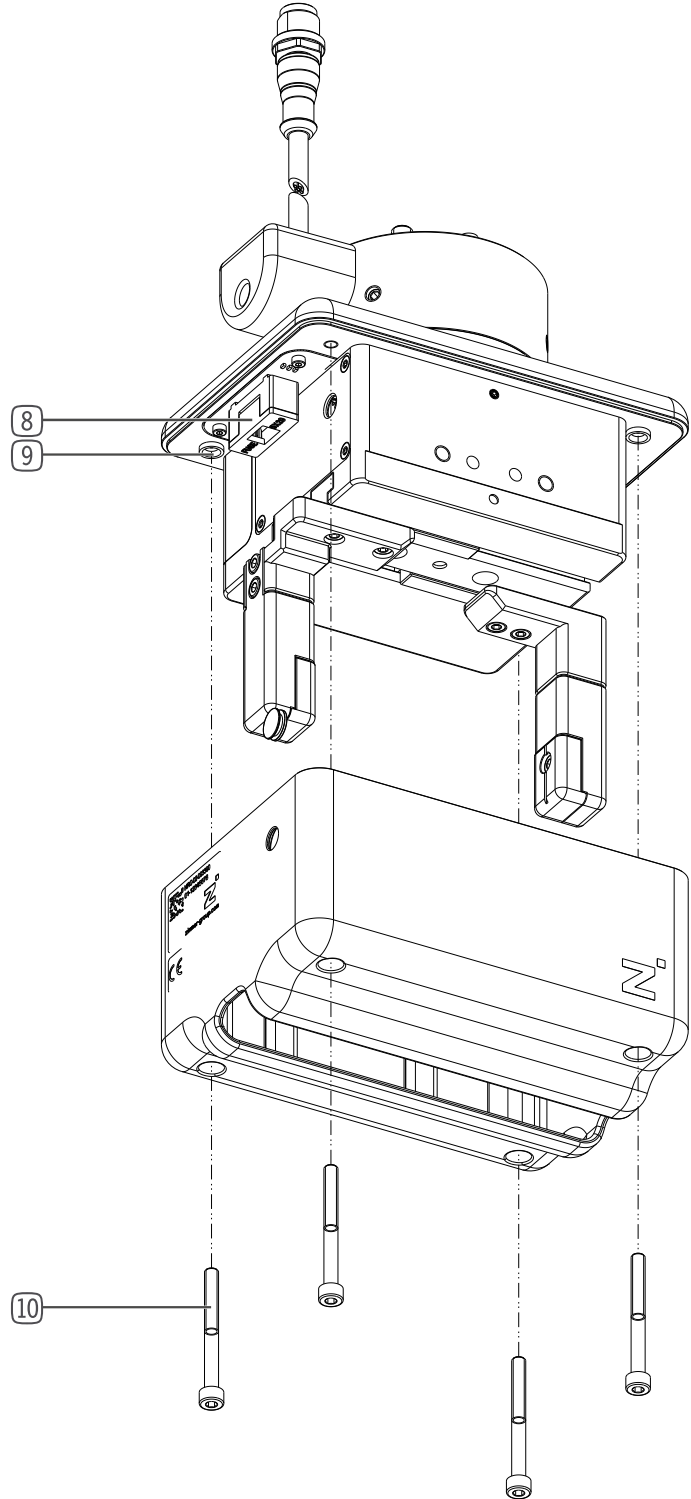


Fig. 4: HRC-02 series gripper, safety fuse



6.3 Electrical specifications

INFORMATION



For electrical specifications, please refer to our website at www.zimmer-group.com.
This data varies within the series, depending on the specific design.
Please contact Zimmer Customer Service if you have any questions.

6.4 Verified configuration

INFORMATION



For information about the verified configuration, please visit our website.
Zimmer Customer Service is available to provide you with assistance if you have any further questions.

6.5 Protection class

NOTICE

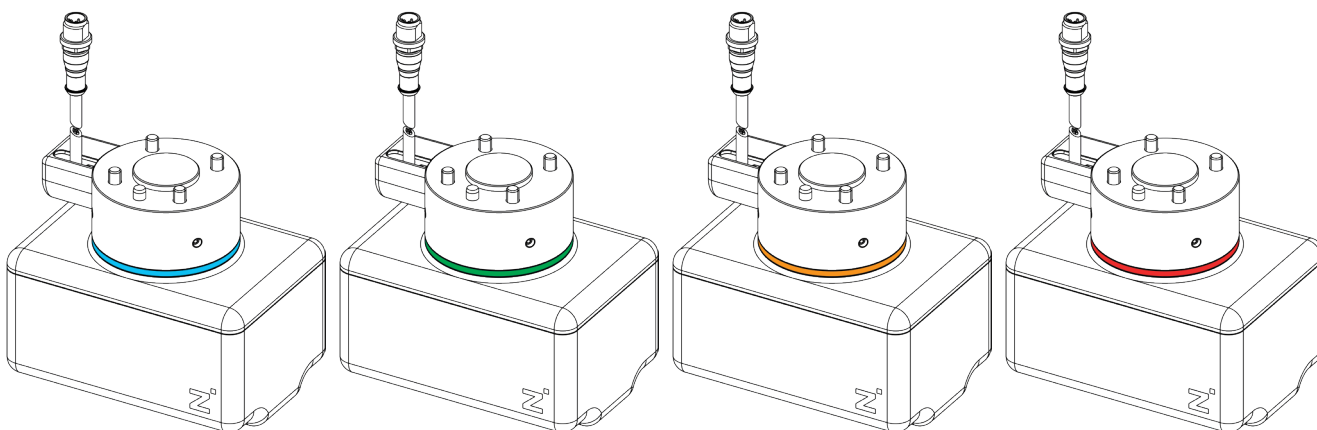


The gripper achieves protection class IP40 in all mounted positions of installation.

6.6 LED display

The colors of the LED ring reflect the status of the gripper. The LED ring enables a 360° status display.

Status	Function
Continuous light	"TeachPosition"
Flashing	Currently not assigned
Continuous light	"BasePosition"
Flashing	Currently not assigned
Continuous light	The gripper has a malfunction
Flashing	No IO-Link connection available
Continuous light	Gripper is in an undefined position
Flashing	Currently not assigned



7 Technical data

INFORMATION



For technical data, please visit our website.
This data varies within the series, depending on the specific design.
Zimmer Customer Service is available to provide you with assistance if you have any further questions.

8 Installation

8.1 Safety notes

WARNING



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

- ▶ Switch off the power supply to the machine before all work.
- ▶ Secure the machine against being switched on unintentionally.
- ▶ Check the machine for any residual energy.

CAUTION



Risk of injury in the event of unexpected movement of the gripper when the power supply is connected.

- ▶ Switch off the power supply to the gripper before all work.
- ▶ Secure the power supply against being switched on unintentionally.
- ▶ Check the power supply for any residual energy.

NOTICE



Switch off the power supply before any assembly, installation or maintenance work.

8.2 General installation information

The gripper must be installed on a mounting surface in accordance with the specifications for flatness.

⇒ Permissible flatness imperfection: 0.03

- The mounting screws are not included in the scope of delivery.
- Strength class of the mounting screws ≥ 8.8 (DIN EN ISO 4762)
- Observe the tightening torque of the mounting screws.

⇒ Zimmer GmbH recommends verifying the permitted load-carrying capacity of the required screw connections in accordance with VDI 2230.

- The exact installation positions can be found on the technical data sheet on our website.

8.3 Installing the "HRC-01" and "HRC-02" products

The gripper is mounted on the robot arm using the adapter flange (2).

Example representations of a gripper:

- HRC-01-101670
- HRC-02-093390

The following work steps must be observed during installation:

- ▶ Loosen the grub screw (12).
- ▶ Remove the adapter flange (2) with the mounting screws (13).
- ▶ Position the adapter flange (2) on the robot arm using the straight pin (11).
- ▶ Mount the adapter flange (2) with the mounting screws (13).
- ▶ Re-insert the gripper (14) into the adapter flange (2).
- ▶ Mount the gripper (14) on the adapter flange (2) using the grub screws (12).

Fig. 1: HRC-02 series gripper

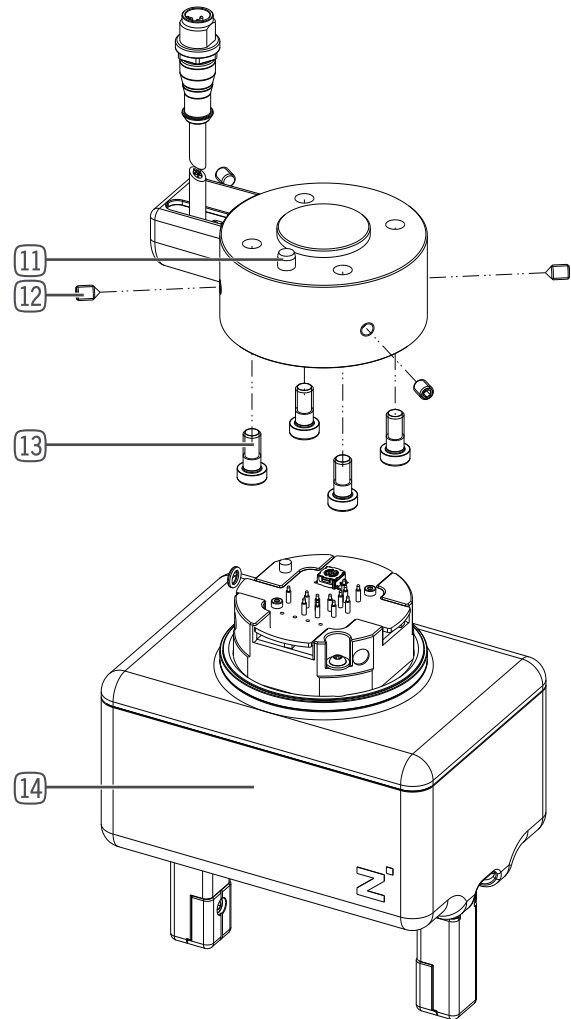
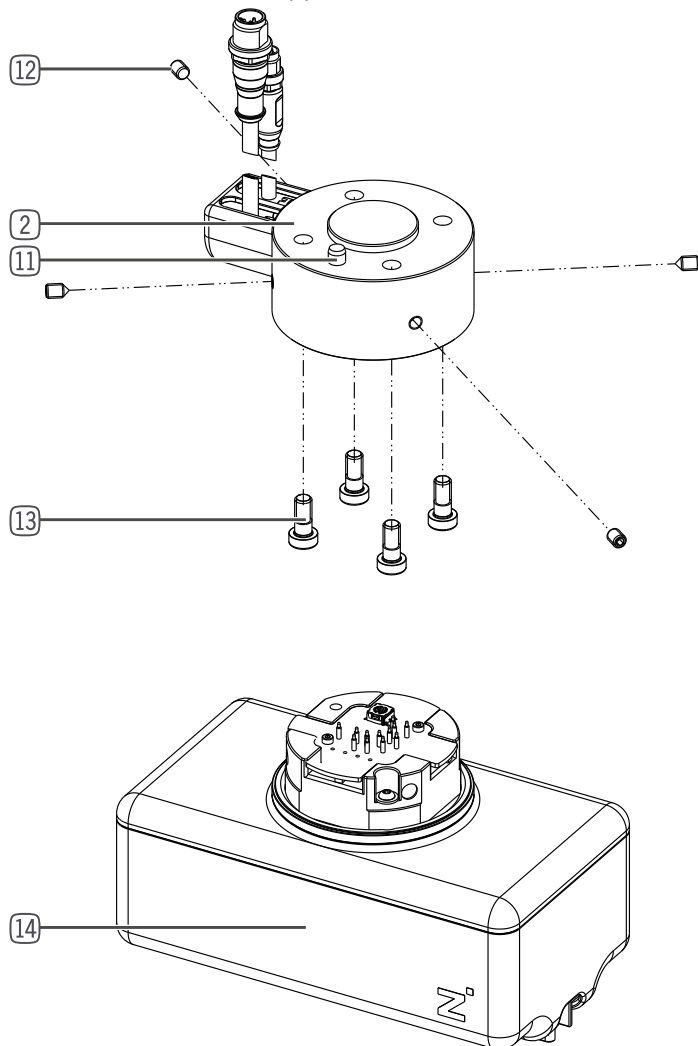


Fig. 2: HRC-01 series gripper



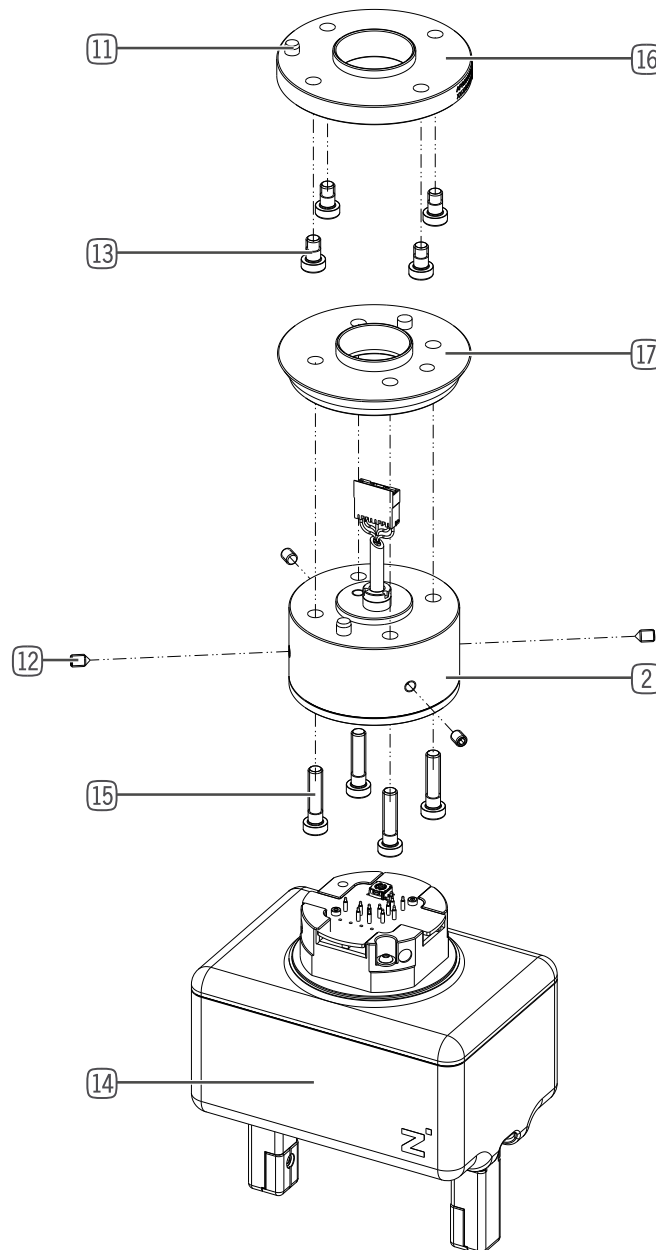
8.4 Installing the "adapter flange" product

The gripper is mounted on the robot arm using the adapter flange (2), adapter (17) and connecting plate (16).

Example representation of a gripper: HRC-02-093677

The following work steps must be observed during installation:

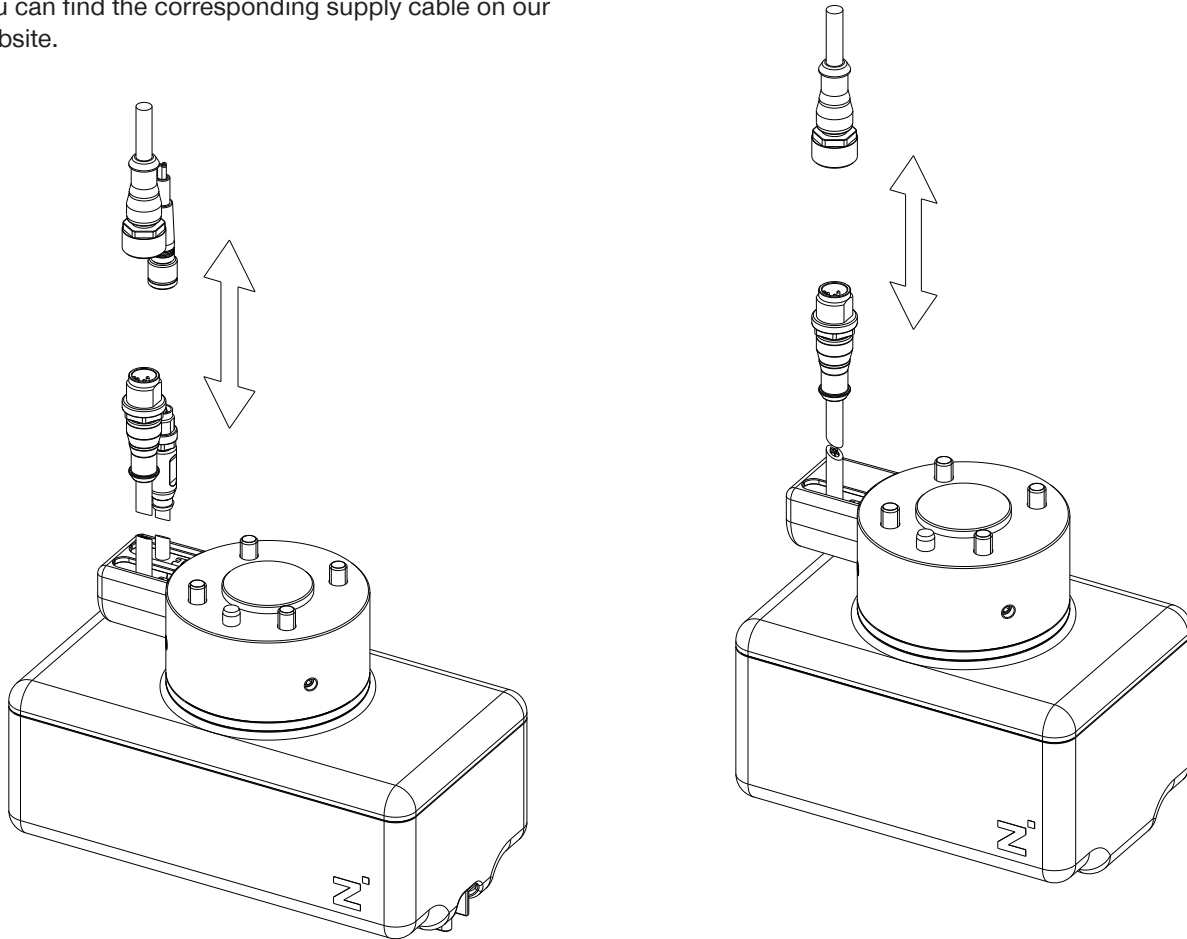
- ▶ Loosen the grub screw (12).
- ▶ Remove the adapter flange (2) with the mounting screws (15).
- ▶ Unscrew and remove the adapter (17) and connecting plate (16).
- ▶ Mount the connecting plate (16) on the robot arm using the mounting screws (13).
- ▶ Re-mount the adapter (17) and adapter flange (2) on the connecting plate (16) with the mounting screws (15).
- ▶ Re-insert the gripper (14) into the adapter flange (2).
- ▶ Mount the gripper (14) on the adapter flange (2) using the grub screws (12).



8.5 Installing the power supply

8.5.1 Installing the wiring

- ▶ Connect the supply cable to the gripper and the control system.
- ⇒ You can find the corresponding supply cable on our website.



INFORMATION



The cables that are used by Zimmer GmbH feature a minimum bending radius of 10 x the outer diameter.

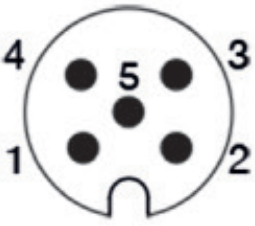
This bending radius must not be undershot!

- ⇒ All IO-Link cables that are installed in the grippers have an outer diameter of 5 mm and thus have a bending radius of 50 mm.
- ⇒ Freely suspended cables must be secured to prevent excessive motion loads or pinching.

8.5.2 Installing the "IO-Link"

PIN assignment of the power supply line:

PIN	Color	Function	Explanation
1	Brown	Sensor + 24 V DC	Power supply for IO-Link communication
2	White	Actuator + 24 V DC	Actuator supply voltage
3	Blue	GND sensor	Sensor 0 V DC supply voltage
4	Black	C/Q	IO-Link communication
5	Gray	GND actuator	Actuator 0 V DC supply voltage



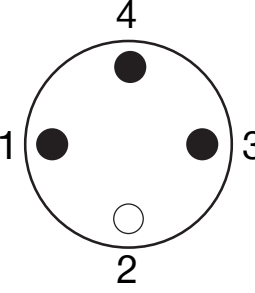
The following steps must be carried out for commissioning or mounting the gripper with IO-Link:

- ▶ Connect the gripper to the IO-Link master.
 - ▶ Secure the voltage supply.
- ⇒ For Port Class A, additional power supply via Y-cable.

8.5.3 Installing the "STO"

PIN assignment of the power supply line:

PIN	Color	Function	Explanation
1	Brown	STO 1	Channel 1 signal line
2	-	-	Not assigned!
3	Blue	GND sensor	Sensor 0 V DC supply voltage
4	Black	STO 2	Channel 2 signal line



The STO (Safe Torque OFF) safety function ensures the safe shutoff of the torques at the drive of the gripper.

The safety function must come into operation when any safety device is triggered in the environment of the human-robot collaboration.

The STO safety function is implemented through the integrated motor control system.

INFORMATION



After the STO safety function is triggered, the gripper can only be restarted with what is called a "cold start"! To do so, the power supply cables and the communication cables must be disconnected briefly and then reconnected.

We recommend the following procedure for performing a cold start:

- ▶ The triggering of a safety device in the environment of human-robot collaboration must be acknowledged through a conscious action performed by a human (actuating a switch element).
- ▶ This acknowledgment must involve the disconnection and reconnection of the power supply and communication cables to the gripper using an external circuit.
- ▶ The self-locking feature of the gearing in the gripper ensures that the gripped object is held securely during the power and communication shutdown.
- ▶ The external programming must ensure that the most recent status of the gripper is transmitted when all signals return and any potential object being gripped is not ejected.

CAUTION

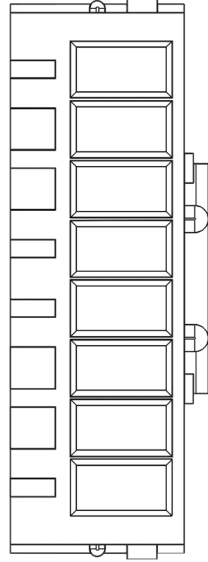


During a cold start, the program must ensure that the gripper cannot perform any hazardous movements.
 ► Danger of injury from being startled

8.5.4 Installing the "Molex connector"

PIN assignment of the power supply line:

PIN	Color	Function	Explanation
1	Brown	+ 24 V DC	IO-Link supply voltage
2	White	+ 24 V DC	Additional supply voltage
3	Blue	GND	IO-Link
4	Black	C/Q	IO-Link communication
5	Gray	GND	Additional GND
6	Brown	STO 1	Channel 1 signal line
7	Blue	STO GND	STO 0 V
8	Black	STO 2	Channel 2 signal line



The following steps must be carried out for commissioning or installing the gripper:

- Connect the gripper to the voltage supply.
- Secure the voltage supply.
- ⇒ For Port Class A, additional power supply via Y-cable.

8.6 Static charge

The movement of the gripper jaws creates low voltages as a result of static charging. These charges cannot be dissipated if the gripper is mounted on an insulating surface and if discharge is also not possible through the workpiece.

NOTICE



Non-compliance may result in material damage

Grounding the gripper attachment / gripper jaws is recommended if ESD-sensitive parts come into contact with the gripper.

Grounding can only be done through the gripper jaws!

8.7 Heat dissipation

In the event of high ambient temperatures, the gripper must be installed on heat-dissipating materials.

If the gripper is operated under very high ambient temperatures and with fast clock cycles on an ongoing basis, this might reduce its service life.

8.8 Installing accessories

NOTICE



Before installing an accessory, make sure it is suitable for use with the selected variant.

For information on all available accessories, please visit our website.

Zimmer Customer Service is available to provide you with assistance if you have any further questions.

9 Commissioning

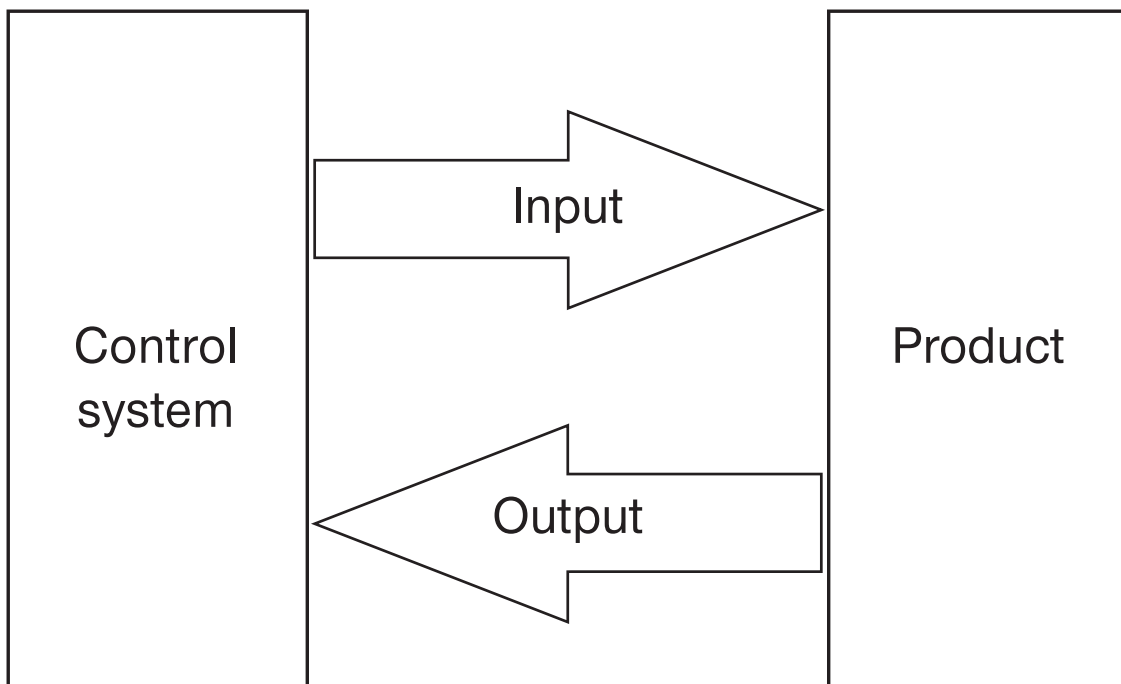
9.1 Commissioning the IO-Link

9.1.1 Process data

There is an option to control the gripper only with the process data that is transmitted in each cycle.

OUTPUTS: PROCESS DATA FROM THE IO-LINK MASTER TO THE GRIPPER!

Name	Data type
ControlWord	UINT 16
DeviceMode	UINT 8
Workpiece No.	UINT 8
Reserve	UINT 8
PositionTolerance	UINT 8
GripForce	UINT 8
DriveVelocity	UINT 8
BasePosition	UINT 16
ShiftPosition	UINT 16
TeachPosition	UINT 16
WorkPosition	UINT 16



Name	Data type
StatusWord	UINT 16
Diagnosis	UINT 16
ActualPosition	UINT 16

9.1.2 IODD import

- ▶ Importing the IODD (device description) into the control system.
- ⇒ Call up our website at www.zimmer-group.com
- ⇒ Select the desired gripper and download the corresponding .zip file via the "Download IODD" link.
- ⇒ The .zip file is required for importing into the control.

When the hardware configuration is complete and the IO-Link connection to the gripper is established, some data must be visible in the process input data.

- ⇒ Some control systems demand a byte swap to bring this process data into a logical sequence.
- ▶ To determine whether a byte swap is necessary, you can view bit 6 (GripperPLCActive) in the "StatusWord"
- ▶ For this purpose, it is necessary to determine whether bit 6 is active in the first or second byte of the "StatusWord."
- ⇒ If bit 6 is active in the first byte, the bytes already have the correct sequence and commissioning can be continued.
- ⇒ If bit 6 is active in the second byte, a byte swap still has to be applied here.
- ⇒ For further information, refer to the "StatusWord" section.

INFORMATION



It is mandatory to verify the process data!

The gripper is controlled via IO-Link by means of the cyclic process data as well as the acyclic service data with a cycle time of 10 ms.

9.1.3 "Handshake" data transfer method

All process data that is transferred to the gripper and is described in the sections that follow must be transferred using the "handshake" method.

INFORMATION



This method is referred to as a "handshake" because it enables "clean" transfer.
The process data transfer takes place, so to speak, from "hand to hand" - from the control system to the gripper.

The following steps are required for the "handshake":

- ▶ The data transfer starts with the transfer of ➡ "ControlWord" = 0x01 ➡ to the gripper.
- ▶ Subsequently, the response of the gripper must be tested by means of ➡ "Statusbit" 12 = TRUE ➡ (data transfer OK).
- ▶ The data transmission is complete when the gripper sends back ➡ "Statusbit" 12 = "DataTransferOK" = FALSE ➡.
- ⇒ For an example, refer to the "Quickstart basic parameters" section.

9.2 Parameter

9.2.1 "ControlWord" parameter

NOTICE



In the "ControlWord" parameter, only one single bit may be set at a time. Only the values listed in the following table are valid:

Parameter	Decimal value	Hexadecimal value
Data transfer	1	0 x 1
WritePDU	2	0 x 2
ResetDirectionFlag	4	0 x 4
Teach	128	0 x 80
MoveToBase	256	0 x 100
MoveToWork	512	0 x 200
JogToWork "+"	1024	0 x 400
JogToBase "-"	2048	0 x 800

Name	"ControlWord"
Data format	UINT16
Permission	Write
Transfer	Cyclical
Value range	0 to 65535

"ControlWord" structure:

	Bit 15	Bit 14	Bit 13	Bit 12	Bit 11	Bit 10	Bit 9	Bit 8
Byte 1	Error Reset	-	-	-	"JogToBase"	"JogToWork"	"MoveToWork"	"MoveToBase"
	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	"Teach"	-	-	-	-	"ResetDirectionFlag"	"WritePDU"	"DataTransfer"

Bit 0: "DataTransfer"

- ▶ When this bit is set, the gripper accepts the data transferred in the process data.

Bit 1: "WritePDU"

- ▶ Setting this bit communicates to the gripper that it should write the current process data to the selected tool recipe.

Bit 2: "ResetDirectionFlag"

- ▶ Setting this bit informs the gripper that the direction flag needs to be reset.
- ▶ This makes a repeated movement to a position possible.
- ▶ This is logical during a switchover of workpiece recipes.

Bit 7: "Teach"

- ▶ Setting this bit informs the gripper to save the current position as the "TeachPosition" in the selected "WorkpieceNo."

INFORMATION



This only works if there is no "0" that is transmitted in the workpiece number!

Bit 8: "MoveToBase"

▶ Setting this bit communicates to the gripper that it should move to the "BasePosition."

Bit 9: "MoveToWork"

▶ Setting this bit communicates to the gripper that it should move to the "WorkPosition."

Bit 10: "JogToWork"

▶ Setting this bit in the "ControlWord" puts the gripper in jog mode and slowly moves toward the "WorkPosition." If the bit is reset, the gripper stops.

Bit 11: "JogToBase"

▶ Setting this bit in the "ControlWord" puts the gripper in jog mode and slowly moves toward the "BasePosition." If the bit is reset, the gripper stops.

9.2.2 "DeviceMode" parameter

Name	"DeviceMode"
Data format	UINT8
Permission	Write
Transfer	Cyclical
Value range	0 to 256

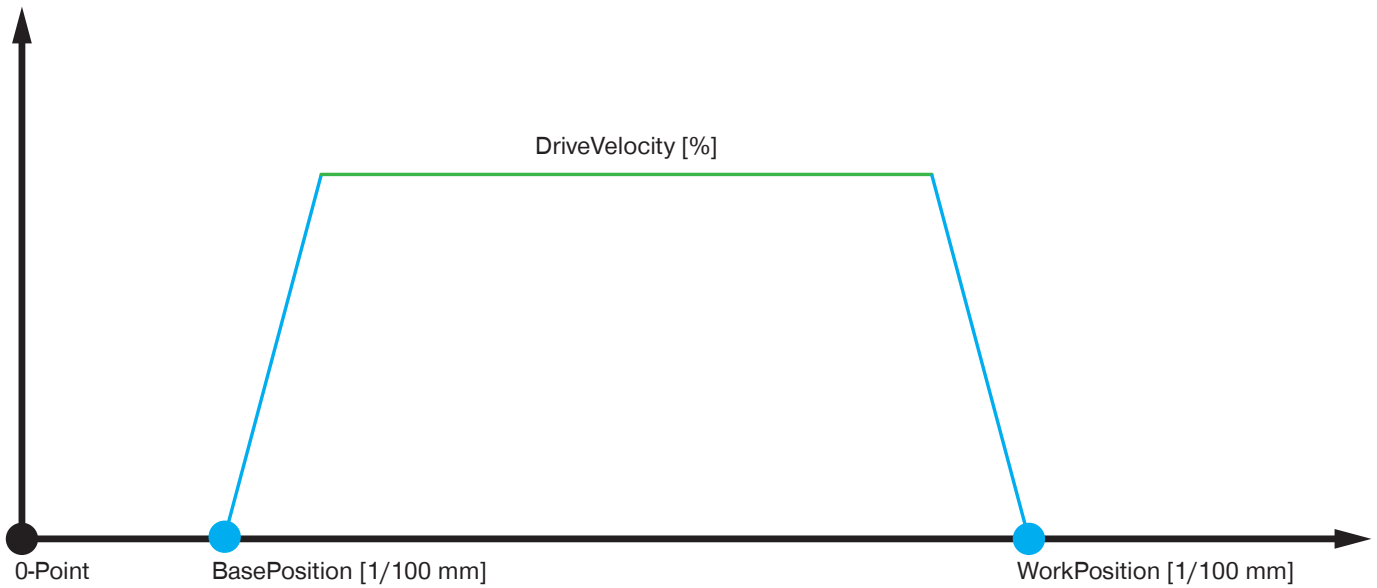
"Basic commands"

These modes control the basic gripper actions.

"DeviceMode"	Action	"ControlWord"
0	Not guided to the motor control system	dc
1	Idle	0x1
2	Gripper reset	0x1
3	Switch on motor	0x1
5	Switch off motor/stop gripping movement	0x1
10	Start homing (necessary only if the gripper was moved without a voltage supply)	0x1
11	Enable jog mode	0x400/0x800

9.2.3 Movement profiles

9.2.3.1 "PositionProfile"



The gripper moves into the "PositionProfile" using this mode.

The movement speed is configured using the "DriveVelocity" parameter.

The "TeachPosition" does not have any significance in this mode, because the "BasePosition" or "WorkPosition" is always approached precisely.

If the gripper encounters an obstacle in this mode while moving, it stops and issues an error message.

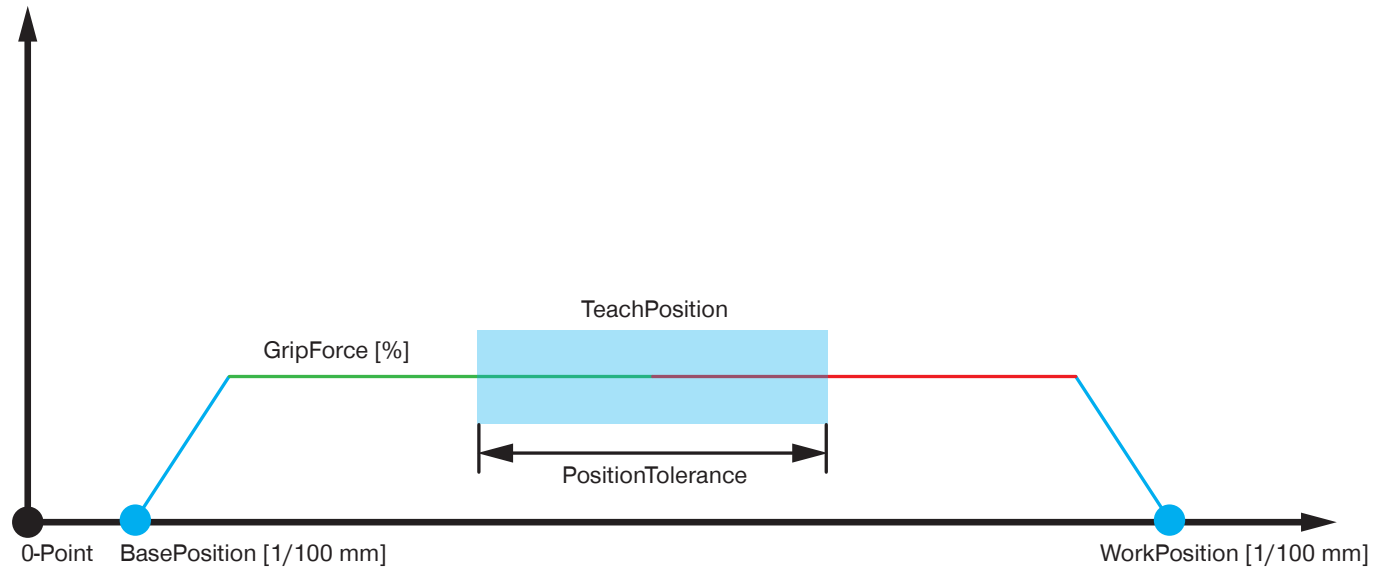
The gripper can be moved from the obstacle back to the starting position if the command is switched in the "ControlWord."

No defined gripping forces can be generated in this mode. As a result, friction-locked gripping is not permitted in this mode.

"DeviceMode"	Action	"ControlWord"
50	Move to "BasePosition"	0x100
50	Move to "WorkPosition"	0x200
51	Move to "BasePosition" Special movement profile for a faster movement of the gripper. The gripper must never be jammed, i.e. neither be at the end stop nor have gripped a workpiece.	0x100
51	Move to "WorkPosition" Special movement profile for a faster movement of the gripper. The gripper must never be jammed, i.e. neither be at the end stop nor have gripped a workpiece.	0x200

9.2.3.2 "ForceProfile"

HRC-01



In this mode, the gripper moves onto the workpiece in the "ForceProfile."

- ⇒ The "GripForce" parameter is used to configure the desired gripping force.
- ⇒ The "TeachPosition" parameter is used to define the workpiece position.

Since gripping typically only occurs in one direction, there is a distinction made between the two mode groups "69" and "79."

- ⇒ In the "69" mode group, the gripper in the "ForceProfile" moves from the "BasePosition" toward the "WorkPosition" onto the workpiece using the "ControlWord" command "0x200."
- ⇒ If the "ControlWord" command "0x100" is written in the "69" mode group, then the gripper travels away from the workpiece to the "BasePosition" in the "PositionProfile," without the need for any prompts from the user. Here, the gripper moves at the speed set in the "DriveVelocity" parameter.
- ⇒ This procedure is reversed in the "79" mode group. As such, the "69" mode group is used for outside gripping and the "79" mode group for inside gripping.

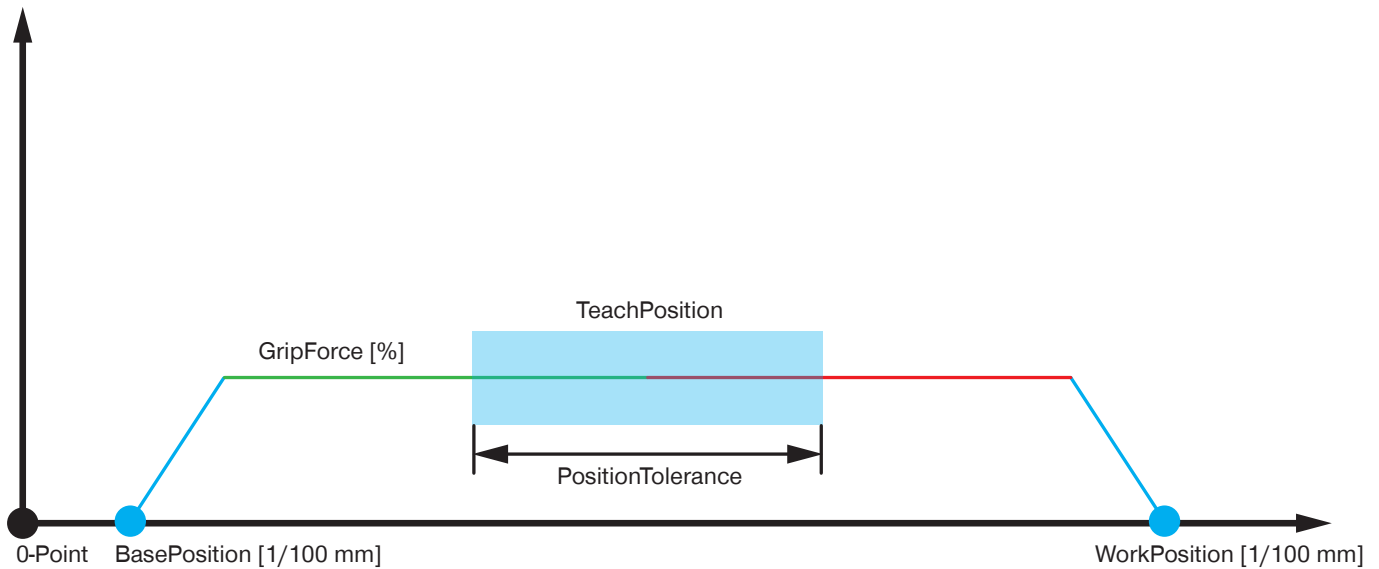
Group "69" - typically used for outside gripping

"DeviceMode"	Action	"ControlWord"
69	Move toward the "WorkPosition" until this position or the workpiece is reached.	0x200
69	Move toward the "BasePosition" for opening the gripper.	0x100

Group "79" - typically used for inside gripping

"DeviceMode"	Action	"ControlWord"
79	Move toward the "BasePosition" until this position or the workpiece is reached.	0x100
79	Move toward the "WorkPosition" for opening the gripper.	0x200

HRC-02



In this mode, the gripper moves onto the workpiece in the “ForceProfile.”

- ⇒ The “GripForce” parameter is used to configure the desired gripping force.
- ⇒ The “TeachPosition” parameter is used to define the workpiece position.

Since gripping typically only occurs in one direction, there is a distinction made between the two mode groups “62” and “72.”

- ⇒ In the “62” mode group, the gripper in the “ForceProfile” moves from the “BasePosition” toward the “WorkPosition” onto the workpiece using the “ControlWord” command “0x200.”
- ⇒ If the “ControlWord” command “0x100” is written in the “62” mode group, then the gripper travels away from the workpiece to the “BasePosition” in the “PositionProfile,” without the need for any prompts from the user. Here, the gripper moves at the speed set in the “DriveVelocity” parameter.
- ⇒ This procedure is reversed in the “72” mode group. As such, the “62” mode group is used for outside gripping and the “72” mode group for inside gripping.

Group “62” - typically used for outside gripping

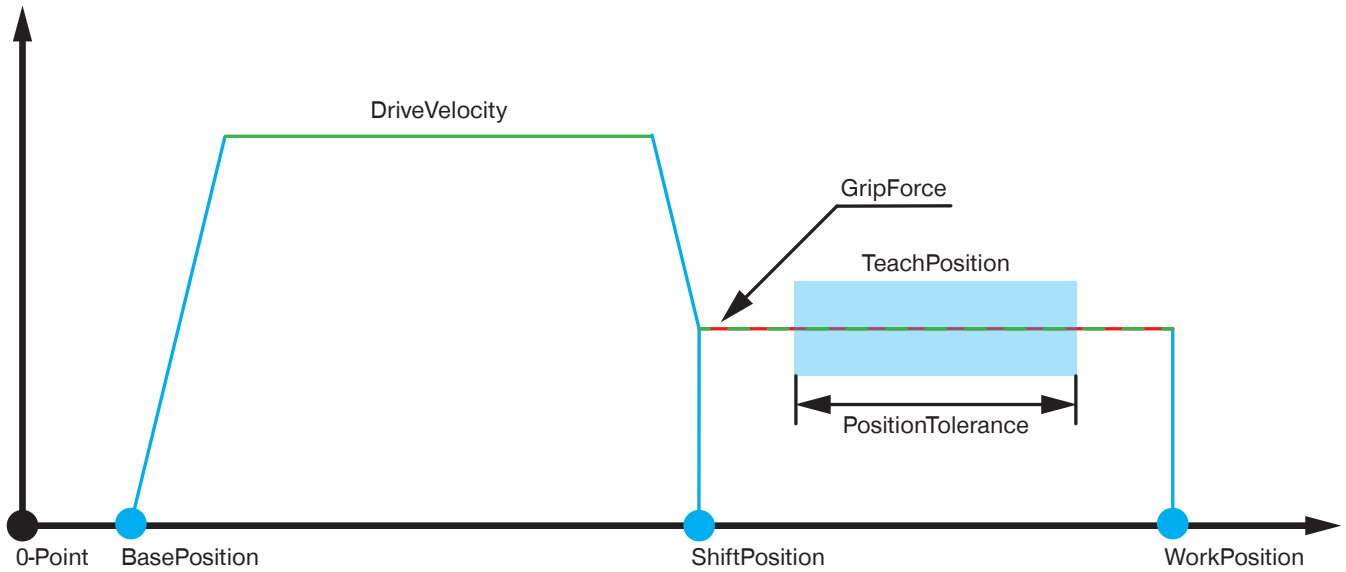
"DeviceMode"	Action	"ControlWord"
62	Move toward the "WorkPosition" until this position or the workpiece is reached.	0x200
62	Move toward the "BasePosition" for opening the gripper.	0x100

Group “72” - typically used for inside gripping

"DeviceMode"	Action	"ControlWord"
72	Move toward the "BasePosition" until this position or the workpiece is reached.	0x100
72	Move toward the "WorkPosition" for opening the gripper.	0x200

9.2.3.3 "PrePosition-ForceProfile"

HRC-01



This mode is an extension of the "ForceProfile." This means that a typically quick prepositioning process takes place until the "ShiftPosition" is reached.

- ⇒ When it reaches the "ShiftPosition," the gripper switches over to the "ForceProfile" without stopping the motor. Therefore, the "BasePosition," "ShiftPosition" and "WorkPosition" have to be defined for this mode.
- ⇒ The "DriveVelocity" and "GripForce" parameters also have to be configured.
- ⇒ Here, the "TeachPosition" also defines the workpiece position with adjustable tolerance.

Just as in the "ForceProfile," the gripper moves away from the workpiece using the "PositionProfile" at the speed specified with the "DriveVelocity" parameter.

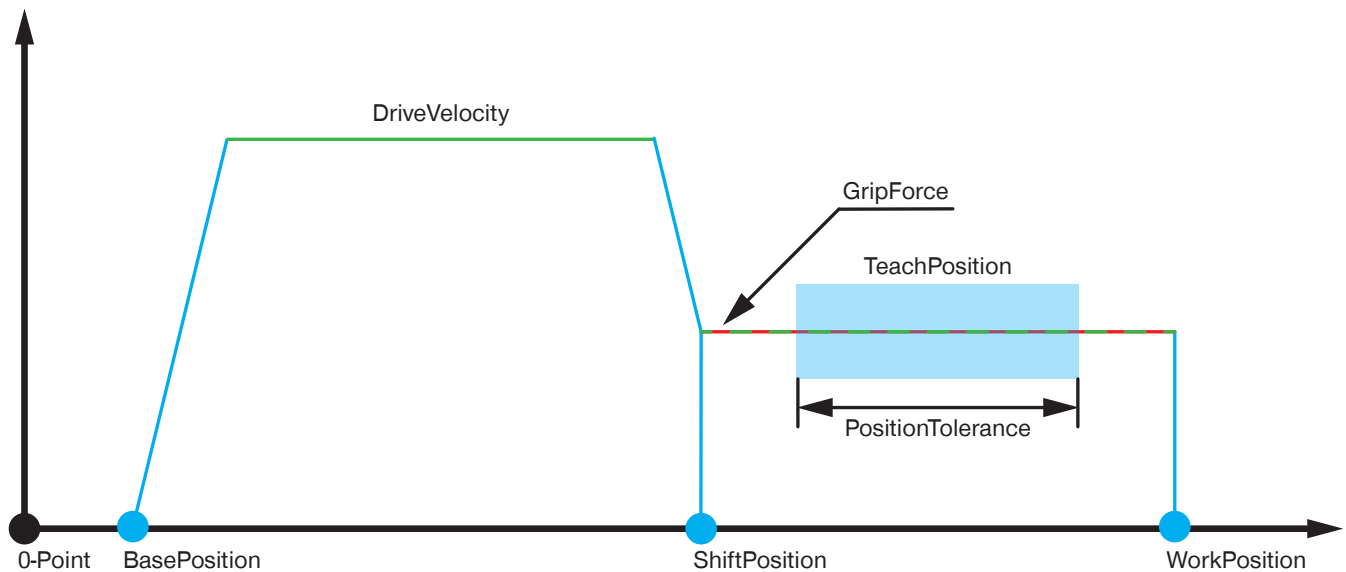
Group "89" - typically used for outside gripping

"DeviceMode"	Action	"ControlWord"
89	Move with $v = \text{"DriveVelocity"}$ to the "ShiftPosition" and then with "GripForce" until the workpiece or the "WorkPosition" is reached.	0x200
89	Move toward the "BasePosition" for opening the gripper.	0x100

Group "99" - typically used for inside gripping

"DeviceMode"	Action	"ControlWord"
99	Move with $v = \text{"DriveVelocity"}$ to the "ShiftPosition" and then with "GripForce" until the workpiece or the "BasePosition" is reached.	0x100
99	Move toward the "WorkPosition" for opening the gripper.	0x200

HRC-02



This mode is an extension of the “ForceProfile.” This means that a typically quick prepositioning process takes place until the “ShiftPosition” is reached.

- ⇒ When it reaches the “ShiftPosition,” the gripper switches over to the “ForceProfile” without stopping the motor. Therefore, the “BasePosition,” “ShiftPosition” and “WorkPosition” have to be defined for this mode.
- ⇒ The “DriveVelocity” and “GripForce” parameters also have to be configured.
- ⇒ Here, the “TeachPosition” also defines the workpiece position with adjustable tolerance.

Just as in the “ForceProfile,” the gripper moves away from the workpiece using the “PositionProfile” at the speed specified with the “DriveVelocity” parameter.

Group “82” - typically used for outside gripping

"DeviceMode"	Action	"ControlWord"
82	Move with $v = \text{"DriveVelocity"}$ to the "ShiftPosition" and then with "GripForce" until the workpiece or the "WorkPosition" is reached.	0x200
82	Move toward the "BasePosition" for opening the gripper.	0x100

Group “92” - typically used for inside gripping

"DeviceMode"	Action	"ControlWord"
92	Move with $v = \text{"DriveVelocity"}$ to the "ShiftPosition" and then with "GripForce" until the workpiece or the "BasePosition" is reached.	0x100
92	Move toward the "WorkPosition" for opening the gripper.	0x200

9.2.4 "WorkpieceNo" parameter

This workpiece number is used for selecting the previously stored workpiece data, as well as for selecting the "WorkpieceNo" data record in which the current process data is stored.

This "WorkpieceNo" data record enables individual workpieces to be taught-in to the gripper very quickly if the recipes are not managed on the control system.

INFORMATION



An example of a code can be found in the "Quickstart basic parameters" section (recipe examples).
⇒ "Store recipe" and "Load recipe"

Name	"WorkpieceNo"
Data format	UINT8
Permission	Write
Transfer	Cyclical
Value range	0 to 32

The corresponding workpiece recipe is loaded in the gripper with a value > 0.

9.2.5 "PositionTolerance" parameter

This parameter is used to configure the position tolerance with a resolution of 0.01 mm.

Thus the value range of 0 to 255 can be used to set a maximum tolerance of 2,55 mm in both directions.

INFORMATION



Example:

If the "Teach position" has a value of 1500 (i.e. 15.00 mm), a tolerance of 1.50 mm in both directions can be set with a value of 150 in the "Position tolerance" parameter.

By doing this, the TeachPosition window starts at 13.50 mm and goes all the way up to 16.50 mm.

Name	"PositionTolerance"
Data format	UINT8
Permission	Write
Transfer	Cyclical
Value range	0 to 255

9.2.6 "GripForce" parameter

The gripper can work with various gripping forces to ensure an optimized process flow. The gripping force is indicated as a percent from the minimum to the maximum gripping force. The user can transmit the required gripping force in increments of 1%.

INFORMATION



When the gripper reaches 100% gripping force, it switches to a higher maximum permitted peak current. This means that, in the range of 100% to 130%, the gripper can draw a maximum current of 7.5 A for a brief period.

Name	"GripForce"
Data format	UINT8
Permission	Write
Transfer	Cyclical
Value range	1% to 100%

9.2.7 "DriveVelocity" parameter

The gripper can use different movement speeds for an optimized process flow.

This parameter determines the movement speed of the gripper in both directions in the "PositionProfile" mode.

In the other modes, this parameter determines the movement speed from the workpiece.

In "PrePosition-ForceProfile" mode, it determines the movement speed to the switching position.

The positioning speed is specified as a percentage value (1% to 100%). The gripper converts this information to its maximum movement speed.

INFORMATION



Example:
To set a movement speed of 75%, a value of 75 ("DriveVelocity" = 75) must be transmitted.

Name	"DriveVelocity"
Data format	UINT8
Permission	Write
Transfer	Cyclical
Value range	1% to 100%

9.2.8 "BasePosition" parameter

The "BasePosition" must always be smaller than the "ShiftPosition."

The gripper verifies this and, if necessary, indicates an error message.

If the current position of the gripper within the tolerance window is in the vicinity of the "BasePosition," bit 8 is set in the "ControlWord."

Name	"BasePosition"
Data format	UINT16
Permission	Write
Transfer	Cyclical
Value range	0.75 to max. jaw stroke of the gripper + 0.75 mm

9.2.9 "ShiftPosition" parameter

The "ShiftPosition" must always be larger than the "BasePosition" and smaller than the "WorkPosition."

The gripper verifies this and, if necessary, indicates an error message.

Name	"ShiftPosition"
Data format	UINT16
Permission	Write
Transfer	Cyclical
Value range	0.75 to max. jaw stroke of the gripper + 0.75 mm

9.2.10 "TeachPosition" parameter

The "TeachPosition" defines the target position of the workpiece and its use is optional.

If the current position of the gripper within the tolerance window is around the "TeachPosition," bit 9 is set in the "Status."

The size of the tolerance window is defined using the "PositionTolerance" parameter.

Name	"TeachPosition"
Data format	UINT16
Permission	Write
Transfer	Cyclical
Value range	0.75 to max. jaw stroke of the gripper + 0.75 mm

9.2.11 "WorkPosition" parameter

The "WorkPosition" defines the maximum travel path of the gripper and has to be greater than the "ShiftPosition."

In the "PositionProfile" mode, this position is precisely approached because the gripper is in positioning mode.

In the "PrePosition-ForceProfile" or "ForceProfile" modes, the gripper is stopped, starting from this position. The gripper will move past the "WorkPosition" slightly.

⇒ A maximum of 2 mm, depending on the movement speed and gripper finger mass.

For "DeviceMode" 70/90, the same applies for the "BasePosition."

Name	"WorkPosition"
Data format	UINT16
Permission	Write
Transfer	Cyclical
Value range	0.75 to max. jaw stroke of the gripper + 0.75 mm

Outputs: Process data from the gripper to the IO-Link master!

9.2.12 "StatusWord" parameter

"StatusWord" structure:

	Bit 15	Bit 14	Bit 13	Bit 12	Bit 11	Bit 10	Bit 9	Bit 8
Byte 1	Error	„ControlWord“ 0x200	„ControlWord“ 0x100	„DataTransferOK“	„UndefinedPo- sition“	„WorkPo- sition“	„TeachPo- sition“	„BasePo- sition“
	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	„Control- lerError“	„Gripper- PLCActive“	„JogWork- Active“ „+“	„JogBaseActive“ „-“	„Movement- Complete“	„InMotion“	„MotorON“	„HomingPo- sition“ OK

Bit 0: "HomingPosition" OK

- ▶ The gripper has its reference.
- ▶ This bit is mandatory.
- ▶ If the reference run is "FALSE," a "Homing" run must be carried out using the "DeviceMode" = 10 or 14, 16 or 17 (decimal) parameter.

Bit 1: "MotorON"

- ▶ This bit is enabled when the motor is switched on by the "DeviceMode" = 3 (decimal) parameter.
- ▶ The motor is automatically switched on during a "Homing" run ("DeviceMode" = 10 (decimal)).

Bit 2: "InMotion"

- ▶ This bit is active during the run.

Bit 3: "MovementComplete"

- ▶ This bit is active after the movement is complete.

Bit 4: "JogBaseActive" "-"

- ▶ Confirmation during the "Jog" run in the direction of "BasePosition."

Bit 5: "JogWorkActive" "+"

- ▶ Confirmation during the "Jog" run in the direction of "WorkPosition."

Bit 6: "GripperPLCActive"

- ▶ This bit is active as soon as the gripper has booted up after the cold start. This bit can be used to verify a "byte swap."

Bit 7: "ControllerError"

- ▶ Error in the controller.

Bit 8: "BasePosition"

- ▶ This bit is active if the gripper is at "BasePosition."

Bit 9: "TeachPosition"

- ▶ This bit is active if the gripper is at "TeachPosition."

Bit 10: "WorkPosition"

- ▶ This bit is active if the gripper is at "WorkPosition."

Bit 11: "UndefinedPosition"

- ▶ This bit is active if the gripper is neither at "TeachPosition," "WorkPosition" nor "BasePosition."

Bit 12: "DataTransferOK"

- ▶ This bit is used for data transmission, using the "handshake."
- ▶ As soon as data has been taken over by the parameter "ControlWord" =1 (decimal) in the gripper, this bit is active.

Bit 13: "ControlWord" 0x100

- ▶ This bit is a direction flag and is active when the last movement order was made in the "BasePosition" direction.

Bit 14: "ControlWord" 0x200

- ▶ This bit is a direction flag and is active when the last movement order was made in the "WorkPosition" direction.

Bit 15: "Error"

- ▶ Error in the gripper.
- ▶ If this bit is active, the error message can be determined using the "Diagnosis" parameter.

9.2.13 "Diagnosis" parameter

The value returned in the parameter corresponds to the error code (see "Troubleshooting" section).

Name	"Diagnosis"
Data format	UINT16
Permission	Read
Transfer	Cyclical
Value range	0 to 65535

9.2.14 "ActualPosition" parameter

The parameter "ActualPosition" corresponds to the current position of the gripper jaws relative to the full stroke.

The value is specified with an accuracy of 0.01 mm.

Name	"ActualPosition"
Data format	UINT16
Permission	Read
Transfer	Cyclical
Value range	0 to max. jaw stroke of the gripper

INFORMATION



The "StatusWord" of the gripper should be used to check whether a workpiece has been gripped correctly.

⇒ The position measurement resolution is: 0.01 mm

⇒ The position measurement accuracy is: 0.1 mm

If the "ActualPosition" parameter is used to detect the workpiece, then fluctuations around the exact value must be taken into account during commissioning!

9.3 "Cold start"

For proper function, we recommend that the actuator and sensor voltage be supplied with power separately. Pins 1 and 3 are intended for the sensor power supply and must be switched on first. Once the gripper is able to communicate with the PLC, the supply voltage can then be activated via pins 2 and 5.

Please note:

If pin 1 is disconnected, pin 4 (IO-Link) must also be disconnected.

9.4 Minimum travel path

The gripper requires a certain "minimum travel path" to accelerate to the desired gripping force. This minimum travel path depends on:

- The desired gripping force
- The dimensions of the gripper fingers

Design size	Minimum travel path
HRC-01 series	3 mm
HRC-02 series	3 mm

9.5 Referencing by "Homing"

NOTICE



Before each "Homing command," make sure that the gripper is able to move freely and easily and that it cannot be blocked by the gripper jaws or interfering edges.

When blocking, the reference position is set.

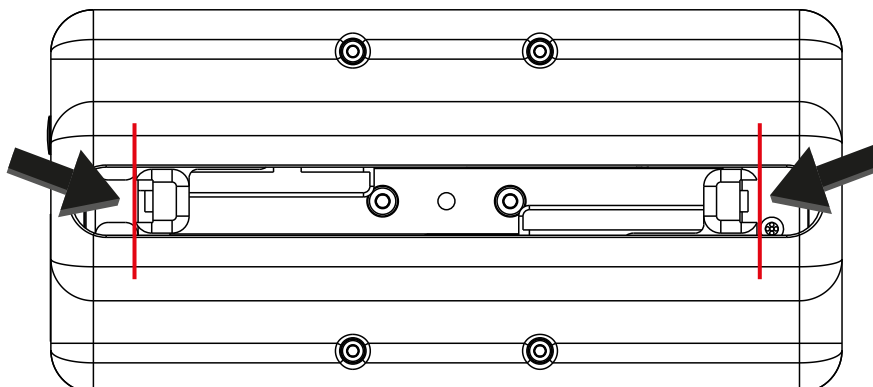
A "Homing command" is not permitted in the gripped state.

There are various "Homing commands" available.

"DeviceMode"	Action
10	Outside homing - to the internal end stop of the gripper (see Section 8.6.1)
14	Inside homing - to the internal end stop of the gripper (see Section 8.6.2)
"DeviceMode" 16 and 17 are not valid for grippers with safety gripper jaws!	
16	Special outside homing - to the external end stop (see Section 8.6.3)
17	Special inside homing - to the external end stop (see Section 8.6.4)

The gripper has reached its "zero position" if the gripper jaws are at the pictured position when referencing ("Homing" "DeviceMode" 10).

Depending on installation size, the gripper jaws move slightly beyond the edge of the gripper housing when moving to home position ("Homing").



9.5.1 "DeviceMode" 10

The following work steps must be observed for "Homing":

- ▶ Assign the parameter "DeviceMode" = 10 and transmit this value to the gripper using the "handshake."
- ⇒ The motor can be switched on or off.

WARNING



Risk of injury resulting from gripper movements

Gripper movement is possible as a result of the transmission of the value.

Ensure an adequate safety distance and do not reach into the operational range of the gripper.

The gripper jaws move to the outside at low speed until they encounter the internal mechanical end stops.

If the gripper jaws encounter resistance, they stop at this spot. In the process, the "ActualPosition" parameter is referenced to the value of 0.

- ⇒ The motor is now switched on.

9.5.2 "DeviceMode" 14

For the "DeviceMode" 14 parameter, the procedure is identical to the "DeviceMode" 10.

- ⇒ Here, you will assign the "DeviceMode" = 14 and transmit it.

NOTICE



Gripper jaws move inward when using this parameter!

9.5.3 "DeviceMode" 16

WARNING



Risk of injury due to increased force of the gripper during "Homing"

The "Homing force" is very high with the new "DeviceMode."

- ▶ Make sure that an external end stop is installed in the machine or system into which the gripper is installed.
- ▶ If the gripper's internal end stop is used, this will result in higher wear.

Make sure that the "DriveVelocity" is set to a low value before sending the "Homing command."

⇒ Recommendation: "DriveVelocity" = **10**

⇒ The value should be increased if greater force is required for "Homing."

The following work steps are to be observed:

- ▶ Assign the parameter "DeviceMode" = 3 and transmit this value to the gripper using the "ControlWord" = 1.
- ⇒ The motor is switched on.
- ▶ Now, transmit the following values.

Parameter	Value	Unit
"DeviceMode"	16	
"WorkpieceNo."	0	
"PositionTolerance"	50	0.01 mm
"DriveVelocity"	10	%
"BasePosition"	100	0.01 mm
"WorkPosition"	4000	0.01 mm

- ▶ Transmit the parameter to the gripper using a "handshake."

⇒ "ControlWord" = 1

⇒ The parameter "BasePosition" must not be smaller than 75.

- ▶ The gripper jaws move to the inside until they encounter the mechanical end stops. After reaching the mechanical end stops, the gripper accepts the value of the "BasePosition" for its new "ActualPosition."

For example, this would be the new "ActualPosition" = **100** (see table).

⇒ After "Homing," the motor is switched off.

- ▶ You can switch on the motor, switch to your movement profile and start it using the "DeviceMode" = 3 and the "handshake."

The gripper answers with → "DiagnoseWord" = 0x00 → The gripper is ready.

WARNING



Gripper jamming and damage

Since the "ActualPosition" in this "DeviceMode" has an offset, the gripper does not know the position of the internal end stop.

This makes it possible to move against the internal end stop at high speed, which can result in jamming of and damage to the gripper.

9.5.4 "DeviceMode" 17

WARNING



Risk of injury due to increased force of the gripper during "Homing"

The "Homing force" is very high with the new "DeviceMode."

- ▶ Make sure that an external end stop is installed in the machine or system into which the gripper is installed.
- ▶ If the internal end stop of the gripper is used, this will result in higher wear.

Make sure that the "DriveVelocity" is set to a low value before sending the "Homing command."

- ⇒ Recommendation: "DriveVelocity" = **10**
- ⇒ The value should be increased if greater force is required for "Homing."

The following work steps are to be observed:

- ▶ Assign the parameter "DeviceMode" = 3 and transmit this value to the gripper using the "ControlWord" = 1.
- ⇒ The motor is switched on.
- ▶ Now, transmit the following values.

Parameter	Value	Unit
"DeviceMode"	17	
"WorkpieceNo."	0	
"PositionTolerance"	50	0.01 mm
"DriveVelocity"	10	%
"BasePosition"	100	0.01 mm
"WorkPosition"	4000	0.01 mm

- ▶ Transmit the parameter to the gripper using a "handshake."
- ⇒ "ControlWord" = 1
- ⇒ The parameter "WorkPosition" must not be larger than the maximum stroke (+75) of the gripper.
- ▶ The gripper jaws move to the inside until they encounter the mechanical end stops. After reaching the mechanical end stops, the gripper accepts the value of the "WorkPosition" for its new "ActualPosition."

For example, this would be the new "ActualPosition" = **4000** (see table).

- ⇒ After "Homing," the motor is switched off.
- ▶ You can switch on the motor, switch to your movement profile and start it using the "DeviceMode" = 3 and the "handshake."

The gripper answers with → "DiagnoseWord" = 0x00 → The gripper is ready.

WARNING



Gripper jamming and damage

Since the "ActualPosition" in this "DeviceMode" has an offset, the gripper does not know the position of the internal end stop.

This makes it possible to move against the internal end stop at high speed, which can result in jamming of and damage to the gripper.

9.6 Interruption of the power supply

During an interruption of the voltage supply (e.g. when using a tool changer), care must be taken to ensure that the gripper stores the last position in the controller.

This can be implemented by performing a "handshake" before switching off the power supply. Additionally, a timer shall delay the switch off of the power supply by 2 seconds.

⇒ This ensures that no change of position occurs during a restart.

INFORMATION



An example of a code can be found in the "Quickstart basic parameters" section (recipe examples).
⇒ "Store recipe" and "Load recipe"

9.7 "Easy Startup"

⇒ From switching on the gripper to the initial movement.

The gripper is to be connected in accordance with its assignment plan.

The gripper reports the "StatusWord," "Diagnosis" and "ActualPosition" process parameters immediately after the internal controller has booted up.

Once the "PLCActive" bit is registered in the "StatusWord," the communication process can start. To move the gripper, the process parameters must first be transmitted.

The following process parameters are to be transmitted:

- "DeviceMode"
- "WorkpieceNo"
- "PositionTolerance"
- "GripForce"
- "DriveVelocity"
- "BasePosition"
- "ShiftPosition"
- "TeachPosition"
- "WorkPosition"

A "handshake" is required to transmit the process parameters to the gripper.

INFORMATION



Please refer to the "Quickstart basic parameters" section (recipe examples) for information on the "handshake."
⇒ Code example "handshake"

9.8 Start of data transmission

The data transmission starts with the "ControlWord" = 1 (decimal).

Once the process parameter has been transmitted to the gripper, the gripper will report this back in the "StatusWord" with the "DataTransferOK" bit.

The gripper is now ready for operation.

INFORMATION



For further information on data transmission and possible positions, refer to the "StatusWord" section.

9.9 "Quickstart" basic parameters

In the following example code, you see the first initialization of the gripper, the activation of the motor and the transmission of the process parameters.

HRC-01

```
//Initialization of the gripper,
//Motor switch-on,
//Initial move command
// = EasyStartUp Example
5:
IF StatusBit.6 THEN           //Queries "PLCActive" bit in the StatusWord
    ControlWord := 1;        //Send bit 5 "DataTransfer" in the ControlWord for initialization
    iStep:= 10;             //Jump to next step
END_IF
10:
    IF StatusBit.12 THEN      //Queries "DataTransferOK" bit in the StatusWord
        ControlWord :=0;    //Reset the initialization
        iStep:= 20;         //Jump to next step
    END_IF
20:
DeviceMode := 3;             //Command to switch on the motor
ControlWord :=1;           //Data transmission to the gripper
    iStep := 30;            //Jump to the next step
30:
If StatusBit.1 THEN         //Queries "MotorON" bit in the StatusWord
    iStep := 40;           //Jump to the next step
END_IF
40:
DeviceMode := 89;          //Loading a DeviceMode
WorkpieceNo. := 0;        // 0 means that the current process parameters are being used
PositionTolerance := 50;
GripForce := 50;
DriveVelocity := 50;
BasePosition := 100;
ShiftPosition := 2000;
TeachPosition := 4000;
WorkPosition := 4000;
    iStep := 50;           //Jump to the next step
50:
ControlWord := 1;         //Begins with the handshake
    iStep := 60;          //Jump to the next step.
60:
IF StatusWord.12 THEN      //Queries the "DataTransferOK"=TRUE bit from StatusWord, this is the response of the gripper to transferred data
    ControlWord := 0      //ControlWord reset
    iStep := 70;         //Jump to the next step
END_IF;
70:
IF NOT StatusWord.12 THEN  //Queries the completion of the data transmission, "DataTransferOK"= FALSE
    ControlWord := 512;   //Handshake is completed, gripper now moves to WorkPosition (0x200 or 512(decimal) = MoveToWork)
    iStep:= 80;
END_IF;
80:
...
```


HRC-02

```
//Initialization of the gripper,
//Motor switch-on,
//Initial move command
// = EasyStartUp Example
5:
IF StatusBit.6 THEN           //Queries "PLCActive" bit in the StatusWord
    ControlWord := 1;        //Send bit 5 "DataTransfer" in the ControlWord for initialization
    iStep:= 10;             //Jump to next step
END_IF
10:
    IF StatusBit.12 THEN      //Queries "DataTransferOK" bit in the StatusWord
        ControlWord :=0;     //Reset the initialization
        iStep:= 20;         //Jump to next step
    END_IF
20:
DeviceMode := 3;             //Command to switch on the motor
ControlWord :=1;            //Data transmission to the gripper
    iStep := 30;             //Jump to the next step
30:
If StatusBit.1 THEN         //Queries "MotorON" bit in the StatusWord
    iStep := 40;            //Jump to the next step
END_IF
40:
DeviceMode := 82;           //Loading a DeviceMode
WorkpieceNo. := 0;         // 0 means that the current process parameters are being used
PositionTolerance := 50;
GripForce := 50;
DriveVelocity := 50;
BasePosition := 100;
ShiftPosition := 2000;
TeachPosition := 4000;
WorkPosition := 4000;
    iStep := 50;            //Jump to the next step
50:
ControlWord := 1;          //Begins with the handshake
    iStep := 60;           //Jump to the next step.
60:
IF StatusWord.12 THEN       //Queries the "DataTransferOK"=TRUE bit from StatusWord, this is the response of the gripper to transferred data
    ControlWord := 0        //ControlWord reset
    iStep := 70;           //Jump to the next step
END_IF;
70:
IF NOT StatusWord.12 THEN   //Queries the completion of the data transmission, "DataTransferOK"= FALSE
    ControlWord := 512;     //Handshake is completed, gripper now moves to WorkPosition (0x200 or 512(decimal) = MoveToWork)
    iStep:= 80;
END_IF;
80:
...
```

9.10 Starting gripping movement

By sending the → "ControlWord" = 0x200 → the gripper moves towards the "WorkPosition," which means that the gripper jaws are moving inward.

By sending the → "ControlWord" = 0x100 → the gripper moves towards the "BasePosition," which means that the gripper jaws are moving outward.

▶ The movement order must be pending for as long as it takes until the desired position is reached.

▶ The current movement order is canceled as a result of a new "handshake."

If the gripper has reached the corresponding position, this is reported back in the "StatusWord" as follows:

- The gripper is at "BasePosition" → "StatusWord" bit 8 = TRUE
- The gripper is at "TeachPosition" → "StatusWord" bit 9 = TRUE
- The gripper is at "WorkPosition" → "StatusWord" bit 10 = TRUE

9.11 Repeated movements in the same direction

The "StatusWord" includes two static "flag bits," each of which is set in alternation when the gripper moves in one direction. This prevents unwanted movements of the gripper in case of faulty data transmission.

Depending on the location of the positions, it is possible that the gripper may move multiple times in the same direction. For this purpose, the direction flags must be reset.

Sending the → "ControlWord" = 0x04 → activates the deletion of the direction flags.

The direction flag is reset when the gripper answers with → "Statusbit" 13 AND 14 = FALSE →.

For multiple movements in the same direction, a schematic program example is shown in the following.

```
//Multiple movement in one direction in Structured Text (ST)
// In this example, the motor is switched on,
// the movement profile
// gripping forces and speeds are transmitted
// The gripper is at BasePosition = 1000.
10:
BasePosition := 100; //Allocation of a new BasePosition
ControlWord := 1; //Handshake is started ("DataTransfer" bit =TRUE in the ControlWord)
iStep := 20; //Jump to the next step
20:
IF StatusWord.12 THEN //Queries the "DataTransferOK"=TRUE bit from StatusWord, this is
the response of the gripper to transferred data
ControlWord := 0; //ControlWord reset
iStep := 30; //Jump to the next step
END_IF;
30:
IF NOT StatusWord.12 THEN //Queries the completion of the data transmission, "DataTransferOK"= FALSE
ControlWord := 4; //Reset the direction flags ("ResetDirectionFlag" bit = TRUE in the ControlWord)
iStep := 40;
END_IF
40:
IF NOT StatusWord.13 AND NOT StatusWord.14 THEN //Queries whether both direction flags ("ControlWord0x100" AND "ControlWord0x200" bit
=FALSE in the ControlWord)
ControlWord := 256; //Moves back towards BasePosition
iStep := 50;
END_IF;
50:
...
```

9.12 Recipe examples

The following example code shows how process parameters can be stored in the internal workpiece recipe.

9.12.1 "Store recipe"

For storing a recipe, a schematic program example is shown in the following.

HRC-01

```
//Store tool workpiece recipes in Structured Text (ST)
10:
DeviceMode := 89;           //Allocation of the desired process parameters
WorkpieceNo := 3;          //Recipe is to be stored as the third workpiece recipe
PositionTolerance := 50;
GripForce := 50;
DriveVelocity := 50;
BasePosition := 100;
ShiftPosition := 2000;
TeachPosition := 4000;
WorkPosition := 4000;
    iStep := 20;           //Jump to the next step
20:
ControlWord := 1;          //Begins with the handshake
    iStep := 30;           //Jump to the next step.
30:
IF StatusWord.12 THEN      //Queries the "DataTransferOK"=TRUE bit from StatusWord, this is the response of the gripper to transferred data
    ControlWord := 0;      //ControlWord reset
    iStep := 40;           //Jump to the next step
END_IF;
40:
IF NOT StatusWord.12 THEN  //Queries the completion of the data transmission, "DataTransferOK"= FALSE
    ControlWord := 2;      //Handshake is completed, storage starts here via the "WritePDU" bit in the ControlWord
    iStep := 50;           //Jump to the next step
END_IF;
50:
IF StatusWord.12 THEN      //Queries the bit "DataTransferOK"=TRUE from StatusWord
    ControlWord := 0;      //ControlWord reset
    iStep := 60;           //Jump to the next step
END_IF;
60:
IF NOT StatusWord.12 THEN  //Queries the completion of the data transmission, "DataTransferOK"= FALSE, this procedure can take several
seconds
    //Do other things...   //Storage is completed
END_IF;
```

HRC-02

//Store tool workpiece recipes in Structured Text (ST)

```

10:
DeviceMode := 82;           //Allocation of the desired process parameters
WorkpieceNo := 3;          //Recipe is to be stored as the third workpiece recipe
PositionTolerance := 50;
GripForce := 50;
DriveVelocity := 50;
BasePosition := 100;
ShiftPosition := 2000;
TeachPosition := 4000;
WorkPosition := 4000;
    iStep := 20;           //Jump to the next step
20:
ControlWord := 1;          //Begins with the handshake
    iStep := 30;          //Jump to the next step.
30:
IF StatusWord.12 THEN      //Queries the "DataTransferOK"=TRUE bit from StatusWord, this is the response of the gripper to transferred data
    ControlWord := 0;      //ControlWord reset
    iStep := 40;          //Jump to the next step
END_IF;
40:
IF NOT StatusWord.12 THEN  //Queries the completion of the data transmission, "DataTransferOK"= FALSE
    ControlWord := 2;      //Handshake is completed, storage starts here via the "WritePDU" bit in the ControlWord
    iStep := 50;          //Jump to the next step
END_IF;
50:
IF StatusWord.12 THEN      //Queries the bit "DataTransferOK"=TRUE from StatusWord
    ControlWord := 0;      //ControlWord reset
    iStep := 60;          //Jump to the next step
END_IF;
60:
IF NOT StatusWord.12 THEN  //Queries the completion of the data transmission, "DataTransferOK"= FALSE, this procedure can take several
seconds
    //Do other things...   //Storage is completed
END_IF;

```

9.12.2 "Load recipe"

For loading a new recipe, a schematic program example is shown in the following.

```
//Load workpiece recipes in Structured Text (ST)
10:
WorkpieceNo := 3;           //Third workpiece recipe is to be loaded
    iStep := 20;           //Jump to the next step
20:
ControlWord := 1;          //Begins with the handshake
    iStep := 30;           //Jump to the next step.
30:
IF StatusWord.12 THEN      //Queries the "DataTransferOK"=TRUE bit from StatusWord, this is the response of the gripper to transferred data
    ControlWord := 0;      //ControlWord reset
    iStep := 40;           //Jump to the next step
END_IF;
40:
IF NOT StatusWord.12 THEN  //Queries the completion of the data transmission, "DataTransferOK"= FALSE
    //Do other things...   //Handshake is completed, the parameters from the third recipe are now taken over into the current process
    parameters
END_IF;
```

10 Operation

NOTICE



In the event of a power failure, the positions of the gripper jaws and the gripping force of products HRC-01 and HRC-02 stay constant.

INFORMATION



If you have any further questions on adjustable gripping force and emergency release, Zimmer Customer Service is available to provide you assistance.

10.1 Emergency release

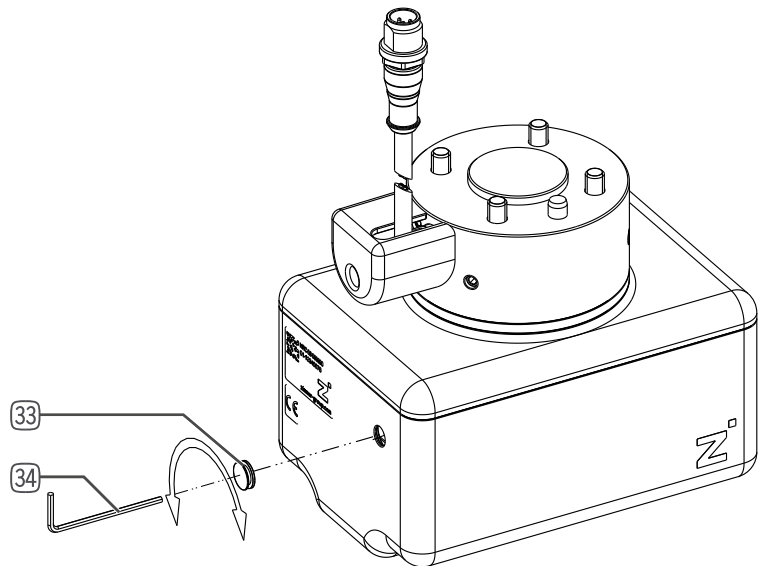
The products of the HRC-01 and HRC-02 series can also be moved without a control system or power supply, if needed. In the event of a power failure, the gripper jaws remain in their positions and the gripping force stays constant. The gripper jaws can be opened manually using the emergency release if the energy supply drops off.

Example representation of a gripper: HRC-02-093390

The following work steps must be observed during an emergency release:

- ▶ Remove the protective cap **33** .
 - ▶ Actuate the emergency release using the corresponding Allen key **34** .
- ⇒ When opening the gripper fingers, make sure that the workpiece in the gripper is secured!

Design size	Wrench size
HRC-01/-02 series	2 mm



INFORMATION



After an emergency release, another "Homing" reference run must be carried out. Zimmer Customer Service is available to provide you with assistance if you have any further questions.

11 Gripping force charts

INFORMATION



You can find information about the gripping force diagrams on our website www.zimmer-group.com.

Zimmer Customer Service is available to provide you with assistance if you have any further questions.

12 Error diagnosis

Error code	Error	Possible cause	Measure
0x0000	No error	-	-
0x0001	Motor is switched off	<ul style="list-style-type: none"> Motor was not activated after power on. Motor was switched off. 	<ul style="list-style-type: none"> ▶ Switch on motor. ▶ With "DeviceMode" = 3
0x0002	Gripper performs a reference run	<ul style="list-style-type: none"> Gripper is in a reference run. 	<ul style="list-style-type: none"> ▶ Wait until the reference run is complete.
0x0003	System boots up	<ul style="list-style-type: none"> The gripper is in the start sequence. 	<ul style="list-style-type: none"> ▶ Wait until the start sequence is complete.
0x0100	Actuator voltage is too low	<ul style="list-style-type: none"> The actuator voltage is not present. The applied voltage is too low. 	<ul style="list-style-type: none"> ▶ Check the applied voltage.
0x0101	Max. permitted temperature exceeded	<ul style="list-style-type: none"> Ambient temperature is too high. Overload of the gripper. Incorrect movement profile selected. 	<ul style="list-style-type: none"> ▶ Provide sufficient ventilation/cooling/connection. ▶ Check the ease of movement. ▶ Choose the selected movement profile.
0x0102	Max. permitted temperature undershot	<ul style="list-style-type: none"> Ambient temperature is too low. 	<ul style="list-style-type: none"> ▶ Provide a sufficient operating temperature.
0x0200	IO-Link communication faulty	<ul style="list-style-type: none"> - 	<ul style="list-style-type: none"> ▶ -
0x0201	SPI communication faulty	<ul style="list-style-type: none"> - 	<ul style="list-style-type: none"> ▶ -
0x0202	CAN communication faulty	<ul style="list-style-type: none"> - 	<ul style="list-style-type: none"> ▶ -
0x0204	STO safety circuit interrupted	<ul style="list-style-type: none"> The voltage level of the STO safety circuit is insufficient. 	<ul style="list-style-type: none"> ▶ Check the connection. ▶ Switch on the STO safety circuit.
0x0300	"ControlWord" not available	<ul style="list-style-type: none"> Multiple bits were set in the "ControlWord." 	<ul style="list-style-type: none"> ▶ In the "ControlWord," only one single bit may be set. ▶ Check the "ControlWord."
0x0301	Positions not available	<ul style="list-style-type: none"> Transmitted positions (Teach, Base, Shift, WorkPosition) are incorrect. Modified process data were not taken over. 	<ul style="list-style-type: none"> ▶ Check the transmitted process data. ▶ Apply the process data via a "handshake."

Error code	Error	Possible cause	Measure
0x0302	"GripForce" not available	<ul style="list-style-type: none"> Transmitted "GripForce" is not correct. Modified process data were not taken over. 	<ul style="list-style-type: none"> ▶ Check the transmitted process data. ▶ Confirm the newly transmitted process data with a "handshake."
0x0303	"SpeedValue" not available	<ul style="list-style-type: none"> Transmitted "SpeedValue" is not correct. Modified process data were not taken over. 	<ul style="list-style-type: none"> ▶ Check the transmitted process data. ▶ Confirm the newly transmitted process data with a "handshake."
0x0304	"TeachTolerance" not available	<ul style="list-style-type: none"> Transmitted "TeachTolerance" is not correct. Modified process data were not taken over. 	<ul style="list-style-type: none"> ▶ Check the transmitted process data. ▶ Confirm the newly transmitted process data with a "handshake."
0x0305	Position measuring system not referenced	<ul style="list-style-type: none"> Gripper has been moved without operating voltage. Internal error in the position measuring system. 	<ul style="list-style-type: none"> ▶ Reference the gripper by using a "HomingCommand."
0x0306	"DeviceMode" not available	<ul style="list-style-type: none"> Transmitted "DeviceMode" not correct. Modified process data were not taken over. 	<ul style="list-style-type: none"> ▶ Check the transmitted process data. ▶ Confirm the newly transmitted process data with a "handshake."
0x0307	Movement order cannot be carried out	<ul style="list-style-type: none"> Multiple errors in the same direction. In DM8x, "MoveToBase" if "Actual-Position" > "ShiftPosition" In DM9x, "MoveToBase" if "Actual-Position" < "ShiftPosition." In DM6x, "MoveToWork" if "Actual-Position" > "WorkPosition" In DM7x, "MoveToBase" if "Actual-Position" < "BasePosition" 	<ul style="list-style-type: none"> ▶ Reset the direction flag and send the move command again. ▶ Before gripping, position the gripper correctly.
0x0308	"WorkpieceNo." not available	<ul style="list-style-type: none"> Transmitted workpiece number is outside the permitted range 0 to 32. Modified process data were not taken over. 	<ul style="list-style-type: none"> ▶ Check the values of the "WorkpieceNo." parameter ▶ Apply the processes data via a "handshake"
0x313	Calculated "ShiftPosition" exceeded	<ul style="list-style-type: none"> In "force mode," transmitted "BasePosition" is less than the "ActualPosition" 	<ul style="list-style-type: none"> ▶ Move to "Base."
0x0400	Difficulty of movement	<ul style="list-style-type: none"> Gripper jaws are blocked. Gripper jaws are tensioned incorrectly. 	<ul style="list-style-type: none"> ▶ Check the gripper's ease of movement. ▶ Error must be acknowledged.
0x0401	Current limit exceeded	<ul style="list-style-type: none"> - 	<ul style="list-style-type: none"> ▶ -

Error code	Error	Possible cause	Measure
0x0402	Jam	<ul style="list-style-type: none"> Gripper jaws are blocked. Gripper jaws are tensioned incorrectly. 	<ul style="list-style-type: none"> ▶ Check the gripper's ease of movement. ▶ Error must be acknowledged.
0x0406	System/internal error	<ul style="list-style-type: none"> Internal error 	▶ -
0x040C	FRAM R/W error	<ul style="list-style-type: none"> An important parameter in FRAM is corrupted. 	▶ Contact Zimmer Customer Service.
0x040D	FRAM R/W error	<ul style="list-style-type: none"> An irrelevant parameter in FRAM is corrupted. 	▶ Contact Zimmer Customer Service.
0x040E	FRAM R/W error	<ul style="list-style-type: none"> A stored workpiece is corrupted. 	▶ Error can be reset using "ControlWord" bit 15 "Error Reset"
0x040F	No or incorrect ELMO script Incorrect parameter set	<ul style="list-style-type: none"> Firmware mismatch 	▶ Contact Zimmer Customer Service.

13 Table with acyclic data (ISDU)

INFORMATION


IO-Link distinguishes between cyclic process data (PDU) and acyclic data (ISDU). Access to acyclic data is not currently very convenient for all control system/IO-Link master combinations. For this reason, the HRC -01 series can be used completely without the need for acyclic data. This makes it as easy as possible for the customer to control the gripper.

Zimmer Customer Service is available to provide you with assistance if you have any further questions.

Index	Name	Data format	Access right	Values	Description
0x64 (64)	Status	UINT 16	Read	0 to 65535	Reflection of the process data
0x41 (65)	Diagnosis	UINT 16	Read	0 to 65535	Reflection of the process data
0x42 (66)	Cycle counter	UINT 32	Read	0 to 4294967295	Current numbers of cycles
0x43 (67)	Temperature	UINT 16	Read	0 °C to 100 °C	Current temperature
0x44 (68)	ControlWord	UINT 16	Read	0 to 65535	Reflection of the process data
0x45 (69)	Error code	STRING	Read	1 to 32	Current error code
0x46 (70)	Error counter	UINT 32	Read	0 to 4294967295	Current error counter
0x100 (256)	Actual position	UINT 16	Read	0 to max. stroke of the gripper	Reflection of the process data
0x101 (257)	TeachPosition	UINT 16	Read	0 to max. stroke of the gripper	Reflection of the process data
0x102 (258)	WorkpieceNo.	UINT 8	Read	0 to 32	Reflection of the process data
0x103 (259)	DeviceMode	UINT 8	Read	1 to 95	Reflection of the process data
0x104 (260)	PositionTolerance	UINT 8	Read	0 to 255	Reflection of the process data
0x105 (261)	GripForce	UINT 8	Read	1% to 130%	Reflection of the process data
0x107 (263)	DriveVelocity	UINT 8	Read	1% to 100%	Reflection of the process data
0x108 (264)	BasePosition	UINT 16	Read	0 to max. stroke of the gripper	Reflection of the process data
0x109 (265)	ShiftPosition	UINT 16	Read	0 to max. stroke of the gripper	Reflection of the process data
0x10A (266)	WorkPosition	UINT 16	Read	0 to max. stroke of the gripper	Reflection of the process data

14 Maintenance

Maintenance-free operation of the gripper is guaranteed for up to **5 million cycles**.

The maintenance interval may shorten under the following circumstances:

- Dirty environment
- Improper use and use that does not comply with the performance data.
- Observe ambient temperatures of +5 °C – +50 °C. If not observed, lubricants will harden faster!

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

We recommend allowing maintenance and seal replacement to be carried out by Zimmer Customer Service.

Dismantling and reassembling the gripper without authorization may result in complications, as special installation equipment is required in some cases.

Zimmer GmbH shall not be liable in the event of unauthorized dismantling and reassembling of the gripper or in the event of any malfunction or damage resulting from this.

14.1 Maintenance interval

CAUTION



Do not blow off the gripper with compressed air, this may cause a malfunction!

- ▶ Risk of accident

To clean the gripper, do not use any liquid or solvent-based cleaning agents!

- ▶ Risk of accident, malfunction

INFORMATION



We recommend using the Zimmer Group Repair Service for repairs.

Unauthorized dismantling and reassembly of the gripper can result in complications, as in some cases, special mounting equipment is required.

- ▶ Opening the gripper without authorization will void the warranty.

Part	Time	Maintenance
Guides for the gripper jaws	Weekly	Cleaning: Use a brush to brush off the guide, remove any build-up. Proceed as follows: Put the gripper in the indicated position. Remove the four mounting screws of the HRC housing. Remove the HRC housing. Clean the gripper jaws. Re-mount the HRC housing.
Entire gripper	After 5 million cycles or, at the very latest, after 7 years	General overhaul: At the end of the specified cycles (B10d) or, at the very latest, after 7 years, the gripper must be sent to Zimmer Customer Service to be completely disassembled.

14.2 Replacing the safety fuse

CAUTION



The replacement of the safety fuse must only be performed by personnel qualified to do so
 ► Risk of accident and injury

INFORMATION



The fuse assembly is sealed in the vicinity of the safety fuse when shipped from the factory.
 The sealing must be removed to replace the safety fuse.

The safety fuses vary depending on the model series:

HRC-02-093390: 315 mA - super quick acting, Püschel (105.000 series)

HRC-02-093677: 315 mA - super quick acting, Püschel (105.000 series)

HRC-02-101487: 800 mA - super quick acting, Püschel (105.000 series)

HRC-02-101528: 800 mA - super quick acting, Püschel (105.000 series)

If any safety fuses not sold or authorized by Zimmer GmbH are used, the function of the gripper cannot be guaranteed.

Unauthorized replacement of the safety fuse may result in complications, as special installation equipment and tools are sometimes required.

► Opening the gripper without authorization will void the guarantee.

Replacement of the safety fuse must be carried out by Zimmer Customer Service!

⇒ Exclusion of liability

15 Accessories/scope of delivery

INFORMATION



If any accessories not sold or authorized by Zimmer GmbH are used, the function of the gripper cannot be guaranteed. The accessories from Zimmer GmbH are specifically fitted for the individual gripper. Information on the corresponding optional accessories included in the scope of delivery can be found at

www.zimmer-group.com.

16 Transportation/storage/preservation

- The gripper must be transported and stored only in the original packaging.
- If the gripper has already been installed on the superordinate machine unit, care must be taken during transport to ensure that no unintentional movements can occur. Before commissioning the machine 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/observe the temperature range of 5 °C - 50 °C.
 - ⇒ Avoid wind/drafts/water condensation formation.
 - ⇒ Package the product.
 - ⇒ During storage, it must be kept away from direct sunlight.
- Clean all components. There must be no soiling left on the components.
- Visually inspect all of the components.
- Remove all foreign substances.
- Properly remove potential corrosion spots.
- Close electrical connections using suitable covers.

17 Decommissioning/disposal

INFORMATION



When the gripper reaches the end of its operational phase, the gripper can be completely disassembled and disposed of. Disconnect the gripper from the power supply completely. The gripper can be disassembled and properly disposed of according to material groups. When disposing of it, observe the locally applicable environmental regulations and codes and regulations for disposal.

18 RoHS declaration

... in terms of the EU Directive 2011/65/EU

Name and address of the manufacturer:

Zimmer GmbH

📍 Im Salmenkopf 5
D-77866 Rheinau, Germany

☎ +49 7844 9138 0

✉ info@zimmer-group.de

🌐 www.zimmer-group.com

We hereby declare that the incomplete machine described below

Product designation: 2-jaw parallel gripper, electric

Type designation: HRC-01/-02 series

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

Authorized representative for the compilation of relevant technical documents

Michael Hoch	See manufacturer's address	Rheinau, Germany, 9/20/2020	Martin Zimmer
First name, last name	Address	(Place and date of issuance)	(Legally binding signature) Managing Partner

19 REACH declaration

...in terms of the EC Regulation 1907/2006

Name and address of the manufacturer:

Zimmer GmbH

📍 Im Salmenkopf 5
D-77866 Rheinau, Germany

☎ +49 7844 9138 0

✉ info@zimmer-group.de

🌐 www.zimmer-group.com

REACH stands for Registration, Evaluation, Authorisation and Restriction of Chemicals.

A full declaration of REACH can be obtained from the manufacturer due to the duty to notify in accordance with Art. 33 of the REACH regulation ("Duty to communicate information on substances in articles").

Authorized representative for the compilation of relevant technical documents

Michael Hoch	See manufacturer's address	Rheinau, Germany, 9/20/2020	Martin Zimmer
First name, last name	Address	(Place and date of issuance)	(Legally binding signature) Managing Partner

20 Declaration of Incorporation

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

Name and address of the manufacturer:

Zimmer GmbH

📍 Im Salmenkopf 5
D-77866 Rheinau, Germany

☎ +49 7844 9138 0

✉ info@zimmer-group.de

🌐 www.zimmer-group.com

We hereby declare that the incomplete machines described below

Product designation: 2-jaw parallel gripper, electric

Type designation: HRC-01/-02 series

conform 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.

The following harmonized standards have been used:

Basic health and safety requirements:

No. 1.1.2, No. 1.1.3, No. 1.1.5, No. 1.3.1, No. 1.3.2, No. 1.3.4, No. 1.3.7, No. 1.5.1, No. 1.5.3, No. 1.5.4, No. 1.6.4, No. 1.7.1, No. 1.7.3.

DIN EN ISO 12100:2011-03 Safety of machinery – General principles for design – Risk assessment and risk reduction

DIN EN 60204-1 Safety of machinery – Electrical equipment of machines, part 1

DIN EN ISO 13849-1 Safety of machinery – Safety-related parts of control systems

DIN EN ISO 13849-2 Safety related parts of control systems

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.

Authorized representative for the compilation of relevant technical documents



Kurt Ross	See manufacturer's address	Rheinau, Germany, 9/20/2020	Martin Zimmer
First name, last name	Address	(Place and date of issuance)	(Legally binding signature) Managing Partner

21 Declaration of Conformity

In terms of the EC Directive 2014/30/EC on electromagnetic compatibility

Name and address of the manufacturer:

Zimmer GmbH

Im Salmenkopf 5
D-77866 Rheinau, Germany

+49 7844 9138 0

info@zimmer-group.de

www.zimmer-group.com

We hereby declare that the products described below

Product designation: 2-jaw parallel gripper, electric

Type designation: HRC-01/-02 series

conform 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 12100:2011-03 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 environments
- DIN EN 61000-6-2 EMC Generic standard, Immunity for industrial environments
- DIN EN 61000-6-4 EMC Generic standard, Emission standard for industrial environments

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

Authorized representative for the compilation of relevant technical documents

Kurt Ross	See manufacturer's address	Rheinau, Germany, 9/20/2020	Martin Zimmer
First name, last name	Address	(Place and date of issuance)	(Legally binding signature) Managing Partner