



INSTALLATION AND OPERATING INSTRUCTIONS

Collision protection
CRR series

DDOC01268

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 the 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 for people 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 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

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 fitted to industrial machines and is used to hold, transport and store workpieces.

- 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 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.
- ▶ When commissioning or testing, make sure that the product cannot be unintentionally activated.
- ▶ Do not reach into the operational range of the product.
- ▶ Always perform maintenance at the required intervals.
- ▶ When using the product under extreme conditions, adjust the maintenance interval according to the degree of contamination.
- ▶ Perform maintenance tasks, retrofitting or attachment work outside of the machine's danger zone when possible.

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

NOTICE



- ▶ Do not place a long-term load on the product by purposely deflecting it!

The product is intended exclusively for detecting a collision of the components and/or tools connected to it and compensating for the resulting collision forces.

The product is designed exclusively for operation within the parameter limits and operating conditions stipulated in the order confirmation.

Use outside of the defined parameters is not permitted.

Unauthorized electrical or mechanical modifications must not be made.

The product is not suitable for operation with operating media other than compressed air.

The product is not suitable for use as an active compensation module.

Direct contact with perishable goods/food is not permitted.

4 Personnel qualification

Installation, commissioning and maintenance may only be performed by trained specialists. These persons must have read and understood the installation and operating instructions in full.

5 Product description

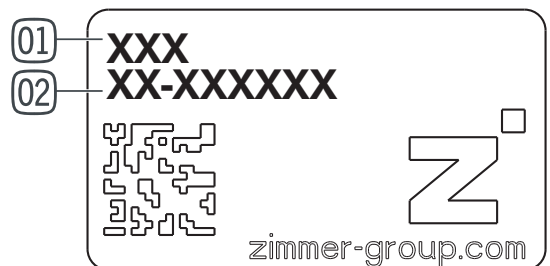
5.1 Type plate

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

The article number and the confirmation number are shown on the type plate.

① Article number

② Confirmation number



6 Functional description

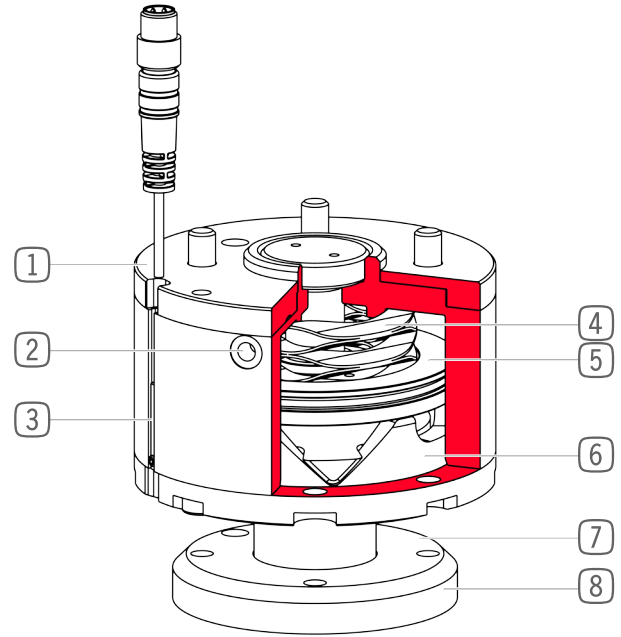
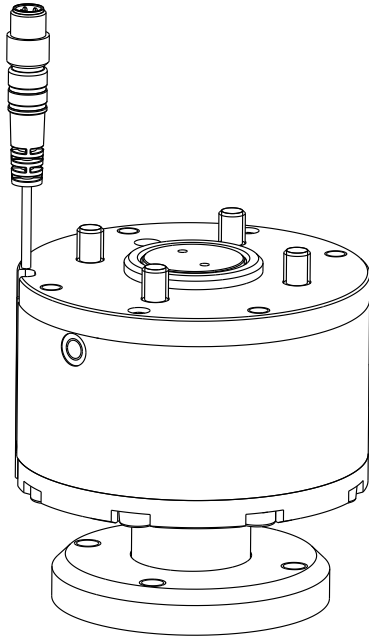
The product prevents machine damage during robot applications and serves as the connecting link between the robot and customer-specific application.

The piston is moved into its home position by filling the internal pneumatic cylinder. It can be pressed out of this position by external forces. The air is conveyed out of the system via the pneumatic connection. Three operation modes are available here for selection (see „Betriebsmodi“).

The pressure drop inside the pneumatic cylinder actuates the magnetic field sensor.

The signal from the magnetic field sensor can be used as an EMERGENCY STOP signal for the machine.

After activation, the compensating flange is put into home position automatically.



- ① Robot flange
- ② Power supply
- ③ Sensors
- ④ Drive

- ⑤ Force transmission
- ⑥ Return ring
- ⑦ Compensating flange (overload detection)
- ⑧

6.1 Operation modes

Operation mode a

Recommended operation mode: The air supply line remains open and is pressurized. In case of collision, the configured operating pressure is always present and the collision forces remain almost constant.

The connected customer-specific application remains in place at the collision point.

The valve position **a** is used both to set the operating pressure and for the rest of operation.

Operation mode b

In case of collision, the collision protection is depressurized by the pilot valve. The air can escape from the inside of the collision protection into the environment. The collision forces drop automatically to a minimum that is limited by the force of the integrated spring.

The connected customer-specific application is suspended on the collision protection with virtually no force (see CSR series).

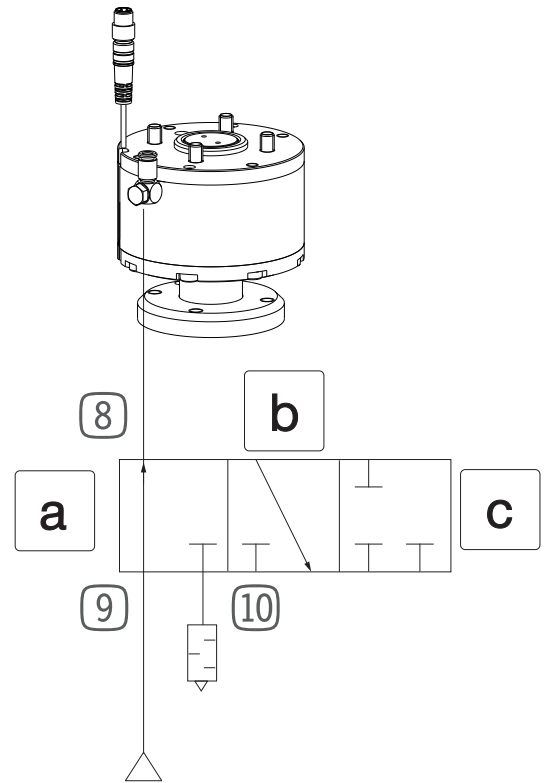
The valve position **a** is maintained in operation and switched to valve position **b** in case of a collision.

Operation mode c

This operation mode is not recommended.

The air supply line is completely blocked during operation (for example by an upstream check valve). The pressure in the chamber increases in case of collision and the collision force increases.

After setting the desired operating pressure, the valve position **c** must be configured on the pilot valve.



Compressed air source in accordance with EN ISO 8573-1

- ⑧ Compressed air line of the collision protection
- ⑨ Compressed air source
- ⑩ Silencer

7 Technical data

INFORMATION



- ▶ You can find information on our website.
- This data varies within the series, depending on the specific design.
- ▶ Please contact Zimmer Customer Service if you have any questions.

7.1 Forces and torques

INFORMATION



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

8 Accessories/scope of delivery

INFORMATION



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

9 Transportation/storage/preservation

- ▶ Transport and store the product only in the original packaging.
- ▶ During transport, make sure that no uncontrolled movements can occur if the product is already mounted on the higher-level machine unit.
 - ▶ Prior to commissioning and after transport, check all power and communication connections as well as all mechanical connections.
- ▶ Observe the following points when storing the product for longer periods of time:
 - ▶ Keep the storage location as dust-free and dry as possible.
 - ▶ Observe the temperature range and avoid temperature fluctuations.
 - ▶ Avoid wind, drafts and formation of condensation.
 - ▶ Cover the product with a weatherproof, tear-resistant foil to prevent dust.
 - ▶ Avoid direct sunlight.
- ▶ Clean all components until all contamination has been removed.
- ▶ Visually inspect all components.
- ▶ Remove and foreign objects.
- ▶ Remove potential corrosion spots properly.
- ▶ Seal electrical connections using suitable covers.

10 Installation

WARNING



Risk of injury due to uncontrolled movement

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

- ▶ Switch off the power supply of the machine before all 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 movement

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 product before all work.
- ▶ Secure the power supply against being switched on unintentionally.
- ▶ Check the product for any residual energy that may be present.

NOTICE



- ▶ Installation may only be carried out by qualified personnel in accordance with these installation and operating instructions.
- ▶ Switch off the power supply before any assembly, installation or maintenance work.

- ▶ Install the product on an appropriate mounting surface in accordance with the flatness specifications.

INFORMATION



Requirements for the mounting surface:

- Permissible unevenness: 0.03 mm

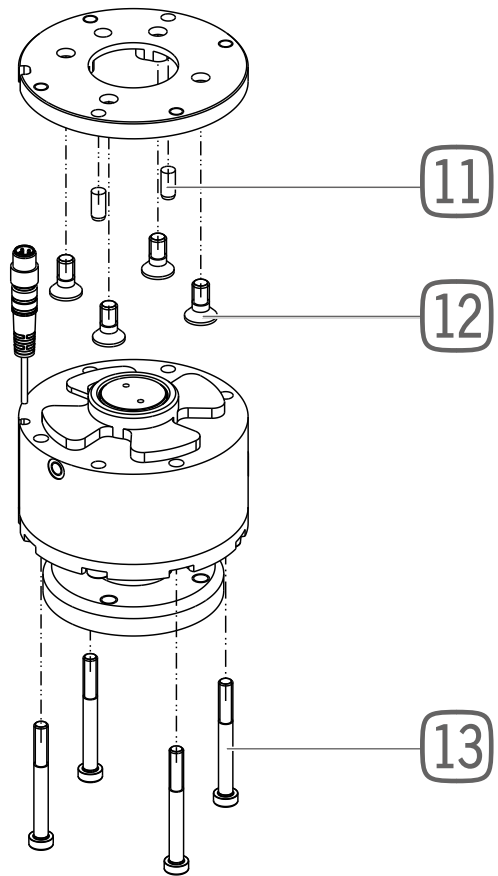
Further installation information:

- Strength class of the mounting screws is at least 10.9 (DIN EN ISO 4762)
- Tightening torque of the mounting screws: 13.7 Nm

- ▶ Comply with the tightening torques of the mounting screws.
- ▶ Verify the permitted load capacity of the required screw connections in accordance with VDI 2230.
- ▶ You can find the exact installation positions in the technical data sheet on our website.

10.1 Installing the product on the robot

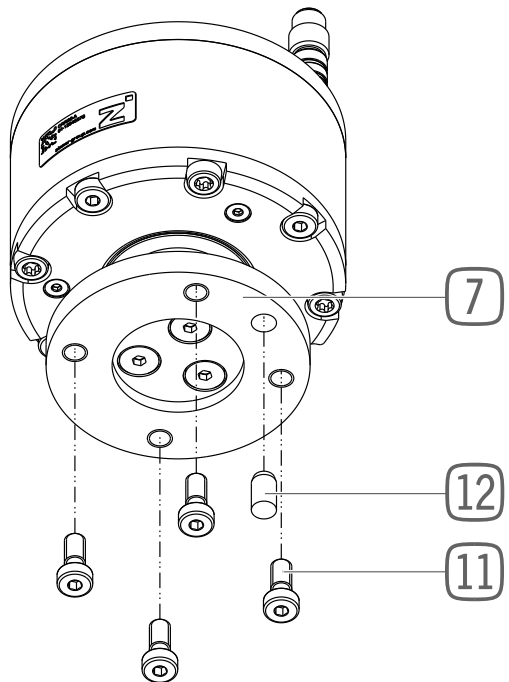
- ▶ Remove the adapter plate from the collision protection.
- ▶ Position the adapter plate on the robot arm with the straight pin.
- ▶ Install the adapter plate on the robot with mounting screws of strength class 10.9.
- ▶ Reinstall the collision protection on the adapter plate with the mounting screws.



- ⑪ Straight pin
- ⑫ Mounting screws of strength class 10.9
- ⑬ Mounting screws

10.2 Installing the product on the customer-specific application

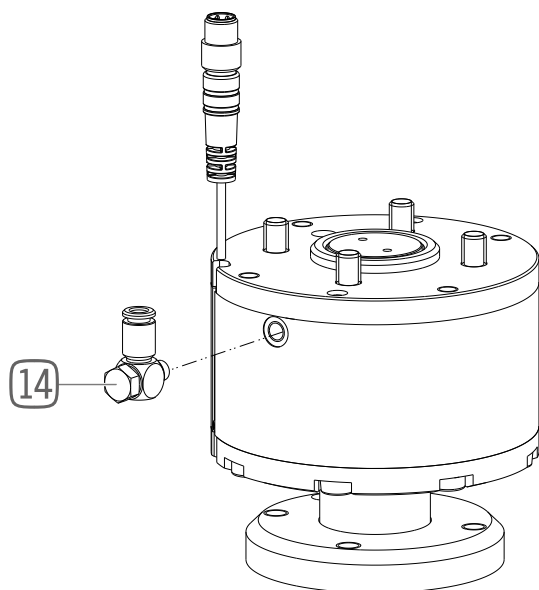
- ▶ Before installing the customer-specific application, check whether its weight and dimensions are suitable for the selected collision protection.
- ▶ Position the customer-specific application on the connecting flange with the straight pin.
- ▶ Install the customer-specific application with cylinder screws of strength class 10.9.



- ⑦ Connecting flange
- ⑪ Mounting screws of strength class 10.9
- ⑫ Straight pin

10.3 Installing the energy supply

- ▶ Insert the screw fitting into the provided connection.



14 Screw fitting

10.4 Installing the sensors

The magnetic field sensor generates a signal that can be evaluated to detect an overload. This can be used to initiate an automatic emergency-stop on the system.

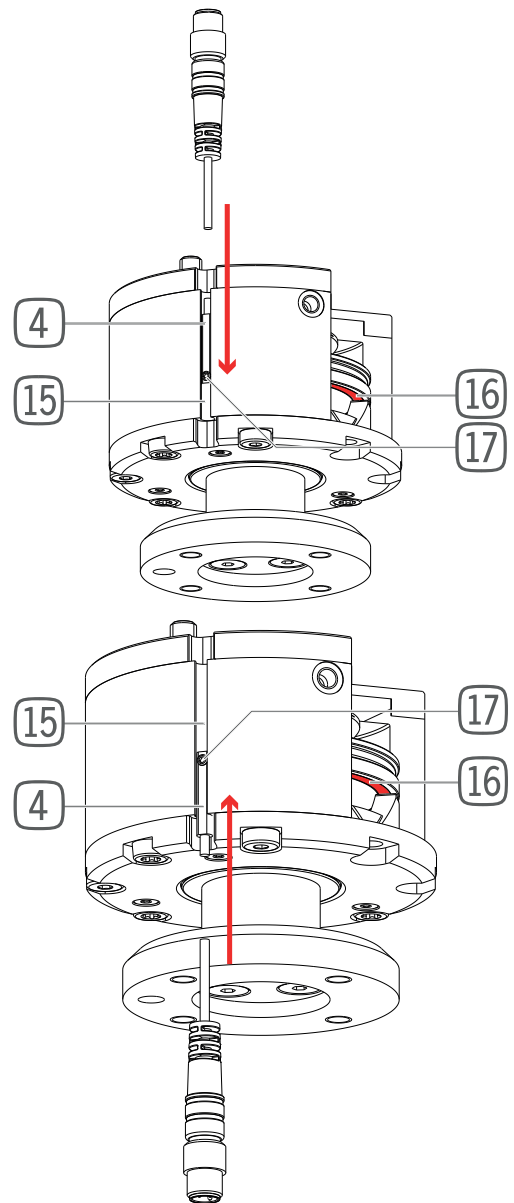
- ▶ Insert the magnetic field sensor into the groove.

From top to bottom:

- ▶ Insert the magnetic field sensor into the groove until it almost loses its signal.
- ▶ Push the magnetic field sensor past the magnet.

From bottom to top:

- ▶ Insert the magnetic field sensor into the groove until it just barely emits a signal.
- ▶ Push the magnetic field sensor up to the magnet.
- ▶ Do not push the magnetic field sensor past the magnet.
- ▶ Clamp the magnetic field sensor with the screw with a maximum torque of 0.8 Nm.
- ▶ Connect the cable.



- ④ Magnetic field sensor
- ⑮ Groove
- ⑯ Magnet
- ⑰ Screw

10.5 Installing accessories

NOTE



- ▶ Before installing the accessories, check whether they are suitable for using the selected variant.
- ▶ You can find information on our website.
- ▶ Please contact Zimmer Customer Service if you have any questions.

11 Maintenance

WARNING



Risk of injury from sharp-edged contours

Crushing and shearing injuries can result from sharp-edged contours, particularly in the area between flange and housing.



▶ Wear suitable protective equipment.

CAUTION



Material damage resulting from blowing out with compressed air

▶ Never purge the product with compressed air.

CAUTION



Material damage caused by liquid and solvent-based cleaners

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

Operation of the product is maintenance-free.

The maintenance interval may be shortened under the following circumstances:

- Operation with compressed air that does not comply with DIN ISO 8573-1 [2:4:1]
 - Dirty environment
 - Improper use and use that does not comply with the performance data
 - Ambient temperature is too high
 - ▶ Despite the maintenance-free performance mentioned, visually check the product regularly for corrosion, damage and dirt.
 - ▶ Have maintenance work be performed by Zimmer Customer Service whenever possible.
- ⇒ Dismantling and reassembling the product without authorization may result in complications, as special installation equipment is required in some cases. Zimmer GmbH accepts no liability for any resulting malfunctions or damage.

12 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.

RoHS declaration

In terms of the EU Directive 2011/65/EU

Name and address of the manufacturer:

Zimmer GmbH

📍 Im Salmenkopf 5, 77866 Rheinau, Germany

☎ +49 7844 9138 0

🌐 www.zimmer-group.com

We hereby declare that the incomplete machine described below

Product designation: Collision protection

Type designation: CRR series

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

Michael Hoch

Authorized representative for
compiling the relevant technical
documents

Rheinau, Germany, 2020-09-20

(Place and date of issuance)



Martin Zimmer
(Legally binding signature)
Managing Partner

REACH declaration

In terms of the EC Regulation 1907/2006

Name and address of the manufacturer:

Zimmer GmbH

📍 Im Salmenkopf 5, 77866 Rheinau, Germany

☎ +49 7844 9138 0

🌐 www.zimmer-group.com

REACH stands for **R**egistration, **E**valuation, **A**uthorisation and **R**estriction of **C**hemicals.

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").

Michael Hoch

Authorized representative for
compiling the relevant technical
documents

Rheinau, Germany, 2020-09-20

(Place and date of issuance)



Martin Zimmer
(Legally binding signature)
Managing Partner

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, 77866 Rheinau, Germany

☎ +49 7844 9138 0

🌐 www.zimmer-group.com

We hereby declare that the incomplete machines described below

Product designation: Collision protection

Type designation: CRR series

conform to the requirements of the Machinery Directive, 2006/42/EC, Article 2g, Annex VIII B – Annex IIB, in their design and the version we put on the market.

Basic health and safety requirements:

No. 1.1.2., No. 1.1.3., No. 1.1.5., No. 1.3.2., No. 1.3.4., No. 1.3.7., No. 1.5.3., No. 1.5.4., No. 1.5.8., No. 1.6.4., No. 1.7.1., No. 1.7.4.

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 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.

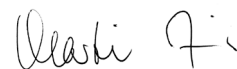
The incomplete machine may only be commissioned if it has been ascertained, if applicable, that the machine or system in which the incomplete machine is to be installed satisfies the requirements of Directive 2006/42/EC on Machinery and an EC Declaration of Conformity has been drawn up in accordance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

Kurt Ross

 Authorized representative for
 compiling the relevant technical
 documents

Rheinau, Germany, 2021-08-01

 (Place and date of issuance)



 Martin Zimmer
 (Legally binding signature)
 Managing Partner

