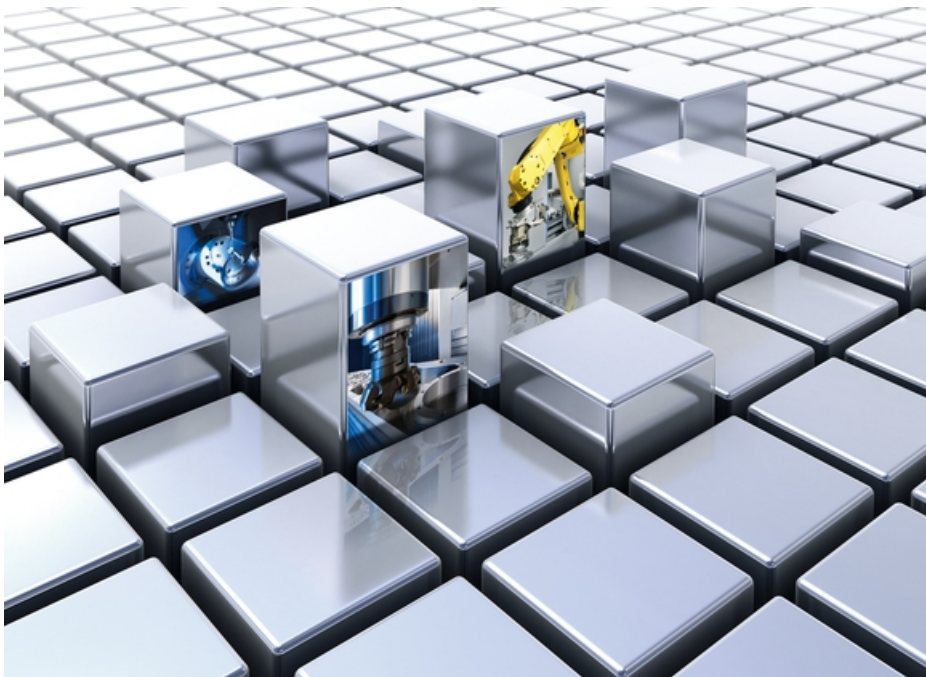


## Technical requirements specification CHIRON Group SE



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CHIRON Group SE  
Kreuzstraße 75  
78532 Tuttlingen  
Telephone: +49 7461 940-0  
Fax: +49 7461 940-53000  
Email: [info@chiron-group.com](mailto:info@chiron-group.com)  
Internet: [www.chiron-group.com](http://www.chiron-group.com)

Translation of the original

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# 1 General part (overall)

## 1.1 General part

### 1.1.1 Foreword

The creator of this document is **CHIRON Group SE**.

The contact partner of the **CHIRON Group SE** is the corresponding specialist department, such as Automation, Research & Development, Commissioned Design, or the person responsible for the project (referred to as **CHIRON Group SE** or **CHIRON** in the following).

This document describes the specifications required by **CHIRON Group SE** for the procurement, execution and scope of performance of components, working materials, automation and machine systems (hereinafter referred to as the **object of the order**).

These technical specifications are intended to support the manufacturer or supplier (hereinafter referred to as the **Contractor**) in the preparation of offers.

In principle, suggestions for improvement or savings are received with interest. If such suggestions are available, they can be submitted to the corresponding specialist department of **CHIRON Group SE**.

### 1.1.2 Validity and scope

The specification document valid at the time of the award of the contract is binding for the contractor. If deviations to individual points are necessary, this must be approved in writing by the responsible specialist department of **CHIRON Group SE**. The deviations become part of the contract in the case of an order.

Verbal agreements are not valid. Applying the deviation to other orders is excluded.

Customer-specific requirements documents have priority.

The document is subject to the revision service, therefore the contractor is obliged to request the latest version of the technical specifications.

The current version of the technical specifications is available on the website <https://chiron-group.com/downloads>.

### 1.1.3 Copyright protection

This document is copyright-protected.

Its use is only permitted within the scope of order processing. Any use going beyond this is not allowed without written permission from **CHIRON Group SE**.

All rights, also those of the translation, reprinting, presentation, extraction of figures and tables and the duplication of the document or parts of it remain reserved by **CHIRON Group SE**.

No part of the document may be reproduced or processed, duplicated, distributed or passed on using electronic systems in any form without the written permission of **CHIRON Group SE**.

## 1.1.4 Order processing

If the contractor realises that contractually agreed services cannot be provided, or can only be provided to a limited extent, **CHIRON Group SE** must be informed immediately in order to jointly develop a mutual, acceptable solution.

## 1.1.5 Applicable documents

- **CHIRON Group SE** preference list, parts and components
- Terms and Conditions of Purchase of the **CHIRON Group SE**, Tuttlingen
- Confidentiality Agreement of the **CHIRON Group SE**, Tuttlingen
- **CHIRON Group SE** implementation regulations for technical documentation, Doc ID 10182
- VDW Validation support according to ISO13849-2:2012 for suppliers (version from May 11, 2021), Doc ID 59132

## 1.2 Directives, standards and safety

### 1.2.1 Laws, standards, regulations, directives, ordinances

Requirements not expressly listed in this technical specification, but applicable to the object of the order, must also be observed.

Applicable legal, international and national requirements in the currently valid version, without claim to completeness:

- Product Safety Act [ProdSG]
- 9. Product Safety Ordinance [ProdSV] (in conjunction with Directive 2006/42/EC [Machinery Directive])
- Directive 2006/42/EC [Machinery Directive] until 19.01.2027
- Regulation (EU) 2023/1230 [Machinery Regulation], as of 20.01.2027
- Directive 2014/30/EU [EMC Directive]
- Directive 2011/65/EU [RoHS Directive]
- Regulation (EC) No 1907/2006 [REACH Regulation]
- Regulation (EU) 2017/821 [Conflict Minerals Regulation]
- Regulation (EU) 2024/2847 [Cyber Resilience Act, CRA]
- Other applicable EU directives and regulations
- Laws and legal regulations
- Technical and other standards

## General part (overall)

Directives, standards and safety > Incomplete machine or machine system

- Generally accepted rules and state of the art, which serve to protect humans, animals, the environment and buildings and systems from damage.
- Country specific regulations and requirements of the installation site

### 1.2.2 Normative references

Applicable standards in the currently valid version, without claim to completeness:

- EN ISO 12100  
Safety of machinery; Basic terms, general principles for design, risk assessment and risk reduction
- EN 60204-1, VDE 0113-1  
Safety of machinery - Electrical equipment of machines - Part 1: General requirements
- EN ISO 13849-1  
Safety of machinery - Safety related parts of control systems - Part 1: General principles for design
- EN ISO 13849-2  
Safety of machinery - Safety related parts of control systems - Part 2: Validation

Other safety standards and regulations in accordance with the risk assessment and legal requirements.

### 1.2.3 Complete machine or machine system

For a complete machine or machine system, the contractor must issue an **EC declaration of conformity** in accordance with the directive 2006/42/EC, Annex II, 1 A or Regulation (EU) 2023/1230, Annex V, Part A.

This also applies to the labelling obligation according to other EU directives.

The standards applied must be listed in the EC Declaration of Conformity.

### 1.2.4 Incomplete machine or machine system

The delivery of an incomplete machine or machine system must be agreed upon with **CHIRON Group SE** before placing the order.

For a partly completed machine or machine system, the contractor must issue a **Declaration for the incorporation of a partly completed machine** in accordance with the directive 2006/42/EC, Annex II, 1 B or Regulation (EU) 2023/1230, Annex V, Part B.

The described interfaces must comply with the essential health and safety requirements of the directive 2006/42/EC or Regulation (EU) 2023/1230.

### 1.2.5 Total of machines

In the case of a totality of machines (concatenation of machines, machinery and automation – also old systems), which are linked to one another with regard to function, control and safety, it must be recorded in writing when the contract is awarded who has to carry out the conformity assessment for the totality of machines. The full scope must be set out in the **EC declaration of conformity**.

### 1.2.6 Risk assessment

Upon request, the risk assessment shall be submitted to **CHIRON Group SE** for inspection; this also applies to risk assessments of sub-suppliers of the contractor.

### 1.2.7 Functional safety

#### Safety functions

The requirements for the safety of the controls must be implemented according to the currently applicable standards EN ISO 13849-1 and EN ISO 13849-2.

The achieved performance level ( $PL_{\text{target}} - PL_{\text{actual}}$ ) of the implemented safety functions shall be documented and presented on request (e.g., the SISTEMA file).

#### Safety-related components

The safety-relevant components shall be listed in an overview together with the safety-related characteristic values.

Examples for safety-related characteristic values:

- $B10_D$
- $MTTF_D$
- PL
- PFH

Safety-relevant components are to be designed for **20 years**.

Components which do not reach this service life must be coordinated with **CHIRON Group SE**.

Upon approval, these components must be identified separately with their expected replacement interval in the documentation.

### 1.2.8 Lag time determination

Two-hand controls or contactless protective mechanisms (AOPD) must be designed in accordance with the current EN ISO 13855.

## General part (overall)

Documentation > Requirements also applicable and normative references

When designing the mechanical elements that are controlled by **CHIRON Group SE**, a control reaction time of 0.05 s for processing the signals must be taken into account.

### 1.2.9 Energy efficiency and sustainability

The overall design and execution of the object of the order must be energy efficient, environmentally friendly, ecological and CO<sub>2</sub>-neutral.

Examples:

- Shut-off strategies in partial-load operation or wait state (short-term standstill)
- Long-term shutdown (for example, at the weekend)
- Design low compressed air and hydraulic energy consumption
- Use of corresponding hardware (e.g. pumps, motors with IE3 or higher)

Connection values for energy and media supply (electrical connection value, electricity, compressed air) as well as the consumption of operating and auxiliary materials for regular operation, partial load operation and standby mode must be specified.

## 1.3 Documentation

### 1.3.1 General requirements

The documentation is an essential part of the order and proof of conformity with existing laws and guidelines.

The complete delivery is an integral part of and a prerequisite for final acceptance.

### 1.3.2 Country specific documentation

In accordance with Directive 2006/42/EC (Machinery Directive) or Regulation (EU) 2023/1230 (Machinery Regulation), the contractor shall always provide the documentation in German and in the local language of the installation site.

The translation reaches over the entire documentation.

### 1.3.3 Requirements also applicable and normative references

#### Execution Documentation

Requirements also applicable and standards in the currently valid version, without claim to completeness:

- EN 82079-1, VDE 0039-1  
Preparation of instructions for use – Structuring, content and presentation  
Part 1: General principles and detailed requirements
- **CHIRON Group SE** document ID10182  
**CHIRON Group SE** implementation regulations for technical documentation
- Directive 2006/42/EC (until 19.01.2027)  
Specifications and scope of the technical documentation in accordance with Directive 2006/42/EC
  - For complete machinery and installations (Annex VII, Section A)
  - For partly completed machinery and installations (Annex VII, Section B)
- Regulation (EU) 2023/1230 (as of 20.01.2027)  
Specifications and scope of the technical documentation in accordance with regulation (EU) 2023/1230
  - For complete machinery and installations (Annex VI, Part A)
  - For partly completed machinery and installations (Annex VI, Part B)

### 1.3.4 Data exchange

Small amounts of data up to 10 MB can be transmitted via e-mail to **CHIRON Group SE**. Larger amounts of data or confidential data is exchanged via the "Cryptshare" application at <https://data.chiron.de>.

### 1.3.5 Software

The software's structure should be clear and modular, in accordance with currently applicable standards.

- IEC 61131-3  
Programmable controllers - Part 3: Programming languages

#### Scope of delivery Software Documentation

- NC program description
- PLC program description
- Allocation lists
- Parameter lists
- Machine data list
- List of alarms with the cause, effect and remedy
- Backup data carriers for recommissioning
- Software requiring license (if required)

## General part (overall)

Documentation > Identification of the replacement and wear parts

### 1.3.6 Technical design documents

Design documents must be prepared in accordance with the applicable guidelines and standards.

**CHIRON Group SE** can view individual design documents on request before the beginning of installation.

If design documents are submitted for approval, this only concerns the design principle. It does not release the contractor from the responsibility for appropriate and state-of-the-art design.

#### Scope of delivery of the technical documentation

- Electrical and pneumatic connection data
- Circuit diagram (incl. control cabinet layout)
- Fluid diagrams
- Construction drawings
- Complete sectional drawings
- Installation plans
- Device manuals
- Data sheets for the installed components
- Test protocols
- Setting parameters (e.g. pressures, flow rates, parameter lists of electrical systems)

### 1.3.7 Piece lists

All electrical, fluid and mechanical components are to be documented in piece lists.

Component subject to export licensing must be marked and identified separately. The corresponding documents are to be supplied.

In the event of wear and replacement parts, ordering data with manufacturer information is to be provided.

#### Scope of delivery for parts lists (electrics, fluidics, mechanics)

- Parts lists of all installed components
- Wear parts lists
- Replacement parts lists

### 1.3.8 Identification of the replacement and wear parts

After successful final acceptance, the replacement and wear parts lists must be submitted within four weeks.

Replacement and wear parts are identified by the respective piece list item of the assembly and is to be coordinated with **CHIRON Group SE**.

#### Identification and identification numbers

- 0 : No replacement part
- 1: Wear part
- 2 : Spare part

- 3: Additional replacement part
- 4: Metric DIN part

## Examples (identification number 1)

- Sealing elements, e.g. O-rings, quad rings, sliding elements, guide elements
- Collet chucks, spacers, driving tenons, springs, wipers on guide rails, gripper claws, toothed belts, plastic inserts
- Shock absorbers, proximity switches, lamps, batteries
- Filter elements (pneumatics, hydraulics, coolant, cooling system)

## Examples (identification number 2)

- Grippers, gripper arms, levers, pockets, magazine chains, bolts, circlips
- Oscillating or rotating components or adjacent parts, assuming they are subject to wear  
torsion stops, articulated levers, sliding bearings, roller bearings, curved pieces, guide and clamping bushes, for example
- Cylinders (pneumatic, hydraulic)
- Valves (pneumatics, hydraulics, coolant), accessory parts, such as couplings, pressure transducers, support elements, screw fittings
- Electrical components, e.g. inductive, optoelectronic or electro-mechanical sensors, identification systems
- Clamping elements, e.g. swivel clamps, clamping chucks
- Components that are in contact with the workpiece, such as clamping jaws/claws and the pressure pieces installed here

## Examples (identification number 3)

- Components which are stocked by major customers, representatives or service support points, e.g. spindles, axis motors, spindle motors, ball screws, concertina guards, control components, electrical drive parts

## Examples (identification number 4)

- Fastening elements, such as screws, pins, nuts

## 1.4 Servicing, maintenance

### Documents for preventive servicing

- Servicing cycles in operating hours
- Work instruction and drawings for servicing
- Contact partner for preventive servicing

### Maintenance intervals

The maintenance interval must be observed in order to keep the entire system in optimum condition.

The maintenance intervals of the system components must be adapted to the maintenance intervals of **CHIRON Group SE**.

Deviations require the written permission of **CHIRON Group SE**.

**General part (overall)**

Acceptance > Factory acceptance

**CHIRON Group SE** provides for four maintenance intervals:

Tab. 1: Excerpt: Maintenance Intervals for CHIRON Group SE

Interval	Examples for typical maintenance work
24 h	<ul style="list-style-type: none"><li>■ Clean work area</li><li>■ Clean components in the work area</li></ul>
250 h	<ul style="list-style-type: none"><li>■ Clean Machine</li><li>■ Check the operating pressure</li><li>■ Check various components for damage</li><li>■ Visual inspection of machine components</li><li>■ Check battery charge levels of components</li></ul>
2000 h	<ul style="list-style-type: none"><li>■ Replace compressed air micro-filter</li><li>■ Inspect and clean ball screws and linear guides</li><li>■ Clean/replace various filters</li><li>■ Check cooling media</li><li>■ Lubrication guides</li></ul>
6000 h	<ul style="list-style-type: none"><li>■ Exchanging the rotary feed-through</li><li>■ Replace lubricating element attachments</li><li>■ Check hoses and lines</li><li>■ Emergency Stop function test</li><li>■ Carry out visual inspection on safety elements</li><li>■ Lamp test</li></ul>

## 1.5 Acceptance

### 1.5.1 Quality requirement

**CHIRON Group SE** is a VDA 6.4 certified manufacturer for high-quality machining centers and flexible manufacturing systems. The quality of the products is ensured by a modern and effective quality assurance system. The quality expertise of the contractor is therefore taken into account when awarding the contract.

When awarding the contract, the quality competence of the contractor is therefore taken into account. Therefore, the contractor is regularly inspected after one or more contracts have been awarded to ensure that the quality requirements are met.

### 1.5.2 Factory acceptance

#### At the contractor site

**CHIRON Group SE** reserves the possibility of factory acceptance of the object of the contract at the Contractor in consultation with the Contractor. The defects found in the process must be remedied by the time the object of the contract is delivered. Deviations require written approval by **CHIRON Group SE**

### **At CHIRON Group SE**

The factory acceptance at **CHIRON Group SE** takes place after integrating the ordered object in coordination with the contractor. If the contractual agreements are not fulfilled at the factory acceptance, this will be repeated. Any costs involved with this are borne by the contractor.

### **Function verification**

If the function, system and process capability of the ordered object is verified according to the task, it is considered accepted; this must be documented in writing.

The factory acceptance of the ordered object does not represent the final acceptance.

### **1.5.3 Set-up and commissioning**

Set-up, installation, alignment and commissioning of the ordered object are done according to the respective contractual agreements and are to be coordinated with **CHIRON Group SE**.

### **1.5.4 Final acceptance**

After fulfilment of the contractual agreements from the corresponding specifications, the final acceptance takes place in coordination with the end customer.

The result of the final inspection must be documented in writing.

## Electrical system (overall)

### Components

## 2 Electrical system (overall)

### 2.1 Electrical equipment

At the time of acceptance, the electrical equipment, design and installation must comply with the relevant standards, the state of the art, the requirements of safety regulations and country-specific regulations in the currently valid version.

The specifications of EN 60204-1 (VDE 0113-1) must be observed.

#### Control cabinet cooling

The system must remain fully functional at an outside temperature of 15°C to 40°C.

If necessary, control cabinet cooling must be provided.

#### Control cabinet socket

A socket for service work must be provided inside the control cabinet.

#### Name plate

The nameplate must be made of metal and is to be fastened with rivets near the main switch.

The information must comply with Directive 2006/42/EC or Regulation (EU) 2023/1230 and the requirements of EN 60204-1 (VDE 0113-1).

#### Tests

Prior to handover to **CHIRON Group SE**, the inspections shall be carried out accordingly of EN 60204-1 (VDE 0113-1) "Electrical equipment of machinery". The test reports must also be supplied.

### 2.2 Components

Components may only be installed in their original condition without modifications. The manufacturer's specifications must be observed.

Customer-specific requirements for components have priority. Otherwise parts and components from the **CHIRON Group SE** preference list must be used.

#### Exceptional permission

Exceptional permissions for individual components must be approved in writing by **CHIRON Group SE**.

#### Components which require testing

Components that are subject to an inspection obligation must be provided with the corresponding inspection deadlines and listed in an overview list.

---

## 2.3 Main connection and voltages

### Connection data

The connection data (supply voltage, frequency, etc.) and the ambient conditions can be found in the order.

The connected load values (maximum power, rated current, pre-fuse) of the object of the order must be communicated to **CHIRON Group SE** prior to delivery.

### Main supply line

The main supply cable into the control cabinet is installed by the end customer.

The cable entry point for the supply cable at the control cabinet must be recognizable in the setup plan. This is to be done variably.

### Main disconnection device

The main disconnection device must be designed according to EN 60204-1 (VDE 0113-1):

- Mechanically actuated
- Lockable in "OFF" position

The connection can be made directly or on terminals before the mains disconnection device.

The terminals are to be labelled as follows:

- L1, L2, L3, N, PE
- Warning sign:  
**"Dangerous electrical charges even when mains disconnection device is switched off!"**

### Control voltage

The control voltage is 24 VDC.

## 2.4 Electrical installation spaces

The design of electrical installation spaces (control cabinet, operating panel, small housing) must comply with the rules of technology and the requirements of the relevant standards.

The specifications of EN 60204-1 (VDE 0113-1) must be observed.

### Requirements

The size, arrangement and colouring of the control cabinet must be coordinated with **CHIRON Group SE**.

The protection class of the control cabinet must be at least IP54.

Free-standing control cabinets must be provided with transport lugs.

Inside the control cabinet, a document tray must be provided for the storage of plans and storage media.

Closures of electrical installation spaces must have locks with a double-bit design.

Small housings made of plastic are not allowed.

## **Electrical system (overall)**

### *Electro-technical installation*

Open threaded bores must be sealed with screw plugs.

Sealing screw connections for cable entries are to be designed in oil-resistant design and must not be mounted going upwards.

**Only electrical components** may be installed in electrical installation spaces.

Attachments to doors and side walls are not permissible; exceptions are devices for cooling the control cabinet.

Installed devices must be replaceable without having to dismantle other parts.

Electrical installation spaces and mounting plates with electrical components must always be earthed.

Electrical installation spaces must be permanently marked with a warning sign according to EN 60204-1 (VDE 0113-1).

Heat generation and heat sensitivity of the installed components must be taken into account when designing the control cabinet.

## **2.5 Electro-technical installation**

An EMC-compliant design, installation and installation must be observed.

Electrical interfaces of individual systems must be designed and marked in a plug-in manner.

It is not permitted to remove plugs for shipping or installation of the system.

### **Protection against contamination**

Plugs are to be installed in such a way that no liquid can penetrate.

To prevent the penetration of foreign objects in plug connectors, blind plugs must be included in delivery.

### **Lines and cables**

Round plug connectors may only be tightened with the provided special tools.

Lines should be designed in PUR or be suitable for towing.

Lines are to be routed using cable mountings.

Connection lines between the individual systems must be laid in suitable, oil-resistant hoses, cable trays or sheet-metal ducts to mechanically protect them.

Lines in the chip area are to be protected by steel mesh hoses with a PUR interior or with non-rusting sheet-metal ducts.

Connection lines of analogue switches, motors and encoder systems must be shielded and earthed accordingly.

Lines, cables and individual wires must be permanently labelled at both ends with source and destination.

Outgoing control lines must be routed to terminal strips, installation distributors or plug systems.

Only one line may be connected to terminal connections of terminal blocks.

Terminals and plugs are to be permanently labelled. Make sure there is agreement with the circuit diagram.

Unused wires in multi-wire lines are to be connected to terminals on both sides.

Ferrules for multi-wire connections are to be used. Push-in technology is to be preferred.

## Cable installation

Shielded lines must be used for the following components:

- Motors
- Measuring and encoder systems
- Bus systems
- Analog or other components susceptible to interference

## Wire colours

Specified wire colours for single wire wiring in accordance with EN 60204-1 (VDE 0113-1):

- Green/yellow: Ground wire
- Black: Main circuits, AC and DC current
- Red: Control circuits, AC current
- Light blue: Neutral conductor
- Blue: Control circuits, DC current (24 V DC)  
Exception: DC current with load supplies with voltages greater than 24 V -> black.
- White/blue: Control circuits, DC current (0 V DC)
- Orange: Live circuits which are not switched off by the main switch (external voltage).  
These must be marked orange over their entire length (e.g. orange protective tube, single wires with orange insulation), except for the protective conductor (green/yellow) and neutral conductor (light blue).

## 2.6 Operating equipment labeling

Operating equipment is labeled according to EN 81346-2.

Components within electrical installation spaces must be permanently legibly marked at the installation location and on the component.

Components outside of electrical installation spaces must be permanently and undetachably (engraved or lasered) marked at the installation location and on the connection cable.

Concealed devices are to be additionally labeled on the coverings.

The conformity of the marking of the components with the circuit diagram must be ensured.

## 2.7 Protective measures

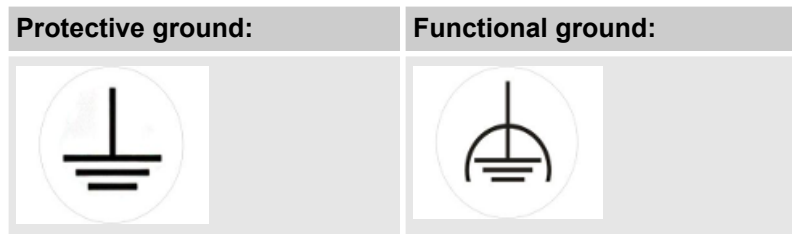
Attachment of warning signs for electrical voltage according to EN 60204-1 (VDE 0113-1).

The shielding of signal and analog lines must be carried out close to the corresponding devices. It must not be used as an equipotential bonding.

Protective conductors must be connected individually and marked with source and destination.

Equipotential bonding is to be consolidated at a central location. Design according to the current EMC directive.

Protective and functional earthing must be distinguished and marked according to EN60204-1 (VDE 0113-1).



DC voltage consumers with a load > 2 A must not be connected to control circuits and are to be protected with suitable fuses.

Transformers must be protected with motor protection switches on the primary side and with circuit breakers on the secondary side.

No safety fuses may be used to protect the current circuits.

After failure of the mains voltage and voltage return, no **"automatic restart"** may be initiated.

## 2.8 Safety equipment

Safety devices must be designed in such a way that they cannot be bypassed easily.

### Safety switch

Safety switches of safety doors, safety fences and other safeguards of danger points or danger areas must be wired 2-channel to safety relays or integrated safety technology with 24 VDC.

### EMERGENCY STOP

The EMERGENCY STOP must be implemented as 2-channel and wired to safety relays or integrated safety technology with 24 VDC.

In the event of an EMERGENCY STOP, every axis or movement is to be braked as quickly as possible. Drives must not run/coast down, but must be shut down by means of appropriate measures.

Emergency Stop command units must supplement other protective measures and not take their place.

The following points must be agreed with **CHIRON Group SE**:

- Emergency Stop concept for mode of operation of the Emergency Stop mechanism
- System parts which are shut down with Emergency Stop
- Number and installation location of EMERGENCY STOP devices

## 3 Mechanical and fluidic (overall)

### 3.1 Mechanical and fluidic equipment

At the time of acceptance, the mechanical and fluidic equipment, design and installation must comply with the relevant standards, the state of the art, the requirements of safety regulations and country-specific regulations in the currently valid version.

The construction must be designed safely in accordance with the specifications of EN ISO 12100.

The fluidics (pneumatics, hydraulics) must be implemented safely in accordance with EN ISO 4413 and EN ISO 4414.

### 3.2 Components

Components may only be installed in their original condition without modifications. The manufacturer's specifications must be observed.

Customer-specific requirements for components have priority, otherwise parts and components from the **CHIRON Group SE** preference list must be used.

#### Exceptional permission

Exemptions for individual components require the written approval of **CHIRON Group SE**.

#### Components which require testing

Components that are subject to mandatory testing must be provided with the corresponding testing period and listed in an overview list.

#### Precisions

The geometric accuracies of the components are to be designed such that smooth operation of the system is assured.

### 3.3 Drive technology

The drive technology of the object of the contract must be designed safely in accordance with the requirements of the project-related specifications.

The rated power of the motors must be designed according to the mechanical power requirement of the system.

Energy-efficient motors must always be used.

The cable routing must be selected and designed in accordance with EMC.

The motors must meet at least IP55 protection. Deviations are required the written approval of **CHIRON Group SE**. In the case of special applications, the degree of protection must be adapted to the corresponding operating environment.

For gravity-loaded axles, motors with built-in holding brakes or secure clamps must be used. Control measures against unintentional sinking due to gravity must be implemented.

Access must be designed to be service-friendly.

## Gravity-loaded axes

In the case of gravity-loaded or suspended axles, motors with a built-in holding brake or secure clamping must be used. Control measures against unintentional sinking due to gravity must be implemented.



### **Gravity loaded and suspended axes**

With gravity loaded and suspended axes there is a danger of unintentional lowering. Appropriate precautions must be taken against this.

We recommend FA Information Sheet No. 005 "Gravity loaded axes (vertical axes)" of the DGUV.

## 3.4 Mechanics and fluidics design

### Design

The design shall be easy to install and service.

Collection trays must be provided where liquids can leak. Cooling lubricants must not be allowed to escape or be carried away.

### Laying of fluidic lines/pipes

In the area of the plant, optimal protection for fluidic lines/pipes must be provided. The course of pipe/hose routes must be designed in such a way that external damage cannot occur.

- Use of cables and hoses suitable for cable towing
- Routing of hoses and electrical cables in separate webs
- No crossing of hoses and lines in the cable carrier
- Strain relief of hoses and lines
- Attention to the minimum static and dynamic bending radii of the manufacturers
- Observe EMC-compliant installation and distribution

### Collection trays

Components, assemblies and containers that transport or contain substances and media hazardous to water must be equipped with drip trays.

The Water Resources Act (WRA) applicable to the installation site must be taken into account for the design of the drip trays of the mechanical system.

### Label

The inscription of the mechanical and fluidic components must be lasered or engraved (permanently marked) and correspond to the designations in the respective scheme.

## 3.5 Fluidics

### General Fluidics

- Regardless of the types of energy available (e.g. electrics, pneumatics, hydraulics, etc.) may not change when the power supply is switched on or off, in case of power failure as well as energy return (unexpected or intentional) do not result in any danger. An unexpected attempt must be prevented.
- Mechanical movements caused by fluidics (pneumatics and hydraulics), intentional or unintentional (including the influences of accelerating, braking or lifting / stopping masses), must not lead to a personal hazard situation.
- The set system pressure of the individual fluidic components must be entered in the fluidic diagram.  
On pressure gauges, pressure gauge selectors and pressure switches, the pressures to be set and the designation of the fluidic component on a sign.
- If the system pressure falls below a permissible value, appropriate measures must be taken to switch off the power supply.
- For maintenance and repair work, all components and assemblies must be easily accessible and must not be obscured by pipe and hose lines or other components / assemblies.

### Line systems

Leaking liquid due to a burst line system must be prevented.

One solenoid valve each in the liquid-conducting supply and return lines is to be installed upstream of the system.

These solenoid valves must close when the system is shut off.

Pneumatic lines must be blue, all other fluidic lines black.

### Sensors, actuators

The control voltage for sensors and actuators is 24 VDC.

According to DIN EN 60529, sensors and actuators must have an overall protection class of at least IP 65 when installed.

The sensors and actuators must either be electrically connected with M12 size cube or round plugs or M8 for smaller sizes.

The cabling must be of the plug-in type.

Sensors and actuators must be equipped with a switching status display.

### Pneumatic system

- The pneumatics must be designed for a system pressure of 6 bar.
- Pressure monitoring must be provided. If there is no pressure drop, safe working, the plant must be shut down. Clamping forces must be maintained.
- Pneumatic controls must be equipped with a maintenance unit with shut-off valve or stopcock, pressure regulator, filter and pressure sensor. This must be installed at an easily accessible point on the machine.
- **Quick-release couplings for connecting the supply line to the maintenance unit are not permitted!**  
Quick-release couplings reduce the cross-section of the pressurized air supply lines and prevent the required flow rate.

- Pneumatic exhaust air openings must be equipped with silencers. Low-noise nozzles and screens must be used.
- The adjustable pressures must be easy to read via a pressure gauge or measuring point. On the pressure gauge, the minimum pressures must be marked with green markings and the maximum pressures with red markings.

### Hydraulic system

- The size of the hydraulic power unit must be chosen as compact as possible.
- A Provision shall be made for electrical temperature monitoring, level control and filter monitoring.
- Valves and installation method must be selected in such a way that the intended use, Adequate tightness and resistance to foreseeable mechanical and environmental influences is ensured. All components must be reliable within their specified values. work.
- The tightness of the hydraulic system must be guaranteed. Pipe and hose lines, screw connections and fastenings must be selected in accordance with the operating conditions.
- Pressure monitoring must be provided. If there is no pressure drop, safe working, the plant must be shut down. Clamping forces must be maintained.
- Hydraulic systems must be planned, designed and adjusted in such a way that pressure surges, vibrations and noise generation are kept to a minimum.

### Lubrication

- Maintenance-free elements must be used, if not possible, lubrication must be carried out as automatic, pressure-monitored central lubrication.
- Conical grease nipples in accordance with DIN 71412 must be used at manual lubrication points.
- Lubrication points and lubrication systems must be accessible for maintenance work and refillable during operation.
- No individual lubrication points are permitted on systems with automatic lubrication
- A lubrication plan with all lubrication points of the system must be installed in a suitable place in a clearly visible place.  
The execution of the lubrication plan must be language-neutral.

## 3.6 Mechanical installation spaces

The design of the mechanical installation chambers and housings must correspond to the state of the art.

The requirements from the corresponding valid standards must be implemented.

### Requirements

The closures of the mechanical installation spaces and housings are to be designed with square closure.

***Mechanical and fluidic (overall)***

*Mechanical installation spaces*

For maintenance and repair work, all components and assemblies must be easily accessible and must not be obscured by components or other assemblies.

It must be possible to replace installed components without dismantling other parts.

## 4 Machinery and automation (overall)



The ordered object is simply referred to as "system" in the following chapters.

### 4.1 Scope of services

- Development and implementation of the system and automation concept
- Coordination of the mechatronic interfaces to the machining centre, cycle times and document exchange with **CHIRON Group SE**
- Creation of documentation in accordance with **CHIRON Group SE** specifications.
- Assembly, commissioning of the system
- Factory acceptance
- Installation of the system at **CHIRON Group SE**
- Final acceptance
- Dismantling of the plant at **CHIRON Group SE**, reconstruction and commissioning at the end customer

### 4.2 Implementation

The following points must be agreed with **CHIRON Group SE**:

- Selection of servo motors and the control technology
- Hand-held operating unit (depends on control type and configuration of the overall system)
- System/automation concept
- EMERGENCY Stop concept
- Modifications/changes to the system or the automation concept

#### Interface

Communication between the system and the **CHIRON Group SE** machining center is carried out in accordance with the currently valid **CHIRON Group SE** documentation "**TR loader interface in general, interface for automation**", Doc ID 7355

The fieldbus type as well as the design of the interface, interface assignment or other interfaces between the system and the **CHIRON Group SE** machining center must be defined at the beginning of the project, coordinated with the relevant specialist department of **CHIRON Group SE** and approved in writing.

A fieldbus coupler for **PROFIBUS** or **PROFINET** can be integrated into **CHIRON Group SE** machining centers. The same fieldbus type must be used for other participants within the system. Deviating bus systems are only permitted after consultation and written approval.

The following Harting components are intended for the interface:

## Machinery and automation (overall)

### Process requirements

#### X103 (PROFIBUS)

- 16-pin mounting housing on the machining center:  
Harting Series 16 Nr. 09 30 016 0301 (bus signals)
- 16-pin feed-through housing for connecting cable:  
Harting Series 16 Nr. 09 30 016 0408 (bus signals)

#### X103 (PROFINET)

- Flange connection cable M12x1 - RJ45, Industrial Ethernet, at the machining center:  
ESCHA Coupling No. 8064025 (Ethernet bus signals)
- Ethernet connection cable from Automation:  
Length depends on the system, must be determined by the contractor (bus signals, Ethernet)

#### X104 (Hardware signal for automation)

- 24-pin mounting housing on the machining center:  
Harting Series 24 No. 09 30 024 0301 (hardware signal)
- 24-pin pin insert on the machining center:  
Harting Series 24 Nr. 09 33 024 4626 (hardware signal)
- 24-pin grommet housing for connecting cable:  
Harting Series 24 No. 19 30 024 1522 (hardware signal)
- 24-pin socket for connecting cable:  
Harting Series 24 Nr. 09 33 024 2701 (hardware signal)

#### X105 (Hardware signal by automation)

- 24-pin mounting housing on the machining center:  
Harting Series 24 No. 09 30 024 0301 (hardware signal)
- 24-pin beech insert on the machining center:  
Harting Series 24 Nr. 09 33 024 4726 (hardware signal)
- 24-pin grommet housing for connecting cable:  
Harting Series 24 No. 19 30 024 1522 (hardware signal)
- 24-pin pin insert for connecting cable:  
Harting Series 24 No. 09 33 024 2601 (hardware signal)

## 4.3 Process requirements

### Operating times

Unless otherwise agreed, the system is to be designed for the following operating hours:

- 365 workdays per year
- Three-shift operation (8 hours per shift)

### Cycle time

The cycle times of the system must be designed by the contractor in such a way that the cycle time of the machining centre is guaranteed. A cycle time reserve of 15-20% must be taken into account for possible later process optimization. In the event of deviations or unjustifiably high effort, **CHIRON Group SE** must be informed in order to jointly develop a solution that can be processed.

## Availability

The determination of the technical availability of the system is carried out in accordance with the VDI guideline 3423.

The technical availability of the system is to be guaranteed by the contractor with 95 % without shift limitation.

If the promised values are not achieved, how to further proceed will be determined in a shared meeting.

If the availability is greatly influenced by repeated malfunctions of individual components (latent defects) within the system, the warranty period will be extended by the time required to eliminate the malfunctions.

Required changes to the system as well as more extensive optimization and test phases will be charged to the contractor.

The following requirements must be taken into consideration and met by the **user** of the system:

- Exact compliance with all regulations from the operating instructions.
- Permissible machine use and preventive maintenance.
- Use of qualified personnel for operation, maintenance and programming.
- Identification of the cause of failure and time through conclusive documentation (e.g. PDA, printer, logbook, trace).

## 4.4 Name plate

The nameplate must be made of metal and is to be fastened with rivets near the main switch.

Specifications must correspond with Directive 2006/42/EC or Regulation (EU) 2023/1230 and EN 60204-1.

A sign with the manufacturer's specifications and the **CHIRON Group SE** project code must be attached to fences at a suitable location.

## 4.5 Emissions

### Collection tray

Media discharge (oils, cooling lubricants, other substances) from the system must be prevented by suitable design measures.

A collection tray must be installed between the system and machining center.

The collection tray is to be designed such that a negative gradient conducts the accumulating coolant into the collection tray of the system or that of the machining center.

Other collection systems are to be provided below the path of workpieces, workpiece carriers, other coolant-adhering components and any supports or portals; if necessary, use guide plates.

The collection trays, drip pans and guide plates are to be designed in such a way that no cooling lubricant can flow onto the hall floor and personnel.

Removal positions must be easily accessible.

## **Machinery and automation (overall)**

### *Malfunction and operation*

In the case of removable collection trays, pay attention to the maximum weight as well as to handling during removal. The tray should have handles, which are to be correctly fastened with regard to position and ergonomics. No coolant may emerge at the fastening.

If the system is set up in a collection tray, the fastening of the setup points must be taken into account. The design must be such that no coolant can penetrate into the ground.

In general, the corresponding national regulations and laws must be observed, particularly those of the Department of the Environment regarding collection tray requirements.

Drawings of the collection tray must be presented to **CHIRON Group SE**. The transport option, material, size and collection volume must be taken into account in the design.

Customer-specific requirements, such as negative gradients are to be observed.

### **Aerosol formation**

If blow-off takes place, e.g., in a separate station, the aerosol formation must be taken into account. Such cases are to be clarified together with **CHIRON Group SE** about how the accumulating aerosol can be discharged.

If necessary, the end customer is to be informed about the formation of the aerosol. Coordinate the scope of delivery and design of the collection trays, drip pans and guide plates with **CHIRON Group SE**.

### **Noise**

The system shall be designed in such a way as to ensure minimum noise generation.

The trigger values and exposure limits according to DIN 45635 apply.

A noise measurement shall be made under nominal load and normal operating conditions. Deviations (e.g., missing workpieces) must be documented.

The result of the noise emission measurement shall be documented and supplied.

If the permissible limit values are exceeded, appropriate improvements shall be made.

If no noise reduction can be achieved, the costs of measures for subsequent noise reduction shall be borne by the contractor.

## **4.6 Malfunction and operation**

If there is a malfunction on the system or if it is not possible to store a machined part, machining must be ended at the next "end of cycle".

A means of diagnosis must be available.

A simple home position run of the system and machining center must be possible by means of a key. The necessary retraction strategies and the handling of workpieces currently being worked on must work from any situation.

#### **Deactivation of the system**

The control system of the machining centre is superordinate to the control system of the system; there must be a way to deactivate the system. To avoid collisions, the system must always be in the initial position in this case.

Deviations require the agreement and written approval of **CHIRON Group SE**.

#### **Independent operation**

The independent operation of the machining centre must be guaranteed (function independent of the system/automation) and coordinated with **CHIRON Group SE**. The valid safety regulations must be complied with.

### **4.7 Protective equipment**

Safety devices are necessary to prevent hazards on machines and equipment. They protect employees from mechanical hazards that can be caused by moving parts..

Protective devices must prevent access to the danger zone and must be designed in such a way that they cannot be bypassed.

- No functional modules may be mounted or fastened to protective devices.
- Frequently used doors should be fitted with hinges and secured by means of safety switches.
- For movable protective guards, interlockable safety switches with interlocking mechanisms in accordance with the **CHIRON Group SE** preference list.

### **4.8 Workpiece handling**

#### **Workpiece feed, workpiece removal**

The workpiece feed and removal are to be realized and delivered according to the project- and system-specific specification document under the aspect of a technically and economically optimal design. Details must be clarified in cooperation with **CHIRON Group SE**.

Workflow principle:

- Unmachined or pre-machined workpieces are fed to the interface to the machining centre without damage and in the correct position.
- Machined parts are removed from the machining center interface and fed to the workpiece removal system without damage or dripping.
- The system is to be designed such that an autarkic run time of the overall system (machining center and system) is guaranteed in the remaining run time required by the customer.

## **Workpiece transport**

- A manual feed of transport devices or pushing the parts on a belt system must also be possible if the drives fail.
- Conveyor belts must be designed so that they can be easily retensioned. Hazards due to pull-in points and crushing points are to be avoided by means of appropriate designs.
- Workpiece-contacting parts are to be designed in such a way that no damage is caused to the workpiece.
- The workpiece driver must be quickly and easily replaceable.
- Part storage places must be provided in sufficient size and coordinated with **CHIRON Group SE**.
- The system must be accompanied by a description of the transport process with time information.
- Workpiece carriers must be permanently marked with clearly legible labels.
- In the event of loss and failure of electrical, pneumatic or hydraulic energy as well as in the event of an emergency stop, gripper and handling systems must still hold the workpiece securely.
- Provide an adjustment option for the workpiece device for handling systems.
- Regardless of the types of energy available (e.g. electrics, pneumatics, hydraulics, etc.) may not change when the power supply is switched on or off, in case of power failure as well as energy return (unexpected or intentional) do not result in any danger. An unexpected start must be prevented.
- Provide an adjustment option for the workpiece device for handling systems.
- Vertical handling systems must be equipped with secure clamps or brakes.
- Portal frames must be adjustable via adjusting plates and adjusting screws.
- Parts grippers must be designed with sensors for checking the presence of the workpieces.
- For parts grippers, a confirmation from the manufacturer of the basic and proven safety principles in accordance with EN ISO 13849-1 must be provided..

## **SPC ejection and NOK handling (option)**

Both the SPC ejection as well as the handling of NOK parts are to be considered as options which might be able to be implemented in relation to the project.

NOK parts must be able to be removed damage-free.

## **4.9 Robot- and Automation-Systems**

### **4.9.1 General**

The construction must be designed to be safe in accordance with the requirements of EN ISO 12100 "Safety of machinery - General design principles - Risk assessment and risk reduction".

Other applicable guidelines, standards, regulations and rules of technology must be observed.

## 4.9.2 Robot system requirements

Purchased robot systems and automation systems must comply with EN ISO 10218-1 "Robots and robotic devices — Safety requirements for industrial robots, Part 1: Robots".

## 4.9.3 Integration Roboter- und Automatisierungssysteme

Robot systems must be integrated according with EN ISO 10218-2 "Industrial robots - Safety requirements - Part 2: Robot systems and integration".



### **EN ISO 11161**

An integrated manufacturing system (IMS) can vary widely in size and complexity; it can combine different technologies that require a wide range of expertise and knowledge.

We recommend EN ISO 11161 Safety of machinery - Integrated manufacturing systems - Basic requirements.

## 5 CHIRON Group SE preference list, parts and components

### 5.1 General information

CHIRON Group SE preference list, parts and components" serves as a guide.

It serves to standardize within the overall system in technical and optical terms and to limit the number of spare and wear parts. Deviations require the agreement of and written approval from CHIRON Group SE.

Only the latest state-of-the-art components should be used.

Safety-critical components must be designed for a service life of **20 years**.

Components that do not achieve this service life must be coordinated with CHIRON Group SE.

Upon approval, these components must be listed separately in the documentation along with their expected replacement intervals.

### 5.2 Extraction technology

Designation	Manufacturer	Remark
Exhaust fan	Camfil APC GmbH	
Electrostatic air filter	Camfil APC GmbH	
Wet separator	Camfil APC GmbH	

### 5.3 Actuators (valves)

Actuators (valves) for hydraulics, pneumatics, cooling lubricant must be coordinated with CHIRON Group SE.

The use of IO-Link-compatible actuators and sensors must always be coordinated with CHIRON Group SE.

Designation	Manufacturer	Remark
Valves, hydraulic	ARGO-HYTOS GmbH Bosch Rexroth AG Hawe Hydraulik SE	
Valves, pneumatic	Festo SE & Co. KG Norgren GmbH SMC Deutschland GmbH	

Designation	Manufacturer	Remark
Valve terminal, pneumatic	Festo SE & Co. KG Norgren GmbH SMC Deutschland GmbH	
Valve, cooling lubricant	Müller co-ax AG Gemü Gebr. Müller Apparatebau GmbH & Co. KG	

## 5.4 Connection and installation technology

Designation	Manufacturer	Remark
Sensor / actuator box	Phoenix Contact GmbH Murrelektronik GmbH Weidmüller GmbH & Co. KG	
Active sensor / actuator box	Balluff GmbH Murrelektronik GmbH K. A. Schmersal GmbH & Co. KG	
Sensor / actuator line	Phoenix Contact GmbH Belden Electronics GmbH Murrelektronik GmbH Weidmüller GmbH & Co. KG	
Ground straps	HEBOTEC GmbH	
Motor line	Nexans Deutschland GmbH Igus GmbH Siemens AG Fanuc Deutschland GmbH	Control-dependent
Encoder line	Nexans Deutschland GmbH Igus GmbH Siemens AG Fanuc Deutschland GmbH	Control-dependent
Connection line	SAB Bröckskes GmbH & Co. KG Igus GmbH HELUKABEL GmbH	
Network / Ethernet line	Phoenix Contact GmbH Murrelektronik GmbH Weidmüller GmbH & Co. KG Siemens AG Fanuc Deutschland GmbH	At a minimum CAT6A

**CHIRON Group SE preference list, parts and components**

*Control and signaling devices*

<b>Designation</b>	<b>Manufacturer</b>	<b>Remark</b>
Bus system line	Phoenix Contact GmbH Siemens AG Fanuc Deutschland GmbH	
M8 / M12 / M23 / M40 plug connectors	Phoenix Contact GmbH Binder GmbH & Co. KG TE Connectivity Industrial GmbH(INTERCONTEC Produkt GmbH)	
Heavy plug connector	Harting GmbH & Co. KG	
Control cabinet socket	Phoenix Contact GmbH	230VAC
Power Socket, Control Panel	Murrelektronik GmbH	Country-specific
Connecting terminal, terminal block	Phoenix Contact GmbH Weidmüller GmbH & Co. KG	Preferred installation technique: "Push-in"
Pluggable connecting terminal, terminal block	Phoenix Contact GmbH Weidmüller GmbH & Co. KG	Preferred installation technique: "Push-in"
Connecting terminal with diodes	Phoenix Contact GmbH Wago GmbH & Co.KG	
Connecting terminal with varistor	Phoenix Contact GmbH Wago GmbH & Co. KG	
Control cabinet wiring	U.I. Lapp GmbH HELUKABEL GmbH	

**5.5 Control and signaling devices**

<b>Designation</b>	<b>Manufacturer</b>	<b>Remark</b>
Mushroom push-button	Siemens AG (22mm) Georg Schlegel GmbH & Co. KG (22.3mm)	
Push-button	Siemens AG (22mm) Georg Schlegel GmbH & Co. KG (22.3mm)	
Illuminated push-button	Siemens AG (22mm) Georg Schlegel GmbH & Co. KG (22.3mm)	
Signal lamp	Siemens AG (22mm) Georg Schlegel GmbH & Co. KG (22.3mm)	

Designation	Manufacturer	Remark
Key-switch button	Siemens AG (22mm) Georg Schlegel GmbH & Co. KG (22.3mm)	
Key switch	Siemens AG (22mm) Georg Schlegel GmbH & Co. KG (22.3mm)	
Electronic key system, EKS	EUCHNER GmbH + Co. KG	
Two-hand start buttons	Siemens AG (22mm) Georg Schlegel GmbH & Co. KG (22.3mm)	
Foot switch	Bernstein AG	
Signal lamp	Werma GmbH & Co. KG	

## 5.6 Lighting

Designation	Manufacturer	Remark
Working & loading area lighting	Waldmann GmbH & Co. KG	24 VDC LED technology
Control cabinet lighting	Phoenix Contact GmbH & Co. KG Rittal GmbH & Co. KG	LED technology

## 5.7 Fire protection

Other fire protection systems must be coordinated with **CHIRON Group SE**.

Designation	Manufacturer	Remark
Extinguishing system	Kraft & Bauer	FB 709 (SF according to ISO 13849-1)
air shut-off flap	Kraft & Bauer	
Pressure relief flap	Kraft & Bauer	

## 5.8 Electrical installation spaces

Locks on electrical installation compartments (control cabinet, control panel, terminal box) must be designed with double-bit locking.

## CHIRON Group SE preference list, parts and components

### Marking

Designation	Manufacturer	Remark
Control cabinet	Omega Blechbearbeitung AG Haslach Group GmbH KMK Metalltechnik GmbH Rittal GmbH & Co. KG	
Control panel	Omega Blechbearbeitung AG Haslach Group GmbH KMK Metalltechnik GmbH Rittal GmbH & Co. KG	
Terminal housing	Rose Systemtechnik GmbH Bernstein AG Rittal GmbH & Co. KG	

## 5.9 Hydraulic system

Designation	Manufacturer	Remark
Hydraulic unit	ARGO-HYTOS GmbH Bosch Rexroth AG HAWE Hydraulik SE	
Hydraulic accumulator	ARGO-HYTOS GmbH Bosch Rexroth AG HAWE Hydraulik SE Hydac International GmbH	

## 5.10 Marking

Designation	Manufacturer	Remark
Operating equipment labeling	Murrplastik GmbH Rosenbaum Phoenix Contact GmbH Weidmüller GmbH & Co. KG	

### 5.11 Coolant and conveying systems

Designation	Manufacturer	Remark
Coolant unit	Knoll Maschinenbau GmbH Bürener GmbH	
Chip conveyor	Knoll Maschinenbau GmbH Bürener GmbH	
Chip screw	Bauer Gear Motor GmbH	

### 5.12 Cooling systems

Designation	Manufacturer	Remark
Cooling system, control cabinet	ATF Cooling GmbH (HAOSCH) Rittal GmbH & Co. KG Burn Engineering AG	
Cooling system, components	ATF Cooling GmbH (HAOSCH) Deltatherm Hirmer GmbH Hydac International GmbH	

### 5.13 Cable routing

Designation	Manufacturer	Remark
Plastic wiring duct	Licatec (F2000) Tehalit BA6 Kanal OBO Bettermann Holding GmbH & Co. KG	Inside control cabinet and clamp housing
Line channel, line trough	Omega Blechbearbeitung AG Pflitsch GmbH Häwa GmbH	
Energy chain	Igus GmbH Murrplastik GmbH Tsubaki Kabelschlepp GmbH	
Protective conduit	Norres GmbH Reiku GmbH	

## CHIRON Group SE preference list, parts and components

### Switching devices

Designation	Manufacturer	Remark
Line gland	Hummel AG Jacob GmbH Pflitsch GmbH	
Cable entry	Icotec GmbH Murrplastik GmbH	

### 5.14 Measurement systems

Designation	Manufacturer	Remark
Probe	Blum-Novotest GmbH Renishaw GmbH	
Laser measuring system	Blum-Novotest GmbH	

### 5.15 Network technology

Designation	Manufacturer	Remark
Modem	INSYS MICROELECTRONICS GmbH Phoenix Contact GmbH	
Router	INSYS MICROELECTRONICS GmbH Phoenix Contact GmbH	
Ethernet Switch	INSYS MICROELECTRONICS GmbH Phoenix Contact GmbH	

### 5.16 Switching devices

Designation	Manufacturer	Remark
NH - fuse switch disconnectors	Siemens AG	
NH - fuse link	Siemens AG	
Electronic circuit breaker	E-T-A Elektrotechnische Apparate GmbH Siemens AG Phoenix Contact GmbH	
Circuit breaker	Siemens AG	
Residual current circuit breaker	Siemens AG	

Designation	Manufacturer	Remark
Thermistor motor protection relay	Siemens AG	
Motor protection switch	Siemens AG	
Motor starter	Siemens AG	
Motor starter with fail-safe shut-down	Siemens AG	
Power contactor	Siemens AG	24 VDC
Auxiliary contactor	Siemens AG	24 VDC
Main switch	Kraus & Naimer Siemens AG	Lockable in the 0 position
Control and load switch	Kraus & Naimer Siemens AG	
Relay module	Phoenix Contact GmbH	
Optocoupler module	Phoenix Contact GmbH	
Safety relays	K.A. Schmersal GmbH & Co. KG Phoenix Contact GmbH Pilz GmbH & Co. KG Euchner GmbH & Co. KG	
Undervoltage relay	Dold & Söhne KG	
Monitoring relay	Dold & Söhne KG	
Time relay	Pilz GmbH & Co. KG	
Two-hand start relay	Pilz GmbH & Co. KG	



**Observe switching cycles.**

If more than  $10^5$  per year in 3-shift operation are to be expected:

Use switch elements (auxiliary contactor, optocoupler) or PLC outputs with a corresponding switching capacity.

## 5.17 Lubrication systems

Designation	Manufacturer	Remark
Grease lubrication	SKF Lubrication Systems Germany GmbH	
Oil lubrication	SKF Lubrication Systems Germany GmbH	
Minimal lubrication	Lubrix GmbH	

## 5.18 Sensors

Sensors for hydraulics, pneumatics, cooling lubricant must be coordinated with **CHIRON Group SE**.

The use of IO-Link-compatible actuators and sensors must always be coordinated with **CHIRON Group SE**.

Designation	Manufacturer	Remark
Pressure switch	IFM Elektronik GmbH Barksdale GmbH Festo SE & Co. KG Norgren GmbH SMC Deutschland GmbH SICK AG	
Proximity switch, inductive	Balluff GmbH IFM Elektronik GmbH Pepperl + Fuchs GmbH Baumer GmbH	
Proximity switch, capacitive	Balluff GmbH IFM Elektronik GmbH Pepperl + Fuchs GmbH Baumer GmbH	
Position and series position switches	Euchner GmbH & Co. KG Balluff GmbH	
Temperature sensors	B+B Thermotechnik	
Temperature switches	Barksdale GmbH	
Filling level limit switch	IFM Elektronik GmbH KNOLL Maschinenbau GmbH Microsonic GmbH Endress+Hauser GmbH & Co. KG Barksdale GmbH Jola GmbH	
Flow monitors and flow control devices	FM Elektronik GmbH Festo SE & Co. KG Norgren GmbH SMC Deutschland GmbH	
Vibration sensor	IFM Elektronik GmbH	with diagnostic electronics

Designation	Manufacturer	Remark
Other sensors	Balluff GmbH Festo AG & Co. KG IFM Elektronik GmbH Siemens AG	
Optical light sensor (light barrier)	Balluff GmbH IFM Elektronik GmbH Sick AG Wenglor Sensoric GmbH Keyence Deutschland GmbH	

## 5.19 Safety technology

Designation	Manufacturer	Remark
Transponder-coded safety switches with guard locking	Euchner GmbH & Co. KG	
Transponder-coded safety switches without guard locking	Euchner GmbH & Co. KG K.A. Schmersal GmbH & Co. KG Pilz GmbH & Co. KG	
Multifunctional Gate Box MGB	Euchner GmbH & Co. KG	
Safety light barrier	Sick AG Pilz GmbH & Co. KG	
Safety switch strip	Barger GmbH	

## 5.20 Voltage supply

Designation	Manufacturer	Remark
Transformers	Hans O. Habermann Siemens AG	
Power supply (stabilized)	Puls GmbH Siemens AG Phoenix Contact GmbH	
Buffer module, power supply	Puls GmbH Siemens AG Phoenix Contact GmbH	

## 5.21 Control and drive technology

The control and drive technology must be coordinated with **CHIRON Group SE**.

Designation	Manufacturer	Remark
Control technology	Siemens AG Fanuc Deutschland GmbH Beckhoff Automation GmbH & Co. KG (Optional, by request only)	
Operating and monitoring systems	Siemens AG Fanuc Deutschland GmbH Beckhoff Automation GmbH & Co. KG (Optional, by request only)	
Hand-held operating device	Euchner GmbH & Co. KG Siemens AG Fanuc Deutschland GmbH	
Digital input / output modules	Phoenix Contact GmbH Siemens AG (Optional, by request only) Fanuc Deutschland GmbH (Optional, by request only) Beckhoff Automation GmbH & Co. KG (Optional, by request only)	
Analog input / output modules	Phoenix Contact GmbH Siemens AG (Optional, by request only) Fanuc Deutschland GmbH (Optional, by request only) Beckhoff Automation GmbH & Co. KG (Optional, by request only)	
Fail-safe input / output modules (functional safety)	Siemens AG Fanuc Deutschland GmbH Beckhoff Automation GmbH & Co. KG (Optional, by request only)	
Bus systems	Profibus Profinet	Other systems only after consultation.
Mains filter drives	EPA Antriebstechnik GmbH Siemens AG	

Designation	Manufacturer	Remark
Drive and control technology	Siemens AG Fanuc Deutschland GmbH Beckhoff Automation GmbH & Co. KG (Optional, by request only)	
Servo motors	Siemens AG Fanuc Deutschland GmbH Beckhoff Automation GmbH & Co. KG (Optional, by request only)	
Linear motor	Siemens AG Fanuc Deutschland GmbH Beckhoff Automation GmbH & Co. KG (Optional, by request only)	
Spindle motors	Siemens AG Fanuc Deutschland GmbH Franz Kessler GmbH Beckhoff Automation GmbH & Co. KG (Optional, by request only)	
Torque drives	INA - Drives & Mechatronics Siemens AG Fanuc Deutschland GmbH	
Motor spindles	CHIRON Group SE WEISS Spindeltechnologie GmbH Franz Kessler GmbH SERVAX Landert Motoren AG FISCHER Deutschland GmbH Innomotics GmbH	
Length measurement system	Heidenhain GmbH Renishaw GmbH	
Angle measuring system	Heidenhain GmbH Renishaw GmbH Lenord, Bauer & Co. GmbH	
Motor throttle	Siemens AG Fanuc Deutschland GmbH Franz Kessler GmbH Hans O. Habermann	
Overvoltage protection module, motors	Siemens AG Fanuc Deutschland GmbH	

**CHIRON Group SE preference list, parts and components**

*Control and drive technology*

<b>Designation</b>	<b>Manufacturer</b>	<b>Remark</b>
Frequency converter	Siemens AG KOSTAL Industrie Elektrik GmbH SEW-EURODRIVE GmbH & Co KG	
Automatic safety door drives	Siemens AG	SIDOOR

## 6 Change history requirement specifications and preference list

### 6.1 Change history requirement technical specifications CHIRON Group SE

The technical specifications for **CHIRON Group SE** are revised at irregular intervals in accordance with the state of technical and normative development.

Version	Date	Author	Comments/changes
6.0.0	16.04.2026	GAM	Revision, additions and adjustments
5.0.0	26.07.2021	GAM	Additions, corrections to text
4.0.0	16.07.2021	GAM	Supplement "General part" , VDW validation support in acc. with ISO13849-2
3.0.0	03.08.2020	GAM	Complete revision
1.0.1	14.07.2017	GAM	Section 5.1 - Test records in acc. with EN 60204-1 (VDE 0113-1)
1.0.1	14.07.2017	GAM	Sections 5.2 and 6.2 – Component subject to export licensing must be marked
1.0.1	14.07.2017	GAM	Corrections of incorrect spelling in various sections, no technical changes
1.0.0	12.06.2017	GAM	Revision and release
0.3.0	14.11.2016	rub	Acceptance into the editing system
0.2.0-2016	21.09.2016	MECA/GAM	S8 and S9 completely revised
0.1.1-2016			Revision, addition, correction
0.1.0-2016	01.04.2016	GAM	Revision, addition, correction
0.1.0-2015	01.10.2015	GAM	First draft and subsequent revision, addition, correction

### 6.2 Change history of "CHIRON Group SE preference list, parts and components"

Version	Date	Author	Comments/changes
6.0.0	16.04.2026	GAM	Revision and correction of the complete CHIRON Group SE preference list, parts and components
5.0.0	26.07.2021	GAM	Manufacturer adaptation
4.0.0	16.07.2021	GAM	CHIRON Group logo
3.0.0-	10.07.2020	GAM	Revision, summary and correction of the complete "CHIRON preference list, parts and components"
1.0.1	14.07.2017	GAM	Corrections of incorrect spelling in various sections, no technical changes

**Change history requirement specifications and preference list**

Change history of "CHIRON Group SE preference list, parts and components"

<b>Version</b>	<b>Date</b>	<b>Author</b>	<b>Comments/changes</b>
1.0.0	12.06.2017	GAM	Revision and release
0.3.0	28.11.2016	GAM	First draft in editing system and revision