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SafetyManual

This system supports many types of robots. This manual only introduces six-joint robots as an example. For other types of robots, please refer to this manual and debugging manual for use.

Relevant instructions of the system:

CRP instruction description
CRP-S40, S80 Instruction Manual
CRP-S40 System Hardware Manual
CRP-S80 System Hardware Manual
CRP-CD□0-CRX8 Hardware Manual
CRP-CD□0-HCA7 Hardware Manual
CRP-SA80-A7 Hardware Manual
CRP-S40 PLC Instruction Manual
CRP-S80 PLC Instruction Manual
CRP-S40, S80 Debugging Manual
CRP-S40, S80 Welding Process Instructions
CRP-S40, S80 Palletizing Process Specification
CRP-S40, S80 Visual Function Instructions
CRP-S40, S80 Appointment Process Specification
CRP-S40, S80 Tracking Process Specification

Handling of Common Problem of Robot

Please ensure that the relevant instructions reach the end user of this product.

CRP-2018-0912

Thank you very much for choosing our products!

Before using the robot, please read this manual in detail and follow all instructions on safety matters and the body.

As for the installation, operation and maintenance of robots, only those who have received relevant training and assessment from our company are required to do so.

When using this robot, we must abide by the laws and regulations of various countries concerning industrial robots and safety.

Be sure to deliver this instruction to the actual operator.

The relevant manuals of this system should be properly kept so that they can be consulted when needed.

If the equipment needs to be handed over, please forward the relevant information to the other party!

The keys, functions and options not specified in the relevant manuals of this system are deemed to be unavailable. Do not use them!

Revision Note:

2018-9-12 First Draft

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1. Conventional information

1.1 Applicable criteria

Robot system design meets the following requirements:

Standard	Describe
GB 5226.1-2002	Mechanical Safety, Mechanical Safety, Mechanical Safety, Electrical Equipment Part 1: General Technical Conditions(IEC 60204-1: 2000, IDT)
GB 11291-1997	Industrial Robot, Safety Specification(eqv ISO10218: 1992)
GB/T 12644-2001	Industrial Robot, Characteristic Representation(eqv ISO 9946: 1999)
GB 14048(All parts)	Low Voltage Switchgear and Control Equipment
GB/T 15706.1-1995	Mechanical Safety, Basic Concepts and Design Principles, Part 1: Basic Terminology, Methodology(eqv ISO/TR 12100-1: 1992)
GB/T 15706.2-1995	Mechanical Safety, Basic Concepts and Design Principles Part 2: Technical Principles and Specifications(eqv ISO/TR 12100-2: 1992)
GB/T 16856-1997	Mechanical Safety, Principles of Risk Assessment(eqv PREN 1050: 1994)

1.2 Safety Terminology

Use the following signs to record safety precautions. Be sure to read them.

Sign	Explain
	Indicates that if the logo is ignored and misused, It can lead to death or serious injury, etc.
	Misoperation is dangerous and may cause moderate injury or minor injury accidents and equipment failure.
	Matters that must be observed.
	Prohibited matters.

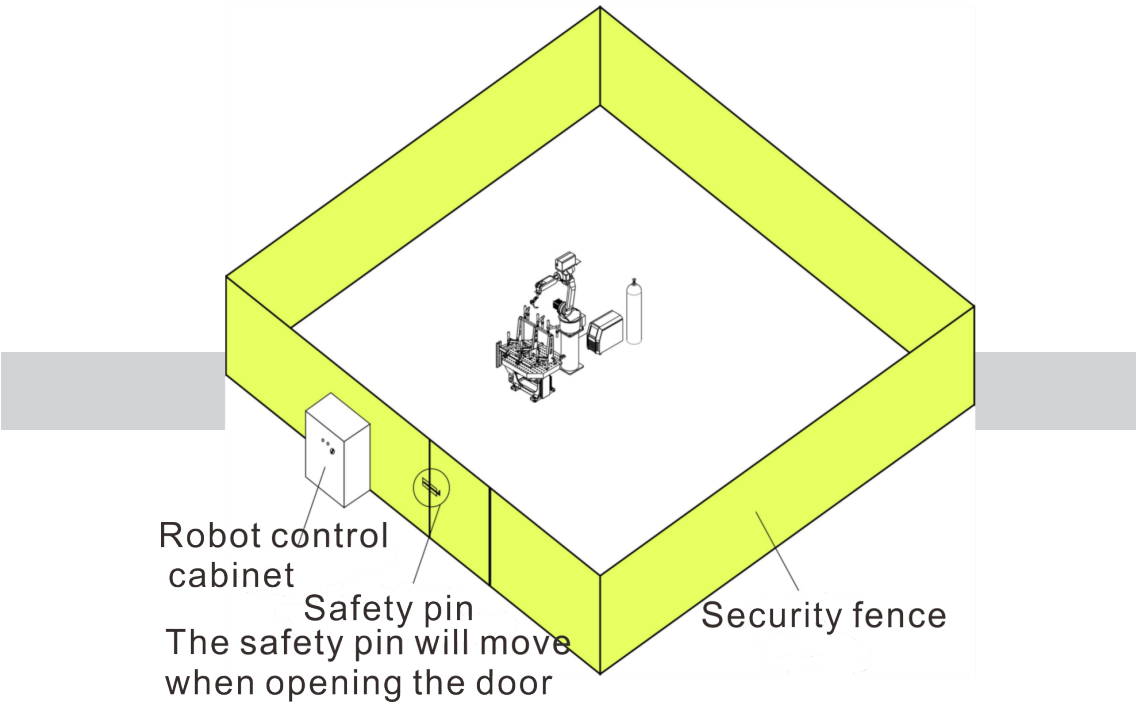
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Attention
Even the contents recorded in "Attention" will have serious consequences because of different situations. Therefore, any precautions are extremely important. Please strictly abide by them. Even where "attention" or "danger" is not marked, it is something that users must strictly observe.

2. Safety-related instructions

2.1 Danger

1. The operation of the robot controller must designate a dedicated operator, and the operator must undergo safety training and pass the examination before he can take up his post.
2. Safety fence should be set around the range of motion of the robot. Safety fence must effectively prevent the robot from popping out or extending out of the fence due to errors, arm falling off, material falling off and so on. The safety door on the fence should be equipped with safety bolts. Only when the safety switch is pulled out, the robot can enter the fence area. And when the safety bolt is pulled out, the robot must stop automatically and safely.

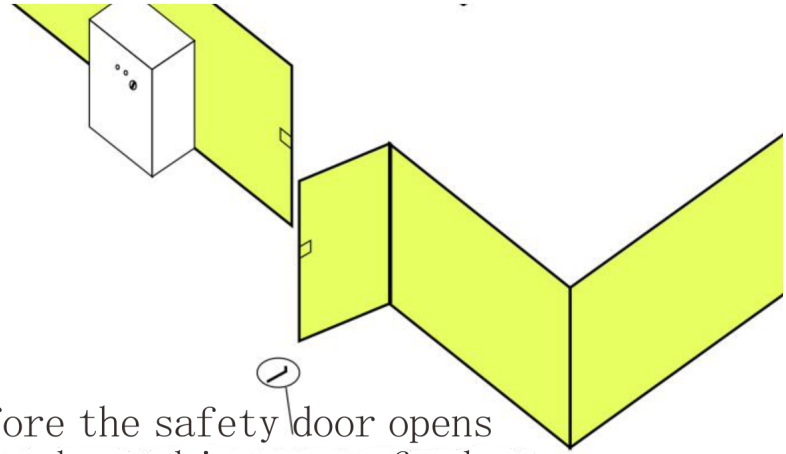


3. Man-machine separation: In the process of robot movement (automatic, manual), no one is allowed to enter the scope defined by the safety fence of the robot.

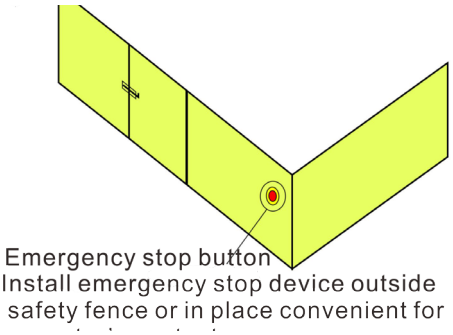
4. If there are several operators working together in the robot application system, it is necessary for all operators and their related personnel to know that the robot has been enabled before starting the robot.

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5. When it is necessary to inspect the robot, the operator should take the safety pin with him, cut off the power supply of the robot or press the "emergency stop" button to avoid the third party operating the robot.



6. Set up emergency stop device at the most convenient position for operator to contact, to ensure that the operator can quickly and easily perform "emergency stop" operation when abnormal movement of the robot occurs.



7. Before starting or starting the robot, we should first confirm the safety conditions, remove obstacles on the robot's running path, and especially ensure that no human activities occur within the range of the robot's motion. Never try to block the motion of a robot with tools or bodies. Remember, to stop the robot immediately, press the "emergency stop" button.



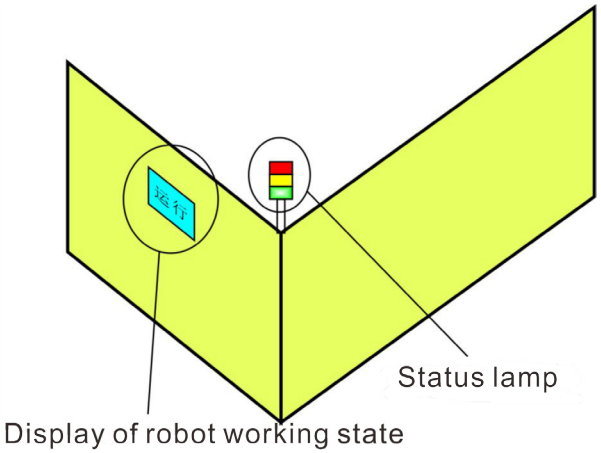
8. Do not operate a robot beyond its rated capacity, including load, speed, range of motion and operating environment.

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2.2 Attention

1. Safety fence must be strong enough, fixed and immovable to prevent operators from easily breaking or dismantling the safety fence. At the same time, safety fence itself should have no sharp edges and sharp corners, and no potential dangerous parts.

2. The outside of the safety fence must clearly indicate the current status of the robot (teaching, operation and maintenance). In order to avoid the misoperation of robots and peripheral equipment through the teaching device, human-machine interface and so on.



3. Please mark dangerous areas on the ground with paint, including the range of motion of robots and peripheral equipment. In addition, sufficient safety space is left around and safety protective devices are installed for operators to avoid abnormal operations or emergencies.

4. Before operating the robot, it is necessary to confirm whether the function of the "emergency stop" button is normal. Check the switch, display, signal name and function required for all robot operations.

5. Before operating the robot, it is necessary to confirm whether the origin of the robot is correct and whether the movements of each axis are normal. During the operation, the operator should always look at the robot from the front.

6. In teaching and maintenance operations, safety supervisors must be deployed outside the safety fence. If there is abnormal movement of the robot in the process of teaching or maintenance, the supervisor must quickly and easily perform the "emergency stop" operation. In addition, safety supervisors must be those who have completed safety training and passed safety assessment.

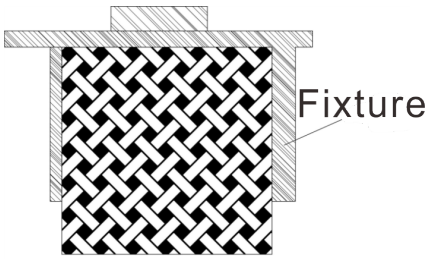
7. When the teaching device is used up, it must be put back to its original place, and ensure that it is firmly placed. If the teaching programmer is improperly placed on the robot, fixture or ground, when the robot moves, the teaching programmer may collide with the robot or fixture, thus causing personal injury or equipment damage accident. To prevent the accidental drop of the teaching device from causing the wrong action of the robot, thus causing personal injury or equipment damage accident.

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8. If you need to restart the robot after the emergency stop, please reset and restart outside the safety fence. At the same time, it confirms that all safety conditions are satisfied and that there is no human or obstacle left in the range of motion and safety fence of the robot.

9. After the robot motion teaching is completed, the soft limit of the robot is set at a distance beyond the scope of the robot motion teaching.

10. When the workpiece is grasped by pneumatic gripper, electromagnetic method and other mechanisms, please use the failure safety system to ensure that once the driving force of the mechanism is suddenly disconnected, the workpiece will not be ejected.



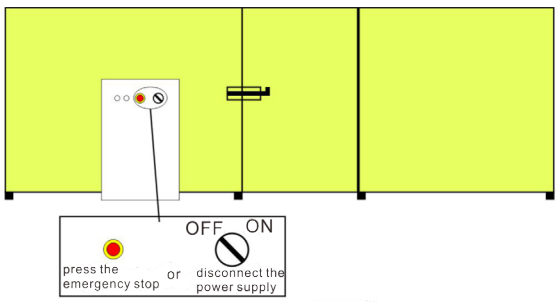
Power-off
clamping state

2.3 Compulsory

1. Operators of all robotic systems should participate in the training of the system, learn safety measures and use the functions of robots.

2. Before starting the operation of the robot, make sure that there are no abnormal or dangerous conditions around the robot and peripheral equipment.

3. Turn off the power supply or press the emergency shutdown button before entering the operation area, even if the robot is not running.



Press the emergency stop or disconnect the power supply before opening the safety door into the working area of the robot

4. When programming in the robot workspace, set up corresponding guards to ensure that the robot can stop quickly in an emergency. Do not operate with gloves when teaching and pointing robots, try to operate at low speed when pointing robots, and effectively control the robot to stop in case of abnormal circumstances.

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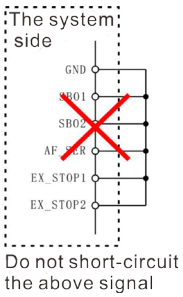
5. It is necessary to know the position of the emergency stop buttons on the robot controller and peripheral control equipment so that they can be pressed accurately in an emergency.

6. Never assume that a robot's program has been completed when it is in a stop state. Because the robot is probably waiting for the input signal to keep it moving.

2.4 Prohibition

1. When the power of the robot is connected, it is forbidden to unplug any electrical connector.

2. It is forbidden to use any method to connect safety devices.



3. It is forbidden to operate and use robots by personnel who have not passed safety training and safety assessment.

4. No drunken work.

5. Disassembly and modification of any parts of the controller is prohibited. If any unauthorized modification results in damage to any equipment and personnel, Canop will not bear any responsibility.