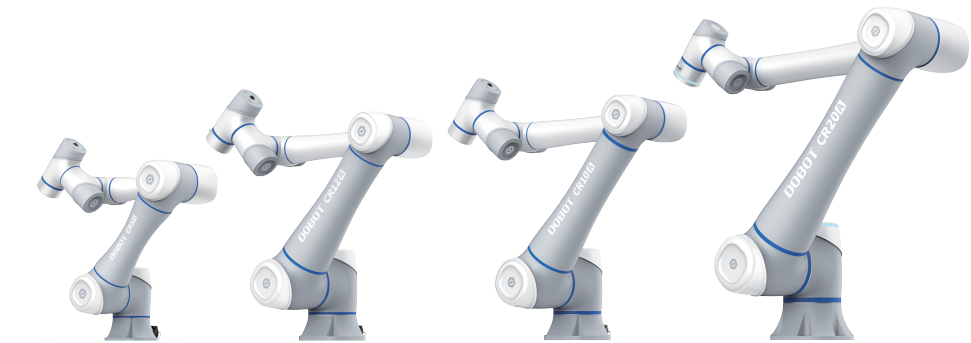


DOBOT 高防护 CRP 系列协作机器人快速安装说明

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一.安全注意事项

⚠ 危险

机器人控制系统属于带电设备,非专业人士不得随意更改线路,否则容易给设备或者人身带来伤害。

使用机器人控制系统进行工业设计与制作时应遵循如下安全规则:

- ★ 操作设备时,应当严格遵守当地的法规和规范,手册中所描述的安全注意事项仅作为当地安全规范的补充。
- ★ 手册中描述的“危险”、“警告”和“注意”事项,只作为所有安全注意事项的补充说明。
- ★ 请在规定的环境范围内使用设备,超出设备规格及负载条件使用会缩短产品的使用寿命甚至损坏设备。
- ★ 负责安装、操作、维护设备的人员必须先经过严格培训,了解各种安全注意事项,掌握正确的操作和维护方法之后,才能操作和维护设备。
- ★ 用户需确保设备处于安全条件下运行,周边不能有危害设备的物体。
- ★ 未经专业培训人员不得擅自拆卸和维修设备。若设备出现故障,请及时联系Dobot技术支持工程师。
- ★ 请务必进行日常检查及定期维护,及时更换故障部件,保障设备的安全运行。
- ★ 若该设备报废,请遵守相关法律正确处理工业废料,保护环境。
- ★ 严禁更改或者去除和修改设备的铭牌、说明、图标和标记。

★ 操作设备之前,请找到并熟知急停功能的操作方法,确保在突发紧急情况下能使机械臂紧急停止。

★ 必须将设备所需线缆连接完成后才能给设备通电。

★ 搬运、安装设备过程中请务必小心,避免磕碰,应按包装箱上的提示注意轻放、按箭头方向正确放置设备,否则容易损坏机器。

★ 为了保护设备和人身安全,请使用配套的线缆。

★ 设备正常运行过程中,请勿随意插拔电源线缆及通信线缆。

★ 请勿频繁开启或关闭控制柜电源,可能会导致控制柜内部的主电路元件性能下降。如果需要反复连续开启或关闭电源,请控制在一分钟一次以下。

★ 搬运设备时,不能超过当地法律或法规所允许单人搬运的最大重量。

★ 操作设备前请穿戴防静电服,佩戴防静电手套,去除身上携带的易导电物体,以免被电击或灼烧。

★ 请勿在通电状态下触摸设备的接线端子或拆卸设备,否则会发生触电事故。

★ 请确认设备接地良好,否则会危及人身安全。

★ 在控制柜切断电源10分钟内请勿接触电源端子或拆卸内部元件,以免控制柜内部电容有残余电压,发生触电事故。

★ 操作机械臂时请勿随意进入机械臂的工作空间,否则容易给机械臂或自身带来伤害。

二.使用注意事项

- ★ 严禁拆卸机器人:拆卸将导致机器人密封失效,降低防护性能。
- ★ 机器人严禁直接在水下运行。
- ★ 按压末端按键前,请确保按键区域及周围水分已擦干。

三.机械臂安装和连接

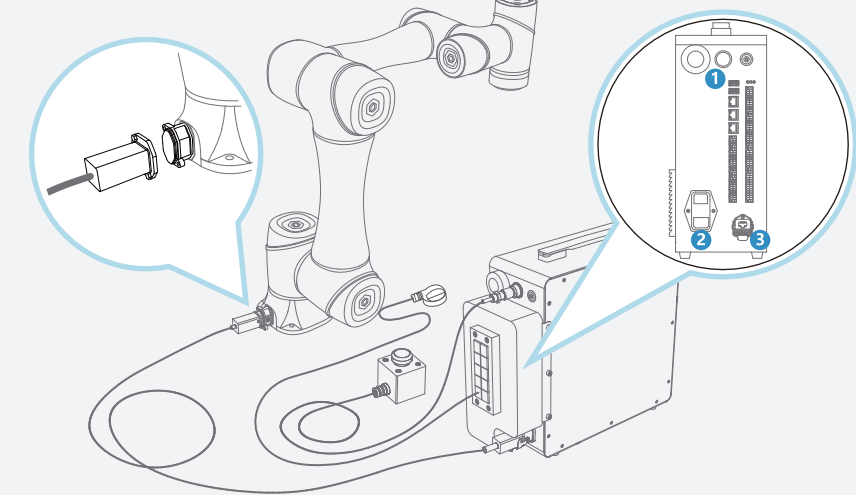
用户在固定机械臂时可根据机械臂底座孔位尺寸以及真实环境自行设计选择固定台。机械臂的固定台不仅需承受机械臂的重量,还需承受最大加速度运动时的动态作用力。

⚠ 注意

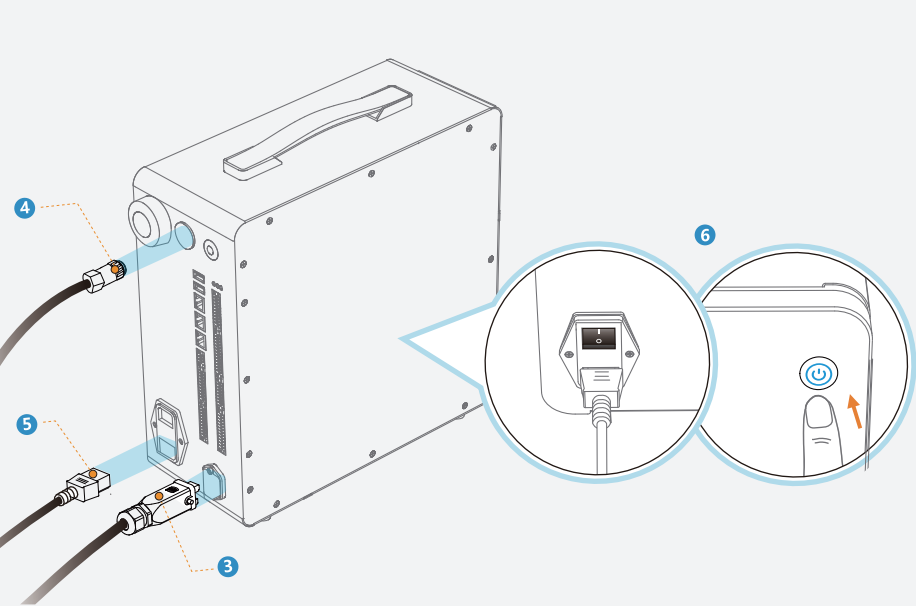
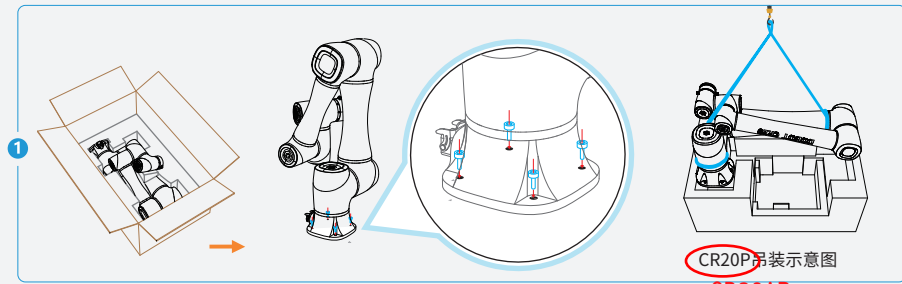
根据机械臂的工作区间设计台架,确保运行过程中机械臂的运动轨迹不受到干扰;台架上用于支撑机械臂的水平面需保持水平。

下图为控制柜与本体连接的总示意图

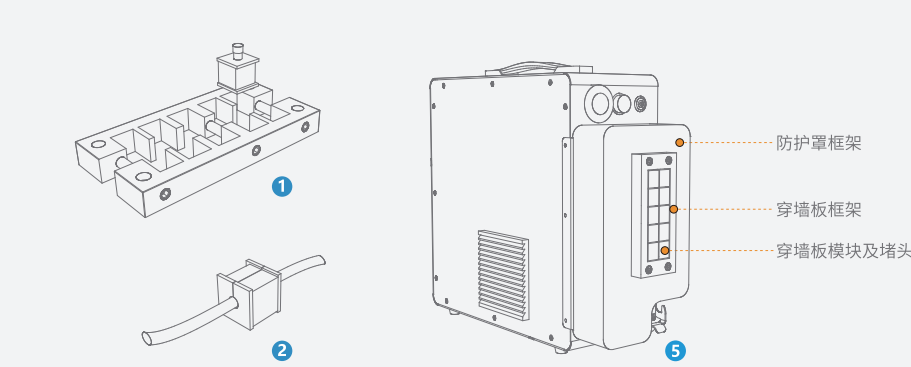
- 1 急停开关/示教器接口
- 2 电源线接口
- 3 重载线接口



- 1 根据机械臂的底座尺寸在安装平面上定位开孔,然后将机械臂从包装箱中取出(CR20AP配有吊装带,建议吊装移动),使用螺栓将机械臂底座固定在平面上。其中, CR20P使用的是6颗M10螺栓,其他型号使用的是4颗M8螺栓。
- 2 将控制柜放置在机械臂工作空间外的坚固且平整的平面上。
- 3 将控制柜与机械臂通过重载线连接。将重载插头插入重载插座时,请锁紧重载插头螺丝(机械臂侧)/卡上卡扣(控制柜侧)
- 4 将急停开关线缆插入急停开关接口。连接时将接头上的白色点与接口上白色点对齐插入,并顺时针旋转蓝色塑料环固定连接。
- 5 将电源线一头插入控制柜电源接口,另一头接到对应的外部电源。
- 6 开启外部电源后,将电源接口上方的开关按到“I”,再短按控制柜上方的圆形按钮,蓝色灯长亮表示控制柜已启动。



安装防护罩

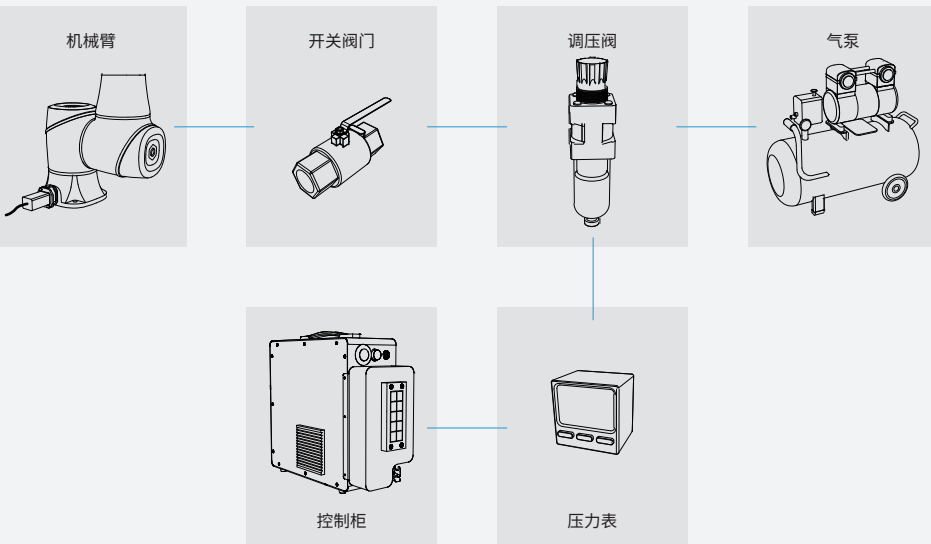


- 1.拆下穿墙板,拧松穿墙板框架侧面的螺栓,取出穿墙板模块。
- 2.根据线径选用合适的模块,将线缆嵌入模块。
- 3.将模块装回穿墙板框架,再将穿墙板框架装回防护罩。
- 4.将穿过防护罩的线缆连接至控制柜。
- 5.将防护罩装到控制柜上,使用5颗M3螺钉两侧固定。

四.气孔使用说明

高防护CRAP系列机械臂底座预留了一个气孔(不同机型具体位置不同,但都在重载插座附近,下图以高防护CR10AP为例),出厂时默认用M5螺丝封住,特殊情况下(例如水下作业)可拧开螺丝后向机械臂内部充气以增加密封性。

建议的气路连接方法如下:



气路中各部件的作用如下:

调压阀:用于调整系统中的气压。

压力表:建议使用数字式或电接点压力表,用于测量系统中的气压,并可在气压超过指定范围时输出数字信号,控制机器人停机。

开关阀门:控制气路开关,便于调试。

使用方法如下:




- 1.参考上图完成气路连接。
- 2.关闭开关阀门,然后打开气泵,调整调压阀,使气压计达到目标气压。
说明:建议运行正压值:2-4KPa,最小运行正压值:1KPa,最大运行正压值:6KPa。
- 3.待气压计稳定后,再打开开关阀门。
- 4.正常情况下气压最终会稳定在目标气压附近。如果气压一直达不到目标气压或波动较大,说明机械臂密封已失效,请立刻停止机械臂。

说明:建议根据现场实际状况合理设置气压计的允许压力范围,使其超出范围时输出数字信号,再将该数字信号接到机器人控制柜安全IO的SI1/SI2即可。

SI1/SI2为用户急停输入,默认为高电平常闭信号输入,任一路低电平触发机器人进入紧急停止状态。

五.系统启停调试

控制柜开启约1分钟后,打开APP搜索并连接WIFI。
WIFI名为“DobotCRXA-XXXX-XXXX”,其中CRXA是产品型号,XXXX是四位流水号。
WIFI密码为:1234567890,选择对应WIFI并连接。

- 1 在APP界面单击 ,连接机械臂。
- 2 连接成功后,单击使能开关 ,开关变为 ,表示机械臂使能成功,此时可通过APP控制机械臂。



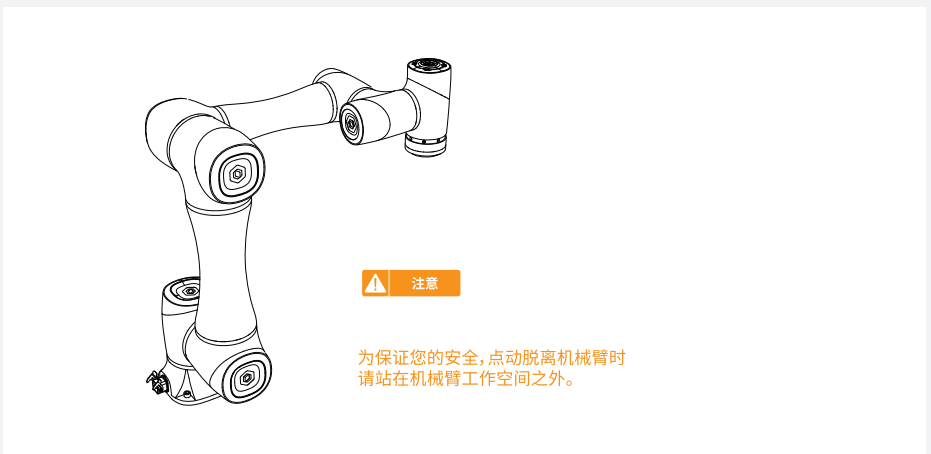
六.点动脱离限位

机械臂安装完成后的姿态仍为出厂姿态,需点动机械臂脱离该位置。

- 1 连接并使能机械臂。



- 2 在点动面板连续点动J3至-90°左右,再连续点动J4至0°左右,最后连续点动J5至90°左右,最终姿态如下图所示。



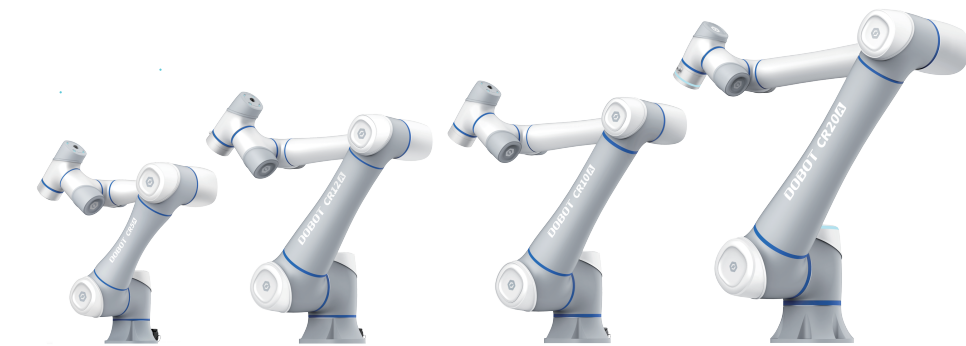
- 3 然后可使用APP对机械臂进行设置与控制。

📖 说明

APP及使用说明请从官网下载:https://www.dobot.cn/service/download-center

DOBOT CRP Series Robot Quick Start

Shenzhen YuejiangTechnology Co., Ltd. China <https://www.dobot-robots.com>
General Information:info@dobot-robots.com
Tel:4008007266



1. Security Precautions



The robot system is electrical equipment. Non-professional technicians should not modify the circuits, otherwise, it may cause damage to the device or personal injury.

The following security rules should be followed when using the robot for industrial design and manufacture.

- ★ You should comply with the local laws and regulations when operating the robot. The security precautions in this document are only supplemental to the local laws and regulations.
- ★ The DANGER, WARNING, and NOTICE marks in this document are only supplemental to the security precautions.
- ★ Please use the robot within the specified environment scope. Exceeding the specifications or load conditions will shorten the service life of the robot, even damage it.
- ★ The personnel responsible for the installation, operation and maintenance of equipment must receive strict training, understand various safety precautions, and master the correct operation and maintenance methods before they can operate and maintain equipment.
- ★ Please ensure that the robot is operated under the security conditions and there is no harmful object around the robot.
- ★ People cannot repair and disassemble the robot without professional training. If there is a problem with the robot, please contact Dobot technical support engineer in time.
- ★ Please execute a daily inspection and regular maintenance, replace the defective parts in time, in order to keep the equipment in working order.
- ★ Please comply with the relevant laws to deal with the product which is scrapped, and protect the environment.
- ★ Before the operation, please wear protective clothing, such as antistatic uniform, protective gloves and protective shoes, remove conductive objects from your body to avoid electric shock.
- ★ It is prohibited to modify or remove the nameplates, instructions, icons and marks on the robot and the related equipment.
- ★ Before operating the robot, please view and understand how to use the emergency stop switch for stopping the robot in an emergency.
- ★ Connect all the required cables before powering on the equipment.
- ★ Be careful during the robot carrying or installing. Please follow the instructions on the packing box to put down the robot gently and place it correctly in direction of the arrow.
- ★ Please use the matched cables when connecting a robot to internal or external equipment for personal security and equipment protection.
- ★ Please do not plug or unplug the power cables or communication cables when equipment is normally operated.
- ★ Turning on or off the controller power continually may result in degraded performance of the main circuit components inside the controller. If it is required to turn on or off the power continually, please keep the frequency less than once per minute.
- ★ To reduce the risk of personal injury, please comply with local regulations with regard to the maximum weight one person is permitted to carry.
- ★ Do not touch the terminal blocks or disassemble the equipment with the power ON. Otherwise, it may result in an electric shock.
- ★ The equipment must be grounded properly at all times to avoid the risk of electric shock.
- ★ Do not touch the terminal blocks or remove the interval circuit components within 10 minutes after the power is shut off, so as to avoid an electric shock since there is residual capacitance inside the controller.
- ★ Do not reach out into the workspace of the robot when operating it, otherwise, it may cause damage to the device or personal injury.

2. Precautions for Use

- ★ DO NOT disassemble the robot. Disassembling the robot will compromise its sealing and reduce its protective performance.
- ★ DO NOT operate the robot directly underwater.
- ★ Before pressing the end button, ensure that the button area and its surroundings are completely dry.

3. Robot Installation and Connection

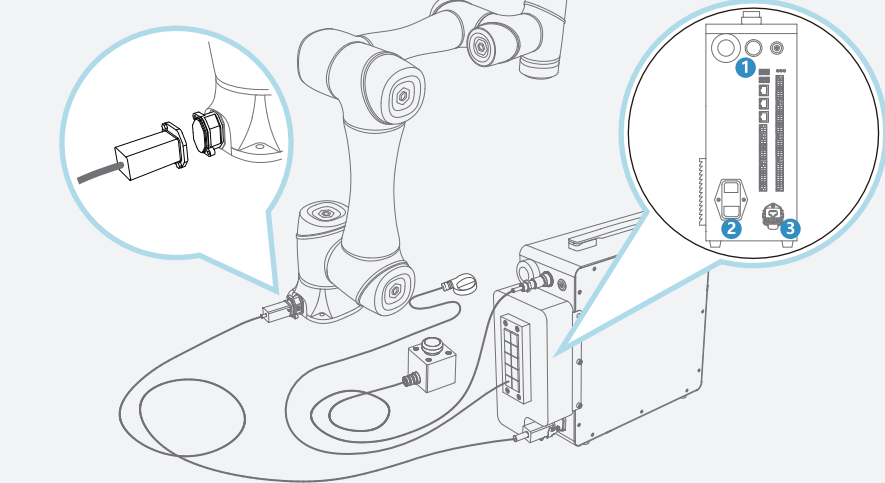
When fixing the robot arm,you can select an installation platform according to the size of the bole of the robot base and the real environment.The installation platform should be stable enough to withstand both the weight of the robot and the dynamic force by the maximum acceleration.



- Design the platform according to the workspace of the robot arm to ensure that the robot arm moves without interference during operation.
- Keep the surface of the platform for supporting the robot arm level.

The following figure shows the general connection of the control cabinet and the robot arm.

- 1 Emergency stop switch / Teach Pendent interface
- 2 Power interface
- 3 Heavy-duty cable interface



Position the mounting holes on the installation platform according to the base dimensions.Take the robot arm out of the package box,CR20P is equipped with a sling.Hoisting is recommended),and fix the robot base on the platform using bolts(6 M10 bolts for CR20P and 4 M8 bolts for other models).

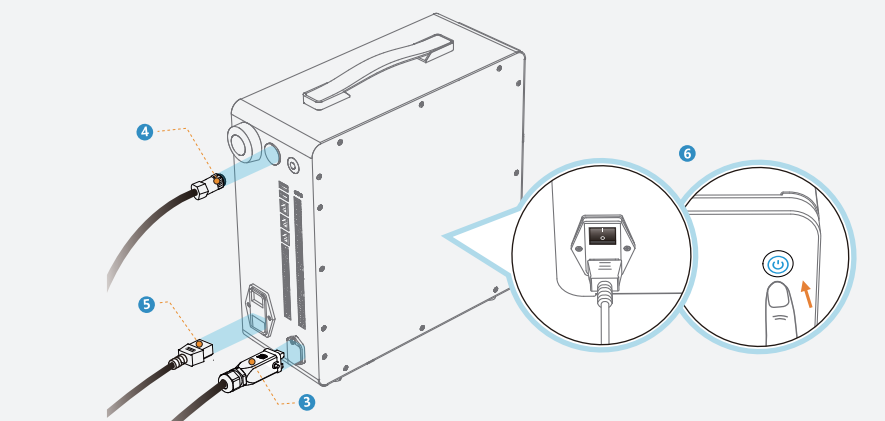
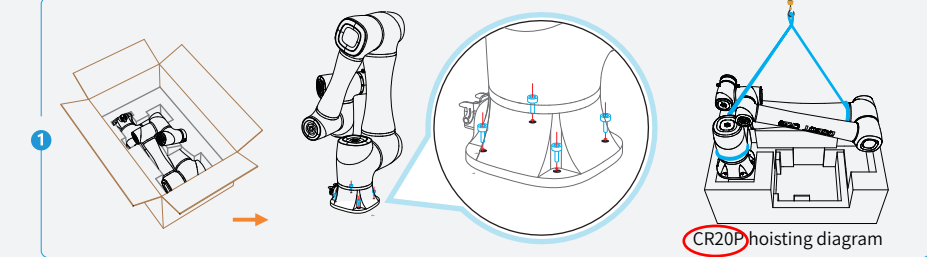
Place the control cabinet on a flat and stable surface outside the working space of the robot.

Connect the control cabinet to the robot arm via the heavy-duty cable.After plugging the heavy-duty cable into the heavy-duty socket,tighten the screws on the heacy-duty plug(robot side)/lock the clip (controller side).

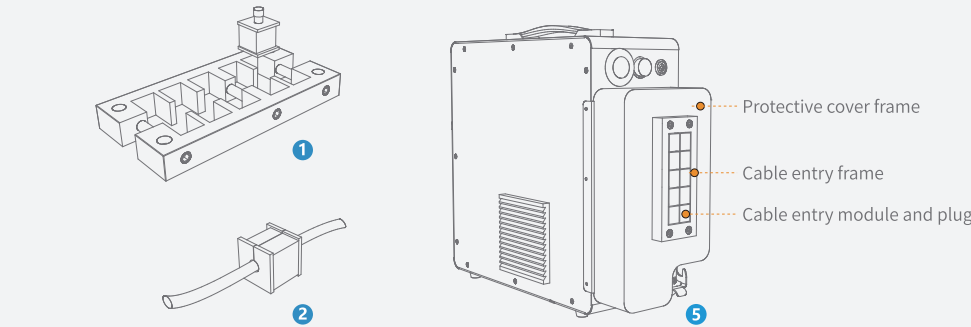
Plug the emergency stop switch cable into the emergency stop switch interface.When connecting, align the white dot on the connector with the white dot on the interface,and rotate the blue plastic ring clockwise to fix.

Plug one end of the power cable into the control cabinet power interface and the other end into the corresponding external power supply.

After turning on the external power supply,press the switch over the power interface to "I". Short-press the round button in the front side of control cabinet.If the blue light is steady on,it indicates that the control cabinet has been started.



Installing protective cover

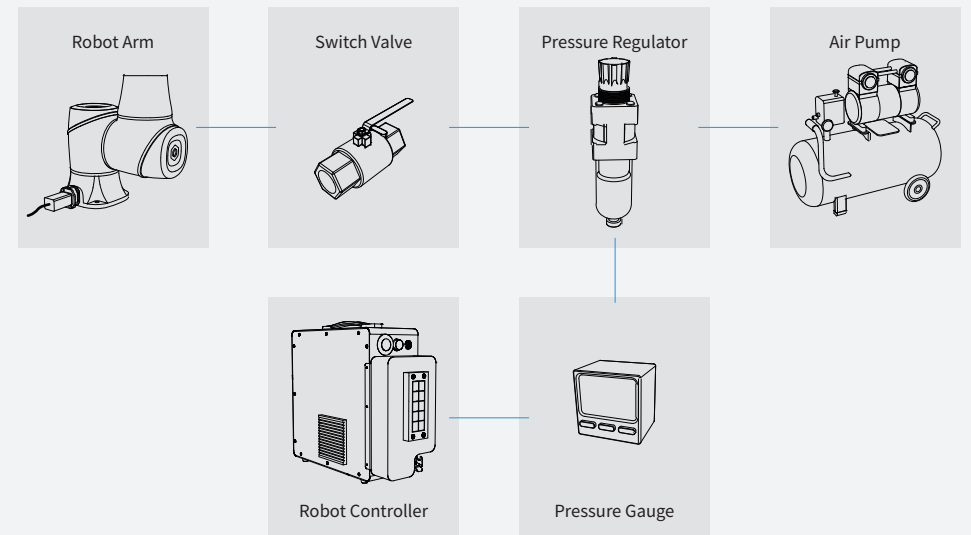


- 1.Remove the cable entry plate. Loosen the bolts on the side of the cable entry frame to take out the cable entry module.
- 2.Select the appropriate module according to the cable diameter and embed the cable into the module.
- 3.Install the module back into the cable entry frame, and install the cable entry frame back into the protective cover.
- 4.Connect the cable through the protective cover to the control cabinet.
- 5.Install the protective cover to the control cabinet, and fix it using 5 M3 screws on both sides.

4.Air Vent Instruction

The base of the high-protection CRAP series robot arm includes a reserved air vent (the exact location varies by model, but it is always near the heavy-duty socket; see the image below for an example using the high-protection CR10AP). By default, this vent is sealed with M5 screws. In special cases, such as underwater operations, the screw can be removed to allow air to be pumped into the robot arm to enhance its sealing.

Recommended Air Circuit Connection:



The functions of the components in the air circuit are as follows:

Pressure Regulator: Adjusts the air pressure within the system.

Pressure Gauge: It's recommended to use a digital or electrical contact pressure gauge to monitor the air pressure in the system. This gauge can output a digital signal to stop the robot if the pressure exceeds the specified range.

Switch Valve: Controls the air circuit's flow, making it easier to conduct adjustments.

How to Use:

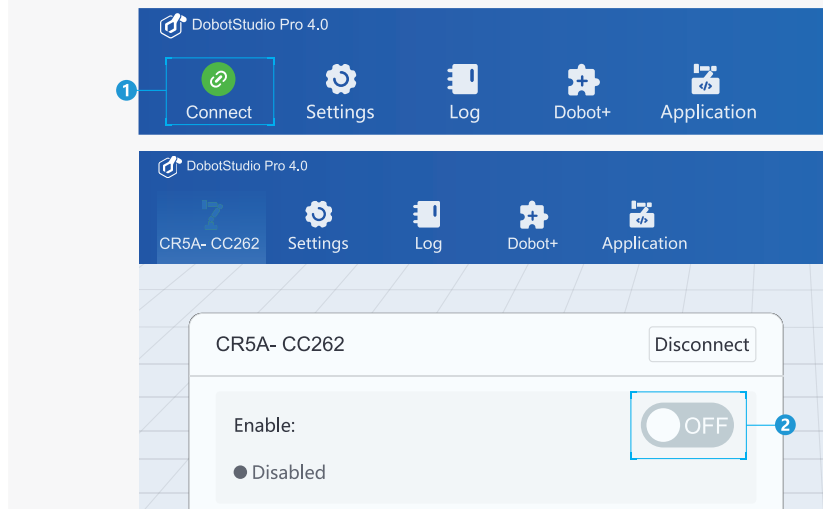
- 1.Connect the air circuit as shown in the diagram.
- 2.Close the switch valve, then turn on the air pump and adjust the pressure regulator until the pressure gauge reaches the target pressure.
- NOTE: Recommended operating positive pressure: 2-4 kPa, minimum operating positive pressure: 1 kPa, maximum operating positive pressure: 6 kPa.
- 3.Once the pressure gauge stabilizes, open the switch valve.
- 4.Under normal conditions, the pressure should stabilize near the target level. If the pressure doesn't reach the target or fluctuates significantly, this indicates a failure in the robot arm's sealing, and the robot should be stopped immediately.
- NOTE:It is advisable to set the allowable pressure range on the gauge according to the actual site conditions. If the pressure exceeds this range, the gauge should output a digital signal, which can be connected to the robot controller's safety IO on SI1/SI2.

SI1/SI2 are user emergency stop inputs, defaulted to high-level normally-closed signal inputs. Any low-level signal on these inputs will trigger the robot to enter an emergency stop state.

5.System Debugging

After starting the controller for one minute, search and connect WiFi using a tablet computer. WIFI name: "DobotCRXA-XXXX-XXXX", where CRXA is the product model and XXXX is the four-digit serial number. WiFi password: 1234567890.

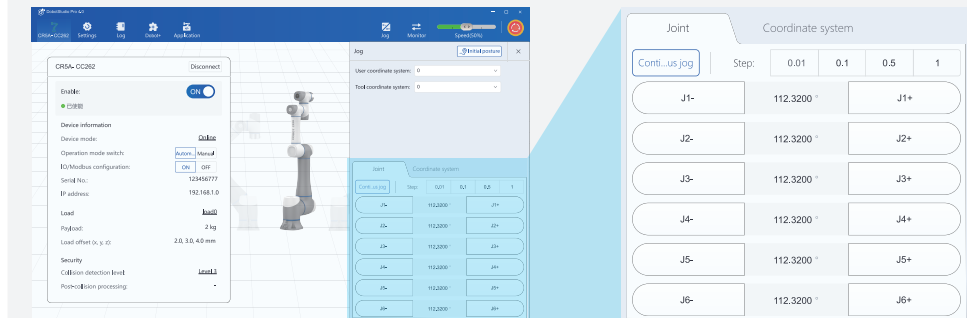
- 1 Click in App to connect the robot.
- 2 Click to enable the robot after connection, and the icon turns to , indicating that the robot is enabled successfully. Now you can control the robot using App.



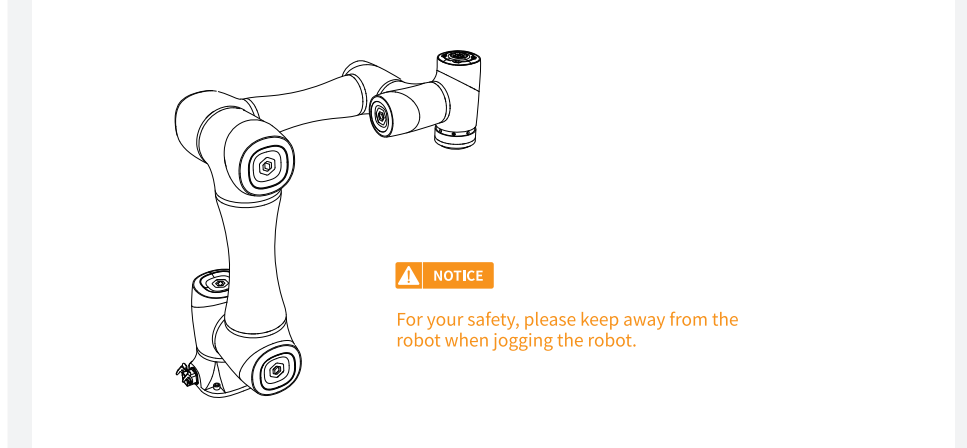
6.Removing Robot Limitation

The robot is still in factory posture after installation. You need to jog the robot arm to move it out of this position.

- 1 Connect to the robot using App, and enable the robot.



- 2 Jog J3 continuously to around -90°; jog J4 continuously to around 0°; jog J5 continuously to around 90°. The final posture of the robot arm is shown below.

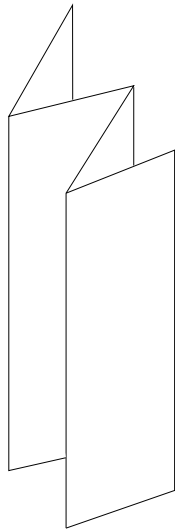
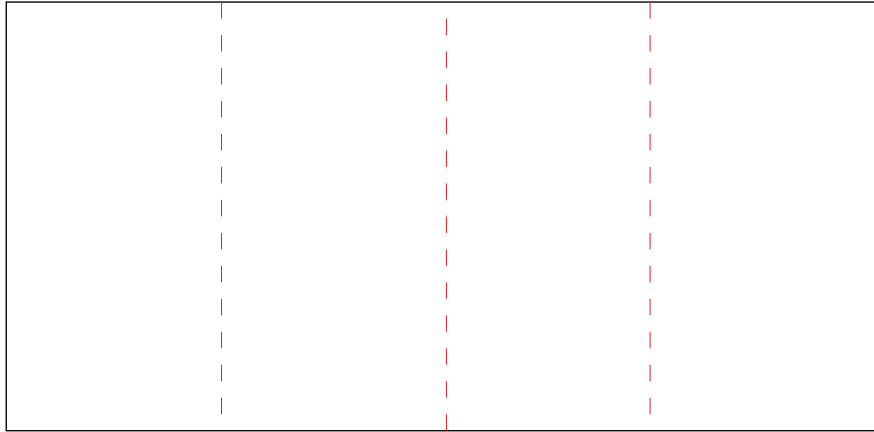


- 3 Set and control the robot arm using App.



For App installation package and user guide, please download in Dobot website: <https://www.dobot-robots.com/service/download-center>

请延红色虚线折叠（虚线不印刷）,如下图



尺寸: 559*297mm 公差: ±1mm

颜色: 蓝色LOGO请用专色 PANTONE 2728 C