



ACU2-H 柔触驱动器

使用说明书



装箱清单



柔触驱动器本体
ACU2-H x 1



电源适配器 (24VDC 2.5A 60W)
EC-64 x 1



电源线
EC-69 x 1



电源口转接线 (5.5x2.1)
EC-70 x 1



变径接头 (6mm转4mm)
PN-273 x 1



6mm气管
x 2m



4mm气管
x 2m

安全注意事项



警告：请严格遵守安全注意事项，错误操作可能导致本产品损坏和人身伤害。

1. 请使用配件中的电源适配器。不可用其他电压及低功率电源适配器，以免造成不可逆电路损伤。
2. 请勿对外壳施加过大外力造成破损，以免降低防护等级。

外观



参数

名称	范围	名称	范围
额定电压	24VDC±10%	外壳材质	铝合金阳极氧化
额定功率	48W	尺寸	120x223x75mm
寿命	5000小时	净重	1.8kg
输出气压	-80~280kPa	防护等级	IP54
输出精度	±3kPa	控制方式	1. 手动按钮
正压流量	8L/min		2. I/O, 电平信号
真空流量	8L/min		3. 电压模拟量调节压力
工作噪音	63dB		4. MODBUS TCP/RTU
工作模式	持续信号驱动		

使用步骤

1. 请使用配件中的电源适配器，给驱动器上电。
2. **根据夹爪型号（柔指/柔爪）设定夹爪气压（非常重要）。**参考“常见问题”解锁面板，通过【调节正压】、调节【负压按钮】，使【夹爪设定气压】数显表中的数值等于夹爪的使用气压（可咨询柔触技术工程师）。
3. 【夹爪端】气管连接夹爪。若管径不一致，可使用配件中的变径接头。
4. 操作【手动控制】按钮，检查夹爪工作情况。驱动器工作中，可通过【夹爪当前气压】数显表实时观察夹爪端气压数值。
5. 根据工况需求，在【端子控制】中选择端口与终端设备连接。

驱动器外部控制信号类型有3种，分别为I/O、电压模拟量以及MODBUS。其中MODBUS控制优先级最高，且分为TCP和RTU两种类型。

端子控制端口说明（16P）		
序号	内容	功能
1	电平输入A+	输出正压
2	电平输入A-	
3	电平输入B+	输出真空
4	电平输入B-	
5	电压模拟量输入C+	设定夹爪正压
6	电压模拟量输入C-	
7	电压模拟量输入D+	设定夹爪真空
8	电压模拟量输入D-	
9	开关量输出E	正压反馈
10	开关量输出E	
11	开关量输出F	真空反馈
12	开关量输出F	
13	RS485-A	MODBUS RTU
14	RS485-B	
15	24V+	电源
16	24V-	

接线案例1：

AUBO协作机器人i5系列，该设备为NPN输出、输入。

控制驱动器输出，请将1、3号线接24V公共端，2、4号线接DO输出端。

接收驱动器反馈信号，请将9、11号线接DI输入端，10、12号线接0V公共端。

设定正、负压力，请将6、8号线接0V公共端，7、9号线接VO模拟量输出端。

接线案例2：

西门子PLC 200SMART系列，该设备为PNP输出，输入也设置成PNP。

控制驱动器输出，请将2、4号线接0V公共端，1、3号线接输出端Q。

接收驱动器反馈信号，请将10、12号线接输入端I，9、11号线接24V公共端。

若需要通过电压模拟量去设定正、负压力，请安装模拟量输出模块EM AQ，然后将6、8号线接模拟量公共端M，7、9号线接模拟量输出端V。

模拟量设定正压、真空压力

设定正压

模拟量0~5V信号对应调压范围量程0~300kPa（实际可调节范围为10~300kPa）
$$\frac{300 - 0}{5} = 60\text{ kPa/V}$$
则
即1V电压信号对应60kPa
例如正压需要设置成80kPa，电压模拟量给1.3V；需要设置成220kPa，电压模拟量给3.7V。

设定真空

模拟量0~5V信号对应调压范围量程-100~0kPa（实际可调节范围为-80~-10kPa）
$$\frac{100 - 0}{5} = 20\text{ kPa/V}$$
则
即1V电压信号对应-20kPa
例如负压需要设置成-40kPa，电压模拟量给2V；需要设置成-80kPa，电压模拟量给4V。

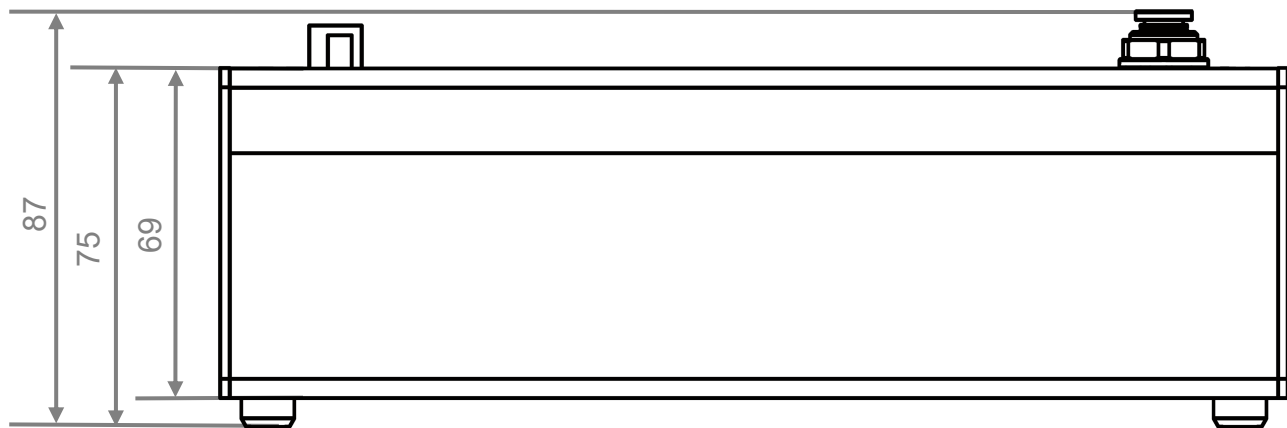
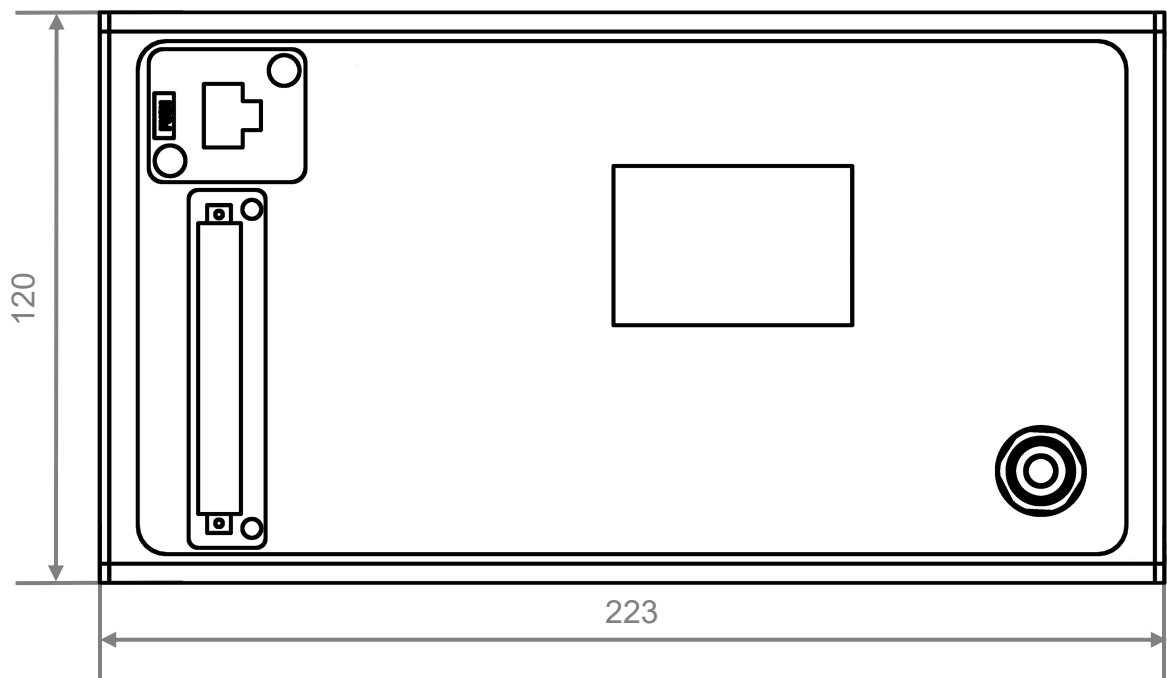
MODBUS说明（TCP/RTU）

RTU默认从站地址：1 波特率：9600
TCP默认IP地址：192.168.1.200 端口：502

序号	功能	功能码		16进制地址	10进制整数型地址	10进制浮点数地址	参数范围
		读	写				
1	触发正压	0x01	0x05	0x100	256		0/1
2	触发负压	0x01	0x05	0x101	257		0/1
3	正压反馈	0x02	/	0x200	512		0/1
4	负压反馈	0x02	/	0x201	513		0/1
5	夹爪当前气压	0x03	/	0x302	770	780	-80~300kPa
6	设定夹爪正压	0x03	0x06 0x10	0x306	774	788	10~300kPa
7	设定夹爪负压	0x03	0x06 0x10	0x307	775	790	-80~-10kPa

若需要变更驱动器IP地址，请联系我司技术工程师下载通讯软件。

尺寸



常见问题

1. 解锁面板调节按钮。

两组调节按钮（【调节正压】、【调节负压】），任意一组的【+】【-】同时长按3秒，直至面板【夹爪设定气压】表头数值闪烁。两组调节按钮10秒内无操作，面板自动进入锁屏状态。

2. 驱动器工作模式。

夹爪气路不泄漏的情况下，夹爪内部气压到位后，呈保压状态（气泵停止工作，夹爪保持住压力状态）。若【夹爪设定气压】表头数值有变化或气路有泄漏，驱动器再次启动直至气压到位为止。

3. 驱动器短暂断电后的状态。

断电前有【手动控制】信号。断电再上电后，手动信号清空，夹爪状态继续保持，同时【夹爪当前气压】表头显示夹爪内部气压值。直到【手动控制】信号再触发，驱动器再工作。

断电前有【端子控制】信号，且为持续信号。断电再上电后，根据实时的信号触发相应驱动器输出状态。

4. 多种控制方式的优先级。

MODBUS TCP > MODBUS RTU > 电压模拟量 > I/O > 手动控制



ACU2-H Rochu Control Unit

Instructions



Packing List



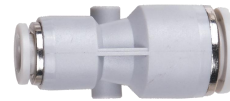
Rochu Control Unit
ACU2-H x 1



Power Adapter
(24VDC 1.04A 25W)
EC-02 x 1



Power Port Conversion Cable
(5.5x2.1)
EC-70 x 1



Reducing Joint
(6mm trun 4mm)
PN-273 x 1



6mm Pipe
x 2m



4mm Pipe
x 2m

Safety Caution



Warning: Please strictly observe the safety cautions, incorrect operation may cause damage to the product and personal injury.

1. Please use the power adapter in the fittings. Do not use other voltage or low power adapter to avoid irreversible circuit damage.
2. Do not put too much force to the shell. It may cause damage and lower the protection level.

Appearance



Parameter

Parameter	Range	Parameter	Range
Rated Voltage	24VDC $\pm$ 10%	Shell Material	aluminum alloy
Rated Power	48W	Size	120x223x75mm
Lifetime	5000hours	Net Weight	1.8kg
Output Pressure	-80~280kPa	Protection Level	IP54
Output Precision	$\pm$ 3kPa	Control Mode	1. manual button
Pressure Flow	8L/min		2. I/O, level signal
Vacuum Flow	8L/min		3. voltage analog
Working Noise	63db		4. MODBUS TCP/RTU
Working Mode	continuous signal drive		

Using Steps

1. Use the power adapter to power up the control unit.
2. **Set working pressure according to the type of the gripper (IMPORTANT).** Unlock the panel by referring to 'F&Q' and adjust the [Set Pressure] and [Set Vacuum] buttons to make the value in the digital display of [Set Work. Press.] equal to the using pressure of the gripper (consult our technical engineers).
3. Connect the [Gripper Port] to the gripper. If the pipe diameter is inconsistent, use the reducing joints in the fitting.
4. Operate the [Manual] button to check the working performance of the gripper. When the control unit is working, the pressure of the gripper can be observed in real time through the [Current Gripper Press.] digital display.
5. According to working conditions, select ports to connect with terminal equipment in the [Port Control].

Signal Communication

There are three types of driver external control signal, namely I/O, voltage analog and MODBUS. MODBUS control has the highest priority and is divided into TCP and RTU.

Port Control Insturctions (16P)		
No.	Content	Function
1	level input A+	output pressure
2	level input A-	
3	level input B+	output vacuum
4	level input B-	
5	voltage analog input C+	set gripper pressure
6	voltage analog input C-	
7	voltage analog input D+	set gripper vacuum
8	voltage analog input D-	
9	switch output E	pressure feedback
10	switch output E	
11	switch output F	vacuum feedback
12	switch output F	
13	RS485-A	MODBUS RTU
14	RS485-B	
15	24V+	power
16	24V-	

Wiring Case 1:

AUBO cooperative robot I5 series, its output and input signals are NPN.
To control the control unit, please connect lines 1 and 3 to the 24V common port, and lines 2 and 4 to the DO output port.
To receive the feedback signal of the control unit, please connect lines 9 and 11 to the DI input port, and lines 10 and 12 to the 0V common port.
To set the pressure and vacuum, connect lines 6 and 8 to 0V common port and lines 7 and 9 to VO analog output port.

Wiring Case 2:

Siemens PLC 200SMART series, its output is PNP, and input is also set to PNP.
To control the control unit, please connect lines 2 and 4 to the 0V common port, and lines 1 and 3 to the output port Q.
To receive the feedback signal of the control unit, please connect lines 10 and 12 to the input port I, and lines 9 and 11 to the 24V common port.
If it is necessary to set the pressure and vacuum through analog quantity, please install the analog quantity output module called EM AQ. Then connect lines 6 and 8 to analog quantity common port M and lines 7 and 9 to analog quantity output port V.

Set the Pressure and Vacuum by Analog Voltage

Set the Pressure

The analog voltage of 0~5V corresponds to the pressure regulating range of 0~300kPa (the actual adjustable range is 10~300kPa).

Then, $\frac{300 - 0}{5} = 60 \text{ kPa/V}$

That is, 1V voltage corresponds to 60kPa

For example, the pressure needs to be set to 80kPa, and the analog voltage is 1.3V. And It needs to be set to 220kPa and the analog voltage is 3.7V.

Set the Vacuum

The analog voltage of 0~5V corresponds to the pressure regulating range of -100~0kPa (the actual adjustable range is -80~-10kPa).

Then, $\frac{100 - 0}{5} = 20 \text{ kPa/V}$

That is, 1V voltage corresponds to -20kPa

For example, the vacuum needs to be set to -40kPa, and the analog voltage is 2V. And It needs to be set to -80kPa and the analog voltage is 4V.

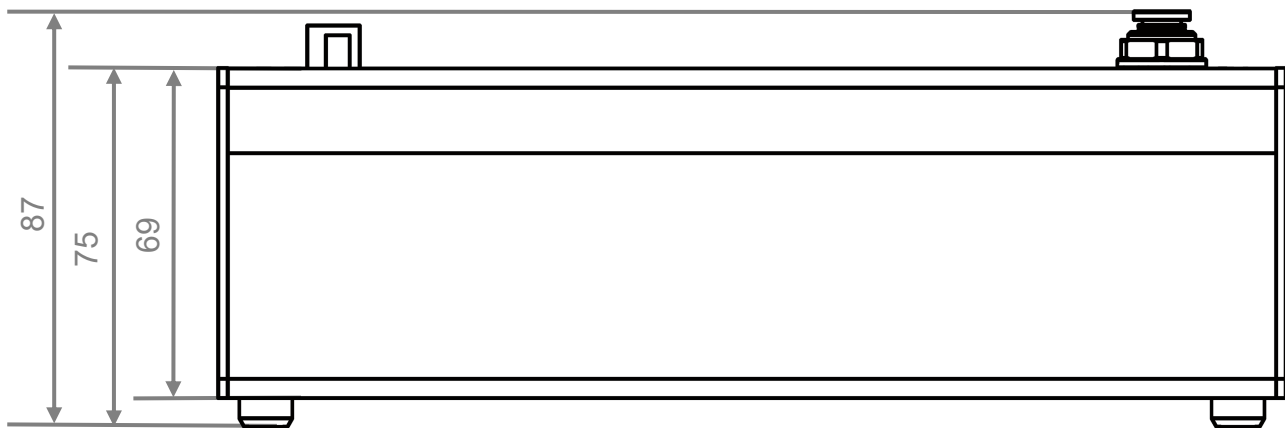
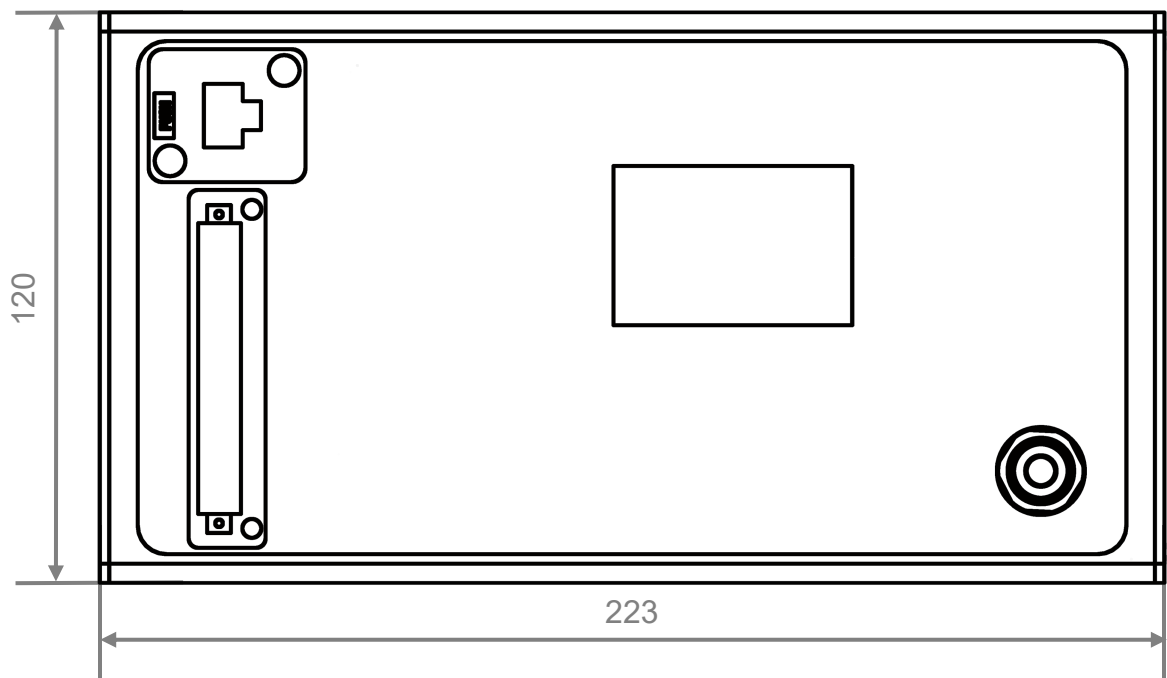
MODBUS Instructions (TCP/RTU)

RTU default Slave Address: 1 Baud Rate: 9600
TCP default IP Address: 192.168.1.200 Port: 502

No.	Function	Function Code		Hexadecimal Address	Decimal Integer Address	Decimal Floating Address	Range
		Read	Write				
1	output pressure	0x01	0x05	0x100	256		0/1
2	output vacuum	0x01	0x05	0x101	257		0/1
3	pressure feedback	0x02	/	0x200	512		0/1
4	vacuum feedback	0x02	/	0x201	513		0/1
5	current gripper pressure	0x03	/	0x302	770	780	-80~300kPa
6	set pressure	0x03	0x06 0x10	0x306	774	788	10~300kPa
7	set vacuum	0x03	0x06 0x10	0x307	775	790	-80~-10kPa

If need to change the IP address of the control unit, please contact our technical engineer to download the communication software.

Size



1. Unlock the panel adjustment button.

Two groups of adjustment buttons ([Set Pressure], [Set Vacuum]), [+] and [-] of any group are pressed for 3 seconds at the same time, until the value of the [Set Work. Press.] display meter on the panel flashes. If there is no operation within 10 seconds, the panel will be locked automatically.

2. The control unit working mode.

Under the condition that the air circuit of the gripper does not leak, after the air pressure inside the gripper is in place, it is in a pressure-holding state (the air pump stops working, and the gripper keeps the pressure state). If there is a change in the value of the [Set Gripper Press.] display meter or there is leakage in the air circuit, the control unit will start again until the air pressure is in place.

3. The state of the drive after a brief power loss.

There is a [Manual] signal before power off. After power on again, the manual signal will be cleared, the state of the gripper will continue to be maintained. And the air pressure value of the gripper will be displayed in the [Current Gripper Press.] display meter at the same time. Until the [Manual] signal is triggered again, the drive will work again.

There is a [Port Control] signal before power off, and it is a continuous signal. After power on again, the control unit will be corresponding state according to the real-time signal.

4. Priority of various control methods.

MODBUS TCP > MODBUS RTU > Analog Voltage > I/O > Manual