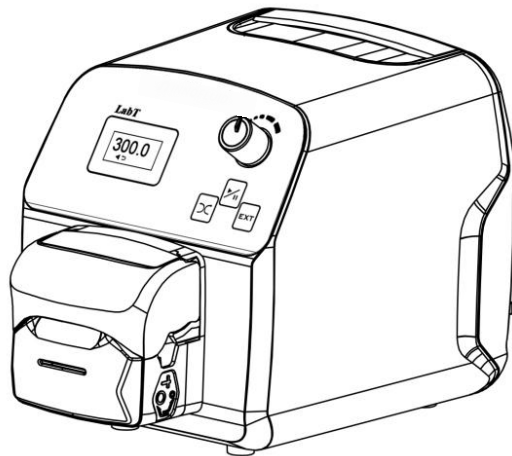


LabT Series USER'S MANUAL





Note:

- Please read the manual carefully before operating the product.



Warning:

- Connect the power cord to the wall socket, and avoid using electric extension cords.
- If the power cord or plug shows wear and/or other damage, please disconnect from socket by pulling the plug, not the wire and contact service.
- In the following circumstances, turn off the power supply and disconnect the plug by holding the plug itself, not the wire:
 - 1.Fluid has splashed onto the pump.
 - 2.Pump needs maintenance or repair.
- The power socket should be equipped with a ground wire and properly grounded.

Note: Ensure that the foot pedal switch and other external control plugs are connected or disconnected only when the power is off, to prevent damage.

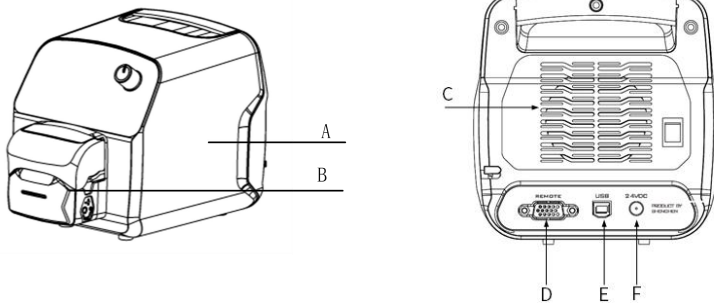
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1. Product Overview

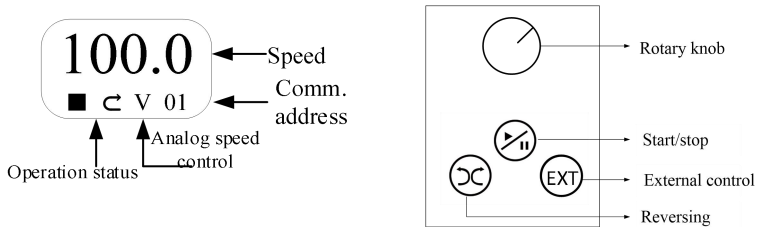
LabT adopts integrated stepper motor drive which has features of low noise, stable operation. The pump has OLED screen and external control interface to realize remote control. It can communicate with computer. Support standard MODBUS communication protocol (RTU mode).

2. Product Appearance



- A—Drive
- B—Pump Head
- C—Fan Interface
- D—External Control Interface
- E—USB Port
- F—Power Supply Interface

3. Operation Panel Instruction



- **Start/Stop Button:** Controlling drive running or stopping. Press [Start/stop] button every time, the operation status will be changed for one time. When drives runs, the screen displays operation icon “▶ ”; When drive stops, the screen displays stop icon “■”.
- **Reversing Button:** Press [reversing] button once, motor will change running direction once.
- **External Control Button:** Change analog speed regulation method. Press the button once to change once. Circularly displays: Empty→5V→10V→mA→Empty, corresponding respectively Turn off analog speed control→0-5V→0-10V voltage analog speed regulation→4-20mA analog speed regulation→turn off analog speed regulation.

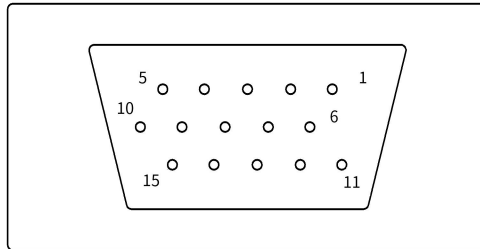
Note: Keep pressing this button and turn on the power supply at same time, that will be initialize the pump, and all the parameters will be lost.

- **Digital Knob:** It's used to increase or decrease the motor running speed.
 - (1) In running status, the knob is used to adjust the speed, the speed will increase in clockwise, and decrease in counterclockwise. If keep pressing this button, the motor will run with the highest (full speed), release the button, the motor will return to normal speed.
 - (2) In stopping status, press the digital knob, at this time, the value at the lower right corner of the LCD flashes, the value is 485 communication address (1~32), at this time, you can change the value by rotating the knob. After completed setting, press the knob one time to save, and it will stop flashing.

4. External Control Interface

The external control interface of LabT series product is 15 Pins, as shown in the figure below.

Including functions of external control start/stop, reversing direction, analog speed regulation, communication, status output.



Pin1 is the external control start/stop port;

Pin2 is the external control reversing port;

Pin3 is switch of external control level mode.

Pin4 is RS485 B-;

Pin5 is RS485A+;

Pin6 is 0-5V signal terminal of analog speed regulation;

Pin7 is 0-10V signal terminal of analog speed regulation;

Pin8 is 4-20mA signal terminal of analog speed regulation;

Pin9 is AGND common port of analog speed regulation;

Pin10 is active external control isolation signal common port, the factory default is passive external control signal, and this pin is empty;

Pin11 is negative terminal (POWER_COM) of status output;

Pin12 is status output terminal (OUT_RUN);

Pin13 is positive terminal (POWER_VDD) of status output;

Pin14 is the positive terminal of internal isolated 5V output;

Pin15 is the negative terminal of internal isolated 5V output.

(1) Passive external control start/stop, reversing:

➤ **Pulse mode**

Pin1 to pin14, short circuited them and then disconnect (pulse mode) is start, do it one more time, the motor will stop.

Pin2 to pin14, short circuited them and then disconnect (pulse mode) is reversing.

➤ **Level mode**

Pin3 is switch pin of external control level mode, short circuited pin3 and pin14 switches to external control level mode.

Pin1 to pin14, short circuited them is to start, disconnect is stop.

Pin2 to pin14, short circuited them, the motor will be in counterclockwise status, disconnect them, the motor will be in clockwise status.

Note: The factory defaults to external control start/stop, reversing to passive signal. And this interface can connect with foot pedal equipped by our company.

(2) Active external control start/stop, reversing

➤ **Pulse mode**

Pin10 connects with negative pole of positive external signal.

Pin1 connects with positive pole of active external control signal, short circuited them and disconnect, the motor will run, and do it one more time, the motor will stop.

Pin2 connects with positive pole of active external control signal, short circuited them, the motor will change the direction, and do it one more time, the motor will change direction again.

➤ **Level mode**

Pin10 connects with negative pole of active external control signal.

Pin3 is switch pin of external control level mode, short circuited pin3 with positive pole of active external control signal to switch to external control level mode.

Pin1 is short circuited with positive pole of active external control signal to starts, and disconnect them to stop.

Pin2 is short circuited with positive pole of active external control signal and the motor will be in counterclockwise status, disconnect them, the motor will be in

clockwise status.

Note: Positive external control isolated signal is universal 5-24V.

(3) Analog speed regulation

0-5V voltage signal speed regulation

Select analog speed regulation signal of the pump to 0-5V voltage signal by external control button., analog signal is displayed “5V” on screen.

Voltage 0-5V speed regulation, pin6 connects positive pole of analog 0-5V voltage signal, pin9 connects negative pole. Change the analog signal voltage value, the speed will change linearly. 0V corresponds to 0rpm, 5V corresponds to the highest speed.

0-10V voltage signal speed regulation

Select analog speed regulation signal of the pump to 0-10V voltage signal by external control button, analog signal is displayed “10V” on screen.

Voltage 0-10V speed regulation, pin7 connects positive pole of analog 0-10V voltage signal, pin9 connects negative pole. Change the analog signal voltage value, the speed will be changed linearly. 0V corresponds to 0rpm, 10V corresponds to the highest speed.

External control button of current signal speed regulation

Select analog speed regulation signal of the pump to current signal, the analog signal is displayed “mA” on screen.

Current 4-20mA speed regulation, pin8 connects positive pole of analog speed regulation signal current 4-20mA, pin9 connects negative pole. Change current value of analog signal, the speed will be changed linearly. 4mA corresponds to 0rpm, 20mA corresponds to the highest speed.

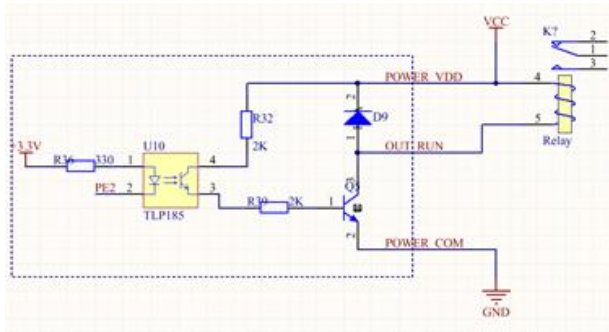
Note: It is forbidden to connect 0-5V/0-10V signal with 4-20mA input terminal.

Wrong connection will damage the equipment.

(4) The output signal

- 1) Connect Power-VDD with external power supply 5V positive;
- 2) Connect Power-COM with external power supply 5V negative;

- 3) Start motor, the relay pull in; the motor stops, the relay disconnect.



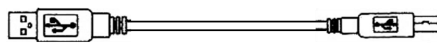
5. Communication Interface Instruction

The pump support standard modbus protocol (RTUmode), communication modes are RS485 and USB. It can control the pump start/stop, direction and motor speed; also can read the current running status.

USB communication mode need to use USB cable (one side is head A and the other side is head B), connect the pump with computer through the USB interface.

Type-A connects computer USB interface

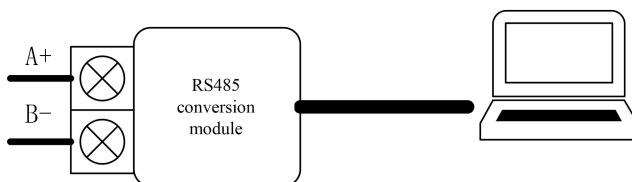
Type-B connects LabT USB interface



Type	Type-A	Type-B
Plug(male) USB2.0	<p>Type-A</p>	<p>Type-B</p>
	Connect with computer	Connect with external control USB interface

- RS485 communication: Connect A+ (pin5) from external control interface (as shown in Picture 8) to T/R+ of RS485 module; and connect B- (pin4) to T/R- of RS485 module. Users can control the pump working according with the

communication protocol.



6. Technical Parameters

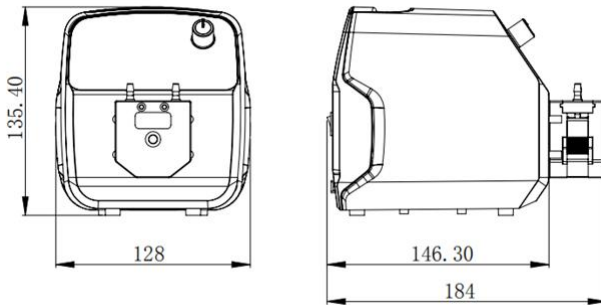
Product model	LabT/KT15 LabT/minipump LabT/UD15	Power supply	Standard 220V to 24VDC/1.25A adapter
Speed range	LabT/Minipump: 0.1-300rpm LabT/UD15: 0.1-350rpm LabT/KT15: 0.1-350rpm	External control method	Start/stop: Switch signal Speed control:0-5V, 0-10V, 4-20mA for option
Speed resolution	0.1rpm	Communication method	USB interface, RS485 interface (Modbus protocol, RTU mode)
Operation method	Digital rotary knob/ pure imported keypad	Temperature	0-40°C
Motor type	42 closed-loop stepper motor	Relative humidity	<80%
Display method	0.96 inch OLED screen	Output interface	Output motor operation status
Power consumption	≤30W	IP rate	IP31

7. Main Functions and Features

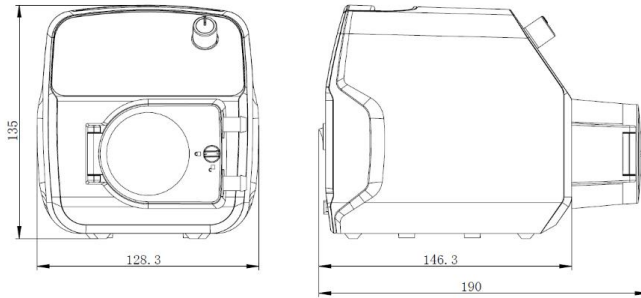
- Suitable pump heads: KT15 pump head, Minipump head, UD15 pump head.
- Rotary knob controls speed, you can control speed manually or automatically control by external control interface.
- One controller controls multiple pumps at same time, 485 address can't be repeat.
- Excellent performance for drive circuit, good heat dissipation condition, low working noise, stable operation, power down memory function.
- RS485 standard Modbus protocol, it is convenient to connect PLC program.
- Higher cost performance.
- 304 stainless steel wire drawing shell, anti-corrosion, no rust, meet the GMP requirements of pharmaceutical factories.
- OLED displays motor speed and working status.

8. Dimension Drawing

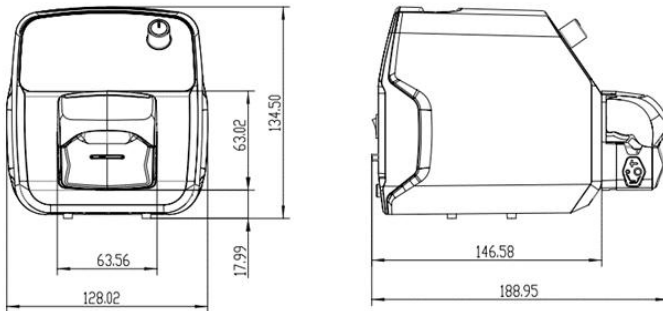
Unit: (mm)



LabT+MiniPump



LabT+UD15



LabT+KT15

9. Maintenance

- Verify the pump current operational status before turning on power. Operate only under normal conditions.
- Inspect for fluid leakage and promptly address any potential faults.
- Clean any spilled liquid around the pump promptly.
- If liquid splashes on the pump, turn off and unplug the power supply, check for internal leakage, and contact the manufacturer if liquid has entered the equipment
- Ensure that the foot pedal switch and other external control plugs are connected or disconnected only when the power is off, to prevent damage.
- The power socket should be equipped with a ground wire and properly grounded.
- This product is not designed to be waterproof. Operators are advised to implement appropriate protective measures when operating in wet environments.
- This product is not equipped with special certifications, such as medical certification. For applications in specialized fields like medical or military, users are responsible for conducting their own certification/validation.
- If the product will not be used for an extended period of time, please clean it thoroughly and store it in a dry, well-ventilated area.
- The company is not liable for any losses resulting from product malfunctions or misuse of the product.