



# Peristaltic Pump Manual

CAT NO. PP1; PP1\$



# Table of Contents

Packing list	3
Warning	4
Safety Information	5
Technical Specifications	7
Introduction	8
Pump Features	9
Operation Instruction	10
YZ1515X Pump Head Introduction	11
Silicon Tubes and Typical Rate	13
Pump Dimension Drawing (mm)	14
Troubleshooting Guide	14
Maintenance	15
Warranty	16

## Packing list

- 1 x Single Digital Peristaltic Pump PP1
- 1 x Silicon tube
- 1 x power cable
- 1 x Instruction Manual
- 1 x Allen key

Packing list checked by \_\_\_\_\_

Date \_\_\_\_\_

**Cleaver Scientific is liable for all missing or damaged parts / accessories within 7 days after customer received this instrument package. Please contact Cleaver Scientific immediately regarding this issue. If no response within such period from consignee party, that will be consignee party's whole responsibility.**



## WARNING

- Please read the manual carefully before operating the instrument.

This equipment has been tested and found to comply with the limits for CE regulation. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates and uses, and may radiate radio frequency energy; and, when not installed and used in accordance with the instruction manual, will cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at their expense. Changes or modifications not expressly approved by the party responsible for compliance could nullify the user's authority to operate the equipment. It is strongly recommended that the user reads the following points carefully before this equipment is operated.

1. Read and follow carefully the manual instructions.
2. Do not alter the equipment. Failure adhered to these directions could result in personal and/ or laboratory hazards, as well as invalidate equipment warranty.
3. Use a properly grounded electrical outlet of correct voltage and current handling capacity.
4. Disconnect the pump from the power source before maintenance and servicing. Refer servicing to qualified personnel.
5. If solution is accidentally spilled into the instrument, disconnect the grounded plug and carry out appropriate decontamination – e.g. turning the pump upside down to prevent solution contacting the internal components. Remove the cover and inspect to assure solution has not contacted the elements, thermostat or connector. Replace any damaged parts.
6. Do not use in the presence of flammable or combustible material as fire or explosion may result. This device contains components, which may ignite such

materials.

7. Refer maintenance and servicing to qualified personnel.
8. Ensure that the system is connected to an electrical supply according to local and national electrical codes. Failure to establish proper connection may create a fire or shock hazard.
9. Ensure the use of appropriate materials and correct operation to avoid possible hazards of explosion, implosion or release of toxic or flammable gases arising from the materials being heated.

## **Safety Information**

Take necessary precautions when using any electrical device. Before connecting with the electrical supply, check the supply voltage is within the range stated on the rating label, and that the device is earthed. Place the unit in a safe and dry location, ensuring that it is not touching anything in the surrounding environment. Also follow the safety precautions for chemicals / dangerous materials, and hot surfaces. If needed, please contact a qualified service representative

### ***Environmental Conditions***

Ensure the instrument is installed and operated strictly in the following conditions:

≤80% RH,

75 KPa-106 Kpa,

Altitude not to exceed 2000 meters

### **Avoiding Electrical Shock**

Follow the guidelines below to ensure safe operation of the unit.

The peristaltic pump has been designed for use with insulated wires, thereby minimising the risk of any potential shock hazard to the user. The manufacturer recommends against the use of uninsulated wires.

### **To prevent electrical shock:**

1. In the event of accidental liquid spillage within the instrument, remove the grounded supply cable from the electrical source and thoroughly dry the contaminated area. It is best to leave the unit standing at room temperature for a minimum of 2 hours before further use.
2. NEVER connect or disconnect wire leads from the power jacks when the power is on.
3. WAIT at least 5 seconds after stopping a run before handling output leads or connected apparatus.
4. ALWAYS make sure that hands, work area and instruments are clean and dry before connecting or disconnecting the unit from the power supply.
5. ONLY connect the power supply to a properly grounded AC outlet.

### **Avoiding Damage to the Instrument**

1. Do not attempt to operate the device if it is damaged.
2. Protect this unit from physical damage, corrosive agents and extreme temperatures (direct sunlight etc.).
3. For proper ventilation and safety, retain at least 10 cm of space behind the instrument, and at least 5 cm of space on each side.
4. Do not operate the device in high humidity environments (> 80%), or where condensation may occur.
5. Before applying any cleaning or decontamination methods, users should check with the manufacturer's instructions to ensure that the proposed method will not damage the equipment.

### **Equipment Operation**

Follow the guidelines below to ensure safe operation of the unit.

1. Check the external temperature probe to ensure the device is within the safe temperature limits of the system at least once a day.
2. NEVER access any HAZARDOUS LIVE parts.

## Technical Specifications

Speed range	1-350rpm	Power supply	PP1: AC220V±10%,50Hz/60Hz
			PP1\$: AC110V±10%,50Hz/60Hz
Speed resolution	0.1rpm 1~100rpm 1rpm 100~600rpm	Operating temperature	0~40°C
		Relative humidity	<80%
Speed control	Rotary encoded switch or priming	Dimension (L*W*H)	254*184*145mm
Display	3 digital LED	Start/stop, direction signal	Passive switch signal
External speed control signal	0-5V(standard), 0-10V, 4-20mA (optional)	Communication interface	RS485
Power consumption	<50W	IP rate	IP31

## **Introduction**

PP1 peristaltic pump is designed to be used quickly and easily within the laboratory. The pump heads accept several different tubing sizes for a wide range of flow rates. It is suitable for many applications such as filtration, circulation, sampling, chemical spraying, dispensing, transfer, feeding, filling and metering.

### **Features:**

Compact size

High precision

Stepper motor driver

Dual CPU control

Digital knob to control speed

Toggle switch to control start/stop and direction

Reversible flows for purging

Easy load pump head

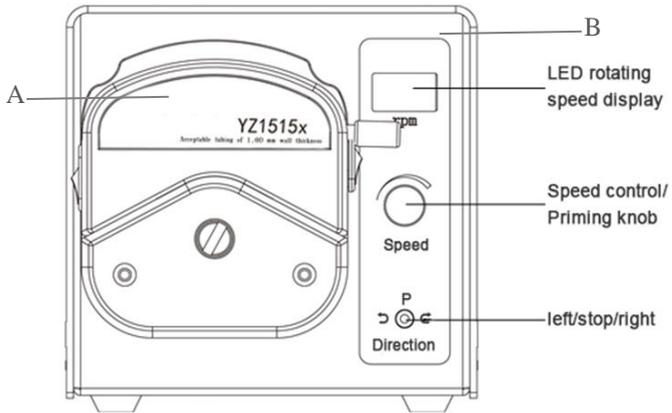
Wide applications

Anti-jamming technology

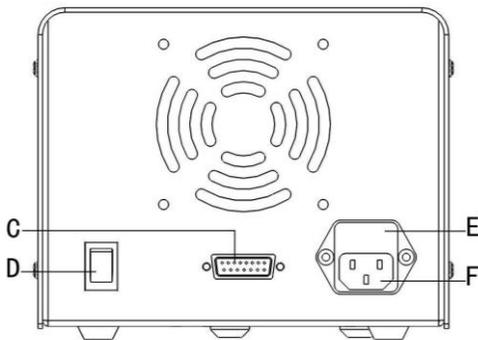
Anti-corrosion coating technology

Can be controlled remotely via the RS485 communication interface (optional)

# Pump Features



- A--Pump head
- B--Drive
- C--External control interface
- D--Power switch
- E--Internal protective tube
- F--Power socket



## Operation Instruction

Plug the peristaltic pump to a main power wall socket and turn the switch situated at the back of the unit on.

### **Toggle switch - Left/stop (P)/right direction**

- Positioning the toggle switch to the 'left' enables the pump to run in an anticlockwise direction at the set speed
- Positioning the toggle switch to the 'right' enables the pump to run in a clockwise direction at the set speed
- Positioning the toggle switch in the middle (P) will turn off the pump.

### **Set the pump speed**

Position the toggle switch to either the left or the right position and rotate the speed knob clockwise to increase the rpm shown in the LED display or anticlockwise to decrease the pump speed settings.

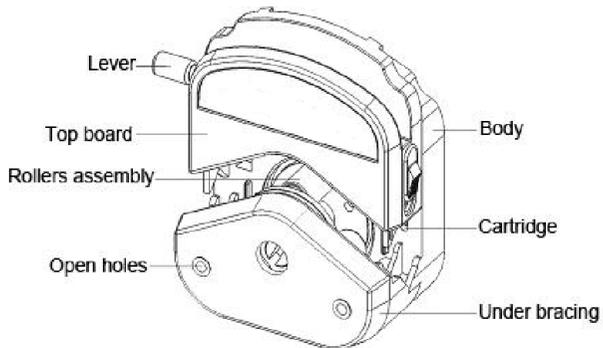
### **Prime key**

While the pump is running you can press the prime key to enable the pump to reach maximum speed (350rpm) to quickly perform application such as emptying, filling or cleaning the tubing system. During this operation the LED screen will display 'FULL'. Releasing the prime key will return the pump to the pre-set speed.

# YZ1515X Pump Head Introduction

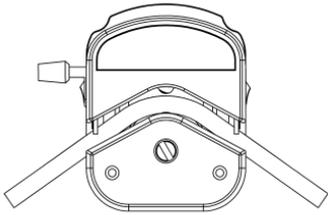
## Single Channel Easy Tube Loading pump head

Pump Head material                      PPS (Polyethylene sulfide); PSF (Polysulfone)



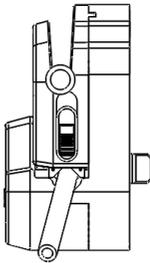
## Pump head Installation

- Screw the pump head into the drive shaft joint (already assembled)
- Install the tubing as follow:
  - o Pull the lever to 180° anticlockwise
  - o Lift the cartridge and insert the tubing between the roller and top board
  - o Close the lever and make sure the system is in the correct position (please refer to below images)

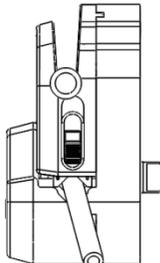


When installing the tubing make sure the tube follows its natural direction to avoid jamming and cracking of the tube. Moreover, straightened the tube to avoid tubing accumulation in the pump head.

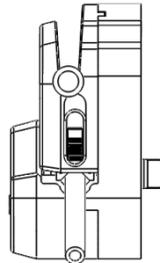
Straighten the tube



Wrong

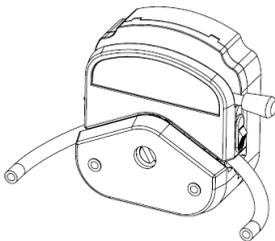


Wrong



Right

Clamp the tube straight into the groove as per above image in order to avoid the tube to cut through during the run.

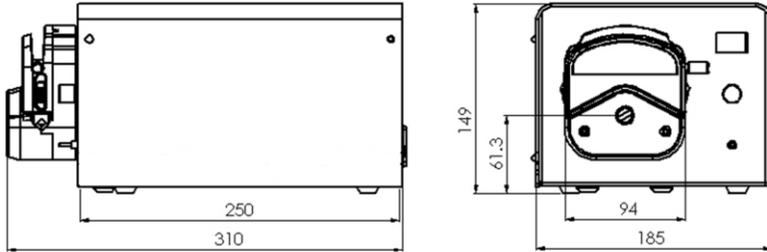


Make sure the lever is completely locked in order to ensure that there is enough pressure to hold the tube into position and to avoid the tube to become loose during the run. It is recommended to check the flow rate with water before adding the experimental fluids.

## Silicon Tubes and Typical Rate

Cat. No.	 MU-S13	 MU-S14		
Inner Diameter (inches / mm)	0.03 (0.8)	0.06 (1.6)		
Hose Barb Size (inches / mm)	1/16 (1.6)	1/16 (1.6)		
Flow Rate with 1 to 600 rpm Drive (ml / min)	0.06 ~ 2280			
Maximum Pressure, Continuous	0.17 Mpa			
Maximum Pressure, Intermittent	0.27 Mpa			
Silicon Tubing Cat. No.	Tube I.D. Size (")	10 rpm (ml / Rev.)	50 rpm (ml / Rev.)	100 rpm (ml / Rev.)
MU-S13	1/32	0.6	3	6
MU-S14	1/16	2.1	10.5	21

## Pump Dimension drawing (mm)



## Troubleshooting Guide

Many operating problems may be solved by carefully reading and following the instructions in this manual accordingly. Some suggestions for troubleshooting are given below. Should these suggestions not resolve the problem, please contact the SERVICE DEPARTMENT or a distributor in your region for assistance. If troubleshooting service is required, please include a full description of the problem.

Problem	Recommendations
Unit does not turn on	Check the <b>FUSE</b>
	Ensure that the AC power switch is ON
	Check the three-pronged power cord are properly plugged into a grounded three-prong AC outlet of the appropriate voltage

## **Maintenance**

The pump is lifetime lubricated. Check condition of power cord annually and visually check for tubing cracks and wear regularly. When pump is not in use, release the tube in the pump head to avoid changes in the tube shape.

Avoid contact to highly corrosive liquid as the pump head is not resistant to them.

Keep the rollers of the pump head clean and dry. If the surface of the rollers is not clean, it can reduce the lifespan of the tubes. If liquids are spilled onto the pump or pump head dry the unit promptly. The pump might be cleaned with a moist cloth containing a mild soap solution. Do not immerse, nor use excessive fluid to clean the units.

## **Warranty**

This warranty guarantees apparatus of its manufacture against defects in materials and workmanship, under normal service, for one years from the shipping date to purchaser. This warranty excludes damages resulting from shipping, misuse, carelessness, or neglect or wear and tear of the tubing system. The manufacturer's liability under the warranty is limited to the receipt of reasonable proof by the customer that the defect is covered within the terms of the warranty. All claims made under this warranty must be presented to the manufacturer or its distributor within one years following the date of delivery of the product to the customer.