

i150 Peristaltic Pump

Operating Manual



Please ensure you read and understand these instructions before using the i150 Peristaltic Pump

WARNING!



PLEASE READ THE OPERATING MANUAL CAREFULLY



PLEASE READ THE WARNINGS & RATING LABEL ON THE BASE OF THE UNIT



THIS EQUIPMENT SHOULD ONLY BE USED AS SPECIFIED IN THIS OPERATING MANUAL



IF OPERATED IN A MANNER NOT SPECIFIED, THE PROTECTION PROVIDED MAY BE IMPAIRED



NEVER TAKE CHANCES WITH SAFETY!

IF IN DOUBT, ALWAYS ASK!

HEALTH & SAFETY

As manufacturers of scientific equipment, we are obliged under the terms of the Health & Safety at Work Act 1974 (for the UK) to provide our users with instructions on the safe installation, operation and maintenance of our equipment.

Our equipment is designed to accepted standards and does not entail any hazard if used in accordance with the instructions provided.

The following safety precautions should be observed by all personnel using this equipment.

General

1. Before operating the pump, please read and make sure you understand this manual. If in any doubt contact:-

iPumps Limited

Email: sales@ipumps.biz or
service@ipumps.biz

Web: www.ipumps.biz

2. Laboratory equipment is complex and is intended to be used only by suitably qualified and trained personnel.
3. A risk assessment should be carried out by a suitably qualified member of staff before working with this equipment.
4. Observe good housekeeping practices at all times. Keep the equipment and adjacent areas clean, dry and uncluttered.
5. Take precautions. Wear the correct protective clothing and eye protection when handling liquids, gases or mechanical items.
6. Should any malfunctions occur or be suspected, immediately call a qualified service engineer or supervisor to investigate.

Electrical Hazards

1. Do not remove any covers. There are voltages in excess of 24 volts AC behind the covers. There are no operable controls.
2. Please ensure you unplug the pump from the mains power supply when the pumps needs maintenance or repair.
3. An electrical safety check should be carried out annually.

Mechanical Hazards

Take extra care when using peristaltic pumps:-

1. **Always** ensure the pump switch is in the STOP position before loading tubing.
2. **Never** put fingers into the pump even when in the STOP position.

*Declaration of
Conformity*

This is to certify that the following iPumps unit:-

iPumps Model i150

complies with **Electromagnetic Compatibility Directive** 89/336/EEC (with amendment 92/31) and **Low Voltage Directive** 73/23/EEC and also complies with **Machinery Directive** 89/392 (with amendments 91/368 and 93/44)

D. MILNE, Director
For and on behalf of **iPumps Ltd**

HOW TO CONTACT US

Post: iPumps Ltd
12 Willis Walk
Northway
Tewkesbury
Glos GL20 8RW
UK

Email:

Sales sales@ipumps.biz
Service service@ipumps.biz

Service Enquiries

When contacting us for service, please endeavour to provide the **Model** and **Serial Number** of your equipment. This is shown on the Serial Number label affixed to the rear of the equipment.

**EUROPEAN WASTE ELECTRICAL &
ELECTRONIC EQUIPMENT DIRECTIVE**



In order to support the European WEEE (Waste Electrical & Electronic Equipment) Directive, our equipment carries the "crossed out wheeled bin" symbol to indicate that, at the end of its life, it should be collected separately for recycling and disposal of any potentially hazardous material.

In countries where collection programmes are not in place, you may return your end-of-life equipment to us. Please contact us for further information.

OPERATING INSTRUCTIONS

UNPACKING

The iPumps Model i150 comes already assembled with the pump head. We would recommend that you retain the original packing material in a safe place should you ever require to return the unit to the manufacturer.

INTRODUCTION

The iPumps Model i150 pump has been designed and manufactured to a high standard to give long and reliable operation.

The pump delivers flow rates from 0.06 to 380 mls/min.

The speed can be adjusted manually using the easy-to-operate membrane keypad, or automatically through an external control interface.

The running parameters of the pump are stored so that when it is switched on it will run at the same parameters as when last used.

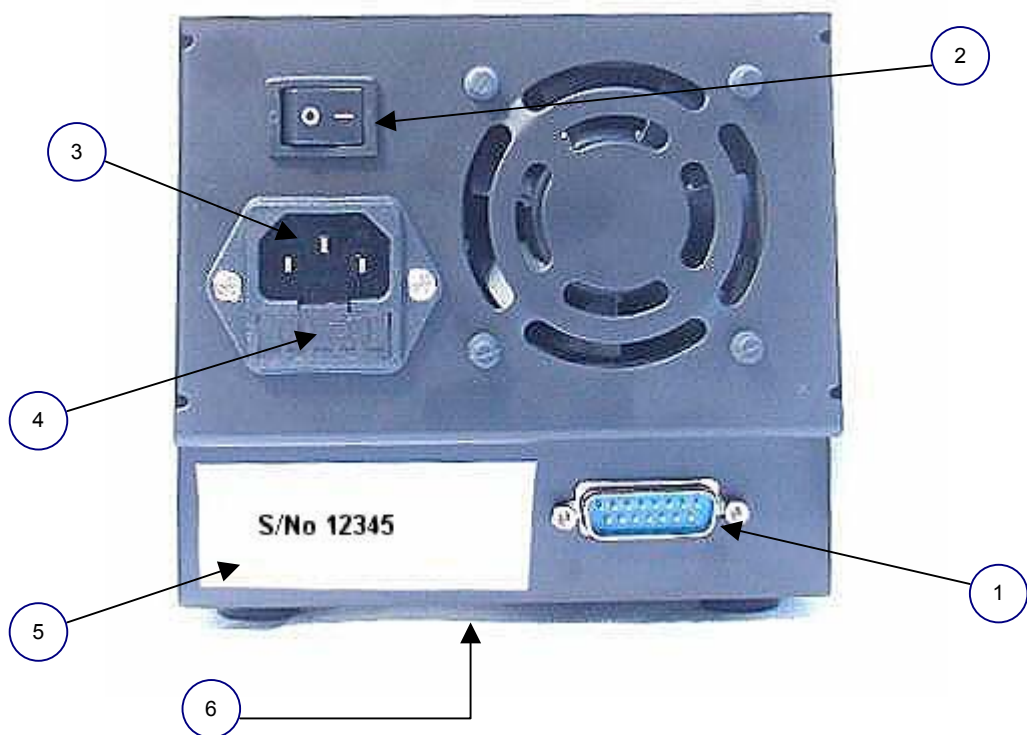
Figure 1 - i150 Front View



Figure 1.1 Pump drive

Figure 1.2 Pump head A1 R3

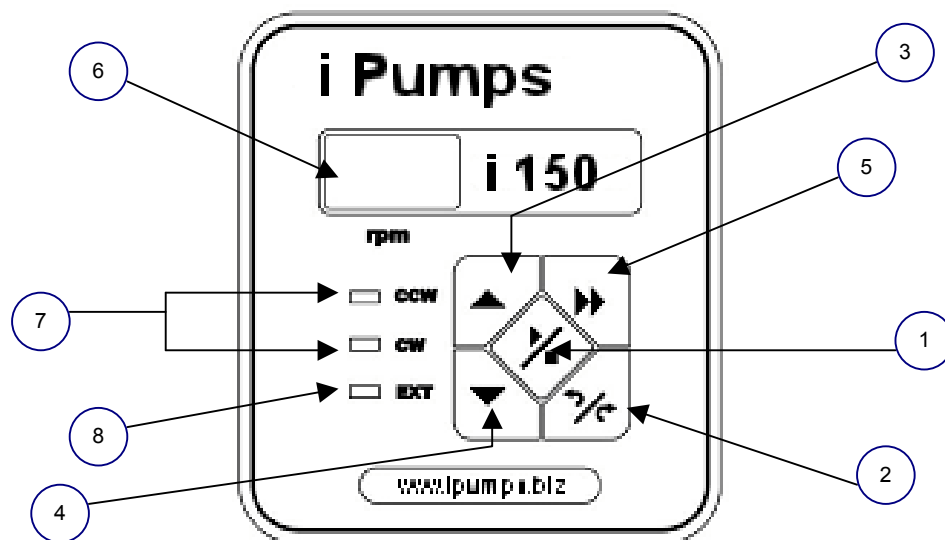
Figure 2 - i150 Rear View



- Figure 2.1 External control interface
- Figure 2.2 Power switch
- Figure 2.3 Power socket
- Figure 2.4 Built-in fuse with spare fuse
- Figure 2.5 Serial number plate
- Figure 2.6 Data/rating plate (on base of unit)

BASIC OPERATION

Figure 3



- Figure 3.1 Stop/Start key
- Figure 3.2 Direction key
- Figure 3.3 Speed Increase key
- Figure 3.4 Speed Decrease key
- Figure 3.5 Prime key
- Figure 3.6 Speed (rpm) display
- Figure 3.7 Direction indicator
- Figure 3.8 External Control indicator

Note: When the Prime key is in operation, all other keys are invalid.

Stop/Start Key

Press the Stop/Start (Fig 3.1) key to start or stop the pump. This key does not operate in the Prime position.

Direction Keys

Press the Direction key (Fig 3.2) to change the rotating direction of the pump. The Direction indicator (Fig 3.7) will also change to show the direction in which the pump is running. This key does not operate in the Prime position.

Speed (rpm) Increase/Decrease Keys

Press the Speed Increase (Fig 3.3) or Decrease (Fig. 3.4) key once to increase or decrease the speed in steps of 0.1rpm. Continuously holding the key down will increase or decrease the speed more rapidly. These keys do not operate in the Prime position.

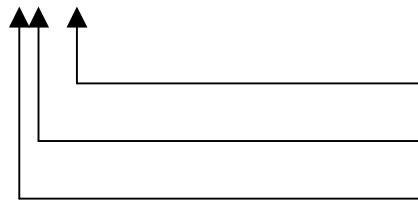
Prime

In normal operation, when no other keys are pressed, pressing the Prime key (Fig 3.5) causes the pump to run at full speed (100 rpm). The LED displays " - - -". The Prime key is used for emptying, filling or rinsing. Press the Prime key again to return to the normal state.

PUMP HEADS

Pump Head Part Numbering System

Pump Head A 1 R3



Number of Rollers

Number of Channels

Pump Head Type

PUMP HEAD A1 R3

Loading the Tubing

Press down the triggers in the direction of the arrows to open the compression block



Load the tubing

Press the triggers in the direction of the arrows to close the compression block



Check that the tube is correctly located in the tubing retention slot indicated

Flow Rates for the A1 R3 Pump Head

Tube Type	ID X Wall	Tube OD	Flow Rate Per Revolution	Flow Rate at 100 rpm (Max)
13#	0.8 x 1.6	4	0.063	6.33
14#	1.6 x 1.6	4.8	0.25	25.0
19#	2.4 x 1.6	5.6	0.416	41.6
16#	3.2 x 1.6	6.4	0.77	76.6
25#	4.8 x 1.6	8	1.60	160.0
17#	6.4 x 1.6	9.6	2.66	266.6
18#	8 x 1.6	11.2	3.66	366.6

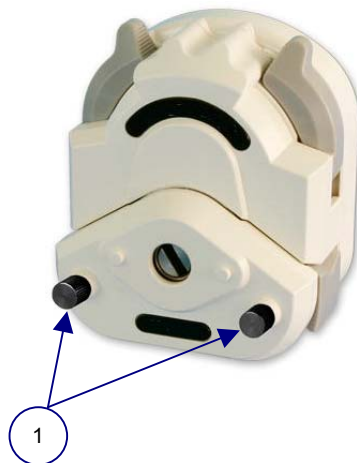
Checking the Pump head Occlusion

Load the tubing into the pump head and insert one end of the tubing into a beaker of water and blow on the other side. There should be no bubbles in the water. If there are air bubbles in the water, it is because the wall thickness of the tubing is incorrect for that pump head.

CHANGING THE PUMP HEAD

The Pump head is installed on the drive before leaving the factory. Please follow the instructions below when fitting a new Pump head.

Figure 4



Note: Always shut down the power supply before changing the Pump head.

1. Loosen the holding screws (Figure 4.1) and remove the pump head.
2. Insert the flat end of the new pump head shaft into the slot in the drive coupling. It is convenient to use a screwdriver in the slot in the front of the pump head to assist location.
3. Line up the pump head and re-insert the holding screws. The screws are finger tight and should not be over-tightened.

PUMP HEAD TYPE B

Figure 5



Pump head Type B (Figure 5) takes tubing in cassettes (Figure 6) which are loaded into the pump head. To adjust the occlusion, there is an occlusion lever (Figure 5.1). When you first use the cassette, turn the occlusion lever fully counter-clockwise, then slowly rotate it clockwise until liquid starts to flow, then add two extra clicks.

Note: Occlusion may need to be adjusted during long pump runs.

To release the cassette, press the trigger (Figures 7 & 8).

Figure 6



Figure 7



Figure 8



The i150 is designed to take the B2 R10 two-channel pump head but the B4 R6 four-channel pump head can also be used at reduced speeds of up to 50 rpm.

Flow Rates for the B4 R6 Pump Head

ID X Wall	Tube OD	Flow Rate Per Revolution	Flow Rate at 100 rpm (Max)
1.02 x 0.86	2.7	0.057	5.7
1.52 x 0.86	3.2	0.15	15.0
2.1 x 0.86	3.8	0.21	21.6
2.4 x 0.86	4.1	0.25	25.0
3.17 x 0.80	4.8	0.48	48.0

Flow Rates for the B2 R10 Pump Head

ID X Wall	Tube OD	Flow Rate Per Revolution	Flow Rate at 100 rpm (Max)
1.02 x 0.86	2.7	0.045	4.5
1.52 x 0.86	3.2	0.12	12.0
2.1 x 0.86	3.8	0.17	17.0
2.4 x 0.86	4.1	0.20	20.0
3.17 x 0.80	4.8	0.32	32.0

EXTERNAL CONTROL MODULES

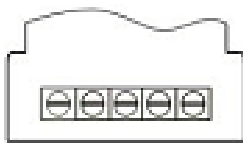
There are 5 external control modules available allowing the pump to be controlled from an external source:-



- 0 - 5V analog input
- 0 - 10V analog input
- 4 - 20mA analog input
- 0 - 10KHz Pulse Input
- RS 485*

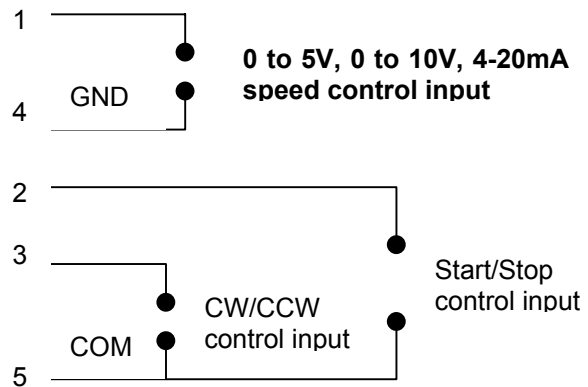
**Please contact iPumps for the communication protocol*

Pin Definition of Standard External Control Interface

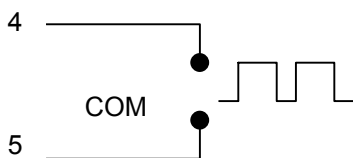


1 2 3 4 5

0 to 5V, 0 to 10V, 4-20mA External Control Interface

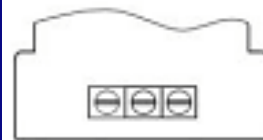


Pulse Input External Control Interface



TTL pulse speed control input
Max. rpm corresponds to 10KHz

RS 485*



A B GND

Insert the external control module into the external control socket on the rear of the pump (Figure 2.1). The external light on the membrane keypad will illuminate and make the relevant connections.

MAINTENANCE

- We recommend that the tubing pressure is released when the pump is not in use. This helps to protect the tubing and rollers from unnecessary strain and prolongs their service life.
- Keep the rollers clean and dry.
- The surface of the drive and rollers can be cleaned with mild detergent in warm water. Do not use organic solvents, aggressive or abrasive liquids.

Should you have any problems with your i150 pump, please contact your iPump distributor.

WARRANTY

The i150 pump carries a warranty of 12 months from date of purchase. Although this is a no-quibble warranty, accidental damage to the pump and tubing are excluded.

TECHNICAL SPECIFICATION**Functions**

Acceptable Pump Heads	A1 R3 single channel B2 R10 two channel B4 R6 four channel (for use at reduced speed)
External Controls	Start/Stop CW/CCW Speed (0-5V, 0-10V, 4-20mA & 0-10KHz optional)
Prime	Fast filling and emptying
Speed Control	The speed can be adjusted manually or automatically through the external control interface
Display	Current rpm Direction Running status External Control
Direction Control	CW and CCW reversible
Communication Function	RS485
Memory Function	Running parameters stored automatically (the running status must stay for at least 5 seconds)

Specifications

Speed	0.1 to 100 rpm
Speed Precision	0.1 rpm
Speed Adjustment	Membrane keypad continuously adjustable
Display Mode	3 digit LED displays current running rpm
Acceptable Voltage Input	90 to 260 VAC, 50/60 Hz
Power Consumption	Less than 30 Watts
Operating Conditions	Temperature 0 to 40°C Relative humidity less than 80%
Dimensions (Drive only) L x W x H	232 x 142 x 149 mm
Weight (Drive only)	2.3 kgs
IP Rating	IP31