

302SW/R

Fixed speed pump

Quick start-up guide

- 1 Ensure mains electricity supply matches that marked on rear panel.
- 2 Load tubing into pumphead.
- 3 Set direction of rotation at front panel switch.
- 4 Switch pump on.

ii Two year warranty

Watson-Marlow warrants, subject to the conditions below, through either Watson-Marlow or its authorised distributors, to repair or replace free of charge, including labour, any part of this product which fails within two years of the product to the end user. Such failure must have occurred because of defect in material or workmanship and not as a result of operation of the product other than in accordance with the instructions given in this manual.

Conditions of and specific exceptions to the above warranty are:

- 1 Consumable items such as fuses, rollers and tubing are excluded.
- 2 Products must be returned by prearrangement carriage paid Watson-Marlow or its authorised distributor.
- 3 All repairs or modifications must have been made by Watson-Marlow or its authorised distributors or with the express permission of Watson-Marlow or its authorised distributors.
- 4 Products which have been abused, misused, or subjected to malicious or accidental damage or electrical surge are excluded.

Warranties purporting to be on behalf of Watson-Marlow made by any person, including representatives of Watson-Marlow or its distributors, which do not accord with the terms of this warranty shall not be binding upon Watson-Marlow unless expressly approved in writing by a Director or Manager of Watson-Marlow.

III Introduction

Thank you for choosing a Watson-Marlow peristaltic pump. This manual is for use with either the 302SW fixed speed drive, or with the 302SW/R fixed speed peristaltic pump which is made up of the 302SW drive and the 501R pumphead. The 302SW is a fixed speed version of the 502S variable speed drive and is fitted with a high quality induction motor. The 302SW is reversible. It can be fitted with either the 501R or 303 pumpheads giving flow rates from 8 ml/min to 2650 ml/min.

The 501R fast-load pumphead has an advanced twin-roller design which allows it to accept a wide range of tubing without adjustment. Clockwise rotation gives extended tube life and anti-clockwise rotation enables the pump to work against higher pressures.

The manual is divided into two parts: Part 1 deals with the 302SW drive and Part 2 deals with the 501R pumphead. For details of other pumpheads please refer to the relevant manuals.

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1 Installation

Ensure that the supply voltage and frequency correspond with those marked on the rear panel. The mains supply cable is coded so that the live lead is coloured brown, the neutral lead is coloured blue, and the earth lead is coloured green and yellow

The 302SW can be operated at ambient temperatures from 0C to 37C. Storage temperatures from -40C to 70C are permissible, but allow time for acclimatisation before use. The pump should be positioned to allow a free flow of air around it. When pumps are stacked, the foot mountings will provide the necessary ventilation space between units.

If the pump does not operate correctly, check that mains electricity is available at the unit, that the fuses are intact, that the pump is not stalled by incorrect fitting of tubing, and that the pumphead is properly located and securely attached to the drive.

WARNING There are dangerous voltages (at mains potential) inside the 302SW. If access is required, isolate the mains before removing the cover.

2 Pumpheads

The 302SW can be fitted with either the 501R or 303 pumpheads. For more information about the 501R see Part 2 of this manual. For details of other pumpheads, please refer to the relevant operating instructions.

Two channel use with the 501R pumphead is permissible but is restricted to tubes of 4.8 mm bore or smaller

Maximum number of 303 pumpheads

Drive	rpm	Silicone tubing Internal diameter (mm)						
		0.5	0.8	1.6	3.2	4.8	6.4	8.0
302SW	265	6	6	6	6	5	4	3

Drive	rpm	Marpren, Marvinal, Neoprene, Butyl and Viton tubing Internal diameter (mm)						
		0.5	0.8	1.6	3.2	4.8	6.4	8.0
302SW	265	6	6	6	4	3	2	2

3 Flow rates

The flow rates given below were obtained using silicone tubing, with the pumphead rotating clockwise, pumping water at 20C with zero suction and delivery pressures (unless otherwise stated). Where an application is critical, the flow rate should be determined under operating conditions. The important factors are suction and delivery pressures, temperature, and fluid viscosity. Tube life will be reduced when pumping against pressure.

501R flow rates (ml/min) rpm	Tubing Internal diameter (mm)						
	0.5	0.8	1.6	3.2	4.8	6.4	8.0
265	11	33	114	500	1090	1690	2650

303 flow rates (ml/min) rpm	Tubing Internal diameter (mm)						
	0.5	0.8	1.6	3.2	4.8	6.4	8.0
265	8.0	19	71	265	583	954	1325

4 Tubing range

Flow precision depends upon the accuracy and consistency of the tubing. All Watson-Marlow tubing is formulated, manufactured and quality controlled to our own specifications. We recommend Marprene tubing wherever it is chemically compatible.

1.6mm wall thickness tubing for 501R and 301 pumpheads

Bore	Marprene	Silicone	Neoprene	Butyl	Marvinal	Viton
0.5mm	900.0005.016	910.0005.016				
0.8mm	900.0008.016	910.0008.016	920.0008.016			
1.6mm	900.0016.016	910.0016.016	920.0016.016	930.0016.016	940.0016.016	970.0016.016
3.2mm	900.0032.016	910.0032.016	920.0032.016	930.0032.016	940.0032.016	970.0032.016
4.8mm	900.0048.016	910.0048.016	920.0048.016	930.0048.016	940.0048.016	970.0048.016
6.4mm	900.0064.016	910.0064.016	920.0064.016	930.0064.016	940.0064.016	970.0064.016
8.0mm	900.0080.016	910.0080.016	920.0080.016	930.0080.016	940.0080.016	970.0080.016

5 Specification

Motor type	Alternating current induction
Nominal rotor speeds	265rpm
Voltage/frequency	230-250V 50Hz
	200-220V 50Hz
Operating temperature range	0C to 37C
Storage temperature range	-40C to 70C
Standards	CEE10, IP31
Dimensions	125 x 185 x 300mm
Weight	5.7kg

6 Care and maintenance

Scheduled maintenance of the 302SW is not required. When the pump needs cleaning, use a cloth dampened with water and mild detergent. Do not use strong solvents.

7 Spares

CE 0065	Motor capacitor, 2uF, 440V (For 240V)
CE 0085	Motor capacitor, 3uF, 440V (For 220V)
CX 0041	Capacitor clip
CX 0044	Cable clamp
FB 0001	Foot rubber
FH 0007	Fuseholder
FS 0025	Fuse, type F, 0.63A
MG 0042	Motor/gearbox, 265rpm, 220V 50Hz
MG 0043	Motor/gearbox, 265rpm, 240V 50Hz
MN 0114S	Motor support bracket
MN 0197H	Mains cable
MN 0708S	Cover
MN 0709S	Case, orange stove enamel
MN 0724H	Harness
SW 0022	Reversing switch, rocker
SW 0023	Power switch, rocker, illuminated, 200-250V
TM 0014	Terminal block

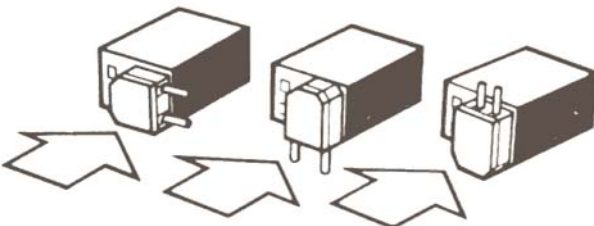
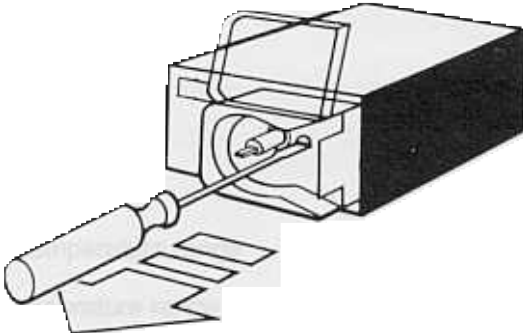
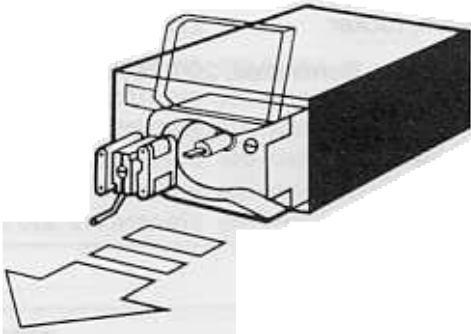
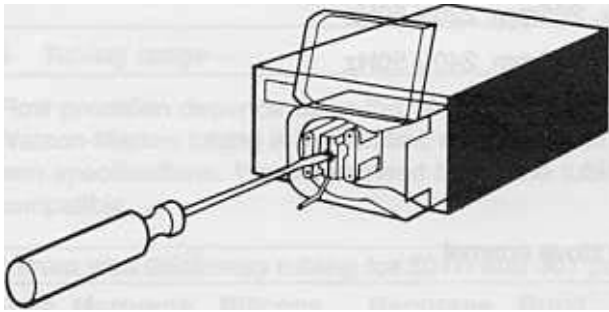
Part 2: 501R pumphead

8 Description

The 501R is set during manufacture to accept tubing with wall thicknesses of between 1.6mm and 2.0mm, and internal diameters of up to 8.0mm. A major feature of the 501R pumphead is the option of increased tube life from clockwise rotation, or higher pressure from anti-clockwise rotation.

9 Positioning the pumphead

Any one of three tubing input/output positions can be selected depending on individual requirements. Only one screw is used to attach the track to the drive. To reposition the track; first remove the rotor assembly, remove the track locating screw, rotate the track to the new position and replace the screw.



10 Tube loading

WARNING Switch off the drive before loading the tube.

- 1 Open the hinged guard and swing out the rotor crank handle until it locks into position.
- 2 Select the length of tubing required, noting that approximately 240mm is required for the track system, (measured from the outside faces of the tube clamps).
- 3 Fit one end of the tubing into one of the spring loaded clamps, and then, whilst rotating the rotor with the crank handle, feed the tubing between the rollers and the track, aligning it within the rotor tube guides. The tubing must lie naturally against the track and must not be twisted or stretched.
- 4 Fit the other end of the tubing into the second spring loaded clamp, ensuring that the tubing is not slack in the pumphead, as this can reduce tube life.
- 5 Close the crank handle and shut the guard.
- 6 After the pump has been started, open the downstream clamp so that the tube can find its natural length.

The 501R pumphead is fitted with four-position tube clamps which can be adjusted by pushing in or pulling out the bars at the top of the upper clamp and the bottom of the lower clamp. Set clamps so that the minimum necessary pressure is applied to the tubing.

11 Adjustment of the gap between the rollers and track

The factory set gap of 2.6mm between the rollers and the track is suitable for tubing having wall thicknesses of between 1.6 and 2.0mm. Adjustment of the gap will be required if tubing having a wall thickness of less than 1.6mm is to be used. There is an adjusting screw on each of the two roller arms, and each of these screws will require adjustment. The correct gap is twice the wall thickness less twenty percent. Correct adjustment is important: over occlusion will reduce tube life; under occlusion will reduce pumping efficiency.

To change the gap setting, turn each adjusting screw clockwise to increase the gap or anticlockwise to decrease the gap. A quarter turn changes the gap by 0.7mm.

To restore the original setting of 2.6mm, turn the adjusting screws until both rollers are just touching the track, then tighten each screw by three and threequarter turns.

12 Care and maintenance

If aggressive liquids are spilled on to the pumphead, the head should be removed and cleaned. Remove any tubing from the pumphead, and swing out the crank handle to expose the rotor retaining screw. Turn the screw anticlockwise one turn to release the collet, and withdraw the rotor from the shaft. Unscrew the track retaining screw and detach the track from its spigot.

Check moving parts of the rotor from time to time for freedom of movement. Lubricate pivot points and rollers occasionally with a light lubricating oil.

