

601P/R

High flow pneumatic pump

Quick start-up guide

- 1 Ensure pump is connected to a suitable air line fitted with a filter and lubricator, to provide clean, dry, correctly lubricated air under conditions of maximum air consumption of 7.6 litre/second at 6 bar (16 cubic feet/minute at 90psi)
- 2 Load tubing into pumphead. Clamp tubing firmly. 19.0mm (3/4") bore tubing needs particular care in loading to avoid kinking.
- 3 Turn **on/off** switch to the **on** position.
- 4 Set running speed on the multi-turn regulator.
- 5 Turn **on/off** switch to **off** to stop pump.

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 delivery 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 rollers and tubing are excluded.
- 2 Products must be returned by pre-arrangement carriage paid to 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 supplied with improperly filtered or improperly lubricated air 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 purchasing this 601P/R peristaltic pump which incorporates a powerful pneumatic motor, safe for use in areas where electric motors could create a risk of fire or explosion. It is fitted with the 601R pumphead which accepts 3.2mm wall thickness tubing up to 19.0mm internal diameter. Two speeds are available, 100rpm and 200 rpm, each of which is controllable from 20 to 100 percent of maximum speed through the front panel mounted regulator.

The 601P/R is one of the best high-flow peristaltic pumps ever produced combining benchtop size and ease of use with a performance only previously found in industrial pumps.

iv Contents

1	Installation	page 4
2	Operation	page 4
3	Specification	page 4
4	Tube loading	page 4
5	Adjustment of pumphead rollers	page 5
6	Flow rates	page 5
7	Tubing range	page 6
8	Care and maintenance	page 6
9	Spares	page 6

1 Installation

Air lines should be large enough to avoid excessive pressure loss under conditions of maximum air consumption of 7.6 litre/second at 6 bar (16 cubic feet/minute at 90psi).

The 601P/R must receive clean, dry, correctly lubricated air through a suitable filter and lubricator in the line, as close to the pump as possible. Ensure the lubrication bowl is kept filled within the correct levels with any of the following lubricants: Shell Tellus 15, Duckhams Zeroflo 2, Esso Nuto H36, Castrol Hyspin AWS10, Mobil Gargoyle Artic, BP HSP40, or any oil to BS 2626 (1965). The oil drip rate should be set to suit the speed at which the pump is being run.

The 601P is supplied with a compression connector to accept 8.0mm external diameter nylon air tubing. It is essential that the tubing is clean and free from debris before it is connected to the pump. A greater degree of silencing can usually be obtained by piping the exhaust away.

If the pump does not operate correctly, check that the air supply connections are properly made, that the pumphead is properly located and securely attached to the pump, and that the rotor is not stalled by incorrectly fitted tubing.

2 Operation

Before loading tubing into the pumphead, turn the pump off and isolate it from the air supply. The direction of rotation of the 601P/R is anti-clockwise. Pumphead speed is set at the front panel regulator and can be varied from 20 to 100 percent of the maximum speed of the pump.

3 Specification

Motor type	Pneumatic
Nominal maximum rotor speeds	100, 200rpm
Speed control range	20 to 100 percent
Operating temperature	0C to 37C 32F to 100F
Storage temperature	-40C to 70C -40F to 160F
Direction of rotation	Anti-clockwise
Dimensions	265 x 200 x 400mm 10 7/8" x 7 7/8" x 15 3/4"
Weight	10kg 22lbs

4 Tube loading

The 601P/R is fitted with a spring loaded twin roller pumphead designed for tubing with a nominal wall thickness of 3.2mm and bore sizes of between 4.8mm and 19.0mm. The pumphead is fixed in one position. A length of 410mm of tubing is needed for the pumphead.

WARNING Switch off the pump and isolate it from the air supply before loading tubing.

Open the pumphead guard and fit one end of the tube into the bottom adjustable clamp. Tighten the lower serrated adjustment wheel. Then, whilst rotating the rotor clockwise (a spanner is provided for this purpose), feed the tube between the rollers and the track, ensuring that the tubing is not twisted or stretched. This is particularly important for the larger bore sizes of tubing. Fit the other end of the tube into the top adjustable clamp, ensuring that the tube is not slack in the pumphead. Clamp the tube very firmly by turning the upper serrated adjustment wheel. Remove the spanner and close the guard.

5 Adjustment of the pumphead rollers

The two spring loaded rollers compensate for tolerance variations in the wall thickness of tubing, eliminating the manual adjustment normally required by peristaltic pumps, and, in general, there should be no need for the gap setting between the rollers and track to be adjusted. Should it ever appear that the roller arms are not equally adjusted, the original factory setting can easily be restored. There is an adjustment screw on each of the two roller arms. Turn each screw anti-clockwise until both rollers are just in contact with the track, and then turn each screw clockwise by five turns. Correct and equal adjustment is important. Over-occlusion will reduce tube life. Under-occlusion will reduce pumping efficiency.

6 Flow rates

The flow rates given below were obtained pumping water at 20C with zero suction and delivery pressures. Where flow rate is critical it should be measured under operating conditions. The major factors affecting flow rate are suction and delivery heads, fluid viscosity and temperature.

rpm	601P/R flow rates (litre/min) Minimum flows 20% of rates given					
	Tubing internal diameter					
	4.8 3/16"	6.4 1/4"	9.6 3/8"	12.7 1/2"	15.9 5/8"	19.0 3/4"
100		1.4	2.4			
200		2.8	5.1			

7 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.

Bore	Wall	Marprene		Silicone	Neoprene
4.8mm	3/16"	3.2mm	1/8"		
6.4mm	1/4"	3.2mm	1/8"	900.0064.032	920.0064.032
9.6mm	3/8"	3.2mm	1/8"	900.0096.032	920.0096.032
12.7mm	1/2"	3.2mm	1/8"	900.0127032	920.0127.032
15.9mm	5/8"	3.2mm	1/8"	900.0159.032	920.0159.032
19.0mm	3/4"	3.2mm	1/8"	900.0190.032	920.0190.032

Bore	Wall	Butyl		Marvinal	Viton
4.8mm	3/16"	3.2mm	1/8"		
6.4mm	1/4"	3.2mm	1/8"	930.0064.032	940.0064.032
9.6mm	3/8"	3.2mm	1/8"	930.0096.032	940.0096.032
12.7mm	1/2"	3.2mm	1/8"	930.0127.032	940.0127.032
15.9mm	5/8"	3.2mm	1/8"	930.0159.032	940.0159.032
19.0mm	3/4"	3.2mm	1/8"	930.0190.032	940.0190.032

8 Care and maintenance

If proper filtration and lubrication are provided there will be no need for scheduled maintenance of the 601P/R pump. If harmful liquids are spilled on to the pump, the pumphead should be removed and cleaned. This can be carried out quickly and easily after first ensuring that the pump is switched off. Remove any tubing in the pumphead.

Remove the rotor by unscrewing the retaining bolt one turn to release the collet, and withdrawing the rotor from the shaft. Remove the track by unscrewing the two retaining screws and detaching the track from its spigot.

All moving parts of the rotor should be checked from time to time for freedom of movement. Occasional lubrication of pivot points and rollers with light lubricating oil will aid trouble free operation. When the pump needs cleaning, use a cloth dampened with water and mild detergent. Do not use strong solvents.

9 Spares

601R pumphead

MR 0571T Main tube roller, 2 required

MR 0572T Follower roller, 2 required

MR 0573T Spindle, main tube roller

MR 0574T Spindle, guide roller

MR 0575T Guide roller, white plastic

~~MR 0601T Collet~~

MR 0276M Guard

MR 0275M Hinge moulding for guard, 4 required

MRA0052A Track assembly

MRA0010A Rotor assembly

SG 0003 Springs, 4 required

601P pneumatic drive

CN 0005	Blanking plug
CN 0009	Female bulkhead coupling, 1/4in
CN 0010	Male stud adaptor, 1/4in
CN 0011	Male stud elbow, 1/4in
CN 0012	Female stud adaptor, 1/8in
CN 0014	Male stud elbow, 1/8in
FB 0001	Foot rubber
GP 0005	Pressure gauge
MD 0866S	Baseplate
MN 0010T	Spacer rod
MR 0596T	Motor collar
MR 0597S	Case
MR 0598S	Front panel
MR 0599S	Back panel
MRA0011A	Air motor/gearbox, 100rpm, with adaptor
MRA0012A	Air motor/gearbox, 200rpm, with adaptor
VM 0001	On/off valve
VM 0002	Pressure regulator, 3/4"