

Publication PB 0143

Issue 2

Watson-Marlow auto control high flow pump  
Installation and operating instructions

Specific to:

|           |                  |
|-----------|------------------|
| Drives:   | 100/120V Issue 4 |
|           | 220/240V Issue 5 |
| EPROM:    | N/A              |
| Pumphead: | 701R Issue 1     |

*701U/R*



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## Declarations

Declaration of  
conformity



When the 701U/R pump unit is used as a stand alone pumps it complies with:  
Machinery Directive 89/392/EEC and EN60204-1  
Low voltage Directive 73/23/EEC and EN61010-1  
EMC Directive 89/336/EEC and EN50081-1/EN50082-1

Declaration of  
incorporation

When the 704U/R pump unit is to be installed into a machine or is to be assembled with other machines for installations, it must not be put into service until the relevant machinery has been declared in conformity with the provisions of the Machinery Directive 89/392/EEC EN60204-1.

Responsible person: Dr. R. Woods, Managing Director, Watson-Marlow Limited, Falmouth, Cornwall TR11 4RU, England.

Telephone 01326 370370 Fax 01326 376009

## ***Two-year warranty***

Watson-Marlow Limited warrants, subject to the conditions below, through either Watson-Marlow Limited, its subsidiaries, 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:

- Consumable items such as tubing and glands are excluded.
- Products must be returned by pre-arrangement carriage paid to Watson-Marlow Limited, its subsidiaries, or its authorised distributor.
- All repairs or modifications must have been made by Watson-Marlow Limited, its subsidiaries, or its authorised distributors or with the express permission of Watson-Marlow Limited, its subsidiaries, or its authorised distributors.
- 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 Limited made by any person, including representatives of Watson-Marlow Limited, its subsidiaries, or its distributors, which do not accord with the terms of this warranty shall not be binding upon Watson-Marlow limited unless expressly approved in writing by a Director or Manager of Watson-Marlow Limited.

## ***Safety***

In the interests of safety, this pump and the tubing selected should only be used by competent, suitably trained personnel after they have read and understood this manual, and considered any hazard involved.

Any person who is involved in the installation or maintenance of this equipment should be fully competent to carry out the work. In the UK this person should also be familiar with the Health and Safety at Work Act 1974.

Ensure the drive is inoperative before opening the track cover

There are dangerous voltages (at mains potential) inside the unit. If access is required, isolate the pump from the mains before removing the cover.



## ***Information for returning pumps***

In the current situation of heightened concern over the handling of hazardous materials, any equipment which has been contaminated with, or exposed to, body fluids, toxic chemicals or any other substance hazardous to health must be decontaminated before it is returned to Watson-Marlow or its distributor.

A certificate (a suitable blank form is included at the rear of these operating instructions), or signed statement, must be attached to the outside of the shipping carton.

This certificate is required even if the pump is unused. If the pump has been used, the fluids that have been in contact with the pump and the cleaning procedure must be specified along with a statement that the equipment has been decontaminated.



## ***Recommended operating procedures***

**DO** keep delivery and suction lines as short as possible.

**DO** use the minimum number of bends in rigid pipe runs. If there must be a bend, use a swept bend and not a tight elbow

**DO** use suction and delivery pipelines with a bore equal to or larger than the bore of the tube fitted in the pumphead. When pumping **viscous** fluids, the losses caused by increased friction can be overcome by using pipe runs with a cross sectional area several times greater than the pumping element.

**DO** use the largest possible bore tube running at slow speed for the longest tube life.

**DO** fit an extra length of pump tube in the system so that you can move the tube through the pumphead occasionally, without needing to break the pumping circuit. This is particularly useful for extending tube life in long running sterile applications.

**DO** keep the track and rollers clean, and ensure that the rollers are free.

**DO NOT** fit valves in the suction or delivery line without considering that peristaltic pumps are self priming and will hold their prime up to several metres, so there may be no need for non-return or foot valves, nor for the loading valves required on many other kinds of pumps.

Any valves fitted must cause no restriction. If electrically actuated valves are fitted, they should be interlocked so that the pump will only run when the valves are open. Fit an automatic by-pass if manual valves are installed.

**When using Marprene or Bioprene tubing**, after the first 30 minutes of running, re-tension the tube in the pumphead by releasing the tube clamp on the delivery side a little and pulling the tube tight. This is to counteract the normal stretching that occurs with Marprene and Bioprene, which can go unnoticed and result in poor tube life.

**Tube selection** The chemical compatibility list published in the Watson-Marlow catalogue is only a guide. If in doubt about the compatibility of a tube material and the duty fluid, request a tube sample card for immersion trials. Remember the sample will be fully immersed, but the fluid when in use will only be in contact with the inside of the tube. If the material swells but does not lose its strength it could be worth considering.

**Viscous dispensing** To overcome the common problems of reduced accuracy and dripping delivery pipes, the suction and delivery lines should be kept as short as possible. Use larger bore transmission tubing than that in the pumphead to keep the friction losses to a minimum. Improved accuracy will be noticed if rigid or semi-rigid pipe is used on the delivery side. The rigid tube is effective in reducing over-run because it does not expand during pumping.

## Part 1: 701U/R

### Siting

The 701U/R can be operated at ambient temperatures from 5C to 40C. 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.

Should the pump fail to operate, check that mains electricity is available at the unit, that the fuses are intact and that the pump is not stalled by incorrect fitting of tubing.

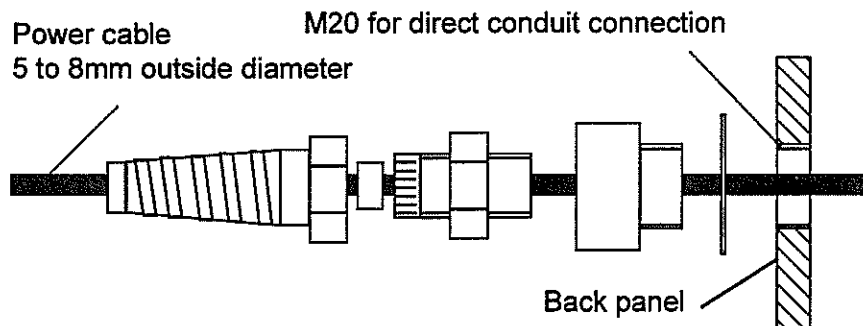
A drain hole (tapped 1/4" BSP) is provided at the left hand side of the pumphead base which is plugged during assembly. If required, the plug can be removed and a drain hose connected.

### Installation

The 701U/R is suitable for single phase mains electricity only. Ensure that the supply voltage and frequency correspond to those marked on the rear panel marked with a white dot. (240V 50Hz, 220V 50/60Hz, 120V 50/60Hz or 100V 50/60Hz) single phase.

### Supplies

Remove the small plate on the rear panel to gain access to the terminal block. Route the mains cable through the entry point to the right of the recess and couple the cable to the terminal block in accordance with the instructions printed on the rear panel. Two alternative connectors are supplied to screw into the entry point gland. One accepts 20mm rigid or flexible conduit, and the other accepts a three core 0.75 square mm pvc sheathed mains cable (via the screwed adaptor provided) so that a flying lead can be used.



Securely replace the transparent plate and the gasket over the recess.

Ingress protection standard will be compromised if transparent plate is not properly replaced.



There are dangerous voltages (at mains potential) inside the motor. If access is required, isolate the pump from the mains before removing the cover.



## **Part 2: Operation**

### **Manual operation**

Set the right hand switch on the control panel to its manual position. Select the direction of rotation with the forward/off/reverse switch on the left hand side of the control panel and press the green start button which will start the pump automatically after a 0.5 second delay. The preferred direction or rotation is clockwise (giving a flow direction of left to right when facing the pump), which will ensure the longest tube life. The pump can be primed rapidly at its maximum speed by turning the switch on the right hand side of the control panel to its max position. When released the switch will return to its manual position.

#### **Stopping the pump and restarting**

To stop the pump, turn the forward/off/reverse switch to its central off position. To change direction of flow, turn the forward/off/reverse switch through its central off position to the other direction and restart the pump with the green start button.

If at any time the pump fails to start, it is likely that the inbuilt protection circuitry is operating. Turn the forward/off/reverse switch to its central off position (you should hear the contactor drop out), and then to the required direction of rotation again. Wait 10 seconds and press the green start button.

The speed control range of the 701U/R is from 2% to 100% of the rated maximum speed (360rpm at the rotor). The speed setting dial has a locking knob to prevent accidental speed changes.

#### **Limiting the top speed**

If the pump is to be used at low speed settings under manual control, and there is a risk that damage could be caused to the process if the pump is taken to higher speeds, then the speed limiting potentiometer in the rear panel recess can be brought into use. First, remove the panel covering the rear panel recess and turn the speed limiting potentiometer fully anti-clockwise.

Next, turn the front panel speed potentiometer fully clockwise. Then start the pump (which will run very slowly - if at all) and turn the rear panel speed limiting potentiometer clockwise until the pump reaches the desired maximum speed.

Securely replace the panel with an intact gasket over the rear panel recess. It will now be found that the pump speed can be varied over a limited range from the front panel potentiometer.

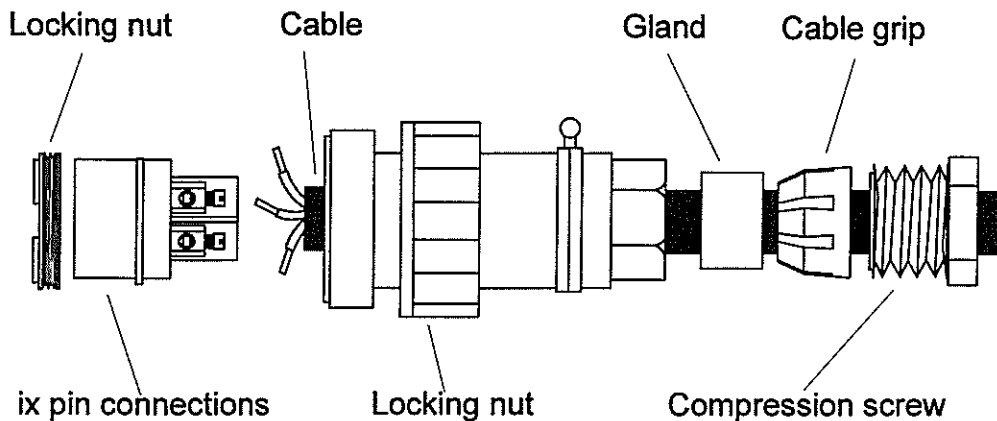
Note that if the maximum speed is reduced using the speed limiting potentiometer, the speed control ratio is also reduced. The minimum speed at which the 701U/R will run is about 7rpm. If the speed limiting potentiometer is set to reduce the maximum speed to, say, 35rpm, then the speed control ratio will be 7rpm to 35rpm, which is a speed control ratio of 5:1.

If the pump has been running under automatic control, and is now to run under manual control, it is only necessary for the switch on the control panel to be moved to its manual position. It is not necessary for the process control signal to be disconnected from the pump or for the calibration potentiometers to be adjusted.

## 6 pin connector

For all auto and remote control operations, the drive is supplied with a 6 pin waterproof connector. To comply fully with the requirements of the EMC directive, all auto control connections should be made using screened cable with the screen taken to earth. Correct assembly of the connector plug is essential or the ingress protection standard will be compromised.

### Connector assembly



## Automatic operation

The 701U/R can be operated from any process control signal up to 60V or 32mA, providing a rising or falling flow rate against a rising signal. When the pump is set to provide a rising flow rate against a rising signal, this is defined as a non-inverted response. When the pump is set to provide a falling flow rate against a rising signal, this is defined as an inverted response.

Signal range is the difference in the signal between that which is to produce maximum speed (flow rate) and that which is to produce minimum speed (flow rate). A 0V to 12V signal has a signal range of 12V. A 4mA to 20mA signal has a signal range of 16mA.

### Range and offset definitions

Signal offset is the signal level at which the pumphead is just about to start rotating. With a 4mA to 20mA signal (to provide a non-inverted response), the signal offset is 4mA. Note that if the same signal is to provide an inverted response, then the signal offset is 20mA, because that is the level at which the pump is just about to start. (It will be rotating fastest when the signal is 4mA).

For the pump to be controlled by a process signal, the switch on the control panel must be switched to its auto position. The process signal must be connected to the 6-pin plug provided, which should then be inserted in the rear panel 6-pin socket.

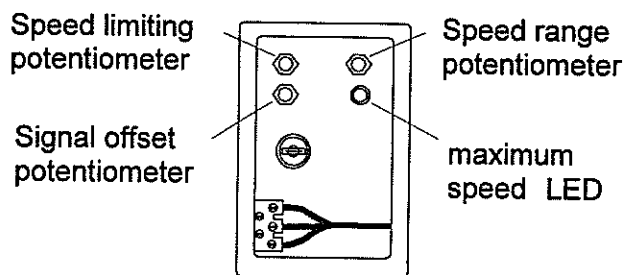
The diagrams and tables overleaf show the minimum and maximum signal ranges and signal offsets available, and the connections and their polarity for non-inverted or inverted response. If the signal rises above its proper maximum, no damage will be caused to the motor or pump circuitry which is inherently protected against signal overload.

| Voltage signal (Input impedance 220 kohm) |         |          |       |       |
|---|---------|----------|-------|-------|
|   |         |          |       |       |
| Response                                  | Range V | Offset V | Pin 2 | Pin 3 |
| Non-inverted                              | 5 to 30 | 0 to 30  | -     | +     |
| Inverted                                  | 5 to 24 | 0 to 24  | +     | -     |

| Current signal (Input impedance 250 ohm) |          |           |       |       |       |
|--|----------|-----------|-------|-------|-------|
|  |          |           |       |       |       |
| Response                                 | Range mA | Offset mA | Pin 2 | Pin 3 | Link  |
| Non-inverted                             | 5 to 30  | 0 to 24   | -     | +     | 2 & 4 |
| Inverted                                 | 5 to 20  | 0 to 20   | +     | -     | 2 & 4 |

**Note:** All the connections in this section are shown viewed from the back of the plug.

### ***Calibration for auto-control***



The process signal (or a suitable signal from another source) can be used in the calibration procedure providing it meets the criteria outlined below.

For voltage modes, a stable, variable dc voltage source (for example a laboratory power supply which has a source resistance of 5 kohm or less) can be used in conjunction with a DC voltage meter. The signal conditioner will accept voltage signals up to a maximum of 30V DC.

Alternatively for current modes, the same DC source can be used for this application, (provided that it will supply the required current) in conjunction with a DC milliamperemeter. The signal conditioner will accept current signals up to a maximum of 32mA.



The procedure for auto-control calibration is as follows. Ensure that the 6 Pin plug is wired correctly for the type of control signal being utilised.

Connect the process signal to the pump by inserting the 6 pin plug into its socket located on the rear panel of the pump. The signal conditioner can now be calibrated.

Set the process signal to the required signal offset. If there is no signal offset this will be 0 volts or 0 milliamps.

The signal offset trim potentiometer, located behind the clear access panel, can now be used to set the speed of the pump.

For a non-inverted response (rising flow rate against rising signal), turn the signal offset trim potentiometer clockwise until the pump rotor rotates at the speed required at signal offset. This speed may be set anywhere between zero rpm and the maximum speed of the drive unit.

For an inverted response (falling flow rate against rising signal), this exercise can be repeated, again noting that the rotor speed can be set anywhere between zero rpm and the maximum speed of the drive unit.

For accurate speed setting requirements apply a hand held tachometer to the shaft in the centre of the pumphead, and adjust the signal range potentiometer until a speed of 1440rpm is observed. The planetary gearbox built in to the pumphead provides a 4:1 reduction which is equivalent to a rotor speed of 360rpm. An alternative method is to use the tachometer output from the pump which is present across pins 2 and 6 of the rear panel 6-pin socket. This is in the form of a plus/minus 5V square wave signal where 1150Hz equals a rotor speed of 360rpm (shaft speed of 1440rpm).

The process signal should now be adjusted to its range maximum. (The maximum permissible settings for the pump unit are 30V or 32mA).

For a non-inverted response, turn the signal range trim potentiometer, located behind the clear access panel, clockwise until the speed which is required at full range, is achieved. If the process signal is increased to more than the upper limits of the conditioner (60V or 32mA), or the range offset trim potentiometer is adjusted to give a rotor speed higher than the maximum speed of the drive unit, then the light emitting diode will illuminate.

At this stage the rotor will stop rotating. Now turn the signal range potentiometer anti-clockwise to the point where the rotor again rotates at the desired maximum speed.

For an inverted response, this exercise can be repeated. The rotor speed can be set anywhere between zero rpm and the maximum speed of the drive unit.

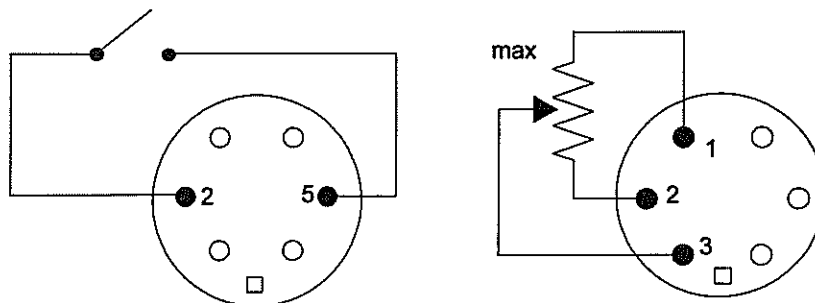
These calibration procedures should be repeated until pump response coincides exactly with the process signal. The pump will now operate under auto-control when the front panel switch is set to the auto position. An indication of the signal type and pump response should be shown on, or attached to, the drive unit.

The front panel potentiometer is not in circuit when the pump is operating under process control and may be safely left at any setting. With the calibration procedure completed, securely replace the rear panel recess on the back of the pump ensuring the gasket is in the correct position. This will avoid the ingress protection standard of the pump unit being compromised.

## Remote control

The 701U/R can be stopped and started from a remote switch, or speed controlled from a remote potentiometer which should have a value between 4.7k $\Omega$  and 5.0k $\Omega$ .

Connections for each function are shown below. Both functions may be used concurrently. The remote stop/start facility may also be used when pump speed is under process control.



### Remote potentiometer

When a remote potentiometer has been connected, the signal conditioner must be calibrated.

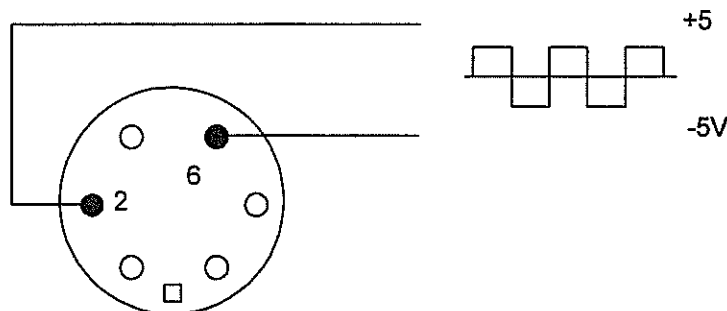
Set the switch on the control panel to its auto position. Remove the small panel covering the rear panel recess, set the remote potentiometer to minimum, adjust the signal offset potentiometer for zero speed by turning the signal offset potentiometer until the centre shaft of the pumphead begins to rotate, and then turn the signal offset potentiometer back until the shaft just stops.

Set the remote potentiometer to maximum, and adjust the signal range potentiometer until the red light emitting diode in the rear panel recess illuminates, and then turn the signal range potentiometer back until the light extinguishes. Securely replace the panel over the rear panel recess with its gasket in position.

Note that when a remote potentiometer is in use, the speed limiting potentiometer on the rear panel is disabled. This means that only the full speed range of 7rpm to 360rpm is available through a remote potentiometer.

## Tachometer output

So that the pump speed can be remotely monitored, a tachometer output is available which provides a plus/minus 5V square wave with a frequency proportional to pump speed. 1150Hz is equal to 360rpm at the rotor (1440rpm at the centre shaft). The output is present across pins 2 and 6 of the rear panel 6-pin socket and carries an impedance of 10 k $\Omega$ .



## Part 3: Maintenance

### Fitting a second pumphead

701U/R pump may be fitted with one 701RX extension pumphead to give two channels of flow. There is no restriction on the size of tube which can be used in each pumphead when two pumpheads are fitted, but if two tubes of 25.4mm bore are fitted, the maximum output pressure against which the pump can operate is 1.5 bar (22 psig).

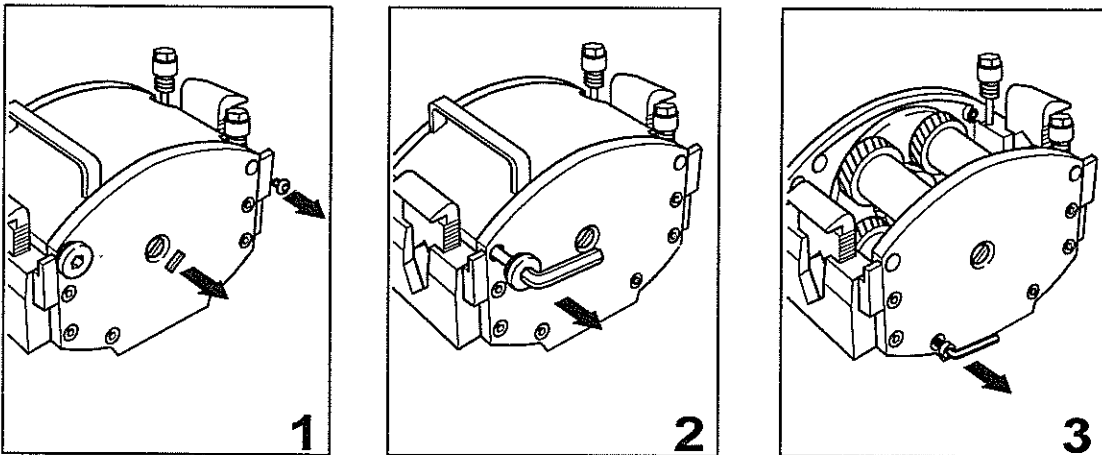
#### *Tube considerations*

1. Remove the plug from the slot in the centre shaft of the first pumphead, and remove the plug from the tapped hole on the top right hand corner of the first pumphead.
2. Remove the track securing bolt and the track from the first pumphead. Remove the M8 x 16 socket head cap screw from the bottom left (just above the left hand foot) of the first pumphead.
3. Remove the track securing bolt and the track from the extension pumphead.

Grease the drive shaft tongue of the extension pumphead with the grease supplied. Turn the centre shaft of the extension pumphead until its drive shaft tongue is aligned with the slot in the drive shaft of the first pumphead.

#### *Important*

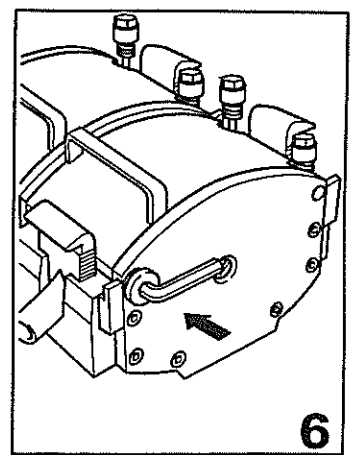
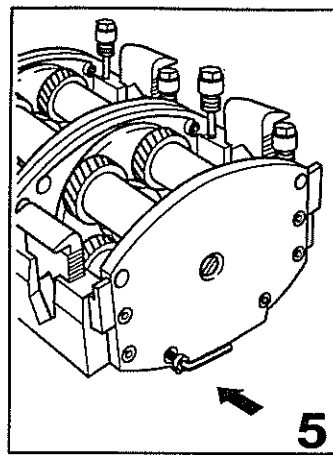
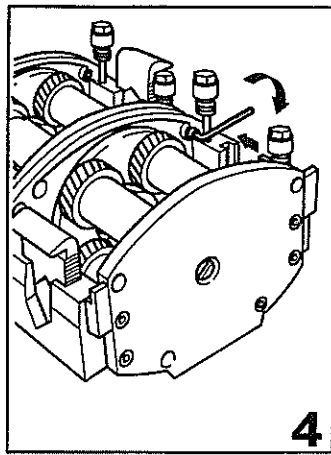
Apply thread locking compound to the M8 x 16 socket head cap screw in the top right hand corner of the backplate of the extension pumphead. Fit the 701RX extension pumphead to the first pumphead, ensuring that the backplate of the extension pumphead is flat against the frontplate of the first pumphead.



4. Tighten the socket head cap screw in the top right hand corner of the extension pumphead with the modified Allen key supplied.
5. Apply thread locking compound to the M8 x 170 socket head cap screw in the bottom left of the extension pumphead frontplate, and tighten it with the Allen key supplied.

Follow the tube loading instructions in the next section for each pumphead, using the double length bolt to secure both tracks.

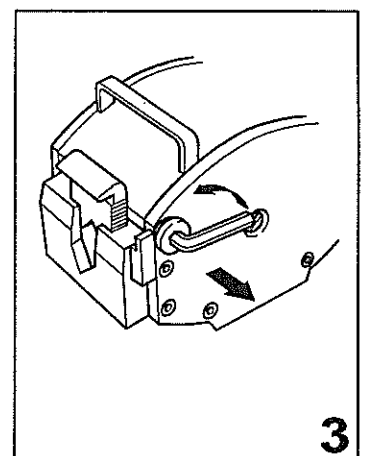
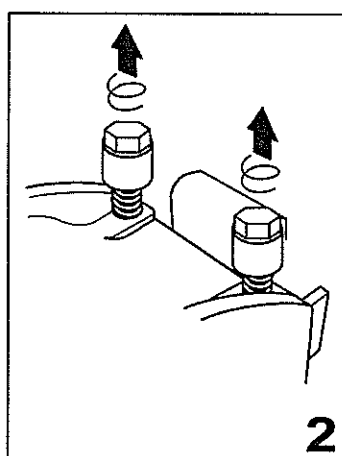
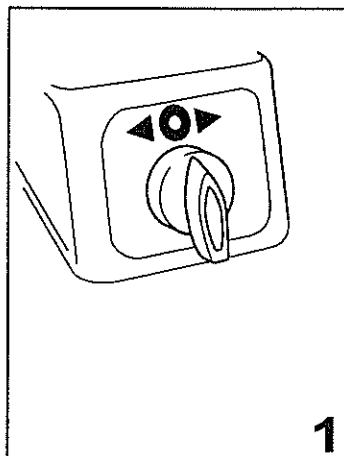
6. Tighten the track securing bolt with the Allen key provided to prevent removal by hand.

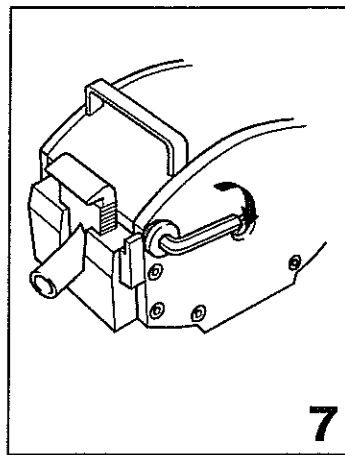
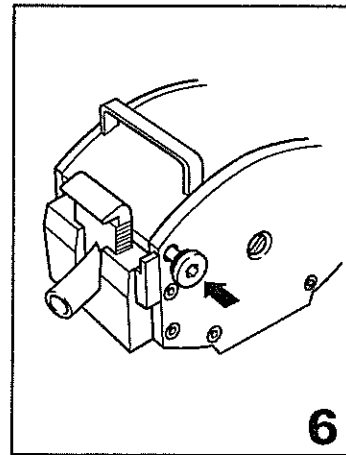
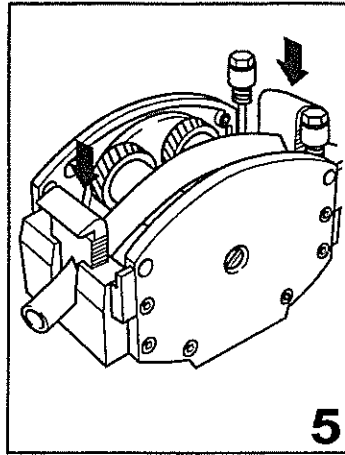
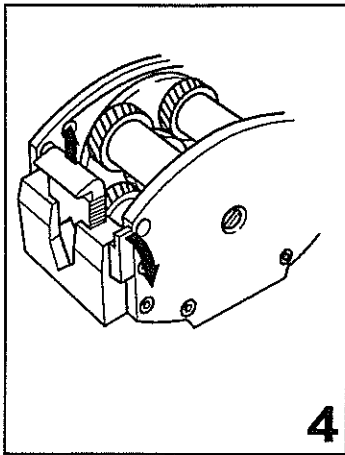


### ***Tube loading***

1. If the pump is running, stop it by turning the forward/off/reverse switch to its central position. The track acts as a guard to the rotor, and should not be removed until the pump has been stopped.
2. Turn the track compression spring knobs anti-clockwise about six turns. This raises the springs and aids both track removal and replacement.
3. Release the track by unscrewing the track securing bolt on the left hand side of the pumphead and withdrawing the bolt fully. Lift the track by its handle and slide out the right hand side of the track from under the springs.
4. Release in turn the two tube clamps by pulling on the release levers on either side of the front plate of the pumphead, and lift out both clamps.
5. Lay the tubing across the pumphead and secure the suction side by sliding in the first tube clamp (with its lip pointing outwards) and pressing it down firmly. Loosely fit the second tube clamp.
6. Slip the right hand end of the track under the springs and position the left hand end so that the track securing bolt can be inserted.
7. Tighten the track securing bolt with the Allen key provided to prevent removal by hand. The Allen key size is 6mm. Spare Allen keys are available from Watson-Marlow Limited or its distributors.

When the track has been fitted, screw down both the spring adjuster nuts fully.





Start the pump, allow any excess tubing to work through the pumphead, and press the delivery end clamp down firmly. Check the tube for movement when the pump is running.

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***Retensioning the tubing***

If there is any sign of the tube working its way through the pumphead, the tube should be more firmly clamped at its suction end, the delivery end unclamped to release any excess tubing, pulled tight and then firmly re-clamped again.

**When using of Marprene tubing, it is advised that the above procedure is carried out after approximately 30 minutes running time following initial tube loading. If the direction of flow is reversed, the tube should again be checked for movement.**



## Part 4: Appendices

### 701U/R Flow rates

These flow rates were obtained using Marprene tubing 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, fluid viscosity and tube material.

| Flow rates 701U/R (litres/hr) | Minimum flows 2% of rates given |                |                |                |              |
|-------------------------------|---------------------------------|----------------|----------------|----------------|--------------|
| Tube #                        | 193                             | 88             | 189            | 191            | 92           |
| Tube bore                     | 9.6mm<br>3/8"                   | 12.7mm<br>1/2" | 15.9mm<br>5/8" | 19.0mm<br>3/4" | 25.4mm<br>1" |
| 360rpm                        | 420                             | 780            | 1080           | 1500           | 2000         |

### Tubing range

Pump performance depends upon the accuracy and consistency of the tubing. Watson-Marlow tubing is specially formulated for peristaltic pumping and it is manufactured and quality controlled to our own specifications. We recommend Marprene with a wall thickness of 4.8mm tubing whenever it is chemically suitable.

| 701U/R Tubing range product codes |        |              |              |  |
|-----------------------------------|--------|--------------|--------------|--|
| Bore                              | Tube # | Marprene     | Silicone     |  |
| 9.6 mm 3/8"                       | 193    | 902.0096.048 | 910.0096.048 |  |
| 12.7mm 1/2"                       | 88     | 902.0127.048 | 910.0127.048 |  |
| 15.9mm 5/8"                       | 189    | 902.0159.048 | 910.0159.048 |  |
| 19.0mm 3/4"                       | 191    | 902.0190.048 | 910.0190.048 |  |
| 25.4mm 1"                         | 92     | 902.0254.048 | 910.0254.048 |  |
| Bore                              | Tube # | Neoprene     | Bioprene     |  |
| 9.6mm 3/8"                        | 193    | 920.0096.048 | 903.0096.048 |  |
| 12.7mm 1/2"                       | 88     | 920.0127.048 | 903.0127.048 |  |
| 15.9mm 5/8"                       | 189    | 920.0159.048 | 903.0159.048 |  |
| 19.0mm 3/4"                       | 191    | 920.0190.048 | 903.0190.048 |  |
| 25.4mm 1"                         | 92     | 920.0254.048 | 903.0254.048 |  |
| Bore                              | Tube # | Butyl*       | Viton        |  |
| 19.0mm 3/4"                       | 191    | 930.0190.048 | 970.0190.048 |  |
| 25.4mm 1"                         | 92     | 930.0254.048 |              |  |

\*Butyl tubing should not be used at pumphead speeds greater than 200rpm.

## Specification

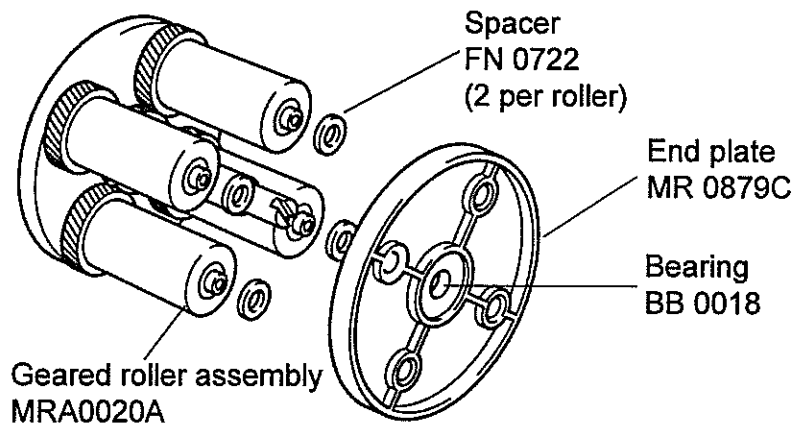
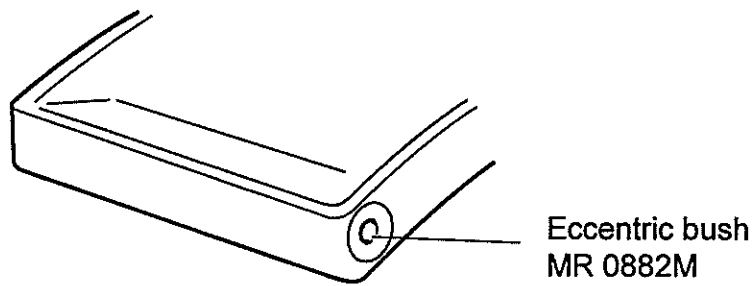
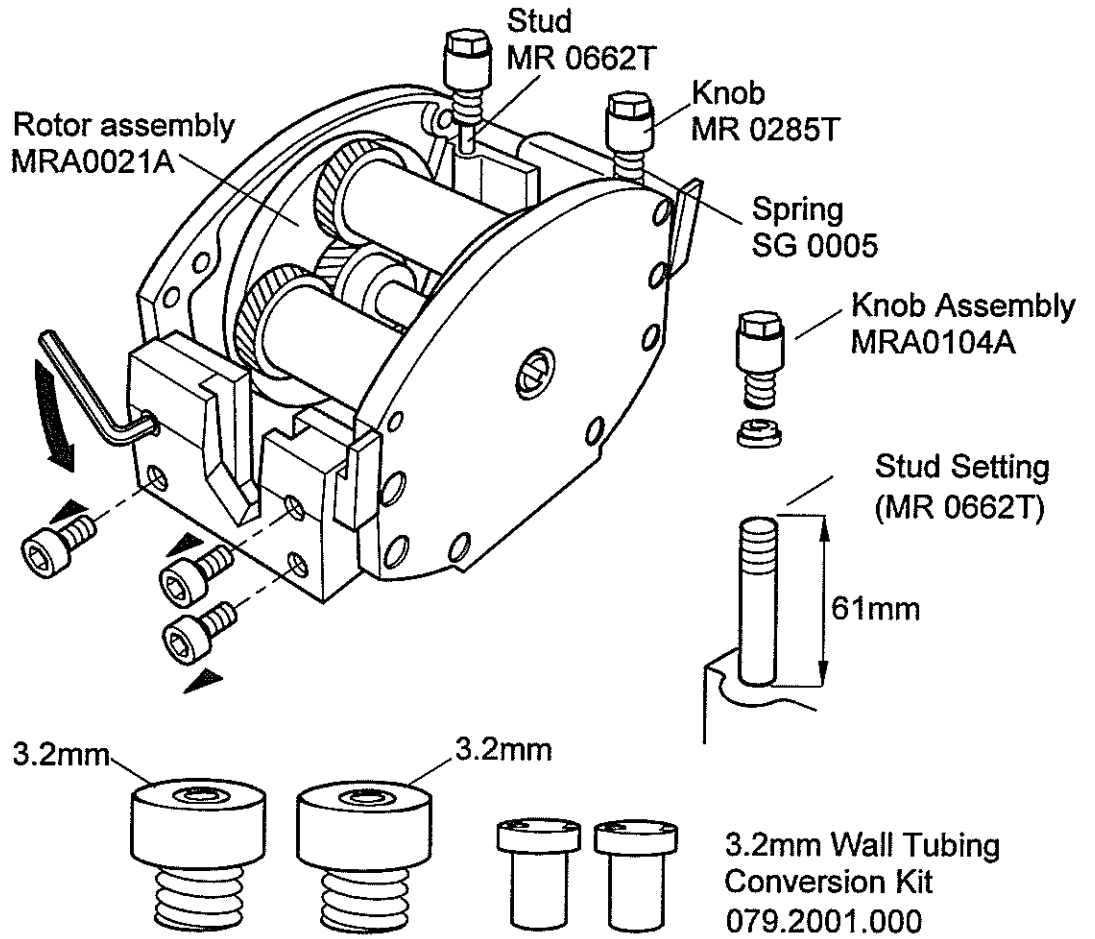
|                             |   |
|-----------------------------|---|
| Nominal maximum rotor speed | 360rpm  |
| Speed control ratio         | 50:1  |
| Maximum power consumption   | 750VA   |
| Operating temperature range | 5C to 40C   |
| Storage temperature range   | -40C to 70C   |
| Weight                      | 26kg  |
| Noise ( one pumphead )      | <78dBA at 1m  |
| Standards                   | IEC 335-1, EN60529 (IP55)<br>Machinery Directive: 91/368/EEC<br>and EN602041<br>Low Voltage Directive: 73/23/EEC<br>and EN61010-1<br>EMC Directive: 89/336/EEC<br>and EN50081-1/EN50082-1 |

## Care and maintenance

The 701U/R uses a permanent magnet direct current motor with a pulse-width-modulated speed controller which provides back commutation. The only scheduled maintenance required for the 701U/R is the inspection of the motor brushes and their replacement before the length is to less than 10mm. The life of the brushes will depend on the duty of the pump, but is expected to be at least 2000 hours at maximum speed.

The sun gear of the gearbox in the 701R and 701RX pumpheads, should be lightly greased with a quality gear grease every one thousand hours. If harmful liquids are spilled on to the pump, the case and pumphead should be thoroughly cleaned with detergent and water. Strong solvents should not be used. The sun gear of the gearbox in the pumphead should be lightly greased with a good gear grease after the pumphead has been cleaned.

# Pumphead spares

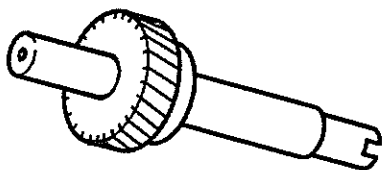
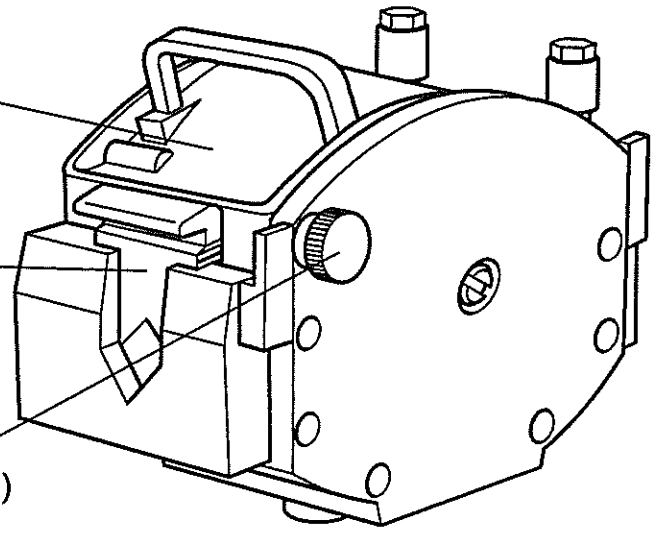




Tube assembly  
MRA0019A

Tube clamp  
MR 0880C

Pivot pin assembly  
MRA0027  
(701RX : MRA0034)



Shaft/Sungear assembly  
MRA0039A  
(701RX : MRA0040A)

Lever (right hand)  
MR 0659M  
Lever (left hand)  
MR 0668M

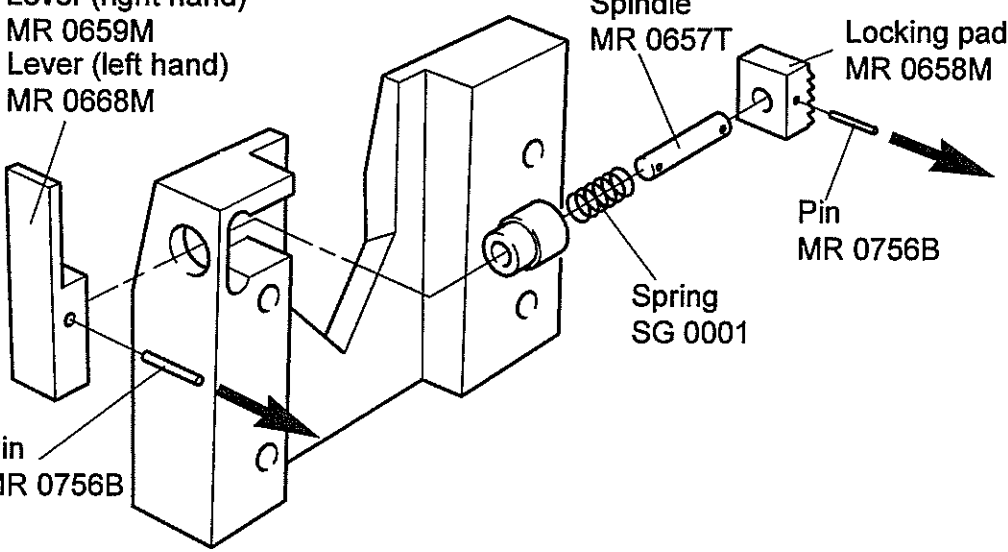
Spindle  
MR 0657T

Locking pad  
MR 0658M

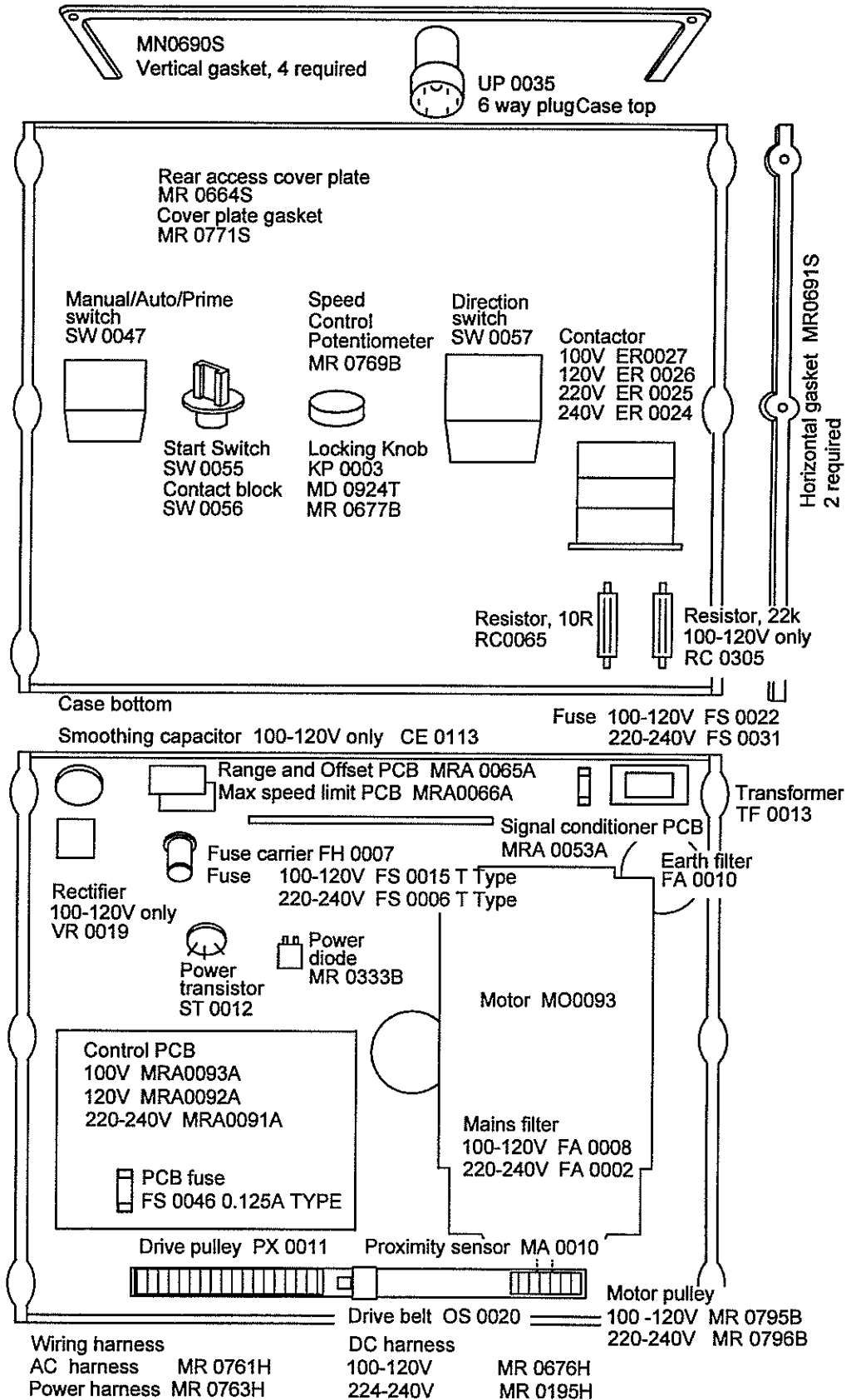
Pin  
MR 0756B

Spring  
SG 0001

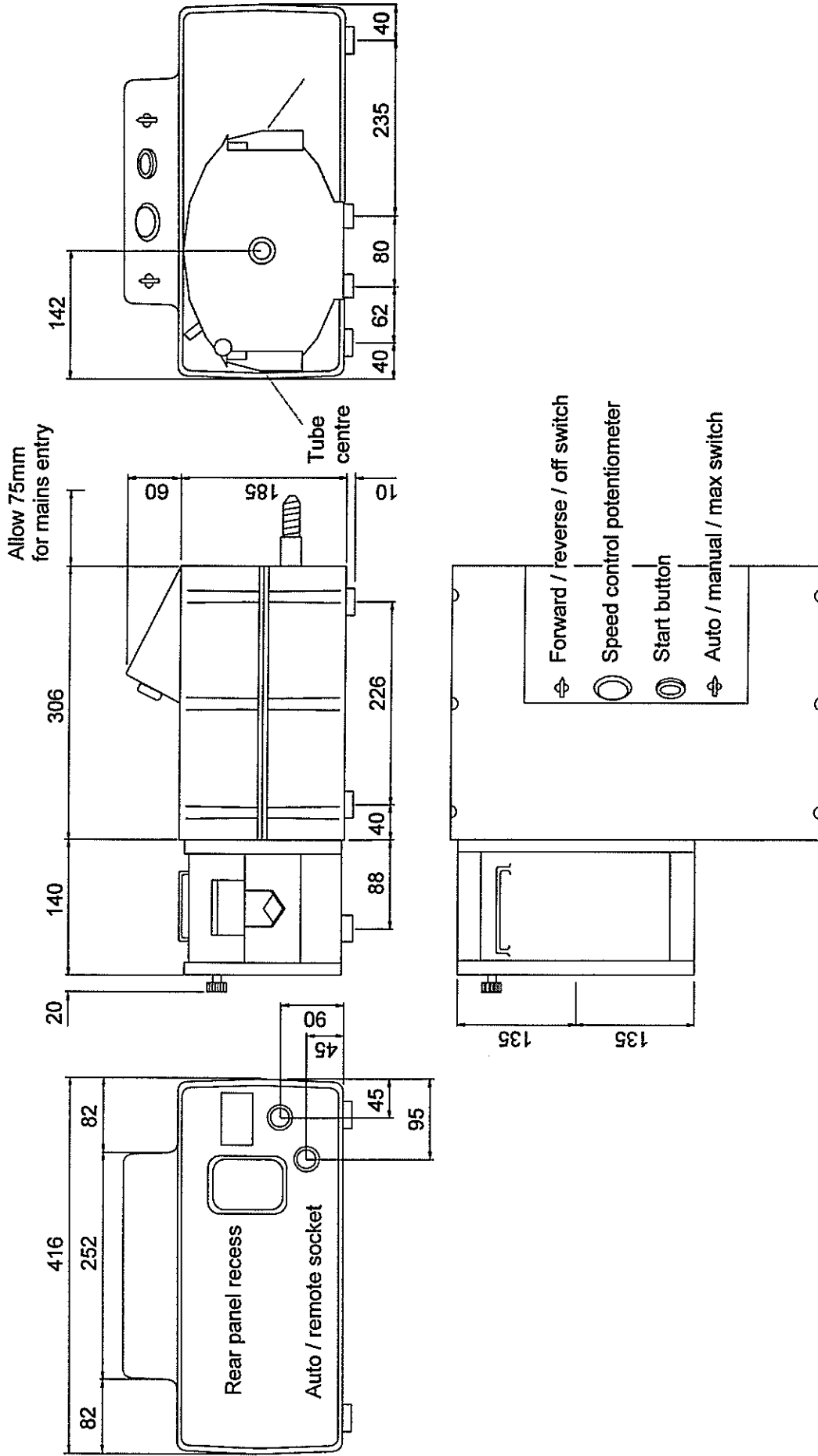
Pin  
MR 0756B



# Drive spares



# 701U/R Outline drawing



# Decontamination certificate

## Watson-Marlow Limited Health and Safety Declaration

1.0 This procedure is a legal requirement in the UK and **must** be used when returning pumps and equipment for service at Watson-Marlow (or its distributor).

3.0 Either fax this form or send by first class post to Watson-Marlow (or its distributor) to **ensure** that we have the information **before** receipt of the equipment.

2.0 Pumps returned for service must be cleaned. You are responsible for their decontamination.

A further copy must be attached to the **outside** of the shipping case.

**Failure to complete the form or comply with the procedure will cause delays in servicing the equipment.**

4.0 Company .....  
 Address .....  
 .....  
 Telephone ..... Post Code.....  
 Fax number.....

5.0 Please complete **all** the following sections

5.4 If substances are not hazardous nor toxic, please complete section 5.4.1. If substances are hazardous or toxic, please complete section 5.4.2.

5.1 Pump Type.....

5.2 Serial number.....

5.4.1 I hereby confirm that the equipment specified has not pumped nor come into contact with any toxic or hazardous substances.

5.3 Details of substances pumped

Signed.....  
 Name.....  
 Position.....  
 Date.....

5.3.1 Chemical names:

- (a) .....
- (b) .....
- (c) .....
- (d) .....

5.4.2 I hereby confirm that the only toxic or hazardous substance(s) that the equipment specified has pumped or come into contact with are those named, and that the information given is correct and the carrier has been informed if the consignment is of a hazardous nature.

5.3.2 Precautions to be taken in handling these substances:

- (a) .....
- (b) .....
- (c) .....
- (d) .....

Signed.....  
 Name.....  
 Position.....  
 Date.....

5.3.3 Action to be taken in the event of human contact:

- (a) .....
- (b) .....
- (c) .....
- (d) .....

5.5 Carrier to be used

.....  
 Delivery date  
 .....

5.3.4 Cleaning fluid to be used if residue of chemicals is found during servicing:

- (a) .....
- (b) .....
- (c) .....
- (d) .....

5.6 Fault description or any other information

.....  
 .....  
 .....  
 .....

**IMPORTANT**

Before returning any product for service, this form **must** be completed and sent to Watson-Marlow, or its subsidiary, or its official distributor undertaking the service