


# 403U, 405U



## Declarations

<b>Declaration of conformity</b> 	When this pump unit is used as a stand-alone pump it complies with: Machinery Directive 2006/42/EC, EMC Directive 2004/108/EC.
<b>Declaration of Incorporation</b>	When this 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 Machinery Directive 2006/42/EC.

Responsible person: Christopher Gadsden, Managing Director, Watson-Marlow Limited, Falmouth, Cornwall TR11 4RU, England. Telephone +44 (0) 1326 370370. Fax +44 (0) 1326 376009.



## Two year warranty

W-M Alitea AB warrants, subject to the conditions below, through either W-M Alitea AB, 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, rollers and motor brushes are excluded.
- Products must be returned by pre-arrangement carriage paid to W-M Alitea AB, its subsidiaries, or its authorised distributor.
- All repairs or modifications must have been made by W-M Alitea AB, its subsidiaries, or its authorised distributors or with the express permission of W-M Alitea AB, 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 W-M Alitea AB made by any person, including representatives of W-M Alitea AB, its subsidiaries, or its distributors, which do not accord with the terms of this warranty shall not be binding upon W-M Alitea AB unless expressly approved in writing by a Director or Manager of W-M Alitea AB.

## Information for returning pumps

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 W-M Alitea AB or its distributor.



A certificate 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.

## 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.

 	<b><i>There are dangerous voltages inside the pump. If access is required, isolate the pump from the mains before removing the cover.</i></b>
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## Installation

- The 403U and 405U drives are suitable for single phase mains electricity supplies only.
- The pumps are supplied with a mains cable fitted with a moulded plug. The wires are colour coded in accordance with the following code:  
220-240V: Live- Brown; Neutral - Blue; Earth - Green/Yellow.  
100-120V: Live - Black; Neutral - White; Earth - Green.
- 403U and 405U drives with product codes ending in "U" (UK mains cable) and "E" (European mains cable) accept 230V, 50/60Hz only, whereas pumps with product codes ending in "A" (American mains cable) accept 110V, 50/60Hz single phase mains voltage.

## Recommended operating procedures

**DO** keep delivery and suction lines as short as possible using a minimum number of swept bends.

**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** run at a slow speed when pumping viscous fluids.

**DO** fit an extra length of pump tube in the system to enable tube transfer. This will extend tube life and minimise the downtime of the pumping circuit.

**DO** keep the track and rollers clean.

The self-priming nature of peristaltic pumps means valves are not required. Any valves fitted must cause no restriction to flow in the pumping circuit.

**When using continuous lengths of Marprene tubing** After the first 30 minutes of running, re-tension the tube in the pumphead by releasing the track latch and pulling the tubing on the delivery side a little. This is to counteract the normal stretching that occurs with Marprene 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.

## Troubleshooting

Should the pump fail to operate, make the following checks to determine whether or not servicing is required.

- Check that mains supply is available at the pump.
- Check the mains supply fuse.
- Check that the pump is not stalled by incorrect fitting of tubing.

## Manual operation

- Change the set speed by pressing the ▲ or ▼ key. Pump speed is displayed in percentage of maximum speed. The 403U has a speed control ratio of 20:1. This will give a minimum speed of 0.5rpm for the 10rpm 403U drive and 2.5rpm for the 50rpm 403U. The 405U has a speed control ratio of 10:1. This will give a minimum speed of 20rpm for the 200rpm 405U drive.
- Start the pump or change rotor running direction by pressing the ⤴ (clockwise rotation) or the ⤵ (counter clockwise) key. Stop the pump by pressing the **Stop** key. The direction of rotation of the rotor, or a stopped rotor, is indicated by the illumination of the LED above the ⤴, **Stop** and ⤵ keys.
- For maximum speed priming press the **Max** key.
- If power is cut to the pump at the mains supply when under manual control, after power is reconnected the pump will remain stopped.
- If returning from auto control to manual control, disconnect the process signal from the pump.

## Remote control

The 403U and 405U drives can be controlled remotely via 0-10V or 4-20 mA analogue signals. 400AC1, 400AC2, 400AC3 and 400AC4 remote control cables with a 15-pin D-sub connector are available from your local Watson-Marlow dealer. Wiring diagrams for each control cable are shown at the bottom of this section.

When using the **400AC1** (0-10V) or **400AC2** (4-20mA) remote control cables for analogue speed control and switching cw/stop/ccw:

- Set the pump to stop by pressing the **Stop** key.
- The keypad speed control setting sets the range of the remote speed signal, and it can be adjusted during remote control use. (If the manual speed is set 50%, only 50% of maximum speed will be achievable at 10V or 20mA). It is advisable to set the speed to 99.9% for full analogue speed range control.
- Start or stop the pump in either cw or ccw direction remotely as shown in the relevant wiring diagrams. If the remote switch is set to stop, cw or ccw direction switching can be achieved using the keypad.

When using the **400AC3** cw/stop/ccw remote cable

- Set the pump speed manually using the ▲ or ▼ keys.
- Start or stop the pump in either cw or ccw direction remotely as shown in the relevant wiring diagram. If the remote switch is set to stop, cw or ccw direction switching can be achieved using the keypad.



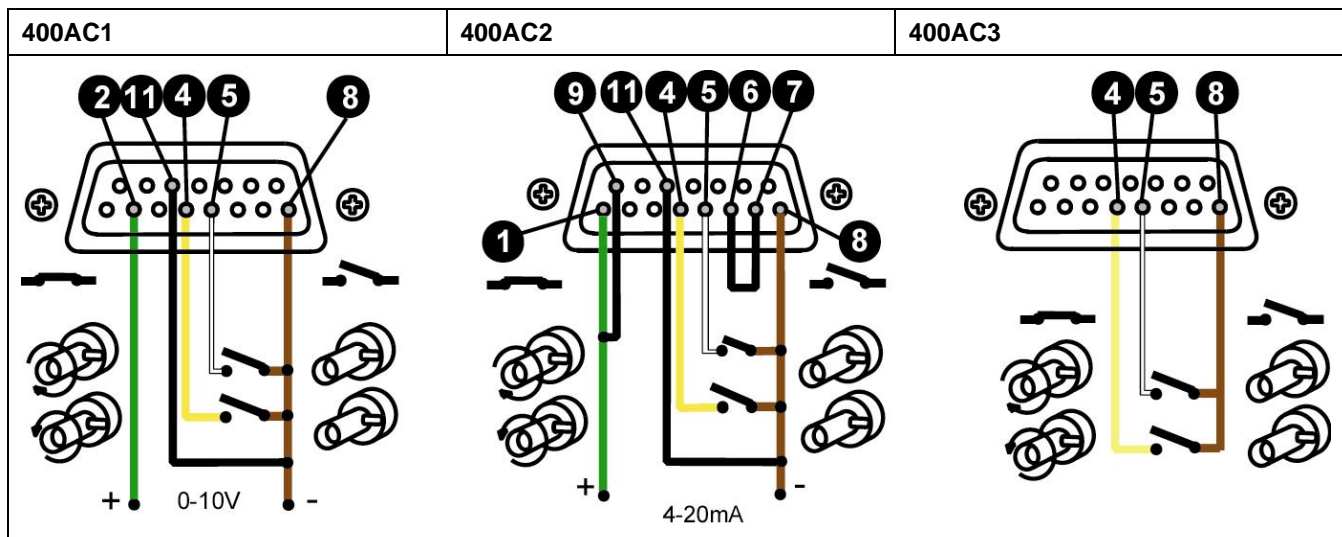
**With a remote direction switch connected and the remote cw/stop/ccw switch set to cw or ccw, you cannot switch direction manually. However, you can stop the pump manually using the keypad which is designed to be used as an "emergency stop". The remote cw/stop/ccw switch needs to be set to stop to release the "emergency stop".**

When using the **400AC4** start/stop 3m remote cable with footswitch fitted:

- Set the pump to stop by pressing the **Stop** key
- Pressing the footswitch will start the pump in the cw direction only. Releasing the footswitch will stop the pump.



**In the event of a power failure when the pump is under remote control, the pump will automatically re-start when the power is returned.**

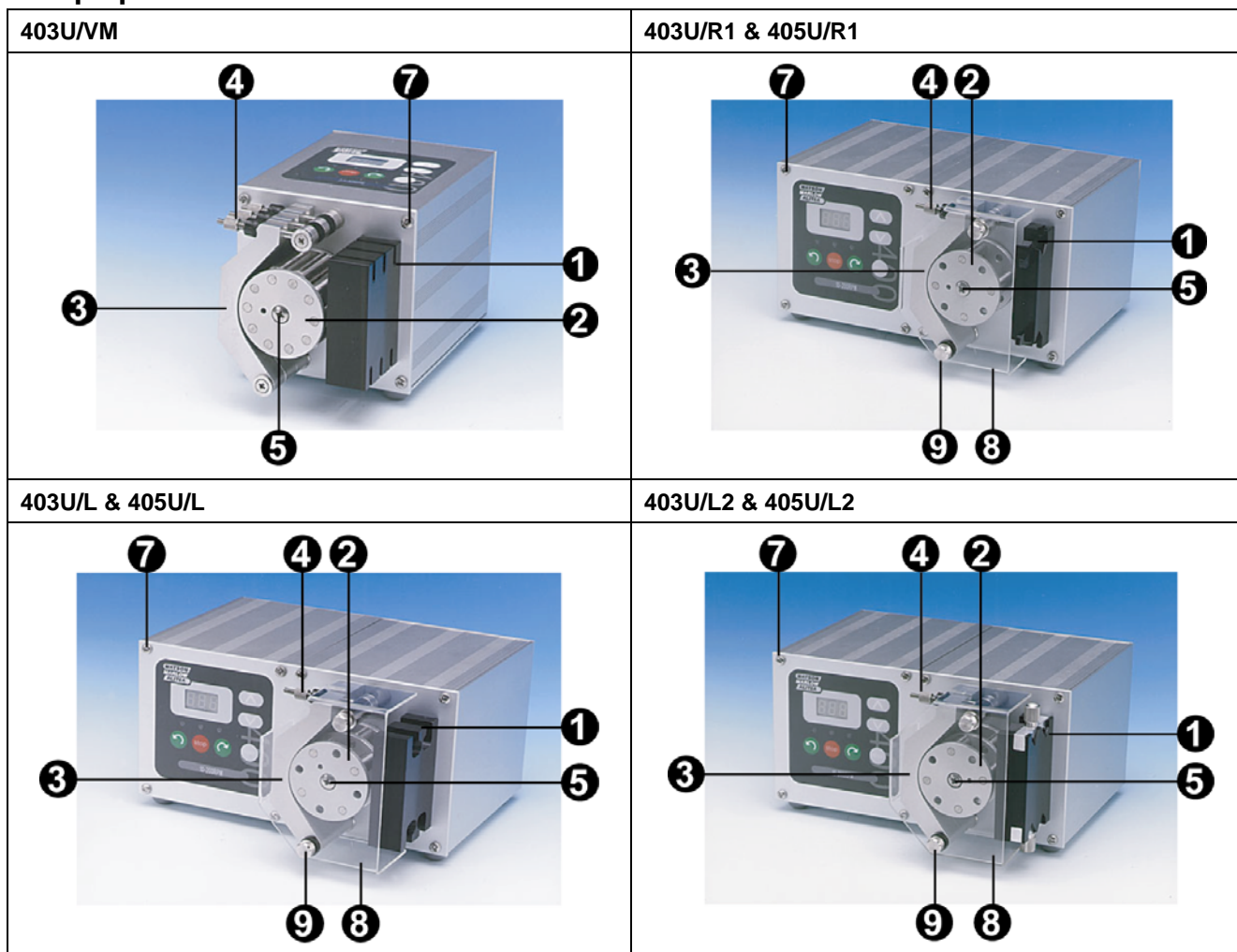


## Care and maintenance

The only scheduled maintenance of the pump unit is to replace the motor brushes and to replace them when necessary, understanding that motor brushes are not covered by the two year warranty. It is recommended that this work be carried out by a Watson-Marlow servicing agent. The life of the brushes depends on the duty of the pump but is expected to be at least 2500 hours at maximum speed for the 403U and 5000 hours for the 405U.

If the pump requires cleaning use a mild solution of detergent in water after removing the pumphead. Do not use strong solvents.

## Pump spares



Number	Description	Part number 403U/VM2	Part number 403U/VM3	Part number 403U/VM4
1	Tube clamping block	970075	990067	990029
2	Rotor	010020	010022	010017
3	Track	941024	941024	941024
4	Track occlusion arm	010040	010040	010040
5	Rotor screw	MRX M5X10 A4	MRX M5X10 A4	MRX M5X10 A4
6	Rotor shaft pin	CPR3H 8x16	CPR3H 8x16	CPR3H 8x16
7	Case screws	D6 B 35x10 NN A542 SPTAND A4	D6 B 35x10 NN A542 SPTAND A4	D6 B 35x10 NN A542 SPTAND A4

Number	Description	Part number 403U/R1, 405U/R1	Part number 403U/L, 405U/L	Part number 403U/L2, 405U/L2
1	Tube clamps/block	010042	930325	010043
2	Rotor	010018	010019	010019
3	Track	970714	950058	950058
4	Track occlusion arm	010040	010040	010040
5	Rotor screw	MRX M4X6 A4	MRX M5X6 A4	MRX M5X6 A4
6	Rotor shaft pin	CPR3H 8x16	CPR3H 8x16	CPR3H 8x16
7	Case screws	D6 B 35x10 NN A542 SPTAND A4	D6 B 35x10 NN A542 SPTAND A4	D6 B 35x10 NN A542 SPTAND A4
8	Transparent guard	950163	950217	950217
9	Finger screw	950169	950169	950169

## Specification

Maximum rotor speeds for 403U	10rpm, 50rpm
Maximum rotor speeds for 405U	200rpm
Voltage/frequency 040.***.**U	240V 50/60Hz
Voltage/frequency 040.***.**E	240V 50/60Hz
Voltage/frequency 040.***.**A	110V 50/60Hz
403U control range	20:1
405U control range	10:1
Operating temperature range	5 to 40C
Storage temperature range	-40C to 70C
Noise	<70 dBA @ 1m
Standards	IEC 335-1, EN60529 (IP21) Machinery Directive 2006/42/EC EMC Directive 2004/108/EC

## 400R1, 400L & 400L2 and 400VM2, 400VM3 & 400VM4 pumpheads

### Performance against pressure

The pressure and the suction height can be increased by compressing the spring in the track occlusion pin. A smaller gap between the rollers and track will give better performance against pressure but will reduce tube life.

Other factors that will influence tube life in peristaltic pumps are pump speed (roller impacts/minute), chemical compatibility of the duty fluid and viscosity of the duty fluid.

It is the pressure capability of the tubing that limits the operating pressure of the pump. The maximum pressure you can obtain is dependent on the wall thickness, tube bore and hardness of the tubing. Normally the maximum pressure is 2 bar.

### Key Safety Information

#### When fitting a new tube in the pumphead

- Ensure that there is no pressure, liquid or gas in the pipeline.
- Disconnect the pump from the mains to prevent the pump from starting unexpectedly.
- Always replace any protective guard after tube changeover.
- If a tube failure has occurred, ensure that any fluid in the pumphead has been allowed to drain to a safe area
- Ensure that protective clothing and eye protection is worn if aggressive fluids are being pumped.

### 400R1 pumphead set-up

The 400R1 pumphead is designed to accept 1.6mm wall standard laboratory tubing up to 6.4mm bore. Care should be taken to establish the normal tube life experienced within a set of operating parameters. Subsequent tubing replacement should be scheduled within the normal expected life of a tube. This will avoid unnecessary tube failure and unplanned pump maintenance.

#### Tube loading (Pictures 1-9)

- Remove the transparent guard.
- Release the track by disengaging the track occlusion pin.
- Before tube loading, make sure that enough suction and delivery tubing is available to connect into the remaining pipeline or to reach the suction reservoir and delivery point.
- Locate the tubing into the suction side tube clamp. Feed the tubing in around the rotor, maintaining reasonable tube tension so that the tube sits around the rotor, and locate into the delivery side tube clamp. Make sure that there are no twists or kinks in the tubing after loading as this will adversely affect tube life.
- Ensure the tube is lined up centrally in the track correctly secured at each clamp.
- Re-position the track over the rotor and fix by slotting the track occlusion pin back into the track slot.
- Re-attach the transparent guard.
- Compressing the spring on the track occlusion pin (picture 10) will increase the suction height and performance against back pressure.



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4



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### Occlusion setting

- Increase the spring pressure until the pump starts pumping and then adjust the spring pressure according to the flow rate required, which will be governed by the suction condition. **For longest tube life, set the spring pressure to the minimum required for satisfactory pumping.**

### Tube re-tensioning (pictures 10-12)

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

### Tube removal

- Release the track by disengaging the sprung track occlusion pin and withdraw the tubing from the sprung clamps.

### 400L and 400L2 pumpheads set-up

The 400L is designed for 1.6mm wall elements up to 4.8mm bore, whereas the 400L2 accepts two 1.6mm wall continuous lengths of tubing up to 4.8mm bore.

Care should be taken to establish the normal tube life experienced within a set of operating parameters. Subsequent tubing replacement should be scheduled within the normal expected life of a tube. This will avoid unnecessary tube failure and unplanned pump maintenance.

### Tube loading (Pictures 1-24)

- Remove the transparent guard
- Release the track by disengaging the track occlusion pin.
- Before tube loading, make sure that enough suction and delivery tubing is available to connect into the remaining pipeline or to reach the suction reservoir and delivery point.
- **For 400L Y elements (pictures 1-9)** locate one Y connection into the lower clamp block and feed the elements around the split rotor ensuring that each leg of the element sits centrally over each section of the rotor. Locate the second y connection in the upper clamp block.
- **For 400L2 continuous tubing lengths (pictures 10-24)** locate the tubing into the suction side w-block clamp. Feed each tube in around the rotor, maintaining reasonable tube tension so that each tube sits centrally over each

section of the rotor. Locate into the delivery side w-block clamp. Make sure that there are no twists or kinks in the tubing after loading as this will adversely affect tube life. If using a long length of tubing it is best to remove the w-block clamps to quickly locate a section of the tubing between the track and rotor.

- Re-position the track over the rotor and fix by slotting the track occlusion pin back into the track slot.
- Replace the transparent guard and secure in place.
- Compressing the spring on the track occlusion pin (picture 9 and 22) will increase the suction height and performance against back pressure.

**1**



**2**



**3**



**4**



**5**



**6**



**7**



**8**



**9**



**10**



**11**



**12**



**13**



**14**



**15**



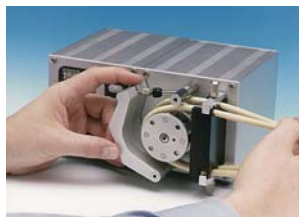
**16**



**17**



**18**



**19**



**20**



**21**



**22**



**23**



**24**





### Tube re-tensioning (pictures 25-27)

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

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### Tube removal

- Release the track by disengaging the track occlusion pin and withdraw the tubing from the w-block clamps.

### 400VM2, 400VM3, 400VM4 pumpheads set up

The 410VM pumpheads are designed to accept two bridge manifold tubing only.

### Tube loading (pictures 1-8)

- Release the track by disengaging the track occlusion pin.
- Locate the first tube bridge into the appropriate tube bridge holder slot. Feed the tubing around the rotor and locate the centre tube bridge into the bridge holder slot immediately opposite the first tube bridge. Repeat for the remaining one (400VM2) or two (400VM3) or three (400VM4) channels. Make sure that there are no twists or kinks in the tubing after loading as this will adversely affect tube life.
- Re-position each track over the rotor and fix by slotting the track occlusion pin back into the track slot.
- Compressing the spring on the track occlusion pin (picture 8) will increase the suction height and performance against back pressure.

1



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3



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8



### Tube removal

- Release the track by disengaging the track occlusion pin.
- Remove both tubing bridges from their location slots and remove the tubing from the pumphead.

## Flow rates

The tables below list the approximate water-flow rate per revolution for the 404D pumpheads. The flow rate will depend on the duty fluid (viscosity, density etc.), pressure, temperature, speed, tubing and the installation. For accurate flow rates and repeatability, calibrate the pump for your application.

### 400R1

Tube bore	0.5mm	0.8mm	1.6mm	2.4mm	3.2mm	4.0mm	4.8mm	6.4mm
Tube number	112	13	14		16		25	15
ml/rev	0.022	0.055	0.22	0.49	0.86	1.31	1.83	3.03
2.5 to 50rpm	0.06-1.1	0.14-2.8	0.55-11	1.2-24	2.1-43	3.3-65	4.6-92	7.6-150
20 to 200rpm	0.44-4.4	1.1-11	4.4-44	9.8-98	17-170	26-260	37-370	61-610

### 400L

Tube bore	0.5mm	0.8mm	1.6mm	2.4mm	3.2mm	4.0mm	4.8mm
Tube number	112	13	14		16		25
ml/rev	0.043	0.11	0.44	0.98	1.71	2.62	3.67
2.5 to 50rpm	0.11-2.2	0.28-5.6	1.1-22	2.4-49	4.3-86	6.5-130	9.2-180
20 to 200rpm	0.86-8.6	2.2-22	8.8-88	20-200	34-340	52-520	73-730

### 400L2

Tube bore	0.5mm	0.8mm	1.6mm	2.4mm	3.2mm	4.0mm	4.8mm
Tube number	112	13	14		16		25
ml/rev	0.022	0.055	0.22	0.49	0.86	1.31	1.83
2.5 to 50rpm	0.06-1.1	0.14-2.8	0.55-11	1.2-24	2.1-43	3.3-65	4.6-92
20 to 200rpm	0.44-4.4	1.1-11	4.4-44	9.8-98	17-170	26-260	37-370

### 400VM2, 400VM3, 400VM4









































Colour	Orange/black	Orange/Red	Orange/Blue	Orange/Green	Orange/yellow
Bore	0.13mm 0.005"	0.19mm 0.007"	0.25mm 0.010"	0.38mm 0.015"	0.50mm 0.020"
0.5-10rpm	0.001-0.01	0.001-0.03	0.002-0.004	0.005-0.1	0.01-0.2
2.5-50rpm	0.003-0.06	0.006-0.13	0.011-0.2	0.025-0.5	0.04-0.9
Colour	Orange/White	Black/Black	Orange/Orange	White/White	Red/Red
Bore	0.63mm 0.025"	0.76mm 0.030"	0.88mm 0.035"	1.02mm 0.040"	1.14mm 0.045"
0.5-10rpm	0.01-0.3	0.02-0.4	0.03-0.5	0.03-0.7	0.04-0.9
2.5-50rpm	0.07-1.4	0.10-2.0	0.13-2.6	0.17-3.5	0.21-4.3
Colour	Grey/Grey	Yellow/Yellow	Yellow/Blue	Blue/Blue	Green/Green
Bore	1.29mm 0.050"	1.42mm 0.055"	1.52mm 0.060"	1.65mm 0.065"	1.85mm 0.07
0.5-10rpm	0.05-1.1	0.06-1.3	0.07-1.4	0.08-1.7	0.10-2.0
2.5-50rpm	0.27-5.4	0.32-6.4	0.36-7.2	0.41-8.3	0.50-10.0
Colour	Purple/Purple	Purple/Black	Purple/Orange	Purple/White	
Bore	2.05mm 0.080"	2.29mm 0.090"	2.54mm 0.100"	2.79mm 0.110"	
0.5-10rpm	0.12-2.3	0.14-2.7	0.16-3.1	0.17-3.4	
2.5-50rpm	0.59-12	0.69-14	0.78-16	0.85-17	



## 1.6mm wall continuous tubing

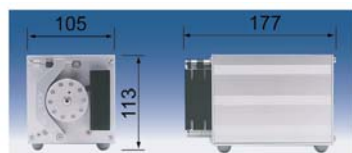
Tube product codes						
mm	"	#	Marprene	Bioprene	Peroxide Silicone	Platinum Silicone
0.5	1/50	112	902.0005.016	903.0005.016	910.0005.016	913.0005.016
0.8	1/32	13	902.0008.016	903.0008.016	910.0008.016	913.0008.016
1.6	1/16	14	902.0016.016	903.0016.016	910.0016.016	913.0016.016
3.2	1/8	16	902.0032.016	903.0032.016	910.0032.016	913.0032.016
4.8	3/16	25	902.0048.016	903.0048.016	910.0048.016	913.0048.016
6.4	1/4	17	902.0064.016	903.0064.016	910.0064.016	913.0064.016
8.0	5/16	18	902.0080.016	903.0080.016	910.0080.016	913.0080.016
mm	"	#	Butyl *	Tygon	Fluorel	Neoprene
0.8	1/32	13				<b>920.0008.016</b>
1.6	1/16	14	930.0016.016	950.0016.016	970.0016.016	920.0016.016
3.2	1/8	16	930.0032.016	950.0032.016	970.0032.016	920.0032.016
4.8	3/16	25	930.0048.016	950.0048.016	970.0048.016	920.0048.016
6.4	1/4	17	930.0064.016	950.0064.016	970.0064.016	920.0064.016
8.0	5/16	18	930.0080.016	950.0080.016	970.0080.016	920.0080.016

## Manifold tubing product codes

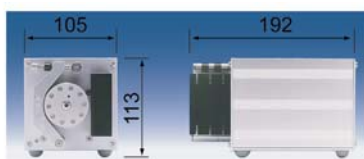
	Bore mm	Bore "	Marprene	PVC	Silicone	Solvent resistant	Acid resistant
		0.13 0.005				984.0013.000	
		0.19 0.007				984.0019.000	
		0.25 0.010	978.0025.000	980.0025.000		984.0025.000	
		0.38 0.015	978.0038.000	980.0038.000		984.0038.000	
		0.50 0.020	978.0050.000	980.0050.000		984.0050.000	986.0050.000
		0.63 0.025	978.0063.000	980.0063.000	982.0063.000	984.0063.000	986.0063.000
		0.76 0.030	978.0076.000	980.0076.000	982.0076.000	984.0076.000	986.0076.000
		0.88 0.035	978.0088.000	980.0088.000	982.0088.000	984.0088.000	986.0088.000
		1.02 0.040	978.0102.000	980.0102.000	982.0102.000	984.0102.000	986.0102.000
		1.14 0.045	978.0114.000	980.0114.000	982.0114.000	984.0114.000	986.0114.000
		1.29 0.050	978.0129.000	980.0129.000	982.0129.000	984.0129.000	986.0129.000
		1.42 0.055	978.0142.000	980.0142.000	982.0142.000	984.0142.000	986.0142.000
		1.47 0.058			982.0147.000		
		1.52 0.060	978.0152.000	980.0152.000	982.0152.000	984.0152.000	986.0152.000
		1.65 0.065	978.0165.000	980.0165.000	982.0165.000	984.0165.000	986.0165.000
		1.85 0.070	978.0185.000	980.0185.000	982.0185.000	984.0185.000	986.0185.000
		2.05 0.080	978.0205.000	980.0205.000	982.0205.000	984.0205.000	986.0205.000
		2.29 0.095	978.0229.000	980.0229.000	982.0229.000	984.0229.000	986.0229.000
		2.54 0.100	978.0254.000	980.0254.000	982.0254.000	984.0254.000	986.0254.000
		2.79 0.110	978.0279.000	980.0279.000	982.0279.000	984.0279.000	986.0279.000

## Outline dimensions

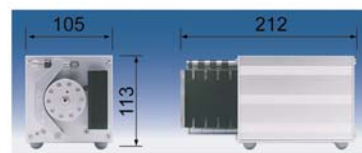
**403U/VM2**



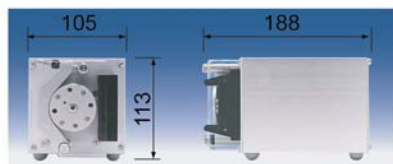
**403U/VM3**



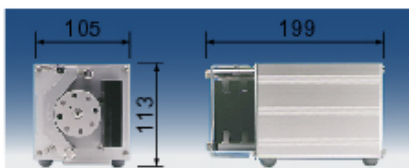
**403U/VM4**



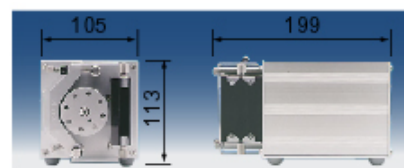
**403U/R1**



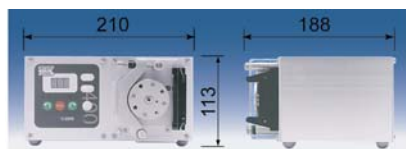
**403U/L**



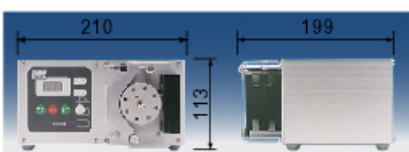
**403U/L2**



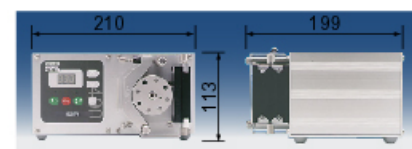
**405U/R1**



**405U/L**



**405U/L2**



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**Watson-Marlow, Bioprene and Marprene are trademarks of Watson-Marlow Limited.**

**Warning, these products are not designed for use in, and should not be used for patient connected applications.**

The information contained in this document is believed to be correct but Watson-Marlow Limited accepts no liability for any errors it contains, and reserves the right to alter specifications without notice.

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## Product use and decontamination declaration

In compliance with the **UK Health & Safety at Work Act** and the **Control of Substances Hazardous to Health Regulations** you, the user are required to declare the substances which have been in contact with the product(s) you are returning to Watson-Marlow or any of its subsidiaries or distributors. Failure to do so will cause delays in servicing the product. Therefore, please complete this form to ensure that we have the information before receipt of the product(s) being returned. A FURTHER COPY *MUST BE ATTACHED TO THE OUTSIDE OF THE PACKAGING CONTAINING THE PRODUCT(S)*. You, the user, are responsible for cleaning and decontaminating the product(s) before returning them.

Please complete a separate Decontamination Certificate for each pump returned.

**RGA No:** .....

### 1 Company

Address ..... Postcode .....

Telephone ..... Fax Number .....

2.1 Serial Number ..... (a).....

2.2 Has the Product been used? (b).....

YES		NO	
-----	--	----	--

(c).....

(d).....

If yes, please complete all the following Sections. If no, please complete Section 5 only

### 3 Details of substances pumped

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

#### 3.1 Chemical names:

5 Signed .....

(a)..... Name .....

(b)..... Position .....

(c)..... Date .....

(d).....

#### 3.2 Precautions to be taken in handling these substances:

To assist servicing, please describe any fault condition(s) you have witnessed

(a).....

(b).....

(c).....

(d).....

#### 3.3 Action to be taken in the event of human contact:

.....

(a).....

(b).....

(c).....

(d).....

#### 3.4 Cleaning fluid to be used if residue of chemical is found: .....

(a).....

(b).....

(c).....

(d).....

Watson-Marlow Bredel Pumps . Falmouth . Cornwall TR11 4RU . England . Tel: 01326 370370 . Fax: 01326 376009