

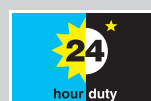
120F, 120S and 120U pumps with 102R, 114DV, 400D1, 400DM2 and 400DM3 pumpheads

100 series

Watson-Marlow Pumps

FEATURES AND BENEFITS

- Flow rates suitable for laboratory applications
- Flows from 0.001ml/min (0.0 USGPH) to 190ml/min (3.04 USGPH) at 2 Bar (30psi)
- Compact and stackable pumps, saving valuable benchtop space
- Superior speed control up to 10,000:1, ±1% set speed accuracy
- IP31/NEMA 2 ingress protection for wipedown environments
- Maintenance-free brushless DC motor
- Three interface options: Fixed speed, manual and remote control
- A selection of pumphead options for high accuracy and smooth precise flow



Watson-Marlow...Innovation in Full Flow

PERFORMANCE: 102R PUMPHEAD

Single channel two roller pumphead

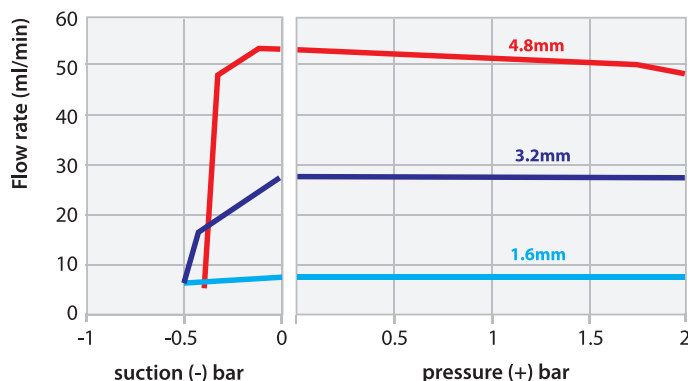
- Flows from 0.003ml/min (0.0USGPH) to 54ml/min (0.86 USGPH)
- Suitable for continuous silicone tubing
- Sprung rotor to maximise tube life



Tube bore and flow rates 120F/R (ml/min)						
	Speed rpm	0.5mm	0.8mm	1.6mm	3.2mm	4.8mm
Pumpsil (Silicone)	10rpm	0.3	0.5	2.1	8.5	17
	17rpm	0.5	0.9	3.6	14	29
	31rpm	0.9	1.6	6.5	26	52

Tube bore and flow rates 120S/R and 120U/R (ml/min)						
	Speed rpm	0.5mm	0.8mm	1.6mm	3.2mm	4.8mm
Pumpsil (Silicone)	1 – 32rpm	0.03-0.9	0.05-1.6	0.21-6.7	0.85-27	1.6-54
	0.1 – 32rpm	0.003-0.9	0.005-1.6	0.021-6.7	0.085-27	0.16-54

Pumpsil 102R pumphead CCW 32rpm



Flows obtained pumping water at 100rpm CCW-rotation
Typically 25% less pressure capacity in the CW direction

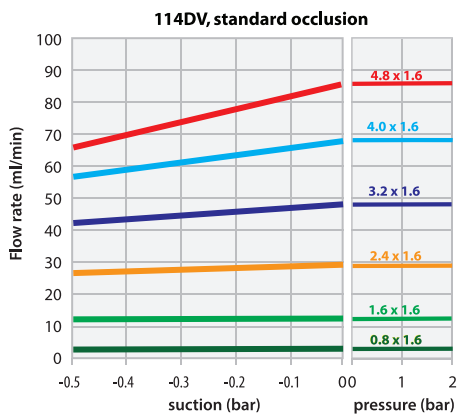
PERFORMANCE: 114DV PUMPHEAD
Flip top single channel pumphead

- Flows from 0.002ml/min (0.0 USGPH) to 190ml/min (3.04 USGPH)
- Four rollers for smooth flow
- Assures trouble free continuous tube loading in seconds
- High accuracy and repeatable flow



Tube bore and flow rates 120F/DV (ml/min)							
Speed rpm	0.5mm	0.8mm	1.6mm	2.4mm	3.2mm	4.0mm	4.8mm
10rpm	0.2	0.4	1.4	2.9	4.7	6.7	8.5
17rpm	0.3	0.7	2.4	4.9	8.0	11	14
31rpm	0.6	1.2	4.3	9.0	15	21	26
52rpm	1.0	2.1	7.3	15	24	35	44
220rpm	4.4	8.8	31	64	100	150	190

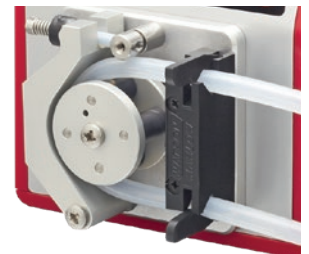
Tube bore and flow rates 120S/DV and 120U/DV (ml/min)							
Speed rpm	0.5mm	0.8mm	1.6mm	2.4mm	3.2mm	4.0mm	4.8mm
1 - 200rpm	0.02 - 4.0	0.04 - 8.0	0.14 - 28	0.29 - 58	0.47 - 94	0.67 - 130	0.85 - 170
0.1 - 200rpm	0.002 - 4.0	0.004 - 8.0	0.014 - 28	0.029 - 58	0.047 - 94	0.07 - 130	0.085 - 170



Flows obtained pumping water at 100rpm CCW-rotation
 Typically 25% less pressure capacity in the CW direction

PERFORMANCE: 400D1 PUMPHEAD
Single channel 400D1 pumphead

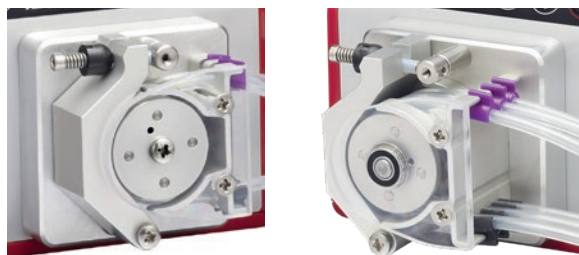
- Flow rates from 0.001ml/min (0.0 USGPH) to 120 ml/min (1.92 USGPH)
- Precision machined four roller aluminium rotor
- Quick release sprung tube clamps
- Smooth precise flow



Tube bore and flow rates 102S/D1 and 120U/D1 (ml/min)							
	Speed rpm	0.5mm	0.8mm	1.6mm	2.4mm	3.2mm	4.0mm
120S/D1	1 - 200rpm	0.01 - 2.2	0.03 - 5.8	0.11 - 23	0.24 - 49	0.41 - 81	0.59 - 120
120U/D1	0.1 - 200rpm	0.001 - 2.2	0.003 - 5.8	0.011 - 23	0.024 - 49	0.041 - 81	0.059 - 120

PERFORMANCE: 400DM2 / 400DM3 PUMPHEADS
DM2—Twin channel / DM3—Three channel pumpheads

- Compatible with two and three bridge manifold tubing
- 0.001ml/min (0.0 USGPH) to 36ml/min (0.58 USGPH) per channel
- Precision machined four roller aluminium rollers
- Ideal for ultra low flow metering
- Smooth precise flow

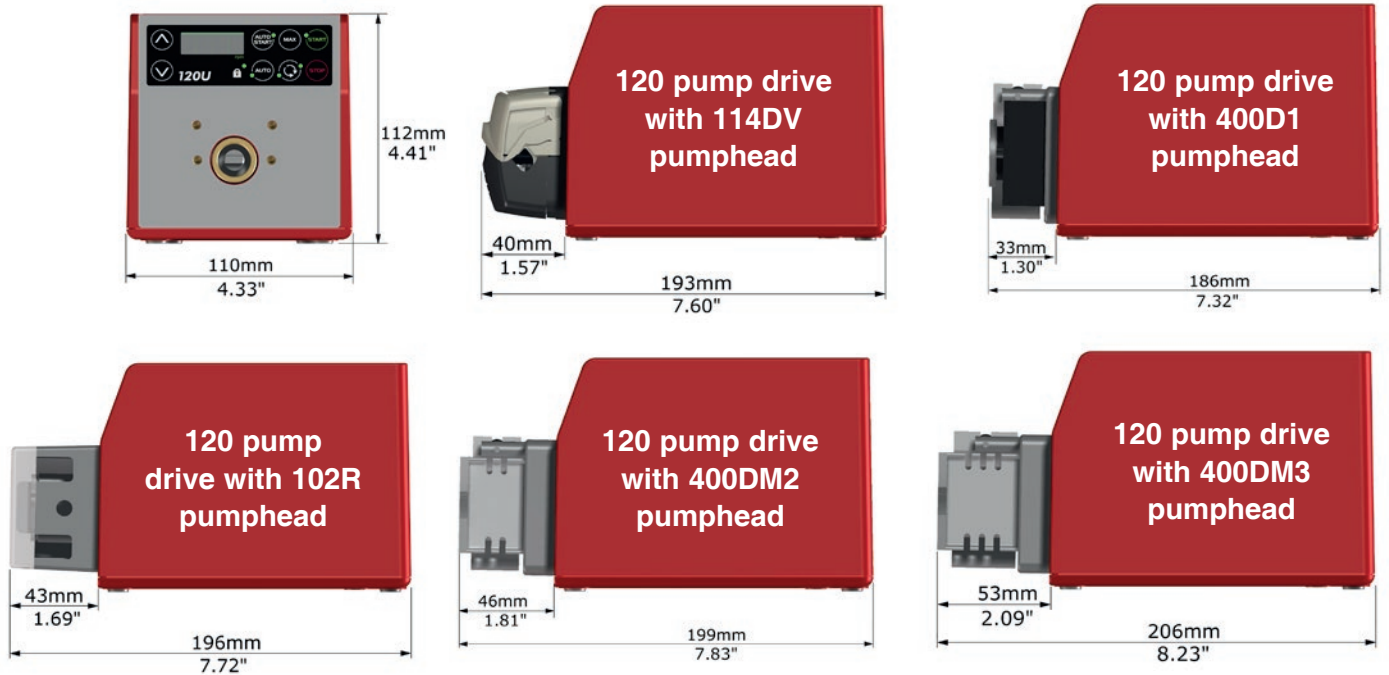


Tube bore and flow rates 400DM2, 400DM3 (ml/min) – per channel						
	Speed rpm	0.13mm	0.19mm	0.25mm	0.38mm	0.50mm
120S	1 – 100rpm	0.001-0.1	0.002-0.2	0.004-0.4	0.008-0.8	0.014-1.4
120U	0.1 – 100rpm	0.0001-0.1	0.0002-0.2	0.0004-0.4	0.0008-0.8	0.001-1.4
	Speed rpm	0.64mm	0.76mm	0.89mm	1.02mm	1.14mm
120S	1 – 100rpm	0.022-2.2	0.031-3.1	0.043-4.3	0.055-5.5	0.070-7.0
120U	0.1 – 100rpm	0.002-2.2	0.003-3.1	0.004-4.3	0.006-5.5	0.007-7.0
	Speed rpm	1.30mm	1.42mm	1.52mm	1.65mm	1.85mm
120S	1 – 100rpm	0.089-8.9	0.110-11	0.120-12	0.140-14	0.180-18
120U	0.1 – 100rpm	0.009-8.9	0.011-11	0.012-12	0.014-14	0.018-18
	Speed rpm	2.06mm	2.29mm	2.54mm	2.79mm	
120S	1 – 100rpm	0.210-21	0.250-25	0.310-31	0.360-36	
120U	0.1 – 100rpm	0.021-21	0.025-25	0.031-31	0.036-36	

TECHNICAL DATA

Functionality	120F	120S	120U
Manual control			
Fixed speed (CW direction)	•		
Variable speed 1rpm increments		•	
Variable speed 0.1rpm increments			•
Numerical speed display		•	•
Direction change		•	•
Max (prime)		•	•
Auto start		•	•
Remote control and feedback			
Run/stop, direction change, auto/man toggle, alarm			•
Analogue control			
Variable speed 0.1rpm increments			•
Analogue speed input; 4-20mA, 0-10V			•
Tacho speed output; 0-5V			•
Security			
Keypad lock to protect set-up		•	•

DIMENSIONS



TECHNICAL SPECIFICATION

120F, 120S, 120U						
Ingress rating	IP31 / NEMA 2					
Enclosure	Wipedown					
Suitability	Dry light-industrial environments					
Humidity	Non-condensing 80% up to 31C, 88F, decreasing linearly to 50% at 40C (104F)					
Temperature	5C to 40C (40F to 104F)					
Pump weight	Drive only	114DV	102R	400D1	400DM2	400DM3
	1.40kg (3lbs 1oz)	1.50kg (3lbs 5oz)	1.55kg (3lbs 7oz)	1.65kg (3lbs 10oz)	1.70kg (3lbs 11oz)	1.70kg (3lbs 11oz)
Torque rating	0.4Nm continuous duty					
Noise	< 60dB(A) at 1m					
Standard	CE, cETLus					
Power supply	Supplied with 24VDC mains transformer plug (range 90-264VAC 47-63Hz) which comes with multi-country adaptors					

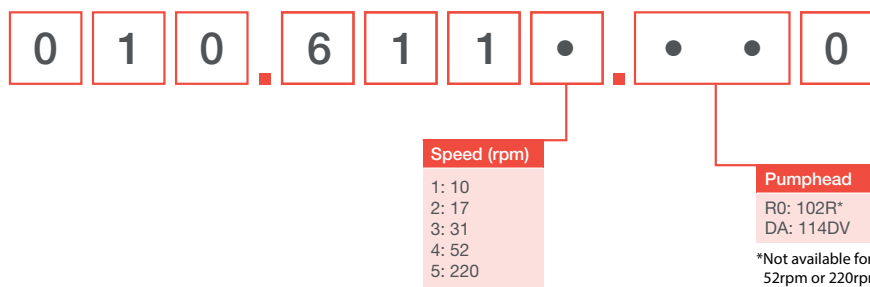
Control Ratio											
	120F		120S				120U				
Pumphead	NA	102R	114DV	400D1	400DM2	400DM3	102R	114DV	400D1	400DM2	400DM3
Manual	Fixed	1-32 rpm (32:1)	1-200 rpm (200:1)	1-200 rpm (200:1)	1-100 rpm (100:1)	1-100 rpm (100:1)	0.1-32 rpm (320:1)	0.1-200 rpm (2,000:1)	0.1-200 rpm (2,000:1)	0.1-100 rpm (1,000:1)	0.1-100 rpm (1,000:1)
Automatic	NA	NA	NA	NA	NA	NA	0.01-32 rpm (3,200:1)	0.01-200 rpm (20,000:1)	0.01-200 rpm (20,000:1)	0.01-100 rpm (10,000:1)	0.01-100 rpm (10,000:1)

MATERIALS OF CONSTRUCTION

Drive	
Component	Material
Keypad	Polyester
Drive casework	ABS plastic
Drive shaft	Stainless Steel

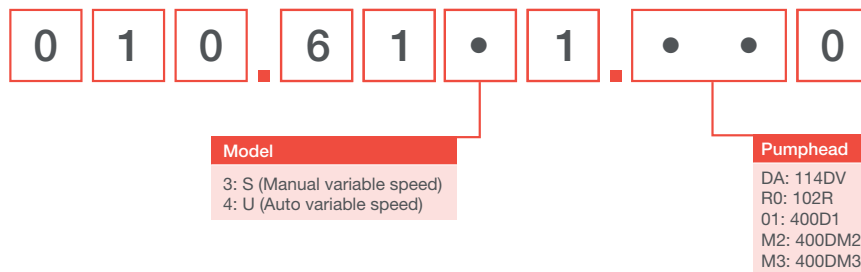
Pumphead					
Component	102R	114DV	400D1	400DM2	400DM3
Pumphead track	Acetal copolymer, Kematal	Stainless steel	Aluminium (anodised)		
Pumphead guard	Polycarbonate	NA	NA	Polyethylene (PETG)	
Pumphead housing	NA	IXEF PEI, Grilamid PA12	NA		
Rotor	IXEF (Polyarylamide)	IXEF PEI	Aluminium (anodised)		
Rollers	MOS2 filled Nylon 6 (nylatron)	PTFE filled PBT	Acetal		
Spindles guide pins	Stainless steel	NA	Stainless steel		
Bearings	NA	Stainless steel	NA		
Shaft					
Springs					

ORDER CONFIGURATOR 120F: Fixed speed pump



Note: All models are IP31 / NEMA 2

ORDER CONFIGURATOR 120S and 120U



ORDER INFORMATION Pumpheads and Tubing

Pumphead product codes		
Model	Description	Product code
114DV	114DV pumphead	013.5000.00A
102R	102R single channel pumphead (8mm shaft)	013.7101.000
400D1	400D1 pumphead kit, 1 channel	043.001D.D1C
400DM2	400DM2 pumphead kit, 2 channel	043.001D.D2C
400DM3	400DM3 pumphead kit, 3 channel	043.001D.D3C
120 PSU	120V PSU kit 1A	MN2634B

Notes:

The pumpheads can only be sold as 120 replacement heads

The pumpheads are not interchangeable between drive models as they use different shaft designs

Tubing 1.6mm wall thickness for 102R					
	0.5mm	0.8mm	1.6mm	3.2mm	4.8mm
Pumpsil	913.A005.016	913.A008.016	913.A016.016	913.A032.016	913.A048.016

Tubing 1.6mm wall thickness for 114DV							
	0.5mm	0.8mm	1.6mm	2.4mm	3.2mm	4.0mm	4.8mm
Bioprene	933.0005.016	933.0008.016	933.0016.016	933.0024.016	933.0032.016	933.0040.016	933.0048.016
Pumpsil (Silicone)	913.A005.016	913.A008.016	913.A016.016	913.A024.016	913.A032.016		913.A048.016
STA-PURE® Series PCS			961.0016.016		961.0032.016		961.0048.016
Marprene	902.0005.016	902.0008.016	902.0016.016	902.0024.016	902.0032.016	902.0040.016	902.0048.016
STA-PURE® Series PFL			966.0016.016		966.0032.016		966.0048.016

Tubing 1.6mm wall thickness for 400D1						
	0.5mm	0.8mm	1.6mm	2.4mm	3.2mm	4.0mm
Bioprene	933.0005.016	933.0008.016	933.0016.016	933.0024.016	933.0032.016	
Pumpsil (Silicone)	913.A005.016	913.A008.016	913.A016.016	913.A024.016	913.A032.016	
STA-PURE® Series PCS			961.0016.016		961.0032.016	
Marprene	902.0005.016	902.0008.016	902.0016.016	902.0024.016	902.0032.016	902.0040.016
STA-PURE® Series PFL			966.0016.016		966.0032.016	
PVC			950.0016.016		950.0032.016	
Neoprene		920.0008.016	920.0016.016		920.0032.016	

Tubing for 400DM2 and 400DM3 pumpheads				
colour code	Bore (mm)	Pharmed® BPT	Tygon® E3603	Tygon® E-LFL
orange/black	0.13		981.A013.072	
orange/blue	0.25	979.A025.072	981.A025.072	988.A025.072
orange/green	0.38	979.A038.072	981.A038.072	988.A038.072
green/yellow	0.44		981.A044.072	
orange/yellow	0.51	979.A051.072	981.A051.072	988.A051.072
white/yellow	0.57		981.A057.072	
orange/white	0.64	979.A064.072	981.A064.072	988.A064.072
black/black	0.76	979.A076.072	981.A076.072	988.A076.072
orange/orange	0.89	979.A089.072	981.A089.072	988.A089.072
white/black	0.95		981.A095.072	
white/white	1.02	979.A102.072	981.A102.072	988.A102.072
white/red	1.09		981.A109.072	
red/red	1.14	979.A114.072	981.A114.072	988.A114.072
red/grey	1.22		981.A122.072	
grey/grey	1.30		981.A130.072	988.A130.072
yellow/yellow	1.42	979.A142.072	981.A142.072	988.A142.072
yellow/blue	1.52	979.A152.072	981.A152.072	988.A152.072
blue/blue	1.65	979.A165.072	981.A165.072	988.A165.072
blue/green	1.75		981.A175.072	
green/green	1.85	979.A185.072	981.A185.072	988.A185.072
purple/purple	2.06	979.A206.072	981.A206.072	988.A206.072
purple/black	2.29	979.A229.072	981.A229.072	988.A229.072
purple/orange	2.54	979.A254.072	981.A254.072	988.A254.072
purple/white	2.79	979.A279.072	981.A279.072	988.A279.072

All flow rates shown were obtained pumping water at 20C (68F) with zero suction and delivery heads. Disclaimer: 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. It is the users responsibility to ensure product suitability for use within their application. Watson-Marlow, qdos, ReNu, LoadSure, Bioprene, Pumpsil and Marprene are trademarks of Watson-Marlow Limited. GORE and STA-PURE are registered trademarks of W.L. Gore and Associates. Pharmed®, Tygon® and Tygon LFL® are registered trademarks of Saint-Gobain. Please state the product code when ordering pumps and tubing.



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