

300 SERIES OEM SYSTEMS

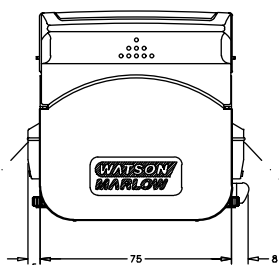
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Custom-Tailored Designs

Features

Simple, ingenious tube loading - slide open the track to expose the rotor, load the tubing, slide the track down and the tubing is clamped and stretched as the track clicks shut. It takes longer to describe than to do!

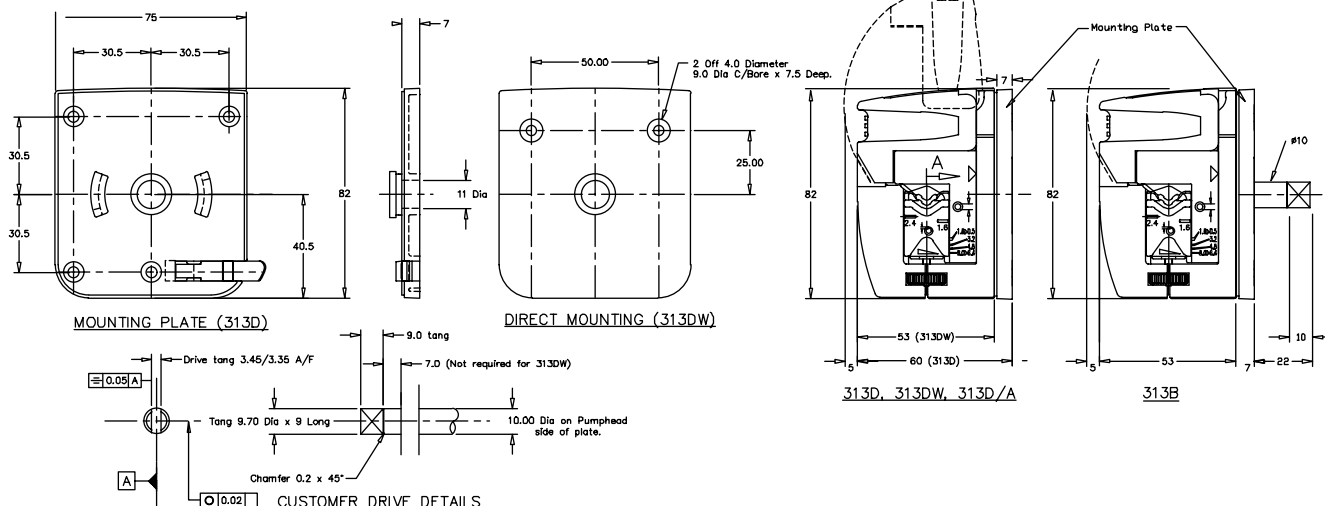


Designed around the 313D flip-top pumphead, these OEM pumps provides high quality single channel pumps, with a choice of AC, DC and brushless DC drive units, and controls. The pumps provide flow rates up to 2 liters per minute (3 liters per minute for intermittent use).

Standard Features/Options of 313D and 314D pumpheads

- 313 has 3 rollers for maximum flows. 314 has 4 rollers for minimum pulsation. Both accept 1.6 mm wall thickness tubing from 0.5 mm to 8 mm bore.
- 313 and 314 pumpheads can be also be ordered with dedicated tube clamps for 0.5 - 1.6 mm, 3.2 mm, 4.8 mm and 6.4 - 8.0 mm bore tubing.
- 313D and 314D with bayonet mounting plate and adjustable clamps. Fits Watson-Marlow Bredel OEM drives.
- 313D/A and 314D/A with bayonet mounting plate, bayonet adapter and adjustable clamps. Fits cased drives.
- 313X and 314X extension pumpheads.
- 313DW and 314DW as 313D and 314D with adjustable clamps but without the bayonet mounting plate. Will fit customer faceplate. Cannot be removed by end-user.
- 313B and 314B bare-shaft versions with bayonet plate and adjustable clamps.
- 313BW and 314BW as 313B and 314B with adjustable clamps but without bayonet mounting plate. Lower cost option.
- For higher pressure applications order 2.4 mm wall tubing versions by adding "2" suffix 313D2 or 313X2.
- Available as pumphead or as a complete assembly.
- AC, DC and brushless DC motor drives are available.

The 313 pump range has hundreds of standard options to choose from. We can also do custom colors, tube sizes and drives. We can also create new products custom-tailored to your unique requirements, such as the tube element version shown at top left. Contact one of our sales engineers for more information on custom products.



313 rapid load pumpheads, three rollers



These pumpheads are fast loading, handle tube sizes with 1.6 mm wall thickness from 0.5 mm to 8.0 mm bore and extension pumpheads can be snapped on up to the power limit of the drive. 313 pumpheads have three Nylatron rollers running in a triangular rotor and are suitable for continuous use up to a speed of 400 rpm, giving flow rates up to 2000 ml/min, or intermittently up to 600 rpm, giving flow rates up to 3000 ml/min.

The 313 range of pumpheads includes the 313D pumphead for mounting on either Watson-Marlow 300 series OEM drives or users' own drive shaft arrangement, the 313B bare shaft pumphead for drives with a flexible coupling, and the 313X extension pumphead for use with the 313D.

The 313D pumpheads accept up to five extension pumpheads for multi-channel installations, depending on the power limit of the drive. A mounting plate which must be incorporated into the installation, is supplied with 313B and 313D pumpheads. Extension pumpheads snap fit directly behind 313D pumpheads.

A pumphead is available that will accept 2.4 mm wall tube, for applications that will benefit from using a thicker wall tube. To order a 313 pumphead for 2.4 mm wall thickness tubing, add suffix "2" - 313D2.

The ordering information below shows the full range of 313 pumpheads as detailed on page 7.

Ordering information

Three roller 1.6 mm wall thickness tubing

Clamp setting	313D	313X	313B	313XB	313DW	313BW
Variable	033.3411.000	033.3431.000	033.3421.000	033.3441.000	033.3451.000	033.3461.000
0.5 - 1.6	033.3411.00c	033.3431.00c	033.3421.00c	033.3441.00c	033.3451.00c	033.3461.00c
3.2	033.3411.00f	033.3431.00f	033.3421.00f	033.3441.00f	033.3451.00f	033.3461.00f
4.8	033.3411.00k	033.3431.00k	033.3421.00k	033.3441.00k	033.3451.00k	033.3461.00k
6.4 - 8.0	033.3411.00n	033.3431.00n	033.3421.00n	033.3441.00n	033.3451.00n	033.3461.00n

Three roller 2.4 mm wall thickness tubing

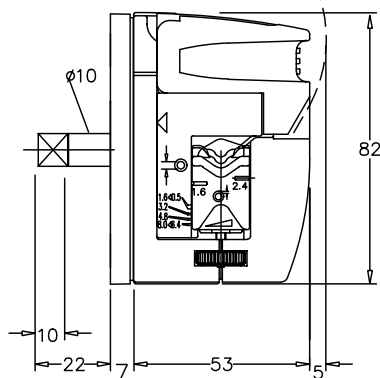
Clamp setting	313D2	313X2	313B2	313XB2	313DW2	313BW2
Variable	033.3511.000	033.3531.000	033.3521.000	033.3541.000	033.3551.000	033.3561.000
0.5 - 1.6	033.3511.00c	033.3531.00c	033.3521.00c	033.3541.00c	033.3551.00c	033.3561.00c
3.2	033.3511.00f	033.3531.00f	033.3521.00f	033.3541.00f	033.3551.00f	033.3561.00f
4.8	033.3511.00k	033.3531.00k	033.3521.00k	033.3541.00k	033.3551.00k	033.3561.00k
6.4	033.3511.00n	033.3531.00n	033.3521.00n	033.3541.00n	033.3551.00n	033.3561.00n

Flow rates

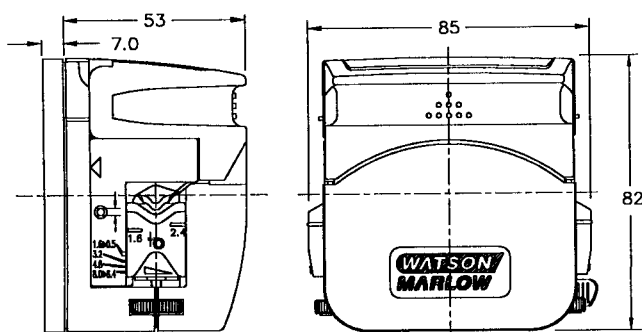
	1.6mm (1/16") wall tubing						
Bore mm	0.5	0.8	1.6	3.2	4.8	6.4	8.0
Bore "	1/50	1/32	1/16	1/8	1/16	1/4	5/16
Flow rate: ml/revolution	0.03	0.06	0.26	1.0	2.2	3.6	5.0
Maximum continuous flow: ml/min	12	24	104	400	880	1400	2000
Maximum intermittent flow: ml/min	18	36	156	600	1320	2160	3000

For tube selections, see Table A on page 48.

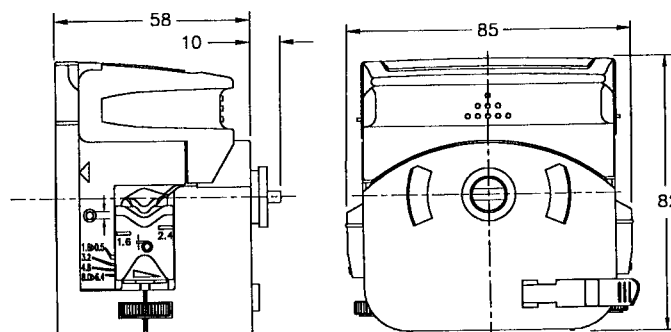
313B BARESHAFT PUMPHEAD



314D PUMPHEAD



314X EXTENSION PUMPHEAD





Materials of construction

Body rear	<i>Glass filled polypropylene</i>
Body front, body front extension, mounting plate, track and lever	<i>IXEF</i>
Rotor, tube clamps and mounting plate locking tab	<i>Glass filled Nylon</i>
Rollers	<i>MoS2 filled Nylon 6 (Nylatron)</i>
Spindles	<i>Electroless nickel plated, hardened steel</i>
Screws	<i>Stainless steel</i>
Sealed bearings	<i>Carbon steel</i>

Specifications

	1.6mm (1/16") wall tubing						
	0.5	0.8	1.6	3.2	4.8	6.4	8.0
Bore mm	1/50	1/32	1/16	1/8	3/16	1/4	5/16
Bore "							
Maximum continuous speed: rpm	400	400	400	400	400	400	400
Maximum intermittent speed: rpm	600	600	600	600	600	600	600
With Marprene tubing							
Required torque up to 0.5 bar: kgcm	1.4	1.4	2.0	2.8	4.2	4.8	6.3
Required torque up to 2.0 bar: kgcm	1.5	1.5	2.1	4.0	6.1	6.8	7.8
Maximum continuous pressure: bar	2	2	2	2	1.3	1.3	1.3
Maximum intermittent pressure: bar	3	3	3	2.5	2	2	1.7
With Silicone tubing							
Required torque up to 0.5 bar: kgcm	1.1	1.1	1.7	2.3	2.9	3.5	4.0
Required torque up to 2.0 bar: kgcm	1.5	1.5	2.1	3.2	4.3	5.2	6.7
Maximum continuous pressure: bar	2	2	1.5	1.5	1	1	1
Maximum intermittent pressure: bar	2.5	2.5	2	2	1.3	1.3	1.3

Performance against pressure

Conditions:

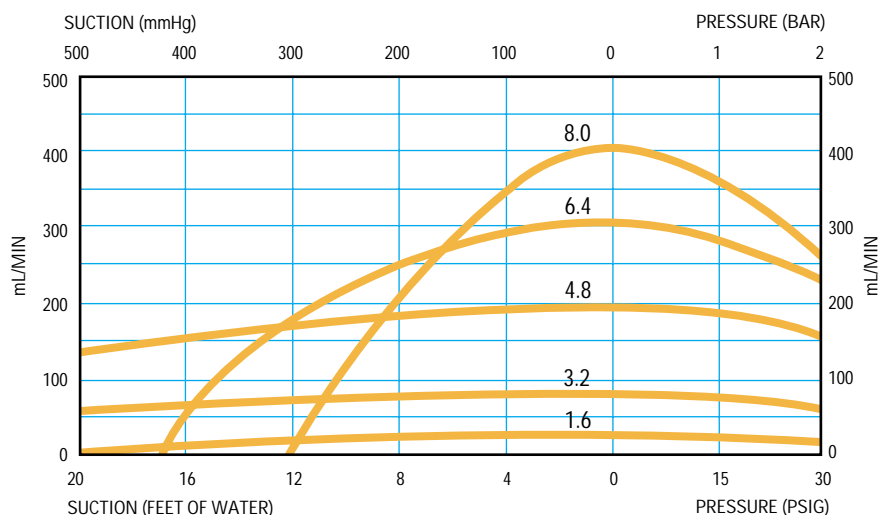
- Suction curves obtained with zero output pressure.
- Pressure curves obtained with zero lift.
- Pumphead speed 100 rpm.

Conversion Factors:

Suction pressure in Bar x 747.7 = mm Hg

Suction pressure in Bar x 33.5 = Ft H₂O

Back pressure in Bar x 14.5 = psi



314 rapid load pumpheads, four rollers



With the same bayonet mounting system, 314 pumpheads may be interchanged with the 313 pumpheads or specified as an alternative head when ordering 300 series OEM pumps. Their four roller design gives higher precision and less pulsation and is suitable for continuous use up to 300 rpm giving flow rates up to 1200 ml/min (intermittent use up to 600 rpm giving flow rates up to 2400 ml/min).

The 314 range of pumpheads includes the 314D pumphead for mounting on either Watson-Marlow 300 series OEM drives or users' own drives having the same drive shaft arrangement, the 314B bare shaft pumphead for drives with a flexible coupling and the 314X extension pumphead for use with the 314D.

The 314D and 314B pumpheads accept up to five extension pumpheads for multi-channel installations depending on the power limit of the drive. A mounting plate which must be incorporated into the installation, is supplied with 314B and 314D pumpheads. Extension pumpheads snap fit directly behind 314D pumpheads. To use 2.4 mm wall thickness tubing, please add the suffix "2" - 314D2

The ordering information below shows the full range of 314 pumpheads as detailed on page 7.

Ordering information

Four roller 1.6 mm wall thickness tubing

Clamp setting	314D	314X	314B	314XB	314DW	314BW
Variable	033.4411.000	033.4431.000	033.4421.000	033.4441.000	033.4451.000	033.4461.000
0.5 - 1.6	033.4411.00c	033.4431.00c	033.4421.00c	033.4441.00c	033.4451.00c	033.4461.00c
3.2	033.4411.00f	033.4431.00f	033.4421.00f	033.4441.00f	033.4451.00f	033.4461.00f
4.8	033.4411.00k	033.4431.00k	033.4421.00k	033.4441.00k	033.4451.00k	033.4461.00k
6.4 - 8.0	033.4411.00n	033.4431.00n	033.4421.00n	033.4441.00n	033.4451.00n	033.4461.00n

Four roller 2.4 mm wall thickness tubing

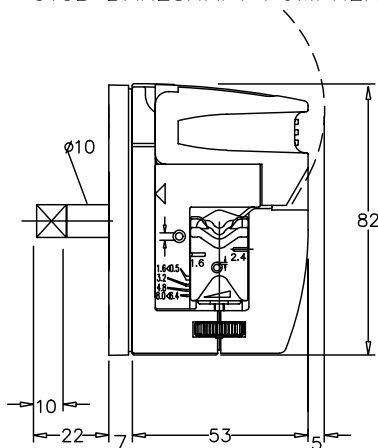
Clamp setting	314D2	314X2	314B2	314XB2	314DW2	314BW2
Variable	033.4511.000	033.4531.000	033.4521.000	033.4541.000	033.4551.000	033.4561.000
0.5 - 1.6	033.4511.00c	033.4531.00c	033.4521.00c	033.4541.00c	033.4551.00c	033.4561.00c
3.2	033.4511.00f	033.4531.00f	033.4521.00f	033.4541.00f	033.4551.00f	033.4561.00f
4.8	033.4511.00k	033.4531.00k	033.4521.00k	033.4541.00k	033.4551.00k	033.4561.00k
6.4	033.4511.00n	033.4531.00n	033.4521.00n	033.4541.00n	033.4551.00n	033.4561.00n

Flow rates

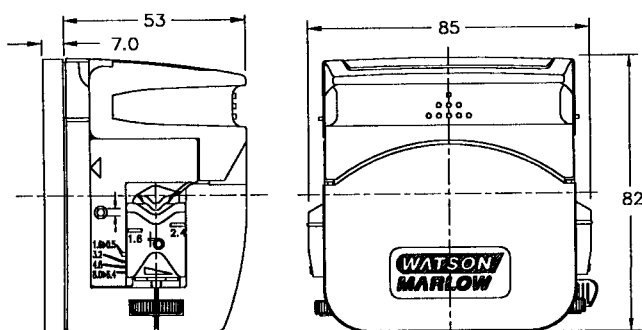
Bore mm Bore "	1.6mm (1/16") wall tubing						
	0.5	0.8	1.6	3.2	4.8	6.4	8.0
	1/50	1/32	1/16	1/8	3/16	1/4	5/16
Flow rate: ml/revolution	0.03	0.06	0.25	0.85	1.9	3.0	4.0
Maximum continuous flow: ml/min	9	18	75	255	570	900	1200
Maximum intermittent flow: ml/min	18	36	150	510	1140	1800	2400

For tube selections, see Tables A and B on page 48.

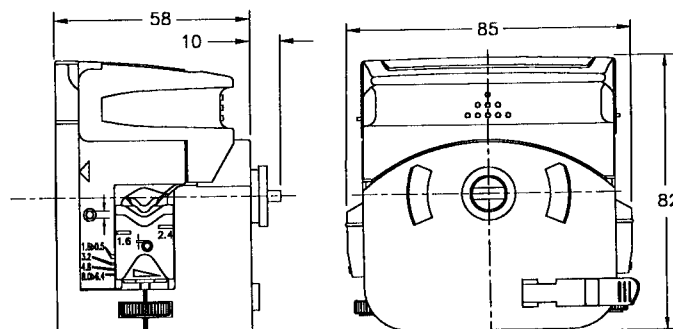
313B BARESHAFT PUMPHEAD



314D PUMPHEAD



314X EXTENSION PUMPHEAD





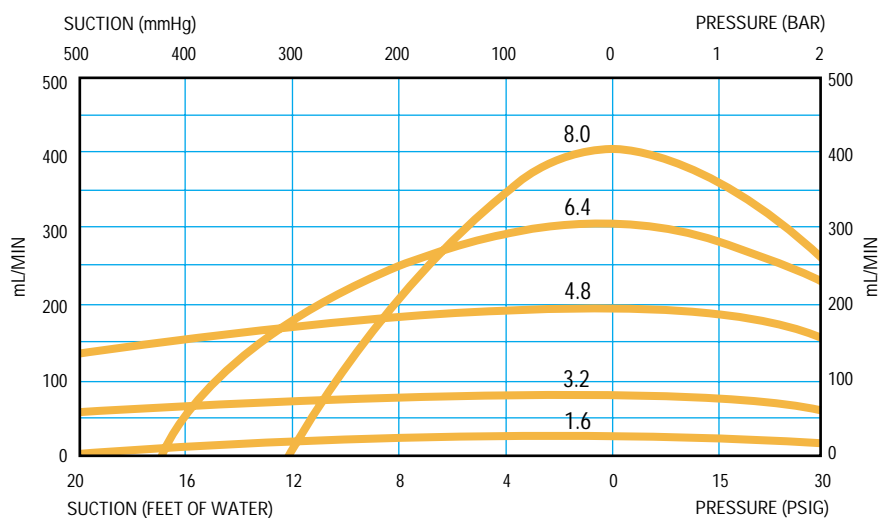
Materials of construction

Body rear	Glass filled polypropylene
Body front, body front extension, mounting plate, track and lever	IXEF
Rotor, tube clamps and mounting plate locking tab	Glass filled Nylon
Rollers	MoS2 filled Nylon 6 (Nylatron)
Spindles	Electroless nickel plated, hardened steel
Screws	Stainless steel
Sealed bearings	Carbon steel

Specifications

	1.6mm (1/16") wall thickness tubing						
Bore mm	0.5	0.8	1.6	3.2	4.8	6.4	8.0
Bore "	1/50	1/32	1/16	1/8	3/16	1/4	5/16
Maximum continuous speed: rpm	400	400	400	400	400	400	400
Maximum intermittent speed: rpm	600	600	600	600	600	600	600
With Marprene tubing							
Required torque up to 0.5 bar: kgcm	1.4	1.4	2.0	2.8	4.2	4.8	6.3
Required torque up to 2.0 bar: kgcm	1.5	1.5	2.1	4.0	6.1	6.8	7.8
Maximum continuous pressure: bar	2	2	2	2	1.3	1.3	1.3
Maximum intermittent pressure: bar	3	3	3	2.5	2	2	1.7
With Silicone tubing							
Required torque up to 0.5 bar: kgcm	1.1	1.1	1.7	2.3	2.9	3.5	4.0
Required torque up to 2.0 bar: kgcm	1.5	1.5	2.1	3.2	4.3	5.2	6.7
Maximum continuous pressure: bar	2	2	1.5	1.5	1	1	1
Maximum intermittent pressure: bar	2.5	2.5	2	2	1.3	1.3	1.3

Performance against pressure

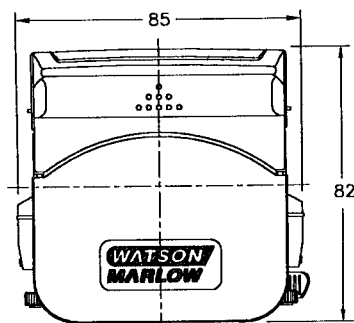


Conditions:

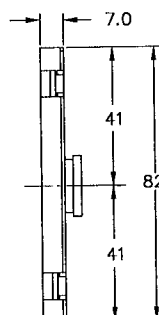
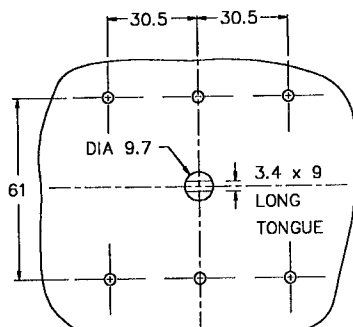
- Suction curves obtained with zero output pressure.
- Pressure curves obtained with zero lift.
- Pumphead speed 100 rpm

Conversion Factors:

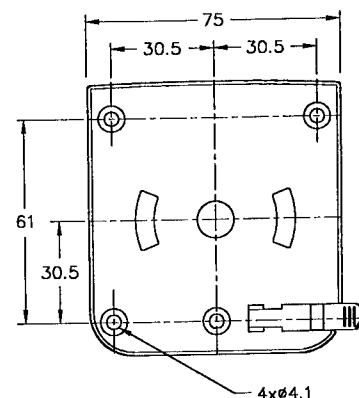
- Suction pressure in Bar x 747.7 = mm Hg
- Suction pressure in Bar x 33.5 = Ft H₂O
- Back pressure in Bar x 14.5 = psi



CUSTOMER DRIVE DETAILS



MOUNTING PLATE



313FDP/D fixed/variable speed DC pump, precision motors



The 313FDP/D uses our highest quality DC motor, offering precise speed adjustment, low electrical and audible noise, and a long operating life.

The 313FDP/D OEM pump is made up of a single channel 313D pumphead, a powerful 12 or 24 volt DC motor-gearbox, mounted on an aluminum faceplate. The coreless DC motors provide high torque output, and speed in a small case size. When fitted with 8.0 mm x 1.6 mm tubing, these pumps provide flow rates of up to 1250 ml/min. Snap-on the 313X extension pumpheads to enable multi-channel pumping, depending on the torque limit of the drive. When used with the 400 series OEM speed control board the 313FDP/D provides a variable speed pumping system with a speed control ratio of 20 to 1, as well as stop/start and direction facilities, and analog control of speed. See page 37 for speed controls.

Ordering information

12V DC		24V DC		Power Consumption
50rpm	030.0301.000	50rpm	030.0701.000	5 Watt
100rpm	030.0121.000	100rpm	030.0721.000	30 Watt
250rpm	030.0141.000	250rpm	030.0741.000	30 Watt

Specifications

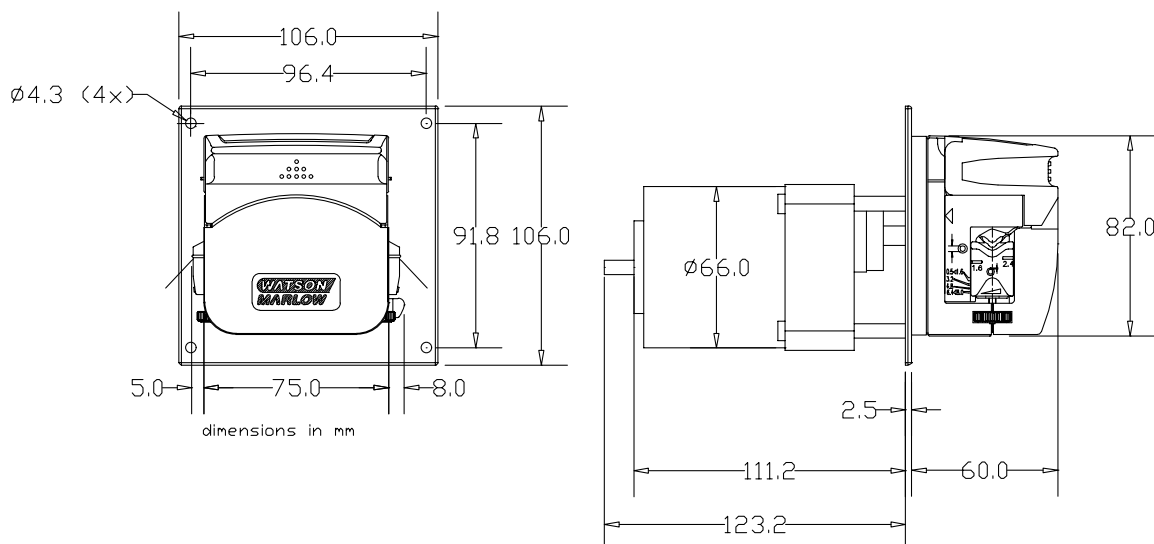
Motor type	12 or 24V DC
Motor torque output	50rpm 11kgcm 100rpm 14kgcm 250rpm 6kgcm
Weight	4.4lbs (2kg)

Flow rates

rpm	1.6mm (1/16") wall thickness tubing						
	0.5mm 1/50"	0.8mm 1/32"	1.6mm 1/16"	3.2mm 1/8"	4.8mm 3/16"	6.4mm 1/4"	8.0mm 5/16"
50	1.50	3.00	13.0	50.0	110	180	250
100	3.00	6.00	26.0	100	220	360	500
250	7.50	15.0	65.0	250	550	900	1250

Minimum flows are 10% of rates given with OEM speed control board

For tube selections, see Tables A and B on page 48.



313VDL/D variable speed pumps with brushless DC motor



The 313VDL/D uses a high quality brushless DC motor that provides precise speed adjustment, and low electrical and audible noise. Brushless DC motors have an extremely long service life because they have no internal wearing components. The 313VDL/D OEM pump is made up of a single channel 313D pumphead, a powerful 24V brushless DC gearmotor with built in controller, mounted on an aluminum faceplate. When fitted with 8.0 mm x 1.6 mm tubing, these pumps provide flow rates of up to 1750 ml/min. Snap-on the 313X extension pumpheads to enable multi-channel pumping, depending on the torque limit of the drive. The built in controller allows control of speed, stop/start, direction, and a frequency tacho output.

Ordering information

	24V DC Brushless
100rpm	030.0521.000
350rpm	030.0561.000

For tube selections, see Tables A and B on inside back cover.

Specification Motor

Motor type	24 Volt Brushless DC with Built in Controller
Motor torque output	100rpm, 7.3kg cm 350rpm, 21.0kg-cm
Power consumption	35VA
Weight	2.2 lbs (1.0 kg)

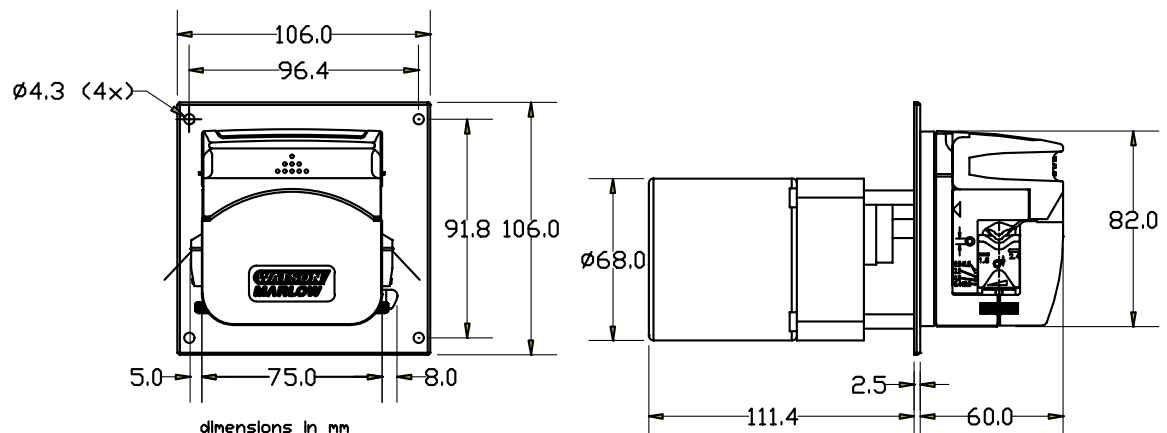
Motor/Controller Connections

Lead no.	Lead Color	Function	Descriptions
1	brown	FW/RV	Direction control input: 'High' CW, 'Low' CC (shaft side)
2	white	Vin	Input voltage (set-point) for speed loop. Resulting speed approx. 1000 rpm/V Vin < 4V: motor at full speed, speed loop off (open loop)
3	green	FG	Frequency generator output, 36 ppr; Rout = 4kOhm (approx.)
4	black	GND	Motor return, ground (0v)
5	red	Vp	Motor supply voltage +24V (min 14V – Max 30V)
6	bare	shield	Shield for cable and connection to motor housing

Flow rates (ml/min)

	1.6mm (1/16") wall tubing						
	0.5mm 1/50"	0.8mm 1/32"	1.6mm 1/16"	3.2mm 1/32"	4.8mm 3/16"	6.4mm 1/16"	8.0mm 5/16"
100	3.00	6.00	26.0	100	220	360	500
350	10.5	21.0	91.0	350	770	1260	1750

For tube selections, see Tables A and B on page 48.



313FD/D fixed/variable speed DC pump



Made up of one 313D pumphead, a 12 or 24V DC motor, gearbox, and a faceplate, these pumps provide flow rates up to 500 ml/min from 8.0 mm bore tubing. Additionally, snap-on the 313X extension pumpheads to enable multi-channel pumping, depending on the torque limit of the drive (see page 18 for details of pumphead torque figures). The six drives available give a choice of speeds and voltages.

When used with the 300 series OEM speed control board 039.2021.000, the 12V 313FD/D provides a variable speed pumping system with a speed control ratio of 10 to 1 and stop/start facilities.

Ordering information

12V DC		24V DC	
10rpm	030.7002.000	10rpm	030.7502.000
50rpm	030.7022.000	50rpm	030.7522.000
100rpm	030.7062.000	100rpm	030.7562.000

Specifications

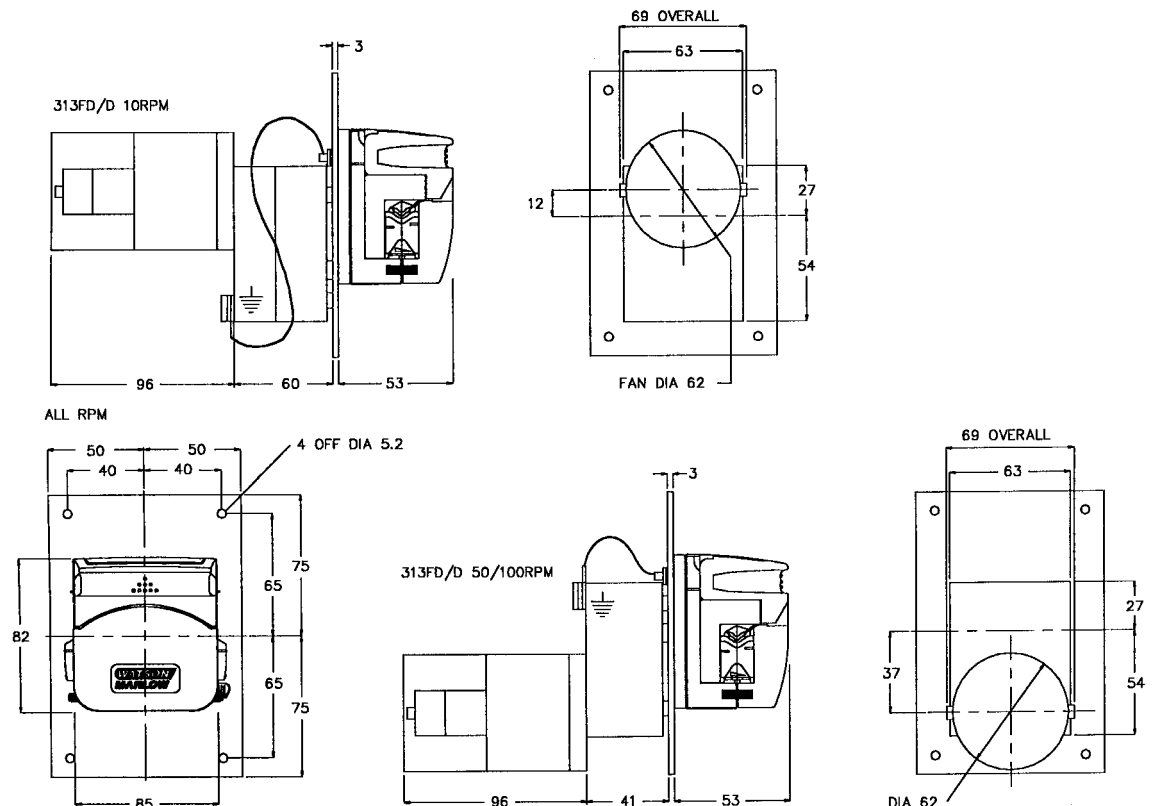
Motor type	12 or 24V DC
Motor torque output	10rpm 24kgcm; 50rpm 11kgcm; 100rpm 6kgcm
Power consumption	17VA
Weight	2kg
Brush life	2500 hours

Flow rates

rpm	1.6mm (1/16") wall thickness tubing						
	0.5mm 1/50"	0.8mm 1/32"	1.6mm 1/16"	3.2mm 1/8"	4.8mm 3/16"	6.4mm 1/4"	8.0mm 5/16"
10	0.30	0.70	2.70	10.0	22.0	36.0	50.0
50	1.50	3.50	14.0	50.0	110	180	250
100	3.00	7.00	27.0	100	220	360	500

Minimum flows are 10% of rates given with OEM speed control board

For tube selections, see Tables A and B on page 48.



313FDC/D fixed speed 12V DC pump



The 313FDC/D oem pump is made up of one 313D pumphead, a 12V DC motor, the Watson-Marlow gearbox, and a faceplate. These pumps are available for applications that require more torque than is available from the 313FD/D, providing flow rates up to 1100 ml/min for continuous use from 8.0mm bore tubing.

Additionally, snap on 313X extension pumpheads for multi-channel pumping depending on the torque limit of the drive (see pumphead torque figures on page 18).

Ordering information

12V DC 220rpm

030.8931.000

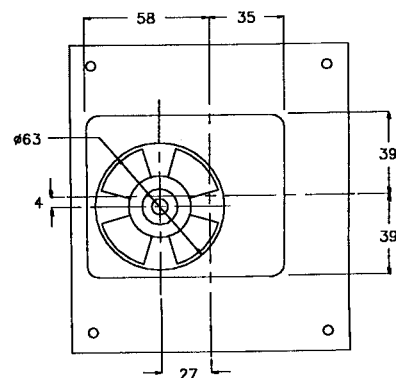
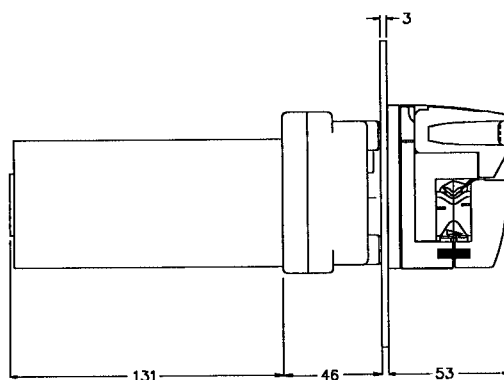
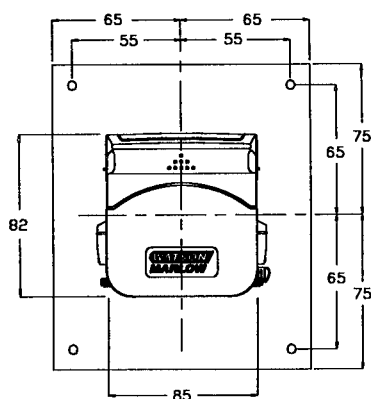
Specifications

Motor type	12V DC
Motor torque output	14kgcm
Motor consumption	35VA
Weight	2.2kg
Brush life	2500 hours

Flow rates

rpm	1.6mm (1/16") wall thickness tubing						
	0.5mm 1/50"	0.8mm 1/32"	1.6mm 1/16"	3.2mm 1/8"	4.8mm 3/16"	6.4mm 1/16"	8.0mm 5/16"
220	6.60	15.4	60.0	220	484	792	1100

For tube selections, see Tables A and B on page 48.



313FAC/D fixed speed AC pump



The 313FAC/D which is made up of one 313D pumphead, an induction motor, Watson-Marlow's purpose designed gearbox, and a faceplate. It is available in three standard voltages with a choice of four speeds providing flow rates up to 1620 ml/min from 8.0 mm bore tubing (1350 ml/min if used on 50 Hz supplies).

Snap-on up to five 313X extension pumpheads for multi-channel pumping depending on the torque limit of the drive (see pumphead torque figures on page 18).

Ordering information

	220V AC	100-120V AC	240V AC
33/40rpm 50/60Hz	030.8803.000	030.8802.000	030.8812.000
67/80rpm 50/60Hz	030.8823.000	030.8822.000	030.8832.000
135/162rpm 50/60Hz	030.8843.000	030.8842.000	030.8852.000
270/324rpm 50/60Hz	030.8863.000	030.8862.000	030.8872.000

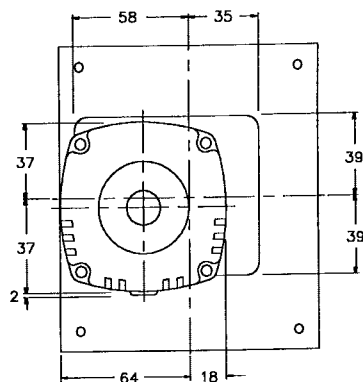
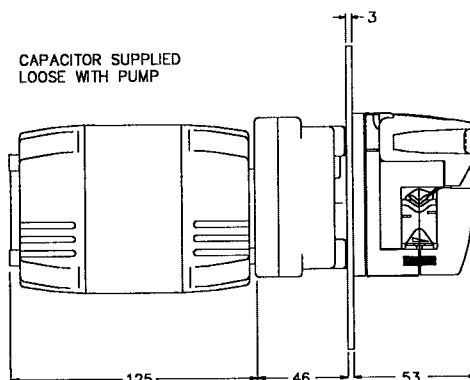
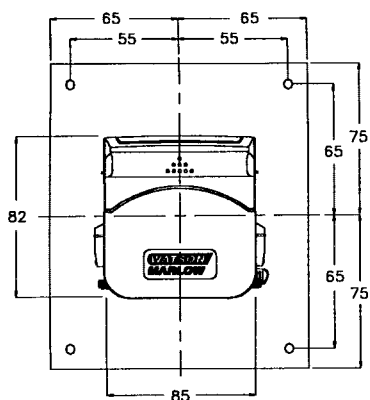
Specification

Motor type	Induction
Motor torque output	33/67rpm 20kgcm 40/80rpm 16kgcm 135/270rpm 10kgcm 162/324rpm 8kgcm
Power consumption	50VA
Weight	2.5kg

Flow rates

		1.6mm (1/16") wall thickness tubing						
		0.5mm	0.8mm	1.6mm	3.2mm	4.8mm	6.4mm	8.0mm
Hz	rpm	1/50"	1/32"	1/16"	1/8"	3/16"	1/4"	5/16"
50	33	1.00	2.00	8.6	33.0	72.6	119	165
	67	2.00	4.00	17.4	67.0	147	241	335
	135	4.00	8.00	35.0	135	297	486	675
	270	8.00	16.0	70.0	270	594	972	1350
60	40	1.20	2.40	10.4	40.0	88.0	144	200
	80	2.40	4.80	20.8	80.0	176	288	400
	162	4.80	9.70	42.1	162	356	583	810
	324	9.70	19.4	84.2	324	712	1166	1620

For tube selections, see Tables A and B on page 48.



313FC/D fixed speed AC Pump



Made up of one 313D pumphead, a shaded pole motor, gearbox, and a faceplate, these pumps provide flow rates up to 500 ml/min from 8.0 mm bore tubing. The motor is rated for continuous duty making this pump ideal for both dosing and transfer duties. Extension pumpheads may be snapped on for multi-channel pumping depending on the torque limit of the drive (see pumphead torque figures on page 18). With a choice of speeds and voltages, the 313FC/D provides a low cost OEM pumping system. The 313FC/D is supplied with a motor cooling fan. U.L. listed motors are available upon request.

Ordering information

	220-240V AC	100-120V AC
10rpm 50Hz	030.6032.000	030.6002.000
50rpm 50Hz	030.6232.000	030.6202.000
100rpm 50Hz	030.6632.000	030.6602.000

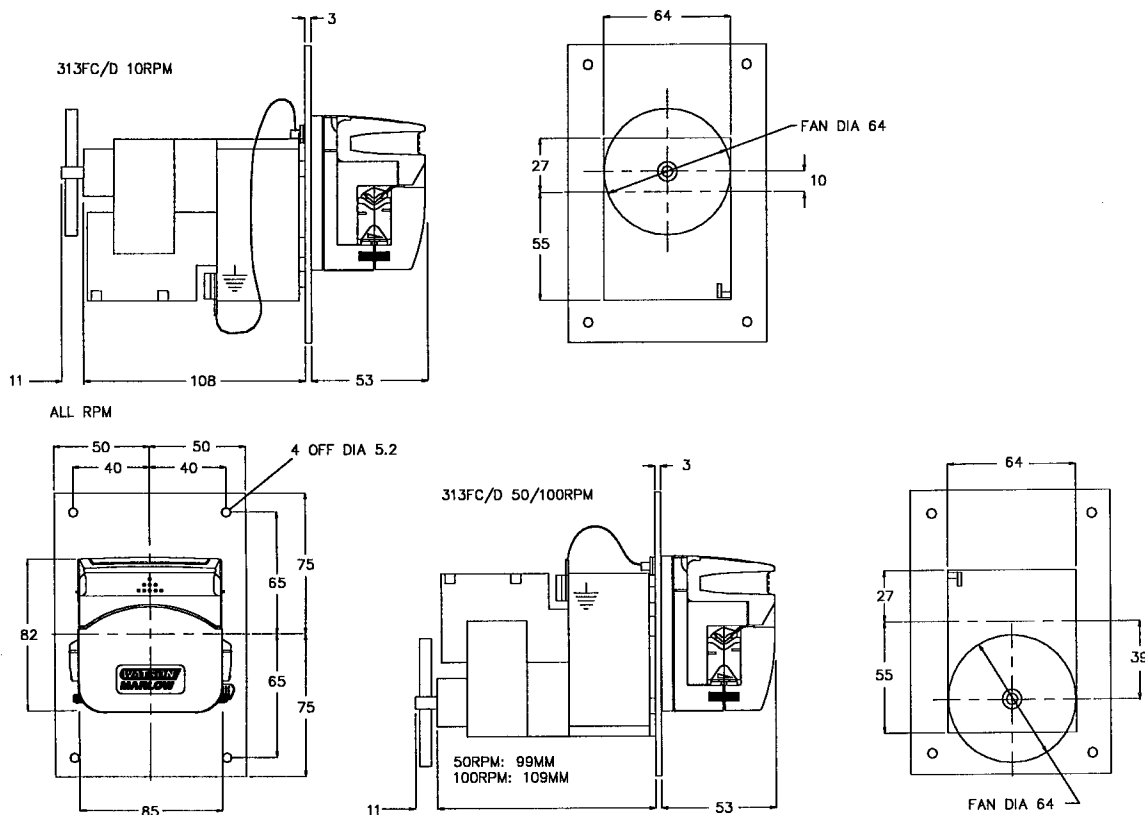
Specifications

Motor type	Shaded pole induction
Motor torque output	10rpm 19.5kgcm; 50rpm 7.5kgcm; 100rpm 6.5kgcm
Power consumption	10rpm 21VA; 50, 100rpm 40VA
Weight	2.2kg

Flow rates

		1.6mm (1/16") wall thickness tubing						
HZ	rpm	0.5mm 1/50"	0.8mm 1/32"	1.6mm 1/16"	3.2mm 1/8"	4.8mm 3/16"	6.4mm 1/16"	8.0mm 5/16"
50	10	0.30	0.70	2.70	10.0	22.0	36.0	50.0
	50	1.50	3.50	14.0	50.0	110	180	250
	100	3.00	7.00	27.0	100	220	360	500
60	12	0.40	0.80	3.20	12.0	26.0	43.0	60.0
	60	1.80	4.20	16.0	60.0	132	216	300
	115	2.90	6.70	26.0	96.0	211	346	480

For tube selections, see Tables A and B on page 48.



313/314 maximum number of pumpheads permissible



Permissible pumpheads

Maximum number of gangable 313/314 pumpheads using Marprene tubing

Pressure limits		Up to 0.5 bar								Up to 2 bar							
Tube	mm	0.5	0.8	1.6	3.2	4.8	6.4	8.0		0.5	0.8	1.6	3.2	4.8	6.4	8.0	
bore	"	1/50	1/32	1/16	1/8	3/16	1/4	5/16		1/50	1/32	1/16	1/8	3/16	1/4	5/16	
313FAC	33/67rpm	6	6	6	6	4	4	3		6	6	6	5	3	2	2	
	40/80rpm	6	6	6	5	3	3	2		6	6	6	4	2	2	2	
	135/270rpm	6	6	5	3	2	2	1		6	6	4	2	1	1	1	
	162/324rpm	5	5	4	2	1	1	1		5	5	3	2	1	1	1	
313FDC	220rpm	6	6	6	5	3	2	2		6	6	6	3	2	2	1	
313FC	10rpm	6	6	6	6	4	4	3		6	6	6	4	3	2	2	
	50rpm	5	5	3	2	1	1	1		5	5	3	1	1	1	0	
	100rpm	4	4	3	2	1	1	1		4	4	3	1	1	0	0	
313FD	10rpm	6	6	6	6	5	5	3		6	6	6	6	3	3	3	
	50rpm	6	6	5	3	2	2	1		6	6	5	2	1	1	1	
	100rpm	4	4	3	2	1	1	0		4	4	2	1	0	0	0	
313FDP	50rpm	6	6	4	3	2	1	1		6	6	4	2	1	1	1	
	100rpm	6	6	6	3	2	2	2		6	6	5	2	1	1	1	
	250rpm	3	3	2	1	1	1	1		3	3	2	1	0	0	0	
313FBD	100rpm	6	6	6	6	5	4	3		6	6	6	5	3	3	2	
	350rpm	4	4	4	2	1	1	1		4	4	3	1	1	1	0	

Maximum number of gangable 313/314 pumpheads using Silicone tubing

Pressure limits		Up to 0.5 bar								Up to 2 bar							
Tube	mm	0.5	0.8	1.6	3.2	4.8	6.4	8.0		0.5	0.8	1.6	3.2	4.8	6.4	8.0	
bore	"	1/50	1/32	1/16	1/8	3/16	1/4	5/16		1/50	1/32	1/16	1/8	3/16	1/4	5/16	
313FAC	33/67rpm	6	6	6	6	6	5	4		6	6	6	6	4	3	2	
	40/80rpm	6	6	6	6	5	4	4		6	6	6	5	3	3	2	
	135/270rpm	6	6	5	4	3	2	2		6	6	5	3	2	1	1	
	162/324rpm	6	6	4	3	2	2	2		5	5	3	2	1	1	1	
313FDC	220rpm	6	6	6	6	5	4	3		6	6	6	4	4	2	2	
313FC	10rpm	6	6	6	6	6	5	4		6	6	6	6	4	3	2	
	50rpm	6	6	4	3	2	2	1		5	5	3	2	1	1	1	
	100rpm	5	5	3	2	2	1	1		4	4	3	2	1	1	1	
313FD	10rpm	6	6	6	6	6	6	6		6	6	6	6	5	4	3	
	50rpm	6	6	6	4	3	3	2		6	6	5	3	2	2	1	
	100rpm	5	5	3	2	2	1	1		4	4	2	1	1	1	0	
313FDP	50rpm	6	6	6	3	3	2	2		6	6	4	2	2	1	1	
	100rpm	6	6	6	5	3	3	2		6	6	5	3	2	2	1	
	250rpm	4	4	2	1	1	1	1		2	2	1	1	1	1	0	
313FBD	100rpm	6	6	6	6	5	5	3		6	6	6	6	5	4	3	
	350rpm	5	5	3	2	2	1	1		3	3	2	1	1	1	1	

Microcassette pumpheads



The 300 series of interchangeable OEM pumpheads also includes the 304MC and 308MC microcassette pumpheads, with a choice of four rollers for higher flow or eight rollers for higher precision. Microcassette pumpheads are available with three or five pumping channels.

Designed to give affordable precision for multi-channel applications, each pumphead contains removable cassettes which may be preloaded with tubing elements. Up to two MCX or three MCX3 extension pumpheads may be added to a maximum twelve or fifteen channels depending on the drive selected.

Cassettes may be removed and tubing changed at any time without stopping the drive or disturbing neighboring channels, and each cassette will accept any of the twenty tube sizes available.

Double segment manifold tubing elements are available in Marprene, PVC and Peroxide cured Silicone and feature two pumping segments to give double tube life. Adjacent cassettes may contain tubing of a different type or size.

Microcassette pumpheads are compatible with all 300 Series motors and controllers.

Ordering information

304MC four roller five channel pumphead	033.6450.000
308MC eight roller five channel pumphead	033.6850.000
304MCX four roller five channel extension pumphead	033.6451.000
308MCX eight roller five channel extension pumphead	033.6851.000
304MC3 four roller three channel pumphead	033.6460.000
308MC3 eight roller three channel pumphead	033.6860.000
304MCX3 four roller three channel extension pumphead	033.6462.000
308MCX3 eight roller three channel extension pumphead	033.6862.000

Materials of construction

Bayonet mounting plate	Polycarbonate
Spindles, shaft, screws	Stainless steel
Cassette	Kematal
Sealed bearings	Carbon steel
Rollers, locking rods	MOS2 filled Nylon 6 (Nylatron)
Body, rotor	Aluminum

304MC Flow rates

	Double segment manifold tubing						
	0.13mm	0.19mm	0.25mm	0.38mm	0.50mm	0.63mm	0.76mm
Bore mm	0.13mm	0.19mm	0.25mm	0.38mm	0.50mm	0.63mm	0.76mm
Bore *	0.005"	0.007"	0.01"	0.015"	0.02"	0.025"	0.03"
Flow rate: ml/revolution	0.001	0.003	0.005	0.008	0.015	0.028	0.042
Maximum continuous flow: ml/min	0.01	0.3	0.52	0.92	1.7	3.1	4.6
Bore mm	0.88mm	1.02mm	1.14mm	1.29mm	1.42mm	1.47mm	1.52mm
Bore *	0.035"	0.04"	0.045"	0.05"	0.055"	0.058"	0.06"
Flow rate: ml/revolution	0.058	0.074	0.09	0.12	0.15	0.16	0.17
Maximum continuous flow: ml/min	6.40	8.10	9.90	13.0	17.0	18.0	19.0
Bore mm	1.65mm	1.85mm	2.05mm	2.38mm	2.54mm	2.79mm	
Bore *	0.065"	0.07"	0.08"	0.09"	0.1"	0.11"	
Flow rate: ml/revolution	0.2	0.25	0.3	0.36	0.43	0.48	
Maximum continuous flow: ml/min	22.0	28.0	33.0	40.0	47.0	53.0	

For tube selections, see Table F on inside back cover.

304MC Specifications

Bore mm	0.5mm	1.02mm	1.52mm	2.05mm	2.54mm	2.79mm
Bore"	0.02"	0.04"	0.06"	0.08"	0.1"	0.11"
<i>Maximum continuous speed: rpm</i>	110	110	110	110	110	110

With Marprene tubing (Cam lever vertical, all cassettes full)

Required torque: kg cm	1.8	2.9	3.6	3.6	3.6	3.6
<i>Maximum pressure: bar</i>	2	2	2	1.3	1.3	1
<i>Maximum vacuum: mmHg</i>	400	400	300	300	200	200
<i>Maximum vacuum: feet of water</i>	16	16	12	12	8	8

With Silicone tubing (Cam lever vertical, all cassettes full)

Required torque: kg cm	1.6	2.6	3.2	3.2	3.2	3.2
<i>Maximum pressure: bar</i>	2	2	1.3	1.3	1	1
<i>Maximum vacuum: mmHg</i>	400	400	300	300	200	200
<i>Maximum vacuum: feet of water</i>	16	16	12	12	8	8

308MC Flow rates

	Double segment manifold tubing						
Bore mm	0.13mm	0.19mm	0.25mm	0.38mm	0.5mm	0.63mm	0.76mm
Bore"	0.005"	0.007"	0.01"	0.015"	0.02"	0.025"	0.03"
<i>Flow rate: ml/revolution</i>	0.001	0.003	0.004	0.008	0.013	0.024	0.035
<i>Maximum continuous flow: ml/min</i>	0.01	0.30	0.47	0.83	1.40	2.60	3.90
Bore mm	0.88mm	1.02mm	1.14mm	1.29mm	1.42mm	1.47mm	1.52mm
Bore"	0.035"	0.04"	0.045"	0.05"	0.055"	0.058"	0.06"
<i>Flow rate: ml/revolution</i>	0.048	0.06	0.08	0.95	0.11	0.12	0.13
<i>Maximum continuous flow: ml/min</i>	5.30	6.60	8.80	10.0	12.0	13.0	14.0
Bore mm	1.65mm	1.85mm	2.05mm	2.38mm	2.54mm	2.79mm	
Bore"	0.065"	0.07"	0.08"	0.09"	0.1"	0.11"	
<i>Flow rate: ml/revolution</i>	0.15	0.18	0.22	0.26	0.30	0.33	
<i>Maximum continuous flow: ml/min</i>	17.0	20.0	24.0	29.0	33.0	36.0	

For tube selections, see Table F on inside back cover.

308MC Specifications

Bore mm	0.5mm	1.02mm	1.52mm	2.05mm	2.54mm	2.79mm
Bore"	0.02"	0.04"	0.06"	0.08"	0.1"	0.11"
<i>Maximum continuous speed: rpm</i>	110	110	110	110	110	110

With Marprene tubing (Cam lever vertical, all cassettes full)

Required torque: kg cm	4.1	4.5	5.5	5.8	6.0	6.0
<i>Maximum pressure: bar</i>	2	2	2	1.3	1.3	1
<i>Maximum vacuum: mmHg</i>	400	400	300	300	200	200
<i>Maximum vacuum: feet of water</i>	16	16	12	12	8	8

With Silicone tubing (Cam lever vertical, all cassettes full)

Required torque: kg cm	2.6	2.8	3.5	3.7	3.8	3.8
<i>Maximum pressure: bar</i>	2	2	1.3	1.3	1	1
<i>Maximum vacuum: mmHg</i>	400	400	300	300	200	200
<i>Maximum vacuum: feet of water</i>	16	16	12	12	8	8

Note: To work against higher pressures the cam lever may be moved beyond the vertical position. Torque requirement will be approximately 2 to 3 times that listed, and tube life could be shortened.

