

NEW

Every peristaltic pump for science



From
Watson-Marlow Bredel



sci from Watson-Marlow Bredel

The new standard in scientific pumping

With over one million pumps sold, Watson-Marlow Bredel is the world's leading peristaltic pump manufacturer, entrusted with the handling of valuable, difficult and sensitive fluids in research, pilot and production processes everywhere that science is building our future.

science

Sci-Q pumps have been created for **science**, by science, exploiting every latest technique from 3D solid design, finite element analysis, rapid prototyping, intensive tooling and cellular build. The results are as near perfection as the state of the art can provide.

intelligence

At the heart of a Sci-Q pump is microprocessor **intelligence**, but what really marks it out is the intelligence of its design, born from a passion for engineering fluid-handling solutions. Watson-Marlow Bredel creates intelligent designs for intelligent users.

quality

The highest **quality** peristaltic pump available today, every Watson-Marlow Bredel product is engineered for quality. Zero-maintenance motors, whisper-quiet gearboxes and the most sophisticated control electronics designed and manufactured to ISO9001:2000 are backed by expert local support.



Inside the Sci-Q 323

Four modular pumphead types for single or multi-channel flows from $\mu\text{l}/\text{minute}$ to 2 liters per minute

Precision brushless DC motor: servo-quality for precise speed control; zero maintenance

Easy-use interface: high-visibility display and contoured membrane keypad designed for intuitive operation

Durable chemical-resistant case, crevice-free for hygiene; distinctive, contemporary and functional

200

SERIES



205U/CA

205U/CA low-flow multi-channel pumps

- High precision, near-pulseless flow through 4 to 32 channels
- Flow rates from 0.6 microliters to 22ml/min per channel
- Eight planetary-driven stainless-steel rollers give extended tube life
- 180:1 speed control range and 19 tube sizes give 36,000:1 control range
- Manual control or analog auto-control (up to 30V or 32mA)
- Change cassettes without stopping the pump or disturbing other channels

The 200 series provides high-precision pulsation-free pumping. Flow control for each individual channel is provided by multi-turn "click-stop" pressure adjustment on each cassette. Manual and analog auto-control options. Selectable dual-voltage operation.

The 205CA pumphead with its snap-fit cassettes and sprung track is factory-set for standard applications, but lockable occlusion adjustment allows settings to be optimized when necessary and, uniquely, remain undisturbed during tube changes. 205CA pumpheads accept manifold pump tubing in five different materials and nineteen sizes.

Keypad lock prevents tampering or accidental changes. Max high speed priming function. All functionality controlled from wipe-clean membrane keypad. 0-5V DC tachometer output for speed monitoring, 5V auxiliary output for motor run indication. Remote low voltage, or TTL (PLC compatible) of start/stop and direction. Selectable dual voltage 100-120V or 220-240V 50/60Hz operation.



Snap-fit cassettes

205S/CA low-flow multi-channel pumps

If you require only manual control, please order the 205S/CA.



205S/CA

205U/CA and 205S/CA flow rate ranges ml/min (maximum 32 channels)

| Color code | Orange/Black | Orange/Red | Orange/Blue | Orange/Green | Orange/Yellow |
|------------|---------------|---------------|---------------|---------------|---------------|
| Tube bore | 0.005" | 0.007" | 0.010" | 0.015" | 0.020" |
| | 0.13mm | 0.19mm | 0.25mm | 0.38mm | 0.50mm |
| 0.5-90rpm | 0.0006-0.10 | 0.0009-0.16 | 0.0013-0.23 | 0.0036-0.65 | 0.0056-1.01 |
| Color code | Orange/White | Black/Black | Orange/Orange | White/White | Red/Red |
| Tube bore | 0.025" | 0.030" | 0.035" | 0.040" | 0.045" |
| | 0.63mm | 0.76mm | 0.88mm | 1.02mm | 1.14mm |
| 0.5-90rpm | 0.0083-1.49 | 0.011-2.02 | 0.016-2.92 | 0.021-3.76 | 0.026-4.68 |
| Color code | Gray/Gray | Yellow/Yellow | Yellow/Blue | Blue/Blue | Green/Green |
| Tube bore | 0.050" | 0.055" | 0.060" | 0.065" | 0.070" |
| | 1.29mm | 1.42mm | 1.52mm | 1.65mm | 1.85mm |
| 0.5-90rpm | 0.033-5.95 | 0.04-7.20 | 0.043-7.69 | 0.051-9.12 | 0.063-11.3 |
| Color code | Purple/Purple | | Purple/Black | Purple/Orange | Purple/White |
| Tube bore | 0.080" | | 0.095" | 0.100" | 0.110" |
| | 2.05mm | | 2.38mm | 2.54mm | 2.79mm |
| 0.5-90rpm | 0.076-13.8 | | 0.092-16.5 | 0.11-19.3 | 0.12-22.0 |

205U/CA and 205S/CA ordering information

Supply 100-120/220-240V 50/60Hz 1ph 60VA

| Channels | 205U/CA | 205S/CA | Channels | 205U/CA | 205S/CA |
|----------|--------------|--------------|----------|--------------|--------------|
| 4 | 020.5704.00A | 020.3704.00A | 20 | 020.5720.00A | 020.3720.00A |
| 8 | 020.5708.00A | 020.3708.00A | 24 | 020.5724.00A | 020.3724.00A |
| 12 | 020.5712.00A | 020.3712.00A | 28 | 020.5728.00A | 020.3728.00A |
| 16 | 020.5716.00A | 020.3716.00A | 32 | 020.5732.00A | 020.3732.00A |





| Color code | Bore | Marpene | PVC | Silicone | Solvent resistant | Acid resistant |
|---------------|-----------------|--------------|--------------|--------------|-------------------|----------------|
| Orange/black | 0.005" (0.13mm) | | 980.0013.000 | | 984.0013.000 | |
| Orange/red | 0.007" (0.19mm) | | 980.0019.000 | | 984.0019.000 | |
| Orange/blue | 0.010" (0.25mm) | 978.0025.000 | 980.0025.000 | | 984.0025.000 | |
| Orange/green | 0.015" (0.38mm) | 978.0038.000 | 980.0038.000 | | 984.0038.000 | |
| Orange/yellow | 0.020" (0.50mm) | 978.0050.000 | 980.0050.000 | | 984.0050.000 | 986.0050.000 |
| Orange/white | 0.025" (0.63mm) | 978.0063.000 | 980.0063.000 | 982.0063.000 | 984.0063.000 | 986.0063.000 |
| Black/black | 0.030" (0.76mm) | 978.0076.000 | 980.0076.000 | 982.0076.000 | 984.0076.000 | 986.0076.000 |
| Orange/orange | 0.035" (0.88mm) | 978.0088.000 | 980.0088.000 | 982.0088.000 | 984.0088.000 | 986.0088.000 |
| White/white | 0.040" (1.02mm) | 978.0102.000 | 980.0102.000 | 982.0102.000 | 984.0102.000 | 986.0102.000 |
| Red/red | 0.045" (1.14mm) | 978.0114.000 | 980.0114.000 | 982.0114.000 | 984.0114.000 | 986.0114.000 |
| Gray/gray | 0.050" (1.29mm) | 978.0129.000 | 980.0129.000 | 982.0129.000 | 984.0129.000 | 986.0129.000 |
| Yellow/yellow | 0.055" (1.42mm) | 978.0142.000 | 980.0142.000 | 982.0142.000 | 984.0142.000 | 986.0142.000 |
| Yellow/blue | 0.060" (1.52mm) | 978.0152.000 | 980.0152.000 | 982.0152.000 | 984.0152.000 | 986.0152.000 |
| Blue/blue | 0.065" (1.65mm) | 978.0165.000 | 980.0165.000 | 982.0165.000 | 984.0165.000 | 986.0165.000 |
| Green/green | 0.070" (1.85mm) | 978.0185.000 | 980.0185.000 | 982.0185.000 | 984.0185.000 | 986.0185.000 |
| Purple/purple | 0.080" (2.05mm) | 978.0205.000 | 980.0205.000 | 982.0205.000 | 984.0205.000 | 986.0205.000 |
| Purple/black | 0.090" (2.29mm) | 978.0229.000 | 980.0229.000 | 982.0229.000 | 984.0229.000 | 986.0229.000 |
| Purple/orange | 0.100" (2.54mm) | 978.0254.000 | 980.0254.000 | 982.0254.000 | 984.0254.000 | 986.0254.000 |
| Purple/white | 0.110" (2.79mm) | 978.0279.000 | 980.0279.000 | 982.0279.000 | 984.0279.000 | 986.0279.000 |

* For autoclavable Marprene tubing, please replace last "0" with "+" for example 978.0238.00+

205U/CA and 205S/CA specifications

| Channels | Dimensions (inches) | Weight (pounds) |
|-----------------------------|---------------------|--------------------------------------|
| 4 | H6.1 x W5.8 x L11.4 | 14.3lbs |
| 8 | H6.1 x W5.8 x L13 | 16.7lbs |
| 12 | H6.1 x W5.8 x L15 | 19.4lbs |
| 16 | H6.1 x W5.8 x L16.9 | 22.0lbs |
| 20 | H6.1 x W5.8 x L20.1 | 27.3lbs |
| 24 | H6.1 x W5.8 x L20.8 | 29.7lbs |
| 28 | H6.1 x W5.8 x L24.8 | 32.3lbs |
| 32 | H6.1 x W5.8 x L26.8 | 35.0lbs |
| Standards | | BS800, IEC 335-1, EN60529 (IP31), CE |
| Operating temperature range | | 5 to 40C |

SERIES



The new Sci-Q 323 range is designed exclusively for scientific pumping needs, and brings a stunning new level of performance and quality to the benchtop. Four brand new drives coupled with five pumphead options meet every need. Up to six 313 and 314 pumpheads (they can be mixed) can be fitted to a single drive, and up to two 314MC or 318MC five-channel pumpheads (which can also be mixed) can be fitted to a single drive to provide ten channels of flow.

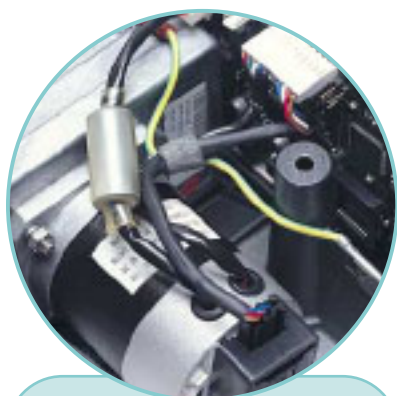
- 323E/D manual control pump
- 323S/D high-performance manual control pump



Hi-Viz display, wipe-clean keypad



Chemical-resistant case, distinctive, contemporary and functional



Brushless DC motor means zero maintenance and precision control



323E/D

323E/D manual control variable speed pump

- 313D pumphead produces flow rates to 2000ml/min
- 27:1 speed control ratio
- Snap-fit 313X extension pumpheads provide up to six channels
- Two year comprehensive warranty



Digital speed control from 15 to 400rpm in 5rpm steps. Instantly reversible, rapid-loading 313 flip-top pumphead accepts seven tube sizes. Switchable between 100-120V or 220-240V.

323E drives may also be fitted with 314 four roller pumpheads if lower pulsing is required, or with 313D2 or 314D2 pumpheads which accept 2.4mm wall thickness tubing for higher pressure operation or pumping more viscous fluids.

See the 300 series drive and pumpheads section on page 7 for details.

For tubing for the 323E/D, see table on page 9.

| 323E/D flow rate ranges (ml/min) | | | | | | | | |
|----------------------------------|--------------|---------|--------|---------|--------|--------|---------|---------|
| Pump | Speed range | 1/50" | 1/32" | 1/16" | 1/8" | 3/16" | 1/4" | 5/16" |
| | | 0.5mm | 0.8mm | 1.6mm | 3.2mm | 4.8mm | 6.4mm | 8.0mm |
| 323E/D | 15 to 400rpm | 0.45-12 | 1.1-28 | 4.1-110 | 15-400 | 33-880 | 54-1400 | 75-2000 |

| Ordering information for 323E/D pumps | | | | |
|---------------------------------------|----------------------------|--------------|------------------------------------|--------------|
| Pump | Pumphead fitted | Speed range | Supply | Product code |
| 323E/D | 313D three roller pumphead | 15 to 400rpm | 100-120/220-240V 50/60Hz 1ph 100VA | 030.3124.3DA |

| Extension pumpheads | Product code |
|---|--------------|
| 313X three-roller extension pumphead (maximum five) | 033.3431.00A |

| 323E/D specifications | |
|-----------------------|------------------------------|
| Weight | 10.3lbs |
| Dimensions (inches) | H5.2 x W9.1 x L8.9 |
| Control ratio | 27:1 |
| Standards | IEC 335-1, EN60529 (IP31) CE |



323S/D

323S/D high-performance manual control variable speed pump

- High-performance microprocessor controlled pumps
- 323S/D can be extended to six channels
- Flows rates to 2000ml/min per channel with 323S/D

323S/D speed adjusts in 1rpm steps from 3 to 400rpm. Instantly reversible, rapid-loading flip-top pumphead accepts seven tube sizes, keypad lock prevents tampering or accidental changes, auto restart for power failure recovery, switchable between 100-120V or 220-240V, two year comprehensive warranty. MemoDose facility for accurate single shot dosing.

323S drives may also be fitted with 314 four roller pumpheads if lower pulsing is required, or with 313D2 or 314D2 pumpheads which accept 3/32" (2.4mm) wall thickness tubing for higher pressure operation or pumping more viscous fluids. For low-flow pumping, up to ten channels, 323S drives may be fitted with 314MC (four-roller) and 318MC (eight-roller) microcassette pumpheads, which can be extended to ten channels by adding one 314MCX or 318MCX extension pumphead. See the 300 series drive and pumpheads section on page 7 for details.

For tubing for the 323S/D, see table on page 9.



323S/D flow rate ranges (ml/min)

| Pump | Speed range | 1/50" | 1/32" | 1/16" | 1/8" | 3/16" | 1/4" | 5/16" |
|---------------|---------------|---------|---------|----------|---------|---------|---------|---------|
| | | 0.5mm | 0.8mm | 1.6mm | 3.2mm | 4.8mm | 6.4mm | 8.0mm |
| 323S/D | 3.0 to 400rpm | 0.09-12 | 0.21-28 | 0.81-110 | 3.0-400 | 6.6-880 | 11-1400 | 15-2000 |

Ordering information for 323S/D pumps

| Pump | Pumphead fitted | Speed range | Supply | Product code |
|---------------|----------------------------|---------------|------------------------------------|--------------|
| 323S/D | 313D three-roller pumphead | 3.0 to 400rpm | 100-120/220-240V 50/60Hz 1ph 100VA | 030.3134.3DA |

Extension pumpheads

| | Product code |
|---|--------------|
| 313X three-roller extension pumphead (maximum five) | 033.3431.00A |

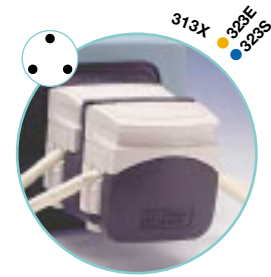
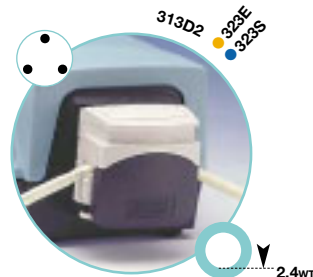
323S specifications

| | |
|---------------------|------------------------------|
| Weights | 10.3lbs |
| Dimensions (inches) | H5.2 x W9.1 x L8.9 |
| Control ratio | 323S/D 400rpm 133:1 |
| Standards | IEC 335-1, EN60529 (IP31) CE |

Sci-Q 300 series drives and pumpheads

The modular design means that many more combinations of drives and pumpheads than those shown on the previous page are possible. Two drives couple to five pumphead types, options to meet every need: Up to six 313 or 314 pumpheads can be fitted to one drive, and up to two 314MC or 318MC (which can also be mixed) can be fitted to a single drive to provide ten channels of flow.

- 313D three-roller high flow pumphead
- 313D2 three-roller high flow pumphead for 3/32" (2.4mm) wall tubing
- 313X three-roller extension pumphead - add up to five extra channels



- 314D four-roller higher-accuracy, low-pulse pumphead
- 314D2 four-roller pumphead for 3/32" (2.4mm) wall tubing
- 314X four-roller extension pumphead - add up to five extra channels



- 314MC four-roller higher-flow five channel cassette pumphead
- 314MCX four-roller extension pumphead - add one for ten channel pumping



- 318MC eight roller higher-accuracy five channel cassette pumphead
- 318MCX eight roller extension pumphead - add one for ten channel pumping





314D

Sci-Q 300 Series Drives and Pumpheads Continued

323 drives can be fitted with 314D four-roller pumpheads when lower pulsing is required (flow rates will be lower than with the 313 three-roller pumphead), and up to five 314X extension pumpheads can be fitted, depending on the size of the tubing fitted and the pressure in the system.

323 drives may also be fitted 313D2 or 314D2 pumpheads which accept 3/32" (2.4mm) wall thickness tubing for higher pressure operation or pumping more viscous fluids. 313D2 or 314D2 pumpheads make higher torque demands, and extension pumpheads may not be fitted.

For low-flow pumping through up to ten channels, 323S drives may be fitted with 314MC (four-roller) and 318MC (eight-roller) microcassette pumpheads, which can be extended to ten channels by adding one 314MCX or 318MCX extension pumphead.

314D and 314X pumphead flow rate ranges (ml/min)

| Drive | Speed range | 1/50" | 1/32" | 1/16" | 1/8" | 3/16" | 1/4" | 5/16" |
|-------------|---------------|---------|---------|----------|---------|---------|----------|---------|
| | | 0.5mm | 0.8mm | 1.6mm | 3.2mm | 4.8mm | 6.4mm | 8.0mm |
| 323E | 15 to 400rpm | 0.45-12 | 0.90-24 | 3.8-100 | 13-340 | 29-760 | 45-1200 | 60-1600 |
| 323S | 3.0 to 400rpm | 0.09-12 | 0.18-24 | 0.75-100 | 2.6-340 | 5.7-760 | 9.0-1200 | 12-1600 |

Ordering information for 323E, 323S drives and 314 four-roller pumpheads

| Drive | Pumphead | Speed range | Supply | Drive code | Pumphead code |
|-------------|----------|---------------|------------------------------------|--------------|---------------|
| 323E | 314D | 15 to 400rpm | 100-120/220-240V 50/60Hz 1ph 100VA | 036.3124.00A | 033.4451.000 |
| 323S | 314D | 3.0 to 400rpm | 100-120/220-240V 50/60Hz 1ph 100VA | 036.3134.00A | 033.4451.000 |

Extension pumphead

| 314X four-roller extension pumphead | Pumphead code |
|-------------------------------------|---------------|
| | 033.4431.000 |

Maximum number of 313 and 314 pumpheads which can be fitted to 323 drives

| Tubing | Pressure | Tube number | 112 | 13 | 14 | 16 | 25 | 17 | 18 |
|--|-----------------|-------------|-------|-------|-------|------|-------|------|-------|
| | | Pressure | 1/50" | 1/32" | 1/16" | 1/8" | 3/16" | 1/4" | 5/16" |
| Platinum Silicone | 7 psi (0.5 bar) | 0.5mm | 6 | 6 | 5 | 3 | 2 | 2 | 1 |
| | 30 psi (2 bar) | 0.8mm | 6 | 6 | 5 | 3 | 2 | 1 | 1 |
| Bioprene, Marprene, PVC, Neoprene | 7 psi (0.5 bar) | 1.6mm | 6 | 6 | 4 | 2 | 2 | 1 | 1 |
| | 30 psi (2 bar) | 3.2mm | 6 | 6 | 4 | 2 | 2 | 1 | 1 |
| Chem-Sure, Sta-Pure | 7 psi (0.5 bar) | 4.8mm | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| | 30 psi (2 bar) | 6.4mm | 1 | 1 | 1 | 1 | 1 | 1 | 1 |

Note that only one 313D2 or 314D2 may be fitted to a 323E, 323S drive

Ordering information for 323E, 323S drives and 313D2 and 314D2 pumpheads

| Drive | Pumphead | Speed range | Supply | Drive code | Pumphead code |
|-------------|--------------|---------------|------------------------------------|--------------|---------------|
| 323E | 313D2 | 15 to 400rpm | 100-120/220-240V 50/60Hz 1ph 100VA | 036.3124.00A | 033.3551.000 |
| | 314D2 | | | 036.3124.00A | 033.4551.000 |
| 323S | 313D2 | 3.0 to 400rpm | 100-120/220-240V 50/60Hz 1ph 100VA | 036.3134.00A | 033.3551.000 |
| | 314D2 | | | 036.3134.00A | 033.4551.000 |

Note that only one 313D2 or 314D2 may be fitted to a 323E or 323S drive

Ordering information for 323E, 323S drives and microcassette pumpheads

| Drive | Speed range | Drive code | 314MC | 318MC |
|-------------|---------------|--------------|--------------|--------------|
| 323E | 15 to 400rpm | 036.3124.00A | 033.6453.000 | 033.6853.000 |
| 323S | 3.0 to 400rpm | 036.3134.00A | 033.6453.000 | 033.6853.000 |

Tubing for 313D2 and 314D2 pumpheads, see table on page 19.

Ordering information for 314MC and 318MC extension pumpheads

| 314MCX four-roller extension pumphead (maximum one extension pumphead) | Pumphead code |
|---|---------------|
| | 033.6454.000 |
| 318MCX eight-roller extension pumphead (maximum one extension pumphead) | Pumphead code |
| | 033.6854.000 |



314MC

314MC pumphead flow rate ranges (ml/min) - maximum 10 channels. Note speed must not exceed 110rpm.

| Drive | Speed range | Orange/Black 0.13mm | Orange/Red 0.19mm | Orange/Blue 0.25mm | Orange/Green 0.38mm | Orange/Yellow 0.50mm |
|-------|-------------|------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| 323S | 3.0-110 rpm | 0.002-0.09 | 0.01-0.3 | 0.01-0.5 | 0.03-0.9 | 0.05-1.7 |
| Drive | Speed range | Orange/White 0.63mm | Black/Black 0.76mm | Orange/Orange 0.88mm | White/White 1.02mm | Red/Red 1.14mm |
| 323S | 3.0-110 rpm | 0.08-3.1 | 0.13-4.6 | 0.17-6.4 | 0.22-8.1 | 0.27-9.9 |
| Drive | Speed range | Gray/Gray 1.29mm | Yellow/Yellow 1.42mm | Yellow/Blue 1.52mm | Blue/Blue 1.65mm | Green/Green 1.85mm |
| 323S | 3.0-110 rpm | 0.35-13 | 0.46-17 | 0.52-19 | 0.60-22 | 0.76-28 |
| Drive | Speed range | | Purple/Purple 2.05mm | Purple/Black 2.29mm | Purple/Orange 2.54mm | Purple/White 2.79mm |
| 323S | 3.0-110 rpm | | 0.90-33 | 1.1-40 | 1.3-47 | 1.4-53 |

318MC pumphead flow rate ranges (ml/min) - maximum 10 channels. Note speed must not exceed 110rpm.

| Drive | Speed range | Orange/Black 0.13mm | Orange/Red 0.19mm | Orange/Blue 0.25mm | Orange/Green 0.38mm | Orange/Yellow 0.50mm |
|-------|-------------|------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| 323S | 3.0-110 rpm | 0.002-0.09 | 0.01-0.3 | 0.01-0.5 | 0.02-0.8 | 0.04-1.4 |
| Drive | Speed range | Orange/White 0.63mm | Black/Black 0.76mm | Orange/Orange 0.88mm | White/White 1.02mm | Red/Red 1.14mm |
| 323S | 3.0-110 rpm | 0.07-2.6 | 0.11-3.9 | 0.14-5.3 | 0.18-6.6 | 0.24-8.8 |
| Drive | Speed range | Gray/Gray 1.29mm | Yellow/Yellow 1.42mm | Yellow/Blue 1.52mm | Blue/Blue 1.65mm | Green/Green 1.85mm |
| 323S | 3.0-110rpm | 0.27-10 | 0.33-12 | 0.38-14 | 0.46-17 | 0.55-20 |
| Drive | Speed range | | Purple/Purple 2.05mm | Purple/Black 2.29mm | Purple/Orange 2.54mm | Purple/White 2.79mm |
| 323S | 3.0-110 rpm | | 0.65-24 | 0.79-29 | 0.90-33 | 0.98-36 |

Tubing for 323E/D and 323S/D

| Tube bore | 1/50" | 1/32" | 1/16" | 1/8" | 3/16" | 1/4" | 5/16" |
|-------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| Tube number | 112 | 13 | 14 | 16 | 25 | 17 | 18 |
| | 0.5mm | 0.8mm | 1.6mm | 3.2mm | 4.8mm | 6.4mm | 8.0mm |
| Bioprene | 903.0005.016 | 903.0008.016 | 903.0016.016 | 903.0032.016 | 903.0048.016 | 903.0064.016 | 903.0080.016 |
| Marprene | 902.0005.016 | 902.0008.016 | 902.0016.016 | 902.0032.016 | 902.0048.016 | 902.0064.016 | 902.0080.016 |
| Sta-Pure | | | 960.0016.016 | 960.0032.016 | 960.0048.016 | 960.0064.016 | 960.0080.016 |
| Platinum silicone | 913.A005.016 | 913.A008.016 | 913.A016.016 | 913.A032.016 | 913.A048.016 | 913.A064.016 | 913.A080.016 |
| Neoprene | | 920.0008.016 | 920.0016.016 | 920.0032.016 | 920.0048.016 | 920.0064.016 | 920.0080.016 |
| PVC | | | 950.0016.016 | 950.0032.016 | 950.0048.016 | 950.0064.016 | 950.0080.016 |
| Chem-Sure | | | 965.0016.016 | 965.0032.016 | 965.0048.016 | 965.0064.016 | 965.0080.016 |

Double pump segment manifold pump tubing for 314MC and 318MC microcassette pumpheads

| Color code | Bore | Marprene | Autoclavable Marprene | PVC | Silicone |
|---------------|-----------------|--------------|-----------------------|--------------|--------------|
| Orange/red | 0.007" (0.19mm) | | | 981.0019.000 | |
| Orange/blue | 0.010" (0.25mm) | 979.0025.000 | 979.0025.00+ | 981.0025.000 | |
| Orange/green | 0.015" (0.38mm) | 979.0038.000 | 979.0038.00+ | 981.0038.000 | |
| Orange/yellow | 0.020" (0.50mm) | 979.0050.000 | 979.0050.00+ | 981.0050.000 | |
| Orange/white | 0.025" (0.63mm) | 979.0063.000 | 979.0063.00+ | 981.0063.000 | 983.0063.000 |
| Black/black | 0.030" (0.76mm) | 979.0076.000 | 979.0076.00+ | 981.0076.000 | 983.0076.000 |
| Orange/orange | 0.035" (0.88mm) | 979.0088.000 | 979.0088.00+ | 981.0088.000 | 983.0088.000 |
| White/white | 0.040" (1.02mm) | 979.0102.000 | 979.0102.00+ | 981.0102.000 | 983.0102.000 |
| Red/red | 0.045" (1.14mm) | 979.0114.000 | 979.0114.00+ | 981.0114.000 | 983.0114.000 |
| Gray/gray | 0.050" (1.29mm) | 979.0129.000 | 979.0129.00+ | 981.0129.000 | 983.0129.000 |
| Yellow/yellow | 0.055" (1.42mm) | 979.0142.000 | 979.0142.00+ | 981.0142.000 | 983.0142.000 |
| Yellow/blue | 0.060" (1.52mm) | 979.0152.000 | 979.0152.00+ | 981.0152.000 | 983.0152.000 |
| Blue/blue | 0.065" (1.65mm) | 979.0165.000 | 979.0165.00+ | 981.0165.000 | 983.0165.000 |
| Green/green | 0.070" (1.85mm) | 979.0185.000 | 979.0185.00+ | 981.0185.000 | 983.0185.000 |
| Purple/purple | 0.080" (2.05mm) | 979.0205.000 | 979.0205.00+ | 981.0205.000 | 983.0205.000 |
| Purple/black | 0.090" (2.29mm) | 979.0229.000 | 979.0229.00+ | 981.0229.000 | 983.0229.000 |
| Purple/orange | 0.100" (2.54mm) | 979.0254.000 | 979.0254.00+ | 981.0254.000 | 983.0254.000 |
| Purple/white | 0.110" (2.79mm) | 979.0279.000 | 979.0279.00+ | 981.0279.000 | 983.0279.000 |

400

PRECISION PUMPS FOR SCIENCE

SERIES



401U/D1

401U/D1, 401U/DM2 and 401U/DM3 manual/auto control ultra compact pumps

- 401U/D1 provides single channel flows up to 120ml/min
- 401U/DM2 and 401U/DM3 provide two and three channel flows up to 36ml/min
- Highly-compact with single control potentiometer for direction, speed and start/stop
- Analog speed control and remote switching via a 15D connector
- Reversible for easy fluid recovery



The 401U/D1 accepts standard 1/16" (1.6mm) wall tubing up to 5/32" (4mm) bore in seven different tube materials.

401U/DM2 and 401U/DM3 multi-channel pumps with precision machined aluminum rotor accept three-bridge manifold tubing and provide flow rates from 0.001-36ml/min per channel.

All are supplied with a 100-120V:15VAC transformer. Order remote switching cables separately. Accepts 4-20mA or 0-10V analog signals and remote TTL (PLC compatible) start/stop and direction switching. Quick release sprung tube clamps on D1 model. A precision machined four-roller aluminum rotor gives smooth, precise flows.



401U/DM2

401U/D1 flow rates per channel (ml/min)

| Tube bore | 1/50" | 1/32" | 1/16" | 3/32" | 1/8" | 5/32" |
|--------------|----------|----------|----------|----------|----------|----------|
| | 0.5mm | 0.8mm | 1.6mm | 2.4mm | 3.2mm | 4.0mm |
| 1.2 to 12rpm | 0.01-0.1 | 0.03-0.3 | 0.14-1.4 | 0.29-2.9 | 0.49-4.9 | 0.70-7.0 |
| 4.0 to 40rpm | 0.05-0.5 | 0.12-1.2 | 0.45-4.5 | 0.97-9.7 | 1.6-16 | 2.3-23 |
| 20 to 200rpm | 0.23-2.3 | 0.58-5.8 | 2.3-23 | 4.9-49 | 8.1-81 | 12-120 |

401U/DM2 and 401U/DM3 flow rates (ml/min)

| Color | Orange/Black | Orange/Red | Orange/Blue | Orange/Green | Orange/Yellow |
|--------------|--------------|------------|-------------|--------------|---------------|
| Tube bore | 0.005" | 0.007" | 0.010" | 0.015" | 0.020" |
| | 0.13mm | 0.19mm | 0.25mm | 0.38mm | 0.50mm |
| 1.2 to 12rpm | 0.001-0.01 | 0.002-0.02 | 0.004-0.04 | 0.01-0.1 | 0.02-0.2 |
| 4.0 to 40rpm | 0.004-0.04 | 0.008-0.08 | 0.014-0.14 | 0.03-0.3 | 0.06-0.6 |
| 10 to 100rpm | 0.009-0.09 | 0.020-0.20 | 0.035-0.35 | 0.08-0.8 | 0.14-1.4 |

| Color | Orange/White | Black/Black | Orange/Orange | White/White | Red/Red |
|--------------|--------------|-------------|---------------|-------------|----------|
| Tube bore | 0.025" | 0.030" | 0.035" | 0.040" | 0.045" |
| | 0.63mm | 0.76mm | 0.88mm | 1.02mm | 1.14mm |
| 1.2 to 12rpm | 0.03-0.3 | 0.04-0.4 | 0.05-0.5 | 0.07-0.7 | 0.08-0.8 |
| 4.0 to 40rpm | 0.09-0.9 | 0.12-1.2 | 0.17-1.7 | 0.22-2.2 | 0.28-2.8 |
| 10 to 100rpm | 0.22-2.2 | 0.31-3.1 | 0.43-4.3 | 0.55-5.5 | 0.70-7.0 |

| Color | Gray/Gray | Yellow/Yellow | Yellow/Blue | Blue/Blue | Green/Green |
|--------------|-----------|---------------|-------------|-----------|-------------|
| Tube bore | 0.050" | 0.055" | 0.060" | 0.065" | 0.070" |
| | 1.29mm | 1.42mm | 1.52mm | 1.65mm | 1.85mm |
| 1.2 to 12rpm | 0.11-1.1 | 0.13-1.3 | 0.15-1.5 | 0.17-1.7 | 0.21-2.1 |
| 4.0 to 40rpm | 0.35-3.5 | 0.43-4.3 | 0.49-4.9 | 0.56-5.6 | 0.70-7.0 |
| 10 to 100rpm | 0.89-8.9 | 1.1-11 | 1.2-12 | 1.4-14 | 1.8-18 |

| Color | Purple/Purple | Purple/Black | Purple/Orange | Purple/White |
|--------------|---------------|--------------|---------------|--------------|
| Tube bore | 0.080" | 0.095" | 0.100" | 0.110" |
| | 2.05mm | 2.38mm | 2.54mm | 2.79mm |
| 1.2 to 12rpm | 0.26-2.6 | 0.31-3.1 | 0.37-3.7 | 0.44-4.4 |
| 4.0 to 40rpm | 0.85-8.5 | 1.0-10 | 1.2-12 | 1.5-15 |
| 10 to 100rpm | 2.1-21 | 2.6-26 | 3.1-31 | 3.6-36 |



401U/DM3

Ordering information for 401

| 401U/D1 single channel 1.6mm wall tubing pump | | Product code |
|---|---|--------------|
| 1.2 to 12rpm | 15VAC single channel standard tubing pump | 040.181D.01A |
| 4.0 to 40rpm | | 040.1H1D.01A |
| 20 to 200rpm | | 040.1S1D.01A |

| 401U/DM2 one or two channel manifold tube pump | | Product code |
|--|--|--------------|
| 1.2 to 12rpm | 15VAC two channel manifold tubing pump | 040.181D.M2A |
| 4.0 to 40rpm | | 040.1H1D.M2A |
| 10 to 100rpm | | 040.1P1D.M2A |

| 401U/DM3 three channel manifold tube pump | | Product code |
|---|--|--------------|
| 1.2 to 12rpm | 15VAC three channel manifold tubing pump | 040.181D.M3A |
| 4.0 to 40rpm | | 040.1H1D.M3A |
| 10 to 100rpm | | 040.1P1D.M3A |

| Remote switching cables for 401U | | |
|----------------------------------|--|--------------|
| 400AC1 | 0-10V CW/Stop/CCW 3.45 feet (1.5m) remote cable | 049.0011.00A |
| 400AC2 | 4-20mA CW/Stop/CCW 3.45 feet (1.5m) remote cable | 049.0031.00A |
| 400AC3 | CW/Stop/CCW 3.45 feet (1.5m) remote cable | 049.0051.00A |
| 400AC4 | Start/Stop 10 feet (3m) remote cable fitted with foot switch | 049.0071.00A |

| Tubing for 401U/D1 | | | | | |
|--------------------|-----|--------------|--------------|-------------------|--------------|
| Tube bore | # | Bioprene | Marpene | Platinum Silicone | Neoprene |
| 1/50" (0.5mm) | 112 | 903.0005.016 | 902.0005.016 | 913.A005.016 | |
| 1/32" (0.8mm) | 13 | 903.0008.016 | 902.0008.016 | 913.A008.016 | 920.0008.016 |
| 1/16" (1.6mm) | 14 | 903.0016.016 | 902.0016.016 | 913.A016.016 | 920.0016.016 |
| 3/32" (2.4mm) | | | 902.0024.016 | 913.A024.016 | |
| 1/8" (3.2mm) | 16 | 903.0032.016 | 902.0032.016 | 913.A032.016 | 920.0032.016 |
| 5/32" (4.0mm) | | | 902.0040.016 | 913.A040.016 | |
| Tube bore | | Sta-Pure | Chem-Sure | PVC | |
| 1/16" (1.6mm) | 14 | 960.0016.016 | 965.0016.016 | 950.0016.016 | |
| 1/8" (3.2mm) | 16 | 960.0032.016 | 965.0032.016 | 950.0032.016 | |

| Double segment manifold pump tubing for 401U/DM2 and 401U/DM3 | | | | | |
|---|-----------------|--------------|-----------------------|--------------|--------------|
| Color code | Bore | Marpene | Autoclavable Marprene | PVC | Silicone |
| Orange/black | 0.005" (0.13mm) | | | 981.0013.000 | |
| Orange/red | 0.007" (0.19mm) | | | 981.0019.000 | |
| Orange/blue | 0.010" (0.25mm) | 979.0025.000 | 979.0025.00+ | 981.0025.000 | |
| Orange/green | 0.015" (0.38mm) | 979.0038.000 | 979.0038.00+ | 981.0038.000 | |
| Orange/yellow | 0.020" (0.50mm) | 979.0050.000 | 979.0050.00+ | 981.0050.000 | |
| Orange/white | 0.025" (0.63mm) | 979.0063.000 | 979.0063.00+ | 981.0063.000 | 983.0063.000 |
| Black/black | 0.030" (0.76mm) | 979.0076.000 | 979.0076.00+ | 981.0076.000 | 983.0076.000 |
| Orange/orange | 0.035" (0.88mm) | 979.0088.000 | 979.0088.00+ | 981.0088.000 | 983.0088.000 |
| White/white | 0.040" (1.02mm) | 979.0102.000 | 979.0102.00+ | 981.0102.000 | 983.0102.000 |
| Red/red | 0.045" (1.14mm) | 979.0114.000 | 979.0114.00+ | 981.0114.000 | 983.0114.000 |
| Gray/gray | 0.050" (1.29mm) | 979.0129.000 | 979.0129.00+ | 981.0129.000 | 983.0129.000 |
| Yellow/yellow | 0.055" (1.42mm) | 979.0142.000 | 979.0142.00+ | 981.0142.000 | 983.0142.000 |
| Yellow/blue | 0.060" (1.52mm) | 979.0152.000 | 979.0152.00+ | 981.0152.000 | 983.0152.000 |
| Blue/blue | 0.065" (1.65mm) | 979.0165.000 | 979.0165.00+ | 981.0165.000 | 983.0165.000 |
| Green/green | 0.070" (1.85mm) | 979.0185.000 | 979.0185.00+ | 981.0185.000 | 983.0185.000 |
| Purple/purple | 0.080" (2.05mm) | 979.0205.000 | 979.0205.00+ | 981.0205.000 | 983.0205.000 |
| Purple/black | 0.095" (2.29mm) | 979.0229.000 | 979.0229.00+ | 981.0229.000 | 983.0229.000 |
| Purple/orange | 0.100" (2.54mm) | 979.0254.000 | 979.0254.00+ | 981.0254.000 | 983.0254.000 |
| Purple/white | 0.110" (2.79mm) | 979.0279.000 | 979.0279.00+ | 981.0279.000 | 983.0279.000 |

| 401U specifications | | | | |
|------------------------------------|-----------------------|---------------|--------------|------------------------------------|
| Weight | Operating temperature | Control ratio | Noise | Standards |
| 2.2lbs | 5-40C | 10:1 | <70dBA at 1m | CE, BS0800, IEC335-1, EN60529 IP21 |
| Supply through a mains transformer | | 15VAC | | |



400

SERIES



403U/R1

403U/R1, 403U/L and 403U/L2 auto/manual control compact pumps

- The 403U/R1 produces single channel flows from 0.06 to 150ml/min
- The 403U/L produces low-pulsing, single channel flows from 0.11 to 180ml/min
- The 403U/L2 produces dual channel flows up to 92ml/min per channel
- Digital speed control via top panel mounted keypad
- Reversible motor for easy fluid recovery
- "Max" high speed priming function

The 403U/R1, 403U/L and 403U/L2 are precision manual/auto-control pumps which use 1/16" (1.6mm) wall tubing. All have spring-loaded tracks to maximize tube life and flow precision against pressures up to 30 psi (2 bar).

403 low-flow models provide speeds up to 50rpm, 405 high-flow models up to 200rpm. All pumpheads have transparent polyester resin (PET) guards.

20:1 speed control. R1 single channel four-roller pumphead accepts up to 1/4" (6.4mm) bore tubing. L2 dual channel or "L" low pulsing Y element option up to 3/16" (4.8mm) bore with twin, precision offset aluminum rotors with four stainless steel rollers. All pumps accept 4-20mA or 0-10V analog signals and remote TTL (PLC compatible) start/stop and CCW/CW switching. Two year comprehensive warranty.



403U/L



405U/R1

405U/R1, 405U/L and 405U/L2 manual/auto control high-flow pumps

- The 405U/R1 produces single channel flows from 0.44 to 610ml/min
- The 405U/L produces low-pulsing, single channel flows from 0.86 to 730ml/min
- The 405U/L2 produces dual channel flows up to 370ml/min per channel
- Digital speed control via front panel mounted keypad
- Reversible motor for easy fluid recovery
- "Max" high speed priming function

The 405U/R1, 405U/L and 405U/L2 pumps are precision manual/auto-control pumps which use 1/16" (1.6mm) wall tubing. All have spring-loaded tracks to maximize tube life and flow precision against pressures up to 30 psi (2 bar).

10:1 speed control. R1 single channel four-roller pumphead accepts up to 1/4" (6.4mm) bore tubing. L2 dual channel or "L" low pulsing Y element option up to 3/16" (4.8mm) bore with twin, precision offset aluminum rotors with four stainless steel rollers. All pumps accept 4-20mA or 0-10V analog signals and remote TTL (PLC compatible) start/stop and CCW/CW switching. Two year comprehensive warranty.



405U/L





403U/L2

| 403U and 405U flow rates per channel (ml/min) | | | | | | | | | |
|---|--------------|----------|----------|---------|--------|--------|---------|---------|---------|
| Pump | Speed range | 1/50" | 1/32" | 1/16" | 3/32" | 1/8" | 5/32" | 3/16" | 1/4" |
| | | 0.5mm | 0.8mm | 1.6mm | 2.4mm | 3.2mm | 4.0mm | 4.8mm | 6.4mm |
| 403U/R1 | 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 |
| 403U/L | 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 | |
| 403U/L2 | 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 | |
| 405U/R1 | 20 to 200rpm | 0.44-4.4 | 1.1-11 | 4.4-44 | 9.8-98 | 17-170 | 26-260 | 37-370 | 61-610 |
| 405U/L | 20 to 200rpm | 0.86-8.6 | 2.2-22 | 8.8-88 | 20-200 | 34-340 | 52-520 | 73-730 | |
| 405U/L2 | 20 to 200rpm | 0.44-4.4 | 1.1-11 | 4.4-44 | 9.8-98 | 17-170 | 26-260 | 37-370 | |

Ordering information

| Pump | Speed range | Description | Supply | Product code |
|---------|--------------|-------------------------------|----------------------|--------------|
| 403U/R1 | 2.5 to 50rpm | Single channel low flow pump | 100-120V 50/60Hz 1ph | 040.3K1R.01A |
| 403U/L | 2.5 to 50rpm | Y-element low flow pump | | 040.3K1L.01A |
| 403U/L2 | 2.5 to 50rpm | Dual channel low flow pump | | 040.3K1L.02A |
| 405U/R1 | 20 to 200rpm | Single channel high flow pump | | 040.5S1R.01A |
| 405U/L | 20 to 200rpm | Y-element high flow pump | | 040.5S1L.01A |
| 405U/L2 | 20 to 200rpm | Dual channel high flow pump | | 040.5S1L.02A |

Remote switching cables for 403U and 405U

| | Product code | |
|--------|--|--------------|
| 400AC1 | 0-10V CW/Stop/CCW 3.45 feet (1.5m) remote cable | 049.0011.00A |
| 400AC2 | 4-20mA CW/Stop/CCW 3.45 feet (1.5m) remote cable | 049.0031.00A |
| 400AC3 | CW/Stop/CCW 3.45 feet (1.5m) remote cable | 049.0051.00A |
| 400AC4 | Start/Stop 10 feet (3m) remote cable with foot switch fitted | 049.0071.00A |

Tubing for R1 and L2 pumpheads

| Bore | # | Bioprene | Marprene | Platinum silicone |
|---------------|-----|--------------|--------------|-------------------|
| 1/50" (0.5mm) | 112 | 903.0005.016 | 902.0005.016 | 913.A005.016 |
| 1/32" (0.8mm) | 13 | 903.0008.016 | 902.0008.016 | 913.A008.016 |
| 1/16" (1.6mm) | 14 | 903.0016.016 | 902.0016.016 | 913.A016.016 |
| 3/32" (2.4mm) | | | 902.0024.016 | 913.A024.016 |
| 1/16" (3.2mm) | 16 | 903.0032.016 | 902.0032.016 | 913.A032.016 |
| 5/32" (4.0mm) | | | 902.0040.016 | 913.A040.016 |
| 3/16" (4.8mm) | 25 | 903.0048.016 | 902.0048.016 | 913.A040.016 |
| 1/4" (6.4mm) | 17 | 903.0064.016 | 902.0064.016 | 913.A064.016 |

| Bore | # | Neoprene | Sta-Pure | Chem-Sure | PVC |
|---------------|----|--------------|--------------|--------------|--------------|
| 1/32" (0.8mm) | 13 | 920.0008.016 | | | |
| 1/16" (1.6mm) | 14 | 920.0016.016 | 960.0016.016 | 965.0016.016 | 950.0016.016 |
| 1/16" (3.2mm) | 16 | 920.0032.016 | 960.0032.016 | 965.0032.016 | 950.0032.016 |
| 3/16" (4.8mm) | 25 | 920.0048.016 | 960.0048.016 | 965.0048.016 | 950.0048.016 |
| 1/4" (6.4mm) | 17 | 920.0064.016 | 960.0064.016 | 965.0064.016 | 950.0064.016 |

Y-elements for L pumphead

| Bore | Marprene | Platinum Silicone |
|---------------|--------------|-------------------|
| 1/16" (1.6mm) | 902.E016.016 | 913.AE16.016 |
| 3/32" (2.4mm) | 902.E024.016 | 913.AE24.016 |
| 1/16" (3.2mm) | 902.E032.016 | 913.AE32.016 |
| 3/16" (4.8mm) | 902.E048.016 | 913.AE48.016 |

403U and 405U specifications

| | 403U | 405U |
|-----------------------|--------------------------------------|--------|
| Weights | 5.5lbs | 7.7lbs |
| Power | 13VA | 30VA |
| Supply | 100-120V 50/60Hz 1ph | |
| Operating temperature | 5-40C | |
| Control ratio | 10:1 | |
| Noise | <70dBA at 1m | |
| Standards | BS0800, IEC335-1, EN60529 (IP21), CE | |



405U/L2

400

SERIES



403U/VM2



401U/VM3



401U/VM4

403U/VM2, 403U/VM3 and 403U/VM4 auto/manual control compact pumps

- VM2 pumphead provides two channels, VM3 three channels and VM4 four channels
- Flow rates from 0.001 to 17ml/min per channel
- Ten stainless-steel rollers with low-friction bearings
- Digital speed control via top panel mounted keypad
- Reversible with Max priming function

403U/VM pumps provide extremely accurate multi-channel pumping, having spring-loaded tracks with individual occlusion adjustment. The VM rotor has stainless-steel low-friction rollers for low pulsation and repeatable flow rates. The fixed position clamping block provides easy tube loading and removal. Pumpheads accept standard two-bridge manifold tubing.

With 20:1 speed control, the 0.5 to 10rpm drive provides low flow accuracy and the 2.5 to 50rpm drive provides higher flows. All pumps accept 4-20mA or 0-10V analog signals and remote low voltage or TTL (PLC compatible) start/stop and direction switching. Two year comprehensive warranty.



Flow rates per channel for 403U/VM2, 403U/VM3 and 403U/VM4 pumpheads (ml/min)

| Color | Orange/Black | Orange/Red | Orange/Blue | Orange/Green | Orange/Yellow |
|---------------------|---------------|---------------|---------------|---------------|---------------|
| Bore | 0.005" | 0.007" | 0.010" | 0.015" | 0.020" |
| | 0.13mm | 0.19mm | 0.25mm | 0.38mm | 0.50mm |
| 0.5 to 10rpm | 0.001-0.01 | 0.001-0.03 | 0.002-0.04 | 0.005-0.1 | 0.01-0.2 |
| 2.5 to 50rpm | 0.003-0.06 | 0.006-0.13 | 0.011-0.2 | 0.025-0.5 | 0.04-0.9 |

| Color | Orange/White | Black/Black | Orange/Orange | White/White | Red/Red |
|---------------------|---------------|---------------|---------------|---------------|---------------|
| Bore | 0.025" | 0.030" | 0.035" | 0.040" | 0.045" |
| | 0.63mm | 0.76mm | 0.88mm | 1.02mm | 1.14mm |
| 0.5 to 10rpm | 0.01-0.3 | 0.02-0.4 | 0.03-0.5 | 0.03-0.7 | 0.04-0.9 |
| 2.5 to 50rpm | 0.07-1.4 | 0.10-2.0 | 0.13-2.6 | 0.17-3.5 | 0.21-4.3 |

| Color | Gray/Gray | Yellow/Yellow | Yellow/Blue | Blue/Blue | Green/Green |
|---------------------|---------------|---------------|---------------|---------------|---------------|
| Bore | 0.050" | 0.055" | 0.060" | 0.065" | 0.070" |
| | 1.29mm | 1.42mm | 1.52mm | 1.65mm | 1.85mm |
| 0.5 to 10rpm | 0.05-1.1 | 0.06-1.3 | 0.07-1.4 | 0.08-1.7 | 0.10-2.0 |
| 2.5 to 50rpm | 0.27-5.4 | 0.32-6.4 | 0.36-7.2 | 0.41-8.3 | 0.50-10.0 |

| Color | Purple/Purple | Purple/Black | Purple/Orange | Purple/White |
|---------------------|---------------|---------------|---------------|---------------|
| Bore | 0.080" | 0.095" | 0.100" | 0.110" |
| | 2.05mm | 2.38mm | 2.54mm | 2.79mm |
| 0.5 to 10rpm | 0.12-2.3 | 0.14-2.7 | 0.16-3.1 | 0.17-3.4 |
| 2.5 to 50rpm | 0.59-12 | 0.69-14 | 0.78-16 | 0.85-17 |

Ordering information

| Pump | Speed range | Description | Supply | Product code |
|----------|-------------|----------------------------------|----------------------|--------------|
| 403U/VM2 | 0.5-10rpm | Dual channel manifold tube pump | 100-120V 50/60Hz 1ph | 040.371V.M2A |
| 403U/VM2 | 2.5-50rpm | | | 040.3K1V.M2A |
| 403U/VM3 | 0.5-10rpm | Three channel manifold tube pump | 100-120V 50/60Hz 1ph | 040.371V.M3A |
| 403U/VM3 | 2.5-50rpm | | | 040.3K1V.M3A |
| 403U/VM4 | 0.5-10rpm | Four channel manifold tube pump | 100-120V 50/60Hz 1ph | 040.371V.M4A |
| 403U/VM4 | 2.5-50rpm | | | 040.3K1V.M4A |

Remote switching cables for 403U

| | | Product code |
|--------|--|--------------|
| 400AC1 | 0-10V CW/Stop/CCW 3.45 feet (1.5m) remote cable | 049.0011.00A |
| 400AC2 | 4-20mA CW/Stop/CCW 3.45 feet (1.5m) remote cable | 049.0031.00A |
| 400AC3 | CW/Stop/CCW 3.45 feet (1.5m) remote cable | 049.0051.00A |
| 400AC4 | Start/Stop 10 feet (3m) remote cable with foot switch fitted | 049.0071.00A |

Manifold pump tubing for 403U/VM2, 403U/VM3 and 403U/VM4

| Color code | Tube bore | Marprene | PVC | Silicone | Solvent resistant | Acid resistant |
|---------------|-----------------|--------------|--------------|--------------|-------------------|----------------|
| Orange/black | 0.005" (0.13mm) | | 980.0013.000 | | 984.0013.000 | |
| Orange/red | 0.007" (0.19mm) | | 980.0019.000 | | 984.0019.000 | |
| Orange/blue | 0.010" (0.25mm) | 978.0025.000 | 980.0025.000 | | 984.0025.000 | |
| Orange/green | 0.015" (0.38mm) | 978.0038.000 | 980.0038.000 | | 984.0038.000 | |
| Orange/yellow | 0.020" (0.50mm) | 978.0050.000 | 980.0050.000 | | 984.0050.000 | 986.0050.000 |
| Orange/white | 0.025" (0.63mm) | 978.0063.000 | 980.0063.000 | 982.0063.000 | 984.0063.000 | 986.0063.000 |
| Black/black | 0.030" (0.76mm) | 978.0076.000 | 980.0076.000 | 982.0076.000 | 984.0076.000 | 986.0076.000 |
| Orange/orange | 0.035" (0.88mm) | 978.0088.000 | 980.0088.000 | 982.0088.000 | 984.0088.000 | 986.0088.000 |
| White/white | 0.040" (1.02mm) | 978.0102.000 | 980.0102.000 | 982.0102.000 | 984.0102.000 | 986.0102.000 |
| Red/red | 0.045" (1.14mm) | 978.0114.000 | 980.0114.000 | 982.0114.000 | 984.0114.000 | 986.0114.000 |
| Gray/gray | 0.050" (1.29mm) | 978.0129.000 | 980.0129.000 | 982.0129.000 | 984.0129.000 | 986.0129.000 |
| Yellow/yellow | 0.055" (1.42mm) | 978.0142.000 | 980.0142.000 | 982.0142.000 | 984.0142.000 | 986.0142.000 |
| Yellow/blue | 0.055" (1.52mm) | 978.0152.000 | 980.0152.000 | 982.0152.000 | 984.0152.000 | 986.0152.000 |
| Blue/blue | 0.065" (1.65mm) | 978.0165.000 | 980.0165.000 | 982.0165.000 | 984.0165.000 | 986.0165.000 |
| Green/green | 0.070" (1.85mm) | 978.0185.000 | 980.0185.000 | 982.0185.000 | 984.0185.000 | 986.0185.000 |
| Purple/purple | 0.080" (2.05mm) | 978.0205.000 | 980.0205.000 | 982.0205.000 | 984.0205.000 | 986.0205.000 |
| Purple/black | 0.090" (2.29mm) | 978.0229.000 | 980.0229.000 | 982.0229.000 | 984.0229.000 | 986.0229.000 |
| Purple/orange | 0.100" (2.54mm) | 978.0254.000 | 980.0254.000 | 982.0254.000 | 984.0254.000 | 986.0254.000 |
| Purple/white | 0.110" (2.79mm) | 978.0279.000 | 980.0279.000 | 982.0279.000 | 984.0279.000 | 986.0279.000 |

* For autoclavable Marprene tubing, please replace last "0" with "+" - for example 978.0238.00+

403U specifications

| | |
|-----------------------|--------------------------------------|
| Weight | 5.5lbs |
| Power | 13VA |
| Supply | 100-120V 50/60Hz 1ph |
| Operating temperature | 5-40C |
| Control ratio | 20:1 |
| Noise | <70dBA at 1m |
| Standards | BS0800, IEC335-1, EN60529 (IP21), CE |

500

SERIES



505Dz/RL

505Dz/RL high-speed, low cost dispenser

- Dispenses 100ml in less than 2 seconds
- Accurate to within +/- 1 percent
- High-accuracy micro-processor control
- Menu driven for simple operation
- Easy-loading 501RL pumphead accepts seven tube sizes without adjustment



For precise dispensing up to 3.0 liters/minute without the need for stored programs or printed records, the 505Dz/RL is triggered from the front panel or a footswitch or handswitch. Menus allow fast setting of the required dose volume, the number of doses and the interval between each one. An adjustable soft-start "ramp" can be programmed to prevent splashing.

High-speed, high-torque motor provides instant stop, and the suck back facility eliminates drips at the end of each dose.

Menus in English, French and German are built-in. Voltage switchable between 100-120V 50/60Hz and 220-240V 50/60Hz. Three-year comprehensive warranty.

| Recommended dose sizes (ml) | | | | | | | |
|-----------------------------|-------|-------|-------|-------|-------|-------|-------|
| Tube bore | 1/50" | 1/32" | 1/16" | 1/8" | 3/16" | 1/4" | 3/8" |
| | 0.5mm | 0.8mm | 1.6mm | 3.2mm | 4.8mm | 6.4mm | 8.0mm |
| Minimum dose | 0.2ml | 0.7ml | 2.5ml | 10ml | 20ml | 35ml | 50ml |
| Maximum dose | 1.0ml | 30ml | 11ml | 45ml | 100ml | 150ml | 250ml |

| 505Dz/RL flow rates (ml/min) | | | | | | | |
|------------------------------|-----------|---------|----------|---------|--------|-----------|---------|
| Tube bore | 1/50" | 1/32" | 1/16" | 1/8" | 3/16" | 1/4" | 3/8" |
| | 0.5mm | 0.8mm | 1.6mm | 3.2mm | 4.8mm | 6.4mm | 8.0mm |
| 2.0-300rpm | 0.08-12.5 | 0.24-37 | 0.85-128 | 3.7-560 | 8-1210 | 12.7-1900 | 20-3000 |

| 505Dz/RL ordering information | | |
|-------------------------------|-------------------------------------|--------------|
| Speed range | Supply | Product code |
| 2.0-300rpm | 100-120V/220-240V 50/60Hz 1ph 100VA | 050.4661.LOA |

| Tubing for 505Dz/RL | | | | | | | |
|---------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| Bore | 1/50" | 1/32" | 1/16" | 1/8" | 3/16" | 1/4" | 3/8" |
| | 0.5mm | 0.8mm | 1.6mm | 3.2mm | 4.8mm | 6.4mm | 8.0mm |
| Bioprene | 903.0005.016 | 903.0008.016 | 903.0016.016 | 903.0032.016 | 903.0048.016 | 903.0064.016 | 903.0080.016 |
| Marpene | 902.0005.016 | 902.0008.016 | 902.0016.016 | 902.0032.016 | 902.0048.016 | 902.0064.016 | 902.0080.016 |
| Sta-Pure | | 960.0016.016 | 960.0032.016 | 960.0048.016 | 960.0064.016 | 960.0080.016 | |
| Platinum silicone | 913.A005.016 | 913.A008.016 | 913.A016.016 | 913.A032.016 | 913.A048.016 | 913.A064.016 | 913.A080.016 |
| Neoprene | | 920.0008.016 | 920.0016.016 | 920.0032.016 | 920.0048.016 | 920.0064.016 | 920.0080.016 |
| PVC | | | 950.0016.016 | 950.0032.016 | 950.0048.016 | 950.0064.016 | 950.0080.016 |
| Chem-Sure | | | 965.0016.016 | 965.0032.016 | 965.0048.016 | 965.0064.016 | 965.0080.016 |

| 505Dz/RL specifications | |
|-------------------------|------------------------------|
| Maximum speed | 300rpm |
| Weight | 24.2lbs |
| Dimensions (inches) | H4.7 x W8.7 X L12.6 |
| Menu languages | English, French, German |
| Standards | IEC 335-1, EN60529 (IP31) CE |



Filling needles

Dispensing accessories

Watson-Marlow Bredel dispensing accessories can tailor-make a complete dispensing system for any individual application.

Two sets of stainless steel filling needles are available with two alternative stainless steel filling stands which accept a variety of bottle sizes and come complete with a holder for the filling needles. Pumping can be activated by a proximity sensor available for either of the filling stands and automatically triggers a fill when a bottle is in place.

Footswitches and handswitches for the 505Dz and 505WDS are also available.

If you are not using a filling stand, you may choose to use one of the hand held lances specifically designed for our dispensing system filling needles. Each lance has a built-in switch.



Filling stand

| Accessory | Description | Product code |
|---|--|--------------|
| Accessories for 505Di/L dispensers | | |
| 505AF | Footswitch for 505Di | 059.3001.000 |
| 505AH | Handswitch for 505Di | 059.3011.000 |
| 505AL | Dispensing lance | 059.5051.000 |
| 505AV | Proximity switch | 059.5071.000 |
| 505AS | Filling stand | 059.5001.000 |
| 505AFN | Filling needle set | 059.5101.000 |
| | Filling needle $\frac{1}{16}$ " (1.6mm) bore | 059.5100.016 |
| | Filling needle $\frac{1}{8}$ " (3.2mm) bore | 059.5100.032 |
| | Filling needle $\frac{3}{16}$ " (4.8mm) bore | 059.5100.048 |
| | Filling needle $\frac{1}{4}$ " (6.4mm) bore | 059.5100.064 |
| | Filling needle $\frac{3}{8}$ " (8.0mm) bore | 059.5100.080 |
| Accessories for 505XY, and 505WDS | | |
| 505AP | Printer and universal cable for 505Di | 059.3201.000 |
| 505LTC | Tube clamps set for 505Di/L | 059.4001.000 |



505WDS

505WDS weigh-dosing system

The Watson-Marlow Bredel 505WDS is an important breakthrough in linking peristaltic dispensing to high-speed balances. The 505WDS is a complete dispensing system comprising a low-pulsation peristaltic pump, high-speed digital balance and printer, or the pump can be purchased separately for use with any Sartorius LC series or Mettler PM series balance.

- 600 doses of 50g per hour
- Dispenses 50g in less than 6 seconds
- Every dose is checked by the balance and optionally dumped to the printer
- Microprocessor controlled 32-character menus in English, French or German
- Programs in ml or g can be recorded and recalled
- Up to 9999 doses can be programmed
- Dispensing accuracy of +/- 0.5 percent

The 505L low-pulsation pumphead accepts food and medical quality silicone and Bioprene, or food quality Marprene tubing elements for volumes from microliters to liters. All elements are autoclavable.

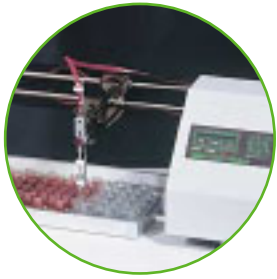
English, French or German language menus can be chosen and up to twenty-six programs can be recorded and recalled.

| Recommended dose sizes (ml) | | | | | | | |
|-----------------------------|--------------|-------|-------|-------|-------|-------|-------|
| Tube # | 119 | 120 | 15 | 24 | 121 | 122 | |
| Tube bore | 1/16" | 1/8" | 3/16" | 1/4" | 5/16" | 3/8" | |
| Maximum speed | 1.6mm | 3.2mm | 4.8mm | 6.4mm | 8.0mm | 9.6mm | |
| 350rpm | Minimum dose | 4ml | 13ml | 25ml | 40ml | 50ml | 70ml |
| | Maximum dose | 20ml | 65ml | 125ml | 200ml | 250ml | 360ml |

| Ordering Information | | |
|--|-------------------------------------|--------------|
| Model /Description | Power Supply | Product code |
| 505WDS System Consisting of: | 100-120V/220-240V 50/60Hz 1ph 100VA | 059.6001.000 |
| <ul style="list-style-type: none"> • 505WDI/L Dispensing Pump Drive • Sartorius Balance LP4200S • Interface Kit • Printer • Printer Cable | | |
| 505WDS Dispensing Drive | 100-120V/220-240V 50/60Hz 1ph 100VA | 056.4742.000 |
| Interface Kit | | 059.6201.00A |
| Printer | 100-120V/220-240V 50/60Hz 1ph 100VA | 059.6251.000 |
| Printer | | MNA0406A |

| Tubing for 505WDS weigh dosing system | | | | | | |
|---------------------------------------|--------------|--------------|--------------|--------------|--------------|--------------|
| "Double Y" tubing elements | | | | | | |
| Tube bore | 1/16" | 1/8" | 3/16" | 1/4" | 5/16" | 3/8" |
| | 1.6mm | 3.2mm | 4.8mm | 6.4mm | 8.0mm | 9.6mm |
| Silicone | 910.AE16.024 | 910.AE32.024 | 910.AE48.024 | 910.AE64.024 | 910.AE80.024 | 910.AE96.024 |
| Marprene | 902.E016.024 | 902.E032.024 | 902.E048.024 | 902.E064.024 | 902.E080.024 | 902.E096.024 |

| Transfer tubing | | | | | | |
|------------------------------------|--------------|--------------|--------------|--------------|--------------|--------------|
| 3/32" (2.4mm) wall transfer tubing | | | | | | |
| Tube # | 119 | 120 | 15 | 24 | 121 | 122 |
| Tube bore | 1/16" | 1/8" | 3/16" | 1/4" | 5/16" | 3/8" |
| | 1.6mm | 3.2mm | 4.8mm | 6.4mm | 8.0mm | 9.6mm |
| Product codes Silicone | 910.A016.024 | 910.A032.024 | 910.A048.024 | 910.A064.024 | 910.A080.024 | 910.A096.024 |
| Marprene | 902.0016.024 | 902.0032.024 | 902.0048.024 | 902.0064.024 | 902.0080.024 | 902.0096.024 |



505XY

The 505 XY Robotic Bottle Filling System

505XY is a complete system that makes mass bottle filling effortless. The system consists of the 505XY robot to position the filling tip, and the 505Di/L high-speed dispenser. The robot is user-programmable, to adapt to a wide variety of trays, and bottle types. Start the system running and it automatically fills a complete tray of vials. The pump can be programmed for the desired fill volume up to 9.999 liters.

Trays are available for a wide variety of bottle sizes, and the robot arm is suitable for bottles up to a maximum height of 200mm and a minimum neck size of 6.5mm with a maximum of 99 rows or columns. Up to 99 fill patterns of either straight rows or honeycomb can be memorized by the XY Robot.

The pump is accurate to +/- 0.5% of fill volume, and pumps at a rate of up to 4 liters per minute with the largest tube size.

Ordering Information

| Model /Description | Power Supply | Product code |
|------------------------------------|-------------------------------------|--------------|
| 505XY System Consisting of: | 100-120V/220-240V 50/60Hz 1ph 100VA | 505XY |

- 505Di/L dispensing Pump
- 505XY Robot
- Interface Kit

Accessories for 505XY robotic bottle filler

XY Module Sectioned Trays

All sectioned container trays for the XY Module are 15.75 x 9.825 inches (L x D) and are made of anodized aluminum (18g).

Details of stainless steel trays are available.

| To fit diameter | Capacity | Product codes |
|-----------------|----------|---------------|
| 0.475" (12mm) | 570 | 059.7032.000 |
| 0.500" (13mm) | 522 | 059.7034.000 |
| 0.550" (14mm) | 416 | 059.7036.000 |
| 0.620" (16mm) | 322 | 059.7040.000 |
| 0.700" (18mm) | 273 | 059.7042.000 |
| 0.800" (20mm) | 228 | 059.7044.000 |
| 0.950" (24mm) | 160 | 059.7046.000 |
| 1.199" (30mm) | 104 | 059.7050.000 |
| 1.250" (32mm) | 77 | 059.7052.000 |
| 1.400" (36mm) | 60 | 059.7054.000 |
| 1.580" (40mm) | 54 | 059.7056.000 |
| 1.920" (49mm) | 40 | 059.7060.000 |

Recommended dose sizes (ml)

| Tube # | 119 | 120 | 15 | 24 | 121 | 122 |
|----------------------|-------|-------|-------|-------|-------|-------|
| Tube bore | 1/16" | 1/8" | 3/16" | 1/4" | 5/16" | 3/8" |
| Maximum speed | 1.6mm | 3.2mm | 4.8mm | 6.4mm | 8.0mm | 9.6mm |
| 350rpm | | | | | | |
| Minimum dose | 4ml | 13ml | 25ml | 40ml | 50ml | 70ml |
| Maximum dose | 20ml | 65ml | 125ml | 200ml | 250ml | 360ml |

Tubing for 505XY Robotic Filling System

"Double Y" tubing elements

| Tube bore | 1/16" | 1/8" | 3/16" | 1/4" | 5/16" | 3/8" |
|-------------------------------|--------------|--------------|--------------|--------------|--------------|--------------|
| | 1.6mm | 3.2mm | 4.8mm | 6.4mm | 8.0mm | 9.6mm |
| Product codes Silicone | 910.AE16.024 | 910.AE32.024 | 910.AE48.024 | 910.AE64.024 | 910.AE80.024 | 910.AE96.024 |
| Marprene | 902.E016.024 | 902.E032.024 | 902.E048.024 | 902.E064.024 | 902.E080.024 | 902.E096.024 |

Transfer tubing

2.4mm wall tubing for 505Di/L, 313D2 and 314D2 pumpheads

| Tube # | 119 | 120 | 15 | 24 | 121 | 122 |
|-------------------------------|--------------|--------------|--------------|--------------|--------------|--------------|
| Tube bore | 1/16" | 1/8" | 3/16" | 1/4" | 5/16" | 3/8" |
| | 1.6mm | 3.2mm | 4.8mm | 6.4mm | 8.0mm | 9.6mm |
| Product codes Silicone | 910.A016.024 | 910.A032.024 | 910.A048.024 | 910.A064.024 | 910.A080.024 | 910.A096.024 |
| Marprene | 902.0016.024 | 902.0032.024 | 902.0048.024 | 902.0064.024 | 902.0080.024 | 902.0096.024 |

Tube selection guide

CHOOSING THE BEST TUBE

Watson-Marlow Bredel tubing is available in seven materials and over forty sizes, giving an extraordinary range of chemical and application capability. Watson-Marlow Bredel pumps are designed to use Watson-Marlow Bredel tubing tolerances and performance, and no other tubing will provide comparable results.

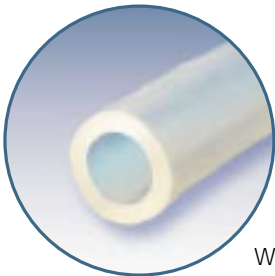
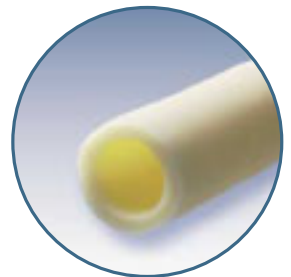
The tubing largely dictates pump performance: Its restitution creates suction, its strength resists pressure, its flex resistance determines pumping life, its bore defines the flow rate, and its wall thickness controls pumping efficiency.



Marprene is Watson-Marlow Bredel's exclusive thermoplastic elastomer.

Always our first recommendation. Marprene is the longest life tubing with a wide chemical compatibility, and is highly resistant to oxidizing agents such as ozone and peroxides and sodium hypochlorite. Marprene is beige in color, opaque to both visible and ultra-violet light with low permeability to gases such as oxygen, carbon dioxide and nitrogen, and meets USDA standards for food handling. Working temperature range 40F to 175F. Autoclavable.

Bioprene has the same long life as Marprene but complies with USP Class VI, FDA requirements 21 CFR 177.2600 and NSF and USDA standards for food handling. It has a wide chemical compatibility, and can handle repeated autoclaving. Bioprene can be sterilized by ethylene oxide or gamma irradiation. Working temperature range 40F to 175F. Beige. Available in 15 meter packs only.



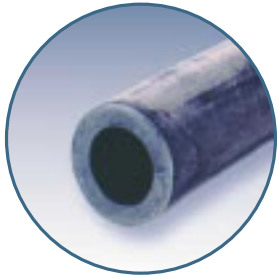
Silicone is the standard laboratory tubing used for small bore sizes up to 3/8" (9.6mm). Food and medical quality, meets USP and NSF Class VI standards and autoclavable.

Watson-Marlow offers a specially developed **platinum-cured silicone tubing** for additional protection from contamination during the pumping process. Platinum-cured tubing produces a smoother surface, less protein binding offers high levels of purity. It is ideal for medical devices, chemical analysis and pharmaceutical production applications, particularly where there is long term contact with the process fluid. Working temperature range -4F to 175F. High permeability to oxygen. Translucent. Autoclavable.

Sta-Pure has a unique composite construction of silicone in a PTFE lattice giving it superior burst resistance up to 100 psi (7bar) and 18 times longer life than silicone tubing. It produces virtually no spalling, is USP Class VI approved and is classified as non toxic. Working temperature range 32F to 175F. Opaque white. Autoclavable, SIP and CIP compatible.

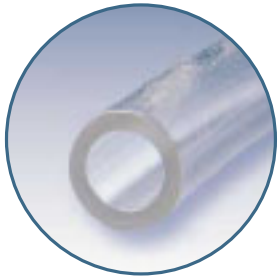


Chem-Sure is effectively pumpable PTFE - a high performance composite of PTFE and a high-grade fluoroelastomer - offering extraordinary chemical resistance, long life and very high burst pressures. Chem-Sure is USP Class VI and food grade approved making it suitable for foods and pharmaceuticals as well as aggressive chemicals



Neoprene tubing

Neoprene offers excellent performance with abrasive slurries and sustained pressure applications. Good suction and pressure capabilities. Food quality. Most often used in bore sizes greater than 1/2" (12.7mm). Working temperature range 32F - 175F. Black.



PVC tubing

PVC has a high Shore hardness giving excellent pressure and suction performance and low gas permeability. FDA approved for use with food and is NFS listed. Working temperature range 70F - 140F. Glass clear

The best way to select a tube is to first decide which materials are chemically suitable, and then choose the one which best meets the physical demands of the application.

Normally, use the longest tube life material, which will usually be Bioprene or Marprene if they are chemically and physically suitable. Otherwise, silicone tubing is most often chosen for sizes up to 3/8" (9.6mm), and Neoprene tubing for bore sizes of 1/2" (12.7mm) or more.

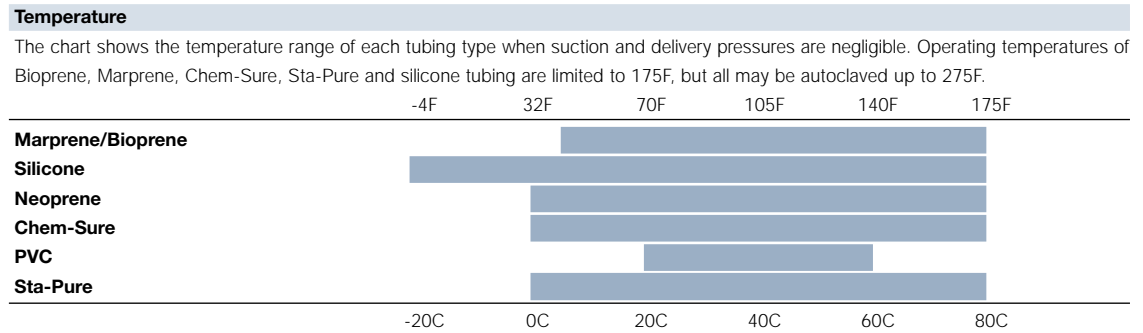
For maximum tube life, use a large bore tube at low speed. For maximum flow rate use the largest tube at maximum speed. For maximum accuracy, use a small bore tube at maximum speed.

Suction lift depends on the tube restituting fully before the advance of the next roller. If it does not, the flow rate will be reduced. For maximum suction lift or pressure, use the smallest practicable bore size of tubing and run the pump at the slowest possible speed.

CHECKING YOUR CHOICE WITH AN IMMERSION TEST

Always conduct an immersion test before choosing a tube material for critical applications. Immerse a short length of the tubing or a disk of rubber sample (always available from Watson-Marlow Bredel or its distributors) in a closed container of the fluid for 48 hours, and then examine for signs of attack, swelling, embrittlement or other deterioration.

PHYSICAL COMPATIBILITY



TUBE LIFE

TUBE LIFE



VISCOSITY

The flow rates given in this brochure are valid for fluids with viscosities in the range 1 to 100 centipoise. Increased fluid viscosity will result in decreased flow rate. Choose a tubing with as large a wall thickness as possible, which could, for instance, mean using a 300 series pump which user greater wall thickness tubing, rather than a 200 series pump.

Contact Watson-Marlow Bredel or its local distributor for advice on specific applications.



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Members of the Spirax-Sarco Engineering Group

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WARNING
These products are not designed for use in, and should not be used for, patient connected applications.

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STA-PURE and CHEM-SURE are trademarks of W.L. Gore & Associates inc.



HBO161



Pump Series Flow Rates

| | | | |
|------------|---|---------------------------------|-------|
| 200 | Near pulseless, multi-channel pumps with up to 32 channels. | 0.6µl/min - 22ml/min | 205U |
| 300 | Single or multi-channel pumps with manual, remote or dispensing control. | 2µl/min - 2 liters/min | 313U |
| 400 | Instrument-quality, ultra-precise, single and multi-channel pumps with manual or process control. | 1µl/min - 730ml/min | 405U |
| 500 | Microprocessor controlled dispensing pumps and systems. | 0.02ml/min - 3.0 liters/min max | 505DZ |

Put a peristaltic pump in your lab **Improve your performance**



PROFILE OF FLOW RATE AGAINST TIME

The flow rate of all peristaltic pump tubing will reduce over time, with the majority of the change occurring in the first hours and days of use, after which the flow rate will stabilize. Maximum accuracy of metering and dosing will be obtained during this period of stability. Where precise flow rates are required, it is recommended that the flow rate is calibrated after at least a one hour running-in period.

FLOW RATES

All flow rates given in this brochure were obtained pumping water at 68F (20C) with zero suction and delivery heads. PVC tubing was used to obtain the 200 series flow rates. All other flow rates were obtained using silicone tubing.

OPERATING AND STORAGE TEMPERATURES

Unless otherwise stated, all pumps listed in this brochure may be operated at ambient temperatures between 41F and 104F (5C and 40C). They may be stored at temperatures between -40F and 158F (-40C and 70C), but allow time for acclimatization before operating.

STANDARDS

CE Meets all relevant directives

EN601010 is the European Norm standard dealing with "Safety requirements for electrical equipment for measurement, control and laboratory use".

IEC 335-1 is the International Electrotechnical Commission standard dealing with the "Safety of household and similar appliances, general requirements". Equivalents are BS3456: Part 101 and DIN VDE 0700: Part 1).

EN60529 is the European Norm standard dealing with the "Classification of degrees of protection provided by enclosures for rotating machines. Equivalents are BS 4999: Part 105, IEN 60 034: Part 5, and DIN VDE 0530: Part 5. IP numbers (such as IP34, IP42, IP55) indicate the degree of ingress protection of the product, with the first digit indicating protection against the ingress of objects, and the second digit indicating the degree of protection against the ingress of water.

SPARE PARTS AVAILABILITY

Watson-Marlow Bredel's policy is to provide spare parts for all products for a minimum of seven years from discontinuation. The ability to implement this policy is not entirely within Watson-Marlow Bredel's control and cannot be guaranteed, but every effort will be made to honor this policy.

Watson-Marlow Bredel Pumps

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