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HB0208



# 620 SERIES PUMPS

**NEW**

Controlled power

Industrial strength pumps with unrivalled precision

Order information			
NEMA 4X pumps	Specification	Pumphead	Product Number
620S/R	NEMA 4X, 0-265rpm	620R head, 0-30psi, continuous tubing	060.413N.02A
620S/RE	NEMA 4X, 0-265rpm	620RE head, 0-60psi, element tubing	060.413N.E2A
620S/RE4	NEMA 4X, 0-265rpm	620RE4 head, 0-60psi, element tubing	060.413N.E4A
620U/R	NEMA 4X, 0-265rpm	620R head, 0-30psi, continuous tubing	060.414N.02A
620U/RE	NEMA 4X, 0-265rpm	620RE head, 0-60psi, element tubing	060.414N.E2A
620U/RE4	NEMA 4X, 0-265rpm	620RE4 head, 0-60psi, element tubing	060.414N.E4A
620DU/R	NEMA 4X, 0-265rpm	620R head, 0-30psi, continuous tubing	060.415N.02A
620DU/RE	NEMA 4X, 0-265rpm	620RE head, 0-60psi, element tubing	060.415N.E2A
620DU/RE4	NEMA 4X, 0-265rpm	620RE4 head, 0-60psi, element tubing	060.415N.E4A
620DU/L	NEMA 4X, 0-265rpm	620L head, 0-30psi	060.415N.5LA
620DU/LG	NEMA 4X, 0-265rpm	620LG head, 0-60psi	060.415N.5GA
620DIN/R	NEMA 4X, 0-265rpm	620R head, 0-30psi, continuous tubing	060.417N.02A
620DIN/RE	NEMA 4X, 0-265rpm	620RE head, 0-60psi, element tubing	060.417N.E2A
620DIN/RE4	NEMA 4X, 0-265rpm	620RE4 head, 0-60psi, element tubing	060.417N.E4A
620DIN/L	NEMA 4X, 0-265rpm	620L head, 0-30psi	060.417N.5LA
620DIN/LG	NEMA 4X, 0-265rpm	620LG head, 0-60psi	060.417N.5GA

Order information			
NEMA 2 pumps	Specification	Pumphead	Product Number
620S/R	NEMA 2, 0-265rpm	620R head, 0-30psi, continuous tubing	060.4131.02A
620S/RE	NEMA 2, 0-265rpm	620RE head, 0-60psi, element tubing	060.4131.E2A
620S/RE4	NEMA 2, 0-265rpm	620RE4 head, 0-60psi, element tubing	060.4131.E4A
620U/R	NEMA 2, 0-265rpm	620R head, 0-30psi, continuous tubing	060.4141.02A
620U/RE	NEMA 2, 0-265rpm	620RE head, 0-60psi, element tubing	060.4141.E2A
620U/RE4	NEMA 2, 0-265rpm	620RE4 head, 0-60psi, element tubing	060.4141.E4A
620DU/R	NEMA 2, 0-265rpm	620R head, 0-30psi, continuous tubing	060.4151.02A
620DU/RE	NEMA 2, 0-265rpm	620RE head, 0-60psi, element tubing	060.4151.E2A
620DU/RE4	NEMA 2, 0-265rpm	620RE4 head, 0-60psi, element tubing	060.4151.E4A
620DU/L	NEMA 2, 0-265rpm	620L head, 0-30psi	060.4151.5LA
620DU/LG	NEMA 2, 0-265rpm	620LG head, 0-60psi	060.4151.5GA
620DI/R	NEMA 2, 0-265rpm	620R head, 0-30psi, continuous tubing	060.4171.02A
620DI/RE	NEMA 2, 0-265rpm	620RE head, 0-60psi, element tubing	060.4171.E2A
620DI/RE4	NEMA 2, 0-265rpm	620RE4 head, 0-60psi, element tubing	060.4171.E4A
620DI/L	NEMA 2, 0-265rpm	620L head, 0-30psi	060.4171.5LA
620DI/LG	NEMA 2, 0-265rpm	620LG head, 0-60psi	060.4171.5GA

Tubing							
Continuous tubing for 620R pumpheads				LOADSURE elements for 620RE and 620RE4 pumpheads			
Tube bore				Sanitary fittings			
				12mm		17mm	
6.4mm	9.6mm	12.7mm	15.9mm				
Sta-Pure	960.0064.032	960.0096.032	960.0127.032	960.0159.032	960.0120.PFT	960.0170.PFT	
Chem-Sure	965.0064.032	965.0096.032	965.0127.032	965.0159.032	965.0120.SST	965.0170.SST	
Bioprene TM					903.P120.PFT	903.P170.PFT	
Bioprene TL	903.0064.032	903.0096.032	903.0127.032	903.0159.032	903.0120.PFT	903.0170.PFT	
Marprene TM					902.P120.PPC	902.P170.PPC	
Marprene TL	902.0064.032	902.0096.032	902.0127.032	902.0159.032	902.0120.PPC	902.0170.PPC	
Pumpsil silicone	913.A064.032	913.A096.032	913.A127.032	913.A159.032	913.A120.PFT	913.A170.PFT	913.A170.PPC
Neoprene	920.0064.032	920.0096.032	920.0127.032	920.0159.032			920.0120.PPC
PVC	950.0064.032	950.0096.032	950.0127.032	950.0159.032			
Fluorel	970.0064.032	970.0096.032	970.0127.032	970.0159.032			

Continuous tubing for 620L pumpheads				Y-elements tubing for 620L pumpheads			
Tube bore				Tube bore			
				8.0mm		12.0mm	
				16.0mm		16.0mm	
Pumpsil silicone	913.A080.040	913.A120.040	913.A160.040	913.AE80.K40	913.A12E.K40	913.A16E.040	
Marprene	902.0080.040	902.0120.040	902.0160.040	902.E080.K40	902.E120.K40	902.E160.040	
Bioprene	903.0080.040	903.0120.040	903.0160.040	903.E080.K40	903.E120.K40	903.E160.040	
Neoprene	920.0080.040	920.0120.040	920.0160.040	920.E080.K40	920.E120.K40	920.E160.040	
Sta-Pure	960.0080.040	960.0120.040	960.0160.040	960.E080.K40	960.E120.K40	960.E160.040	
Chem-Sure	965.0080.040	965.0120.040	965.0160.040				

Feature	620S	620U	620Du	620Di
<b>Manual control</b>				
Run/stop; speed adjustment; forward/reverse; max key for rapid priming and purging; auto-restart	•	•	•	•
Simple calibration to display flow rate	•	•	•	•
Choice of flow rate display; metric or imperial units	•	•	•	•
MemoDose one-shot dispensing	•	•	•	•
Specialist dispensing control software				
Numeric keypad for entry of speed, flow or PIN			•	•
<b>Remote control</b>				
Run/stop direction change; auto/manual mode, leak detector input (via contact closure or 5V TTL to 24V industrial logic)		•	•	•
Remote switch operation of MemoDose		•	•	•
Remote operation of dosing programs				•
<b>Analogue speed control</b>				
Software programmable inputs; 0-10V, 1-5V or 4-20mA		•	•	•
Analog outputs; 0-10V, 4-20mA or 0-1478Hz		•	•	•
<b>Digital network control</b>				
RS485 through 620N module NEMA 4X				620DIN
RS232 via 9-pin D-connector NEMA 2			620Du	620Di
<b>Process security and record keeping</b>				
Basic security code to protect set-up		•		
Pin-secure Process Protection; two level PIN access			•	•
Batch records				•
<b>Pumphead options (620R and 620L pumpheads are not interchangeable)</b>				
620R, 620RE and 620RE4 MkII pumpheads	•	•	•	•
620L and 620LG pumpheads			•	•
<b>Enclosure options</b>				
NEMA 2 wipe-down or NEMA 4X hose-down (with 620N module)	•	•	•	•

Order information		
Pumphead options	Specification	Product Number
620R MkII	Two roller pumphead for 3.2mm wall continuous tubing, 0-30 psi	063.4211.000
620RE MkII	Two roller pumphead for 4.0mm wall element tubing, 0-60 psi	063.4231.000
620RE4 MkII	Four roller pumphead for 4.0mm wall element tubing, 0-60 psi	063.4431.000
620L	Low pulse, twin channel, 6 roller pumphead for 4.0mm wall tubing, 0-30 psi	063.4603.000
620LG	Low pulse, twin channel, 6 roller pumphead for 4.0mm wall Sta-Pure tubing, 0-60 psi	063.4623.000

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**NEMA 4X**  
**NEMA 2**

Call 1-800-282-8823 for further information on the 620 pump range including technical data sheets.

or log on to our web site:

www.watson-marlow.com to view details on our complete peristaltic pump range.

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 www.watson-marlow.com

TIMOTHY GUY DESIGN



**W**  
**3**  
year warranty

Industrial strength pumps with unrivalled precision

# 620 pumping power at your fingertips

- 50% more flow: up to 4.8 gpm (18 liter/minute)
- Class-leading 2650:1 control ratio: 0.1 rpm to 265 rpm
- NEMA 4X washdown enclosure; 50% smaller footprint than its predecessor
- Remote, analog and digital network control
- Value for life: the lowest cost of ownership

620 pumps are powerful but gentle with delicate fluids, rugged but refined. They offer 50% more throughput than previous models, huge functionality with extraordinary precision, unbeatable tube life and greater control than competitors' pumps.

Models include the 620S with manual control; the analog automatic control 620U, and the digital 620Du with unique two-level PIN-secure Process Protection. The 620Di dispensing pump combines power with accurate dispensing within  $\pm 0.5\%$  and batch records for cGMP requirements.

We lead the field with a choice of NEMA 2 or NEMA 4X enclosures; a choice of pumpheads: 620L for smooth dispensing and the 620R in two-roller or low-pulsation four-roller versions; and a choice of continuous tubing or quick-change LoadSure™ elements.

With Watson-Marlow Bredel's record of quality and reliability the 620 is backed by a three-year warranty.



The 620L pumphead is designed for minimal pulsation and precise dosing

At Watson-Marlow Bredel ...

We engineer our winning performance – we don't just turn up the speed. 60% fewer occlusions than our competitors for the same flow means 2½ times the tube life.

- Pumps, pumpheads and tubing last longer.
- There's less downtime, fewer failures – and less maintenance.
- In the unlikely event of a problem, next-day delivery keeps your production rolling.
- Our products are recognized for quality, reliability and performance, backed by a three-year guarantee.

So the best pump really does cost less. Call us for the proof.

It all adds up to –

*Value for life*



Manual control plus calibration

Page 2-3 620S



Remote control, analog speed inputs and status outputs.

Page 2-3 620U



Top-of-the-range versatility, digital network control and PPP security.

Page 4-5 620Du



Specialized dispensing pump for complete system integration.

Page 6-7 620Di

High torque, amazing turndown and a clean, brushless DC motor: all contained in a tough, powder-coated housing with sleek, curved lines for liquid run-off and no bug traps. 620R pumpheads provide volume pumping with continuous tubing and element versions, and a choice of two or four rollers, maximizing speed or smoothness

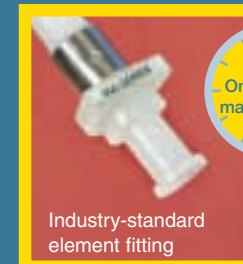


## Why peristaltics?

Compared with other displacement pumps, peristaltic pumps win on every count. They handle difficult fluids and suspended solids with ease, and provide precision dosing and metering, without gas locking or crystallization problems. Cleaning and maintenance are quick and easy. They self-prime, can run dry and have no valves or seals to leak, corrode or clog, and the duty fluid is totally contained within the tube. That's why Watson-Marlow Bredel pumps outperform piston, progressive cavity, lobe, gear and diaphragm pumps.

## Choose tubing or elements

The 620R pumphead takes tubing from 6.4mm to 15.9mm bore, ideal for single-use tubing or continuous source to discharge applications. The 620RE and four-roller 620RE4 pumpheads take LoadSure™ tubing elements for increased capacity and pressure with Tri-clamp fittings for hygienic markets and cam-and-groove for industry.



Industry-standard element fitting



One minute maintenance

## NEMA 2 or NEMA 4X enclosure options

620 series pumps have a tough and clean case for every environment. NEMA 2 models feature D-connector wiring and easy wipe-down cleaning. NEMA 4X models' washdown 620N module includes large terminals for easy wiring-in and four built-in relays for industrial switching.



# 620S for manual control 620U for remote control

The 620S NEMA 2 and 620SN NEMA 4X for hassle-free pumping:

- Manual control via 9-key display pad
- Simple calibration to display flowrate
- MemoDose for easy, powerful one-shot dispensing

The 620U and 620UN add multiple control options:

- Analog speed control (0-10V or 4-20mA inputs)
- Remote control via industrial logic with digital status outputs
- 0-10V or 0-1478Hz analog speed feedback

Tough, rugged, powerful: 620 pumps are ideally qualified for a lifetime of use in critical processes. Quick tube-change means that one pump can perform many tasks without contamination and time-wasting cleaning.

620 pumps offer sophisticated, but user-friendly, controllability. Speed can be adjusted from 0.1rpm to 265rpm. The wipe-clean keypad gives instant access to every function. The 620 is logical to program and easy to manage, whether through manual keypad control or through remote automatic operation



Industrial connectivity is easy: plug in the D-connectors and the 620U is instantly ready for remote control. The 620UN (inset) goes one step further: easy permanent connection and complete NEMA 4X washdown security with four relay outputs

## Manual control

Nine keys control the 620S, with one-button operation for all regular functions. Like Start/Stop Direction, and Flow control though the full speed range with the Up and Down keys. MemoDose opens the one-shot dispensing facility; Menu gives access to the pump's set-up; Max runs the pump at full speed for easy priming. Other functions include Keypad lock, display illumination and Auto-restart. The 620U's keypad allows quick changing between automatic and manual control.

## Remote control

The 620U and 620UN can also be controlled using contact-closure or logic input (5V TTL to 24V industrial) for remote Start/Stop, Direction changes, Auto/Man mode selection and leak detection. Speed can be controlled using a 0-10V or 4-20mA analog input, and monitored via 0-10V or 0-1478Hz analog signal output. Four digital status outputs are available for process monitoring.



## Rugged and resilient

Engineered to last, the new 620 series will deliver the lowest cost of ownership, even in the most arduous environments. Minimal down-time is ensured by unbeatable tube life. Our admirable reliability record is maintained by features such as a brushless DC drive, a toughened LCD screen and a recessed keypad.

The chemical resistance of the 620 outlasts our competition; the powder-coated casing outperforms stainless steel when exposed to aggressive fluids such as ferric chloride and sodium hypochlorite. Our tough stance on durability is supported by our commitment to a three-year warranty for continuous duty.

## MemoDose

MemoDose allows you to pump a quantity of fluid, measure it, and repeat that quantity, exactly or proportionately.

You might wish to fill bottles with 250ml of a chemical. First pump a sample 250ml into a measuring vessel. From now on, every press on Start will dispense 250ml. MemoDose is standard even on the entry-level 620S.



# 620Du for digital network control



As well as the features of the 620U, the 620Du NEMA 2 and 620DuN NEMA 4X adds:

- PIN-secure Process Protection (PPP): safeguard your process with two levels of set-up security
- Digital network control using RS485 or RS232
- Numeric keypad for direct entry of flow and pump settings
- Twin analog inputs for simultaneous flow adjustment with two signals (supersedes stroke adjustment on diaphragm pumps)
- Wide choice of US flow units or metric; easy calibration for precise metering

The 620Du is the top-of-the-range pump for process and production, with built-in control and integration options that are second to none: whatever your production system, the 620Du fits perfectly, bringing instant power and precision to the production line.

The 16-key numeric keypad makes manual control truly simple. Want a specific speed or flowrate? Dial it in and that's it.

In addition, analog or digital network control is easy to set-up with an intuitive menu system.

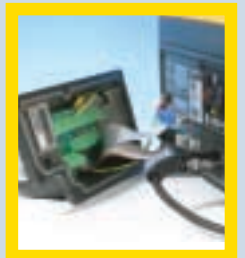


## RS485 / RS232

Full industry-standard connectivity is available in both the NEMA 2 and the NEMA 4X models. The 620 DuN's watertight module offers RS485 and easy-wire relays. The NEMA 2 620Du uses a 9-pin D-connector for RS232 communication.

## Status outputs

The 620Du offers four configurable digital status outputs (24V relay outputs on the 620DuN), allowing monitoring and processing of: Run/Stop; Direction of rotation; Auto/Manual mode of operation; general fault alarm; guard-open safety shutdown; or leak-detected shutdown (if used with a Watson-Marlow Bredel leak sensor).



## Speed scaling

Programmable twin analog inputs allow you to over-ride the main speed control. This makes stroke adjustment on a diaphragm pump redundant: the **620Du is the perfect drop-in diaphragm pump replacement.**



## The perfect pump for pharmaceuticals and biotechnology

The hygienic 620 series is designed for clean-room operation in pharmaceutical and biotech installations. In applications such as fermentation it is the pump of choice to guarantee the quality of pH control, antifoam treatment and harvesting duties. The requirements of regulatory agencies, such as the cGMP from the FDA, are satisfied by the exclusive functionality of the flagship 620Du.

The Watson-Marlow Bredel product range has a common control methodology. As a result, up-scaling is straightforward. A validated research process on a pilot scale Watson-Marlow Bredel 300 series pump can easily be up-scaled to bulk manufacturing with the new 620 series.



The option of two 620R pumphead orientations and a 50% smaller footprint, plus flows from 1ml/min to 18 liter/min make it easy to incorporate the new 620 into compact skids and contract manufacturing applications where flexibility is paramount.

## PIN-secure Process Protection

Customize the 620Du and 620DuN to your precise needs – and lock it. PIN-secure Process Protection (PPP) allows you to keep your set-up safe, giving assurance of production quality. Top-level PIN code holders can retain complete control over the pump's configuration; or calibration duties can be released to production staff with second-level PIN access. Alternatively, the keypad can be disabled, so that control is limited to Start/Stop – and accidental key-presses are eliminated.



# 620Di: the power to dispense precisely

The 620Di NEMA 2 and 620DiN NEMA 4X is designed to function as an automatic, programmable dispenser able to output batch records for cGMP requirements.

- Accurate, fast dispensing. Dispenses 500ml in 3.5 seconds with  $\pm 0.5\%$  accuracy
- Calibration by weight or volume, US units or metric; calibration without disturbing batch dispensing
- Dose triggered by timed interval, keypad, remote signal or additional footswitch, handswitch or proximity switch
- PIN-secure Process Protection (PPP): safeguard your process with two levels of set-up security
- Stores 50 dispensing programs



Ease of use meets dispensing perfection in the powerful 620Di. Batch records satisfy the requirements of cGMP; simply add a PC and details of dispensing jobs are recorded for display or printing. Production records were never so simple.

Peristaltic pumps bring huge advantages to the dispensing line: accuracy, sterility and low-shear characteristics for delicate fluids such as fragile cell cultures. The 620Di adds superb control, convenience and versatility, and its PIN-secure Process Protection (PPP) safeguards user configurations.

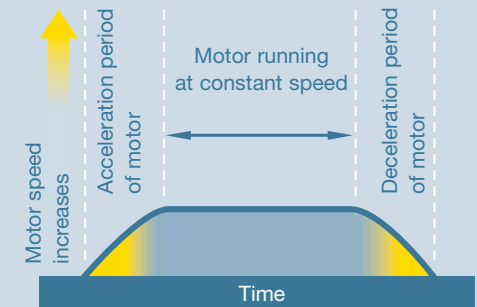
## Integration

The 620Di is designed with two functions in mind: as a stand-alone dispensing unit; and as a fully integrated part of a filling line. The wide-ranging industrial logic I/O control options and serial communications allow the flexibility for the pump to be linked to other filling equipment via a PLC

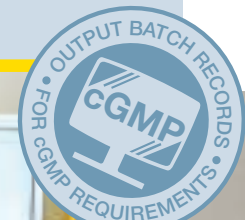
## 50 programs

Store 50 dispensing programs for immediate use, complete with batch size, dose size, flow speed and dosing interval. You can even save the ramp and drip settings. Need a variation? Instant changes are easy.

## The principle of ramping



The 620Di can be set to "ramp" up to full speed at the start of a dose and ramp down to zero speed at the end. The slope of each ramp can be independently adjusted. Ramping aids accuracy and allows filling to start and stop at speeds which avoid splashing or foaming, but still allows the highest speed to be used for the main part of the dose. So filling is faster. End-of-dose drips are easily avoided using the pump's anti-drip feature: a momentary direction reverse at the end of each dose.



## Dosing batch records

The RS232-enabled 620Di allows the details of every dispensing batch to be named and recorded. When a computer (or RS232-compatible controller) is connected, batch records are exported, providing a complete audit trail to satisfy modern manufacturing requirements (including cGMP requirements). Batch records include operator and batch names, pump type, dose size, batch size, start date and time, batch progress and pump parameters such as ramp and drip control.

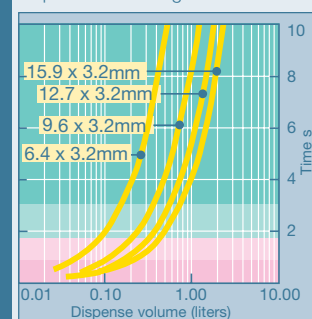
## 620R

Dispensing performance for 620 series pumpheads

## 620RE4

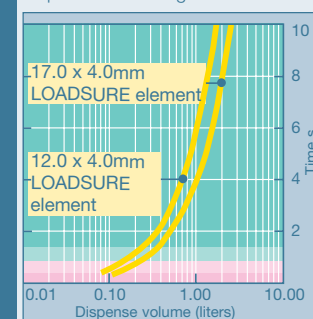
## 620L

Dispense volume against time 620R



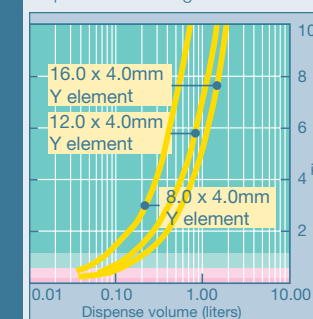
		Recommended tube sizes				
		0.2 ltrs	0.5 ltrs	1.0 ltrs	2.0 ltrs	5.0 ltrs
Bore	$\pm 0.5\%$	6.4 mm	6.4 mm	9.6 mm	12.7 mm	15.9 mm
Dose time		3.7 secs	9.4 secs	8.3 secs	10.9 secs	20.0 secs
Bore	$\pm 1.0\%$	6.4 mm	9.6 mm	12.7 mm	15.9 mm	15.9 mm
Dose time		3.7 secs	4.2 secs	5.5 secs	8.0 secs	20.0 secs
Bore	$\pm 2.0\%$	12.7 mm	15.9 mm	15.9 mm	15.9 mm	15.9 mm
Dose time		1.1 secs	2.0 secs	4.0 secs	8.0 secs	20.0 secs

Dispense volume against time 620RE4



		Recommended tube sizes				
		0.2 ltrs	0.5 ltrs	1.0 ltrs	2.0 ltrs	5.0 ltrs
Bore	$\pm 0.5\%$	12.0 mm	17.0 mm	17.0 mm	17.0 mm	17.0 mm
Dose time		1.4 secs	2.7 secs	5.5 secs	10.9 secs	27.3 secs
Bore	$\pm 1.0\%$	17.0 mm	17.0 mm	17.0 mm	17.0 mm	17.0 mm
Dose time		1.1 secs	2.7 secs	5.5 secs	10.9 secs	27.3 secs
Bore	$\pm 2.0\%$	17.0 mm	17.0 mm	17.0 mm	17.0 mm	17.0 mm
Dose time		1.1 secs	2.7 secs	5.5 secs	10.9 secs	27.3 secs

Dispense volume against time 620L



		Recommended tube sizes				
		0.2 ltrs	0.5 ltrs	1.0 ltrs	2.0 ltrs	5.0 ltrs
Bore	$\pm 0.5\%$	12.0 mm	16.0 mm	16.0 mm	16.0 mm	16.0 mm
Dose time		1.4 secs	2.6 secs	5.2 secs	10.4 secs	26.0 secs
Bore	$\pm 1.0\%$	16.0 mm	16.0 mm	16.0 mm	16.0 mm	16.0 mm
Dose time		1.0 secs	2.6 secs	5.2 secs	10.4 secs	26.0 secs
Bore	$\pm 2.0\%$	16.0 mm	16.0 mm	16.0 mm	16.0 mm	16.0 mm
Dose time		1.0 secs	2.6 secs	5.2 secs	10.4 secs	26.0 secs

Pumping time per dose: accuracy

= within  $\pm 0.5\%$

= within  $\pm 1.0\%$

= within  $\pm 2.0\%$

= within  $\pm 5.0\%$

Recommended tube sizes (based on 265rpm)

# 620RE for maximum throughput

The two-roller 620RE is a high-performance pumphead offering rapid tubing element change with Watson-Marlow Bredel's LoadSure™ technology, which ensures the correct position and tension for long tubing life and accurate flow. A four-roller element version (the 620RE4) minimizes pulsation while reducing flow. The two-roller 620R is for use with continuous tubing and is ideal for single-use applications.

The LoadSure™ system allows easy clean-in-place (CIP) and steam-in-place (SIP). Simply retract the rollers, clean in-line, and snap the rollers back into position.

- Maximum throughput: 4.8 gpm (18 liter/min)
- 60 psi capability
- LoadSure™ elements for a perfect fit every time
- Retractable rollers for tube installation and CIP and SIP
- Two orientations: ports right or ports down
- Guard-open indication

# 620L for maximum accuracy metering and dispensing

The 620L is a specialized pumphead designed for accurate dispensing. It almost eliminates the natural pulsation of peristaltic pumping. The secret lies in the unique offset, spring-loaded tracks which set the flow in each channel of a Y-element out of phase. When the channels merge, the pulses are cancelled out.

Continuous tubing can also be used in two separate or merging channels.

- Precision dispensing pumphead
- Pulsation-free flow from 0.00053 to 3.3 gpm (0.002 to 12.4 liter/min)
- Accurate to ±0.5%.



Element change is a one-minute job with LoadSure™ elements. Open the guard and spring back the rollers ... Replace the old element with a new one ... Click the rollers out and close the guard

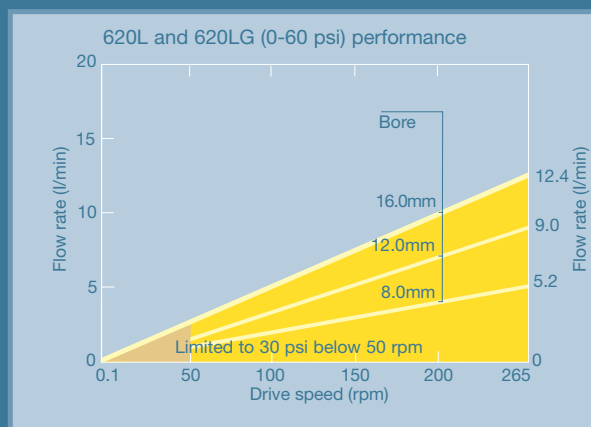


With two parallel tubes, the 620L pumphead becomes a twin-channel unit; alternatively, two tubes can be used to draw viscous fluid more easily from its source, discharging it through a Y-connector as a single pulseless flow

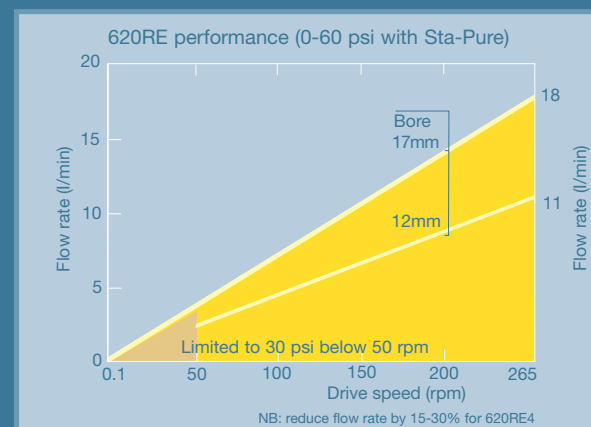


Tube clamps hold the tubing in place when the 620R pumphead is used with continuous tubing

## Performance 620L



## 620RE



## 620R

