

**WATSON
MARLOW**
Pumps



Quantum

ReNu
SU TECHNOLOGY

Redefining peristaltic pump technology
for single-use downstream bioprocessing

Introducing Quantum®

with its patented ReNu SU Technology® cartridge system

Watson-Marlow Fluid Technology Group is proud to introduce the new Quantum peristaltic bioprocessing pump with its patented ReNu SU Technology cartridge. Quantum offers a step change in pump technology enabling higher downstream process yields throughout the pressure range, exceeding the performance of any other bioprocessing pump available.

Quantum is specifically designed for tangential flow filtration (TFF), virus filtration (VF), and high-performance liquid chromatography (HPLC) applications. Quantum delivers flow linearity throughout

the 43.5 psi (3 bar) single-use processing pressure range up to 20 L/min (LPM), leading the market with virtually no pulsation (1.7 psi [0.12 bar] pressure stability). With 4000:1 control ratio, sustaining constant transmembrane pressure (TMP) in micro and ultrafiltration via servo valves and being limited to a 200:1 control ratio in HPLC gradient work are now a problem of the past.

Quantum exhibits half the shear of diaphragm pumps and accurate flow at set speed through the life of the cartridge meaning auxiliary flow monitoring is no longer required.

- A step change in bioprocessing pump capabilities, providing flow linearity to 20 L/min at 43.5 psi (3 bar), with 1.7 psi (0.12 bar) pulsation
- With the patented ReNu SU Technology cartridge, Quantum delivers ultra-low shear for increased downstream process yield
- Quantum is the first to provide integrated 4000:1 control ratio and validation in line with BPOG/ BPSA/USP/ISO guidelines



The patented ReNu SU Technology cartridge is simple to install, enabling its aseptic fluid paths to be positioned quickly and accurately ready for use.

Redefining peristaltic technology for downstream bioprocessing

Traditionally, peristaltic pumps have been the pump of choice in low pressure upstream processes including fermentation feed and media transfer. The gentle peristaltic pumping action guarantees low shear, high accuracy and zero cross contamination to uphold cell viability and corresponding high cell densities.

With this knowledge in mind, Watson-Marlow Fluid Technology Group designed and developed Quantum to redefine the use of peristaltic pump technology specifically for downstream bioprocessing.

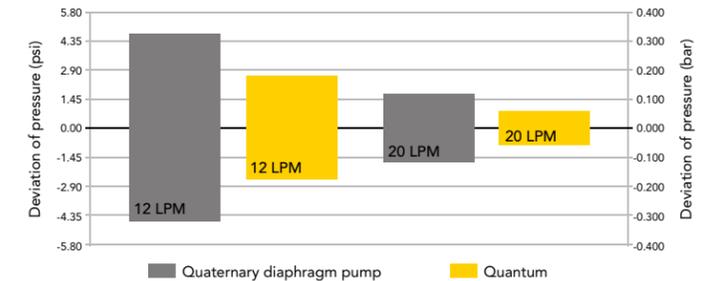
By adding Quantum's unique and revolutionary capabilities to the established peristaltic pumping principle—matched with ReNu SU Technology—Quantum is clearly the most logical choice for downstream bioprocessing.

- Trace pulsation at 43.5 psi (3 bar)
- Ultra-low shear
- Designed specifically for downstream



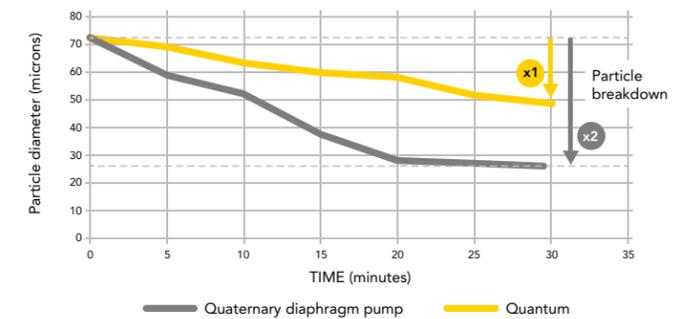
Trace pulsation at 43.5 psi (3 bar)

The revolutionary performance provided by Quantum extends the frontiers of peristaltic technology, delivering up to 43.5 psi (3 bar) constant pressure with only trace pulsation of 1.7 psi (0.12 bar) throughout the flow range.



Ultra-low shear

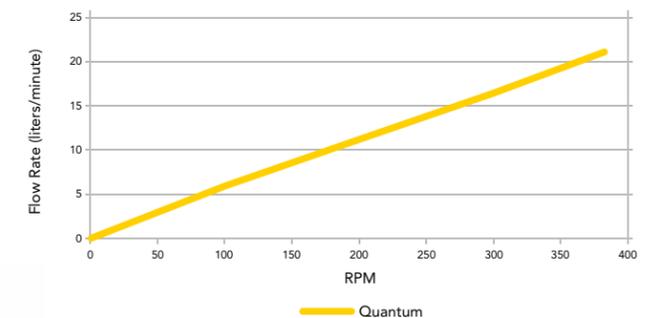
Quantum matched with its patented ReNu SU Technology cartridge delivers ultra-low shear and accuracy at set speed throughout the cartridge life. The independent test data (right) demonstrates how Quantum delivers low shear and higher process yields by comparing the mean diameter of fragile oil based emulsion particles as they pass through a pump. The particle breakdown is twice as much with the quaternary pump (grey line) as with Quantum (yellow line). Tests were conducted at 12 L/min and 14.5 psi (1 bar) pressure.



The data presented in the above two graphs was provided by an independent third-party source

Designed specifically for downstream

Quantum delivers flow linearity throughout the pressure range. With a 4000:1 control ratio, operators can sustain constant transmembrane pressure in micro/ultrafiltration.



Single-use fluid path

The synergy between peristaltic pumps and single-use pump systems cannot be overstated. The ReNu SU Technology cartridge slides effortlessly into position allowing for a change of fluid path in minutes whilst eliminating alignment errors.



ReNu SU Technology

reduces time and cost for validation

Quantum successfully combines application specific pump capabilities with single-use fluid path components such as the ground breaking ReNu SU Technology cartridge, the popular BioPure range of barbs, gaskets, clamps, and high pressure transfer tubing. For the first time, this integrated approach allows a considerable reduction in cost and time of pump validation prior to being specified into single-use systems (SUS).

ReNu SU Technology cartridges are fully manufactured in ISO Class 7 cleanrooms and are suitable for gamma irradiation at up to 50kGy.

ReNu SU Technology cartridges are supplied with an industry-leading validation guide. The guide includes a comprehensive set of biocompatibility data with material tests such as USP88, Class VI (*In Vivo*) and USP87 (*In Vitro*). Detailed extractable testing with a range of solvents in line with BPOG and BPSA guidelines has also been undertaken. The validation guide supports your validation process, reducing your overall time to market.



The secure and consistent positioning of the ReNu SU Technology cartridge in the pumphead—clamped firmly in place at its manifolds—guarantees a secure connection every time. Additionally each cartridge is supplied with a quick change kit comprising of clamps, gaskets and end caps all designed to keep the time it takes to replace a cartridge to a minimum.

Connection kits are also available consisting of braid reinforced silicone hose configured to customers' requirements with BioBarb fittings. All components are manufactured in ISO Class 7 cleanrooms.

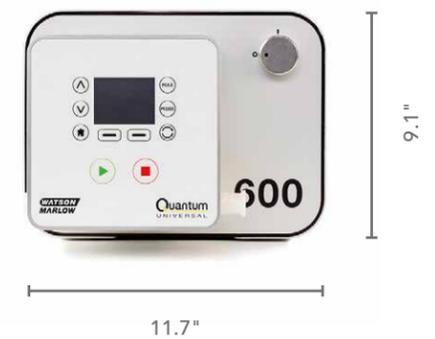
The Quantum pump

Quantum has been designed and built specifically for bioprocessing. The paint free housing is IP66 (NEMA 12/13) rated with industry standard power and interface connections.

Quantum offers analogue remote control functionality, common to all Watson-Marlow Fluid Technology Group cased pumps avoiding the need for operator retraining.

Quantum's user interface is uniquely positioned at the front of the pump enabling visual confirmation of operating state and access to operation controls even when skid mounted.

Quantum is fully certified to CE, UL and IEC61010-1 electrical safety standards.





Fluid Technology Group

BIOTECHNOLOGY AND PHARMACEUTICAL SOLUTIONS



Watson-Marlow Fluid Technology Group

Watson-Marlow Fluid Technology Group supports its customers locally through an extensive global network of direct sales operations and distributors

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