Spin Pompen

QUATTROFLOW™
Fluid Systems
Part of Pump Solutions Group
A DOVER COMPANY

Expert Solutions for Critical Applications

BRAND Portfolio

Where Innovation Flows

www.quattroflow.com

MULTIPLE-USE QUATERNARY DIAPHRAGM PUMPS
SINGLE-USE QUATERNARY DIAPHRAGM PUMPS

PUMP SOLUTIONS GROUP
A DOVER COMPANY

Dover's Pump Solutions Group (PSG®), a global leader in positive displacement pump and supporting technologies, delivers value-added pumps and systems that serve customers requiring the safe and efficient transfer of critical and valuable materials. PSG features world-class pump brands and has multiple facilities on three continents (North America, Europe and Asia) that are ISO certified. We are passionately committed to innovative technologies that will positively impact the world. Our priority is providing the market expertise you need by delivering tomorrow's innovative fluid and material transfer solutions today.

Where Innovation Flows

POSITIVE DISPLACEMENT PUMPS

RECIPROCATING	ROTARY
Almatec® AODDP	Abaque™ PERISTALTIC
Neptune™ METERING	Blackmer® SLIDING VANE
Wilden® AODDP	EnviroGear® INTERNAL GEAR
Quattroflow™ QUATERNARY DIAPHRAGM	Maag EXTERNAL GEAR
	Mouvex® ECCENTRIC DISC
	RedScrew™ SCREW

PSG® Technologies:

PUMPS & SYSTEMS TECHNOLOGIES

CENTRIFUGAL	MIXERS	COMPRESSORS	SYSTEMS
System One®	Neptune™	Blackmer®	Automatik®
Griswold™		Mouvex®	Fluid Dynamics™
			Maag® Filtration
			Neptune™

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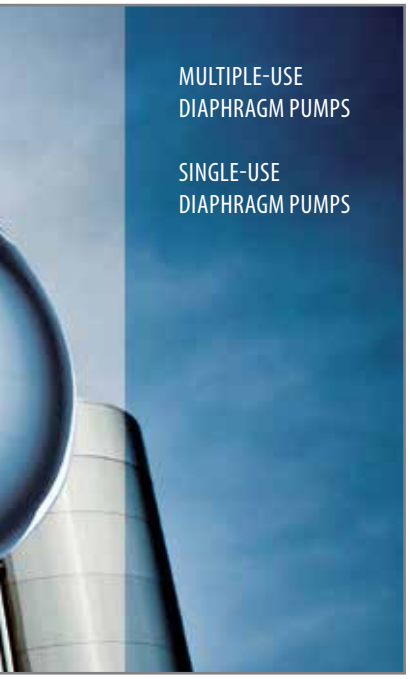
Who We Are



Quattroflow™ Fluid Systems, part of Pump Solutions Group (PSG®), is a leading manufacturer of quaternary diaphragm displacement pumps for multiple-and single-use applications in the pharmaceutical and biotech industries. When pharmaceutical companies need low shear, low slip and low pulsation to pump biological organisms in aqueous suspension through specialized filtration equipment, they turn to Quattroflow. Quattroflow is a brand of Dover Corporation's Pump Solutions Group, Oakbrook Terrace, IL, USA.

Kamp-Linfort, Germany

– Quattroflow's world headquarters are located with Almatec® in Kamp-Lintfort, Germany. The spacious 2,200 square-meter, state-of-the-art facility recently expanded to include an additional 1,000 square-foot production area.

The Birth of a Biotechnology Innovator

The Quattroflow story dates back to the 1990s. One of the founders was working in the filtration technology sector when he was in need of a pump that would produce a protein solution. Together with the second company founder, an electric-specialist, they developed a diaphragm pump with four smooth-action pistons. The start of the company was in 2000 using the location of the existing electrical installation company.

The World's Top Pharmaceutical Companies Choose Quattroflow

Quattroflow is a world leader in pumping technology for the pharmaceutical industry with roughly 3,000 units of its stainless steel pumps installed worldwide at top pharmaceutical companies.

Quality German Engineering

When it comes to innovation and quality, nothing beats German engineering. Quattroflow exemplifies this type of progressive and innovative engineering by providing precision and reliability in the manufacturing of pumps, peripheral components, control systems and data logging. From our highly trained staff to our leading pumping solutions, Quattroflow truly is where innovation flows.

MARKETS SERVED

HYGIENIC: Pharmaceutical, Bio-Pharma, and Laboratory

Quattroflow™ developes and manufactures, in close cooperation with the customers, special pumps for bio-tech processes. For many years the world's top pharmaceutical and bio-pharm companies have been provided with the best pumping solutions. They trust Quattroflow pumping technologies with their critical fluid transfer and biological applications.

Quattroflow's unique quaternary diaphragm pumps offers seal-less designs that provide gentle handling of products. This technology is CIP / SIP capable and offers disposable technologies that help reduce the cost of decontamination and cleaning while also improving purification yields of filtration systems.

This innovative pump technology can be found in multiple (stainless steel) or single use (polypropylene) applications in the whole area of biological manufacturing such as cross-flow filtration systems, chromatography columns and centrifuges. Quattroflow™ products are known for gentle transferring of aqueous media and biological products such as blood by-products of vaccines, ultimately ensuring product safety, efficiency and reliability.

Typical Applications Handled:

- Chromatography systems
- Cross-flow systems
- Centrifuges
- Separators
- Homogenizators
- Filter capsules
- Reaction dosing
- Virus filtration
- Buffer mixing systems
- Blood plasma fractionation
- Virus cultures
- Bacterial and viral vaccines
- Cell cultures
- Cell cultures supernatants
- Enzyme solutions
- Antibodies

Gerner
Research & Development Center
Gallagher
Biological Processing

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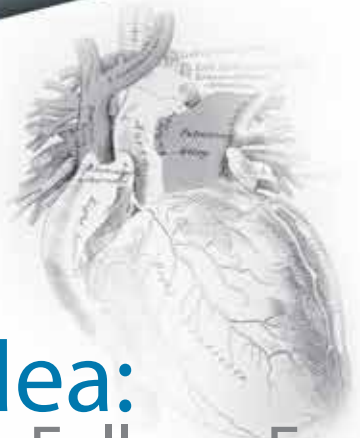
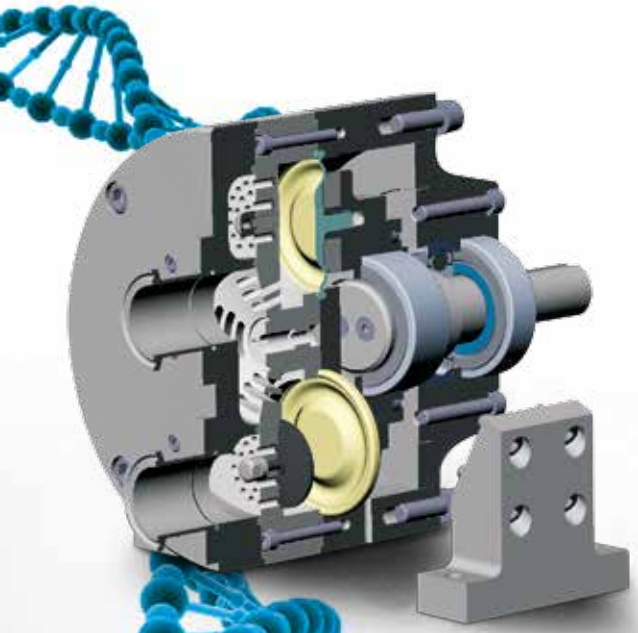


The Idea:
Pump Follows Evolution



How does a pump have to be designed to convey extremely delicate biologically active molecules? The solution is in nature itself!

Millions of years of evolution developed the perfect device to pump blood that contains albumin, gamma globulins, clotting factors and cells. It is the heart!

The Quattroflow displacement pump is based on this principle. The 4-piston (quaternary) diaphragm technology enables a gentle pumping through soft "heartbeats". Each stroke of the four diaphragms is derived by an eccentric shaft, which is connected to the electric motor.

PUMP SELECTION GUIDE

	QF150S	QF150SU	QF1200S	QF1200SU	QF4400S	QF4400SU	QF20k
Range of Flow[1]	1 - 150 lph (0.26 - 40 gph)	1 - 150 lph (0.26 - 40 gph)	6 - 1200 lph (1.6 - 317 gph)	6 - 1200 lph (1.6 - 317 gph)	60 - 4000 lph (16 - 1057 gph)	60 - 4000 lph (16 - 1057 gph)	200 - 20,000 lph (53 - 5283 gph)
Max Pressure	6 bar @ 20°C (87 psi @ 68°F)	4 bar @ 20°C (58 psi @ 68°F)	6 bar @ 20°C (87 psi @ 68°F)	4 bar @ 20°C (58 psi @ 68°F)	6 bar @ 20°C (87 psi @ 68°F)	4 bar @ 20°C (58 psi @ 68°F)	6 bar @ 20°C (87 psi @ 68°F)
Max Temp Process / CIP / SIP	80 / 90 / 130°C (176 / 194 / 260°F) autoclavable	130°C autoclavable	80 / 90 / 130°C (176 / 194 / 260°F) autoclavable	130°C autoclavable	80 / 90 / 130°C (176 / 194 / 260°F) autoclavable	130°C autoclavable	80 / 90 / 130°C (176 / 194 / 260°F) autoclavable
Chamber Diameter	70 mm 2.75 in	70 mm 2.75 in	119 mm 4.69 in	119 mm 4.69 in	225 mm 8.86 in	225 mm 8.86 in	325 mm 12.80 in
Porting[2]	25 mm Flange 1/4"TC	25 mm Flange 1/4"TC	25 mm Flange 3/4"TC	25 mm Flange 3/4"TC	50.5 mm Flange 1-1/2"TC	50.5 mm Flange 1-1/2"TC	64 mm Flange 2"TC
Power Consumption[3]	50 W	50 W	370 W	370 W	2200 W	2200 W	4000 W
Power Supply	115 / 230 V 1 - phase	115 / 230 V 1 - phase	115 / 230 V 1 or 3 - phase	115 / 230 V 1 or 3 - phase	400 V 3 - phase	400 V 3 - phase	400 V 3 - phase
Material of Construction[4]	Stainless Steel: 1.4435 / 1.4539 Valves: EPDM Diaphragm: TPE	Polypropylene Valves: EPDM Diaphragm: TPE	Stainless Steel: 1.4435 / 1.4539 Valves: EPDM Diaphragm: TPE	Polypropylene Valves: EPDM Diaphragm: TPE	Stainless Steel: 1.4435 / 1.4539 Valves: EPDM Diaphragm: TPE	Polypropylene Valves: EPDM Diaphragm: TPE	Stainless Steel: 1.4435 / 1.4539 Valves: EPDM Diaphragm: TPE
Note	Multiple-Use	Single-Use	Multiple-Use	Single-Use	Multiple-Use	Single-Use	Multiple-Use

[1]Range of flow rates depend on the pump drive.
[2]Other connecting ports (type, diameter) are available upon request.
[3]Can vary with specific drives, values are for standard drives.
[4]Other materials available upon request.

Accessories:

- Miniflow magnetic flow meter
- Pressure switch
- Power supply box
- Diaphragm monitoring sensor

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Multiple-Use Pumps

Pump Development for Special Applications

Pharmaceutical and biotech applications require the highest level of purity, containment and cleanability. Quattroflow pumps meet these requirements. They are especially designed for such application fields. Quattroflow provides the most versatile and efficient stainless-steel multiple-use pumps for worldwide applications in laboratories, pilot plants and production plants.

QF-Series Multiple-Use Biotech Pumps

The QF 150S, QF 1200S, QF 4400S, QF 5050S and QF 20k Series quaternary diaphragm positive displacement pumps do not feature a mechanical shaft seal or wetted rotating parts, ensuring total product containment without abrasion and particle creation. Moreover, the pumping principle particle of the Quattroflow pumps allows risk-free dry running.

QF 4400S
Multiple-Use Quaternary
Diaphragm Pump

Single-Use Pumps

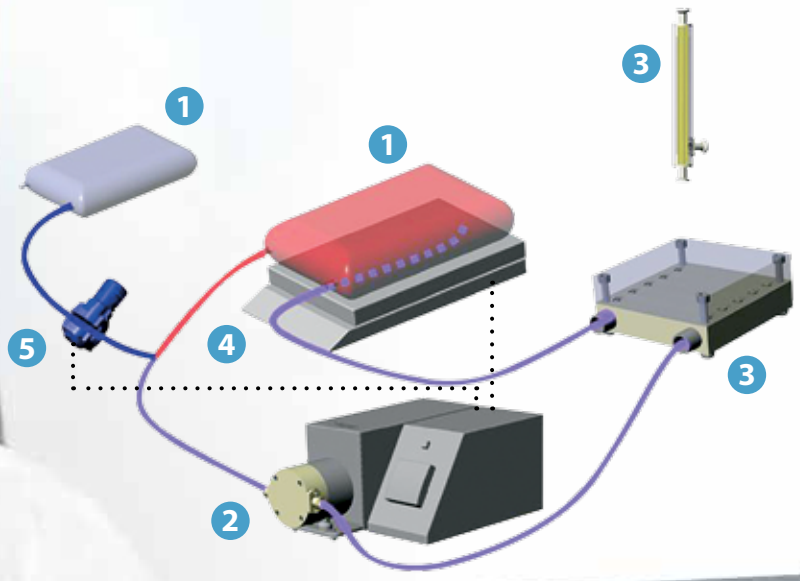
The Single Leader in Single-Use Pumps

Quattroflow is the leader in disposal or single-use technology with its low-pulsation single-use pumps. The simple disposal of the pump chamber saves time and money. This drops the effort for cleaning, sterilization or a complex cleaning validation and any risk of cross-contamination is excluded. Single-use pumps are critical in patent expiration as the turnaround time in the development process is accelerated significantly. In general frequently changing products is the typical field of application of the single-use pumps (e.g. process development, production of clinical reference samples, contract manufacturing).

QF 150SU, QF 1200SU, QF 4400SU and QF 5050SU

Single-Use Quaternary Diaphragm Pumps

The Quattroflow single-use pumps are self-priming and can run dry. Inside the pump chamber, there are no rotating parts that are subject to friction that might cause heating up and/or modifying the product or create particles. A new single-use pump chamber can be replaced and ready for a new batch in under one minute. Its simple design requires only one tool and its flow rate matches that of the multiple-use 150 / 1200 / 4400 / 5050. For the refitting of a multi-use pump into a single-use pump an exchange kit is available.



AUTOMATED CONCENTRATION AND DIAFILTRATION PROCESS USING ONLY 5 COMPONENTS.

1. Bags (product, buffer)
2. Quattroflow-1200 Single-Use
3. Membrane filter modules
4. Balance
5. Magnetic pinch valve

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TECHNOLOGY: QUATERNARY DIAPHRAGM

Multiple-Use and Single-Use

Quaternary Diaphragm Pumps

Quattroflow multi-use pumps have a vast array of options and flow rates to accommodate many pharmaceutical and biotech systems. Whether your requirement is 1 lph (.26 gph) or 20,000 lph (5283 gph) Quattroflow has your application covered with high purity, easily cleanable, multiple use units. From OEM's and small scale automated systems, to large laboratories and cross-filter systems, the QF Series provides the purity needed for the most demanding pharmaceutical and bio-technology applications.

Quattroflow single-use combines convenience with the ability to save time and money by reducing the cost of cleaning and decontamination. Gamma-radiated and sterility tested upon request, these pumps ensure the integrity of your process and production output by providing the safe, clean and reliable transfer of your high purity process fluids.

QF 150S
Multiple-Use Quaternary
Diaphragm Pump

QF 1200SU
Single-Use Quaternary
Diaphragm Pump

Applications

- Chromatography systems
- Cross-flow systems
- Centrifuges
- Separators
- Homogenizators
- Filter capsules
- Reaction dosing
- Virus filtration
- Buffer mixing systems
- Blood plasma fractionation
- Virus cultures
- Bacterial and viral vaccines
- Cell cultures
- Cell cultures supernatants
- Enzyme solutions
- Antibodies

Features and Benefits

- Minimal maintenance
- Minimal downtime
- Low pulsation
- Superior containment
- Variable and wide flow
- No particle shedding
- High purity
- Quiet operation
- CIP & SIP
- Proof against dry running
- Self-priming
- Easy cleanable outer surface
- Linear turndown
- Hygienic compact design
- Low heat input

Technical Data

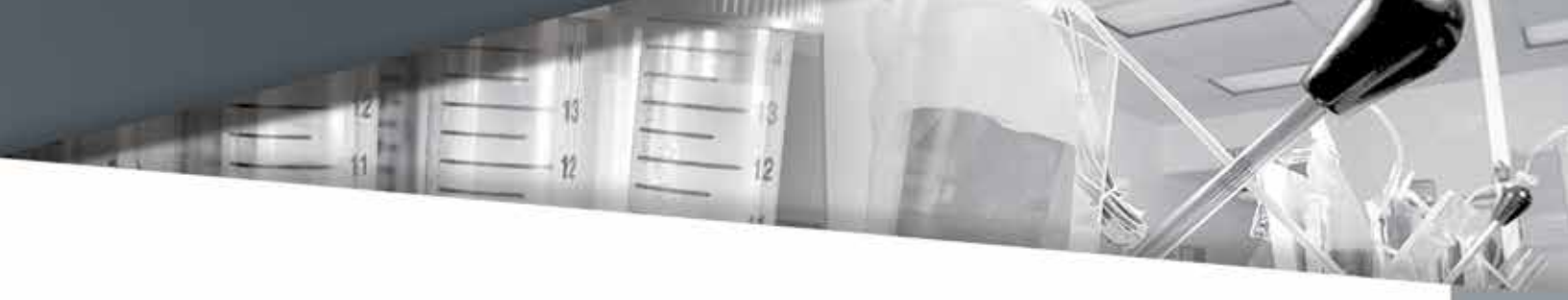
- Stainless steel materials of construction
- Pump chamber: Polypropylene (single-use only)
- Valves: EPDM
- Diaphragm: TPE

Performance Data

- Flow range: 1 lph – 20,000 lph (.26 gph-5283 gph)
- Max. discharge pressure: 6 bar (87 psi)
- Max. temperature: 130°C (266°F)

Certifications & Associations

FDA USP CLASS VI Ex CE



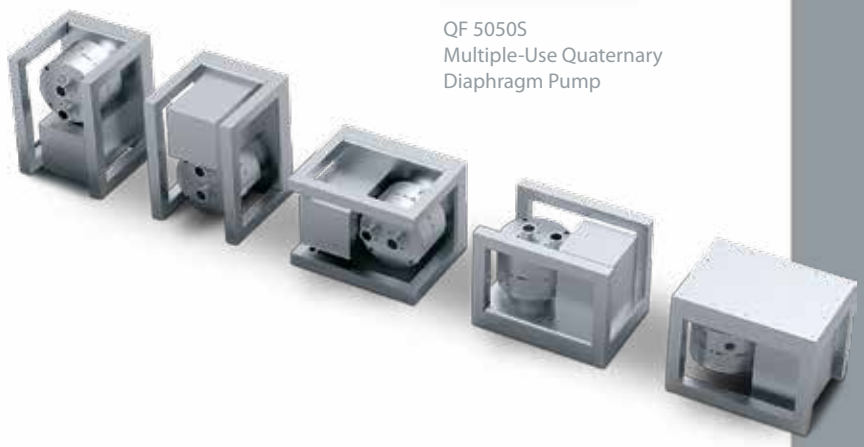
Compact and Versatile

The New Model 5050

The new Quattroflow 5050 is a step beyond the 4400 pump, that features an innovative pumping system for demanding applications with compact dimensions, multi-directional connections and a wide flow rate.

Features and Benefits:

- Multi-option installation flexibility
- Compact design of the whole unit, dimensions 440 x 320 x 323 mm (17.3 x 12.6 x 12.7 inch)
- Multi-directional pump head connections positioning
- Wide range of flow, with linear turndown: 50 – 5000 l/h (13 – 1321 gph)
- Complete flow range with one drive (no further drive options needed)
- Drainable and cleanable
- Multiple-use and single-use models available



QF 5050S
Multiple-Use Quaternary Diaphragm Pump

PUMP SELECTION GUIDE

	QF 5050S	QF5050SU
Range of Flow	50 - 5000 lph (13 - 1321 gph)	50 - 5000 lph (13 - 1321 gph)
Max Pressure	6 bar @ 20°C (87 psi @ 68°F)	4 bar @ 20°C (58 psi @ 68°F)
Max Temp Process / CIP / SIP	80 / 90 / 130°C (176 / 194 / 260°F) autoclavable	130°C autoclavable
Chamber Diameter	225 mm 8.86 in	225 mm 8.86 in
Porting	50 mm Flange 1-1/2"TC	50 mm Flange 1-1/2"TC
Power Consumption	3000 W	3000 W
Power Supply	400 V 3 - phase	400 V 3 - phase
Material of Construction	Stainless Steel: 1.4435 / 1.4539 Valves: EPDM Diaphragm: TPE	Polypropylene Valves: EPDM Diaphragm: TPE
Note	Multiple-Use	Single-Use

ABAQUE™
PERISTALTIC PUMPS
mouvex.com

ALMATEC®
AIR-OPERATED
DOUBLE-DIAPHRAGM PUMPS
almatec.de

BLACKMER®
VANE PUMPS & COMPRESSORS
blackmer.com

ENVIROGEAR®
INTERNAL GEAR PUMPS
envirogearpump.com

FLUID DYNAMICS™
POLYMER BLENDING SYSTEMS
fluiddynamics1.com

GRISWOLD™
CENTRIFUGAL PUMPS
griswoldpump.com

MAAG®
PUMP SYSTEMS
PELLETIZING SYSTEMS
FILTRATION SYSTEMS
maag.com

MOUVEX®
ECCENTRIC DISC PUMPS,
VANE PUMPS &
COMPRESSORS
mouvex.com

NEPTUNE™
DIAPHRAGM (METERING) PUMPS,
POLYMER SYSTEMS & MIXERS
neptune1.com

QUATTROFLOW™
QUATERNARY DIAPHRAGM
quattroflow.com

REDSCREW™
SCREW PUMPS
redscrewpump.com

SYSTEM ONE®
CENTRIFUGAL PUMPS
blackmer.com

WILDEN®
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