

Expert Solutions for Biopharma Applications

> BIOPHARMA Pumps



Where Innovation Flows

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



quattroflow.com



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Quattroflow™ Pumps Overview TECHNOLOGY:

TECHNOLOGY: 4-PISTON DIAPHRAGM

Multiple-Use and Single-Use

Quaternary Diaphragm Pumps

Quattroflow multiple-use pumps have a vast array of options and flow rates to accommodate many biopharmaceutical applications. Whether your requirement is 1 lph (0.017 lpm) or 16,000 lph (267 lpm) 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 crossflow 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 eliminating the cost of cleaning and decontamination. Gamma-irradiated 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.

Applications and Products

- Chromatography systems
- · Cross-flow systems, TFF
- Centrifuges
- Homogenizers
- Direct flow filters
- Reaction dosing
- Virus or sterile filtration
- Depth filtration
- **Buffer mixing systems**

Features and Benefits

- Minimal maintenance
- Minimal downtime
- Low pulsation
- Superior containment
- · Variable wide flow
- Capable of dry run
- Self-priming
- · Cleanable outer surface
- · Linear turndown
- Compact design

- Blood plasma fractionation
- Virus cultures
- · Bacterial and viral vaccines
- Cell cultures
- Cell cultures supernatants
- Enzyme solutions
- Antibodies
- Virus inactivation
- DF/MF/UF filters
- Low heat input
- High purity
- · Minimum particle shedding
- Quiet operation
- · Lower life cycle cost
- Ease of use
- Quick start-up
- Scaleable
- · No cell damage · Low shear



- · Stainless steel materials of construction
- Single-use pump chamber: Solid polypropylene or injection-molded polyethylene
- Valves: EPDM
- Diaphragm: TPE (EPDM/PP)

Performance Data

- Flow range: 1 lph 16,000 lph (0.017 267 lpm)
- Max. discharge pressure: 6 bar (87 psi)
- Max. temperature: 130°C (266°F)

Certifications & Associations











OF1200S

Multiple-Use Quaternary

Diaphragm Pump



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Markets Served

BIOPHARMACEUTICAL:

Quattroflow™ develops and manufactures single-use and multiple-use Quaternary (Four-Piston) Diaphragm Pumps for critical applications in the biopharmaceutical industry. This technology is CIP/SIP capable and offers disposable solutions that increase flexibility, reduce down-time, eliminate costs of cleaning validation, and risks of cross-contamination.

Quattroflow pumps can be found in all areas of biologic manufacturing such as cross-flow filtration systems, chromatography, and centrifuges. Quattroflow ensures safety, efficiency and reliability for handling biologics such as plasma products, therapeutic proteins, monoclonal antibodies, vaccines, and other high value products.

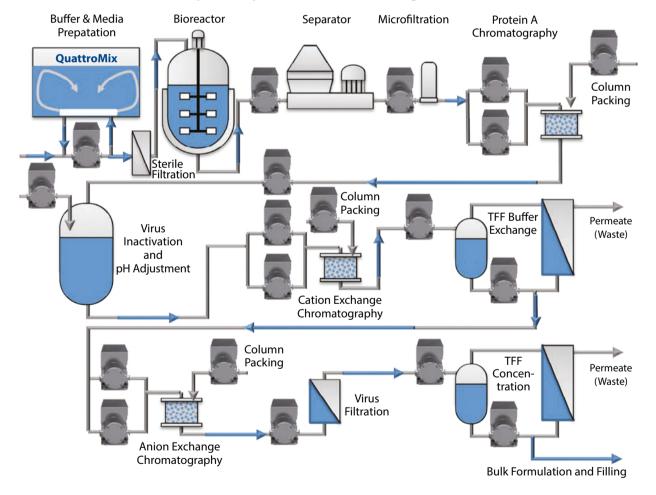
Typical Applications and Products Handled:

- Chromatography systems
- · Cross-flow systems, TFF
- Centrifuges
- Homogenizers
- Direct flow filters
- Reaction dosing
- Virus or sterile filtration
- Depth filtration
- Buffer mixing systems
- Blood plasma fractionation
- Virus cultures
- Antibodies

· Virus inactivation

- Bacterial and viral vaccines
- Cell cultures
- Cell cultures supernatants
- Enzyme solutions

Quattroflow Pumps in the Up- and Downstream Processing of Monoclonal Antibodies







Multiple-Use & Single-Use Pumps

Quattroflow pumps are available in two variations: Cleanable Multiple-Use and the increasingly popular Single-Use

Multiple-Use Pumps:

Quattroflow stainless-steel Multiple-Use pumps deliver the highest level of purity, containment and, perhaps most important, cleanability in biopharmaceutical-manufacturing operations, from simple product transfer to critical and demanding filtration and chromatography applications. These pumps are suitable for clean-in-place/steaming-in-place (CIP/SIP) operations, as well as offering autoclave capability. The 10k pump size has a new pump chamber design (patent pending) with excellent drainability to maximize product recovery.

Single-Use Pumps:

Quattroflow Single-Use pumps have a disposable wetted pump chamber constructed of solid polypropylene (PP) or injection-molded polyethylene (PE) that can be replaced as a complete unit. The simple disposability of the pump chamber saves time and money by eliminating cleaning validation, sterilization and product cross-contamination. Single-use pumps are critical to reduce equipment turnaround times in the development biosimilar processes. In general, multi-product facilities are the typical field of application of the single-use pumps (e.g. process development, production of clinical reference samples, contract manufacturing), helping to increase operational efficiencies.



PALL Allegro™ Single-Use Tangential Flow Filtration System" using a Quattroflow QF1200SU as recirculation pump.



PALL Allegro™ MVP Single-Use System" also with a Quattroflow QF1200SU pump, for different applications like virus filtration, sterile filtration, membrane chromatography, etc.





Diaphragm Pump

Images supplied courtesy of Pall Corporation





Quattroflow EZ-Set

Faster Replacement of Single-Use Pump Chambers

With the EZ-Set, you can change your Single-Use pump chamber in 30 seconds without the use of special tools or torque wrenches. The comfortable handgrip design makes replacing the chamber so easy, even while wearing rubber gloves. EZ-Set reduces downtime between batches, allowing you to spend more time doing what is really important for your work. It's quick, it's easy, and it's safe.

- Easy installation of Single-Use pump chambers
- For Single-Use pump chamber sizes 150 and 1200
 (QF150SU / QF1200SU / QF1200SU-CV / QF1200SU-HT)
- Nothing to screw in
- Easy visual guide for proper tightening, no torque wrenches needed
- Available for new pumps by adding "EZ" to the pump code
- Retrofittable on existing standard Quattroflow Single-Use pumps by replacing pump chamber, pressure plate and shaft bearing kit



Order information for a new pump (example):

| Pump | Order Number |
|----------|--------------------------|
| QF150SU | QF15SU-EZ |
| QF1200SU | QF12SU3-EZ QF12SU5-EZ |

Order information to upgrade from a standard pump to an EZ pump:

| Pump | Single-Use Pump Chambers (3 units) | Pressure Plate Including Bolts | Shaft Bearing Kit |
|----------|------------------------------------------|-----------------------------------|----------------------|
| QF150SU | QF15DISPP-EZ | PQ15DISKIT-EZ | PSKITWLC155-EZ |
| QF1200SU | QF12DISPP-EZ | PQ12DISKIT-EZ | PSKITWLC125-EZ |

Upgrade your Quattroflow™ pump with the EZ-Set pressure plate for Single-Use Quattroflow QF150 and QF1200 sizes





QF1200HT & QF4400HT

With integrated controller High turn-down ratio & space-saving design

The Quattroflow pump sizes 1200 and 4400 are also available in a special HT version. These pumps are similar to the standard QF 1200/4400 pumps, but has integrated the pump chamber, pump drive, motor and control box into one unit. The elimination of a separate control box results in a more compact design, a smaller footprint and an easier handling.

The HT pumps offer the following features and benefits:

 "All-in-One" technology; integration of pump chamber, pump drive, motor, controller and pump housing into one unit

 Extended turndown ratio for a wider range of flow rates than the standard versions and optimal linearity

- Maximum flow rates of 1200 lph (QF1200HT) and 5000 lph (QF4400HT)
- · High accuracy in controlling flow rates
- Compact design
- Keypad for manual control and display of motor speed
- Easy "Plug and Play" installation and startup with one power cable
- Flexible single-phase 110-230V power supply (QF1200HT), three phase 230V or 400V power supply (QF4400HT)
- Available with multiple-use (SS316L) and single-use (machined polypropylene) pump chamber, in addition the QF1200HT pump size can be equipped with a single-use pump chamber constructed of injection-molded polyethylene
- Clean-In-Place/Steaming-In-Place (CIP/SIP) for multiple-use pumps
- Autoclavability
- Analog input (4-20mA) as standard
- · Compatible with Quattroflow PID controller



OF4400HT

Multiple-Use & Single-Use

Quaternary Diaphragm Pump





Concerned about your 1 - P - C - 2

Concerned about your Lobe Pump Performance?

Quattroflow[™] Pumps and Lobe Pumps Compared:

| Lobe Pump Shortcomings (And Shortcomings of Gear and PD Pumps) | Quattroflow Pump Benefits |
|-------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Can't satisfy all duty needs or scalability requirements | High turn-down allows for multiple flow duties and scaleup |
| Unable to handle both product and CIP flow duties with the same pump | High turn-down allows for consistent completion of both duties |
| Can't self-prime, limited suction-lift capabilities | Self-priming (even dry), wider range of suction-lift capabilities |
| Mechanical seals do not permit dry running | Risk-free dry running |
| Leakage problems with mechanical seals | Seal-less technology |
| High maintenance costs due to expensive mechanical seals | Seal-less design helps ensure low maintenance costs |
| Shock during pump shipment may lead to damaged mechanical leads | No special risks during transport |
| Highly skilled staff required for replacement of mechanical seals | Easy replacement of wear parts |
| Compromised polished fluid path because of incidental metal-to-metal contact resulting in high re-polish costs (see figure 1) | No metal-to-metal parts moving in proximity, so no loss of internal polish finish |
| Damage by rigid particles of undissolved salts | Less prone to damage Figure 1 |
| Large clearance required for SIP temperatures | SIP and CIP capable with no influence on performance |
| Low efficiency for low-viscosity products | Specially developed for low-viscosity products |
| Shear produced, unacceptable for shear-sensitive products | Optimized flow path for shear-sensitive products |
| Pump efficiency affected by component wear with time | Consistent efficiency along the pump curve independent of time |
| Particle generation caused by internal pump wear and mechanical seal wear can lead to product contamination | The quaternary (four-piston) technology does not require a mechanical seal or wetted rotating parts, ensuring total product containment with minimum particle generation |
| High power required to compensate for slip results in greater heat and shear generation for pumped products | Just 0.37 kW needed for a QF1200 pump size |
| Pulsation due to the high and irregular slip during rotation | Low pulsation due to quaternary diaphragm pump principle |
| Not suitable for single-use biopharma applications | Convertible to cleanable Multiple-Use and disposable Single-Use pump chambers |

Performance of Quattroflow Pumps and Lobe Pumps Compared

Fixed Speed Curves

Quattroflow pump at maximum speed.

Pump is only slightly influenced by pressure and wear over time.

The same Quattroflow pump at half speed.
Pump is only slightly influenced by pressure and wear over time. Pump is able to match a lobe pump that slips at maximum speed.

Larger traditional **lobe pump** slips and needs to be oversized.

Smaller traditional **lobe pump** does not have needed flow range (turn-down) to meet flow.



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^{*} For applications that experience loss of performance from pump wear.



Quattroflow™ Pumps and Peristaltic Pumps Compared

Limitations of Peristaltic Pumps

in Biopharma Production Processes

Particle generation

The major drawback of peristaltic pumps is the particle generation that is caused by the pump design. The working principle of peristaltic pumps is linked with a permanent mechanical stress of the hose material, which can be a substantial source of particles entering the fluid stream.

This abrasion may contaminate the pumped liquid and the pharmaceutical end product. As a result, the flow rate can be reduced and some pumps are not capable of reaching more than 1 bar.

Particle generation outside the hose Spallation release may also occur outside the hose. This may compromise the fluid path but also contaminate the external clean room environment. **Pulsation**

Tube failure

High mechanical stress can result in tube rupture, which can lead to a catastrophic failure, costly product loss, downtime and maintenance.

Flow rate consistency

With increasing operating time of the tube, mechanical stress changes the hose geometries over time and can lead to an inconsistent flow.

Due to their operational design, peristaltic pumps create a pulsing flow, which can adversely affect the process.

Scaling Limitations

Limited flow and pressure capabilities of peristaltic pumps means changing pump technologies as processes move from process development to cGMP creating scale up issues.

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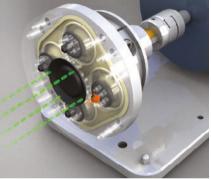
Features and Benefits of Quattroflow Quaternary Pumps in Biopharma Production Processes

- Minimal particle generation
- Low pulsation
- Superior containment
- Consistent flow rate
- High turn-up/down ratio
- Variable and wide performance range
- · Minimal component wear

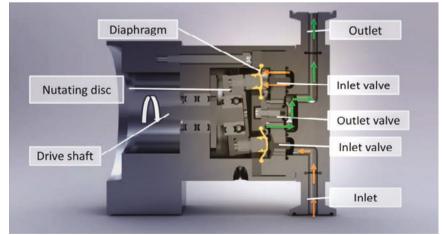
- Minimal maintenance/downtime
- · Quiet operation
- · Low heat input
- · Proof against dry running
- Self-priming
- Gamma irradiation possible



Minimal friction, shearing or temperature increase



As each diaphragm expands, fluid is gently pushed through the valve



The diaphragm contracts, pulling fresh fluids from the inlet resulting in low pulsation with a high turn down ratio





Accessories



Control Box

- Variable speed controller with integrated key pad for manual speed control
- Configurable for remote speed control with 4 –20 mA analogue input
- 230V / 50 Hz or 115 V / 60 Hz for model 1200 (image left)
- 400V, 3P for models 4400/5050/20k (image right)
- · Hygienic 1.4301 housing, IP 54
- · Easy plug & play installation



Power Box

- Plug & Play installation
- Protects system and pump from overpressure
- Configurable pressure switch setpoint
- Reset button for pump reset
- To be used with pressure switch (also available)
- · For multiple-use models only

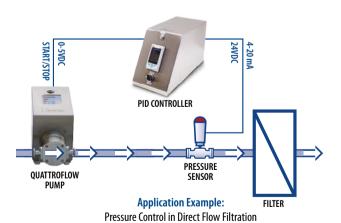


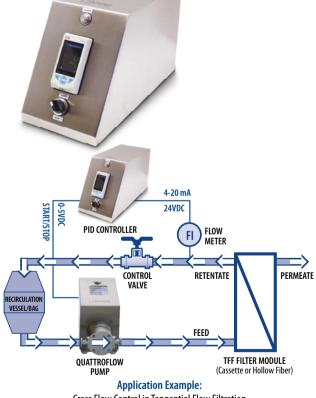
Diaphragm Sensor

- Sensor installed in ring drive unit
- Detection of all liquids
- Signal output to a controller, if diaphragm is ruptured

PID Pressure Controller

- Ideal for processes, where the Quattroflow pump should be controlled to a defined pressure or flow rate (e.g. for filtration)
- 4-20mA input for pressure or flow sensor
- 24VDC voltage supply for sensors
- Autotune function for optimization of PID parameters
- $0-5\mbox{VDC}$ output signal for use with QF150 or QF1200CV (requires optional analogue input), 4 - 20mA for QF1200HT
- · Configurable alarm setpoints for automatic shutoff of pump





Cross Flow Control in Tangential Flow Filtration

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| Multiple-Use Pumps | Pump Size | Flow Range | More Data Available on Page: |
|-----------------------|--------------|--------------------------------------|------------------------------------|
| | QF150S | 1 – 180 lph 0.017 – 3 lpm | 14 |
| | QF1200S | 10 – 1,200 lph 0.167 – 20 lpm | 15 |
| | | | |
| | QF1200S-CV | 10 – 1,200 lph 0.167 – 20 lpm | 16 |
| | QF1200S-HT | 6 – 1,200 lph 0.1 – 20 lpm | 17 |
| | QF4400S | 150 – 5,000 lph 2.5 – 83 lpm | 18 |
| | QF4400S-HT | 50 – 5,000 lph 0.83 – 83 lpm | 19 |
| | QF5050S | 50 – 5,000 lph 0.83 – 83 lpm | 20 |
| | QF10k | 500 – 10,000 lph 8.3 – 167 lpm | 21 |
| 100 | QF20k | 1,000 – 16,000 lph 16.7 – 267 lpm | 22 |

| Single-Use Pumps | Pump Size | Flow Range | More Data Available on Page: |
|---------------------|--------------|--------------------------------------|------------------------------------|
| | QF150SU | 1 – 180 lph 0.017 – 3 lpm | 23 |
| | QF1200SU | 10 – 1,200 lph 0.167 – 20 lpm | 24 |
| 60 | QF1200SU-M | 10 – 1,200 lph 0.167 – 20 lpm | 25 |
| | QF1200SU-CV | 10 – 1,200 lph 0.167 – 20 lpm | 26 |
| | QF1200SU-HT | 6 – 1,200 lph 0.1 – 20 lpm | 27 |
| 10 | QF4400SU | 150 – 5,000 lph 2.5 – 83 lpm | 28 |
| | QF4400SU-HT | 50 – 5,000 lph 0.83 – 83 lpm | 29 |
| 00 | QF5050SU | 50 – 5,000 lph 0.83 – 83 lpm | 30 |
| | | | |
| | QF20kSU | 1,000 – 16,000 lph 16.7 – 267 lpm | 31 |

All mentioned data valid for the standard pump equipment.





QF150S

Quaternary Diaphragm Pumps Multiple-Use

- New version with 90W motor
- · Integrated controller
- Digital key pad for manual operation
- Small and portable format
- Ideal for R&D and process development

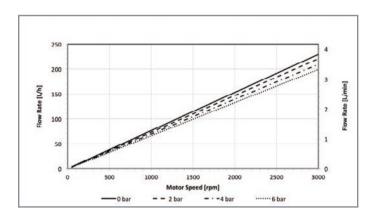
Technical Data

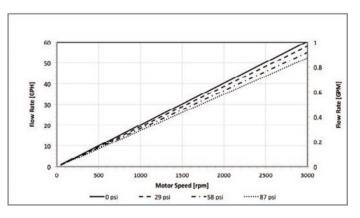
| Teermitee | Technical Data | | |
|-------------------------------------------|-------------------------------------------------------------|---------------------------------------------------|--|
| | QF150S Standard Moto | r | |
| Flow Rate Maximum: | Eccentric Shaft 5° | 180 lph (3 lpm) | |
| Flow Rate Minimum: | Eccentric Shaft 5° | 1 lph (0.017 lpm) | |
| Pressure: | Temperature of Fluid $<$ 40 $^{\circ}$ C (104 $^{\circ}$ F) | 6 bar (87 psi) | |
| Pressure: | Temperature of Fluid $> 40^{\circ}$ C (104° F) | 4 bar (58 psi) | |
| | Fluid | 80° C (176° F) | |
| Maximum | CIP | 90° C (194° F) | |
| Temperature: | SIP | 130° C (266° F) | |
| | Autoclave | 130° C (266° F) | |
| Suction Lift Dry at 3000 rpm: | Eccentric Shaft 5° | 2 - 3 m (6.6 - 9.8 ft) | |
| Volume Specifications: | Approximated Volume per Revolution at Free Output | 1.2 ml | |
| | Filling Volume Without Connectors | 15 ml | |
| Connection | Connectors | 1/4" TC | |
| Specification | Position of Connectors | Inline | |
| (Standard): | Number of Flow Directions | 4 | |
| | Pump Housing | SS316L | |
| Product Wetted | Valve Plate | SS316L | |
| Materials | Diaphragms | TPE | |
| (Standard): | Valves | EPDM | |
| | 0-rings | EPDM | |
| c .:c . / | Elastomere | USP <88> Cl. VI; | |
| Certificates/ Proofs (Optional): | (product wetted) Stainless Steel Parts | FDA21CFR177; BSE/TSE Safe 3.1; Surface Roughness; | |
| rious (optional). | (product wetted) | Ferrite Content | |
| | Rated speed | 3000 min-1 | |
| Motor (Standard): | Voltage | 230 V (110 V as option) | |
| | Power | 90 W | |
| Pump Dimension | Length | 257 mm (10.12") | |
| with Motor and | Width | 164 mm (6.46") | |
| Housing: | Height | 185 mm (7.28") | |
| Pump Weight with Motor and Housing: | | 9 kg (20 lb) | |

Other connection specifications, materials and motors available on request.



Performance Charts Eccentric Shaft: 5°







QF1200S

Quaternary Diaphragm Pumps Multiple-Use

- Separate control box for manual operation available
- ATEX version available

Technical Data

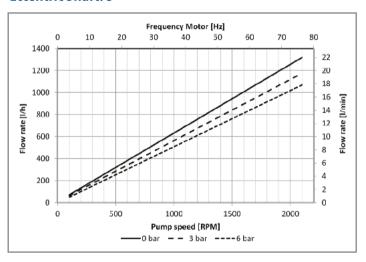
| Flow Rate Maximum: Eccentric Shaft 3° 1200 lph (13.3 lpm) Flow Rate Minimum*: Eccentric Shaft 5° 1200 lph (20 lpm) Flow Rate Minimum*: Eccentric Shaft 5° 20 lph (0.333 lpm) Fressure: Temperature of Fluid < 40° C (104° F) 6 bar (87 psi) 7 temperature of Fluid > 40° C (104° F) 4 bar (58 psi) Maximum CIP 90° C (194° F) 130° C (266° F) Maximum CIP 90° C (194° F) 130° C (266° F) Maximum CIP 90° C (194° F) 130° C (266° F) Autoclave 130° C (266° F) Approximated Volume per Revolution at Free Output 5.8 ml (3°) Filling Volume Without Connectors 75 ml Connection Specification (Standard): Number of Flow Directions 4 Product Wetted Materials (Standard): Valves Plate Materials (Standard): Valve Plate PDM Certificates/ Proofs (Optional): Stainless Steel Parts (product wetted) Motor (Standard): Stainless Steel Parts (product wetted) Motor (Standard): Power 0.37 kW Pump Dimension With Motor and Housing: Height 24 kg (53 lb) Pump Weight with Motor and Housing: Pump Weight With Motor and Pump Weight With Motor and Housing: Pump Weight With Motor and Pump Meight Pump Weight With Motor and Pump Weight With Motor and Pump Meight Pump Weight Pump Weight Pump Weight Pump Meight Pump Weight P | Teerimear Data | | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|------------------------------------------------|-------------------------------|
| Range Suction Lift Dry at 1800 rpm | | QF1200S Standard Motor | |
| Flow Rate Eccentric Shaft 3° 10 lph (0.167 lpm) | Flow Rate | Eccentric Shaft 3° | 800 lph (13.3 lpm) |
| Minimum*: Eccentric Shaft 5° 20 lph (0.333 lpm) Pressure: Temperature of Fluid < 40° C (104° F) 4 bar (58 psi) Temperature of Fluid > 40° C (104° F) 4 bar (58 psi) Maximum CIP 90° C (194° F) Temperature: SIP 130° C (266° F) Autoclave 130° C (266° F) Pump Speed Range: Eccentric Shaft 3° 2.5-3 m (8.2-9.8 ft) Autoclave Pump Speed Range: Eccentric Shaft 3° 4-4.5 m (13.1-14.7 ft) Volume Specification: Filling Volume Without Connectors Specification (Standard): Number of Flow Directions A Fungh Housing StafeL Valve Plate Materials (Standard): Valve Plate Pump Housing StafeL Stainless Steel Parts (product wetted) Certificates/ Proofs (Optional): Stainless Steel Parts (product wetted) Motor (Standard): Power 0.37 kW Pump Dimension With Motor and Housing: Height Valve Plate 1375 min-1 (50 Hz) Pump Weight with Motor and Width 159 mm (6.26") Pump Weight with Motor and Pump Weight with Motor and Housing: Height 210 mm (8.27") | Maximum: | Eccentric Shaft 5° | 1200 lph (20 lpm) |
| Temperature of Fluid < 40° C (104° F) | Flow Rate | Eccentric Shaft 3° | 10 lph (0.167 lpm) |
| Pressure: Temperature of Fluid > 40° C (104° F) | Minimum*: | Eccentric Shaft 5° | 20 lph (0.333 lpm) |
| Temperature of Fluid > 40° C (104° F) Maximum CIP 90° C (194° F) 130° C (266° F) Autoclave Pump Speed Range: Suction Lift Dry at 1800 rpm: Volume Specifications: Connection Specification (Standard): Product Wetted Materials (Standard): Certificates/ Proofs (Optional): Certificates/ Proofs (Optional): Motor (Standard): Mo | Droccuro | Temperature of Fluid $< 40^{\circ}$ C (104° F) | 6 bar (87 psi) |
| Maximum Temperature: SIP 130° C (194° F) 130° C (266° F) Autoclave 130° C (266° F) Autoclave 130° C (266° F) Pump Speed Range: Suction Lift Dry at 1800 rpm: Volume Specifications: Connection Specification Specification (Standard): Product Wetted Materials (Standard): Certificates/ Proofs (Optional): Certificates/ Proofs (Optional): Motor (Standard): Motor (Standard): Motor (Standard): Motor (Standard): Motor (Standard): Motor (Standard): Pump Dimension with Motor and Housing: Pump Weight with Motor and Housing: Pump Weight with Motor and Pump Wight Width 159 mm (6.26") Pump Weight with Motor and Pump Weight with Motor and Autoclave Recentric Shaft 3° 2.5-3 m (8.2-9.8 ft) 4-4-5 m (13.1-14.7 ft) 4-4-5 m (13.1-14.7 ft) Approximated Volume per Revolution at Free Output Sp. 8 ml (3°) Foml (3°) Foml (13.1-14.7 ft) Approximated Volume per Revolution at Free Output Sp. 8 ml (3°) Foml (13.1-14.7 ft) Autoclave (13.1-14.7 ft) Autoclave P. 9.6 ml (5°) 5.8 ml (3°) Foml (13.1-14.7 ft) Autoclave P. 9.6 ml (5°) Foml (13.1-14.7 ft) Autoclave P. 9.6 ml (5°) Soml (3°) Foml (13.1-14.7 ft) Autoclave P. 9.6 ml (5°) Foml (13.1-14.7 ft) Autoclave P. 9.6 ml (5°) Autoclave P. 4.4.5 ml (13.1-14.7 ft) Autoclave P. 4.5 ml (13.1-14.7 ft) Autoclave P. 9.6 ml (5°) Autoclave P. 4.5 ml (13.1-14.7 ft) Autoclave P. 4.5 ml | riessuie. | Temperature of Fluid $>$ 40° C (104° F) | 4 bar (58 psi) |
| Temperature: SIP 130° C (266° F) Autoclave 130° C (266° F) Autoclave 130° C (266° F) Pump Speed Range: Suction Lift Dry at 1800 rpm: Eccentric Shaft 3° 2.5-3 m (8.2-9.8 ft) Approximated Volume Eccentric Shaft 5° Volume Approximated Volume per Revolution at Free Output Specifications: Connection Specification Standard): Filling Volume Without Connectors Connection Position of Connectors Standard): Number of Flow Directions 4 Pump Housing S5316L Product Wetted Walve Plate S5316L Materials Diaphragms TPE Standard): Valves EPDM Certificates/ Proofs Stainless Steel Parts (product wetted) Certificates/ Proofs (Optional): Stainless Steel Parts (product wetted) Motor (Standard): Power 0.37 kW Pump Dimension Length 487 mm (19.17") Pump Weight with Motor and Height 210 mm (8.27") Pump Weight with Motor and 24 kg (53 lb) | | Fluid | 80° C (176° F) |
| Pump Speed Range: Suction Lift Dry at 1800 rpm: Volume Specifications: Connection Specification (Standard): Product Wetted Materials (Standard): Certificates/ Proofs (Optional): Coption Standard): Certificates/ Proofs (Optional): Coption Standard): Certificates/ Proofs (Optional): Certificates/ Proofs | Maximum | CIP | 90° C (194° F) |
| Pump Speed Range: Suction Lift Dry at 1800 rpm: Volume Specifications: Connection Specification (Standard): Product Wetted Materials (Standard): Certificates/ Proofs (Optional): Coptional: Continum Standard: Certificates/ Proofs (Optional): Coptional: Coptiona | Temperature: | SIP | 130° C (266° F) |
| Suction Lift Dry at 1800 rpm: Volume Specifications: Connection Specification (Standard): Product Wetted Materials (Standard): Certificates/ Proofs (Optional): Certificates/ Proofs (Standard): Certificates/ Proofs (Optional): Certificates/ Proofs (Optional): Motor (Standard): Motor (Standard): Pump Dimension with Motor and Housing: Pump Weight with Motor and Eccentric Shaft 3° Eccentric Shaft 5° Eccentric Shaft 5° Eccentric Shaft 5° A-4.5 m (13.1-14.7 ft) 9.6 ml (5°) 5.8 ml (3°) 5.8 ml (3°) 5.8 ml (3°) 9.6 ml (5°) 5.8 ml (3°) 9.6 ml (5°) 5.8 ml (3°) 5.8 ml (3°) 9.6 ml (5°) 5.8 ml (3°) 9.6 ml (5°) 5.8 ml (3°) 5.8 ml (3°) 9.6 ml (5°) 5.8 ml (3°) 5.8 ml (3°) 9.6 ml (5°) 5.8 ml (3°) 9.6 ml (5°) 5.8 ml (3°) 9.6 ml (5°) 5.8 ml (3°) Fyone Ush Directions 4 Ush Seas Cl. Vl; FDA21CFR177; BSE/ TSE Safe 3.1; Surface Roughness; Ferrite Content 1375 min-1 (50 Hz) 230/400 V Power 0.37 kW Pump Dimension Width 159 mm (6.26") Pump Weight with Motor and Pump Weight with Motor and 24 kg (53 lb) | | Autoclave | 130° C (266° F) |
| Suction Lift Dry at 1800 rpm: Volume | | rpm | 30 - 2,400 |
| Approximated Volume per Revolution at Free Output Specifications: Volume Specifications: Filling Volume Without Connectors 5.8 ml (3°) | Suction Lift Dry | Eccentric Shaft 3° | 2.5 - 3 m (8.2-9.8 ft) |
| Volume Specifications: Filling Volume Without Connectors Connection Specification (Standard): Product Wetted Materials (Standard): Certificates/ Proofs (Optional): Motor (Standard): Motor (Standard): Motor (Standard): Pump Dimension with Motor and Peroperication Specification (Standard): Position of Connectors Inline SS316L Pump Housing SS316L Valve Plate SS316L Valves EPDM USP <88> CI. VI; FDA21CFR177; BSE/ TSE Safe 3.1; Surface Roughness; Ferrite Content 1375 min-1 (50 Hz) 159 mm (6.26") Pump Dimension Width Motor and Housing: Pump Weight with Motor and Pump Weight with Motor and Voltage Pump Weight With Motor and Pump Weight Width Motor and Pump Weight Width Motor and Position of Connectors JA'" TC Stalling Volume Without Connectors JA'" TC SAII SUFFICE SS316L USP <88> CI. VI; FDA21CFR177; BSE/ TSE Safe 3.1; Surface Roughness; Ferrite Content 1375 min-1 (50 Hz) 230/400 V Power 0.37 kW Pump Dimension Width 159 mm (6.26") Pump Weight With Motor and Pump Weight With Motor and Pump Weight With Motor and Position of Connectors Number of Flow Directions 4 Pump Usp <88> CI. VI; FDA21CFR177; BSE/ TSE Safe 3.1; Surface Roughness; Ferrite Content 1375 min-1 (50 Hz) 230/400 V Power 0.37 kW Pump Dimension Width 159 mm (6.26") | • | Eccentric Shaft 5° | |
| Specifications: Connection Specification (Standard): Connectors Specification (Standard): Product Wetted Materials (Standard): Certificates/ Proofs (Optional): Certificates/ Proofs (Optional): Motor (Standard): Stainless Steel Parts (product wetted) Motor (Standard): Motor (Standard): Pump Dimension with Motor and Housing: Filling Volume Without Connectors Position of Connectors Inline Sta3/4" TC Pump Housing St316L Valve Plate SS316L Valves EPDM USP <88> CI. VI; FDA21CFR177; BSE/ TSE Safe 3.1; Surface Roughness; Ferrite Content 1375 min-1 (50 Hz) 230/400 V Power 0.37 kW Pump Dimension with Motor and Housing: Pump Weight with Motor and Pump Weight With Motor and Connectors Sylva Valves EPDM USP <88> CI. VI; FDA21CFR177; BSE/ TSE Safe 3.1; Surface Roughness; Ferrite Content 1375 min-1 (50 Hz) 230/400 V 1375 min (50 Hz) 24 kg (53 lb) | Volume | • • • • • • • • • • • • • • • • • • • • | |
| Connection Specification (Standard): Product Wetted Materials (Standard): Certificates/ Proofs (Optional): Motor (Standard): Motor (Standard): Motor (Standard): Proper Dimension with Motor and Position of Connectors Inline Position of Connectors Inline Statiles Pump Housing SS316L Valve Plate SS316L Valve Plate SS316L Valves EPDM USP <88> CI. VI; FDA21CFR177; BSE/ TSE Safe 3.1; Surface Roughness; Ferrite Content 1375 min-1 (50 Hz) Power 0.37 kW 487 mm (19.17") Pump Weight with Motor and Housing: Pump Weight with Motor and Position of Connectors Inline Statiles SS316L Valves EPDM USP <88> CI. VI; FDA21CFR177; BSE/ TSE Safe 3.1; Surface Roughness; Ferrite Content 1375 min-1 (50 Hz) 159 mm (6.26") Power 0.37 kW Pump Dimension Width 159 mm (6.26") Pump Weight with Motor and | | | |
| Certificates/ Proofs (Optional): Motor (Standard): Motor (Standard): Motor (Standard): Pump Dimension with Motor and Housing: Pump Weight with Motor and Large (Standard): Position of Connectors Inline Pump Housing SS316L Pump Housing SS316L Valve Plate SS316L Valves EPDM O-rings EPDM USP <88> Cl. Vl; FDA21CFR177; BSE/ TSE Safe 3.1; Surface Roughness; Ferrite Content 1375 min-1 (50 Hz) 24 kg (53 lb) | | - | |
| Product Wetted Materials (Standard): Certificates/ Proofs (Optional): Motor (Standard): Motor (Standard): Pump Dimension with Motor and Housing: Pump Housing SS316L Valve Plate SS316L Valves EPDM Elastomere (product wetted) Stainless Steel Parts (product wetted) Rated speed 1375 min-1 (50 Hz) 487 mm (19.17") Pump Weight with Motor and Housing: Pump Weight with Motor and Width 159 mm (6.26") Pump Weight with Motor and 24 kg (53 lb) | | | -, |
| Product Wetted Materials (Standard): Certificates/ Proofs (Optional): Motor (Standard): Motor (Standard): Pump Housing S5316L S5316L S5316L S5316L S5316L S5316L S5316L Valves EPDM USP <88> CI. VI; FDA21CFR177; BSE/ TSE Safe 3.1; Surface Roughness; Ferrite Content 1375 min-1 (50 Hz) Power O.37 kW Pump Dimension with Motor and Housing: Pump Weight with Motor and Pump Weight with Motor and Valves EPDM USP <88> CI. VI; FDA21CFR177; BSE/ TSE Safe 3.1; Surface Roughness; Ferrite Content 1375 min-1 (50 Hz) 230/400 V 159 mm (19.17") Pump Weight with Motor and Vidth 159 mm (6.26") Pump Weight with Motor and | | | - |
| Product Wetted Materials (Standard): Certificates/ Proofs (Optional): Motor (Standard): Motor (Standard): Pump Dimension with Motor and Housing: Product Wetted Valves EPDM USP <88> Cl. VI; FDA21CFR177; BSE/ TSE Safe 3.1; Surface Roughness; Ferrite Content 1375 min-1 (50 Hz) 230/400 V 487 mm (19.17") Pump Weight with Motor and Housing: Pump Weight with Motor and Valve Plate SS316L SS316L SS316L USP <88> Cl. VI; FDA21CFR177; BSE/ TSE Safe 3.1; Surface Roughness; Ferrite Content 1375 min-1 (50 Hz) 230/400 V 159 mm (6.26") Height 210 mm (8.27") | (Standard). | Number of Flow Directions | · ' |
| Materials (Standard): (Standard): Certificates/ Proofs (Optional): Motor (Standard): Pump Dimension with Motor and Housing: Pump Weight with Motor and Materials (Standard): Diaphragms TPE (Bastomere (product wetted) Elastomere (product wetted) Stainless Steel Parts (product wetted) Stainless Steel Parts (product wetted) Rated speed 1375 min-1 (50 Hz) 230/400 V Power 0.37 kW 487 mm (19.17") Pump Weight with Motor and Pump Liength 210 mm (8.27") | | , , | 333.02 |
| (Standard): (Standard): (Standard): (O-rings EPDM Elastomere (product wetted) Proofs (Optional): Stainless Steel Parts (product wetted) Motor (Standard): Pump Dimension with Motor and Housing: Pump Weight with Motor and (Standard): (Standard | Product Wetted | Valve Plate | |
| Certificates/ Proofs (Optional): Motor (Standard): Pump Dimension with Motor and Housing: Pump Weight with Motor and O-rings EPDM USP <88> CI. VI; FDA21CFR177; BSE/ TSE Safe 3.1; Surface Roughness; Ferrite Content 1375 min-1 (50 Hz) 230/400 V 0.37 kW 487 mm (19.17") 159 mm (6.26") Pump Weight with Motor and Quide terbin 159 mm (6.26") Length 210 mm (8.27") | | Diaphragms | TPE |
| Certificates/ Proofs (Optional): Stainless Steel Parts (product wetted) Motor (Standard): Pump Dimension with Motor and Housing: Pump Weight with Motor and Elastomere (product wetted) Stainless Steel Parts (product wetted) Rated speed 1375 min-1 (50 Hz) 230/400 V Power 0.37 kW 487 mm (19.17") Pump Weight with Motor and Height 210 mm (8.27") | (Standard): | Valves | EPDM |
| Certificates/ Proofs (Optional): Stainless Steel Parts (product wetted) Motor (Standard): Pump Dimension with Motor and Housing: Pump Weight with Motor and Proofs (Optional): Stainless Steel Parts (product wetted) Rated speed 1375 min-1 (50 Hz) 230/400 V Power 0.37 kW 487 mm (19.17") Pump Weight with Motor and Height 210 mm (8.27") | | 0-rings | |
| (Optional): Stainless Steel Parts (product wetted) Rated speed 1375 min-1 (50 Hz) Standard): Power 0.37 kW Pump Dimension with Motor and Housing: Pump Weight with Motor and with Motor and with Motor and with Motor and Pump Weight with Motor and with Motor and with Motor and Pump Weight with Motor and Width 159 mm (8.27") | | | FDA21CFR177; BSE/ TSE Safe |
| Motor (Standard): Power 0.37 kW Pump Dimension Width 159 mm (6.26") Housing: Height 210 mm (8.27") Pump Weight with Motor and 24 kg (53 lb) | | | Roughness; |
| (Standard): Power 0.37 kW Pump Dimension With Motor and Housing: Pump Weight with Motor and Width 210 mm (8.27") Pump Weight with Motor and 24 kg (53 lb) | •• | Rated speed | 1375 min-1 (50 Hz) |
| Pump Dimension Width Motor and Housing: Height With Motor and Width Motor and Housing: Height With Motor and Width Motor Middle Width Middle | | Voltage | 230/400 V |
| with Motor and Housing: Height 210 mm (6.26") Pump Weight with Motor and 24 kg (53 lb) | (Standard). | Power | 0.37 kW |
| with Motor and Housing: Width 159 mm (6.26") Pump Weight with Motor and Height 210 mm (8.27") | Pump Dimension | Length | 487 mm (19.17") |
| Pump Weight with Motor and 24 kg (53 lb) | with Motor and | Width | 159 mm (6.26") |
| with Motor and 24 kg (53 lb) | Housing: | Height | 210 mm (8.27") |
| | with Motor and | | 24 kg (53 lb) |

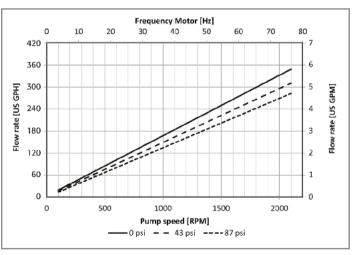
Other connection specifications, materials and motors available on request.

* When using pump with control box: 20 lph (0.333 lpm) and 40 lph (0.667 lpm)



Performance Charts Eccentric Shaft: 5°









QF1200S-CV

Quaternary Diaphragm Pumps Multiple-Use

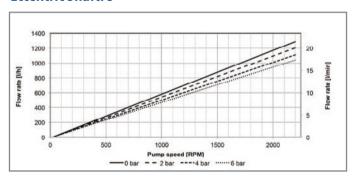
- · Integrated controller
- · Digital key pad for manual operation
- · Compact size
- 230V motor

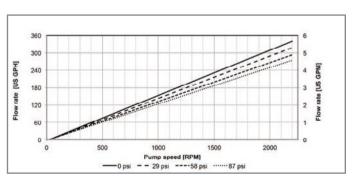
Technical Data

| QF1200S-CV Standard Motor | | |
|----------------------------------------|-------------------------------------------|--------------------------------------------------|
| Flow Rate Maximum: | QF12003-CV Standard Moto | |
| | | 1200 lph (20 lpm) |
| Flow Rate Minimum: | Eccentric Shaft 5° | 10 lph (0.167 lpm) |
| Pressure: | Temperature of Fluid < 40° C (104° F) | 6 bar (87 psi) |
| | Temperature of Fluid > 40° C (104° F) | 4 bar (58 psi) |
| | Fluid | 80° C (176° F) |
| Maximum | CIP | 90° C (194° F) |
| Temperature: | SIP | 130° C (266° F) |
| | Autoclave | 130° C (266° F) |
| Pump Speed Range: | rpm | 10 - 2200 |
| Suction Lift Dry at 1800 rpm: | Eccentric Shaft 5° | 4 - 4.5 m (13.1-14.7 ft) |
| Volume Specifications: | Filling Volume Without Connectors | 75 ml |
| Connection | Connectors | 3/4" TC |
| Specification (Standard): | Position of Connectors | Inline |
| | Number of Flow Directions | 4 |
| | Pump Chamber | SS316L |
| | Valve Plate | SS316L |
| Product Wetted | Diaphragms | TPE |
| Materials (Standard): | Valves | EPDM |
| | 0-rings | EPDM |
| Certificates/Proofs | Elastomere (product wetted) | USP <88> Cl. VI; FDA21CFR177; BSE/TSE Safe |
| (Optional): | Stainless Steel Parts (product wetted) | 3.1; Surface Roughness; Ferrite Content |
| | Rated speed | 2200 min-1 |
| Motor: | Voltage | 230 V |
| | Power | 0.75 kW |
| | Length | 487 mm (19.17") |
| Pump Dimension with | Width | 200 mm (7.87") |
| Motor and Housing: | Height | 210 mm (8.27") |
| Pump Weight with Motor and Housing: | | 25 kg (55 lb) |



Performance Charts Eccentric Shaft: 5°







QF1200S-HT

Quaternary Diaphragm Pumps Multiple-Use

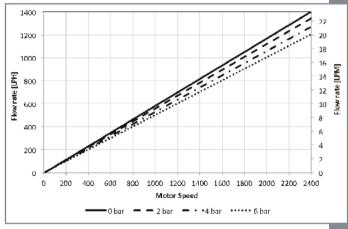
- Integrated pump chamber, pump drive, motor and control box into one unit
- Extended turn-down ratio (200:1)
- Digital key pad for manual operation
- Compact size
- Flexible single-phase 110-230V power supply

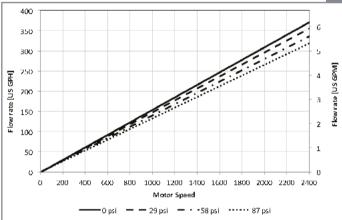
Technical Data

| QF1200S-HT Standard Motor | | | |
|--------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------|--|
| Flow Rate Maximum: | Eccentric Shaft 5° | 1200 lph (20 lpm) | |
| Flow Rate Minimum: | Eccentric Shaft 5° | 6 lph (0.1 lpm) | |
| Pressure: | Temperature of Fluid $<$ 40 $^{\circ}$ C (104 $^{\circ}$ F) | 6 bar (87 psi) | |
| riessure: | Temperature of Fluid $> 40^{\circ}$ C (104° F) | 4 bar (58 psi) | |
| | Fluid | 80° C (176° F) | |
| Maximum | CIP | 90° C (194° F) | |
| Temperature: | SIP | 130° C (266° F) | |
| | Autoclave | 130° C (266° F) | |
| Pump Speed Range: | rpm | 10 - 2,400 | |
| Suction Lift Dry at 1800 rpm: | Eccentric Shaft 5° | 4 - 4.5 m (13.1-14.7 ft) | |
| Volume Specifications: | Filling Volume Without Connectors | 75 ml | |
| Connection | Connectors | 3/4" TC | |
| Specification (Standard): | Position of Connectors | Inline | |
| | Number of Flow Directions | 4 | |
| | Pump Chamber | SS316L | |
| 5 L .W I | Valve Plate | SS316L | |
| Product Wetted Materials (Standard): | Diaphragms | TPE | |
| | Valves | EPDM | |
| | 0-rings | EPDM | |
| Certificates/Proofs | Elastomere (product wetted) | USP <88> Cl. VI; FDA21CFR177; BSE/TSE Safe | |
| (Optional): | Stainless Steel Parts (product wetted) | 3.1; Surface Roughness; Ferrite Content | |
| | Rated speed | 2400 min-1 | |
| Motor: | Voltage | 110 - 230 V | |
| | Power | 0.485 kW | |
| D D • • • • • • • • • • • • • • • • • • • | Length | 489 mm (19.25") | |
| Pump Dimension with Motor and Housing: | Width | 200 mm (7.87") | |
| otor una nousing. | Height | 220 mm (8.66") | |
| Pump Weight with Motor and Housing: | | 25 kg (55 lb) | |



Performance Charts Eccentric Shaft: 5°









QF4400S

Quaternary Diaphragm Pumps Multiple-Use

- Separate control box for manual operation available
- · ATEX version available

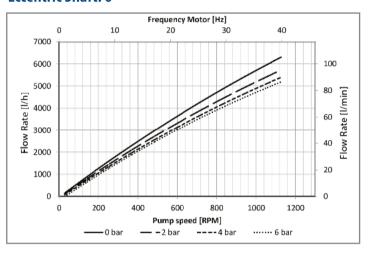
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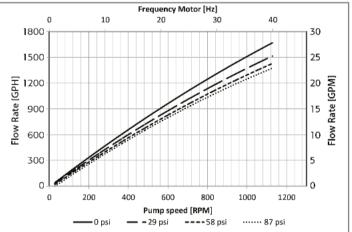
| Eccentric Shaft 6° Eccentric Shaft 6° Eccentric Shaft 6° e of Fluid < 40° C (104° F) e of Fluid > 40° C (104° F) Fluid CIP SIP Autoclave Eccentric Shaft 6° epproximated Volume per devolution at Free Output tume Without Connectors Position of Connectors Pump Housing | 5000 lph (83 lpm) 150 lph (2.5 lpm) 6 bar (87 psi) 4 bar (58 psi) 80° C (176° F) 90° C (194° F) 130° C (266° F)* 4 - 4.5 m (13.1-14.7 ft) 95 ml 820 ml 1.5" TC Front |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Eccentric Shaft 6° e of Fluid < 40° C (104° F) e of Fluid > 40° C (104° F) Fluid CIP SIP Autoclave Eccentric Shaft 6° epproximated Volume per levolution at Free Output lume Without Connectors Connectors Position of Connectors | 150 lph (2.5 lpm) 6 bar (87 psi) 4 bar (58 psi) 80° C (176° F) 90° C (194° F) 130° C (266° F)* 130° C (266° F)* 4 - 4.5 m (13.1-14.7 ft) 95 ml 820 ml 1.5" TC |
| e of Fluid < 40° C (104° F) e of Fluid > 40° C (104° F) Fluid CIP SIP Autoclave Eccentric Shaft 6° epproximated Volume per Revolution at Free Output tume Without Connectors Connectors Position of Connectors | 6 bar (87 psi) 4 bar (58 psi) 80° C (176° F) 90° C (194° F) 130° C (266° F)* 130° C (266° F)* 4 - 4.5 m (13.1-14.7 ft) 95 ml 820 ml 1.5" TC |
| e of Fluid > 40° C (104° F) Fluid CIP SIP Autoclave Eccentric Shaft 6° approximated Volume per Revolution at Free Output tume Without Connectors Connectors Position of Connectors | 4 bar (58 psi) 80° C (176° F) 90° C (194° F) 130°C (266° F)* 130°C (266° F)* 4 - 4.5 m (13.1-14.7 ft) 95 ml 820 ml 1.5" TC |
| Fluid CIP SIP Autoclave Eccentric Shaft 6° approximated Volume per Revolution at Free Output tume Without Connectors Connectors Position of Connectors | 80° C (176° F) 90° C (194° F) 130°C (266° F)* 130°C (266° F)* 4 - 4.5 m (13.1-14.7 ft) 95 ml 820 ml 1.5" TC |
| CIP SIP Autoclave Eccentric Shaft 6° pproximated Volume per devolution at Free Output tume Without Connectors Connectors Position of Connectors | 90° C (194° F) 130°C (266° F)* 130°C (266° F)* 4 - 4.5 m (13.1-14.7 ft) 95 ml 820 ml 1.5" TC |
| SIP Autoclave Eccentric Shaft 6° pproximated Volume per levolution at Free Output ume Without Connectors Connectors Position of Connectors | 130°C (266° F)* 130°C (266° F)* 4 - 4.5 m (13.1-14.7 ft) 95 ml 820 ml 1.5" TC |
| Autoclave Eccentric Shaft 6° approximated Volume per devolution at Free Output tume Without Connectors Connectors Position of Connectors | 130°C (266° F)* 4 - 4.5 m (13.1-14.7 ft) 95 ml 820 ml 1.5" TC |
| Eccentric Shaft 6° pproximated Volume per devolution at Free Output ume Without Connectors Connectors Position of Connectors | 4 - 4.5 m (13.1-14.7 ft) 95 ml 820 ml 1.5" TC |
| pproximated Volume per tevolution at Free Output ume Without Connectors Connectors Position of Connectors | 95 ml 820 ml 1.5" TC |
| levolution at Free Output ume Without Connectors Connectors Position of Connectors | 820 ml 1.5" TC |
| Connectors Position of Connectors | 1.5" TC |
| Position of Connectors | |
| | Front |
| Pump Housing | |
| | SS316L |
| Valve Plate | SS316L or PP |
| Diaphragms | TPE |
| Valves | EPDM/SS316L |
| 0-rings | EPDM |
| tomere (product wetted) | USP <88> Cl. VI; FDA21CFR177; BSE/TSE Safe |
| el Parts (product wetted) | 3.1; Surface Roughness; Ferrite Content |
| Rated speed | 1410 min-1 (50 Hz) |
| Voltage | 230/400 V |
| Power | 2.2 kW |
| Length | 852 mm (33.54") |
| | 250 mm (9.84") |
| Width | |
| Width Height | 333 mm (13.11") |
| | Voltage Power Length |

Other connection specifications, materials and motors available on request. *With SS316L valve plate only



Performance Charts Eccentric Shaft: 6°







QF4400S-HT

Quaternary Diaphragm Pumps Multiple-Use

- Integrated pump chamber, pump drive, motor and control box into one unit
- Extended turn-down ratio
- Compact design

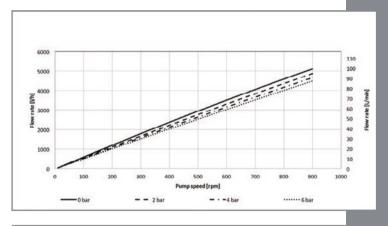
Technical Data

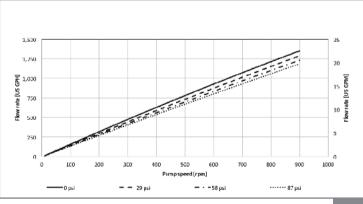
| recrimed bata | | |
|-------------------------------------------|-------------------------------------------------------------|--------------------------------------------------|
| | QF4400S-HT Standard Mo | otor |
| Flow Rate Maximum: | Eccentric Shaft 6° | 5000 lph (83 lpm) |
| Flow Rate Minimum: | Eccentric Shaft 6° | 50 lph (0.83 lpm) |
| D | Temperature of Fluid $<$ 40 $^{\circ}$ C (104 $^{\circ}$ F) | 6 bar (87 psi) |
| Pressure: | Temperature of Fluid $>$ 40° C (104° F) | 4 bar (58 psi) |
| | Fluid | 80° C (176° F) |
| Maximum | CIP | 90° C (194° F) |
| Temperature: | SIP | 130°C (266° F) |
| | Autoclave | 130°C (266° F) |
| Suction Lift Dry at 1200 rpm: | Eccentric Shaft 6° | 4 - 4.5 m (13.1-14.7 ft) |
| Volume | Approximated Volume per Revolution at Free Output | 95 ml |
| Specifications: | Filling Volume Without Connectors | 820 ml |
| Connection | Connectors | 1.5" TC |
| Specification (Standard): | Position of Connectors | Front |
| | Pump Housing | SS316L |
| Product Wetted | Valve Plate | SS316L |
| Materials | Diaphragms | TPE |
| (Standard): | Valves | EPDM/SS316L |
| | 0-rings | EPDM |
| Certificates/ | Elastomere (product wetted) | USP <88> CI. VI; FDA21CFR177; BSE/TSE Safe |
| Proofs (Optional): | Stainless Steel Parts (product wetted) | 3.1; Surface Roughness; Ferrite Content |
| | Rated speed | 1200 min-1 |
| Motor (Standard): | Voltage | 400 V* |
| | Power | 4.0 kW |
| Pump Dimension | Length | 790 mm (31.10") |
| with Motor and | Width | 275 mm (10.83") |
| Housing: | Height | 393 mm (15.47") |
| Pump Weight with Motor and Housing: | | 90 kg (198 lb) |

 $Other \ connection \ specifications, \ materials \ and \ motors \ available \ on \ request.$



Performance Charts Eccentric Shaft: 6°







^{* 3} x 230 V as option



QF5050S

Quaternary Diaphragm Pumps Multiple-Use

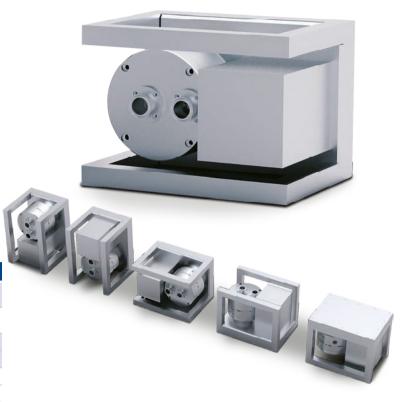
- Compact footprint
- · High turn-down ratio
- · Multi-option installation flexibility
- Separate control box for manual operation available

Technical Data

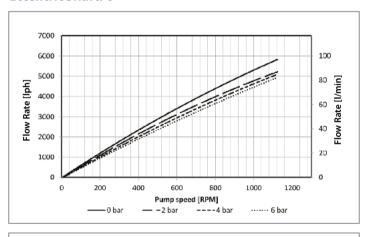
| recrimica | | |
|-------------------------------------------|-------------------------------------------------------------|--------------------------------------------------|
| | QF5050S Servo Motor | |
| Flow Rate Maximum: | Eccentric Shaft 6° | 5000 lph (83 lpm) |
| Flow Rate Minimum: | Eccentric Shaft 6° | 50 lph (0.83.lpm) |
| D | Temperature of Fluid $<$ 40 $^{\circ}$ C (104 $^{\circ}$ F) | 6 bar (87 psi) |
| Pressure: | Temperature of Fluid > 40° C (104° F) | 4 bar (58 psi) |
| | Fluid | 80° C (176° F) |
| Maximum | CIP | 90° C (194° F) |
| Temperature: | SIP | 130°C (266° F)* |
| | Autoclave | 130°C (266° F)* |
| Suction Lift Dry at 1200 rpm: | Eccentric Shaft 6° | 4 - 4.5 m (13.1-14.7 ft) |
| Volume | Approximated Volume per Revolution at Free Output | 95 ml |
| Specifications: | Filling Volume Without Connectors | 820 ml |
| Connection | Connectors | 1.5" TC |
| Specification (Standard): | Position of Connectors | Front |
| | Pump Housing | SS316L |
| Product Wetted | Valve Plate | SS316L or PP |
| Materials | Diaphragms | TPE |
| (Standard): | Valves | EPDM/SS316L |
| | O-rings | EPDM |
| Certificates/ Proofs (Optional): | Elastomere (product wetted) | USP <88> CI. VI; FDA21CFR177; BSE/TSE Safe |
| riodis (optional). | Stainless Steel Parts (product wetted) | 3.1; Surface Roughness; Ferrite Content |
| | Rated speed | 3000 min -1 (2.66:1 reduction) |
| Motor (Standard): | Voltage | 400 V |
| | Power | 3 kW |
| Pump Dimension | Length | 440 mm (17.32") |
| with Motor and | Width | 325 mm (12.80") |
| Housing: | Height | 320 mm (12.60") |
| Pump Weight with Motor and Housing: | | 66 kg (146 lb) |

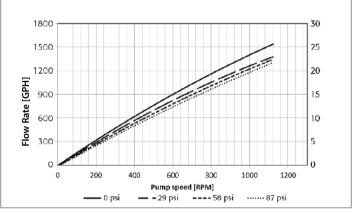
Other connection specifications, materials and motors available on request. *With SS316L valve plate only

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Performance Charts Eccentric Shaft: 6°





 $Depending \ on \ the \ selected \ motor/frequency \ drive \ combination, \ the \ motor \ frequency \ and \ the \ resulting \ pump \ speed \ might \ differ.$



QF10k

Quaternary Diaphragm Pumps Multiple-Use

- Optimized stainless steel pump chamber design (patent pending)
- · Excellent drainability to maximize product recovery
- 20:1 turn-down ratio

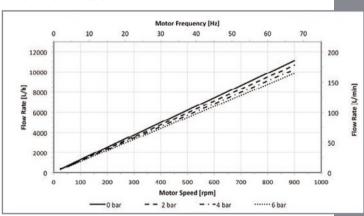
Technical Data

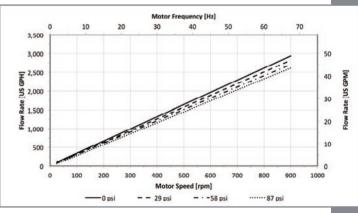
| | Technical Data | | |
|-------------------------------------------|-------------------------------------------------------------|--------------------------------------------------|--|
| | QF10k Standard Motor | | |
| Flow Rate Maximum: | Eccentric Shaft 6° | 10000 lph (167 lpm) | |
| Flow Rate Minimum: | Eccentric Shaft 6° | 500 lph (8.3 lpm) | |
| D | Temperature of Fluid $<$ 40 $^{\circ}$ C (104 $^{\circ}$ F) | 6 bar (87 psi) | |
| Pressure: | Temperature of Fluid $> 40^{\circ}$ C (104° F) | 4 bar (58 psi) | |
| | Fluid | 80° C (176° F) | |
| Maximum | CIP | 90° C (194° F) | |
| Temperature: | SIP | 130° C (266° F) | |
| | Autoclave | 130° C (266° F) | |
| Suction Lift Dry at 1,800 rpm: | Eccentric Shaft 6° | 4 - 4.5 m (13.1-14.7 ft) | |
| Volume | Approximated Volume per Revolution at Free Output | 194 ml | |
| Specifications: | Filling Volume Without Connectors | 1,300 ml | |
| Connection | Connectors | 2" TC | |
| Specification (Standard): | Position of Connectors | Front | |
| | Pump Housing | SS316L | |
| Product Wetted | Valve Plate | SS316L | |
| Materials | Diaphragms | TPE | |
| (Standard): | Valves | EPDM | |
| | 0-rings | EPDM | |
| Certificates/Proofs | Elastomere (product wetted) | USP <88> CI. VI; FDA21CFR177; BSE/TSE Safe | |
| (Optional): | Stainless Steel Parts (product wetted) | 3.1; Surface Roughness; Ferrite Content | |
| | Rated speed | 2,894 min-1 (50 Hz) | |
| Matau (Ctau day I) | Voltage | 230/400 V | |
| Motor (Standard): | Power | 3.0 kW | |
| | Gear | 4.32:1 | |
| Pump Dimension | Length | 1155 mm (45.48") | |
| with Motor and | Width | 437 mm (17.20") | |
| Housing: | Height | 430 mm (16.38") | |
| Pump Weight with Motor and Housing: | | 185 kg (408 lb) | |

Other connection specifications, materials and motors available on request.



Performance Charts Eccentric Shaft: 6°







QF20k

Quaternary Diaphragm Pumps Multiple-Use

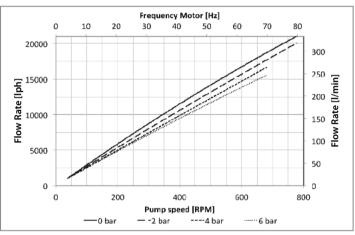
- Separate control box for manual operation available
- ATEX version available

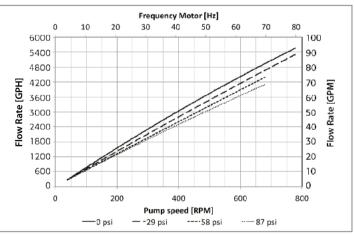


| Technical Data | | |
|-------------------------------------------|-------------------------------------------------------------|--------------------------------------------------|
| | QF20k Standard Moto | r |
| Flow Rate Maximum: | Eccentric Shaft 7° | 16000 lph (267 lpm) |
| Flow Rate Minimum: | Eccentric Shaft 7° | 1000 lph (16.7 lpm) |
| Pressure: | Temperature of Fluid $<$ 40 $^{\circ}$ C (104 $^{\circ}$ F) | 6 bar (87 psi) |
| r ressure. | Temperature of Fluid $>$ 40 $^{\circ}$ C (104 $^{\circ}$ F) | 4 bar (58 psi) |
| | Fluid | 80° C (176° F) |
| Maximum | CIP | 90° C (194° F) |
| Temperature: | SIP | 130° C (266° F) |
| | Autoclave | 130° C (266° F) |
| Suction Lift Dry at 330 rpm: | Eccentric Shaft 7° | 4 - 4.5 m (13.1-14.7 ft) |
| Volume | Approximated Volume per Revolution at Free Output | 470 ml |
| Specifications: | Filling Volume Without Connectors | 2950 ml |
| Connection | Connectors | 2" TC |
| Specification (Standard): | Position of Connectors | Front |
| | Pump Housing | SS316L |
| Product Wetted | Valve Plate | SS316L |
| Materials | Diaphragms | TPE |
| (Standard): | Valves | EPDM/SS316L |
| | 0-rings | EPDM |
| Certificates/ Proofs | Elastomere (product wetted) | USP <88> Cl. VI; FDA21CFR177; BSE/TSE Safe |
| (Optional): | Stainless Steel Parts (product wetted) | 3.1; Surface Roughness; Ferrite Content |
| | Rated speed | 1460/474 min-1 (50 Hz) |
| Motor (Standard): | Voltage | 230/400 V |
| (Stantaura). | Power | 4 kW |
| Pump | Length | 1152.5 mm (45.37") |
| Dimension with Motor and | Width | 400 mm (15.75") |
| Housing: | Height | 416 mm (16.38") |
| Pump Weight with Motor and Housing: | | 217 kg (478 lb) |

 $Other \ connection \ specifications, \ materials \ and \ motors \ available \ on \ request.$

Performance Charts Eccentric Shaft: 7°







QF150SU

Quaternary Diaphragm Pumps Single-Use

- New version with 90W motor
- Disposable wetted pump chamber
- · Integrated controller
- Digital key pad for manual operation
- Small and portable format
- Ideal for R&D and process development

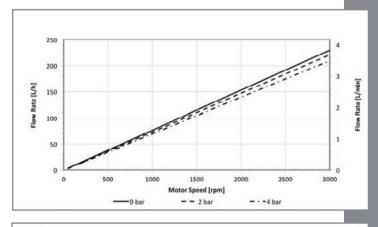
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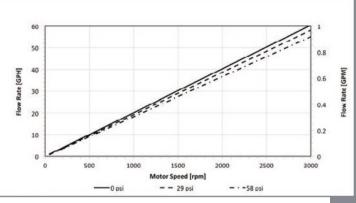
| QF150SU Standard Motor | | |
|---------------------------------------------------------------------|-------------------------------------------------------------|-------------------------------------------|
| 180 lph (3 lpm) | Eccentric Shaft 5° | Flow Rate Maximum: |
| 1 lph (0.017 lpm) | Eccentric Shaft 5° | Flow Rate Minimum: |
| 4 bar (58 psi) | Temperature of Fluid $<$ 40 $^{\circ}$ C (104 $^{\circ}$ F) | Pressure: |
| 4 bar (58 psi) | Temperature of Fluid $>$ 40 $^{\circ}$ C (104 $^{\circ}$ F) | riessure: |
| 60° C (140° F) | Fluid | Maximum |
| 130° C (266° F) | Autoclave* | Temperature: |
| 2 - 3 m (6.6 - 9.8 ft) | Eccentric Shaft 5° | Suction Lift Dry at 3000 rpm: |
| 1.2 ml | Approximated Volume per Revolution at Free Output | Volume |
| 15 ml | Filling Volume Without Connectors | Specifications: |
| 1/4" TC | Connectors | Connection |
| Inline | Position of Connectors | Specification |
| 4 | Number of Flow Directions | (Standard): |
| PP | Pump Chamber | |
| PP | Valve Plate | Product Wetted |
| TPE | Diaphragms | Materials |
| EPDM | Valves | (Standard): |
| EPDM | 0-rings | |
| USP <88> CI. VI; FDA21CFR177; BSE/TSE Safe; USP 87/381/661 | Elastomere (product wetted) | Certificates/ Proofs (Optional): |
| 3000 min-1 | Rated speed | |
| 230 V (110 V as option) | Voltage | Motor (Standard): |
| 90 W | Power | (Standard). |
| 262 mm (10.31") | Length | Pump Dimension |
| 164 mm (6.46") | Width | with Motor and |
| 185 mm (7.28") | Height | Housing: |
| 7.6 kg (16.8 lb) | | Pump Weight with Motor and Housing: |

Other connection specifications, materials and motors available on request.



Performance Charts Eccentric Shaft: 5°









QF1200SU

Quaternary Diaphragm Pumps Single-Use

- Disposable wetted pump chamber
- Pump chamber made of solid polypropylene
- Separate control box for manual operation available

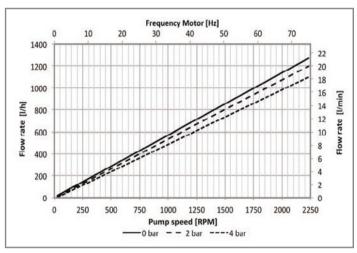


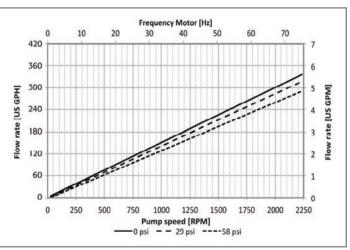
Technical Data

| lechnical Data | | |
|-------------------------------------------|-------------------------------------------------------------|---------------------------------------------------------------------|
| QF1200SU Standard Motor | | |
| Flow Rate | Eccentric Shaft 3° | 800 lph (13.3 lpm) |
| Maximum: | Eccentric Shaft 5° | 1200 lph (20 lpm) |
| Flow Rate | Eccentric Shaft 3° | 10 lph (0.167 lpm) |
| Minimum*: | Eccentric Shaft 5° | 20 lph (0.333 lpm) |
| Pressure: | Temperature of Fluid $< 40^{\circ}$ C (104° F) | 4 bar (58 psi) |
| riessuie. | Temperature of Fluid $>$ 40 $^{\circ}$ C (104 $^{\circ}$ F) | 4 bar (58 psi) |
| Maximum | Fluid | 60° C (140° F) |
| Temperature: | Autoclave | 130° C (266° F) |
| Pump Speed Range: | rpm | 30 - 2,400 |
| Suction Lift Dry | Eccentric Shaft 3° | 2.5 - 3 m (8.2-9.8 ft) |
| at 1800 rpm: | Eccentric Shaft 5° | 4 - 4.5 m (13.1-14.7 ft) |
| Volume | Approximated Volume per Revolution at Free Output | 9.6 ml (5°) |
| Specifications: | Filling Volume Without Connectors | 5.8 ml (3°) 75 ml |
| | Connectors | 3/4" TC |
| Connection Specification | Position of Connectors | Inline |
| (Standard): | Number of Flow Directions | 4 |
| | Pump Chamber | PP |
| 5 1 | Valve Plate | PP |
| Product Wetted Materials | Diaphragms | TPE |
| (Standard): | Valves | EPDM |
| | 0-rings | EPDM |
| Certificates/ Proofs (Optional): | Elastomere (product wetted) | USP <88> CI. VI; FDA21CFR177; BSE/TSE Safe; USP 87/381/661 |
| | Rated speed | 1375 min-1 (50 Hz) |
| Motor (Standard): | Voltage | 230/400 V |
| (= tulluulu) | Power | 0.37 kW |
| Pump Dimension | Length | 497 mm (19.56") |
| with Motor and | Width | 159 mm (6.26") |
| Housing: | Height | 210 mm (8.27") |
| Pump Weight with Motor and Housing: | | 21 kg (46 lb) |

Other connection specifications, materials and motors available on request. * When using pump with control box: 20 lph (0.333 lpm) and 40 lph (0.667 lpm)

Performance Charts Eccentric Shaft: 5°





Depending on the selected motor/frequency drive combination, the motor frequency and the resulting pump speed might differ.



QF1200SU-M

Quaternary Diaphragm Pumps Single-Use

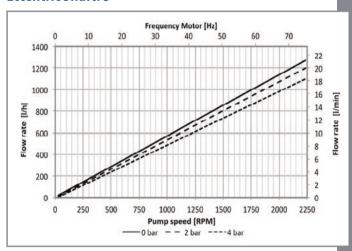
- Disposable wetted pump chamber
- Pump chamber made of injection-molded polyethylene
- Separate control box for manual operation available
- Front side connections

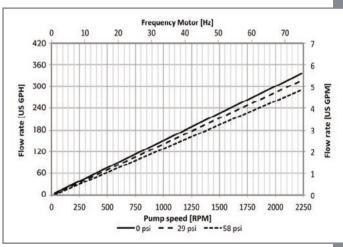
Technical Data

| lechnical Data | | |
|-------------------------------------------|------------------------------------------------------|---------------------------------------------------------------------|
| QF1200SU-M Standard Motor | | |
| Flow Rate | Eccentric Shaft 3° | 800 lph (13.3 lpm) |
| Maximum: | Eccentric Shaft 5° | 1200 lph (20 lpm) |
| Flow Rate | Eccentric Shaft 3° | 10 lph (0.167 lpm) |
| Minimum*: | Eccentric Shaft 5° | 20 lph (0.333 lpm) |
| Pressure: | Temperature of Fluid $<$ 40° C (104° F) | 4 bar (58 psi) |
| riessuie. | Temperature of Fluid $>$ 40° C (104° F) | 4 bar (58 psi) |
| Maximum | Fluid | 50° C (122° F) |
| Temperature: Pump Speed | | |
| Range: | rpm | 30 - 2,400 |
| Suction Lift Dry | Eccentric Shaft 3° | 2-2.5 m (6.6-8.2 ft) |
| at 1800 rpm: | Eccentric Shaft 5° | 3-3.5 m (9.8-11.5 ft) |
| Volume | Approximated Volume per Revolution at Free Output | 9.6 ml (5°) 5.8 ml (3°) |
| Specifications: | Filling Volume Without Connectors | 75 ml |
| Connection | Connectors | 3/4" TC |
| Specification | Position of Connectors | Front |
| (Standard): | Pump Chamber | PE injection molded** |
| | Valve Plate | PE injection molded |
| Product Wetted Materials | Diaphragms | TPE |
| (Standard): | Valves | EPDM |
| | 0-rings | EPDM |
| Certificates/ Proofs (Optional): | Elastomere (product wetted) | USP <88> Cl. VI; FDA21CFR177; BSE/TSE Safe; USP 87/381/661 |
| | Rated speed | 1375 min-1 (50 Hz) |
| Motor (Standard): | Voltage | 230/400 V |
| (5 1111 111 117) | Power | 0.37 kW |
| Pump Dimension | Length | 503 mm (19.8") |
| with Motor and | Width | 159 mm (6.26") |
| Housing: | Height | 210 mm (8.27") |
| Pump Weight with Motor and Housing: | | 20 kg (44 lb) |



Eccentric Shaft: 5°







Other connection specifications, materials and motors available on request.

* When using pump with control box: 20 lph (0.333 lpm) and 40 lph (0.667 lpm)

** Connectors PP



QF1200SU-CV

Quaternary Diaphragm Pumps Single-Use

- Disposable wetted pump chamber
- · Integrated controller
- Digital key pad for manual operation
- Compact size

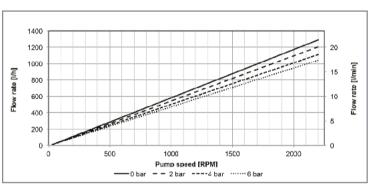
Technical Data

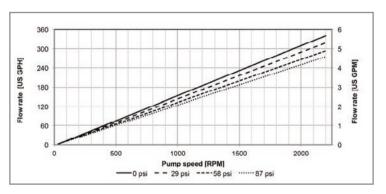
| QF1200SU-CV | | |
|-------------------------------------------|------------------------------------------------------|---------------------------------------------------------------------|
| Flow Rate Maximum: | Eccentric Shaft 5° | 1200 lph (20 lpm) |
| Flow Rate Minimum: | Eccentric Shaft 5° | 10 lph (0.167 lpm) |
| Pressure: | Temperature of Fluid $<$ 40° C (104° F) | 4 bar (58 psi) |
| riessure: | Temperature of Fluid $>$ 40° C (104° F) | 4 bar (58 psi) |
| Maximum | Fluid | 60° C (140° F) |
| Temperature: | Autoclave | 130° C (266° F) |
| Pump Speed Range: | rpm | 10 - 2200 |
| Suction Lift Dry at 1800 rpm: | Eccentric Shaft 5° | 4 - 4.5 m (13.1-14.7 ft) |
| Volume | Approximated Volume per Revolution at Free Output | 9.6 ml |
| Specifications: | Filling Volume Without Connectors | 75 ml |
| Connection | Connectors | 3/4" TC |
| Specification | Position of Connectors | Inline |
| (Standard): | Number of Flow Directions | 4 |
| | Pump Chamber | PP |
| Product Wetted | Valve Plate | PP |
| Materials | Diaphragms | TPE |
| (Standard): | Valves | EPDM |
| | 0-rings | EPDM |
| Certificates/ Proofs (Optional): | Elastomere (product wetted) | USP <88> CI. VI; FDA21CFR177; BSE/TSE Safe; USP 87/381/661 |
| | Rated speed | 2200 min-1 |
| Motor: | Voltage | 230 V |
| | Power | 0.75 kW |
| Pump | Length | 497 mm (19.56") |
| Dimension with Motor and | Width | 200 mm (7.87") |
| Housing: | Height | 210 mm (8.27") |
| Pump Weight with Motor and Housing: | | 21 kg (46 lb) |

Technical data for the QF1200SU-CV-M (pump chamber made of injection-molded PE) available on request.



Performance Charts Eccentric Shaft: 5°







26

QF1200SU-HT

Quaternary Diaphragm Pumps Single-Use

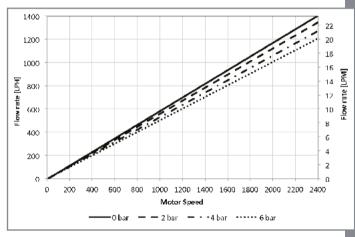
- Integrated pump chamber, pump drive, motor and control box into one unit
- Extended turn-down ratio
- · Disposable plastic pump chamber

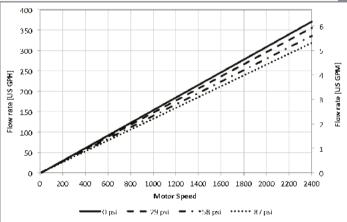
Technical Data

| QF1200SU-HT Standard Motor | | |
|----------------------------------------|------------------------------------------------------|---------------------------------------------------------------------|
| Flow Rate Maximum: | Eccentric Shaft 5° | 1200 lph (20 lpm) |
| Flow Rate Minimum: | Eccentric Shaft 5° | 6 lph (0.1 lpm) |
| Pressure: | Temperature of Fluid $<$ 40° C (104° F) | 4 bar (58 psi) |
| riessule. | Temperature of Fluid $>$ 40° C (104° F) | 4 bar (58 psi) |
| Maximum | Fluid | 60° C (140° F) |
| Temperature: | Autoclave | 130° C (266° F) |
| Pump Speed Range: | rpm | 10 - 2,400 |
| Suction Lift Dry at 1800 rpm: | Eccentric Shaft 5° | 4 - 4.5 m (13.1-14.7 ft) |
| Volume | Approximated Volume per Revolution at Free Output | 9.6 ml |
| Specifications: | Filling Volume Without Connectors | 75 ml |
| Connection | Connectors | 3/4" TC |
| Specification | Position of Connectors | Inline |
| (Standard): | Number of Flow Directions | 4 |
| | Pump Chamber | PP |
| Product Wetted | Valve Plate | PP |
| Materials | Diaphragms | TPE |
| (Standard): | Valves | EPDM |
| | 0-rings | EPDM |
| Certificates/ Proofs (Optional): | Elastomere (product wetted) | USP <88> CI. VI; FDA21CFR177; BSE/TSE Safe; USP 87/381/661 |
| | Rated speed | 2400 min-1 |
| Motor: | Voltage | 110 - 230 V |
| | Power | 0.485 kW |
| Pump | Length | 499 mm (19.65") |
| Dimension with Motor and | Width | 200 mm (7.87") |
| Housing: | Height | 220 mm (8.66") |
| Pump Weight with Motor and Housing: | | 21 kg (46 lb) |



Performance Charts Eccentric Shaft: 5°









QF4400SU

Quaternary Diaphragm Pumps Single-Use

- Disposable wetted pump chamber
- Separate control box for manual operation available

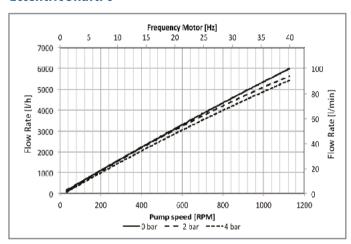


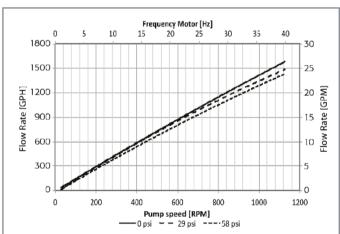
| | QF4400SU Standard Mo | tor |
|-------------------------------------------|------------------------------------------------------|---------------------------------------------------------------------|
| Flow Rate Maximum: | Eccentric Shaft 6° | 5000 lph (83 lpm) |
| Flow Rate Minimum: | Eccentric Shaft 6° | 150 lph (2.5 lpm) |
| Pressure: | Temperature of Fluid $<$ 40° C (104° F) | 4 bar (58 psi) |
| riessure: | Temperature of Fluid $>$ 40° C (104° F) | 4 bar (58 psi) |
| Maximum | Fluid | 60° C (140° F) |
| Temperature: | Autoclave | 130° C (266° F) |
| Suction Lift Dry at 1800 rpm: | Eccentric Shaft 6° | 4 - 4.5 m (13.1-14.7 ft) |
| Volume | Approximated Volume per Revolution at Free Output | 95 ml |
| Specifications: | Filling Volume Without Connectors | 820 ml |
| Connection | Connectors | 1.5" TC |
| Specification (Standard): | Position of Connectors | Front |
| | Pump Chamber | PP |
| Product Wetted | Valve Plate | PP |
| Materials | Diaphragms | TPE |
| (Standard): | Valves | EPDM / SS316L |
| | 0-rings | EPDM |
| Certificates/ Proofs (Optional): | Elastomere (product wetted) | USP <88> CI. VI; FDA21CFR177; BSE/TSE Safe; USP 87/381/661 |
| | Rated speed | 1410 min-1 (50 Hz) |
| Motor: | Voltage | 230/400 V |
| | Power | 2.2 kW |
| Pump | Length | 852 mm (33.54") |
| Dimension with Motor and | Width | 250 mm (9.84") |
| Housing: | Height | 333 mm (13.11") |
| Pump Weight with Motor and Housing: | | 105 kg (232 lb) |
| nousing: | | |

Other connection specifications, materials and motors available on request.



Performance Charts Eccentric Shaft: 6°







QF4400SU-HT

Quaternary Diaphragm Pumps Single-Use

- Integrated pump chamber, pump drive, motor and control box into one unit
- Extended turn-down ratio
- Compact design

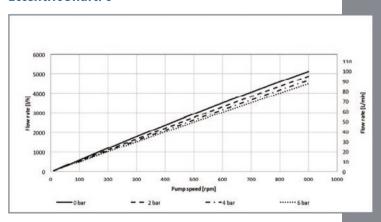
Technical Data

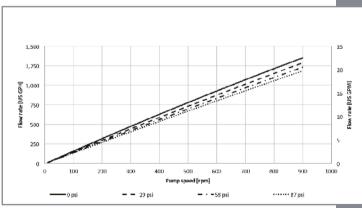
| QF4400SU-HT Standard Motor | | |
|-------------------------------------------|------------------------------------------------------|---------------------------------------------------------------------|
| Flow Rate Maximum: | Eccentric Shaft 6° | 5000 lph (83 lpm) |
| Flow Rate | Eccentric Shaft 6° | 50 lph (0.83 lpm) |
| | Temperature of Fluid < 40° C (104° F) | 4 bar (58 psi) |
| Pressure: | Temperature of Fluid > 40° C (104° F) | 4 bar (58 psi) |
| Maximum | Fluid | 60° C (140° F) |
| Temperature: | Autoclave | 130° C (266° F) |
| Suction Lift Dry at 1800 rpm: | Eccentric Shaft 6° | 4 - 4.5 m (13.1-14.7 ft) |
| Volume | Approximated Volume per Revolution at Free Output | 95 ml |
| Specifications: | Filling Volume Without Connectors | 820 ml |
| Connection | Connectors | 1.5" TC |
| Specification (Standard): | Position of Connectors | Front |
| , | Pump Chamber | PP |
| Product Wetted | Valve Plate | PP |
| Materials | Diaphragms | TPE |
| (Standard): | Valves | EPDM / SS316L |
| | 0-rings | EPDM |
| Certificates/ Proofs (Optional): | Elastomere (product wetted) | USP <88> CL. VI; FDA21CFR177; BSE/TSE Safe; USP 87/381/661 |
| | Rated speed | 1200 min-1 (50 Hz) |
| Motor: | Voltage | 400 V |
| | Power | 4.0 kW |
| Pump Dimension | Length | 790 mm (31.10") |
| with Motor and | Width | 275 mm (10.83") |
| Housing: | Height | 393 mm (15.47") |
| Pump Weight with Motor and Housing: | | 75 kg (165 lb) |

Other connection specifications, materials and motors available on request.



Performance Charts Eccentric Shaft: 6°









QF5050SU

Quaternary Diaphragm Pumps Single-Use

- Disposable wetted product chamber
- Compact footprint
- High turn-down ratio
- Multi-option installation flexibility
- Separate control box for manual operation available

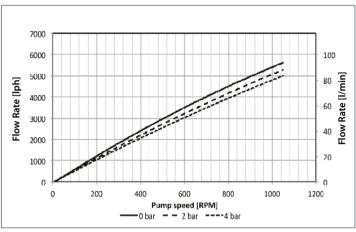
Technical Data

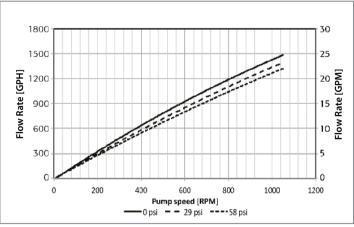
| Technical Data | | |
|----------------------------------------|-------------------------------------------------------------|---------------------------------------------------------------------|
| | QF5050SU Servo Moto | r |
| Flow Rate Maximum: | Eccentric Shaft 6° | 5000 lph (83 lpm) |
| Flow Rate Minimum: | Eccentric Shaft 6° | 50 lph (0.83.lpm) |
| Pressure: | Temperature of Fluid $<$ 40 $^{\circ}$ C (104 $^{\circ}$ F) | 4 bar (58 psi) |
| riessuie. | Temperature of Fluid $>$ 40° C (104° F) | 4 bar (58 psi) |
| Maximum | Fluid | 60° C (140° F) |
| Temperature: | Autoclave | 130° C (266° F) |
| Suction Lift Dry at 1,200 rpm: | Eccentric Shaft 6° | 4 - 4.5 m (13.1-14.7 ft) |
| Volume | Approximated Volume per Revolution at Free Output | 95 ml |
| Specifications: | Filling Volume Without Connectors | 820 ml |
| Connection Specification | Connectors | 1.5" TC |
| (Standard): | Position of Connectors | Front |
| | Pump Chamber | PP |
| Product Wetted | Valve Plate | PP |
| Materials | Diaphragms | TPE |
| (Standard): | Valves | EPDM / SS316L |
| | 0-rings | EPDM |
| Certificates/ Proofs (Optional): | Elastomere (product wetted) | USP <88> CI. VI; FDA21CFR177; BSE/TSE Safe; USP 87/381/661 |
| | Rated speed | 3000 min -1 (2.66:1reduction) |
| Motor: | Voltage | 400 V |
| | Power | 3 kW |
| Pump | Length | 440 mm (17.32") |
| Dimension with Motor and | Width | 325 mm (12.80") |
| Housing: | Height | 320 mm (12.60") |
| Pump Weight with Motor and Housing: | | 51 kg (112 lb) |

Other connection specifications, materials and motors available on request.



Performance Charts Eccentric Shaft: 6°





 $Depending \ on \ the \ selected \ motor/frequency \ drive \ combination, \ the \ motor \ frequency \ and \ the \ resulting \ pump \ speed \ might \ differ.$



QF20kSU

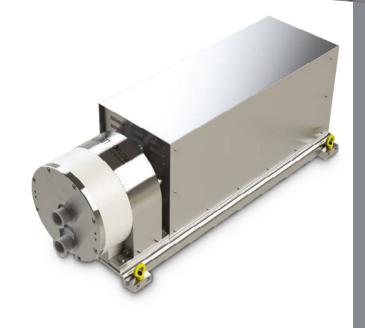
Quaternary Diaphragm Pumps Single-Use

- Disposable machined polypropylene pump chamber
- · Easy replacement
- Installation aid

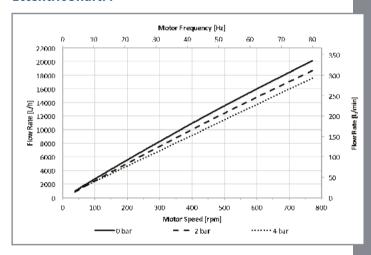
Technical Data

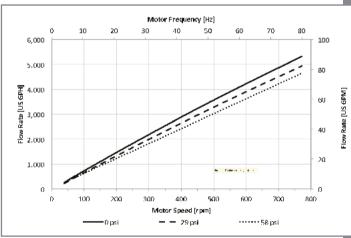
| QF20kSU Standard Motor | | |
|-------------------------------------------|------------------------------------------------------|---------------------------------------------------------------------|
| Flow Rate Maximum: | Eccentric Shaft 7° | 16000 lph (267 lpm) |
| Flow Rate | Eccentric Shaft 7° | 1000 lph (16.7 lpm) |
| Millilliulli: | Temperature of Fluid < 40° C (104° F) | 4 bar (58 psi) |
| Pressure: | Temperature of Fluid > 40° C (104° F) | 4 bar (58 psi) |
| Maximum Temperature: | Fluid | 60° C (140° F) |
| Suction Lift Dry at 330 rpm: | Eccentric Shaft 7° | 4 - 4.5 m (13.1-14.7 ft) |
| Volume | Approximated Volume per Revolution at Free Output | 470 ml |
| Specifications: | Filling Volume Without Connectors | 2950 ml |
| Connection | Connectors | 2" TC |
| Specification (Standard): | Position of Connectors | Front |
| | Pump Housing | PP |
| Product Wetted | Valve Plate | PP |
| Materials | Diaphragms | TPE |
| (Standard): | Valves | EPDM/SS316L |
| | 0-rings | EPDM |
| Certificates/ Proofs (Optional): | Elastomere (product wetted) | USP <88> Cl. VI; FDA21CFR177; BSE/TSE Safe; USP 87/381/661 |
| | Rated speed | 1460/474 min-1 (50 Hz) |
| Motor (Standard): | Voltage | 230/400 V |
| | Power | 4 kW |
| Pump | Length | 1152.5 mm (45.37") |
| Dimension with Motor and | Width | 400 mm (15.75") |
| Housing: | Height | 416 mm (16.38") |
| Pump Weight with Motor and Housing: | | 190 kg (419 lb) |

Other connection specifications, materials and motors available on request.



Performance Charts Eccentric Shaft: 7°











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