SAMOA®

LEADING THROUGH INNOVATION

directflo®

Central flow technology

AIR OPERATED DOUBLE DIAPHRAGM PUMPS

Innovative | Unique | Simple | Reliable | Durable | Compact | Efficient | Quiet | Versatile

Headquarters Offices and Technical Centre in Gijón (Spain)

FLUID HANDLING TECHNOLOGY

SAMOA, a privately owned company, is a leading European manufacturer of equipment for fluid transfer, dispensing, dosing, recovery and inventory control. SAMOA designs and manufactures volume flow meters, hose reels, air operated piston pumps and air operated diaphragm pumps, including innovative Directflo® diaphragm pumps.

PRODUCT DEVELOPMENT

Product research and development is a fundamental part of SAMOA's philosophy. We are in permanent contact with the market to identify new customer needs, that we satisfy with product improvements and new products.

MANUFACTURING

SAMOA's headquarters have been in Gijón, on the Spanish North Coast, for over 55 years. SAMOA's manufacturing facilities are modern and equipped with the latest state-of-the-art production equipment and technology. We are committed to design and manufacturing excellence, environmental sustainability and a healthy and safe workplace; our work processes and facilities are consequently ISO 9001, ISO 14001 and OHSAS 18001 certified.

DISTRIBUTION

Our products are available through a network of knowledgeable distributors. This global network provides a sales and consulting service, to identify the products that best meet each customer's needs, and when required offers after sales service to ensure the long and satisfactory use of our equipment.

GLOBALLY COMPETITIVE

Our continuous product improvement process ensures that our products meet customer requirements worldwide, including in even the most demanding applications and environments. As a result, we are proud to say that SAMOA products are reliably working away, night and day, in more than 100 countries.

Research & Development and Manufacturing facility in Gijón (Spain)

SAMOA QUALITY AND LEADERSHIP

RESEARCH & DEVELOPMENT

SAMOA's R&D Department are at the cutting edge of air operated pump developments and feed the product development programme with innovative technology concepts.

PRODUCT DESIGN & ENGINEERING

Attractive product designs are created and robust product engineering is ensured by using 3D CAD.

PRODUCT PROTOTYPING & TESTING

CAD-CAM manufacturing equipment dedicated to prototyping, and a well equipped test laboratory, allow fast product evolution and the release to market of optimized and fully proven products.

ROBOTISED CNC MANUFACTURING

High volume CNC manufacturing equipment is fed by robots. The robotised material handling processes incorporate part cleaning and 100% automated part inspection.

QUALITY CONTROL INCLUDING FUNCTIONAL TESTING

Components are inspected following SPC standards, many sub-assemblies are 100% functionally tested and every finished pump must pass an automated functional test. Pumps are run wet and taken through a carefully defined test procedure, to ensure zero defects on shipment.

RAPID & RELIABLE ORDER FULFILLMENT

SAMOA's experienced customer service staff and worldwide distributors can recommend the pump that best meets each application's needs.
After order entry, the ERP system drives the work flow through to shipment. Low rotation products are built to order; a generous inventory of finished parts allows fast delivery times. High rotation products are stored in an automated warehouse integrated with the ERP system and so can be shipped almost immediately after order entry.

EFFICIENT AFTER-SALES SERVICE

Prompt after-sales service and immediate spare parts availability ensure a long and trouble-free pump life.

DIRECTFLO®, BETTER BY DESIGN

Stainless steel DF50 & DF100.

SUPERIOR ALL-ROUND PUMPING PERFORMANCE

- Significant dry suction lift eliminates self-priming issues
- Discharge fluids at up to 7 bar (100 psi), to pump even medium viscosity fluids over long pipe runs and up to significant heights
- Efficient compressed air usage

SIMPLE, RELIABLE & DURABLE

- Few parts
- Start up every time
- Easy operation, for example: variable flow rate and pressure by adjusting the air pressure
- Inline servicing possible without disconnecting the fluid lines
- Quick error free non-expert maintenance
- Short stroke and robust construction long life diaphragms

ROBUST

- Compact design
- No protuding manifolds
- Integrated muffler
- Metal fluid connections and external parts for noncorrosive applications
- Tough plastic external parts for corrosive applications

SMOOTH RUNNING

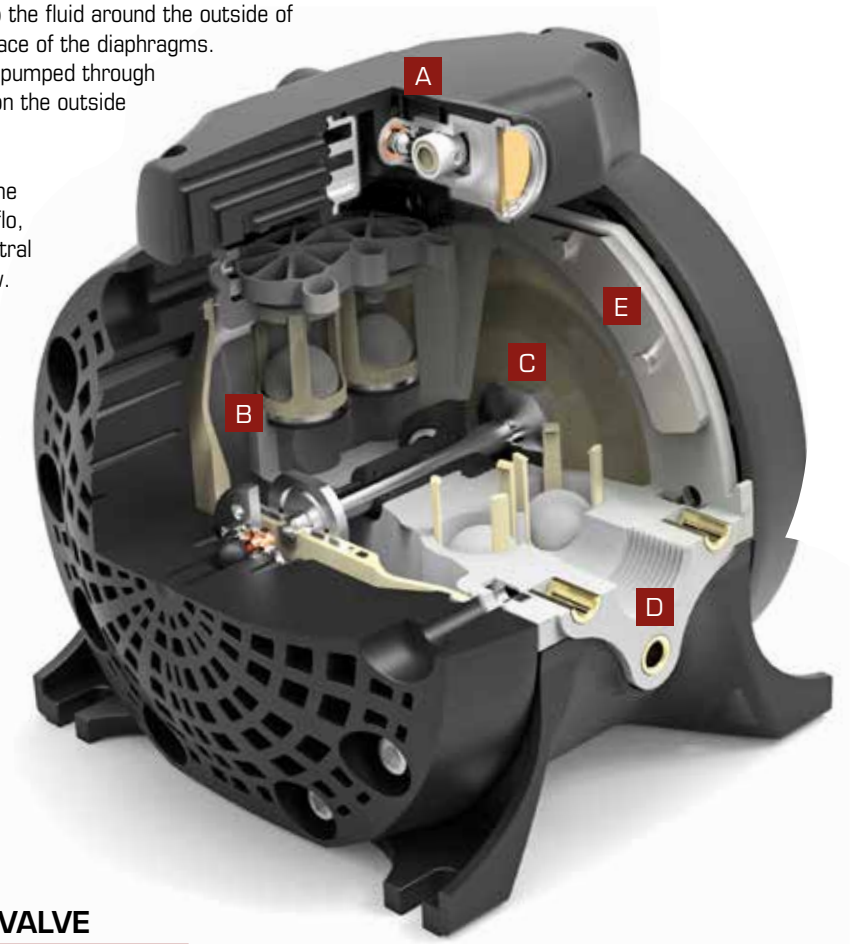
- Gentle pumping suitable for fluids that may form emulsions or shear sensitive fluids
- Reduced pulsation: greater accuracy during dosing and less splashing when dispensing
- Fewer vibrations and lower noise level

INNOVATIVE SAMOA TECHNOLOGIES INSIDE

Conventional air operated diaphragm pumps pump the fluid around the outside of the pump and compressed air acts on the inside face of the diaphragms. Directflo pumps are inside out pumps, the fluid is pumped through the centre of the pump and compressed air acts on the outside face of the diaphragms.

Important innovations were necessary to realise the central flow concept and, whilst developing Directflo, further inventions were made that built on the central flow concept. A few highlights are described below.

PATENTED WORLDWIDE



A FRICTIONLESS PIVOTING AIR VALVE

- High operational reliability
- Variable flow rate and pressure by adjusting the air pressure
- Non stalling
- Non icing
- Self-cleaning
- Extremely fast switching between strokes reduces air consumption and minimizes pulsations
- Enables a short stroke pump design, for long diaphragm life
- Tolerates dry, damp, dirty or oily air

B BALL CHECK VALVES ADJACENT TO DIAPHRAGMS

- Very fast valve action, even with viscous fluids. Together with the high speed frictionless pivoting air valve, this enables a short stroke pump design, for long diaphragm life
- Enables superior pump suction and thus improves overall pump performance

C STRESS FREE DIAPHRAGM COUPLINGS

- Non-rigid sliding couplings between push rod and diaphragms prevent diaphragm and push rod stress
- Long leak free diaphragm life
- Fast and easy diaphragm service

D SINGLE PART MOULDED PUMP BODY

- Minimizes energy losses within the pump
- No leaks
- Compact

E FLANGE FASTENING PLATES

- Pumps with plastic central bodies are fitted with load spreading stainless steel flange fastening plates
- Reduces the risk of damage to plastic bodies when flange bolts are over tightened
- Enhances sealing in the areas between flange bolts and so reduces the risk of flange leaks

Directflo® pumps are also available without the directional air valve and without the end of stroke sensors, to be externally driven. These special pumps are used, for example, in dosing applications.

WIDE CHOICE OF MATERIALS

SINGLE PART MOULDED PUMP BODY

PP - Polypropylene: good chemical compatibility resisting harsh fluids such as strong acids and alkalis.

AC - Acetal: tough, impact resistant with good abrasion resistance and a low friction surface. Generally good chemical resistance except for strong acids, alkalis and oxidizing agents.

PVDF (Kynar® or Solef®) - Polyvinylidene Fluoride: excellent chemical compatibility. PVDF can be used with many very chemically aggressive fluids, including hot concentrated acids. Not recommended for some strong alkalis.

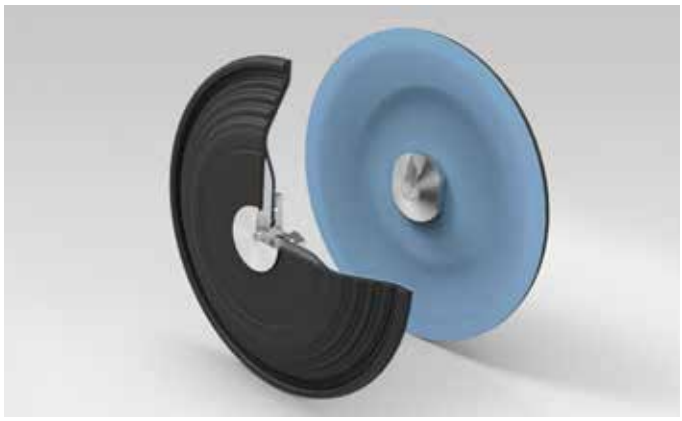
AL - Aluminium: robust lightweight material used in many pH neutral applications. Optionally can be electroless nickel plated for use with highly abrasive fluids.

SS - Stainless Steel: robust, excellent compatibility with solvents and many chemicals.

PP (EX) - Conductive Polypropylene: good chemical compatibility, as with nonconductive PP, and also enables pump earthing, to eliminate the risk of static electricity build up.

AC (EX) - Conductive Acetal: good compatibility with solvents and enables pump earthing, to eliminate the risk of static electricity build up.

PVDF (Kynar® or Solef®) (EX) - Conductive Polyvinylidene Fluoride: excellent chemical compatibility, as with nonconductive PVDF, and also enables pump earthing, to eliminate the risk of static electricity build up.

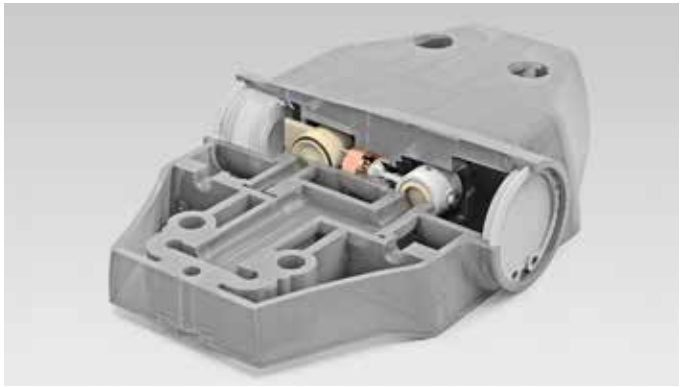


LONG LIFE DIAPHRAGMS

PTFE (Teflon®) - Polytetrafluoroethylene: all Directflo® PTFE diphragms are composite diaphragms with a PTFE fluid-side diaphragm bonded to a textile reinforced EPDM diaphragm. The EPDM diaphragm supports the PTFE diaphragm to ensure a long life. Excellent fluid compatibility, including with chemically highly aggressive fluids.

Hytrel® - Durable with excellent abrasion resistance. Offers long life with chemically non aggressive fluids.

Santoprene® - Very good resistance to abrasion and long flex life. Good resistance to chemicals, but not recommended for solvents. Higher operating temperatures than Hytrel®.

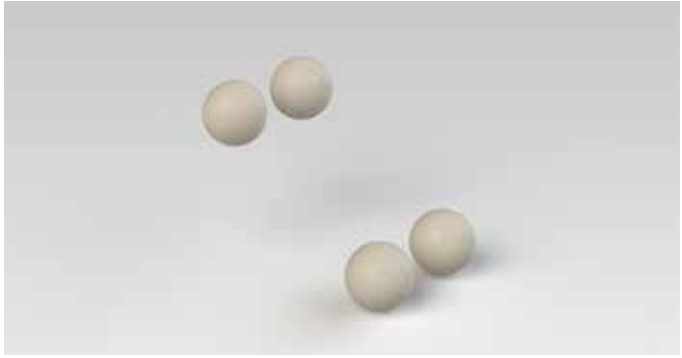


DIRECTIONAL AIR VALVE AND AIR CHAMBER COVERS

AL - Aluminium: robust lightweight material for use in noncorrosive environments.

PP - Polypropylene: good chemical compatibility and so suitable for use in corrosive environments.

PP (EX) - Conductive Polypropylene: good chemical compatibility, as with nonconductive PP, and so suitable for use in corrosive environments, also enables pump earthing, to eliminate the risk of static electricity build up.



BALL CHECK VALVES

PTFE (Teflon®) - Polytetrafluoroethylene: excellent chemical compatibility.

AC - Acetal: good resistance against abrasion and wide fluid compatibility.

SS - Stainless Steel: optionally for use with high viscosity fluids.

A BALL VALVE SEATS

SS - Stainless Steel: good resistance against corrosion and abrasion.

PVDF (Kynar® or Solef®) - Polyvinylidene Fluoride: for fluids which are not compatible with stainless steel, PVDF can be used with many very chemically aggressive fluids. Not recommended for some strong alkalis.

B BALL VALVE GUIDES

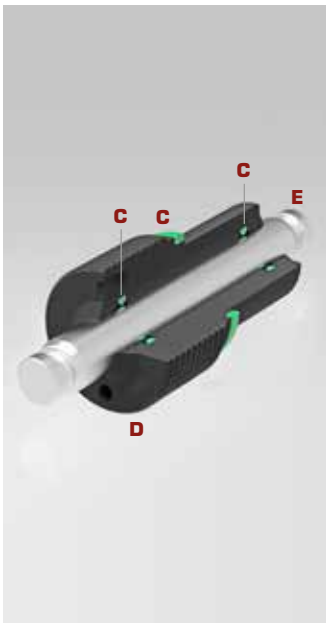
AC - Acetal: good resistance against abrasion and wide fluid compatibility.

PP - Polypropylene: good chemical compatibility resisting harsh fluids such as strong acids and alkalis.

PVDF (Kynar® or Solef®) - Polyvinylidene Fluoride: PVDF can be used with many very chemically aggressive fluids. Not recommended for some strong alkalis.

PTFE (Teflon®) - Polytetrafluoroethylene: excellent chemical compatibility.

SS - Stainless Steel: good resistance against corrosion and abrasion.



C SEALS

EPDM - Ethylene Propylene Diene Monomer Rubber: wide chemical compatibility, good abrasion resistance.

FKM (Viton®) - Fluoroelastomer: good chemical compatibility, good abrasion resistance.

FFKM (Isolast® or Kalrez®) - Perfluoroelastomer: compatible with most chemicals, even at high temperatures. Not recommended with concentrated nitric acid. Good abrasion resistance.

PTFE (Teflon®) - Polytetrafluoroethylene: excellent fluid compatibility, including with chemically highly aggressive fluids.

NBR - Nitrile Butadiene Rubber: often used in industrial applications with chemically non aggressive fluids. Very good abrasion resistance.

D BUSHING

PTFE (Teflon®) - Polytetrafluoroethylene: excellent fluid compatibility and minimum friction.

PTFE (Teflon®) (EX) - Conductive Polytetrafluoroethylene: excellent fluid compatibility and minimum friction, as with nonconductive PTFE, and also enables pump earthing, to eliminate the risk of static electricity build up.

AC - Acetal: offers good resistance to a broad range of chemicals, good abrasion resistance and a low friction surface.

E PUSH ROD

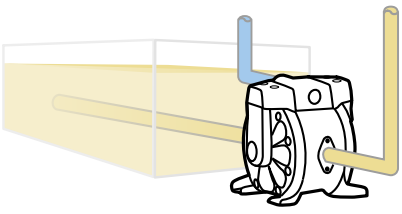
SS - Stainless Steel: good resistance against corrosion and abrasion.

HASTELLOY® - Hastelloy: excellent chemical compatibility, including with many fluids that attack stainless steel such as hydrochloric acid and sodium hypochlorite.

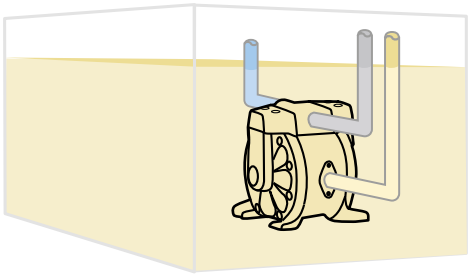
SAMOA

INSTALLATION OPTIONS

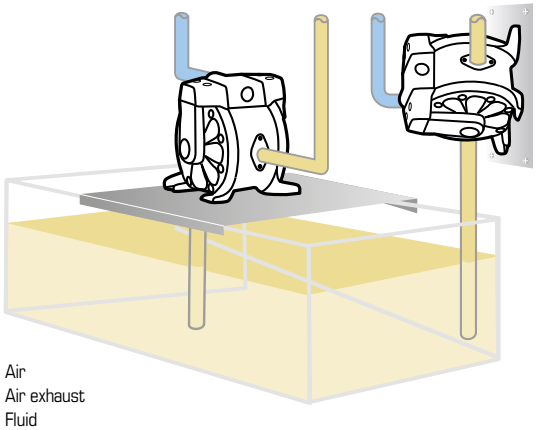
Flooded Suction



Submerged

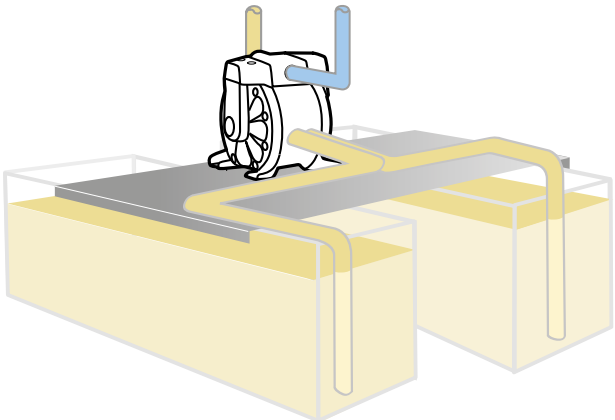


Self Priming



Air
Air exhaust
Fluid

Mixing Pump (50/50)



MARKETS SERVED

APPLICATIONS

- FLUID TRANSFER AND DISPENSING
- FLUID EVACUATION
- DOSING/BLENDING/ FORMULATION
- FLUID RECIRCULATION
- SUPPLY FOR LOW PRESSURE SPRAY
- FLUID FLUSHING/ CLEAN IN PLACE (CIP)
- PUMPING SAMPLES
- FILTER & FILTER PRESS FEEDING
- SLURRY HANDLING
- TANK/BARREL FILLING & EMPTYING

VEHICLE PRODUCTION & MAINTENANCE

CONSTRUCTION & MINING

PRINT & PACKAGING / PULP & PAPER CONVERTERS

PAINT & COATINGS

PROCESS WATER / SURFACE TREATMENTS / WASTEWATER

METALWORKING

CHEMICAL, PETROCHEMICAL & REFINERIES

HYGIENIC APPLICATIONS

CERAMIC SLIP & GLAZE

FLUIDS

Acids	Abrasive
Alkalis	Corrosive
Alcohols	Hazardous
Solvents	Flammable
Water based fluids	Solids in suspension
Chemicals	Shear sensitive
Fuels & oils	Medium viscosity
Inks, paints & varnishes	
Additives	
Etc.	

For further details of markets served and applications please see page 23.

Directflo® PUMP RANGE

PLASTIC PUMPS

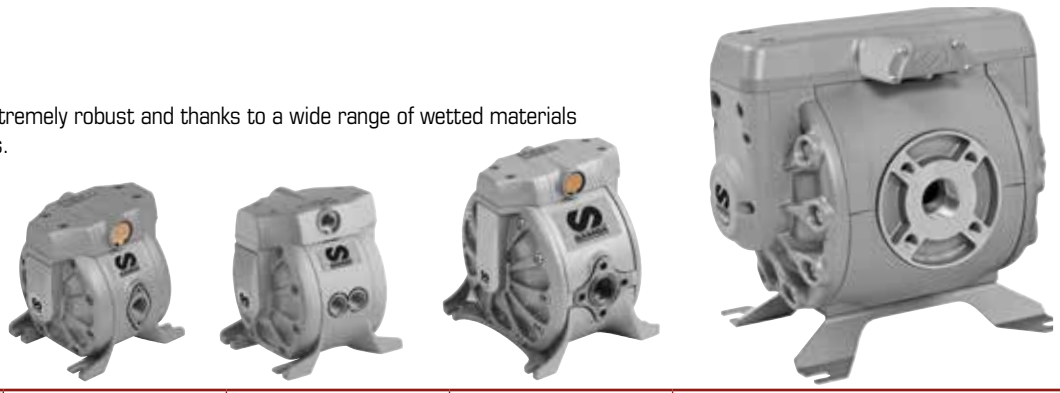
Plastic Directflo® pump wetted bodies are compatible with even the most aggressive chemicals, and the plastic directional air valve and air chamber covers are suitable for use in corrosive environments.

DF PUMPS	DF30	DF30T	DF50	DF50T	DF100
Pressure ratio	1:1	1:1	1:1	1:1	1:1
Maximum free delivery (1)	38 l/min (10 US gal/min)	38 l/min (10 US gal/min)	50 l/min (14 US gal/min)	50 l/min (14 US gal/min)	100 l/min (28 US gal/min)
Delivery per stroke approx. (1)	0,07 litres (0.02 US gal)	0,07 litres (0.02 US gal)	0,1 litres (0.026 US gal)	0,1 litres (0.026 US gal)	0,25 l (0.07 US gal)
Delivery per cycle (2 x strokes) (1)	0,14 litres (0.04 US gal)	0,14 litres (0.04 US gal)	0,2 litres (0.05 US gal)	0,2 litres (0.05 US gal)	0,50 l (0.13 US gal)
Air pressure operating range	1,5 to 7 bar (22 to 102 psi)	1,5 to 7 bar (22 to 102 psi)	1,5 to 7 bar (22 to 102 psi)	1,5 to 7 bar (22 to 102 psi)	1,5 to 7 bar (22 to 102 psi)
Solids in suspension max. size	3 mm (1/8")	3 mm (1/8")	3 mm (1/8")	3 mm (1/8")	4 mm (3/16")
Maximum dry suction lift (1)	4 m (13')	4 m (13')	6 m (20')	6 m (20')	4,5 m (15')
Maximum wet suction lift (1)	8 m (26')	8 m (26')	8 m (26')	8 m (26')	7 m (23')
Weight	1,9 kg (4.19 lb)	1,9 kg (4.19 lb)	2,2 kg (4.85 lb)	2,2 kg (4.85 lb)	5,1 kg (11.24 lb)
Fluid inlet connection	1/2" BSP/NPT (F) and flange	2 x 3/8" BSP/NPT (F) and flange	1/2" BSP/NPT (F) and flange	2 x 3/8" BSP/NPT (F) and flange	1" BSP/NPT (F) and flange
Fluid outlet connection	1/2" BSP/NPT (F) and flange	1/2" BSP/NPT (F) and flange	1/2" BSP/NPT (F) and flange	1/2" BSP/NPT (F) and flange	1" BSP/NPT (F) and flange
Air inlet connection	3/8" NPSM (F)	3/8" NPSM (F)	3/8" NPSM (F)	3/8" NPSM (F)	3/8" NPSM (F)
Wetted part materials	See recommended models in corresponding pump page				

(1) Data measured with water, air inlet pressure 7 bar (100 psi), 20 °C (68 °F).

METAL PUMPS

Metal Directflo® pumps are extremely robust and thanks to a wide range of wetted materials are compatible with many fluids.



DF PUMPS	DF50	DF50T	DF100	DF250
Pressure ratio	1:1	1:1	1:1	1:1
Maximum free delivery (1)	50 l/min (14 US gal/min)	50 l/min (14 US gal/min)	100 l/min (28 US gal/min)	250 l/min (66 US gal/min)
Delivery per stroke approx. (1)	0,1 litres (0.026 US gal)	0,1 litres (0.026 US gal)	0,25 l (0.07 US gal)	0,6 l (0.16 US gal)
Delivery per cycle (2 x strokes) (1)	0,2 litres (0.05 US gal)	0,2 litres (0.05 US gal)	0,5 l (0.13 US gal)	1,2 l (0.32 US gal)
Air pressure operating range	1,5 to 7 bar (22 to 102 psi)	1,5 to 7 bar (22 to 102 psi)	1,5 to 7 bar (22 to 102 psi)	1,5 to 7 bar (22 to 102 psi)
Solids in suspension max. size	3 mm (1/8")	3 mm (1/8")	4 mm (3/16")	6 mm (1/4")
Maximum dry suction lift (1)	6 m (20')	6 m (20')	4,5 m (15')	5 m (16.4')
Maximum wet suction lift (1)	8 m (26')	8 m (26')	7 m (23')	8 m (26')
Weight	3,5 kg (7.72 lb)	3,5 kg (7.72 lb)	7,2 kg (16 lb)	20 kg (45 lb)
Fluid inlet connection	1/2" NPSM (F) and flange	2 x 3/8" NPSM (F) and flange	1" BSP/NPT (F) and flange	1 1/2" BSP (F) and DIN PN-10 flange or 1 1/2" NPT (F) and ANSI B16.5 150 lb flange
Fluid outlet connection	1/2" NPSM (F) and flange	1/2" NPSM (F) and flange	1" BSP/NPT (F) and flange	1 1/2" BSP (F) and DIN PN-10 flange or 1 1/2" NPT (F) and ANSI B16.5 150 lb flange
Air inlet connection	3/8" NPSM (F)	3/8" NPSM (F)	3/8" NPSM (F)	1/2" NPSM (F)
Wetted part materials	See recommended models in corresponding pump page			

(1) Data measured with water, air inlet pressure 7 bar (100 psi), 20 °C (68 °F).

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