03

AIR OPERATED PUMPS FOR OTHER SERVICE FLUIDS

directflo®

Directflo® MAIN FEATURES

Directflo® are innovative Air Operated Double Diaphragm Pump (AODDPs) that retain the advantages of conventional AODDPs whilst making a leap forward to address their shortcomings.

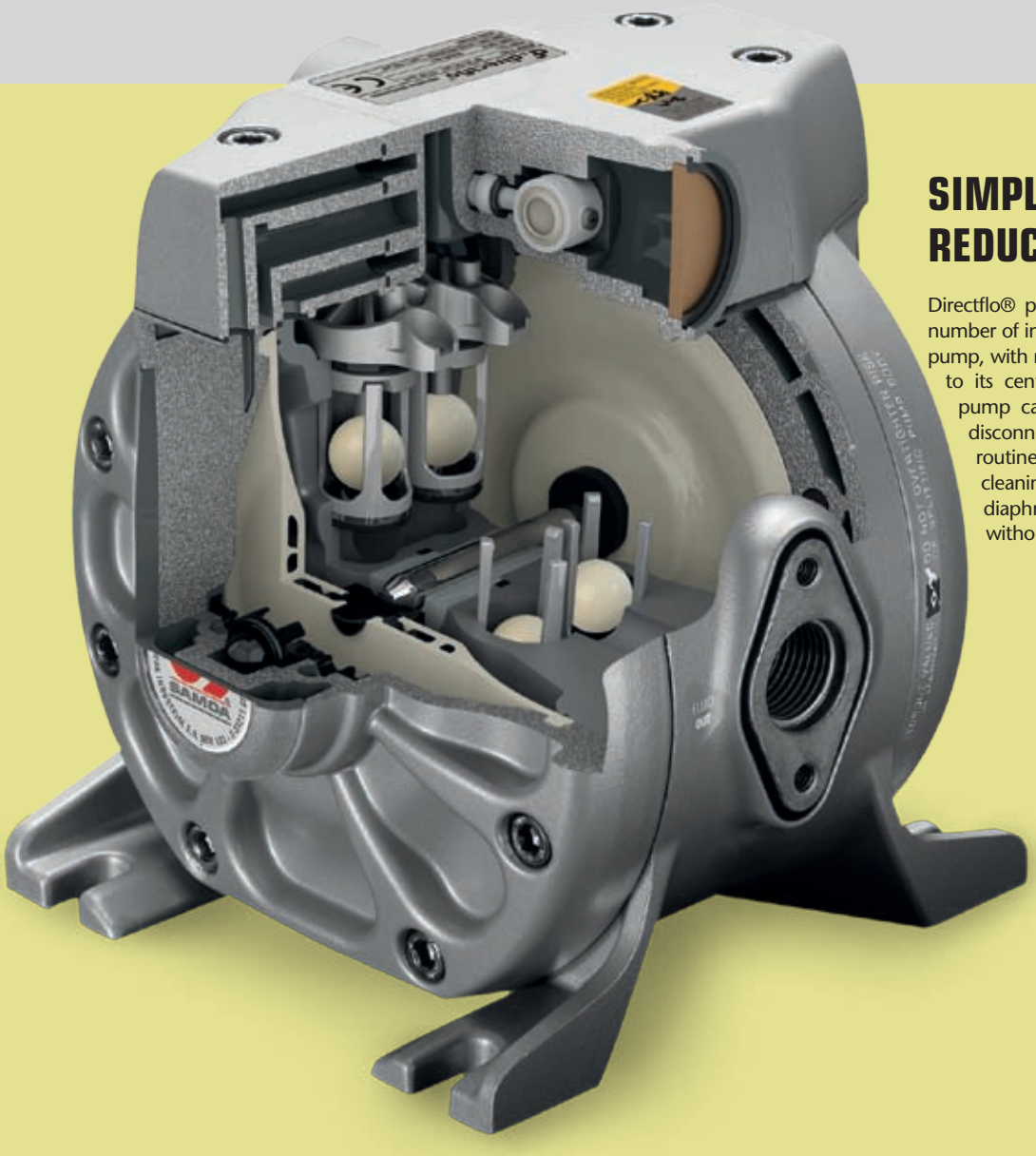
The parts of Directflo® that come into contact with the pumped fluid are available in a wide variety of materials, and so it is possible to configure Directflo® pumps to offer complete chemical compatibility with most fluids.

Directflo® pumps offer all the advantages of conventional AODDPs:

- Discharge fluids at up-to 7 bar, to pump medium viscosity fluids even over long pipe runs and up to significant heights.
- No rotating shaft seals: no leaks pumping abrasive fluids.
- No rotating parts and no tight clearances: pump slurries.
- Gentle pumping action suitable for shear sensitive fluids or fluids that may form emulsions.
- Compressed air operation with no electricity required, inherently safe concept for environments with explosion risks. ATEX certified models available.
- Variable flow rate and pressure through simple adjustment of the air pressure.
- Tolerate dry running.
- Dead heading: pumps stop without any risk of damage when the fluid discharge line is fully closed.

Plus significant improvements, through the unique Directflo® design, that will be appreciated in your application:

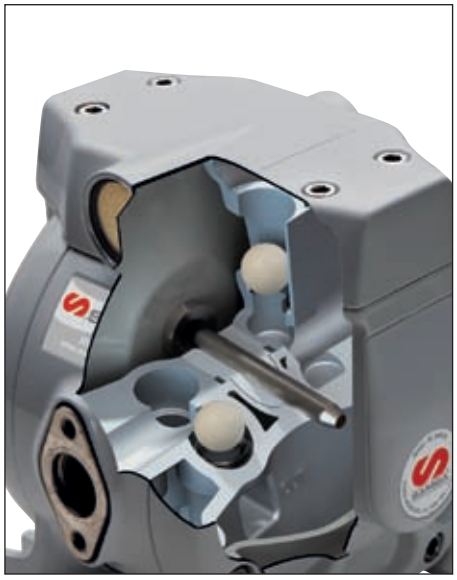
- Superior performance against back pressure, less loss of nominal flow capacity under real application conditions.
- Significant dry suction lift, eliminate self-priming issues pumping from drums and even tall tanks.
- Dependable lube free directional pivot air valve: starts-up every time. Tolerant of oil, moisture and dirt. Non icing. No air leaks when pumps are stalled by closing the fluid discharge line.
- Reduced air consumption per liter pumped, saves energy and possibly avoids the need to buy a bigger compressor.
- Reduced pulsation, greater accuracy during dosing and less splashing when dispensing.
- Lower vibrations and lower noise level.
- Extremely reliable: reduced part count design and very long life wear parts.
- Inline servicing of air valve, diaphragms and ball valves, without disconnecting the plumbing. The low part count design allows fast and reliable servicing by non-expert technicians.
- Robust, compact design.



SIMPLE RELIABILITY, REDUCED TO THE MAX

Directflo® pumps are extremely simple. The reduced number of internal components results in a very reliable pump, with minimal maintenance requirements. Thanks to its central flow design, with no manifolds, the pump can be fully serviced without the need to disconnect the fluid distribution line. Furthermore, routine service and maintenance (air valve service, cleaning or replacing ball valves, replacing worn diaphragms, etc.) can be performed quickly and without errors by non-expert personnel.

The unique «Inside-Out» pump concept makes possible to bring, in addition to the central ball-valves fluid (CBV) path technique, Directflo® pumps feature two significant innovations: the Flexible Diaphragm Suspension (FDS) and the Frictionless Pivoting Air Valve (FPV).



FRICTIONLESS PIVOTING AIR VALVE

The FDS principle is complemented with the use of short stroke diaphragms that reciprocate very quickly. Shortening the stroke length dramatically reduces the fatigue wear of the diaphragms and so extends their life. A traditional sliding air valve could not be used as the friction in these kind of air valves is too high to allow the fast reversing action required. Therefore a new friction free and extremely fast air valve, the FPV (Frictionless Pivoting Air Valve), was developed.

The FPV is the heart of the reciprocate drive system and ensures very high operational reliability. The air distribution system (including the directional air valve module, the end of stroke sensor valves, and the air channels) is self-cleaning and withstands non lubricated, oily, dry, humid and dirty compressed air.

FLEXIBLE DIAPHRAGM SUSPENSION

One of the innovations behind the pump's smooth operation is the FDS technology (Flexible Diaphragm Suspension): The diaphragms are not rigidly fixed to the shaft.

Flexible Diaphragm Suspension reduces fatigue on the diaphragms, contributing to extend their service life. Also, shaft life is significantly increased, since the diaphragm only pushes the shaft but does not transmit non-axial loads.

This contributes to minimize pulsations, increases time between services and enables a central flow.

SIMPLEST MAINTENANCE

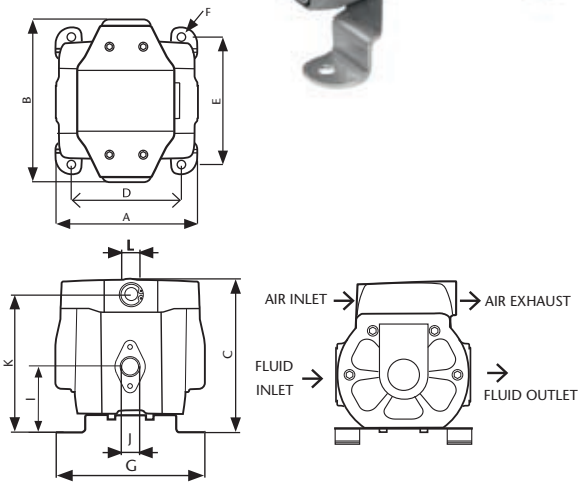
Pump maintenance has never been so easy. The entire pump can be disassembled without dismounting the fluid pipe lines. This makes replacing diaphragms, cleaning valves and other maintenance jobs easier and faster than in other diaphragm pumps.

553 010

DF30 NON METALLIC PUMPS

For fluid dosing, spray, transfer, evacuation and distribution systems.
38 l/min (10.4 US gpm), 1/2" fluid inlet and outlet ports.
Very robust construction, the pump is fully enclosed in a shield and has non-metallic wetted parts.

MODELS AND APPLICATIONS				
APPLICATION	**WETTED MATERIAL**	**CHECK BALLS**	**DIAPHRAGMS**	**PART No.**
ANTIFREEZE AND COOLANT SOLUTIONS, WINDSHIELD WASH SOLUTIONS AdBlue® (DEF)	Polypropylene	PTFE	Hytrel®	**553 010**



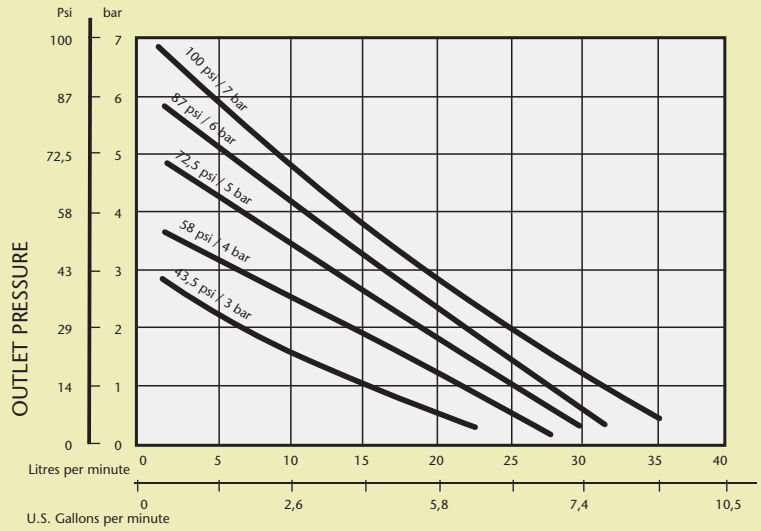
TECHNICAL DATA	
Pressure ratio	1:1
Maximum free delivery *(1)*	38 l/min (10.4 US gpm)
Delivery per stroke aprox. *(1)*	0,07 litres (0.019 US gallons)
Air pressure operating range	3 to 7 bar (45 to 100 psi)
Solids in suspension max size	3 mm (1/8")
Max dry suction head *(1)*	2,5 m (8.20')
Max wet suction head *(1)*	8 m (26.25')
Weight	2,2 Kg (4.85 lb)
Fluid inlet	1/2" BSP/NPT (F) and flange
Fluid outlet	1/2" BSP/NPT (F) and flange
Air inlet	3/8" NPSM (F)
Wetted part materials	See models and applications

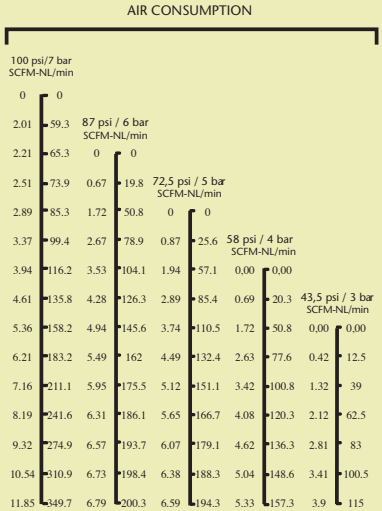
(1) Data measured with water, air inlet pressure 7 bar, 20 °C.

DIMENSIONS (mm)					
A	**B**	**C**	**D**	**E**	**F**
130	160	162	105	122	8
G	**I**	**J**	**K**	**L**	
140	70	1/2" (F)	145	3/8" (F)	

CAPACITY

Tested at room temperature, with water and flooded pump with 80 mm (3.5 inches) positive suction.





DF30 NON METALLIC PUMPS WITH DUAL INLET

553 020

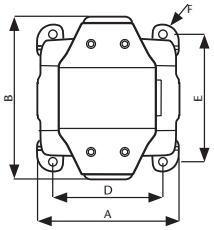
Dual inlet pumps for 1:1 proportion mixing of fluids with similar viscosity. Both fluids and the resulting solution must be compatible with the pump wetted materials.

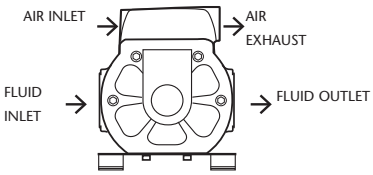
38 l/min (10.4 US gpm), 2 x 3/8" fluid inlet and 1/2" fluid outlet.

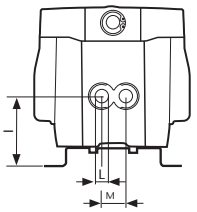
MODELS AND APPLICATIONS				
APPLICATION	**WETTED MATERIAL**	**CHECK BALLS**	**DIAPHRAGMS**	**PART No.**
1:1 SOLUTIONS OF WATER, ANTIFREEZE AND WATER, WINDSHIELD WASH	Polypropylene	PTFE	Hytrel®	**553 020**

TECHNICAL DATA	
Pressure ratio	1:1
Maximum free delivery *(1)*	38 l/min (10.4 US gpm)
Delivery per stroke *(1)*	0,07 litres (0.019 US gallons)
Air pressure operating range	3 to 7 bar (45 to 100 psi)
Solids in suspension max size	3 mm (1/8")
Max dry suction head *(1)*	2,5 m (8.2')
Max wet suction head *(1)*	8 m (26.25')
Weight	2,2 Kg (4.85 lb)
Fluid inlet	2 x 3/8" BSP/NPT (F)
Fluid outlet	1/2" BSP/NPT (F) and flange
Air inlet	3/8" NPSM (F)
Wetted part materials	See models and applications

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



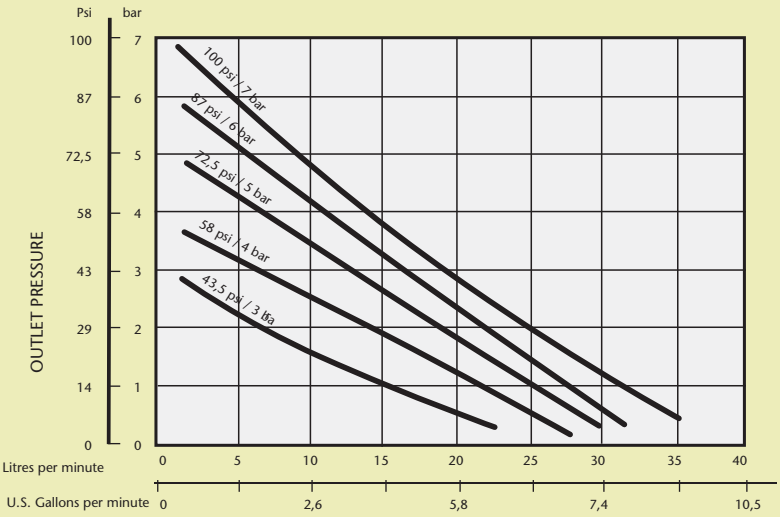


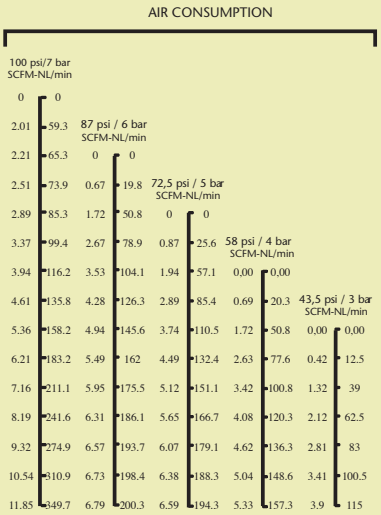


DIMENSIONS (mm)							
A	**B**	**C**	**D**	**E**	**F**	**G**	**I**
130	160	162	105	122	8	140	70
J	**K**	**L**	**M**				
1/2" (F)	145	3/8" (F)	24				

CAPACITY

Tested at room temperature, with water and flooded pump with 80 mm (3.5 inches) positive suction.





552 017 - 552 010

DF50 METALLIC AND NON METALLIC PUMPS

For fluid dosing, spray, transfer, evacuation and distribution systems.
50 l/min (14 US gpm), 1/2" fluid inlet and outlet ports.
Very robust construction, the pump body is fully enclosed in a shield, except ATEX models.

MODELS AND APPLICATIONS

APPLICATION	WETTED MATERIAL	CHECK BALLS	DIAPHRAGMS	PART No.
LUBRICANTS, WASTE OIL, ANTIFREEZE AND WINDSHIELD WASH SOLUTIONS	Aluminum	Acetal	Hytrel®	**552 010**
ANTIFREEZE AND COOLANT SOLUTIONS, WINDSHIELD WASH SOLUTIONS, AdBlue® (DEF)	Polypropylene	PTFE	Hytrel®	**552 015**
PURE ETHANOL, PURE WINDSHIELD WASH (ATEX PUMP)	Conductive acetal	PTFE	PTFE	**552 017**

TECHNICAL DATA

Pressure ratio	1:1
Maximum free delivery *(1)*	50 l/min (14 US gpm)
Delivery per stroke aprox. *(1)*	0,1 litres (0.026 US gallons)
Air pressure operating range	3 to 7 bar (45 to 100 psi)
Solids in suspension max size	3 mm (1/8")
Max dry suction head *(1)*	6 m (20')
Max wet suction head *(1)*	8 m (26.25')
Weight	3,5 Kg (7.72 lb) (metallic) 2,8 Kg (6.17 lb) (non metallic)
Fluid inlet	1/2" NPSM (F) and flange (metallic) 1/2" BSP/NPT (F) and flange (non metallic)
Fluid outlet	1/2" NPSM (F) and flange (metallic) 1/2" BSP/NPT (F) and flange (non metallic)
Air inlet	3/8" NPSM (F)
Wetted part materials	See models and applications

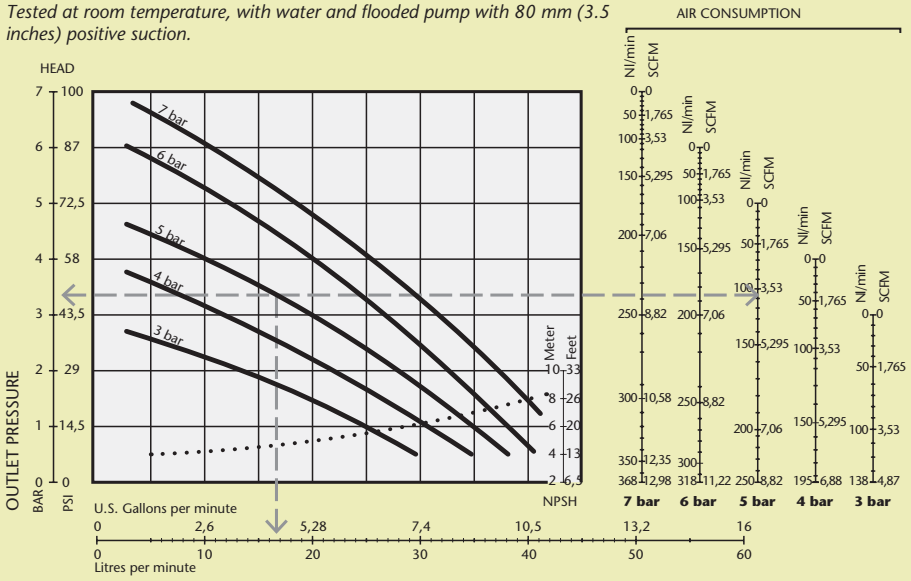
(1) Data measured with water, air inlet pressure 7 bar, 20 °C.

DIMENSIONS (mm)

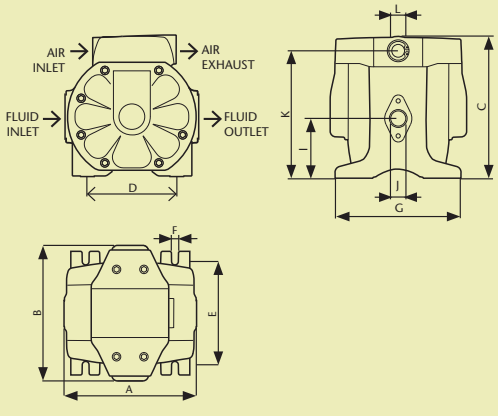
A	B	C	D	E	F
156	160	167	105	122	8
G	**I**	**J**	**K**	**L**	
146	70	1/2" (F)	150	3/8" (F)	

CAPACITY

Tested at room temperature, with water and flooded pump with 80 mm (3.5 inches) positive suction.



DIMENSIONS



DF50 NON METALLIC PUMPS WITH DUAL INLET

552 025

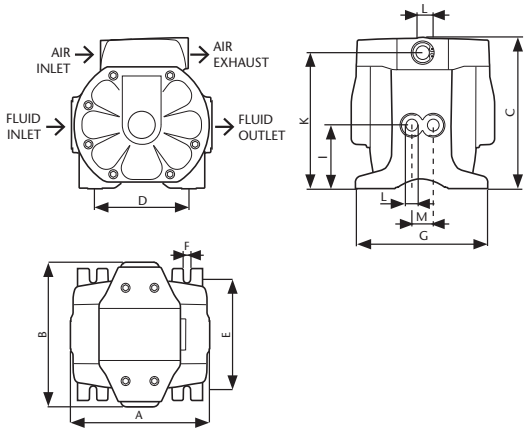
Dual inlet pumps for 1:1 proportion mixing of fluids with similar viscosity. Both fluids and the resulting solution must be compatible with the pump wetted materials.

MODELS AND APPLICATIONS

APPLICATION	WETTED MATERIAL	CHECK BALLS	DIAPHRAGMS	PART No.
1:1 SOLUTIONS OF WATER, ANTIFREEZE AND WATER, WINDSHIELD WASH	Polypropylene	PTFE	Hytrel®	**552 025**

TECHNICAL DATA	
Pressure ratio	1:1
Maximum free delivery *(1)*	50 l/min (14 US gpm)
Delivery per stroke approx. *(1)*	0,1 litres (0.026 US gallons)
Air pressure operating range	3 to 7 bar (45 to 100 psi)
Solids in suspension max size	3 mm (1/8")
Max dry suction head *(1)*	6 m (20')
Max wet suction head *(1)*	8 m (26.25')
Weight	3,5 Kg (7.72 lb)
Fluid inlet	2 x 3/8" BSP/NPT (F)
Fluid outlet	1/2" BSP/NPT (F) and flange
Air inlet	3/8" NPSM (F)
Wetted part materials	See models and applications

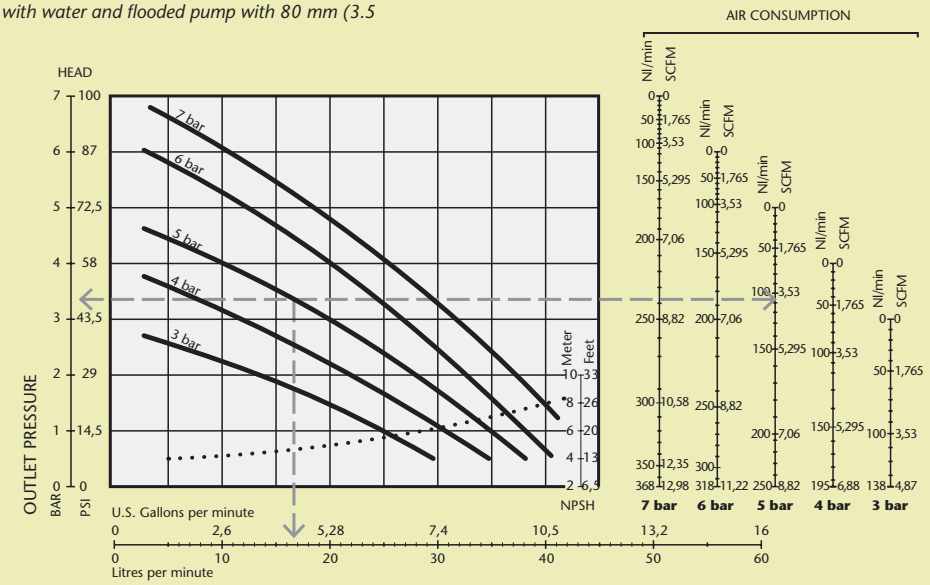
(1) Data measured with water, air inlet pressure 7 bar, 20 °C.



DIMENSIONS (mm)					
A	**B**	**C**	**D**	**E**	**F**
156	160	167	105	122	8
G	**I**	**J**	**K**	**L**	**M**
146	70	1/2" (F)	150	3/8" (F)	24

CAPACITY

Tested at room temperature, with water and flooded pump with 80 mm (3.5 inches) positive suction.



551 010 - 551 015

DF100 METALLIC AND NON METALLIC PUMPS

For fluid dosing, spray, evacuation, transfer and distribution systems. 100 l/min, 28 US gpm 1" fluid inlet and outlet ports. Very robust construction, the pump is fully enclosed in a shield.

MODELS AND APPLICATIONS

APPLICATION	WETTED MATERIAL	CHECK BALLS	DIAPHRAGMS	PART No.
LUBRICANTS, WASTE OIL AND ANTIFREEZE	Aluminum	Acetal	Hytrel®	**551 010**
LUBRICANTS, WASTE OIL, ANTIFREEZE AND WINDSHIELD WASH SOLUTIONS ADBLUE® (DEF)	Polypropylene	PTFE	Hytrel®	**551 015**
PURE ETHANOL, PURE WINDSHIELD WASH (ATEX PUMP)	Conductive acetal	PTFE	PTFE	**551 017**

TECHNICAL DATA	
Pressure Ratio	1:1
Maximum free delivery *(1)*	100 l/min (28 US gpm)
Delivery per stroke *(1)*	0,25 l (0.064 US gallons)
Air pressure operating range	3 to 7 bar (45 to 100 psi)
Solids in suspension max size	4 mm (3/16")
Max dry suction head *(1)*	4,5 m (15')
Max wet suction head *(1)*	7 m (23')
Weight	7,2 Kg (16 lb) (metallic) 6,5 Kg (14.4 lb) (non metallic)
Fluid inlet	1" BSP/NPT (F) and flange
Fluid outlet	1" BSP/NPT (F) and flange
Air inlet	3/8" NPSM (F)
Wetted part materials	See models and applications

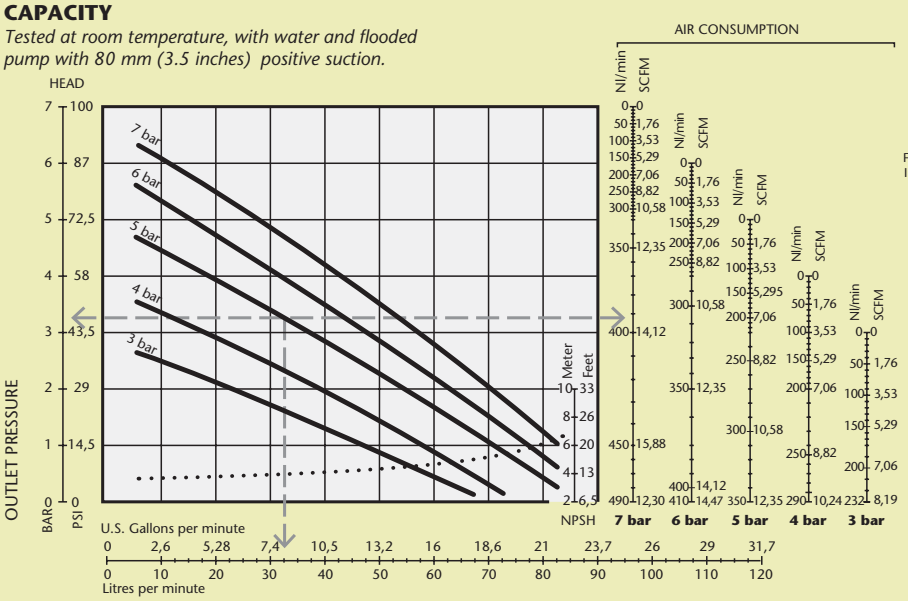
(1) Data measured with water, air inlet pressure 7 bar, 20 °C.

DIMENSIONS (mm)

A	B	C	D	E	F
216	189	227	175	154	9
G	**I**	**J**	**K**	**L**	
184	94,5	1" (F)	210	3/8" (F)	

CAPACITY

Tested at room temperature, with water and flooded pump with 80 mm (3.5 inches) positive suction.



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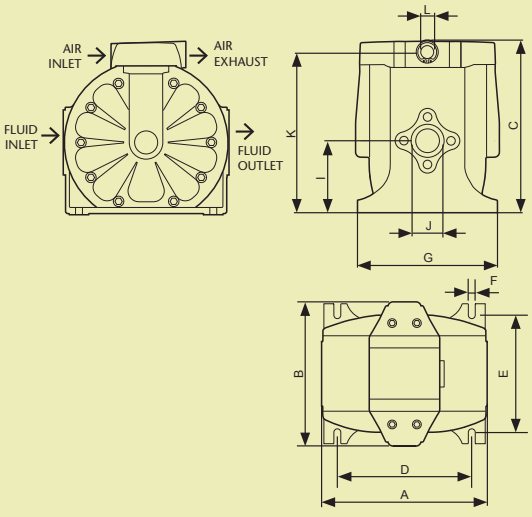

AIR LINE ACCESSORIES

For DF30, DF50 and DF100 pumps
Air filters protect pump motors from damage and wear caused by dirt and moisture contained in compressed air. Air pressure regulators maintain a selected air pressure constant (between 0 to 12 bar), eliminating over pressure risks and erratic operation of equipment.

240 500 Combined air filter and pressure regulator. 1/4" BSP (FF).
240 201 Air pressure regulator, 0 - 12 bar, 1/4" BSP (FF).

253 114 Automatic quick coupling, 1/4" BSP (F). Manufactured in brass, with nickel plated body and stainless steel wear parts for a longer life. Compatible with US MIL C4109 - ISO B6. Flow capacity: 1.000 l/min.

259 038 Air nipple, 3/8" BSP (M). To be mounted at pump air inlet.

Connection adaptors
Required when connecting air accessories to a pump.
239 000, 1/4" BSP (M) x 1/4" BSP (M).
239 001, 3/8" BSP (M) x 1/4" BSP (M).

Air hoses
246 006, Air hose, 0,6 m 1/4" BSP (MM).
246 010, Air hose, 1,0 m 1/4" BSP (MM).
246 015, Air hose, 1,5 m 1/4" BSP (MM).

Air valves
950 302, 1/4" BSP (FF), needle valve.
950 321, 1/4" BSP (FF).
950 318, 3/8" BSP (FF).

SPECIAL AIR ACCESSORIES

951 432

951 432 Pump silencer
When replaces the standard air muffler, the noise pump noise level is reduced down to 70 dB. Includes air exhaust connection kit.

558 338 Air exhaust connection kit
When placed at the air exhaust port instead of the standard air muffler, allows connecting a hose for evacuating the air exhaust from the pump. Required when the pump is mounted submerged in the fluid or when the exhaust has to be vented outside the pump room. Connection thread: 3/8" BSP (F).

PUMP BRACKETS

360 131 Wall bracket
For DF30 and DF50 diaphragm pumps.

755 900 Wall bracket
For DF100 diaphragm pumps.

360 137 Universal bracket with carrying handle
Fits a DF30 or a DF50 diaphragm pump on top of a drum or an IBC.

CONNECTION ADAPTORS

945 593, 1/2" BSP (MM)
945 555, 1" BSP (MM)
945 552, 1" BSP (M) – 3/4" BSP (M)
945 554, 3/4" BSP (M) – 1/2" BSP (M)

SUCTION ACCESSORIES

367 011 suction hose
3 m spring reinforced transparent PVC suction hose for 205 l drums and 1.000 l IBCs. Includes height adjustable 2" bung adaptor.

367 012 suction hose
3 m spring reinforced transparent PVC suction hose with foot valve For 205 l drums and 1.000 l IBCs. Includes height adjustable 2" bung adaptor and foot valve manufactured in steel.

330 100

PUMPMASTER 1 FLUID TRANSFER PUMP

Small but very versatile air operated transfer pump compatible with a wide range of slightly corrosive fluids such as detergents, windshield wash, light inks, water based paint, ink and varnish, etc.
Includes air needle valve at the air inlet for adjusting the pump speed. Mounting thread 3/4" BSP (M).

TECHNICAL DATA	
PART No.	**330 100**
Pressure ratio	1:1
Air pressure operating range	2 - 8 bar (30 - 115 psi)
Air consumption ***(1)***	240 Nl/min - (8.5 cfm)
Maximum fluid outlet pressure	8 bar - (115 psi)
Air motor piston diameter	36 mm (1 1/2")
Air motor effective diameter	20 mm (0.8 ")
Air motor piston stroke	80 mm (3")
Number of cycles per litre	10,5 (40 US cycles per gallon)
Maximum free flow delivery ***(2)***	15 l/min (4 US gpm)
Air inlet	1/4" BSP (F)
Fluid inlet	3/8" BSP (F) and 1/2" hose adaptor
Fluid outlet	3/8" BSP (M)
Wetted and seals materials	Aluminium / Stainless steel / Chromium steel / PTFE / Viton
Noise level ***(3)***	86 dB

351 121

PUMPMASTER 2 SUCTION PUMP

1:1 pressure ratio, double acting air operated pump for non-corrosive liquids, waste oil, etc. For wall, floor or drum trolley installation. This special pump is designed to create maximum vacuum and will not race when there is no liquid in the suction side. Recommended when you cannot control the pumping process or when using suction wands.

TECHNICAL DATA	
PART No.	**351 121**
Pressure ratio	1:1
Air pressure operating range	3 - 10 bar (42 - 140 psi)
Air consumption ***(1)***	335 Nl/min - (11.8 cfm)
Maximum fluid outlet pressure	10 bar - (140 psi)
Air motor piston diameter	51 mm (2")
Air motor effective diameter	35 mm (1.4")
Air motor piston stroke	75 mm (3")
Number of cycles per litre	7,4 (28 US cycles per gallon)
Maximum free flow delivery ***(4)***	20 l/min (5.3 US gpm)
Air inlet	1/4" NPSM (F)
Fluid inlet	1" NPSM (F)
Fluid outlet	3/4" NPSM (F)
Wetted and seals materials	Nikel coated aluminum / Stainles steel / Acetal / NBR / Polyurethane
Noise level ***(3)***	91,5 dB

(1) Maximum air consumption with 7 bar air inlet pressure and free delivery.
(2) Free delivery at 7 bar air inlet pressure, using water. Continuos duty flow rate: 6,5 l/min (1.7 US gpm).
(3) Maximum noise level measured 1 m from the pump, 7 bar air pressure and free delivery.
(4) Free delivery at 7 bar air inlet pressure, using SAE 20 oil at 20 ºC room temperature.

PUMPMASTER 2/1:1 PRESSURE RATIO NICKEL COATED LIQUID PUMP — 601 202

1:1 pressure ratio PUMPMASTER 2 pump with corrosion protected wetted parts. It can be used with all types of lubricants and glycol or windshield washer water based solutions.

TECHNICAL DATA	
PART No.	**601 202**
Pressure ratio	1:1
Air pressure operating range	3 - 10 bar (42 - 140 psi)
Air consumption (1)	335 Nl/min (11.8 cfm)
Maximum fluid outlet pressure	10 bar - (140 psi)
Air motor piston diameter	51 mm (2")
Air motor effective diameter	35 mm (1.4")
Air motor piston stroke	75 mm (3")
Number of cycles per litre	7,4 (28 cycles per US gallon)
Maximum free flow delivery (2)	55 l/min (14.53 US gpm)
Air inlet	1/4" NPSM (F)
Fluid inlet	1" NPSM (F)
Fluid outlet	3/4" NPSM (F)
Wetted and seals materials	Nickel coated aluminum / Steel / Stainles steel / Acetal / Polyurethane
Noise level (3)	91,5 dB

Accessories:
331 110.002 PVC suction tube for 205 l drums.

PUMPMASTER 2 AND PUMPMASTER 4 STAINLESS STEEL PISTON PUMPS — 333 120 - 331 120

PUMPMASTER 2 and PUMPMASTER 4 air motors with AISI 316 stainless steel divorced pumps. Pumps can be used with a wide variety of fluids such as paint solvents, cleaning fluids, anti-freeze and wind shield washer fluids, detergents, anticorrosion fluids, light inks, etc.

TECHNICAL DATA		
PART No.	**331 120**	**333 120**
Pressure ratio	1:1	3:1
Air pressure operating range	3 - 10 bar	3 - 10 bar
Air consumption *(1)*	195 Nl/min (6.86 cfm)	720 Nl/min (25.36 cfm)
Maximum fluid outlet pressure	10 bar (140 psi)	30 bar (420 psi)
Air motor piston diameter	51 mm (2")	88 mm (3.5")
Air motor effective diameter	35 mm (1.4")	60 mm (2.4")
Air motor piston stroke	75 mm (3")	100 mm (4")
Number of cycles per litre	4 (15 cycles per US gallon)	3.5 (13 cycles per US gallon)
Maximum free flow delivery *(2)*	38 lpm (10 US gpm)	45 lpm (11.9 US gpm)
Air inlet	1/4" NPSM (F)	3/8" NPSM
Fluid inlet	1" NPSM (F)	1" NPSM
Fluid outlet	3/4" NPSM (F)	3/4" NPSM
Wetted and seal materials	PTFE / Viton / Stainless steel	PTFE / Viton / Stainless steel
Noise level *(3)*	86 dB	93 dB

Accessories:
331 110.002 PVC suction tube for 205 l drums.

(1) Maximum air consumption with 7 bar air inlet pressure and free delivery.
(2) Maximum free delivery at 7 bar air inlet pressure, using water.
(3) Maximum noise level measured 1 m from the pump, 7 bar air pressure and free delivery.