

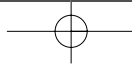
SANITARY EQUIPMENT BUYER'S GUIDE

Sanitary equipment for unloading direct from
original shipping containers



PROCESS EQUIPMENT

PROVEN QUALITY. LEADING TECHNOLOGY.



Catalog Reference Guide

Graco products can be found in the following catalogs:

Title	Form Number
Accessories	303119
Process Equipment	300435
Finishing Equipment	303252
Protective Coatings Equipment	303253
Sealants and Adhesives Equipment	303254

Graco Trademarks and Products

Graco catalogs are designed to provide you with a selection of equipment for use in our primary industries and applications. Below is a listing of our most commonly used trademarks and product names. Find the product you are interested in, then refer to the appropriate catalog(s). See each catalog's table of contents for more detailed information. For Technical Data Reference and Compatibility Charts, see form number 321123.

Name	Catalog(s)	Name	Catalog(s)
510 Gun	Protective Coatings	LSR™	Accessories
950 Series Sealant Gun	Sealants and Adhesives	Monark®	Finishing, Process, Protective Coatings, Sealants and Adhesives, Sanitary
8900 Proportioner	Sealants and Adhesives	PlasmaCoat™ Rods	Finishing, Protective Coatings
1:1 Extruder	Sealants and Adhesives	Plural Component Mix Gun	Protective Coatings
2K Mix Manifold	Sealants and Adhesives	PrecisionDose™	Sealants and Adhesives
2K Monitor	Finishing, Protective Coatings, Sealants and Adhesives	PrecisionFlo™	Sealants and Adhesives
AA Plus™ Gun	Finishing, Protective Coatings	PrecisionMix®	Finishing
AL Plus™ Gun	Finishing	PrecisionSwirl™	Sealants and Adhesives
Alpha™ Gun	Finishing	PrecisionView™ AMR	Finishing
Alpha™ Plus Gun	Finishing, Protective Coatings	Premier®	Finishing, Protective Coatings, Sealants and Adhesives
Bin Evacuation System (BES)	Sanitary	President®	Finishing, Process, Protective Coatings
Batch Dispense System™	Finishing	Pressure Pots	Accessories, Finishing
Bulldog®	Finishing, Protective Coatings, Sealants and Adhesives	ProBatch™	Finishing
Check-Mate®	Sanitary	ProDispense™	Finishing
Color Change System™	Sealants and Adhesives	ProMix™	Finishing
CycleFlo™	Finishing	PRO™ Xs Electrostatic Guns	Finishing
Delta Spray®	Process	Regulus®	Finishing
Duo-Flo®	Finishing	Senator®	Finishing, Sanitary, Protective Coatings
Dura-Flo®	Sealants and Adhesives	Silver Plus™	Finishing, Protective Coatings
DynaMite™ Dispense Valve	Sealants and Adhesives	Standard 2:1	Finishing, Process, Sealants and Adhesives
EnDure™ Dispense Valve	Sealants and Adhesives	SuperCat™	Protective Coatings
Falcon™	Finishing	Therm-O-Flow™	Sealants and Adhesives
Fast-Flo®	Process	TRITON™	Finishing
Foam Cat®	Protective Coatings	Triumph®	Finishing
Gear Meters	Finishing and Sealants and Adhesives	Tuff-Stack™	Accessories, Protective Coatings
Glutton®	Finishing	Twistork™	Accessories
High-Flo®	Finishing	Ultra-Lite™ Flow Gun	Sealants and Adhesives
Husky™	Finishing, Process, Sealants and Adhesives	Uni-Drum™ Bulk Supply System	Sealants and Adhesives
Hydra-Cat®	Finishing, Protective Coatings, Sealants and Adhesives	ValueMix™	Finishing
Hydra-Clean®	Protective Coatings	Viscon™	Accessories, Finishing, Protective Coatings
Hydra-Mate™	Sealants and Adhesives	Viscount®	Finishing, Protective Coatings
Imperial™	Finishing	Xtreme™	Finishing, Protective Coatings
Informer™	Finishing	Xtreme Seal Packings	Finishing, Protective Coatings
King®	Finishing, Protective Coatings		
LSA™	Accessories		

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GRACO

SANITARY EQUIPMENT CATALOG ■ TYPICAL APPLICATIONS

Cleaner, safer, faster.

If your production process means working with thick, heavy ingredients—up to 1,000,000 centipoise—we're there with the solutions. Graco sanitary equipment is ideal for a wide range of applications: tote; drum and pail evacuation; batching of ingredients into processing kettles, vats and mixers; package filling; and food product assembly spraying.

Graco has the best solutions for your pumping needs.

Transfer/Unloading

- Fruit juice concentrate
- Corn syrup
- Condensed milk
- Barbecue sauce
- Salad dressing
- Peanut butter
- Caramel
- Almond paste
- Cereal filling
- Tomato paste
- Honey
- Mayonnaise
- Fruit purees
- Soup base
- Ricotta cheese
- Chocolate
- Shortening
- Cinnamon smear

Batching and Metering

- Tomato sauce for pizza
- Mustard for sandwiches
- Tomato paste for sauces
- Peanut butter for snack crackers
- Jelly for doughnuts
- Liquid eggs for omelets
- Cheese for snack foods

Spraying

- Graham cracker coating
- Lecithin for bread pans
- Cheese coating
- Cereal sugar coating
- Snack food

Cosmetics

- Mascara base
- Moisturizing cream
- Package filling
- Hand lotion
- Toothpaste

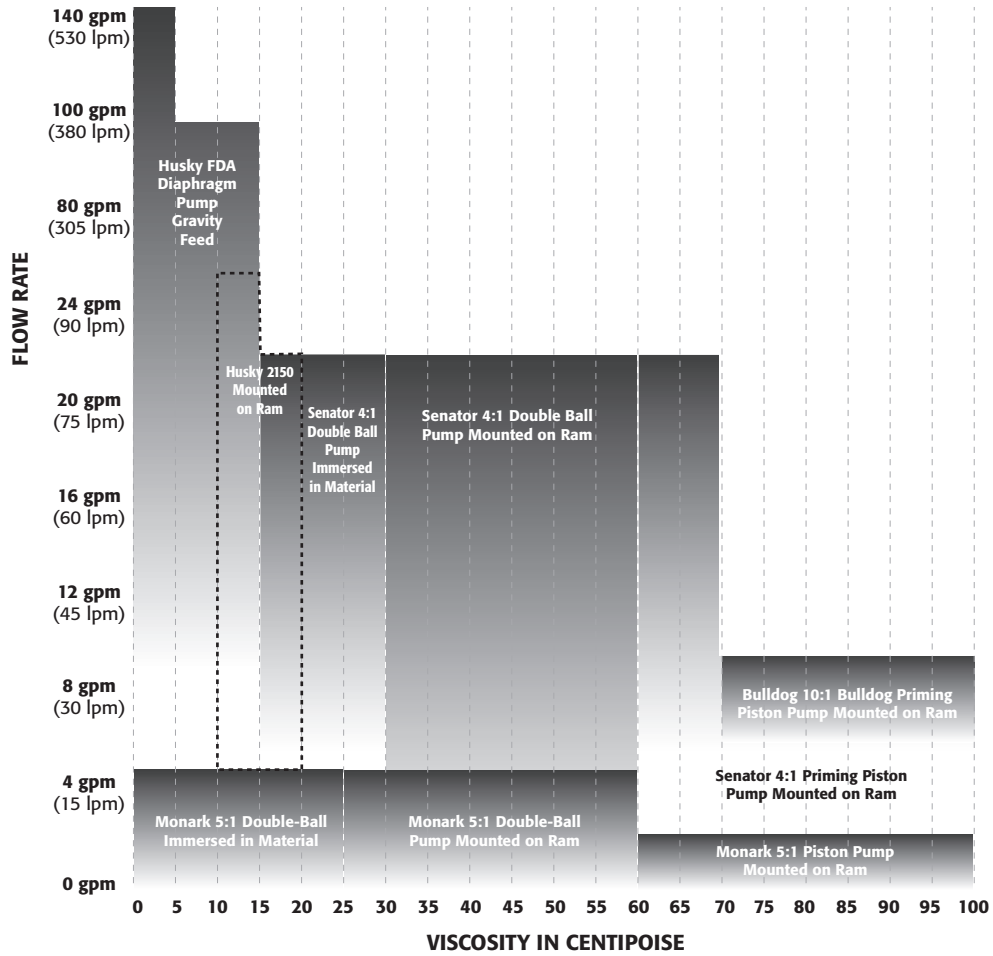
Pharmaceuticals

- Cough medicine
- Prescription ointment
- Baby care cream
- Nitroglycerin cream
- Over-the-counter ointment
- Petroleum jelly



Sanitary Pump and Package Selection Guide

Choose the best package solution.



LOW VISCOSITY MATERIALS FLOWS WITHOUT EFFORT	MODERATE VISCOSITY MATERIALS FLOWS WITH ASSISTANCE	HIGH VISCOSITY MATERIALS DOES NOT FLOW
LIGHT OILS CAKE BATTER CAKE ICING MEAT SAUCE STARCH	TOMATO PASTE FROSTING CHEESE SPREAD SHORTENING SOFT BUTTER MOLASSES	THICK PEANUT BUTTER FRUIT PASTE CARAMEL

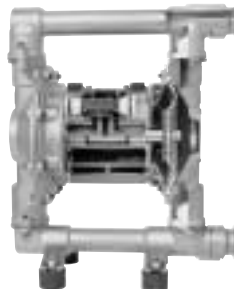
EXAMPLE:

Choose a Graco Senator 4:1 double-ball pump immersed in material to pump low viscosity materials like cake batter and tomato paste (100 to 30,000 cps) at flow rates up to 23 gpm (87.1 lpm).

Sanitary Model Overview

	Husky 1040 FDA	Husky 1590 FDA	Husky 2150 FDA
Models	Diaphragm Pump	Diaphragm Pump	Diaphragm Pump
Packages	N/A	N/A	Stainless Steel Ram-Mounted
Typical Materials	Fruit juice Frozen concentrate Mayonnaise Tomato paste Corn syrup Jam & jelly Icing	Fruit juice Frozen concentrate Mayonnaise Tomato paste Corn syrup Jam & jelly Icing	Fruit juice Frozen concentrate Mayonnaise Tomato paste Corn syrup Jam & jelly Icing
Maximum fluid viscosity:			
■ Immersed directly	N/A	N/A	N/A
■ Syphon feed	5,000	8,000	10,000
■ Gravity feed	5,000	8,000	10,000
■ Mounted on 2-post ram	N/A	N/A	11,000 cps
USDA Approved	no	no	no
FDA Approved	yes	yes	yes
Maximum flow rate @ 100 cpm	40 gpm (151 lpm)	100 gpm (378 lpm)	150 gpm (378 lpm)
Time to empty the container:			
■ 55 gallon (208.2 l)	4 min @ 100 cpm	1 min @ 100 cpm	0.5 min @ 100 cpm
■ 300 gallon (1135.6 l)	20 min @ 100 cpm*	6 min @ 100 cpm*	3 min @ 100 cpm
Maximum fluid pressure	120 psi (8.4 bar; 0.8 MPa)	120 psi (8.4 bar; 0.8 MPa)	120 psi (8.4 bar; 0.8 MPa)
Wetted Parts	316 Stainless Steel Teflon	316 Stainless Steel Teflon	316 Stainless Steel Teflon

*Assumes a flowable fluid



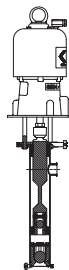
DIAPHRAGM PUMPS

Double acting design, draws in fluid on one side while pumping out the fluid on the opposite side. Upon changing direction, the material that was pulled in, is pumped out and the other side draws in more material.

Sanitary Model Overview

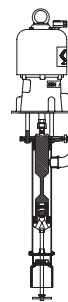
	Monark 5:1 Double-Ball	Monark 5:1 Priming Piston	Senator 4:1 (FT-14) Double-Ball	Senator 4:1 (FT-14) Priming Piston	Bulldog 10:1 Priming Piston
Models	Drum and Stubby Length Pumps with or without Tri-Clamp Inlet	5:1 Monark Priming Piston Pump (Stubby)	FT-14 Double-Ball Pump FT-14 Double-Ball Pump with Tri-Clamp Inlet	FT-14 Priming Piston Pump	Drum Length Pump Drum Length Pump with Adjust-A-Stroke Air Motor
Packages	Stainless Steel Ram-Mounted	Stainless Steel Ram-Mounted	Stainless Steel Ram-Mounted	Stainless Steel Ram-Mounted	Stainless Steel Ram-Mounted
Typical Materials	Fruit juice Frozen concentrate Mayonnaise Tomato paste Corn syrup Jams & jellies Icing	Peanut butter Cookie filling Cream cheese Fruit paste Moist pet food Tomato paste	Fruit juice Frozen concentrate Mayonnaise Pizza sauce Corn syrup Jams & jellies Icing	Peanut butter Shortening Cookie filling Cream cheese Icing Fruit paste Moist pet food	Peanut butter Tomato paste Shortening Dough conditioners Ricotta cheese Moist pet food Caramel
Maximum fluid viscosity:					
■ Immersed directly	25,000 cps	Not recommended	30,000 cps	Not recommended	Not recommended
■ Mounted on 2-post ram	60,000 cps	1,000,000 cps	60,000 cps	1,000,000 cps	1,000,000 cps
USDA Approved	yes	yes	yes	yes	yes
Maximum flow rate @ 100 cpm	4 gpm (15.1 lpm)	4 gpm (15.1 lpm)	23 gpm (87.1 lpm)	23 gpm (87.1 lpm)	13.3 gpm (50.3 lpm)
Time to empty the container:					
■ 55 gallon (208.2 l)	22 min @ 60 cpm	22 min @ 60 cpm	2.5 min @ 100 cpm	2.5 min @ 100 cpm	6 min @ 100 cpm
■ 300 gallon (1135.6 l)	120 min @ 60 cpm	120 min @ 60 cpm	7 min @ 100 cpm	7 min @ 100 cpm	15 min @ 100 cpm
Maximum fluid pressure	600 psi (41 bar; 4.1 MPa)	600 psi (41 bar; 4.1 MPa)	430 psi (30.1 bar; 3 MPa)	430 psi (30.1 bar; 3 MPa)	1000 psi (70 bar; 70 MPa)
Wetted Parts	316 Stainless Steel Buna-N Neoprene®	316 Stainless Steel Buna-T Neoprene	316 Stainless Steel UHMWPE Buna-N Teflon®	316 Stainless Steel Buna-T Neoprene	303/304 Stainless Steel Teflon Acetal (Delrin) UHMWPE

Teflon® is a registered trademark of DuPont.



DOUBLE-BALL PUMPS

A double-ball pump is a reciprocating displacement pump that uses two ball checks (the piston check valve and the intake check valve) to control the flow of fluid through the fluid section. Designed to handle low to medium viscosity materials.



PRIMING PISTON PUMPS

Priming piston pumps are reciprocating, two-check displacement pumps that include a priming piston assembly or shovel at the bottom. Designed to pump highly viscous, non-flowable, fiber- or chunk-filled materials.

Husky 1040 FDA

Sanitary Pump

This FDA-Compliant pump is constructed of stainless steel with a 1-1/2 in (38 mm) Tri-Clamp® connection. The center section is available in aluminum or stainless steel. The Husky FDA is an on-demand pump; by closing the outlet or dispense valve, the pump will stop until flow is again required.

Features and Benefits

- All fluid contact materials are FDA-compliant and meet the United States Code of Federal Regulations (CFR) Title 21
- FDA pumps have an epoxy-coated, aluminum center section and FDA Plus pumps have a 316 stainless steel center section
- Seats, balls and diaphragms are available in a wide range of food grade elastomers
- Patented dual cup air valve – one of the most reliable air valves in the market
- External controller for optional remote operation

Typical Application

- Moving very flowable materials
- Evacuating food process mixing kettles
- Transferring ingredients from original containers to mixing tanks
- Evacuating liquid concentrates from shipping tankers to holding vessels

Typical Fluids Handled

- | | |
|-------------------|---------------------|
| • Fruit juice | • Sauce |
| • Wine | • Oil |
| • Pureed fruit | • Paste and starche |
| • Corn syrup | • Mineral oil |
| • Lanolin alcohol | • Glycol |



Husky 1040 FDA



*Husky 1040
FDA Plus*

Husky 1040 FDA Sanitary Pump

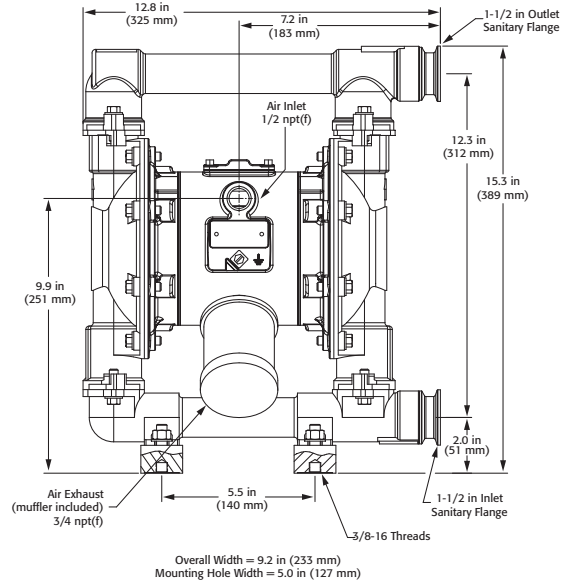
Technical Specifications

Maximum fluid working pressure 120 psi (8.4 bar, 0.84 MPa)
 Maximum free flow delivery* 40 gpm (151 lpm)
 Maximum pump speed 276 cpm
 Displacement per cycle** 0.15 gallon (0.57 liter)
 Maximum suction lift (D7S888) 18 ft (5.48 m) wet or dry
 Maximum size pumpable solids 0.13 in (3.2 mm)
 Maximum diaphragm ball and seat operating temperature ratings***
 Teflon 220°F (104.4°C)
 Santoprene 180°F (82.2°C)
 Buna-N 180°F (82.2°C)
 Viton 250°F (121°C)
 Typical sound level at 70 psi air (0.49 bar, 4.9 MPa) air @ 50 cpm 78 dBA
 Maximum air consumption 60 scfm (1.7 m³/min)
 Air pressure operating range 20 to 120 psi (1.4 to 8.4 bar, 0.14 to 0.84 MPa)
 Air inlet size 1/2 npt(f)
 Fluid inlet & outlet size 1-1/2 in (38.1 mm) Tri-Clamp
 Weight (with aluminum center section) 34 lb (16 kg)
 Weight (with SST center section) 47 lb (22 kg)
 Instruction manual 309528

* Flow rates are with muffler and do not vary based on diaphragm material.

** Displacement per cycle may vary based on suction condition, discharge head, air pressure and fluid type.

*** Actual pump performance may be affected by prolonged usage at temperature.



Ordering Information

FDA		FDA Plus		Materials for Seats	Materials for Balls	Materials for Diaphragms	Fluid Kit	Air Kit	Air Control*
Standard Air Valve	Remote Air Valve	Standard Air Valve	Remote Air Valve						
D7S311	D8S311	DRS311	DSS311	Stainless Steel w/ Teflon Seal	Teflon	Teflon	D07311	236273	246948
D7SB11	D8SB11	DRSB11	DSSB11	Stainless Steel w/ Viton Seal	Teflon	Teflon	D07B11	236273	246948
D7S666	D8S666	DRS666	DSS666	Santoprene w/ Teflon Seal	Santoprene	Santoprene	D07666	236273	246948
D7SC66	D8SC66	DRSC66	DSSC66	Santoprene w/ Viton Seal	Santoprene	Santoprene	D07C66	236273	246948
D7S377	D8S377	DRS377	DSS377	Stainless Steel w/ Teflon Seal	Buna	Buna	D07377	236273	246948
D7SB77	D8SB77	DRSB77	DSSB77	Stainless Steel w/ Viton Seal	Buna	Buna	D07B77	236273	246948
D7S388	D8S388	DRS388	DSS388	Stainless Steel w/ Teflon Seal	Viton	Viton	D07388	236273	246948
D7SB88	D8SB88	DRSB88	DSSB88	Stainless Steel w/ Viton Seal	Viton	Viton	D07B88	236273	246948
D7S766	D8S766	DRS766	DSS766	Buna	Santoprene	Santoprene	D07766	236273	246948
D7S777	D8S777	DRS777	DSS777	Buna	Buna	Buna	D07777	236273	246948
D7S811	D8S811	DRS811	DSS811	Viton	Teflon	Teflon	D07811	236273	246948
D7S866	D8S866	DRS866	DSS866	Viton	Santoprene	Santoprene	D07866	236273	246948
D7S888	D8S888	DRS888	DSS888	Viton	Viton	Viton	D07888	236273	246948

*Air control includes air regulator and filter with gauge

Husky 1590 FDA

Sanitary Pump

This FDA-Compliant pump is constructed of stainless steel with a 2 in (50.8 mm) Tri-Clamp connection. The center section is available in aluminum or stainless steel. The Husky FDA is an on-demand pump; by closing the outlet or dispense valve, the pump will stop until flow is again required.

Features and Benefits

- All fluid contact materials are FDA-compliant and meet the United States Code of Federal Regulations (CFR) Title 21
- FDA pumps have an epoxy-coated, aluminum center section and FDA Plus pumps have a 316 stainless steel center section
- Seats, balls and diaphragms are available in a wide range of food grade elastomers
- Patented dual cup air valve – one of the most reliable air valves in the market.
- External controller for optional remote operation

Typical Application

- Moving fluids ranging from slow moving to very flowable
- Evacuating food process mixing kettles
- Transferring of ingredients from original containers to mixing tanks
- Evacuating liquid concentrates from shipping tankers to holding vessels
- Repackaging fluids from original containers to smaller receptacles

Typical Fluids Handled

- | | |
|-----------------------------|---------------------|
| • Concentrated fruit juices | • Pizza paste |
| • Wine | • Oil |
| • Jam & jelly | • Paste and starche |
| • Corn syrup | • Mineral oil |
| • Lanolin alcohol | • Glycol |
| • Pudding | • Chocolate |



Husky 1590 FDA



*Husky 1590
FDA Plus*

Husky 1590 FDA Sanitary Pump

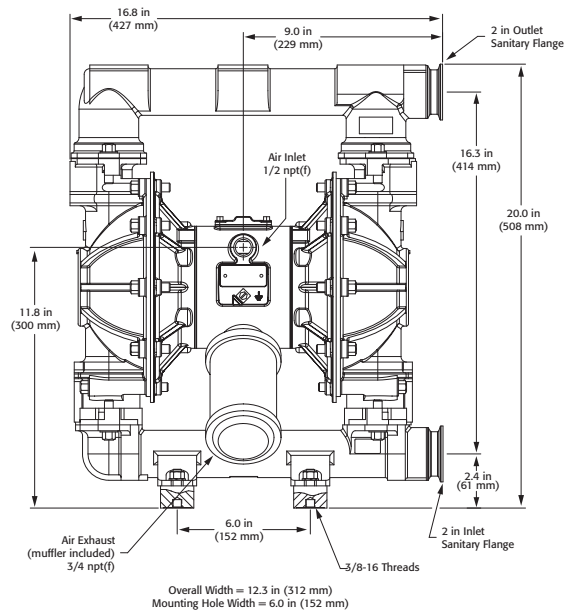
Technical Specifications

- Maximum fluid working pressure 120 psi (8.4 bar, 0.84 MPa)
- Maximum free flow delivery* 100 gpm (378.5 lpm)
- Maximum pump speed 200 cpm
- Displacement per cycle** 0.5 gallon (1.96 liter)
- Maximum suction lift (DBS888) 18 ft (5.48 m) wet or dry
- Maximum size pumpable solids 0.19 in (4.8 mm)
- Maximum diaphragm operating temperature***
 - Teflon 220°F (104.4°C)
 - Santoprene 180°F (82.2°C)
 - Buna-N 180°F (82.2°C)
 - Viton 250°F (121°C)
- Typical sound level
 - at 70 psi air (4.9 bar, 0.49 MPa) air @ 50 cpm 72 dBA
- Maximum air consumption 125 scfm (3.5 m³/min)
- Air pressure operating range 20 to 120 psi
(1.4 to 8.4 bar, 0.14 to 0.84 MPa)
- Air inlet size 1/2 npt(f)
- Fluid inlet & outlet size 2 in (50.8 mm) Tri-Clamp
- Weight (with aluminum center section) 72 lb (32.7 kg)
- Weight (with SST center section) 86 lb (40 kg)
- Instruction manual 309528

* Flow rates are with muffler and do not vary based on diaphragm material.

** Displacement per cycle may vary based on suction condition, discharge head, air pressure and fluid type.503

*** Actual pump performance may be affected by prolonged usage at temperature.



Ordering Information

FDA		FDA Plus		Materials for Seats	Materials for Balls	Materials for Diaphragms	Fluid Kit	Air Kit	Air Control*
Standard Air Valve	Remote Air Valve	Standard Air Valve	Remote Air Valve						
DBS311	DCS311	DTS311	DUS311	Stainless Steel w/ Teflon Seal	Teflon	Teflon	D0B311	236273	246948
DBS811	DCS811	DTS811	DUS811	Stainless Steel w/ Viton Seal	Teflon	Teflon	D0B811	236273	246948
DBS666	DCS666	DTS666	DUS666	Santoprene w/ Teflon Seal	Santoprene	Santoprene	D0B666	236273	246948
DBSC66	DCSC66	DTSC66	DUSC66	Santoprene w/ Viton Seal	Santoprene	Santoprene	D0BC66	236273	246948
DBS377	DCS377	DTS377	DUS377	Stainless Steel w/ Teflon Seal	Buna	Buna	D0B377	236273	246948
DBS877	DCS877	DTS877	DUS877	Stainless Steel w/ Viton Seal	Buna	Buna	D0B877	236273	246948
DBS388	DCS388	DTS388	DUS388	Stainless Steel w/ Teflon Seal	Viton	Viton	D0B388	236273	246948
DBS888	DCS888	DTS888	DUS888	Stainless Steel w/ Viton Seal	Viton	Viton	D0B888	236273	246948
DBS766	DCS766	DTS766	DUS766	Buna	Santoprene	Santoprene	D0B766	236273	246948
DBS777	DCS777	DTS777	DUS777	Buna	Buna	Buna	D0B777	236273	246948
DBS811	DCS811	DTS811	DUS811	Viton	Teflon	Teflon	D0B811	236273	246948
DBS866	DCS866	DTS866	DUS866	Viton	Santoprene	Santoprene	D0B866	236273	246948
DBS888	DCS888	DTS888	DUS888	Viton	Viton	Viton	D0B888	236273	246948

* Air control includes air regulator and filter with gauge

Husky 2150 FDA

Sanitary Pump

This FDA-Compliant pump is constructed of stainless steel with a 2-1/2 in (63.5 mm) Tri-Clamp connection. The center section is available in aluminum or stainless steel. The Husky FDA is an on-demand pump; by closing the outlet or dispense valve, the pump will stop until flow is again required.

Features and Benefits

- All fluid contact materials are FDA-compliant and meet the United States Code of Federal Regulations (CFR) Title 21
- FDA pumps have an epoxy-coated, aluminum center section and FDA Plus pumps have a 316 stainless steel center section
- Seats, balls and diaphragms are available in a wide range of food grade elastomers
- Patented dual cup air valve – one of the most reliable air valves in the market.
- External controller for optional remote operation

Typical Application

- Moving fluids ranging from very slow moving to very flowable
- Evacuating food process mixing kettles
- Transferring ingredients from original containers to mixing tanks
- Evacuating liquid concentrates from shipping tankers to holding vessels

Typical Fluids Handled

- | | |
|----------------------------|--------------------|
| • Concentrated fruit juice | • Tomato paste |
| • Wine | • Oil |
| • Jam & jelly | • Paste and starch |
| • Corn syrup | • Glycol |
| • Thick sauce | • Pudding |
| • Chocolate | • Fruit filling |



Husky 2150 FDA



*Husky 2150
FDA Plus*

Husky 2150 FDA Sanitary Pump

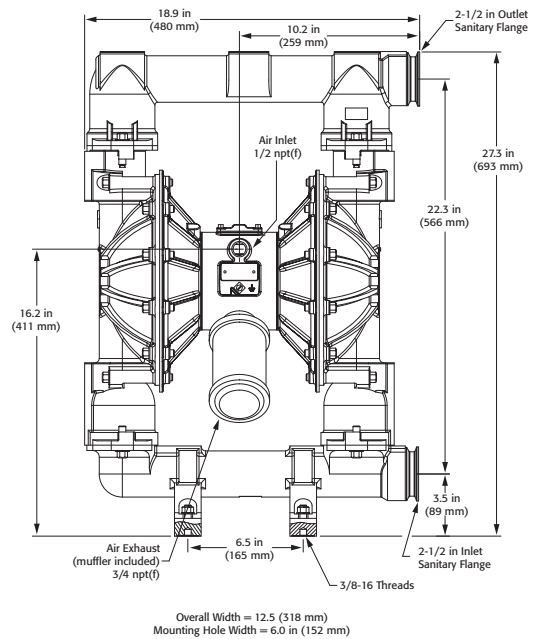
Technical Specifications

- Maximum fluid working pressure 120 psi (8.4 bar, 0.84 MPa)
- Maximum free flow delivery* 150 gpm (568 lpm)
- Maximum pump speed 145 cpm
- Displacement per cycle** 1.03 gallon (3.90 liter)
- Maximum suction lift (DFS888) 18 ft (5.48 m) wet or dry
- Maximum size pumpable solids 0.25 in (6.3 mm)
- Maximum diaphragm operating temperature***
 - Teflon 220°F (104.4°C)
 - Santoprene 180°F (82.2°C)
 - Buna-N 180°F (82.2°C)
 - Viton 250°F (121°C)
- Typical sound level at 70 psi air
(4.9 bar, 0.49 MPa) air @ 50 cpm 85 dBa
- Maximum air consumption 175 scfm (4.9 m³/min)
- Air pressure operating range 20 to 120 psi
(1.4 to 8.4 bar, 0.14 to 0.84 MPa)
- Air inlet size 1/2 npt(f)
- Fluid inlet & outlet size 2-1/2 in (63.5 mm) Tri-Clamp
- Weight (with aluminum center section) 122 lb (50.8 kg)
- Weight (with SST center section) 134 lb (61 kg)
- Instruction manual 309528

* Flow rates are with muffler and do not vary based on diaphragm material.

** Displacement per cycle may vary based on suction condition, discharge head, air pressure and fluid type.

*** Actual pump performance may be affected by prolonged usage at temperature.



Ordering Information

FDA		FDA Plus		Materials for Seats	Materials for Balls	Materials for Diaphragms	Fluid Kit	Air Kit	Air Control*
Aluminum Center Section	Remote Air Valve	Standard Air Valve	Remote Air Valve						
DFS311	DGS311	DVS311	DWS311	Stainless Steel w/ Teflon Seal	Teflon	Teflon	D0G311	236273	246948
DFS811	DGS811	DVS811	DWS811	Stainless Steel w/ Viton Seal	Teflon	Teflon	D0G811	236273	246948
DFS666	DGS666	DVS666	DWS666	Santoprene w/ Teflon Seal	Santoprene	Santoprene	D0G666	236273	246948
DFSC66	DGSC66	DVSC66	DWSC66	Santoprene w/ Viton Seal	Santoprene	Santoprene	D0GC66	236273	246948
DFS377	DGS377	DVS377	DWS377	Stainless Steel w/ Teflon Seal	Buna	Buna	D0G377	236273	246948
DFS877	DGS877	DVS877	DWS877	Stainless Steel w/ Viton Seal	Buna	Buna	D0G877	236273	246948
DFS388	DGS388	DVS388	DWS388	Stainless Steel w/ Teflon Seal	Viton	Viton	D0G388	236273	246948
DFS888	DGS888	DVS888	DWS888	Stainless Steel w/ Viton Seal	Viton	Viton	D0G888	236273	246948
DFS766	DGS766	DVS766	DWS766	Buna	Santoprene	Santoprene	D0G766	236273	246948
DFS777	DGS777	DVS777	DWS777	Buna	Buna	Buna	D0G777	236273	246948
DFS811	DGS811	DVS811	DWS811	Viton	Teflon	Teflon	D0G811	236273	246948
DFS866	DGS866	DVS866	DWS866	Viton	Santoprene	Santoprene	D0G866	236273	246948
DFS888	DGS888	DVS888	DWS888	Viton	Viton	Viton	D0G888	236273	246948

*Air control includes air regulator and filter with gauge

Monark 5:1

Bare Pump

This USDA and 3A-approved, quick-knockdown pump is constructed of 316 stainless steel, with a 1-1/2 in (38 mm) sanitary tube flange outlet. The Monark 5:1 is an on-demand pump; by closing the outlet or dispense valve, the pump will stop until flow is again required.

Features and Benefits

- Flow to 4.0 gpm (15.1 lpm)
- Maximum fluid pressure of 600 psi (41 bar; 4.1 MPa)
- Monark air motor includes a 10-year warranty
- Available in double-ball and priming piston designs

Typical Application

- Fluid transfer and supply of low to medium viscosity fluids

Typical Fluids Handled

- | | |
|----------------|-----------------|
| • Fruit juice | • Corn syrup |
| • Mascara base | • Jam and jelly |
| • Pizza sauce | • Icing |



Monark 5:1 Bare Pump

Ordering Information

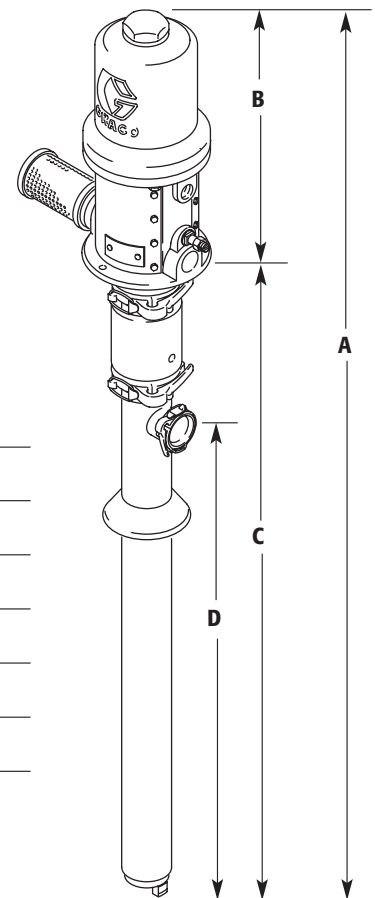
Part Number	Pump Type	Pump Length Description	Pump Inlet Type	Packings	Weight
207550	Double Ball	Drum Length	2 -1/8" (53.9 mm) Slotted	Buna & UHMWPE	33.0 lb (14.9 kg)
903035	Double Ball	Drum Length	2 -1/8" (53.9 mm) Slotted	Teflon	36.3 lb (16.4 kg)
954383	Double Ball	Stubby	1-1/2" in (38.1 mm) Clamp	Buna & UHMWPE	25.0 lb (11.3 kg)
965520	Double Ball	Stubby	1-1/2" in (38.1 mm) Clamp	Teflon	33.0 lb (14.9 kg)
952793	Priming Piston	Stubby	2" (50.8 mm) Priming Piston	Buna & UHMWPE	24.4 lb (11.0 kg)
952995	Double Ball	Stubby	2" (50.8 mm) ACME Thread	Buna & UHMWPE	19.9 lb (9.0 kg)

Technical Specifications

Fluid to air pressure ratio 5:1
 Maximum fluid pressure 600 psi (41 bar, 4.1 MPa)
 Maximum fluid flow at 100 cpm 4 gpm (15.1 lpm)
 Maximum fluid flow at 60 cpm 2.5 gpm (9.5 lpm)
 Volume per cycle 0.04 gal (0.15 liter)
 Maximum operating temperature 200°F (93°C)
 Maximum size pumpable solids 0.13 in (0.32 cm)
 Maximum air input pressure 120 psi (8.2 bar; 0.8 MPa)
 Air inlet size 3/8 npt(f)
 Fluid outlet size 1-1/2 in. (38 mm) Tri-Clamp
 Instruction manual 307056

Dimensions

Part Number	Overall Length (A)	Air Motor Height (B)	Air Motor Base (C)	Inlet to Outlet (D)
207550	56.80 in (144.2 cm)	11.80 in (29.9 cm)	45.00 in (114.3 cm)	36.70 in (93.2 cm)
903035	56.80 in (144.2 cm)	11.80 in (29.9 cm)	45.00 in (114.3 cm)	36.70 in (93.2 cm)
954383	35.75 in (90.8 cm)	11.80 in (29.9 cm)	24.00 in (60.9 cm)	15.90 in (40.3 cm)
965520	35.75 in (90.8 cm)	11.80 in (29.9 cm)	24.00 in (60.9 cm)	15.90 in (40.3 cm)
952793	35.80 in (90.9 cm)	11.80 in (29.9 cm)	24.00 in (60.9 cm)	15.10 in (38.3 cm)
952995	35.80 in (90.9 cm)	11.80 in (29.9 cm)	23.20 in (58.9 cm)	15.10 in (38.3 cm)



GRACO

SANITARY EQUIPMENT CATALOG ■ BARE PUMPS

Senator 4:1 (FT-14)

Bare Pump

The USDA-approved FT-14 is a quick knock-down pump constructed of 316 SST with a 2 in (50.8 mm) sanitary tube outlet. It can be fit into open-head drums or directly inserted into a 4.5 in (114 mm) closed-head drum bung. The FT-14 is an on-demand pump; by closing the outlet or dispense valve, the pump will stop until flow is again required.

Features and Benefits

- Maximum flow 23 gpm (87 lpm)
- Maximum pressure 400 psi (28 bar; 2.8 MPa)
- Available in double-ball and priming piston designs

Typical Application

- Fluid transfer and supply of low to medium viscosity fluids

Typical Fluids Handled

- | | |
|----------------------------|-----------------|
| • Concentrated fruit juice | • Jam and jelly |
| • Tomato paste/pizza sauce | • Icing |
| • Mascara base | • Corn syrup |



Senator 4:1 (FT-14) Bare Pump

Ordering Information

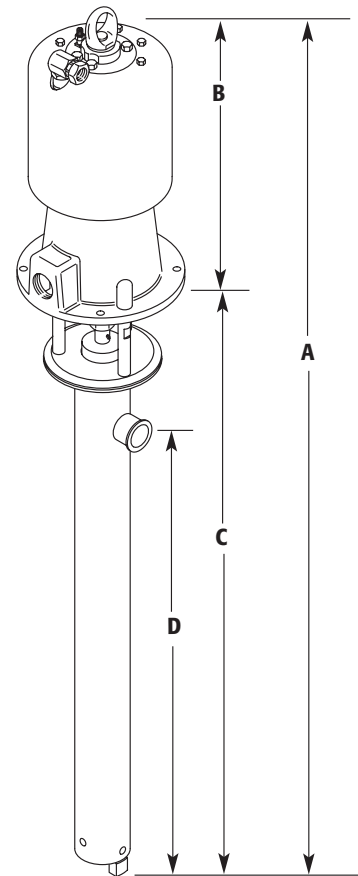
Part Number	Pump Type	Pump Length Description	Pump Inlet Type	Packings	Weight
948292	Double Ball	Drum Length	4" (10.2 cm) Slotted	Buna, Teflon, UHMWPE	127 lb (57.6 kg)
948649	Double Ball	Stubby (Ram Package)	4" (10.2 cm) Slotted	Buna, Teflon, UHMWPE	95 lb (43.0 kg)
570019	Priming Piston	Drum Length (Ram Package)	4" (10.2 cm) Priming Piston	Buna, Teflon, UHMWPE	95 lb (43.0 kg)
949080	Double Ball	Stubby (CIP capable)	90 degree elbow, 3" (7.6 cm) Clamp	Buna, Teflon, UHMWPE	83 lb (37.6 kg)
949704	Double Ball	Drum Length (BES mount)	4" (10.2 cm) Clamp	Buna, Teflon, UHMWPE	86 lb (39.0 kg)

Technical Specifications

Fluid to air pressure ratio 4:1
 Maximum fluid pressure 400 psi (28 bar; 2.8 MPa)
 Maximum fluid flow at 100 cpm23 gpm (87 lpm)
 Maximum fluid flow at 60 cpm14 gpm (53 lpm)
 Volume per cycle 0.23 gal (0.87 liter)
 Maximum operating temperature 160°F (71°C)
 Maximum size pumpable solids 0.25 in (0.64 cm)
 Maximum air input pressure 100 psi (7 bar; 0.7 MPa)
 Air inlet size 3/4 npsm(f)
 Fluid outlet size2 in (50.8 mm) Tri-Clamp
 Instruction manual 308076

Dimensions

Part Number	Overall Length (A)	Air Motor Height (B)	Air Motor Base (C)	Inlet to Outlet (D)
948292	68.4 in (173.7 cm)	21.4 in (54.3 cm)	47.0 in (119.3 cm)	36.8 in (93.4 cm)
948649	52.4 in (133.0 cm)	21.4 in (54.3 cm)	31.0 in (78.7 cm)	20.8 in (52.8 cm)
570019	51.3 in (130.3 cm)	21.4 in (54.3 cm)	29.9 in (75.9 cm)	18.8 in (47.7 cm)
949080	54.9 in (139.4 cm)	21.4 in (54.3 cm)	29.9 in (75.9 cm)	18.8 in (47.7 cm)
949704	50.1 in (127.3 cm)	21.4 in (54.3 cm)	29.9 in (75.9 cm)	18.8 in (47.7 cm)



Bulldog 10:1

Bare Pump

This USDA approved pump features 303 stainless steel wetted construction and can be fitted with the optional Adjust-A-Stroke® air motor to provide accurate volumetric metering to $\pm 2\%$. The Bulldog 10:1 is ideal for materials up to 1,000,000 cps, which have poor flow characteristics and usually require ram pressure to level the product and feed the pump inlet.

Features and Benefits

- Delivery up to 8 gpm (31 lpm)
- Fluid outlet pressures up to 1000 psi (70 bar; 7 MPa)
- 303 stainless steel wetted construction

Typical Application

- Fluid transfer and supply of high viscosity non-flowable fluids

Typical Fluids Handled

- Peanut butter
- Ricotta cheese
- Cream candy filling
- Moist pet food



Bulldog 10:1

Ordering Information

Ordering Information

Part Number	Pump Type	Pump Length Description	Pump Inlet Type	Packings	Weight
949444	Priming Piston	Drum Length (Ram Package)	4" (10.2 cm) Priming Piston	Teflon and UHMWPE	95 lb (43 kg)
954180	Priming Piston	Drum Length (Adjust-a-stroke, Ram Package)	4" (10.2 cm) Priming Piston	Teflon and UHMWPE	101 lb (45 kg)

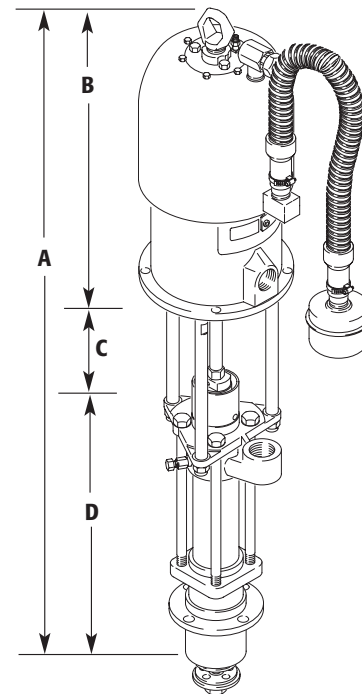
Technical Specifications

- Fluid to air pressure ratio 10:1
- Maximum fluid pressure 1000 psi (70 bar; 7 MPa)
- Maximum fluid flow at 100 cpm 13.3 gpm (50.3 lpm)
- Maximum fluid flow at 60 cpm 8 gpm (31 lpm)
- Volume per cycle 0.14 gal (0.54 liter)
- Maximum air input pressure 100 psi (7 bar; 0.7 MPa)
- Maximum operating temperature 160°F (71°C)
- Maximum size pumpable solids 0.25 in (0.64 cm)
- Air inlet size 3/4 npsm(f)
- Fluid inlet size 4 in (10.2 cm)
- Fluid outlet size 1-1/2 npt(f)
- Weight 101 lb (46 kg)
- Wetted parts SST, Teflon, UHMWPE, Acetal, Delrin®
- Instruction manual 306916

Delrin® is a registered trademarks of DuPont.

Dimensions

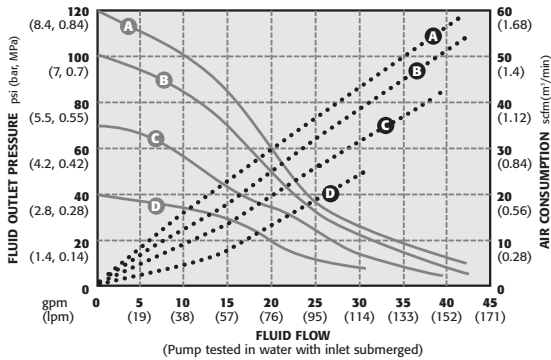
Part Number	Overall Length (A)	Air Motor Height (B)	Air Motor Base (C)	Inlet to Outlet (D)
949444	47 in (119.3 cm)	21.25 in (53.9 cm)	25.8 in (65.5 cm)	17.5 in (44.4 cm)
954180	52.6 in (133.7 cm)	21.25 in (53.9 cm)	31.4 in (79.7 cm)	17.5 in (44.4 cm)



Performance Charts

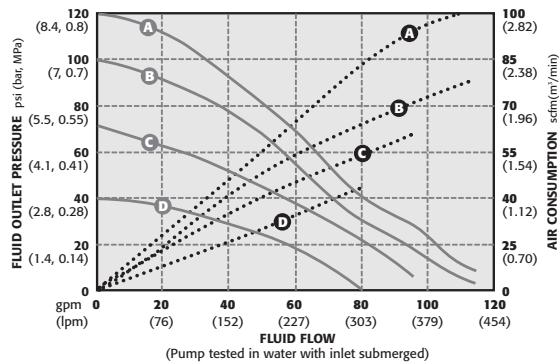
Sanitary Pumps

Husky 1040 Performance Chart



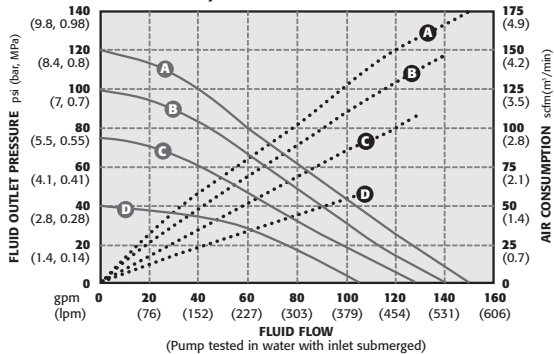
AIR PRESSURES	LEGEND
(A) = @ 120 psi (8.4 bar, 0.84 MPa)	Air Consumption.....
(B) = @ 100 psi (7.0 bar, 0.7 MPa)	Fluid Flow _____
(C) = @ 70 psi (4.8 bar, 0.5 MPa)	
(D) = @ 40 psi (2.8 bar, 0.3 MPa)	

Husky 1590 Performance Chart



AIR PRESSURES	LEGEND
(A) = @ 120 psi (8.4 bar, 0.84 MPa)	Air Consumption.....
(B) = @ 100 psi (7.0 bar, 0.7 MPa)	Fluid Flow _____
(C) = @ 70 psi (4.8 bar, 0.5 MPa)	
(D) = @ 40 psi (2.8 bar, 0.3 MPa)	

Husky 2150 Performance Chart



AIR PRESSURES	LEGEND
(A) = @ 120 psi (8.4 bar, 0.84 MPa)	Air Consumption.....
(B) = @ 100 psi (7.0 bar, 0.7 MPa)	Fluid Flow _____
(C) = @ 70 psi (4.8 bar, 0.5 MPa)	
(D) = @ 40 psi (2.8 bar, 0.3 MPa)	

How to use this chart:

- Step 1:** Locate the required fluid flow rate along bottom axis of chart.
- Step 2:** Follow vertical line to the intersection with the solid curve (A, B or C – based on your air inlet pressure).
- Step 3:** Follow to left axis to read fluid outlet pressure.
- Step 4:** From Step 2, follow vertical line up or down to the intersection with the dotted line (A, B or C – based on your air inlet pressure) then follow to right axis to read air consumption.

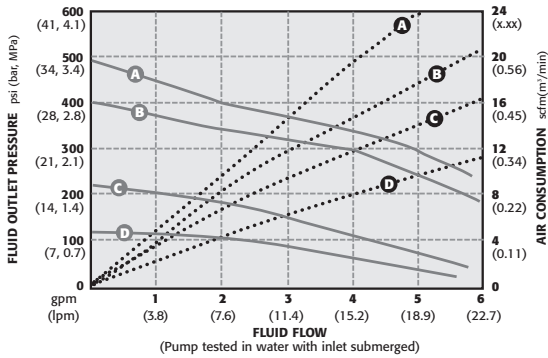
Example:

With a Husky 2150 pump, to obtain 80 gpm (302.8 lpm) at approximately 50 psi (3.4 bar, 0.34 MPa), you will need 100 psi (7.0 bar, 0.7 MPa) of air pressure. The air consumption will be approximately 70 scfm.

Performance Charts

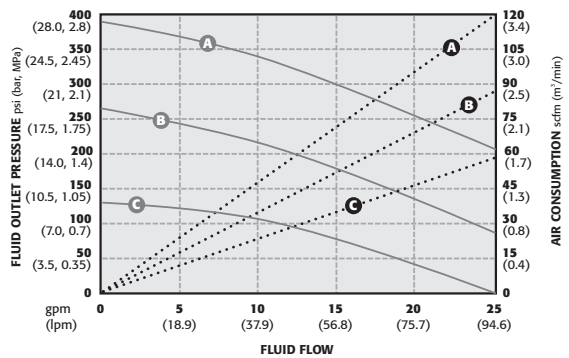
Sanitary Pumps

Monark 5:1 Performance Chart



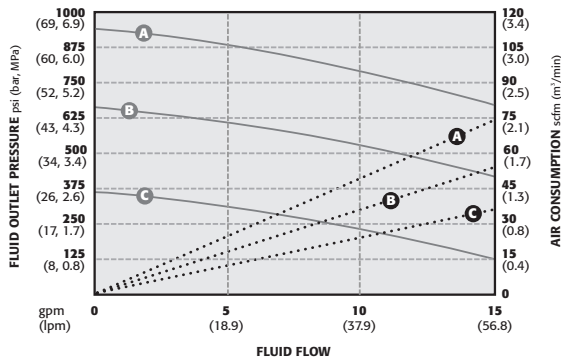
AIR PRESSURES	LEGEND
(A) = @ 120 psi (8.4 bar, 0.84 MPa)	Air Consumption.....
(B) = @ 100 psi (7.0 bar, 0.7 MPa)	Fluid Flow _____
(C) = @ 70 psi (4.8 bar, 0.5 MPa)	
(D) = @ 40 psi (2.8 bar, 0.3 MPa)	

Senator 4:1 Performance Chart



AIR PRESSURES	LEGEND
(A) = @ 100 psi (7.0 bar, 0.7 MPa)	Air Consumption.....
(B) = @ 70 psi (4.8 bar, 0.5 MPa)	Fluid Flow _____
(C) = @ 40 psi (2.8 bar, 0.3 MPa)	

Bulldog 10:1 Performance Chart



AIR PRESSURES	LEGEND
(A) = @ 100 psi (7.0 bar, 0.7 MPa)	Air Consumption.....
(B) = @ 70 psi (4.8 bar, 0.5 MPa)	Fluid Flow _____
(C) = @ 40 psi (2.8 bar, 0.3 MPa)	

How to use this chart:

- Step 1:** Locate the required fluid flow rate along bottom axis of chart.
- Step 2:** Follow vertical line to the intersection with the solid curve (A, B or C – based on your air inlet pressure).
- Step 3:** Follow to left axis to read fluid outlet pressure.
- Step 4:** From Step 2, follow vertical line up or down to the intersection with the dotted line (A, B or C – based on your air inlet pressure) then follow to right axis to read air consumption.

Example:

With a Bulldog 10:1, to obtain 5 gpm (18.9 lpm) at 875 psi (60 bar; 6.0 MPa), you will need approximately 100 psi (7.0 bar; 0.7 MPa) of air pressure. The air consumption will be approximately 28 scfm.

The Typical Sanitary Package

Understanding Containers

Before selecting the appropriate sanitary package, you should be familiar with the various container options. There are four types of containers:

ONE

Open-head 55 gallon (208.2 l) drums

- metal drum with chimes
- lid must be clamped to drum
- 22-1/2 in (57.15 cm) [\pm 1/16 in (1.6 mm)] I.D.

TWO

Closed-head 55 gallon (208.2 l) drums

- metal drum with chimes
- permanent crimped drum lid (must be removed for ram applications)
- varying I.D. from 22 in (55.9 cm) to 22-1/2 in (57.15 cm)
- pumps fit into 2.5 in (63.5 mm) or 4 in (101.6 mm) bung openings

THREE

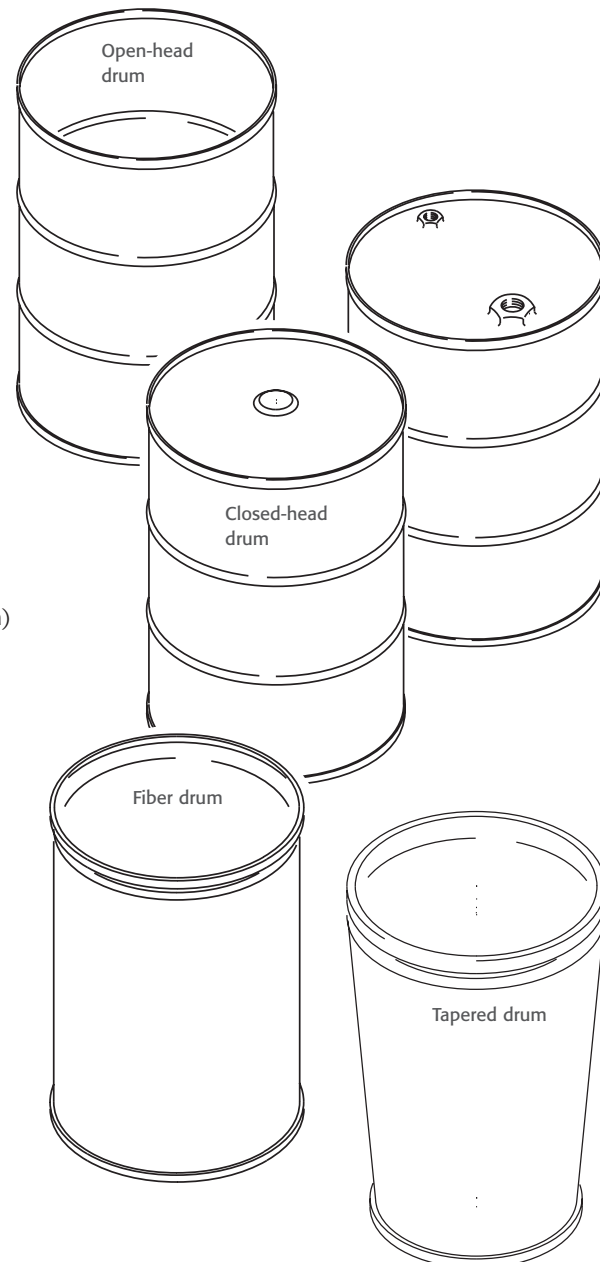
Fiber drums

- fiber drum with straight sides (no chimes)
- drum lip is 1 in (2.54 cm) less than I.D.
- varying I.D. from 18 in (46.9 cm) to 23 in (58.4 cm) [in 1-1/2 in (3.8 cm) increments]

FOUR

Tapered plastic drums

- designed for stacking after material evacuation
- taper distance from top to bottom is 2.5 in (63.5 mm)

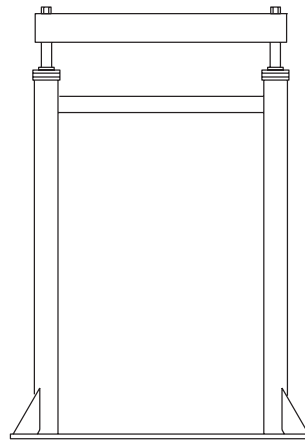


What Makes up a Sanitary Package

Complete sanitary packages are available for different drum types and dimensions. They are fully-tested and shipped totally assembled. Based on the type of container to be evacuated, the following options are standard on your sanitary packages:

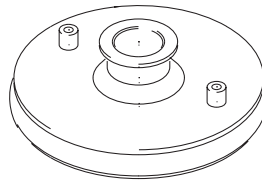
ONE Pneumatic Ram

- Stainless steel
- Controls can be mounted on either side
- Comes with regulators for wipers and down force
- Accepts all sanitary ram plates and pumps
- Part number: 234015 used with inflatable wipers
- Part number: 954285 used with non-inflatable wipers



TWO Ram plates

- Available flat inflatable wiper seal
- Fit a variety of drum sizes
- Handle a wide range of viscosities
- Two plate sizes for 21.5 in (54.6 cm) and 22.5 in (57.1 cm)
- Plate styles include conical and flat bottom design



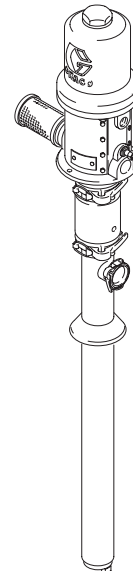
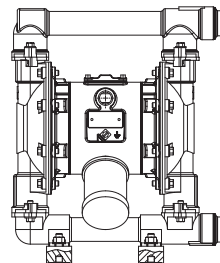
THREE Inflatable Seal Options

Seal Material	21.5 in (54.6 cm) Plate Size Part No.	22.5 in (57.1 cm) Plate Size Part No.	Materials
Neoprene*	15B097	15B098	All purpose materials
Buna-N	15B099	15B100	Oils, fatty materials
EPDM	15B101	15B102	Wide chemical compatibility, alternative to Neoprene

*standard on systems

FOUR Sanitary pump

- Husky 2150 FDA pg. 10 – 11
- Monark 5:1 pg. 12 – 13
- Senator 4:1 pg. 14 – 15
- Bulldog 10:1 pg. 16 – 17



Husky 2150 FDA

Sanitary Pump Package

This FDA-compliant pump features work-on-demand capability. By closing the outlet or dispense valve, the pump will stop until flow is again required. The Husky 2150 is capable of emptying a drum in less than 1 minute when pumping somewhat flowable fluids.

Features and Benefits

- Evacuation rates of up to 50 gpm, running at 60 cycles per minute
- 120 psi (8.4 bar, 0.84 MPa), outlet pressure
- Unique to air operated pumps, all packages work on demand and do not require special controls to shut pump off when fluid line is shut off
- Improved plate design with inflatable wiper seals, allows for faster change-out of drums
- Packages fully assembled and tested prior to shipment
- All pumps and packages are compliant to specific agency standards
- Available packages designed to fit 21.5 in (54.6 cm), 22.5 in (57.1 cm), 23.0 in (58.42 cm) and 23.25 in (59.06 cm) 55-gallon container sizes
- Packages capable of pumping from straight-sided fiber drums, chimed metal drums, and tapered plastic drums

Typical Application

- Unloading of somewhat flowable fluids, from the original 55-gallon containers without the need to reduce the viscosity through liquid injection

Typical Fluids Handled

- Fruit juice concentrate
- Sauce
- Tomato paste
- Light chocolate
- Fruit puree



Husky 2150 FDA Sanitary Pump Package

Ordering Information

Part Number	Pump Number	Pump Style	Plate Number	Flat bottom Plate Size	Inflatable Seal Number	Ram Number	Former Package Number	Weight
248025	234361	2150 FDA (DFS666)	15C737	21.5" (54.6 cm)	15B097	234015	NA	536.5 lb. (243.6 kg)
248026	234362	2150 FDA (DFS888)	15C736	22.5" (57.1 cm)	15B098	234015	NA	549.0 lb. (249.5 kg)
248022	234361	2150 FDA (DFS666)	15C737	21.5" (54.6 cm)	15B097	234015	NA	536.0 lb. (243.6 kg)
248023	234362	2150 FDA (DFS888)	15C736	22.5" (57.1 cm)	15B098	234015	NA	549.0 lb. (249.5 kg)

Please note: Pump is configured as noted, but is center-ported and has no inlet manifold

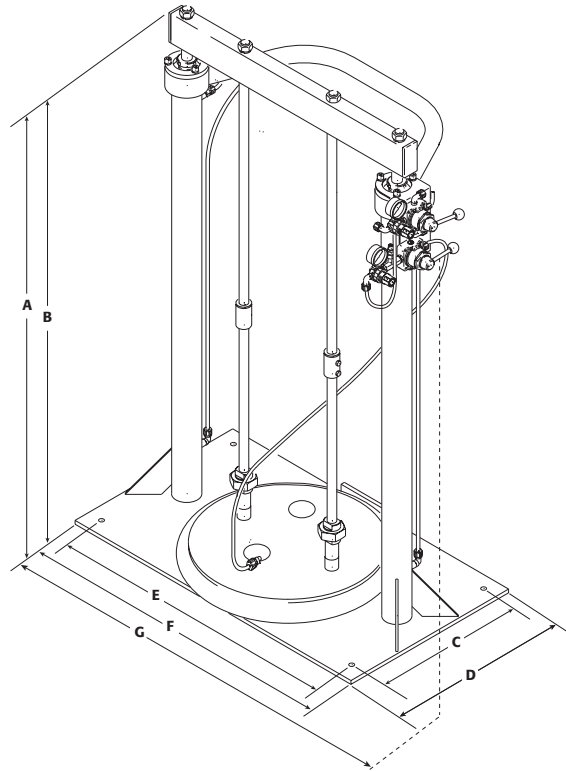
Technical Specifications

Maximum fluid pressure 120 psi (8.4 bar, 0.84 Mpa)
 Maximum flow @ 60 cpm* 60 gpm (234 lpm)
 Maximum flow @ 100 cpm* 100 gpm (390 lpm)
 Viscosity range of package 10,000 to 20,000 cps
 Maximum inlet air pressure 120 psi (8.4 bar, 0.84 MPa)
 Air inlet size 3/4 npt (f)
 Evacuation efficiency 99%
 Instruction manual 309505

*Flow rates based on full displacement of lower and S.G. = 1

Dimensions

- A** = 107 in (271.8 cm) raised
- B** = 67 in (170.2 cm) lowered
- C** = 20 in (50.8 cm)
- D** = 24 in (61.0 cm)
- E** = 38 in (96.5 cm)
- F** = 42 in (106.7 cm)
- G** = 43.7 in (111.1 cm)



Monark 5:1

Sanitary Pump Package

The USDA and 3A approved pumps feature work on demand capability. By closing the outlet or dispense valve, the pump will stop until flow is again required.

Features and Benefits

- Evacuation rates of up to 4gpm, running at 60 cycles per minute
- 600 psi (41 bar, 4.1 MPa), outlet pressure
- Unique to air operated pumps, all packages work on demand and do not require special controls to shut pump off when fluid line is shut off
- Improved plate design with inflatable wiper seals, allows for faster change-out of drums
- Available in double ball and priming piston design for additional system flexibility
- Packages fully assembled and tested prior to shipment
- All pumps and packages compliant to specific agency standards
- Available packages designed to fit 21.5 in (54.6 cm), 22.5 in (57.1 cm), 23.0 in (58.42 cm) and 23.25 in (59.06 cm) 55-gallon container sizes
- Packages capable of pumping from straight-sided fiber drums, chimed metal drums, and tapered plastic drums

Typical Application

- Unloading of somewhat flowable to moderately flowable fluids, from the original 55-gallon containers without the need to reduce the viscosity through liquid injection

Typical Fluids Handled

- Mascara base
- Tomato paste
- Icing
- Jam and jelly
- Pharmaceutical lotion



Monark 5:1

Sanitary Pump Packages

Ordering Information

Part Number	Pump Number	Pump Style	Conical Plate Number	Plate Size	Inflatable Seal Number	Ram Number	Former Pkg Number	Weight
234005	952793	Priming Piston	15B111	21.5" (54.6 cm)	15B097	234015	954722	470 lb (213.1 kg)
234006	952793	Priming Piston	15B114	22.5" (57.1 cm)	15B098	234015	954989	472 lb (214.1 kg)
234007	207550	Double Ball	15B111	21.5" (54.6 cm)	15B097	234015	954783	472 lb (214.1 kg)
234008	207550	Double Ball	15B114	22.5" (57.1 cm)	15B098	234015	965726	474 lb (215.0 kg)

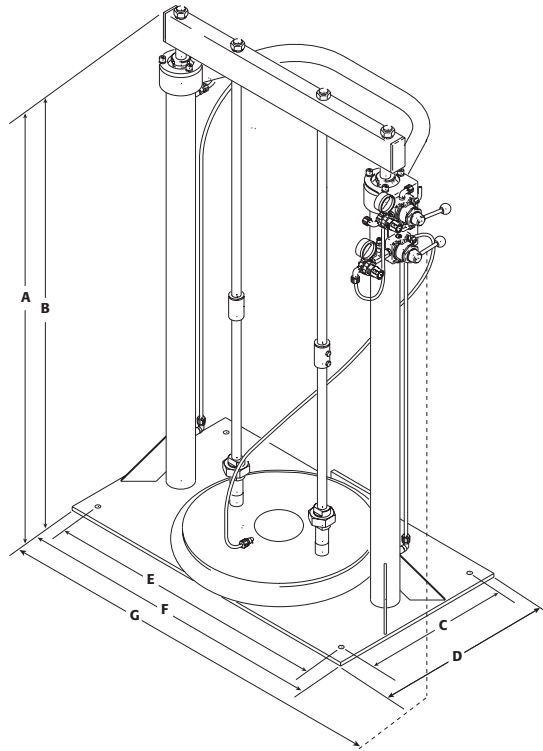
Technical Specifications

	Double Ball Pump	Priming Piston
Maximum fluid pressure	600 psi (41 bar, 4.1 MPa)	600 psi (41 bar, 4.1 MPa)
Maximum flow @ 60 cpm*	2.5 gpm (9.5 lpm)	2.5 gpm (9.5 lpm)
Maximum flow @ 100 cpm*	4 gpm (15.1 lpm)	4 gpm (15.1 lpm)
Viscosity range of package	25,000 to 60,000 cps	60,000 to 100,000
Maximum inlet air pressure	120 psi (8.4 bar, 0.84 MPa)	120 psi (8.4 bar, 0.84 MPa)
Air inlet size	3/4" npt(f)	3/4" npt(f)
Evacuation efficiency	98%	98%
Instruction manual	309505	309505

* Flow rates based on full displacement of lower and S.G. = 1

Dimensions

- A** = 107 in (271.8 cm) raised
- B** = 67 in (170.2 cm) lowered
- C** = 20 in (50.8 cm)
- D** = 24 in (61.0 cm)
- E** = 38 in (96.5 cm)
- F** = 42 in (106.7 cm)
- G** = 43.7 in (111.1 cm)



Senator 4:1

Sanitary Pump (FT-14) Package

This USDA approved pump features work-on-demand capability. The pump can be taken apart in less than 5 minutes for those applications that require daily sanitation, and can empty a drum in less than 3 minutes when pumping somewhat flowable to moderately flowable fluids

Features

- Evacuation rates up to 14 gpm, running at 60 cycles per minute
- 400 psi (27 bar, 2.8 MPa), outlet pressure
- Unique to air operated pumps, all packages work on demand and do not require special controls to shut pump off when fluid line is shut off
- Improved plate design with inflatable wiper seals, allows for faster change out of drums
- Available in double ball and priming piston design for additional system flexibility
- Packages fully assembled and tested prior to shipment
- All pumps and packages are compliant to specific agency standards
- Available packages designed to fit 21.5 in (54.6 cm), 22.5 in (57.1 cm), 23.0 in (58.42 cm) and 23.25 in (59.06 cm) 55-gallon container sizes
- Packages capable of pumping from straight sided fiber drums, chimed metal drums, and tapered plastic drums

Typical Application

- Unloading of somewhat flowable to moderately flowable fluids, from the original 55-gallon containers without the need to reduce the viscosity through liquid injection

Typical Fluids Handled

- Jam and jelly
- Soft peanut butter
- Heavy chocolate
- Tomato paste
- Fudge



Senator 4:1

Sanitary Pump (FT-14) Package

Ordering Information

Part Number	Pump Number	Pump Style	Conical Plate Number	Plate Size	Inflatable Seal Number	Ram Number	Former Pkg Number	Weight
234009	570019	Priming Piston	15B111	21.5" (54.6 cm)	15B097	234015	965793	544 lb (246.7 kg)
234010	570019	Priming Piston	15B114	22.5" (57.1 cm)	15B098	234015	687139	552 lb (250.3 kg)
234011	948649	Double Ball	15B111	21.5" (54.6 cm)	15B097	234015	965476	530 lb (240.4 kg)
234012	948649	Double Ball	15B114	22.5" (57.1 cm)	15B098	234015	965145	542 lb (245.8 kg)

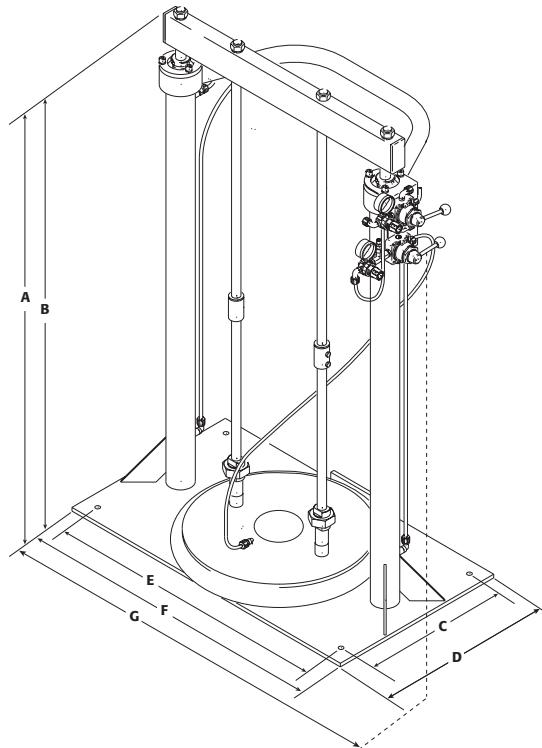
Technical Specifications

	Double Ball Pump	Priming Piston
Maximum fluid pressure	400 psi (28 bar 2.8 MPa)	400 psi (28 bar 2.8 MPa)
Maximum flow @ 60 cpm*	14 gpm (53 lpm)	14 gpm (53 lpm)
Maximum flow @ 100 cpm*	23 gpm (87 lpm)	23 gpm (87 lpm)
Viscosity range of package	25,000 cps to 60,000 cps	60,000 to 100,000
Maximum inlet air pressure	100 psi (7 bar 0.7 MPa)	100 psi (7 bar 0.7 MPa)
Air inlet size	3/4" npt(f)	3/4" npt(f)
Evacuation efficiency	98%	98%
Instruction manual	309505	309505

* Flow rates based on full displacement of lower and S.G. = 1

Dimensions

- A = 107 in (271.8 cm) raised
- B = 67 in (170.2 cm) lowered
- C = 20 in (50.8 cm)
- D = 24 in (61.0 cm)
- E = 38 in (96.5 cm)
- F = 42 in (106.7 cm)
- G = 43.7 in (111.1 cm)



Bulldog 10:1

Sanitary Priming Piston Pump Package

This USDA approved pump features work-on-demand capability. By closing the outlet or dispense valve, the pump will stop until flow is again required. The Bulldog 10:1 is capable of pumping the highest viscosity fluids and can empty a drum in less than 5 minutes

Features and Benefits

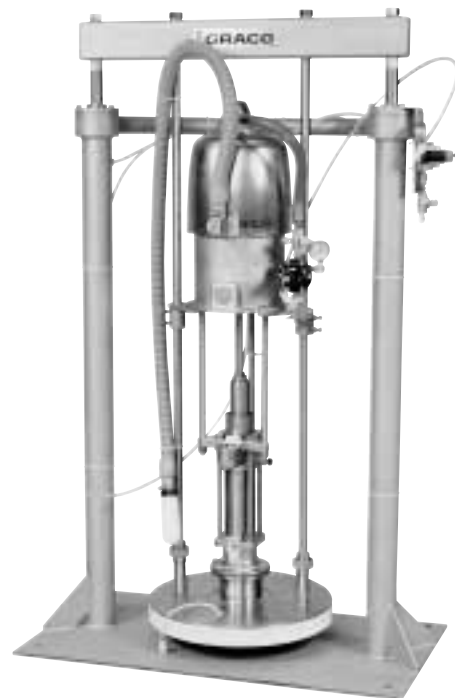
- Evacuation rates of up to 8 gpm, running at 60 cycles per minute
- 1000 psi (70 bar, 7 MPa), outlet pressure
- Unique to air operated pumps, all packages work on demand and do not require special controls to shut pump off when fluid line is shut off
- Improved plate design with inflatable wiper seals, allows for faster change out of drums
- Available in priming piston version for pumping the highest viscosity fluids (Bulldog only)
- Packages fully assembled and tested prior to shipment
- All pumps and packages compliant to specific agency standards
- Available packages designed to fit 21.5 in (54.6 cm), 22.5 in (57.1 cm), 23.0 in (58.42 cm) and 23.25 in (59.06 cm) 55-gallon container sizes
- Packages capable of pumping from straight sided fiber drums, chimed metal drums, and tapered plastic drums

Typical Application

- Unloading of very heavy to non flowing fluids, from the original 55-gallon containers without the need to reduce the viscosity through liquid injection

Typical Fluids Handled

- Fruit paste
- Heavy peanut butter
- Heavy chocolate
- Cream candy filling
- Moist pet food



Bulldog 10:1 Sanitary Priming Piston Pump Package

Ordering Information

Part Number	Pump Number	Pump Style	Conical Plate Number	Plate Size	Inflatable Seal Number	Ram Number	Former Pkg Number	Weight
234013	949444	Priming Piston	15B111	21.5" (54.6 cm)	15B097	234015	965796 / 965788	548 lb (248.5 kg)
234014	949444	Priming Piston	15B114	22.5" (57.1 cm)	15B098	234015	954409 / 965788	562 lb (254.9 kg)
234016	954180	Priming Piston, w/ Adjust-A-Stroke Motor	15B114	22.5" (57.1 cm)	15B098	234015	946500	568 lb (257.6 kg)

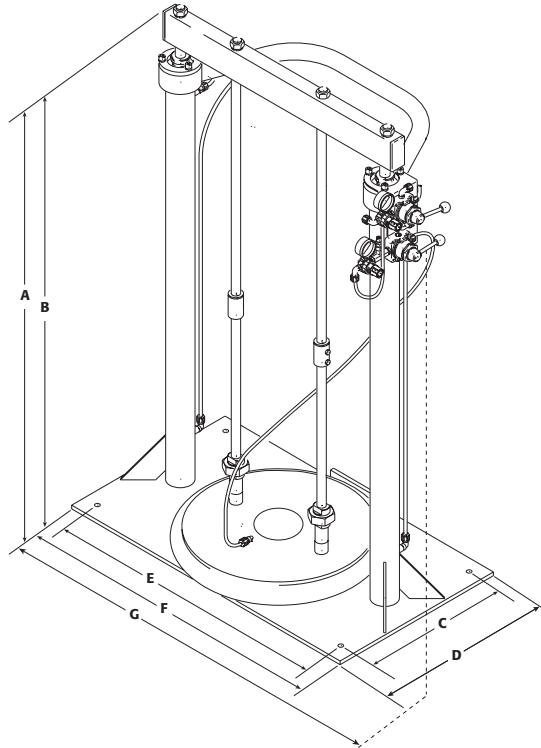
Technical Specifications

Priming Piston	
Maximum fluid pressure	1000 psi (70 bar, 7 MPa)
Maximum flow @ 60 cpm*	8 gpm (31 lpm)
Maximum flow @ 100 cpm*	13.3 gpm (50.3 lpm)
Viscosity range of package	60,000 to 250,000 cps
Maximum inlet air pressure	100 psi (7 bar, 0.7 MPa)
Air inlet size	3/4" npt(f)
Evacuation efficiency	98%
Instruction manual	309505

* Flow rates based on full displacement of lower and S.G. = 1

Dimensions

- A = 107 in (271.8 cm) raised
- B = 67 in (170.2 cm) lowered
- C = 20 in (50.8 cm)
- D = 24 in (61.0 cm)
- E = 38 in (96.5 cm)
- F = 42 in (106.7 cm)
- G = 43.7 in (111.1 cm)



BES 300

Bin Evacuation System

This USDA approved pump features work-on-demand capability. By closing the outlet or dispense valve, the pump will stop until flow is again required.

Features and Benefits

- Evacuation rates with standard 2 pump systems up to 28 gpm with a Senator and 16 gpm with a Bulldog, running at 60 cycles per minute
- Evacuation rates can double with the available 4 pump BES 300 systems
- Outlet pressures of 400 psi (27 bar, 2.8 MPa) with a Senator pump and 1000 psi (70 bar, 7 MPa) with a Bulldog pump, enable the system to be installed further away from the production area
- Equipped with an inflatable wiper that seals the area between the plate and sides of the bin, virtually eliminating the potential for material to collect on top of the plate due to seal leakage
- Wiper seal automatically deflated to allow for faster change out of bins
- Packages fully assembled and tested prior to shipment
- All pumps and packages compliant to specific agency standards

Typical Applications

- Unloading of moderately flowable to very heavy, non flowing fluids, from the original 300-gallon containers without the need to reduce the viscosity through liquid injection

Typical Fluids Handled

Senator system

- Jam and jelly
- Tomato paste
- Soft peanut butter
- Fudge
- Heavy chocolate

Bulldog systems

- Fruit paste
- Heavy peanut butter
- Heavy chocolate
- Cream candy filling
- Moist pet food



687257 shown

BES 300

Bin Evacuation System

Ordering Information

Part Number	Pump Number	Pump Style	Number of Pumps	Bin Type	Bin Dimensions	Weight
687257	949704	4x1 Senator, Double Ball	2	Plywood	41.5 in W x 45.25 in D x 39.0 in H (1.05 m W x 1.14 m D x 0.99 m H)	2100 lb (952.5 kg)
988327	949444	10x1 Bulldog, Priming Piston	2	Arena	41.5 in W x 45.25 in D x 39.0 in H (1.05 m W x 1.14 m D x 0.99 m H)	2462 lb (1116.7 kg)
687110	949444	10x1 Bulldog, Priming Piston	4	TNT	43.0 in W x 44.0 in D x 39.0 in H (1.04 m W x 1.12 m D x 0.99 m H)	2672 lb (1212.0 kg)
A	949704	4x1 Senator, Double Ball	4	Plywood	41.5 in W x 45.25 in D x 39.0 in H (1.05 m W x 1.14 m D x 0.99 m H)	2272 lb (1030.6 kg)
B	949444	10x1 Bulldog, Priming Piston	4	Arena	41.25 in W x 44.25 in D x 39.0 in H (1.05 m W x 1.13 m D x 0.99 m H)	2672 lb (1212.0 kg)
C	949444	10x1 Bulldog, Priming Piston	2	TNT	43.0 in W x 44.0 in D x 39.0 in H (1.04 m W x 1.12 m D x 0.99 m H)	2462 lb (1116.7 kg)

Note: Systems designated as A, B, C, can be built but need to be special ordered. Systems designed for other bin types are also available. Contact Graco marketing for information.

Technical Specifications

	Arena Bin	Plywood Bin	TNT Bin
Maximum fluid pressure	1000 psi (7 bar, 7 MPa)	400 psi (28 bar, 2.8 MPa)	1000 psi (7 bar, 7 MPa)
Maximum flow @ 60 cpm*			
2 pumps	16 gpm (63 lpm)	28 gpm (106 lpm)	32 gpm (126 lpm)
4 pumps	32 gpm (126 lpm)	56 gpm (212 lpm)	16 gpm (63 lpm)
Maximum flow @ 100 cpm*			
2 pumps	26.6 gpm (100.6 lpm)	46 gpm (174 lpm)	53.2 gpm (201 lpm)
4 pumps	53.2 gpm (201 lpm)	96 gpm (348 lpm)	26.6 gpm (100.6 lpm)
Viscosity range of package	60,000 cps to 200,000 cps	60,000 cps to 200,000 cps	60,000 cps to 200,000 cps
Maximum inlet air pressure	100 psi (7 bar, 0.7 MPa)	100 psi (7 bar, 0.7 MPa)	100 psi (7 bar, 0.7 MPa)
Air inlet size	3/4" npt (f)	3/4" npt (f)	3/4" npt (f)
Communication	RS232 Serial	RS232 Serial	RS232 Serial
Electrical requirements	115 VAC (60 Hz)	115 VAC (60 Hz)	115 VAC (60 Hz)
Overall dimensions	62 in W x 64 in D x 110 in H (1.5 m W x 1.6 m D x 2.7 m H)	62 in W x 64 in D x 110 in H (1.5 m W x 1.6 m D x 2.7 m H)	62 in W x 64 in D x 110 in H (1.5 m W x 1.6 m D x 2.7 m H)
Evacuation efficiency			
2 pumps	98%	98%	98%
4 pumps	99%	99%	99%
Instruction manual	309526	309526	309526

*Flow rates based on full displacement of lower and S.G. = 1

Ram Plates

Accessories

Features and Benefits

- Inflatable wiper for maximum material coverage and minimal waste
- Blow-off port or conical plate available if required for sticky materials
- Conical bottom for high viscosity material and better priming
- Flat bottom for lower viscosity materials using diaphragm pumps
- Welded and grounded stainless steel sanitary construction for ultimate cleanliness
- 21-1/2 in (54.6 cm) straight sided fiber, 22-1/2 (57.1 cm) metal chimed or 22-1/2 (57.1 cm) tapered plastic drums
- Designed to handle a 23-1/4 in (59.1 cm) tapered drum with 2.5 in (63.5 mm) taper

Typical Applications

- Unloading of moderately flowable to very heavy, non-flowable fluids, from the original 300-gallon containers without the need to reduce the viscosity through liquid injection

Typical Fluids Handled

- Peanut butter
- Ricotta cheese
- Cream candy filling
- Moist pet food



Ram Plates

Ordering Information

	Piston Pumps		Husky 2150 FDA Diaphragm Pump	
	21.5 in (54.6 cm) Plate Size Part No.	22.5 in (57.1 cm) Plate Size Part No.	21.5 in (54.6 cm) Plate Size Part No.	22.5 in (57.1 cm) Plate Size Part No.
Plate without Seal	15B080	15B081	15C737	15C736

Technical Specifications

	Piston Pumps	
	21.5 in (54.6 cm) Diameter Unloader Plate	22.5 in (57.1 cm) Diameter Unloader Plate
Container I.D.	20-1/2 - 21-3/4 in (52.1 - 55.2 cm)	21-1/2 - 23-1/4 in (54.6 - 59.1 cm)
Material	316 SST	316 SST
Weight	40 lb (18.14 kg)	40 lb (18.14 kg)
Wiper	Inflatable Neoprene	Inflatable Neoprene
Pump mount	Universal (piston pump)	Universal (piston pump)
Top lip minimum clearance I.D.	20-1/4 in (51.4 cm)	21-1/4 in (54.0 cm)
Max inflatable seal pressure	15 psi (1.0 bar, 0.1 MPa)	15 psi (1.0 bar, 0.1 MPa)

Safety relief valve for inflatable seal is factory-set at 22 psi (1.5 bar, 0.15 MPa).

	Husky 2150 Diaphragm	
	21.5 in (54.6 cm) Diameter Unloader Plate	22.5 in (57.1 cm) Diameter Unloader Plate
Container I.D.	20-1/2 - 21-3/4 in (52.1 - 55.2 cm)	21-1/2 - 23-1/4 in (54.6 - 59.1 cm)
Material	316 SST	316 SST
Weight	40 lb (18.14 kg)	40 lb (18.14 kg)
Wiper	Inflatable Neoprene	Inflatable Neoprene
Pump mount	Husky 2150 FDA	Husky 2150 FDA
Top lip minimum clearance I.D.	20-1/4 in (51.4 cm)	21-1/4 in (54.0 cm)
Max. inflatable seal pressure	15 psi (1.0 bar, 0.1 MPa)	15 psi (1.0 bar, 0.1 MPa)

Safety relief valve for inflatable seal is factory-set at 22 psi (1.5 bar, 0.15 MPa).

Accessories

Sanitary Pumps and Packages

Pumps

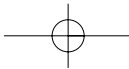
Air Controls	Part Number
Air regulator and filter for Husky FDA and FDA Plus pumps 1/2 in npt (12.7 mm) (f)	246947
Filter, regulator, and lubricator combination for Monark 3/8 in npt (9.52 mm) (f)	110150
Filter, regulator, and lubricator combination for Senator and Bulldog 3/4 in npt (19.05 mm) (f)	217073
Air shut off valve 1/2 in npt (12.7 mm), bleed type, relieves trapped air downline of valve. FDA pumps	110225
Air shut off valve 3/8 in npt (9.52 mm), bleed type, relieves trapped air downline of valve. Monark pumps	110224
Air shut off valve 3/4 in npt (19.05 mm), bleed type, relieves trapped air downline of valve. Senator/Bulldog pumps	110226
Air runaway valve (stop pump from cavitating when empty)	224040
Air Hoses	
Air hose: 3/8 in (9.52 m) male connections. 10 ft (3 m) length	109131
Air hose: 3/4 in (19.05 m) male connections. 10 ft (3 m) length	214955
Fluid Hoses	
2 in (50.8 m) ID, sanitary clamp connections. 10 ft (3 m) length	552175
55 Gallon Ram	
Ram Plates for Inflatable Wiper Seals	
316 SST 21.5 in (54.6 cm). Conical bottom. Seals not included. Designed for Monark, Senator, and Bulldog pumps	15B080
316 SST 22.5 in (57.1cm). Conical bottom. Seals not included. Designed for Monark, Senator, and Bulldog pumps	15B081
316 SST 21.5 in (54.6 cm). Flat bottom. Seals not included. Designed for Husky 2150 pump	15C737
316 SST 21.5 in (57.1 cm). Flat bottom. Seals not included. Designed for Husky 2150 pump	15C736
Replacement Seals for Inflatable Wiper Seals	
Neoprene seal for 21.5 in (54.6 cm) plates. Good for general purpose use. Comes standard on packages	15B097
Neoprene seal for 22.5 in (57.1 cm) plates. Good for general purpose use. Comes standard on packages	15B098
Buna-N seal for 21.5 in (54.6 cm) plates. Good for petroleum based materials at ambient temperatures	15B099
Buna-N seal for 22.5 in (57.1 cm) plates. Good for petroleum based materials at ambient temperatures	15B100
EPDM seal for 21.5 in (54.6 cm) plates. Good for acidic materials	15B101
EPDM seal for 22.5 in (57.1 cm) plates. Good for acidic materials	15B102
Ram Plates for Solid Wiper Seals	
304 SST 22.5 in (57.1 cm). Conical bottom, includes 2 round wipers. For 22.5 in (57.1 cm) and 23.0 in (58.42 cm) drums	901950
316 SST 21.5 in (54.6 cm). Conical bottom. Includes 1 flat wiper. For 21.5 in (54.6 cm) drum	948092

Accessories

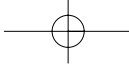
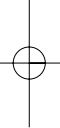
Sanitary Pumps and Packages

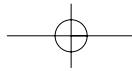
55 Gallon Ram (continued)

Replacement Seals for Ram Plates with Solid Wiper Seals	Part Number
Flat Neoprene seal for 21.5 in (54.6cm) plate, part number 948092.	608193
Round Neoprene seal for 22.5 in (57.1cm) plate, part number 901950.	165601
Flat Neoprene seal for 23.0 in (58.42cm) plate, part number 948024. Plate is obsolete	623781
Flat Neoprene seal for 22.0 in (55.88cm) plate, part number 948652. Plate is obsolete	624958
Miscellaneous	
55-gallon pneumatic ram with air controls for solid wiper seal plates	954285
55-gallon pneumatic ram with air controls for inflatable wiper seal plates	234015
Universal tie rod connectors for either the 954285 or 234015 rams	947376
Pump mounting bracket for Senator and Bulldog pumps	621871
Pump mounting bracket for Monark pumps	624317
Bracket connecting tie rods and pump mounting brackets	943329
Retrofit kit to change ram air controls from non-inflatable to inflatable	15B154
Conversion kit for solid wiper ram plate to inflatable. Includes air controls, wiper seal and plate. For 21.5 in (54.6 cm) drums	15B111
Conversion kit for solid wiper ram plate to inflatable. Includes air controls, wiper seal and plate. For 22.5 in (57.1 cm) drums	15B114
300 Gallon	
Inflatable seal for BES 300 systems designed for Plywood bins - 687257	514984
Inflatable seal for BES 300 systems designed for Arena bins -988327	551413
Inflatable seal for BES 300 systems designed for TNT bins - 687110	116464
Corner seals for BES 300 systems	551065



Notes



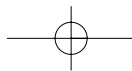
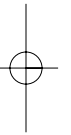
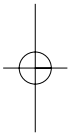


Equipment Misuse Hazard

General Safety. Any misuse of Graco equipment or accessories, such as overpressurizing, modifying parts, using incompatible chemicals and fluids, or using worn or damaged parts, can cause them to rupture and result in fluid injection, splashing in the eyes or on the skin, or other serious bodily injury, or fire, explosion or property damage. NEVER alter or modify any part of Graco equipment; doing so could cause the product to malfunction. CHECK all equipment regularly and repair or replace worn or damaged parts immediately. Always wear protective eyewear, gloves, clothing and respirator as recommended by fluid and solvent manufacturers.

System Pressure. Be sure that all equipment and accessories used are rated to withstand the applicable MAXIMUM WORKING PRESSURE. DO NOT exceed the maximum working pressure of any component or accessory used in a system.

Fluid and Solvent Compatibility. All chemicals used in a Graco sprayer must be compatible with wetted parts. Consult your chemical supplier to ensure compatibility. Do not use 1,1,1-trichloroethane, methylene chloride, other halogenated hydrocarbon solvents or fluids containing such solvents in this equipment, which contains aluminum and/or zinc parts. Such use could result in a serious chemical reaction, with the possibility of explosion, which could cause death, serious bodily injury and/or substantial property damage.



SANITARY

ABOUT GRACO

PROVEN QUALITY. LEADING TECHNOLOGY.

Founded in 1926, Graco is a world leader in fluid handling systems and components. Graco products move, measure, control, dispense and apply a wide range of fluids and viscous materials used in vehicle lubrication, commercial and industrial settings.

The company's success is based on its unwavering commitment to technical excellence, world-class manufacturing and unparalleled customer service. Working closely with qualified distributors, Graco offers systems, products and technology which set the quality standard in a wide range of fluid handling solutions. Graco provides equipment for spray finishing, protective coating, paint circulation, lubrication, and dispensing sealants and adhesives, along with power application equipment for the contractor industry. Graco's ongoing investment in fluid management and control will continue to provide innovative solutions to a diverse global market.

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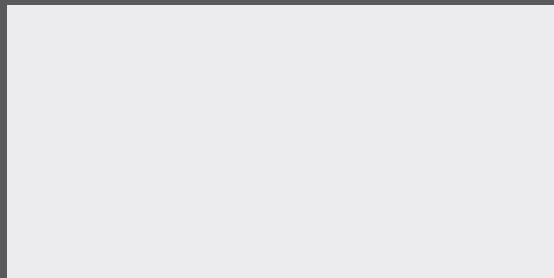
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