SEALANTS & ADHESIVES
buyer's guide and specifications

Sealant and Adhesive Solutions for Industrial and Automotive Applications

PROVEN QUALITY. LEADING TECHNOLOGY.

Catalog Reference Guide

Graco products can be found in the following catalogs:

Title	Form Number
Accessories	303119
Finishing Equipment	303252
Process Equipment	300435
Protective Coatings Equipment	303253
Sanitary Equipment	300299

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

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Introduction

1

There are a number of basic pump styles which are used for transferring sealant and adhesive material. The following pages detail Graco's selections for sealant and adhesive transfer. Of course, there are many other possibilities within the Graco product line, to list every possibility would mean that the catalog you are holding would look more like the Manhattan phone directory!

What we concentrate on in this document are ram-fed pumps. Ram-fed pumps are used for medium to high viscosity material. The ram provides force to a follower plate, which in turn drives the material to the pump opening. There are two basic styles of ram pumps: priming piston pumps and 2-ball pumps. In general, this is how they are applied:

Pump Style	**Priming Piston**	**2-Ball**
Graco brand	**Check-Mate™**	**Dura-Flo™**
Choose for…	• Adhesives and Sealants which do not flow well on their own (i.e. are not self-leveling) • Offset, heat-set inks which need to be sheared in order to pump • Filled adhesives and sealants which are abrasive to pump components	• Low to medium viscosity adhesives and sealants • High flow applications, such as PVC sealer in automotive plants • Spray applications, e.g. in the HVAC industry

Other pumps, such as diaphragm pumps, are also used for moving lower viscosity sealants and adhesives. A representative sample from our family of transfer pumps is included in this catalog. If you don't see a transfer pump which meets your needs, please see the Graco Process Equipment Catalog, form number 300435.

Pressure Drop Calculation

In order to correctly size a pump, you should know the desired dispense rate and the viscosity of the material you are working with. The following example shows how to apply this information:

Calculations

Bead Size Diameter in. (mm)	Gallons (Ls) per 1000 Lineal Ft.	Feet (Meters) per Lineal Gallon
1/16 (1.7)	0.16 (0.1)	6000 (1829)
3/32 (2.4)	0.36 (0.3)	2700 (823)
1/8 (3.2)	0.64 (0.5)	1500 (457)
3/16 (5)	1.44 (1.2)	675 (206)
1/4 (6.3)	2.55 (2.1)	375 (114)
5/16 (8.3)	3.98 (3.3)	240 (73)
3/8 (9.5)	5.74 (4.8)	165 (50)
1/2 (12.7)	10.20 (8.5)	95 (29)
5/8 (15.8)	15.92 (13.3)	50 (15)
3/4 (19)	22.95 (19.1)	35 (11)
1 (25.4)	40.80 (34)	19 (6)

Pressure drop or ΔP

$$\Delta P = \frac{.0273\ Q\ V\ L}{D^4}$$

WHERE:

P = Pressure drop in psi (bar, MPa)
V = Viscosity in poise (PS)
D = Diameter in inches (mm)
Q = Flow rate in gpm (lpm)
L = Length in ft (m)

OTHER ΔP CONSIDERATIONS:

- 0.094 diameter nozzle = 300 psi (21 bar, 2.1 MPa)
- Gun drop ΔP
  Ultra-Lite® 6000 = 400 psi (28 bar, 2.8 MPa)
  Ultra-Lite 4000 = 400 psi (28 bar, 2.8 MPa)

- Mastic Regulator ΔP = 400 psi (28 bar, 2.8 MPa)
- Straight Swivel 1/2 in (12.7 mm) = 200 psi (14 bar, 1.4 MPa)
- Z Swivel 1/2 in (12.7 mm) = 200 psi (14 bar, 1.4 MPa)
- Filters = 100-400 psi (7-28 bar, 0.7-2.8 MPa)

Example

Material is 2000 poise (200,000 cps) non-thixotropic acrylic latex sealant. Includes 5 gallon (4.2 l) pail, one manual gun, 25 ft x 3/8 in (7.6 m x 9.5 mm) I.D. hose, 1/4 in (6.3 mm) bead. The part is 6 in (152 mm) in diameter. Need to do 3 parts per minute. Need swivel at the gun.

- 6 in (152 mm) diameter to circumference - $\prod$D or 3.14 x 6 in (152 mm) = 18.84 in (479 mm) (total) per part
- 18.84 in (479 mm) x 3 (3 parts) = 57 in (1448 mm) of bead per minute
- Flow rate (gpm/lpm) = Area $_{bead}$ x Length $_{bead}$ = 0.049 in^2 ($\prod r^2$) x 57 in (1448mm) = 2.77 in^3 = 0.01 gpm (231 in^3 = 1 gal)

$$\Delta P = \frac{(0.0273)\ (0.01)\ (2000)\ (25)}{(.375)\ 4} = \frac{13.65}{.0198} = 689 \text{ PSI}$$

Nozzle	ΔP = 300
Ultra-Lite 6000 Flow Gun	ΔP = 400
Fittings & Swivel	ΔP = 400

$$\Delta P_{Total} = \Delta P_{Nozzle} + \Delta P_{Gun} + \Delta P_{Swivel} + \Delta P_{Hose}$$
$$= (300 + 400 + 400 + 689) = 1789 \text{ psi (123.4 bar, 12.34 MPa)}$$

From the chart, we selected a 46:1 President with a 3 in (76.2 mm) single post ram. Since the material is an acrylic, use SST wetted parts or part no. 231169. A 46:1 pump at 90 psi (6.2 bar, 0.6 MPa) of air will produce 4140 psi (285 bar, 28.5 MPa) [46 x 90 psi (6.2 bar, 0.6 MPa)] of pressure. Calculated pressure loss is only 1789 psi (123 bar, 12.3 MPa), so this selection will be fine for the application.

Checkmate® Pump Selection Chart

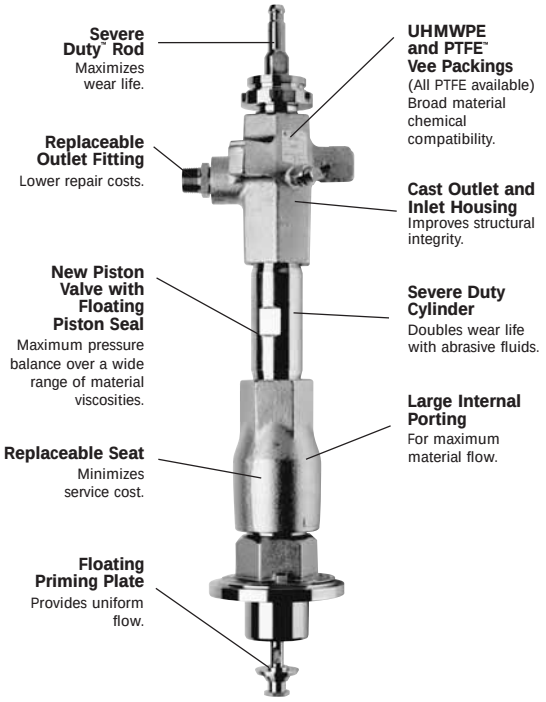
1

To select the proper pump for a given sealant or adhesive material, you must know:

1) Material Viscosity in centipoise (cps)
2) Material Type - urethane, epoxy, acrylic, silicone, etc.
3) Flow Rate in gallons per minute (gpm)

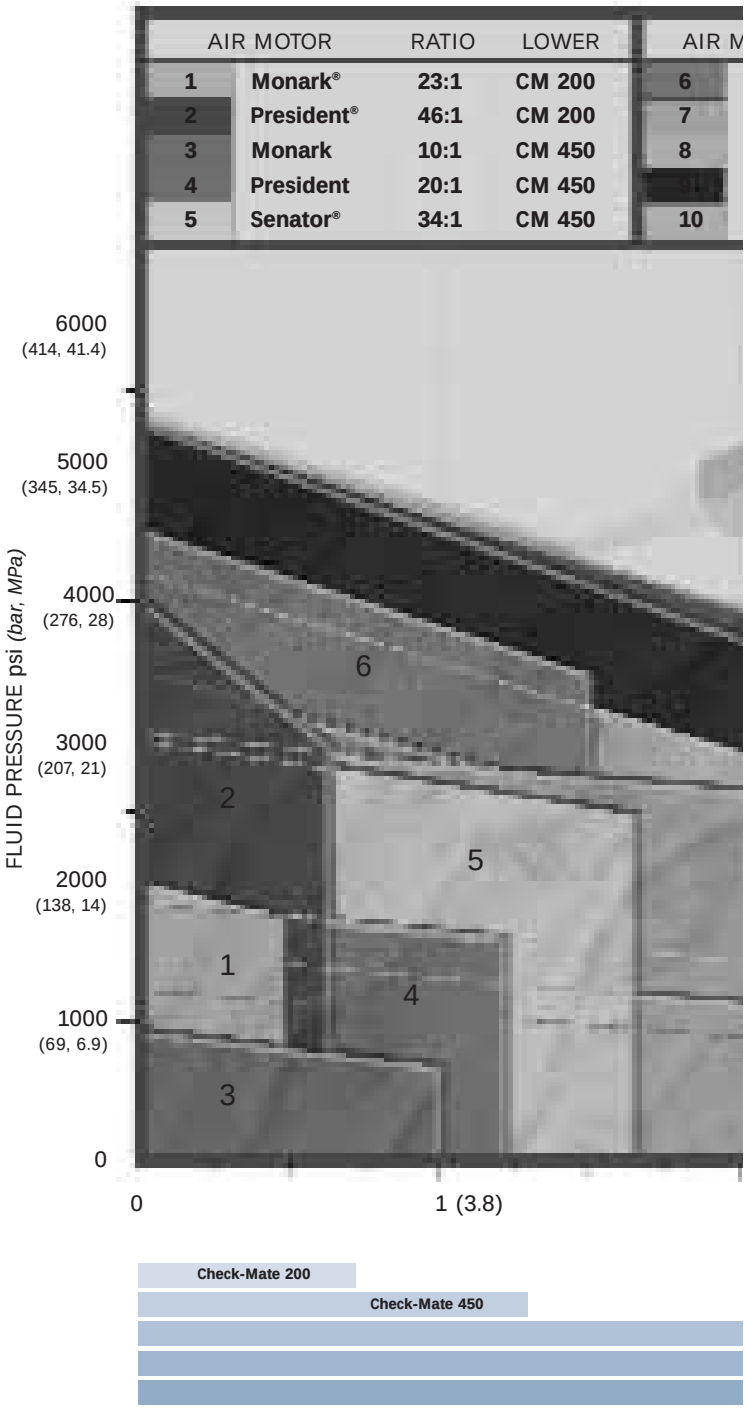
After obtaining the above information, use the pump selection chart to find the recommended pump. The chart on the right gives the air motor name, pressure ratio and lower type.

Check-Mate™ Features



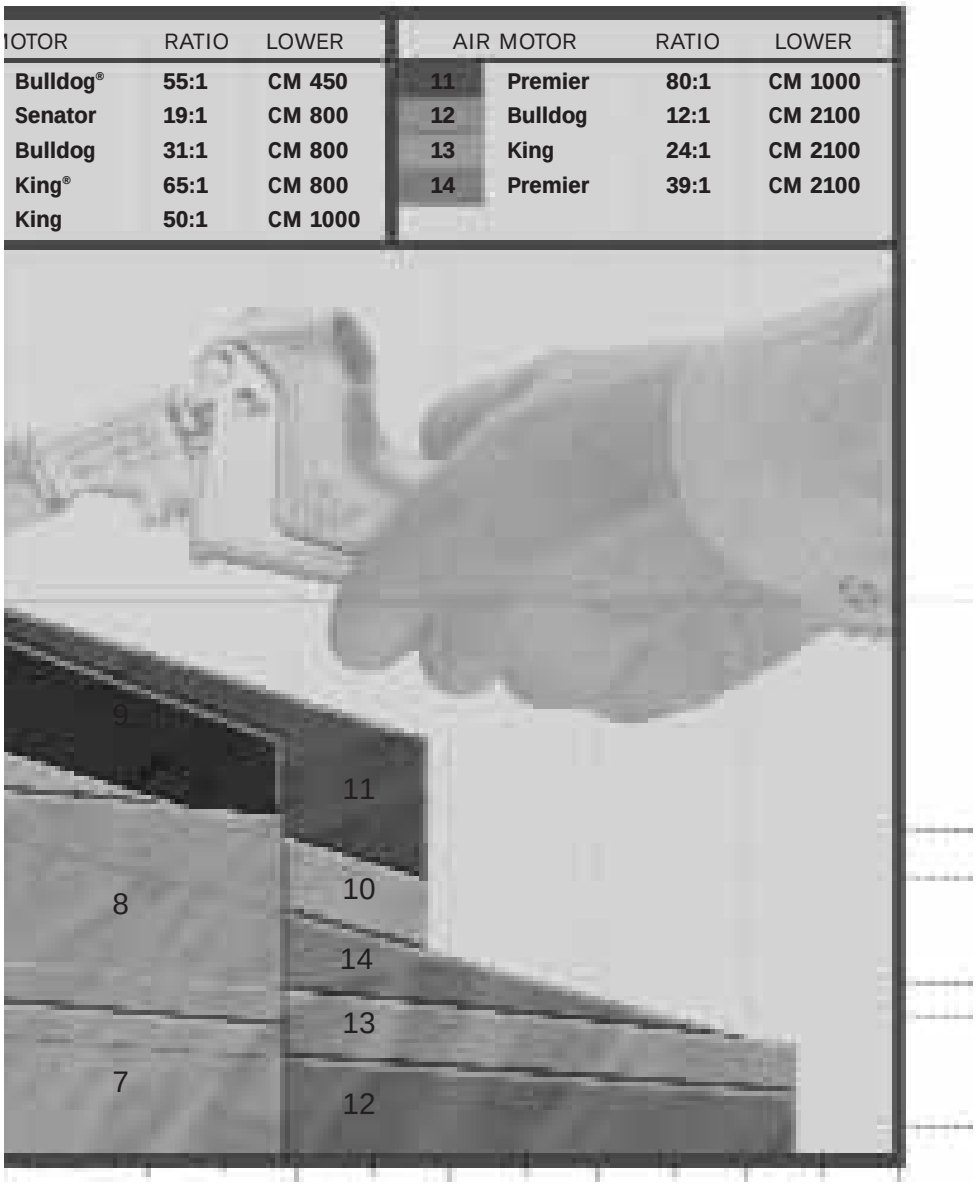
Registered trademarks mentioned herein are the property of their respective owners.

	AIR MOTOR	RATIO	LOWER	AIR M
1	Monark®	23:1	CM 200	6
2	President®	46:1	CM 200	7
3	Monark	10:1	CM 450	8
4	President	20:1	CM 450	
5	Senator®	34:1	CM 450	10



Use this chart as a guide only. Contact your local Graco representative for further details.

IOTOR	RATIO	LOWER	AIR MOTOR		RATIO	LOWER
Bulldog®	**55:1**	**CM 450**	**11**	**Premier**	**80:1**	**CM 1000**
Senator	**19:1**	**CM 800**	**12**	**Bulldog**	**12:1**	**CM 2100**
Bulldog	**31:1**	**CM 800**	**13**	**King**	**24:1**	**CM 2100**
King®	**65:1**	**CM 800**	**14**	**Premier**	**39:1**	**CM 2100**
King	**50:1**	**CM 1000**				



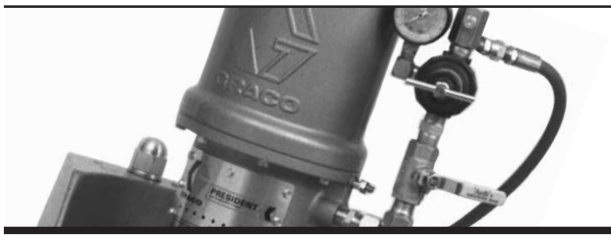
2 (7.6) 3 (11.4) 4 (15) 5 (18.9) 6 (22.7) 7 (26.5)

FLOW RATE gpm *(lpm)*

Check-Mate 800

Check-Mate 1000

Check-Mate 2100



Check-Mate® 200

Priming Piston Fluid Pumps

Check-Mate 200 pumps provide fluid flow to 0.75 gpm (2.84 lpm) and operating pressures to 4600 psi (320 bar, 32 MPa).

Features and Benefits

- SST models for waterborne compatibility
- Severe Duty™ rod and cylinder for durability
- Large internal porting for maximum flow
- Floating piston seal and priming plate improve balance and performance

Typical Applications

- Dispensing of silicone, latex or acrylic sealants
- Feed pumps for 2-component epoxy or urethane materials
- Dispensing of greases and other lubricants

Typical Fluids Handled

- Sealants
- Adhesives
- Inks
- Mastics
- Lubricants

231117
23:1 Monark

231118
46:1 President

Check-Mate 200

Priming Piston Fluid Pumps

Technical Specifications

23:1 Monark

Maximum fluid outlet pressure . . 4140 psi (285 bar, 28.5 MPa)
Maximum fluid flow @ 60 cpm . . . . . .0.5 gpm (1.9 lpm)
Maximum air inlet pressure . . . . . .180 psi (12.5 bar, 1.25 MPa)
Fluid outlet size . . . . . 1/2 npt(m)
Air inlet size (bare pump) . . . . . 3/8 npt(f)
Rod and cylinder . . . . . Severe Duty™ (chrome over SST)
Packings
- Throat . . . . . .UHMWPE/PTFE
- Piston (CS) . . . . . UHMWPE
- Piston (SST) . . . . . PTFE

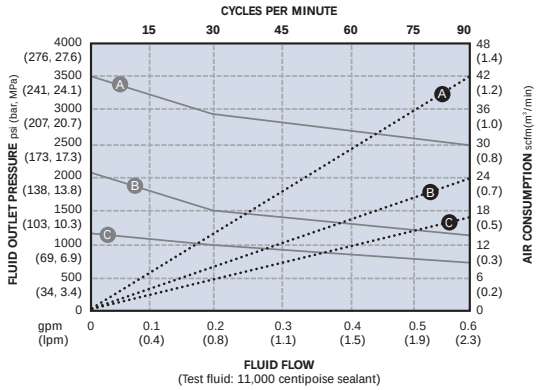
Overall length (bare pump) . . . . . 45 in (115 cm)
Weight (pump only) . . . . . 43 lbs (19.5 kg)
Instruction manual
- Carbon steel 308080
- Stainless steel 308200
- Ram mounted pumps 308026
- Cart mounted pumps 308087

46:1 President

Maximum fluid outlet pressure . . 4600 psi (320 bar, 32.0 MPa)
Maximum fluid flow @ 60 cpm . . . . . 0.6 gpm (2.3 lpm)
Maximum air inlet pressure . . . . . 108 psi (7.5 bar, 0.75 MPa)
Fluid outlet size . . . . . 1/2 npt(m)
Air inlet size (bare pump) . . . . . 1/2 npt(f)
Rod and cylinder . . . . . Severe Duty™ (chrome over SST)
Packings
- Throat . . . . . .UHMWPE/PTFE
- Piston (CS) . . . . . UHMWPE
- Piston (SST) . . . . . PTFE

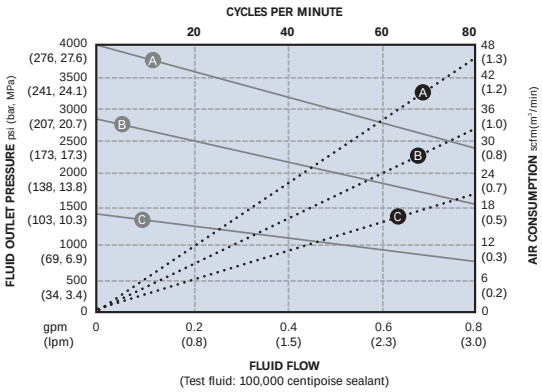
Overall length (bare pump) . . . . . 47-1/2 in (121 cm)
Weight (pump only) . . . . . 48 lbs (21.8 kg)
Instruction manual
- Carbon steel 308080
- Stainless steel 308200
- Ram mounted pumps 308026
- Cart mounted pumps 308087

Performance Chart: 23:1 Monark



AIR PRESSURES	LEGEND
Ⓐ = @ 180 psi (12.4 bar, 1.2 MPa)	Air Consumption . . . . .
Ⓑ = @ 100 psi (7 bar, 0.7 MPa)	Fluid Flow ————
Ⓒ = @ 70 psi (4.8 bar, 0.5 MPa)	

Performance Chart: 46:1 President



AIR PRESSURES	LEGEND
Ⓐ = @ 100 psi (7 bar, 0.7 MPa)	Air Consumption . . . .
Ⓑ = @ 70 psi (4.8 bar, 0.5 MPa)	Fluid Flow ————
Ⓒ = @ 40 psi (2.8 bar, 0.3 MPa)	

Check-Mate 200 Ram Packages

Priming Piston Fluid Pumps

1

Ordering Information

Cart-Mounted, Single-Post Inductor Packages for 5 Gallon (19 l) Pails

231135 Includes 23:1 Monark pump with carbon steel lower, 5 gal (19 l) inductor assembly, air regulator, cart, 3/8 npt(mbe) x 25 ft (7.6 m) nylon-lined hose (215244) and extrusion flow gun (207945).

231134 Same as 231135, but without hose or gun.

231171 Includes 23:1 Monark pump with stainless steel lower, 5 gal (19 l) inductor assembly, air regulator, cart, 3/8 npt(mbe) x 25 ft (7.6 m) nylon-lined hose (215244) and extrusion flow gun (207945). Note: Not assembled at factory.

231170 Same as 231171, but without hose or gun. Note: Not assembled at factory.

231137 Includes 46:1 President pump with carbon steel lower, 5 gal (19 l) inductor assembly, air regulator, cart, 3/8 npt(mbe) x 25 ft (7.6 m) nylon-lined hose (215244) and extrusion flow gun (207945).

231136 Same as 231137, but without hose or gun.

231173 Includes 46:1 President pump with stainless steel lower, 5 gal (19 l) inductor assembly, air regulator, cart, 3/8 npt(mbe) x 25 ft (7.6 m) nylon-lined hose (215244) and extrusion flow gun (207945). Note: Not assembled at factory.

231172 Same as 231173, but without hose or gun. Note: Not assembled at factory.

Stationary, Single-Post Ram Packages for 5 Gallon (19 l) Pails

231117 Includes 23:1 Monark pump with carbon steel lower, 5 gal (19 l) single-post ram assembly with air regulator and ram plate.

231168 Same as 231117 but with 23:1 Monark pump with stainless steel lower.

231118 Includes 46:1 President pump with carbon steel lower, 5 gal (19 l) single-post ram assembly with air regulator and ram plate.

231169 Same as 231118 but with 46:1 President with stainless steel lower.

233030 46:1 President single-post ram assembly; no ram plate.

Bare Pump Modules

222782 **23:1 Monark, Carbon Steel Lower**

222839 **23:1 Monark, Stainless Steel Lower**

222783 **46:1 President, Carbon Steel Lower**

222907 **46:1 President, Stainless Steel Lower**

Check-Mate 200 Displacement Pump

222771 **Carbon Steel Lower**

222814 **Stainless Steel Lower**

Check-Mate 200
Priming Piston Fluid Pumps

Accessories

222781 **Single-Post, 5 gal (19 l) Pail Ram**
Includes pail ram and extender kit (223889). Use with Wiper Plate (222812 or 222909).

224137 **Pneumatic Elevator Cart**
Uses air pressure to raise pump from 5 gal (19 l) pail. Use with wiper plate (222812 or 222909). Cart accessory kit (224376) required.

224376 **Cart Accessory Kit**
Mounts a Check-Mate 200 pump on pneumatic elevator cart (224137).

222812 **5 gal (19 l) Wiper Plate**

222909 **5 gal (19 l) Wiper Plate (SST)**
For use with pail ram or pneumatic cart.

223689 **Plastic Shields, 5 gal (19 l) size**
10 per pack. Protects plate and simplifies clean-up.

207279 **55 gal (200 l) Ram**
For 23:1 Monark and 46:1 President. Requires mounting kit (224829).

224829 **Mounting Kit**
To mount 23:1 Monark and 46:1 pumps President on a 55 gal (200 l) ram.

223881 **Ram Accessory Kit**
Provides air hose and air line fittings to mount 23:1 Monark and 46:1 President on 55 gal (200 l) ram.

Repair Kits

222784 **Seal Repair Kit (for CS lowers)**

222972 **Seal Repair Kit (for SST lowers)**
Includes all pump seals and O-rings, except throat packings.

222785 **Throat Packing Repair Kit**
UHMWPE/PTFE. Includes V-packings and glands.

222798 **Intake Seat Repair Kit (for CS)**

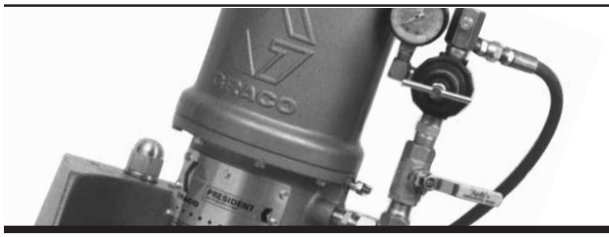
222784 **Seal Conversion Kit**
For stainless steel lowers. Converts piston and intake seals to UHMWPE. Includes seals and O-rings.

222786 **Throat Packing Conversion Kit**
To convert pump throat to all-PTFE packings. V-packing and glands.

Air Motor Service Kits

206728 **For Monark**

207385 **For President**



Check-Mate® 450

Priming Piston Transfer Pumps

Check-Mate 450 provides flow rates to 1.7 gpm (6.44 lpm) and operating pressures to 5000 psi (345 bar, 34.5 MPa).

Features & Benefits

- Severe Duty™ rod and cylinder for durability
- Large internal porting for maximum flow
- Floating piston seal and priming plate improve balance and performance
- Maintains balance over a wide viscosity range
- Minimal bead distortion for critical dispensing of expensive materials

Typical Applications

- Dispensing of silicone, latex or acrylic sealants
- Feed pumps for 2-component epoxy or urethane materials
- Dispensing of greases and other lubricants

Typical Fluids Handled

- Sealants
- Adhesives
- Inks
- Mastics
- Lubricants

222770
10:1 Monark

222769
34:1 Senator

222768
20:1 President

222778
55:1 Bulldog

Check-Mate 450

Priming Piston Transfer Pumps

Technical Specifications

Maximum fluid output pressure	
10:1 Monark	1800 psi (125 bar, 12.5 MPa)
20:1 President	4600 psi (317 bar, 31.7 MPa)
34:1 Senator	4100 psi (283 bar, 28.3 MPa)
55:1 Bulldog	5000 psi (345 bar, 34.5 MPa)
Maximum fluid flow @ 60 cpm	
10:1 Monark	1.0 gpm (3.8 lpm)
20:1 President	1.2 gpm (4.5 lpm)
34:1 Senator	1.7 gpm (6.5 lpm)
55:1 Bulldog	1.7 gpm (6.5 lpm)
Maximum air input pressure	
10:1 Monark, President 20:1	180 psi (12.6 bar, 1.26 MPa)
34:1 Senator	120 psi (8.3 bar, 0.83 MPa)
55:1 Bulldog	90 psi (6.2 bar, 0.62 MPa)
Fluid outlet size	
10:1 Monark	3/4 npt(m)
20:1 President, 34:1 Senator, 55:1 Bulldog	3/4 npt(m)
Air inlet size (bare pump)	
10:1 Monark	3/8 npt(f)
20:1 President	1/2 npt(f)
34:1 Senator, 55:1 Bulldog	3/4 npsm(f)
Packings	
Throat	UHMWPE/PTFE
Piston	UHMWPE
Rod and cylinder	Severe Duty™ (chrome over stainless steel)
Other wetted parts	CS; Delrin®; 304, 316 and 17-4 PH SST; ductile iron; zinc and nickel plating
Overall length (bare pump)	
10:1 Monark	46.25 in (119 cm)
20:1 President	49.25 in (125 cm)
20:1 President Stubby	44 in (112 cm)
34:1 Senator	55 in (140 cm)
34:1 Senator Stubby	52 in (133 cm)
55:1 Bulldog	55 in (140 cm)
55:1 Bulldog Stubby	52 in (133 cm)
Weight (pump only)	
10:1 Monark	45 lbs (21.0 kg)
20:1 President	50 lbs (22.7 kg)
34:1 Senator	100 lbs (45.5 kg)
55:1 Bulldog	100 lbs (45.5 kg)
Instruction manual	
Carbon steel	308017
Cart mounted pump	308087
Ram mounted pump 5 gal (19 l)	308026
Ram mounted pump 55 gal (200 l)	308027

Delrin® is a registered trademark of Du Pont.

Check-Mate 450

Priming Piston Transfer Pumps

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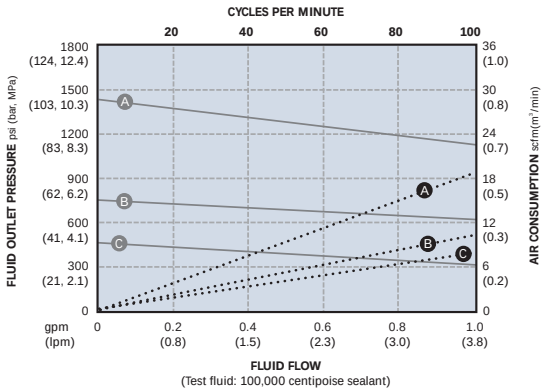
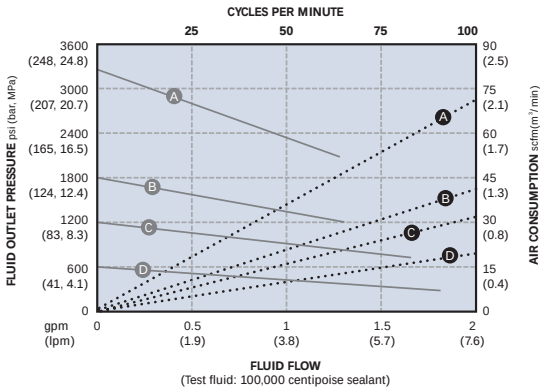
Performance Chart for 10:1 Monark Pump



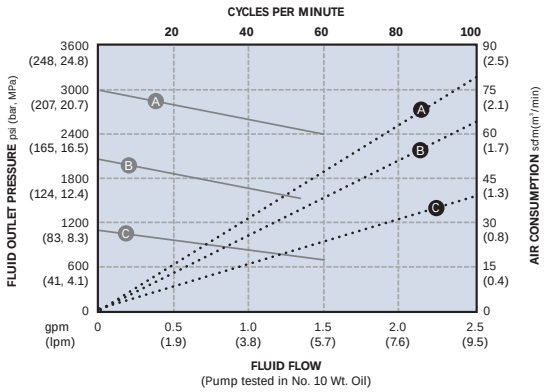
AIR PRESSURES	LEGEND
Ⓐ = @ 180 psi (12.4 bar, 1.2 MPa)	Air Consumption.....
Ⓑ = @ 100 psi (7 bar, 0.7 MPa)	Fluid Flow _____
Ⓒ = @ 70 psi (4.8 bar, 0.5 MPa)	

Performance Chart for 20:1 President Pump



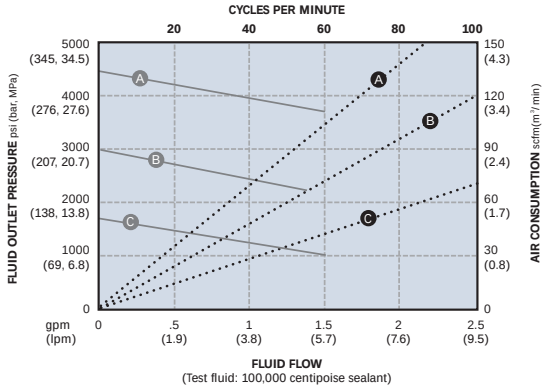
AIR PRESSURES	LEGEND
Ⓐ = @ 180 psi (12 bar, 1.2 MPa)	Air Consumption.....
Ⓑ = @ 100 psi (7.0 bar, 0.7 MPa)	Fluid Flow _____
Ⓒ = @ 70 psi (4.8 bar, 0.5 MPa)	
Ⓓ = @ 40 psi (2.8 bar, 0.3 MPa)	

Performance Chart for 34:1 Senator Pump



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

Performance Chart for 55:1 Bulldog Pump



AIR PRESSURES	LEGEND
Ⓐ = @ 90 psi (6.2 bar, 0.6 MPa)	Air Consumption ....
Ⓑ = @ 70 psi (4.8 bar, 0.5 MPa)	Fluid Flow _____
Ⓒ = @ 40 psi (2.8 bar, 0.3 MPa)	

Check-Mate 450

Priming Piston Transfer Pumps

Ordering Information

3 in (7.6cm) Dual-Post Ram Packages for 55 Gallon (200 l) Drums

970022 Tandem 55:1 Bulldog Ram Pumps (EPDM tire seal material) with Pneumatic Crossover includes: follower plates, outlet check valves and supply hoses with shutoff valves.

970023 Tandem 55:1 Bulldog Ram Pumps (EPDM tire seal material) with Electric Crossover includes: follower plates, drum empty light kit, outlet check valves and supply hoses with shutoff valves.

970024 Single 55:1 Bulldog Ram Pump (EPDM tire seal material) with Pneumatic Low-Level Shutoff includes: follower plate, outlet check valve and supply hose with shutoff valve.

223816 Includes 10:1 Monark pump with air regulator, 55 gal (200 l) dual-post ram with air-regulator, ram plate and drum clamps.
Note: Not assembled at factory.

223817 Includes 20:1 President pump with air regulator, 55 gal (200 l) dual-post ram with air regulator, ram plate and drum clamps.

223818 Includes 34:1 Senator pump with air regulator, 55 gal (200 l) dual-post ram with air regulator, ram plate and drum clamps.

223819 Includes 55:1 Bulldog pump with air regulator, 55 gal (200 l) dual-post ram with air regulator, ram plate and drum clamps.

224661 Same as 223818 with quiet air motor.
Note: Not assembled at factory.

224662 Same as 223819 with quiet air motor.
Note: Not assembled at factory.

Cart-Mounted Single-Post Inductor Packages for 5 Gallon (19 l) Pails

231144 Includes 10:1 Monark pump with 5-gal (19 l) inductor plate, air regulator and cart.

231146 Includes 20:1 President pump with 5 gal (19 l) ram plate, inductor regulator and cart.

231145 Same as 231144 with hose and gun (207945).

231147 Same as 231146 with hose and gun (207945).

C50256 Includes 20:1 President pump, cart, tefon-lined hose, 3 ft (10.9 m) extension wand and applicator nozzle and pistol grip gun (C27020).

Stationary, Single-Post Ram Packages for 5 Gallon (19 l) Pails

231113 Includes 10:1 Monark pump, 5 gal (19 l) ram plate and air regulator.

231111 Includes 20:1 President pump, 5 gal (19 l) ram plate and air regulator.

231112 Includes 34:1 Senator pump, 5 gal (19 l) ram plate and air regulator.

231115 Includes 55:1 Bulldog pump, 5 gal (19 l) ram plate and air regulator.

231167 Same as 231115 with quiet air motor.

233028 20:1 President pump on single-post ram; no ram plate.

233029 55:1 Bulldog pump on single-post ram; no ram plate.

3 in (7.6cm) Dual-Post Ram Packages for 5 Gallon (19 l) Drums or 30 l (8 gal) Pails

970249 55:1 Quiet Bulldog with 30 l ram plate, outlet hose and ball valve (241083 base unit)

231111 55:1 Quiet Bulldog with 5 gal (19 l) plate, outlet check valves.

Bare Pump Modules

222770 10:1 Monark

222768 20:1 President

237207 20:1 President Stubby

222769 34:1 Senator

224660 34:1 Senator with RIQ*

237492 34:1 Senator Stubby

237780 34:1 Senator Stubby with RIQ

222778 55:1 Bulldog

222813 55:1 Bulldog with RIQ

237208 55:1 Bulldog Stubby

237779 55:1 Bulldog Stubby with RIQ

***RIQ = reduced icing quiet**

Check-Mate 450 Displacement Pump

222790 Long stroke UHMWPE and PTFE

235540 Long stroke PTFE

237206 Short stroke UHMWPE and PTFE (for President Stubby)

237450 Short stroke UHMWPE and PTFE (Senator and Bulldog Stubby)

Check-Mate 450

Priming Piston Transfer Pumps

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Accessories

Repair Kits

222773 **Seal Repair Kit**
Includes all UHMWPE pump seals and O-rings, except throat packings.

222774 **Throat Packing Repair Kit**
UHMWPE/PTFE. Includes V-packings and glands.

222793 **Intake Seat Repair Kit**
Valve body and seals.

222775 **Throat Packing Conversion Kit**
To convert pump throat to all-PTFE packings, V-packing and glands.

184302 **Alternative Leather Throat Packing**
Requires 5 per pump.

237916 **Throat Packing Conversion Kit**
Leather and UHWPE packings.

Air Motor Repair Kits

206728 **Monark**

207385 **President**

218122 **Senator**

206734 **Bulldog**

243421 **President Muffler Kit**
For noise levels under 80 dBA.

Mounting Accessories

222780 **Floor Stand**
Includes ball valve and mounting kit (222776).

207279 **55 gal (200 l) Ram**
Includes follower plate. Requires pump mounting kit.

222776 **Mounting Kit**
Includes bolts, lugs and gasket for mounting pump to floor stand, ram or inductor.

222812 **5 gal (19 l) Carbon Steel Wiper Plate**

222909 **5 gal (19 l) Stainless Wiper Plate**

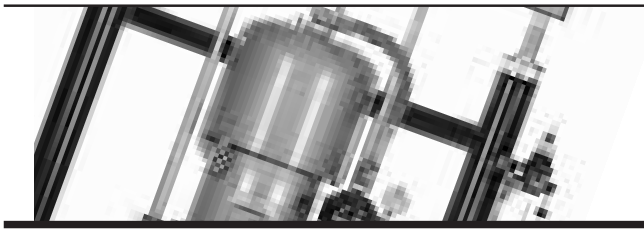
191991 **55 gal (200 l) Carbon Steel Plate**

Plate Shields

10 per pack. Protects plate and simplifies clean-up.

223689 **5 gal (19 l)**

222792 **55 gal (200 l)**



Check-Mate® 800

CS and SST Priming Piston Fluid Pumps

Check-Mate 800 pumps provide flow rates to 2.8 gpm (10.6 lpm) and operating pressures to 5850 psi (403 bar, 40.3 MPa).

Features and Benefits

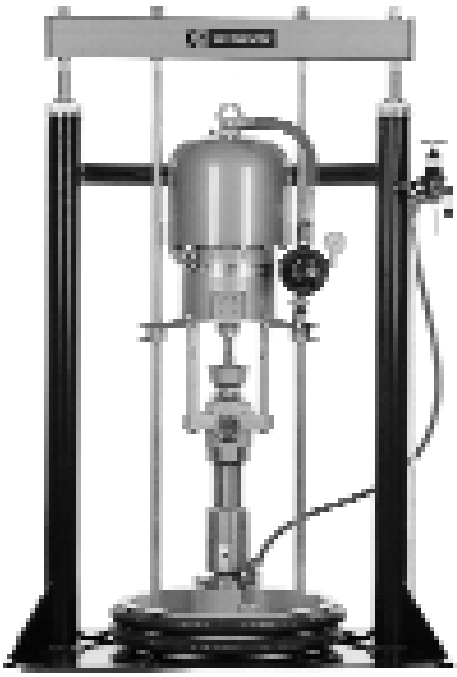
- Available in Severe Duty Carbon Steel and Stainless Steel models
- 55 gal (200 l) or 5 gal (19 l) ram systems available
- 19:1 Senator, 31:1 Bulldog, and 65:1 King fluid power ratios
- High flow and pressures increase production
- High output per cycle reduces wear for longer life and lower repair costs
- Floating piston seal and flow-through priming plate improves pump loading of high viscosity materials

Typical Applications

- Feeding applicators, meters or proportioners directly from pails or drums
- Transferring sealants or adhesives to one or more operator dispensing stations
- Transferring viscous chemicals in the formulation of high viscosity materials
- Packaging drums, pails, caulking tubes or chubs

Typical Fluids Handled

- Acrylics
- Butyl
- Epoxy
- Inks
- Lubricants
- PVC Sealers
- Silicones
- Urethanes



236472
65:1 King

Check-Mate 800

CS and SST Priming Piston Fluid Pumps

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Technical Specifications

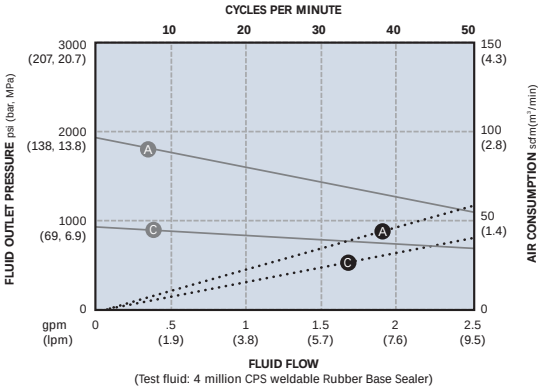
Maximum fluid outlet pressure:	
65:1 King Check-Mate	5850 psi (403 bar, 40.3 MPa)
31:1 Bulldog Check-Mate	3100 psi (214 bar, 21.4 MPa)
19:1 Senator Check-Mate	2280 psi (157 bar, 15.7 MPa)
Fluid flow at 60 cpm	2.8 gpm (10.6 lpm)
Volume per cycle	11.7 in^3 (192 cm^3)
Pump cycles per 1 gal (3.8 l)	21
Maximum operating temperature	150°F (66°C)
Maximum air inlet pressure:	
65:1 King Check-Mate	90 psi (6.2 bar, 0.62 MPa)
31:1 Bulldog Check-Mate	100 psi (7 bar, 0.7 MPa)
19:1 Senator Check-Mate	120 psi (8.4 bar, 0.84 MPa)
Fluid outlet size	1 npt(f)
Air inlet size	3/4 npsm(f)
Wetted parts	*Carbon steel; chrome; zinc; and nickel-plating; 304, 316, 440, and 17-4 PH grades of SST; alloy steel; ductile iron; PTFE; glass-filled PTFE; UHMWPE
Stroke length	4.75 in (120 mm)
Displacement pump effective area	1.24 in^2 (8 cm2)
Weight	160 lbs (73 kg)
Displacement pump weight	81 lbs (37 kg)
Instruction manual	
Carbon steel	308351
Stainless steel	308352
3 in (7.6 cm), 55 gal (200 l) ram modules	308027
Ram mounted, 5 gal (19 l), 30 l (8 gal) pumps	310526
6.5 in (16.5 cm), ram modules, 55 gal (200 l)	310524

* Not included in Stainless Steel Pump.

Check-Mate 800

CS and SST Priming Piston Fluid Pumps

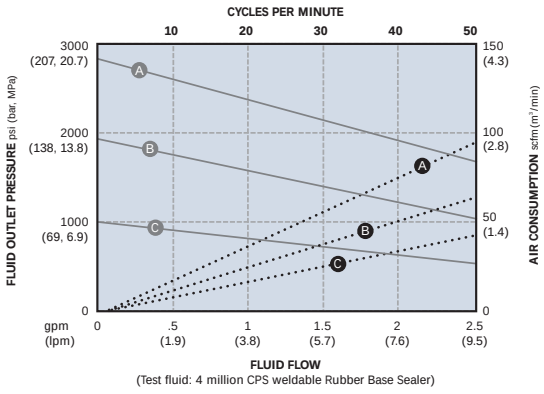
Performance Chart for 19:1 Senator Check-Mate 800 Pump



(Test fluid: 4 million CPS weldable Rubber Base Sealer)

AIR PRESSURES	LEGEND
Ⓐ = @ 120 psi (8.3 bar, 0.8 MPa)	Air Consumption ....
Ⓑ = @ 100 psi (7 bar, 0.7 MPa)	Fluid Flow ————
Ⓒ = @ 70 psi (4.8 bar, 0.5 MPa)	

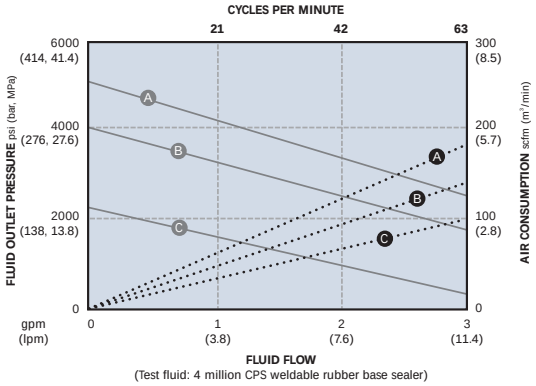
Performance Chart for 31:1 Bulldog Check-Mate 800 Pump



(Test fluid: 4 million CPS weldable Rubber Base Sealer)

AIR PRESSURES	LEGEND
Ⓐ = @ 100 psi (6.2 bar, 0.6 MPa)	Air Consumption ....
Ⓑ = @ 70 psi (4.8 bar, 0.5 MPa)	Fluid Flow ————
Ⓒ = @ 40 psi (2.8 bar, 0.3 MPa)	

Performance Chart for 65:1 King Check-Mate 800 Pump



(Test fluid: 4 million CPS weldable rubber base sealer)

AIR PRESSURES	LEGEND
Ⓐ = @ 90 psi (6.2 bar, 0.6 MPa)	Air Consumption ....
Ⓑ = @ 70 psi (4.8 bar, 0.5 MPa)	Fluid Flow ————
Ⓒ = @ 40 psi (2.8 bar, 0.3 MPa)	

Check-Mate 800

CS and SST Priming Piston Fluid Pumps

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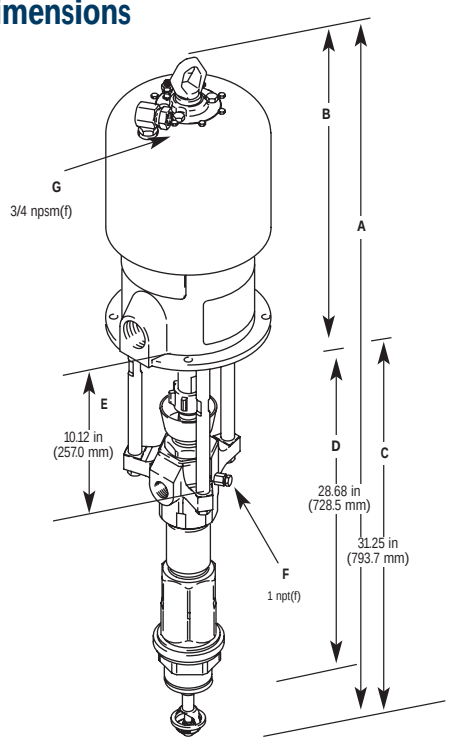
Dimensions



236471

Model	A	B
236471 **65:1 King, CS**	54.20 in (1377 mm)	22.95 in (583 mm)
237265 **65:1 King, RIQ, CS**	54.33 in (1383 mm)	23.21 in (590 mm)
240945 **65:1 Quiet King, CS**	54.33 in (1383 mm)	23.21 in (590 mm)
237261 **31:1 Bulldog, CS**	52.68 in (1338 mm)	21.42 in (544 mm)
237274 **31:1 Bulldog, RIQ, CS**	54.65 in (1388 mm)	23.43 in (595 mm)
237264 **19:1 Senator, CS**	52.80 in (1341 mm)	21.57 in (548 mm)

RIQ = Reduced Icing Quiet

Check-Mate 800

CS and SST Priming Piston Fluid Pumps

Ordering Information

55 Gallon (200 l) with 6.5 in (16.5 cm) Dual-Post Ram

918313 **65:1 King Ram Pump**
SST lower, PVC plate, air controls.

918314 **65:1 Quiet King Ram Pump**
EPDM plate, air controls and SST lower.

918597 **65:1 King Ram Pump**
CS lower, EPDM wiper and air controls.

970086 **Tandem 65:1 King Ram Pumps (PVC) with Pneumatic Crossover**
Includes: (2) 55 gal (200 l), 6.5 in (16.5 cm) dual-post rams; 55 gal (200 l) PVC follower plates and pneumatic crossover control; outlet check valves and (2) 1-1/4 in (31.8 mm) x 10 ft (3 m) supply hoses with shutoff valves.

970088 **Single 65:1 King Ram Pump (PVC) with Pneumatic Low-Level Shutoff**
Includes: (1) 55 gal (200 l), 6.5 in (16.5 cm) dual-post ram with low-level shutoff; 55 gal (200 l) PVC follower plate; outlet check valve, and (1) 1-1/4 in (31.8 mm) x 10 ft (3 m) supply hose with shutoff valve.

970204 **Tandem 65:1 Quiet King Ram Pumps (EPDM) with Pneumatic Crossover**
Includes: (2) 55 gal (200 l), 6.5 in (16.5 cm) dual-post rams; 55 gal (200 l) EPDM follower plates and pneumatic crossover control; outlet check valves, and (2) 1-1/4 in (31.8 mm) x 10 ft (3 m) supply hoses with shutoff valves.

970205 **Tandem 65:1 Quiet King Ram Pumps (EPDM) with Electric Crossover**
Includes: (2) 55 gal (200 l), 6.5 in (16.5 cm) dual-post rams; 55 gal (200 l) EPDM follower plates and electric crossover control with drum empty light kit; outlet check valves and (2) 1-1/4 in (31.8 mm) x 10 ft (3 m) supply hoses with shutoff valves.

970206 **Single 65:1 Quiet King Ram Pumps (EPDM) with Pneumatic Low-Level Shutoff**
Includes: (1) 55 gal (200 l), 6.5 in (16.5 cm) dual-post ram with low-level shutoff; 55 gal (200 l) EPDM follower plate; outlet check valve and (1) 1-1/4 in (31.8 mm) x 10 ft (3 m) supply hose with shutoff valve.

687105 **Single 65:1 King CS Pump**
With outlet check valve, applicator hand. “Road Hog” package.

55 Gallon (200 l) with 3 in (7.6 cm) Dual-Post Ram

236472 **65:1 King Ram Pump**
EPDM plate, air controls, CS lower.

C59521 **65:1 King Ram Pump**
EPDM plate, CS lower, check valve kit on pump outlet, enhanced bleed handle and blow off.

918552 **31:1 Bulldog Ram Pump**
PVC wiper, air controls, CS lower.

686537 **31:1 Bulldog Ram Pump**
PVC plate, air controls, SST lower.

970019 **Tandem 65:1 King Ram Pumps (EPDM) with Pneumatic Crossover**
Includes: (2) 55 gal (200 l), 3 in (7.6 cm) dual- post rams; 55 gal (200 l) EPDM follower plates and pneumatic crossover control; outlet check valves and (2) 1-1/4 in (31.8 mm) x 10 ft (3 m) supply hoses with shutoff valves.

970020 **Tandem 65:1 King Ram Pumps (EPDM) with Electric Crossover**
Includes: (2) 55 gal (200 l), 3 in (7.6 cm) dual- post rams; 55 gal (200 l) EPDM follower plates and electric crossover control with drum empty light kit; outlet check valves and (2) 1-1/4 in (31.8 mm) x 10 ft (3 m) supply hoses with shutoff valves.

970021 **Single 65:1 King Ram Pump (EPDM) with Pneumatic Low-Level Shutoff**
Includes: (1) 55 gal (200 l); 3 in (7.6 cm) dual- post ram with low-level shutoff; 55 gal (200 l) EPDM follower plate; outlet check valve and (1) 1-1/4 in (31.8 mm) x 10 ft (3 m) supply hose with shutoff valve.

970074 **Single 65:1 King Ram Pump/Hose/Gun**
Includes: 55 gal (200 l); 65:1 King 3 in (7.6 cm) dual-post ram pump with 1/2 in (12.7 mm) x 15 ft (4.6 m) fluid dispense hose; straight swivel and Ultra-Lite 6000 manual dispense gun with nozzle.

55/5 Gallon (200/19 l) with 55 Gallon (200 l) 3 in (7.6 cm) Dual-Post Ram

970025 **Tandem 65:1 King Ram Pumps with Pneumatic Crossover**
Includes: (2) 55 gal (200 l) 3 in (7.6 cm) dual-post rams; 5 gal (19 l) follower plates and pneumatic crossover control; outlet check valves and (2) 1-1/4 in (31.8 mm) x 10 ft (3 m) supply hoses with shutoff valves.

970026 **Tandem 65:1 King Ram Pumps with Electric Crossover**
Includes: (2) 55 gal (200 l), 3 in (7.6 cm) dual-post rams; 5 gal (19 l) follower plates and electric crossover control with drum empty light kit; outlet check valve, and (2) 1-1/4 in (31.8 mm) x 10 ft (3 m) supply hoses with shutoff valves.

970027 **Single 65:1 King Ram Pumps with Pneumatic Low-Level Shutoff**
Includes: (1) 55 gal (200 l), 3 in (7.6 cm) dual post ram with low-level shutoff; 5 gal (19 l) follower plate; outlet check valve and (1) 1-1/4 in (31.8 mm) x 10 ft (3 m) supply hose with shutoff valve.

Check-Mate 800 Ram Packages

CS and SST Priming Piston Fluid Pumps

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Ordering Information, continued

5 Gallon (19 l) with 3 in (7.6 cm) Dual-Post Ram

970018 **Single 65:1 King Ramp/Pump/Hose/Gun**
Includes: 5 gal (19 l); 65:1 King, 3 in (7.6 cm) dual-post ram pump on casters; 1/2 in (12.7 mm) x 15 ft (4.6 m) fluid dispense hose; straight swivel; and Ultra-Lite 6000 manual dispense gun with nozzle.

970031 **Single 65:1 King Ram Pump**
Includes: (1) 5 gal (19 l), 3 in (7.6 cm) dual- post ram; 5 gal (19 l) follower plate; outlet check valve and (1) 1-1/4 in (31.8 mm) x 10 ft (3 m) supply hose with shutoff valve.

918372 **Single 65:1 King Ram Pump**
Includes: PVC follower plate and air control, outlet check valve assembly.

918371 **Single 31:1 Bulldog Ram Pump**
Includes: PVC tire follower plate and air control.

686997 **Floor Stand Mounted 31:1 Bulldog**
Includes: ball valve, pump adapter, mounting kit, 236471 pump.

Bare Pump Modules

236471 **65:1 King**
Carbon steel, Severe-Duty

237265 **65:1 King**
Carbon steel, Severe-Duty, RIQ*

240945 **65:1 King**
Quiet air motor, carbon steel lower

236462 **65:1 King**
Stainless steel, Severe-Duty

237261 **31:1 Bulldog**
Carbon steel, Severe Duty

237274 **31:1 Bulldog**
Carbon steel, Severe-Duty, RIQ*

237264 **19:1 Senator**
Carbon steel, Severe-Duty

** RIQ = Reduced Icing Quiet*

Displacement Pumps

236611 **Carbon Steel Module**

236612 **Stainless Steel Module**

Accessories

235417 **Conversion Kit**
Includes tie rods and parts necessary to connect displacement pump to existing Bulldog air motor.

208804 **Air Motor Silencer for Bulldog and King**
Encloses motor to reduce exhaust noise.

222780 **Floor Stand Base**

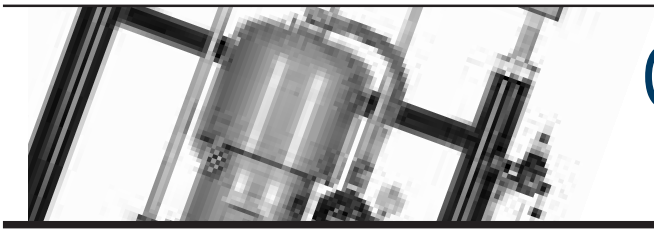
233087 **6.5 in (16.5 cm) Bare Dual-Post Ram Module**

918309 **Pump and Plate Mounting Kit**
Includes tie rods and motor mounting.

222864 **Pump Repair Kit, Carbon Steel Pumps**
UHMPE/PTFE throat and intake packages.

237945 **Pump Repair Kit**
PTFE throat and intake packages.

222866 **Pump Repair Kit, SST Pumps**
PTFE throat and intake packages.



Check-Mate® 1000

Priming Piston Fluid Pumps

Check-Mate 1000 provides flow rates to 3.8 gpm (14.4 lpm) and operating pressures to 5850 psi (404 bar, 40.4 MPa).

Features and Benefits

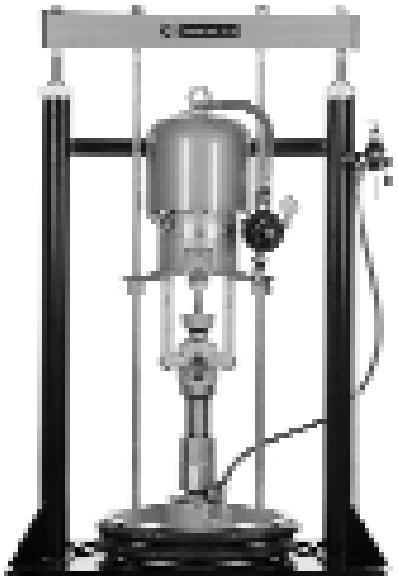
- Available in Severe Duty carbon steel and stainless steel models
- 55 gal (200 l) ram systems available in 50:1 King and 80:1 Premier fluid power ratios
- High flow and pressures increase production
- High output per cycle reduces wear for longer life and lower repair costs
- Exclusive air valve design decreases pump changeover time and minimizes icing
- Floating piston seal and flow-through priming plate improves pump loading of high viscosity materials

Typical Applications

- Transferring sealants and adhesives to multiple operator dispensing stations
- Transferring viscous chemicals in the formulation of high viscosity materials
- Packaging drums, pails, caulking tubes or chubs
- Feeding high volume applicators, multiple meters or proportioners

Typical Fluids Handled

- Acrylics
- Butyl
- Caulking Compounds
- Epoxy
- Inks
- PVC Sealers
- Silicones
- Urethanes



686695
50:1 King

Check-Mate 1000

Priming Piston Fluid Pumps

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Technical Specifications

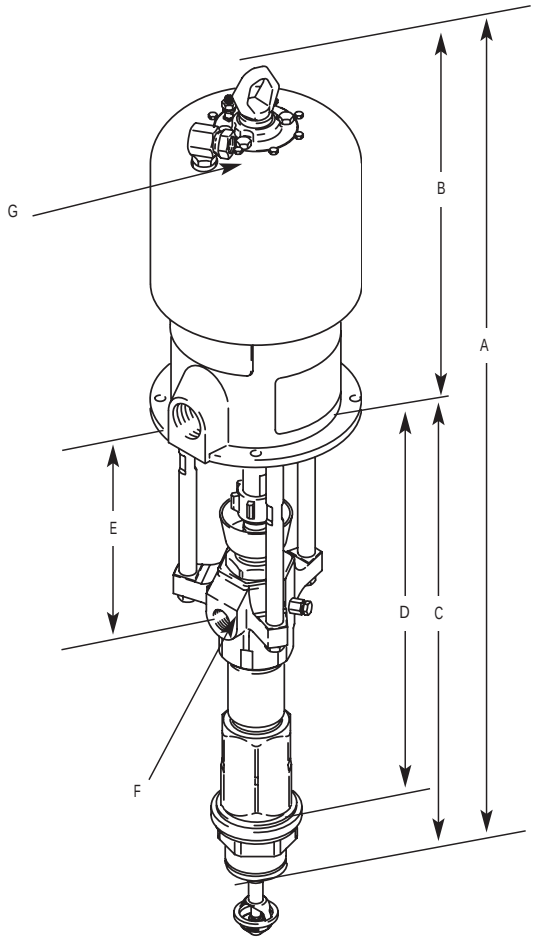
Maximum fluid outlet pressure:	
50:1 King	4500 psi (311 bar, 31.1 MPa)
80:1 Premier	5850 psi (404 bar, 40.4 MPa)
Fluid flow at 60 cpm	3.8 gpm (14.4 lpm)
Volume per cycle	14.7 in^3 (240 cm^3)
Pump cycles per 1 gal (3.8 ls)	16
Maximum operating temperature	150°F (66°C)
Maximum air inlet pressure:	
50:1 King	90 psi (6.2 bar, 0.62 MPa)
80:1 Premier	73 psi (5 bar, 0.5 MPa)
Fluid outlet size	1 npt(f)
Air inlet size	
50:1 King	3/4 npsm(f)
80:1 Premier	1 npt(f)
Wetted parts	
Carbon steel	Carbon steel; chrome; zinc; and nickel plating; 304, 316, 440, and 17-4 PH grades of SST; alloy steel; ductile iron; PTFE; glass-filled PTFE; UHMWPE
Stainless steel	Chrome; zinc and nickel plating; 304, 316, 440, 440C, PH 13-8 MO, and 17-4 PH grades of stainless steel; PTFE; glass-filled PTFE and UHMWPE
Stroke length	4.75 in (120 mm)
Displacement pump effective area	1.55 in^2 (10 cm^2)
Weight	160 lbs (73 kg)
Displacement Pump weight	81 lbs (37 kg)
Instruction manuals	
Carbon steel	308355
Stainless steel	308356
Ram modules	310524

Check-Mate 1000

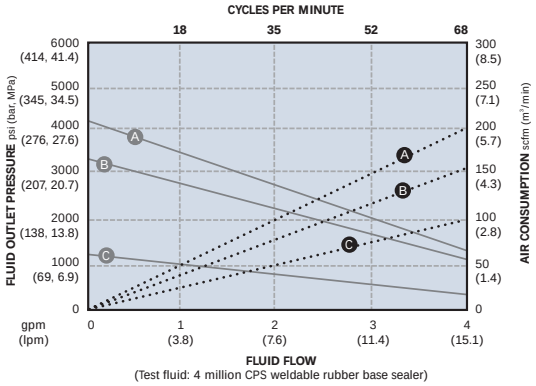
Priming Piston Fluid Pumps

Dimensions

Model	Motor	A	B	C	D	E	F	G
237707 237708	King	54.20 in (1377 mm)	22.95 in (583 mm)	31.25 in (794 mm)	25.61 in (651 mm)	10.12 in (257 mm)	1 npt(f)	3/4 npsm(f)
237518 237520	Premier	53.06 in (1349 mm)	16.88 in (429 mm)	36.18 in (919 mm)	30.75 in (781 mm)	15.26 in (387 mm)	1 npt(f)	1 npsm(f)

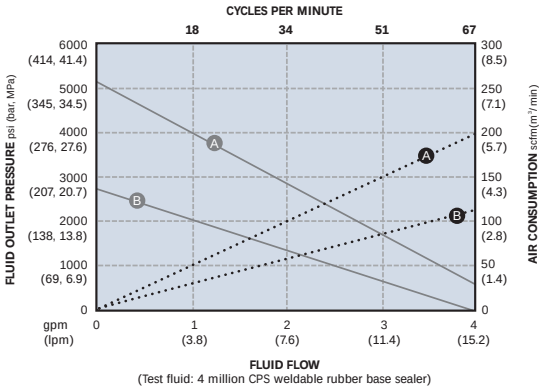


Performance Chart for 50:1 King Pump



AIR PRESSURES	LEGEND
Ⓐ = @ 90 psi (6.2 bar, 0.6 MPa)	Air Consumption ....
Ⓑ = @ 70 psi (4.8 bar, 0.5 MPa)	Fluid Flow ————
Ⓒ = @ 40 psi (2.8 bar, 0.3 MPa)	

Performance Chart for 80:1 Premier Pump



AIR PRESSURES	LEGEND
Ⓐ = @ 73 psi (5 bar, 0.5MPa)	Air Consumption ....
Ⓑ = @ 40 psi (2.8 bar, 0.3 MPa)	Fluid Flow ————

Check-Mate 1000
Priming Piston Fluid Pumps

1

Ordering Information

55 gal (200 l) with 6.5 in (16.5 cm) Dual Post Ram

918315 **50:1 King**
CS pump with EPDM plate, air controls

918316 **80:1 Premier**
CS pump with EPDM plate, air controls

970187 **Single 80:1 Premier**
CS pump with pneumatic low-level shutoff

970185 **Tandem 80:1 Premier**
CS pump with pneumatic crossover

55 gal (200 l) with 3 in (7.6 cm) Dual Post Ram

686965 **50:1 King**
CS pump with EDPM wipers

5 gal (19 l) with 3 in (7.6 cm) Dual Post Ram

918378 **50:1 King, EDPM wiper plate, air controls**

918379 **50:1 King, PVC wiper plate, air controls**

918380 **50:1 King SST, EDPM wiper plate, air controls**

Bare Pump Modules

237707 **50:1 King Check-Mate Pump, Severe Duty, CS**

237708 **50:1 King Check-Mate Pump, Severe Duty, SST**

237518 **80:1 Premier Check-Mate Pump, Severe Duty, CS**

237520 **80:1 Premier Check-Mate Pump, Severe Duty, SST**

Displacement Pumps

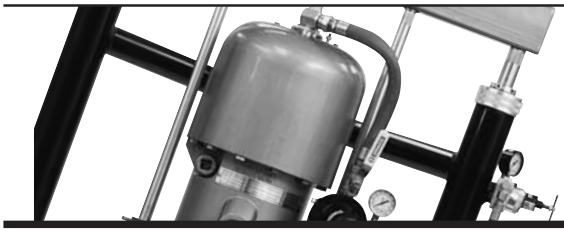
222954 **Carbon Steel Model**

236613 **Stainless Steel Model**

Repair Kits

222869 **Pump Repair Kit, CS Pumps**
UHMPE/PTFE throat and intake seals.

222871 **Pump Repair Kit, SST Pumps**
All PTFE throat and intake seals.



Check-Mate® 2100

Priming Piston Fluid Pump

Check-Mate 2100 provides flow rates to 7.5 gpm (28.4 lpm) and operating pressures to 3900 psi (269 bar, 26.9 MPa).

Features and Benefits

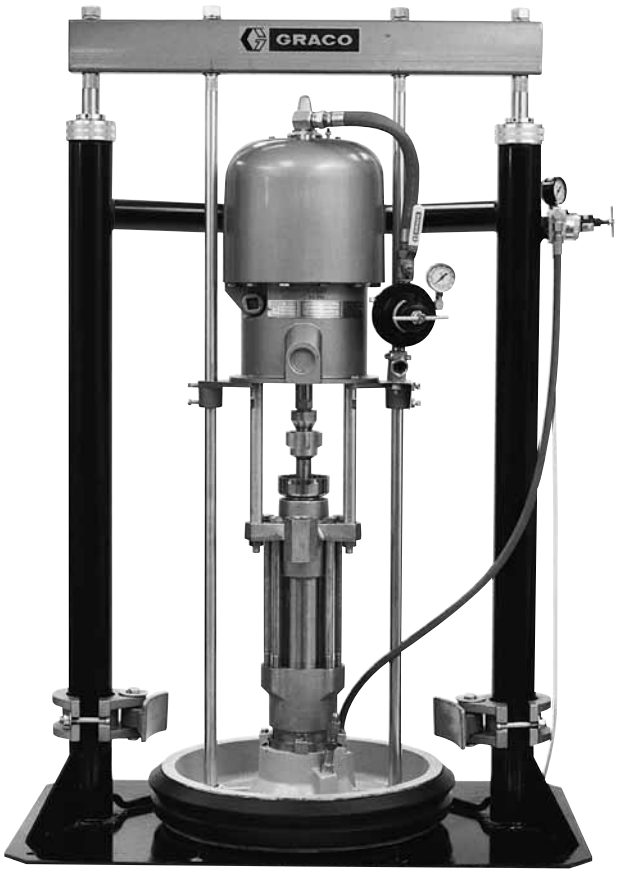
- Available in Severe Duty Carbon Steel and Stainless Steel models
- High flow and fluid pressures increase production
- High output per cycle reduces wear for longer life and lower repair costs
- Exclusive air valve design decreases changeover time and minimizes icing
- Floating piston seal and priming plate improve pump loading of high viscosity materials

Typical Applications

- Transferring sealants or adhesives to multiple operator dispensing stations
- Transferring viscous chemicals
- Feeding high volume applicators, multiple meters or proportioners
- Transferring offset inks to printing presses

Typical Fluids Handled

- Acrylics
- Butyl
- Caulking compounds
- Epoxy
- Inks
- Lubricants
- PVC sealers
- Silicones
- Urethanes



235836
24:1 King

Check-Mate 2100

Priming Piston Fluid Pumps

1

Technical Specifications

Maximum air inlet pressure	100 psi (7 bar, 0.7 MPa)
Air inlet	3/4 npsm(f)
Fluid outlet	1-1/2 npt(m)
Packings	
Throat and intake	UHMWPE and PTFE
Piston	UHMWPE
Wetted parts	
CS lower	CS, zinc, nickel, SST, iron, Delrin®, PTFE, UHMWPE
SST lower	SST, Delrin, PTFE, UHMWPE
Maximum flow at 60 cpm	7.5 gpm (28.4 lpm)
Air motor piston diameter	12.64 in (321mm)
Weight	
Premier CM 2100	248 lbs (113 kg)
King CM 2100	160 lbs (73 kg)
Bulldog CM 2100	142 lbs (65 kg)
Check-Mate 2100 instruction manuals	
All CS models	308149
All SST models	308150
All 6.5 in (16.5 cm) ram modules	310524
All 3 in (7.6 cm) ram modules	3080270

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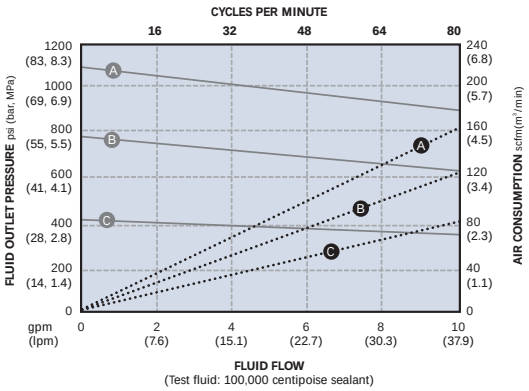
Check-Mate 2100

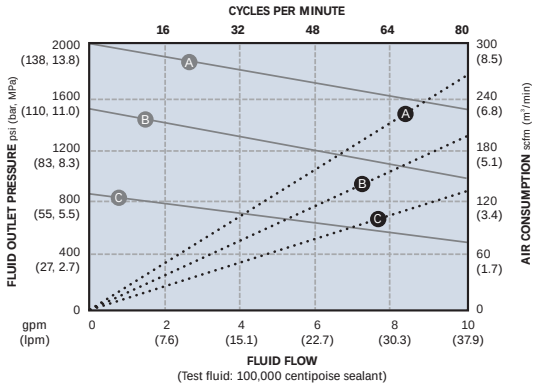
Priming Piston Fluid Pumps

Performance Chart for 12:1 Bulldog Pump



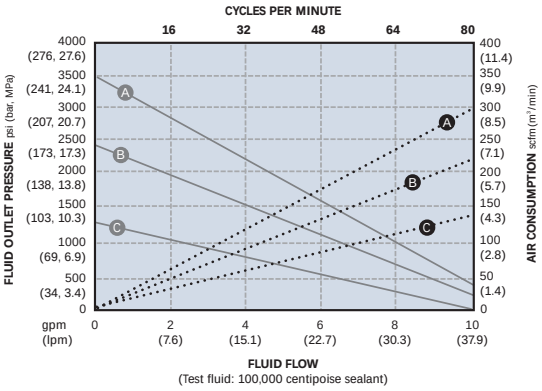
AIR PRESSURES	LEGEND
Ⓐ = @ 100 psi (7.0 bar, 0.7 MPa)	Air Consumption .....
Ⓑ = @ 70 psi (4.8 bar, 0.5 MPa)	Fluid Flow ————
Ⓒ = @ 40 psi (2.8 bar, 0.3 MPa)	

Performance Chart for 24:1 King Pump



AIR PRESSURES	LEGEND
Ⓐ = @ 90 psi (6.2 bar, 0.6 MPa)	Air Consumption ....
Ⓑ = @ 70 psi (4.8 bar, 0.5 MPa)	Fluid Flow ————
Ⓒ = @ 40 psi (2.8 bar, 0.3 MPa)	

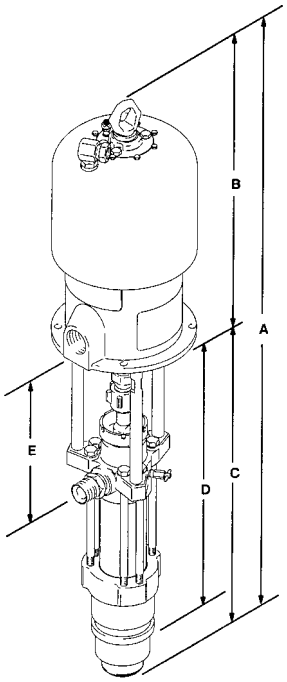
Performance Chart for 39:1 Premier



AIR PRESSURES	LEGEND
Ⓐ = @ 100 psi (7 bar, 0.7 MPa)	Air Consumption ....
Ⓑ = @ 70 psi (4.8 bar, 0.5 MPa)	Fluid Flow ————
Ⓒ = @ 40 psi (2.8 bar, 0.3 MPa)	

Check-Mate 2100

Priming Piston Fluid Pumps



Dimensions - Bare Pumps

Model	Motor	A	B	C	D	E
222940	39:1 Premier	60.31 in (1531 mm)	16.89 in (429 mm)	43.41 in (1102 mm)	26.17 in (665 mm)	22.26 in (565 mm)
222835	24:1 King	54.18 in (1376 mm)	22.95 in (583 mm)	31.22 in (793 mm)	26.17 in (665 mm)	10.11 in (257 mm)
222828	12:1 Bulldog	53.11 in (1349 mm)	21.89 in (556 mm)	31.22 in (793 mm)	26.17 in (665 mm)	10.11 in (257 mm)
222905	24:1 King	54.55 in (1386 mm)	23.33 in (592 mm)	31.22 in (793 mm)	26.17 in (665 mm)	10.11 in (257 mm)
222902	Viscount Hydraulic, SST	55.72 in (1415 mm)	24.5 in (622 mm)	31.22 in (793 mm)	26.17 in (665 mm)	10.11 in (257 mm)

Check-Mate 2100

Priming Piston Fluid Pumps

Ordering Information

Ram Pump Modules

918303 **39:1 Pump and 6.5 in (16.5 cm) Ram Assembly**
Includes: 39:1 Premier CS pump, 6.5 in (16.5 cm) dual-post ram, ram and motor air control, 55 gal (200 l) follower plate and dual PVC follower seals.

235836 **King 24:1 and 3 in (7.6 cm) Ram Assembly**
Includes: 24:1 King CS pump, 3 in (7.6 cm) dual-post ram, ram and motor control, 55 gal (200 l) follower plate and dual Buna-N follower seals.

235835 **Bulldog 12:1 and 3 in (7.6 cm) Ram Assembly**
Includes: 12:1 Bulldog CS pump; 3 in (7.6 cm) dual-post ram; ram and motor control; 55 gal (200 l) follower plate and dual Buna-N follower seals.

Bare Pump Modules

222828 **12:1 Bulldog Check-Mate Pump, CS**

222903 **12:1 Bulldog Check-Mate Pump, SST/RIQ**

222835 **24:1 King Check-Mate Pump, CS**

222836 **24:1 King Check-Mate Pump, SST**

222905 **24:1 King Check-Mate Pump, SST/RIQ**

222940 **39:1 Premier Check-Mate Pump, CS**

222902 **Viscount II Hydraulic, CS**

Displacement Pumps

222810 **Carbon Steel**

222811 **Stainless Steel**

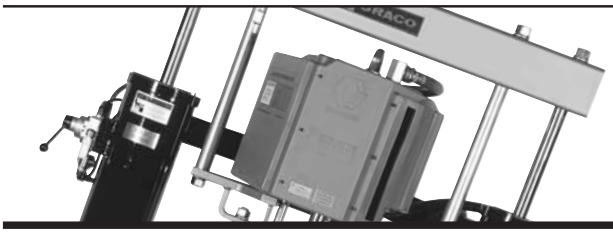
Repair Kits

222860 **Repair Kit, CS and SST Pumps**
Includes: UHMWPE/PTFE throat and intake seals.

222974 **Intake Valve Repair Kit, CS and SST Pumps**

222861 **PTFE Packing Conversion Kit, CS and SST Pumps**

222862 **Leather Packing Conversion Kit**



Dura-Flo™ 600 Ram Pumps

5, 30, and 55 Gallon (19, 120 and 200 l) Supply Packages

1

Dura-Flo 600 pumps provide flow rates to 2.3 gpm (8.7 lpm) and operating pressures to 2500 psi (172 bar, 17.2 MPa).

Features and Benefits

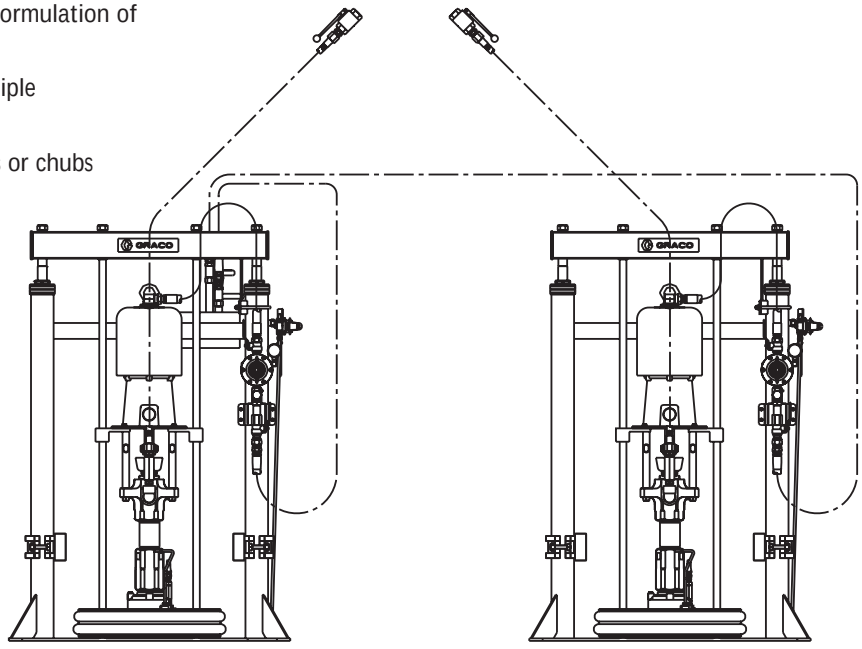
- Heavy-duty stainless steel pump, rod and cylinder for long life and durability
- High flow and fluid pressures for increased production
- High output per cycle reduces wear for longer life and lower repair costs
- Exclusive air valve and shroud design decreases pump changeover time and minimizes icing

Typical Applications

- Transferring to multiple application dispensing stations
- Transferring viscous chemicals in the formulation of sealants and adhesives
- Feeding high volume applicators, multiple meters or proportioners
- Packaging drums, pails, caulking tubes or chubs

Typical Fluids Handled

- PVC sealers
- Plastisol-based sealants
- Flowable epoxy
- Flowable inks
- Flowable lubricants



970056
Tandem Dura-Flo Ram Pump

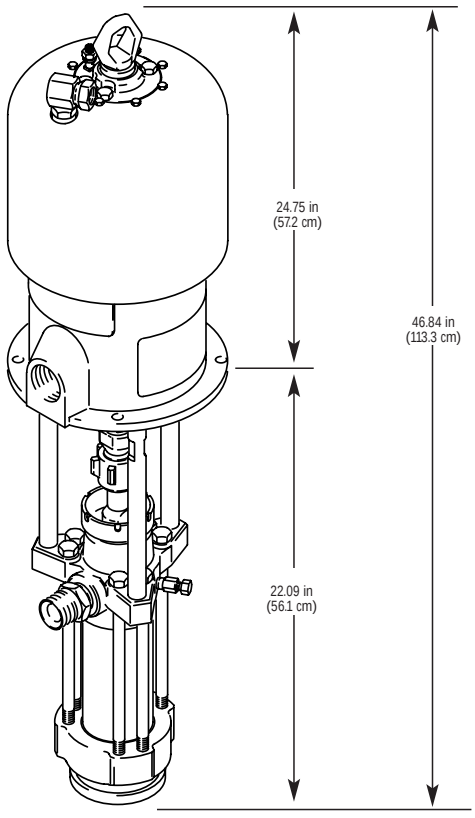
Dura-Flo 600 Ram Pumps

5, 30, and 55 Gallon (19, 120 and 200 l) Supply Packages

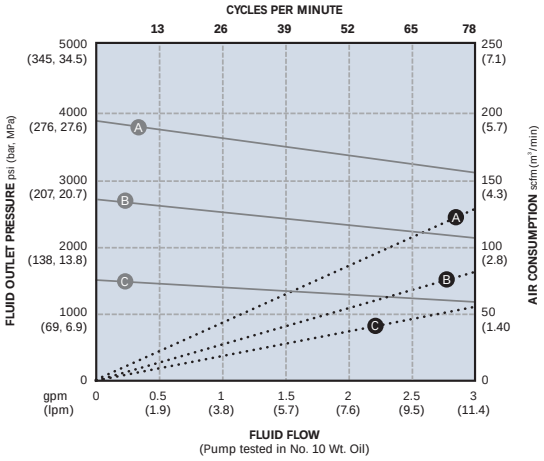
Technical Specifications

Maximum fluid outlet pressure	2500 psi (172 bar, 17.2 MPa)
Fluid flow at 60 cpm	2.3 gpm (8.7 lpm)
Volume per cycle	4.89 oz. (144.7 cc)
Maximum air inlet pressure	100 psi (7 bar, 0.7 MPa)
Maximum operating temperature	180°F (82°C)
Fluid outlet size	3/4 npt(f)
Air inlet size	3/4 npsm(f)
Weight	135 lbs (61 kg)
Instruction manuals	
Senator air motor (217540)	307592
Dura-Flo lower (236458)	308350

Dimensions



Performance Chart for 25:1 Senator Pump



AIR PRESSURES	LEGEND
Ⓐ = @ 100 psi (7 bar, 0.7 MPa)	Air Consumption .....
Ⓑ = @ 70 psi (4.8 bar, 0.5 MPa)	Fluid Flow ———
Ⓒ = @ 40 psi (2.8 bar, 0.3 MPa)	

Dura-Flo 600 Ram Pumps

5, 30, and 55 Gallon (19, 120 and 200 l) Supply Packages

1

Ordering Information

55 Gal (200 l) Ram Packages with 3 in (7.6 cm) Dual-Post Ram

970056 **Tandem SST 25:1 Senator Ram Pumps, Pneumatic Crossover**
Includes: (2) 55 gal (200 l), 3 in (7.6 cm) dual- post rams; 55 gal (200 l) TFE-coated follower plates and pneumatic crossover control; outlet check valves and (2) 10 ft (3 m) supply hoses with SST shutoff valves.

233023 **Tandem SST 41:1 Bulldog Ram Pump**
Includes: (2) 55 gal (200 l), 3 in (7.6 cm) dual- post rams; (2) 55 gal (200 l) TFE-coated follower plates with EDPM wipers; outlet check valves, and (2) 10 ft (3 m) supply hoses with SST shutoff valves.

55/30 Gal. (200/120 l) Ram Packages

970071 **Tandem SST 25:1 Senator Ram Pumps, Pneumatic Crossover**
Includes: (2) 55 gal (200 l); 3 in (7.6 cm) dual-post rams; 30 gal (120 l) CS follower plates and pneumatic crossover control; outlet check valves; and (2) 10 ft (3 m) supply hoses with SST shutoff valves.

970073 **Single SST 25:1 Senator Ram Pump**
Includes: (1) 55 gal (200 l), 3 in (7.6 cm) dual- post ram with low-level shutoff; 30 gal (120 l) CS follower plate; outlet check valve and (1) 10 ft (3 m) supply hose with SST shutoff valve.

233024 **SST 41:1 Bulldog Ram Pump, Pneumatic Crossover**
Includes: Outlet check valves, 30 gal (120 l) follower plate, 10 ft (3 m) outlet hose, ball valve with locking handle and ross lockout valve.

243386 **55/30 Gal. (200/120 l) Dura-Flo with 41:1 Bulldog motor**
Includes SST pump outlet check valve.

C59530 **55 Gal. (200 l) Dura-Flo with 25:1 Senator motor**
Includes PTFE wipers.

243384 **55 Gal. (200 l) Dura-Flo 41:1 Bulldog motor**
Includes outlet check valve and EPDM wipers.

Pump Modules

686615 **25:1 Senator Air Motor, SST**

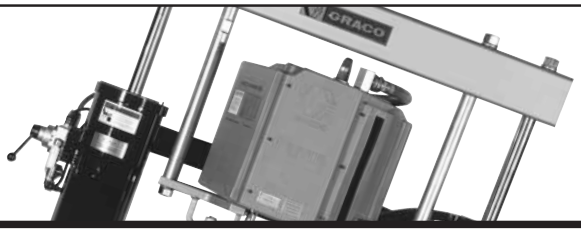
237634 **41:1 Bulldog Air Motor, SST**

Dura-Flo 600 Displacement Pumps

236458 **Stainless Steel for 25:1 Models**

241177 **Stainless Steel for 41:1 Models**

Ram Modules



Dura-Flo™ 900 Ram Pumps

5 Gallon (19 l), 30 l and 55 Gallon (200 l) Supply Packages

Dura-Flo 900 pumps provide flow rates to 3.4 gpm (13 lpm) and operating pressures to 5000 psi (345 bar, 34.5 MPa).

Features and Benefits

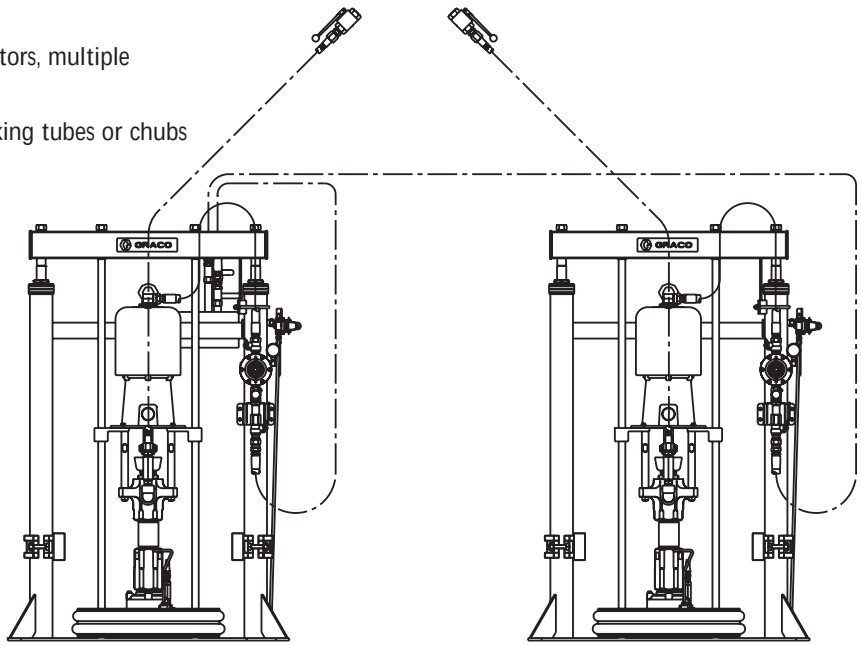
- Heavy-duty stainless steel pump rod and cylinder for long life and durability
- High flow and fluid pressures for increased production
- High output per cycle reduces wear for longer life and lower repair costs
- Exclusive air valve and shroud design decreases pump changeover time and minimizes icing

Typical Applications

- Transferring to multiple application dispensing stations
- Transferring viscous chemicals in the formulation of sealants and adhesives
- Feeding high volume applicators, multiple meters or proportioners
- Packaging drums, pails, caulking tubes or chubs

Typical Fluids Handled

- PVC sealers
- Plastisol-based sealants
- Flowable epoxy
- Flowable inks
- Flowable lubricants



970056
Tandem Dura-Flo Ram Pump

Dura-Flo 900 Ram Pumps

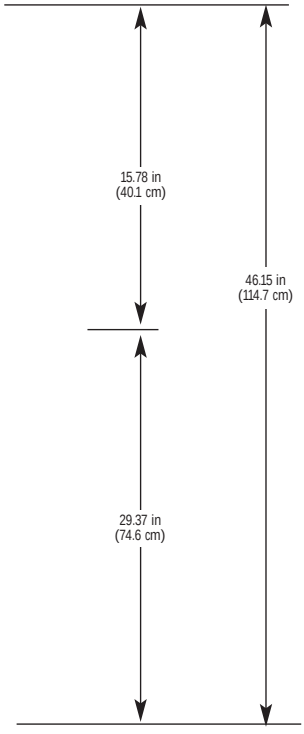
5 Gallon (19 l), 30 l and 55 Gallon (200 l) Supply Packages

1

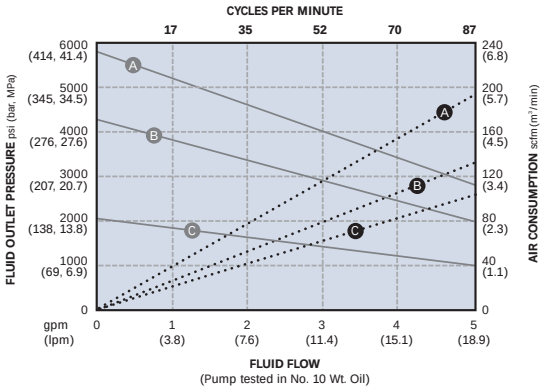
Technical Specifications

Maximum fluid outlet pressure	5000 psi (345 bar, 34.5 MPa)
Fluid flow at 60 cpm	3.4 gpm (13 lpm)
Volume per cycle	7.25 oz. (0.21 cc)
Maximum air input pressure	90 psi (6.2 bar, 0.62 MPa)
Maximum operating temperature	180°F (82°C)
Fluid outlet size	1 npt(f)
Air inlet size	3/4 npsm(f)
Weight	240 lbs (109 kg)
Instruction manual	
SST models	308354

Dimensions



Performance Chart for 56:1 King Pump



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

Dura-Flo 900 Ram Pumps

5 Gallon (19 L), 30 L and 55 Gallon (200 L) Supply Packages

Ordering Information

55 Gal. (200 l) Ram Packages with 3 in (26 cm) Dual-Post Ram

970161 **Tandem 56:1 King Ram Pumps, Pneumatic Crossover**
Includes: (2) 55 gal (200 l) 3 in (7.6 cm) dual- post rams, 55 gal (200 l) follower plates, pneumatic crossover control, outlet check valves, and (2) 10 ft (3 m) fluid dispense hoses with shutoff valves.

970092 **Single 56:1 King Ram Pump**
Includes: (1) 55 gal (200 l) 3 in (7.6 cm) dual- post ram, 55 gal (200 l) follower plate, 15 ft (4.6 m) fluid dispense hose, Z-swivel and Ultra-Lite 4000 SD manual pistol grip flow gun without nozzle.

970164 **Single 56:1 King Ram Pump, Pneumatic Low-Level Shutoff**
Includes: (1) 55 gal (200 l) 3 in (7.6 cm) dual- post ram with low-level shutoff, 55 gal (200 l) follower plate, outlet check valve and (1) 10 ft (3 m) fluid dispense hose with shutoff.

970259 **Tandem 56:1 King Ram Pump, Pneumatic Crossover**
Includes: (1) 55 gal (200 l) 3 in (7.6 cm) dual- post ram with low-level shutoff; 55 gal (200 l) follower plate; outlet check valve; 10 ft (3 m) outlet hose and ball valve, manual depressurization and filter stand and EPDM wipers.

55/5 Gal. (200/19 l) Ram Packages

970093 **Single 56:1 King Ram Pump**
Includes: (1) 55 gal (200 l), 3 in (7.6 cm) dual-post ram; 5 gal (19 l) follower plate; 15 ft (4.6 m) fluid dispense hose; Z-swivel and Ultra-Lite 4000 SD manual pistol grip flow gun without nozzle.

30 l (7.9 gal) Ram Packages

970250 **Single 20:1 King Ram Pump**
Includes: (1) 30 l (7.9 gal) 3 in (7.6 cm) dual- post ram, 30 l (7.9 gal) follower plate, outlet check valve, and (1) 10 ft (3 m) supply hose with shutoff valve.

970251 **Single 56:1 King Ram Pump**
Includes: (1) 30 l (7.9 gal) 3 in (7.6 cm) dual- post ram, 30 l (7.9 gal) follower plate, outlet check valve, mastic regulator, low level with audible alarm, and (1) 10 ft (3 m) supply hose with shutoff valve.

Ram Modules

241630 **30 l (7.9 gal) Dura-Flo with 56:1 King motor** CE marked pump. 3 in (76 mm).

241085 **30 l (7.9 gal) Dura-Flo with 56:1 King motor** CE marked pump.

C59777 **5 gal (19 l) Dura-Flo with 56:1 King**
Includes outlet valve.

C59427 **55 gal (200 l) Dura-Flo with 56:1 King**
Includes outlet check valve.

Pump Modules

237286 **56:1 King, RIQ, SST Lowers**

237280 **17:1 Senator**

237287 **28:1 Bulldog**

245172 **56:1 King, SST Lowers**

Dura-Flo 900 Displacement Pump

236470 **Stainless Steel Model**

Dura-Flo™ 1200 Ram Pumps

55 Gallon (200 l) Supply Packages

Dura-Flo 1200 pumps provide flow rates to 4.8 gpm (18.2 lpm) and operating pressures to 5000 psi (345 bar, 34.5 MPa).

Features and Benefits

- Heavy-duty stainless steel pump, rod and cylinder for long life and durability
- High flow and fluid pressures for increased production
- High output per cycle reduces wear for longer life and lower repair costs
- Exclusive air valve and shroud design decreases pump changeover time and minimizes icing

Typical Applications

- Transferring to multiple application dispensing stations
- Transferring viscous chemicals in the formulation of sealants and adhesives
- Feeding high volume applicators, multiple meters or proportioners
- Packaging drums, pails, caulking tubes or chubs

Typical Fluids Handled

- PVC sealers
- Plastisol-based sealants
- Flowable epoxy
- Flowable inks
- Flowable lubricants

C59702
Dura-Flo Ram Pump

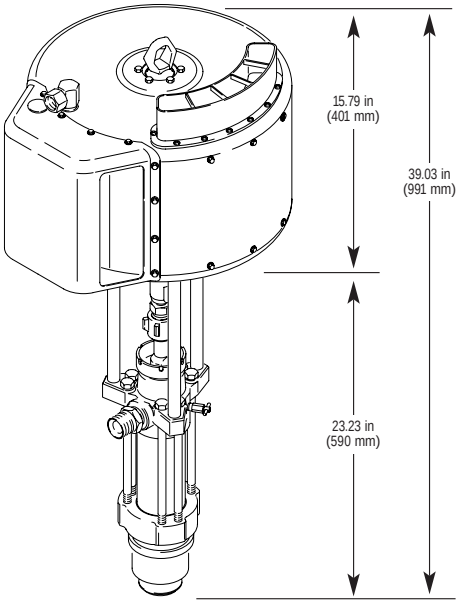
Dura-Flo 1200 Ram Pumps

55 Gallon (200 L) Supply Packages

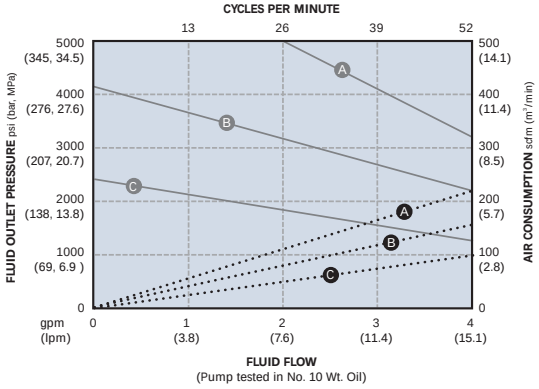
Technical Specifications

Maximum fluid outlet pressure	5000 psi (345 bar, 34.5 MPa)
Fluid flow at 60 cpm	4.8 gpm (18.2 lpm)
Volume per cycle	10.24 oz (303 cc)
Maximum air input pressure	75 psi (5.2 bar, 0.52 MPa)
Fluid outlet size	1 npt(f)
Air inlet size	1 npsm(f)
Weight	195 lb (88.5 kg)
Instruction manual	308812

Dimensions



Performance Chart for 67:1 Premier Pump



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

Dura-Flo 1200 Ram Pumps

55 Gallon (200 l) Supply Packages

1

Ordering Information

55 Gal. (200 l) Ram Packages with 6.5 in (16.5 cm) Dual-Post Ram

970067 **Tandem 67:1 Premier Ram Pumps, Pneumatic Crossover**
Includes: (2) 55 gal (200 l) 6.5 in (16.5 cm) dual-post rams, 55 gal (200 l) follower plates, pneumatic crossover control, outlet check valves and (2) 10 ft (3 m) fluid dispense hoses with shutoff valves.

Ram Modules

C59702 **67:1 Premier Single Ram Module**
6.5 in (165 mm) dual-post ram and outlet check valve.

Pump Modules

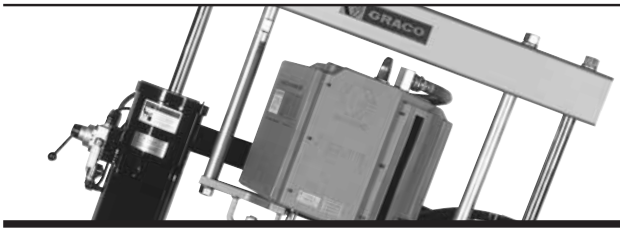
237517 **13:1 Senator**

237516 **21:1 Bulldog**

245174 **67:1 Premier**

Dura-Flo 1200 Displacement Pump

237514 **Stainless Steel Model**
PTFE/Leather packings.



Dura-Flo™ 1800 Ram Pumps

55 Gallon (200 L) Supply Packages

Dura-Flo 1800 pumps provide flow rates to 6.9 gpm (26.1 lpm) and operating pressures to 4500 psi (310 bar, 31 MPa).

Features and Benefits

- Heavy-duty carbon steel pump, rod and cylinder for long life and durability
- High flow and fluid pressures for increased production
- High output per cycle reduces wear for longer life and lower repair costs
- Exclusive air valve and shroud design decreases pump changeover time and minimizes icing

Typical Applications

- Transferring to multiple application dispensing stations
- Transferring viscous chemicals in the formulation of sealants and adhesives
- Feeding high volume applicators, multiple meters or proportioners
- Packaging drums, pails, caulking tubes or chubs

Typical Fluids Handled

- PVC sealers
- Plastisol-based sealants
- Flowable epoxy
- Flowable inks
- Flowable lubricants

918481
Dura-Flo Ram Pump

Dura-Flo 1800 Ram Pumps

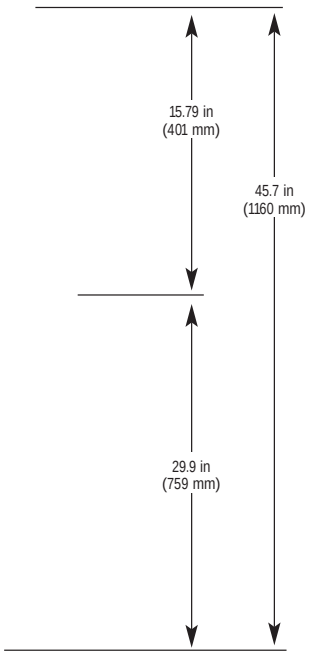
55 Gallon (200 L) Supply Packages

1

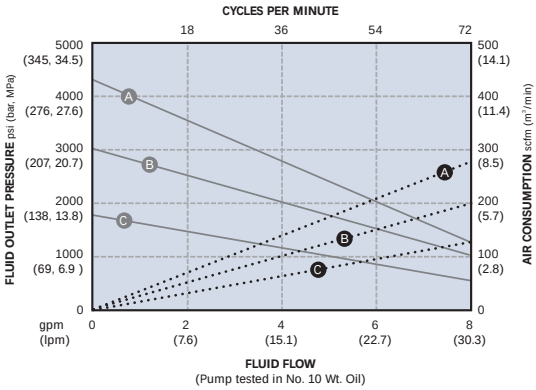
Technical Specifications

Maximum fluid outlet pressure	4500 psi (310 bar, 31 MPa)
Fluid flow at 60 cpm	6.9 gpm (26.1 lpm)
Volume per cycle	14.7 oz (434.6 cc)
Maximum air input pressure	100 psi (7 bar, 0.7 MPa)
Fluid outlet size	1-1/2 npt(m)
Air inlet size	3/4 npsm(f)
Weight	240 lb (109 kg)
Instruction manual	
CS models	308147
SST models	308148

Dimensions



Performance Chart for 45:1 Premier Pump



AIR PRESSURES	LEGEND
Ⓐ = @ 4100 psi (283 bar, 28.3MPa)	Air Consumption ....
Ⓑ = @ 3000 psi (207 bar, 20.7 MPa)	Fluid Flow ————
Ⓒ = @ 1800 psi (124 bar, 12.4 MPa)	

Dura-Flo 1800 Ram Pumps

55 Gallon (200 L) Supply Packages

Ordering Information

55 Gal. (200 l) Ram Packages with 6.5 in (16.5 cm) Dual-Post

970196 **Tandem 45:1 Premier Ram Pumps, Pneumatic Crossover**
Includes: (2) 55 gal (200 l) 6.5 in (16.5 cm) dual-post rams, 55 gal (200 l) follower plates, pneumatic crossover control, outlet check valves and (2) 10 ft (3 m) fluid dispense hoses with shutoff valves.

Ram Module

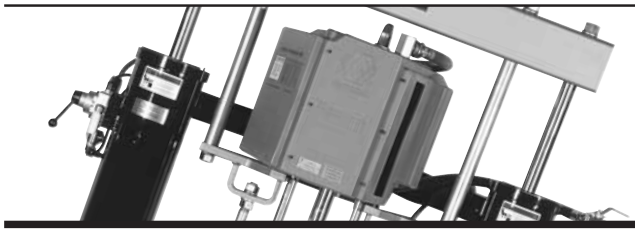
918481 **Single 45:1 Premier Ram Pump**
6.5 in (165 mm) dual-post ram and outlet check valves.

Pump Module

241490 **45:1 Premier with CS Lower**

Dura-Flo 1800 Displacement Pump

222796 **Carbon Steel Module**



Dura-Flo™ 2400 Ram Pumps

55 Gallon (200 L) Supply Packages

Dura-Flo 2400 pumps provide flow rates to 9.2 gpm (34.8 lpm) and operating pressures to 3400 psi (230 bar, 23 MPa).

Features and Benefits

- Heavy-duty carbon steel pump, rod and cylinder for long life and durability
- High flow and fluid pressures for increased production
- High output per cycle reduces wear for longer life and lower repair costs
- Exclusive air valve and shroud design decreases pump changeover time and minimizes icing

Typical Applications

- Transferring to multiple application dispensing stations
- Transferring viscous chemicals in the formulation of sealants and adhesives
- Feeding high volume applicators, multiple meters or proportioners
- Packaging drums, pails, caulking tubes or chubs

Typical Fluids Handled

- PVC sealers
- Plastisol-based sealants
- Flowable epoxy
- Flowable inks
- Flowable lubricants

918481
Dura-Flo Ram Pump

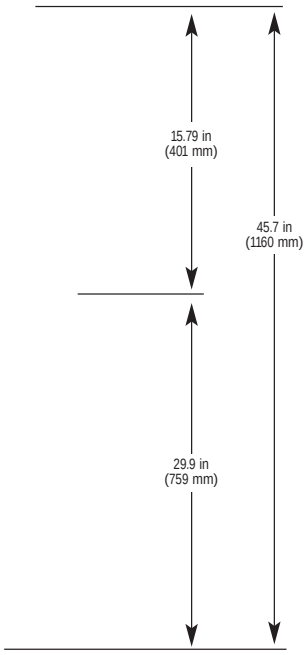
Dura-Flo 2400 Ram Pumps

55 Gallon (200 L) Supply Packages

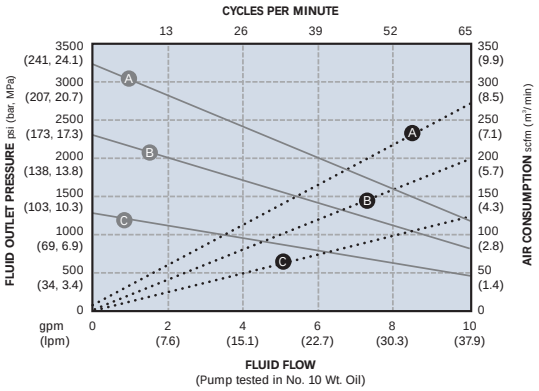
Technical Specifications (34:1 Premier models)

Maximum fluid outlet pressure	3400 psi (230 bar, 23 MPa)
Fluid flow at 60 cpm	9.2 gpm (34.8 lpm)
Volume per cycle	19.6 oz (579 cc)
Maximum air input pressure	100 psi (7 bar, 0.7 MPa)
Fluid outlet size	1-1/2 npt(m)
Air inlet size	3/4 npsm(f)
Weight	240 lb (109 kg)
Instruction manuals	
Carbon steel	308151
Stainless steel	308152

Dimensions



Performance Chart for 34:1 Premier Pump



AIR PRESSURES	LEGEND
Ⓐ = @ 100 psi (7 bar, 0.7 MPa)	Air Consumption ....
Ⓑ = @ 70 psi (4.8 bar, 0.5 MPa)	Fluid Flow _____
Ⓒ = @ 40 psi (2.8 bar, 0.3 MPa)	

Dura-Flo 2400 Ram Pumps

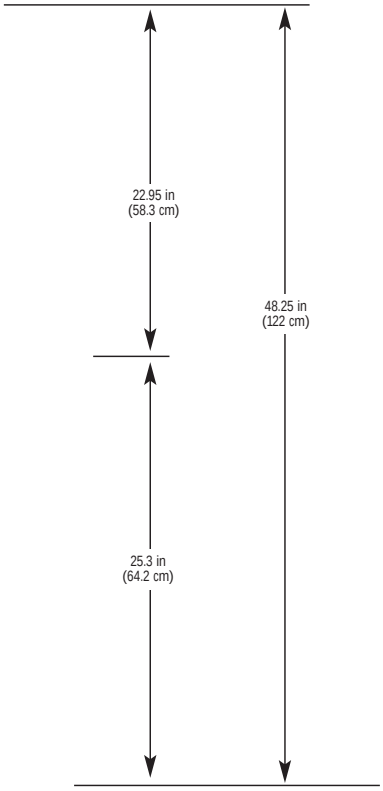
55 Gallon (200 L) Supply Packages

1

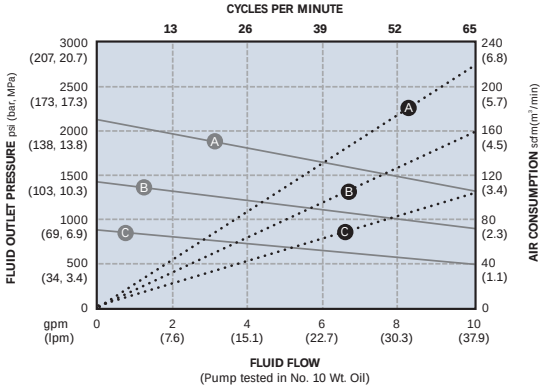
Technical Specifications (20:1 King models)

Maximum fluid outlet pressure	1800 psi (126 bar, 12.6 MPa)
Fluid flow at 60 cpm	7.7 gpm (29.1 lpm)
Volume per cycle	19.7 oz (582.5 cc)
Maximum air input pressure	90 psi (6 bar, 0.6 MPa)
Fluid outlet size	1-1/2 npt(m)
Air inlet size	3/4 npsm(f)
Weight	152 lb (69 kg)
Instruction manuals	
Carbon steel	308151
Stainless steel	308152

Dimensions



Performance Chart for 20:1 King Pump



AIR PRESSURES	LEGEND
Ⓐ = @ 90 psi (6.2 bar, 0.6 MPa)	Air Consumption ....
Ⓑ = @ 70 psi (4.8 bar, 0.5 MPa)	Fluid Flow ————
Ⓒ = @ 40 psi (2.8 bar, 0.3 MPa)	

Dura-Flo 2400 Ram Pumps

55 Gallon (200 L) Supply Packages

Ordering Information

55 gal (200 l) Ram Packages

970159 **Tandem 20:1 King Ram Pumps, Pneumatic Crossover**
Includes: (2) 55 gal (200 l) 3 in (7.6 cm) dual- post rams; 55 gal (200 l) follower plates and pneumatic crossover control; outlet check valves and (2) 10 ft (3 m) supply hoses with shutoff valves.

970260 **Tandem 34:1 Premier Ram Pumps, Pneumatic Crossover (LH: 241460, RH: 241461)**
Includes: (2) 55 gal (200 l) 6.5 in (16.5 cm) dual post rams, 55 gal (200 l) follower plates, pneumatic crossover control, outlet check valves and (2) 10 ft (3 m) supply hoses with shutoff valves.

55 gal (200 l) Ram Packages

970250 **Single 20:1 King Package**
Includes 10 ft (3 m) outlet hose and ball valve and 3 in (7.6 cm) dual post ram. CE marked.

Ram Module

C59769 **Single 55 Gallon (200 l) 20:1 King Ram Pump**
Includes outlet check valves and 3 in (7.6 cm) dual-post ram.

918469 **Single 55 Gallon (200 l) 34:1 Premier Ram Pump**
Includes outlet check valves and 6.5 in (16.5 cm) dual-post ram.

241084 **Single 7.9 Gallon (30 l) 20:1 King**
Includes 3 in (7.6 cm) dual post ram.

Pump Module

222832 **20:1 King, Carbon Steel**

222833 **20:1 King, Quiet Air Motor, Carbon Steel**

241506 **34:1 Premier, Carbon Steel**

Dura-Flo 2400 Displacement Pump

222801 **Carbon Steel Module**

Ram Pump Accessories

Fluid Hoses

Nylon Fluid Hose

184156 20 ft (6.1 m), 1/2 npt (mbe) maximum working pressure 5000 psi (345 bar, 34.5 MPa)

215244 25 ft (7.6 m), 3/8 npt (mbe) maximum working pressure 5000 psi (345 bar, 34.5 MPa)

PTFE Core, Wire Braid-Reinforced Fluid Hose 0.222 in I.D.

685612 6 ft (1.8 m), maximum working pressure 4000 psi (276 bar, 27.6 MPa), 1/4 npt (mbe) coupling

685614 15 ft (4.6 m), maximum working pressure 4000 psi (276 bar, 27.6 MPa),1/4 npt (mbe) coupling 0.308 in I.D. with 3/8 npt (mbe) coupling

685602 15 ft (4.6 m), maximum working pressure 4000 psi (276 bar, 27.6 MPa), 3/8 npt (mbe) coupling

222934 15 ft (4.6 m), maximum working pressure 4000 psi (276 bar, 27.6 MPa),1/2-14 npt coupling

685602 25 ft (7.6 m), maximum working pressure 4000 psi (276 bar, 27.6 MPa), 3/8 npt (mbe) coupling

222935 15 ft (4.6 m), maximum working pressure 4000 psi (276 bar, 27.6 MPa), 1/2-14 npt coupling

PTFE Core, Wire Braid-Reinforced Fluid Hose 0.41 in I.D.

511381 10 ft (3.0 m), maximum working pressure 4000 psi (276 bar, 27.6 MPa),1/2 npt (mbe) coupling

PTFE Core, Wire Braid-Reinforced Fluid Hose 0.51 in I.D.

C12288 10 ft (3.0 m), maximum working pressure 4000 psi (276 bar, 27.6 MPa),1/2 npt (mbe) coupling

PTFE Core, Wire Braid-Reinforced Fluid Hose 0.62 in I.D.

685605 6 ft (1.8 m), maximum working pressure 4000 psi (276 bar, 27.6 MPa), 3/4 npt (mbe) coupling

685606 10 ft (3.0 m), maximum working pressure 4000 psi (276 bar, 27.6 MPa), 3/4 npt (mbe) coupling

685607 15 ft (4.6 m), maximum working pressure 4000 psi (276 bar, 27.6 MPa), 3/4 npt (mbe) coupling

685608 25 ft (7.6 m), maximum working pressure 4000 psi (276 bar, 27.6 MPa), 3/4 npt (mbe) coupling

C12410 10 ft (3.0 m), max working pressure 5000 psi (345 bar, 34.5 MPa), 1-1/16 (-12) JIC coupling

PTFE Core, Wire Braid-Reinforced Fluid Hose 1-7/64 in I.D.

C12433 10 ft (3.0 m), maximum working pressure 5000 psi (345 bar, 34.5 MPa),1-5/8 (-12) JIC coupling

Moisture-Lok™ Hoses

Working Pressure 4000 psi (276 bar, 27.6 MPa)

Couplings are 3/4 npt (mbe)

511385 10 ft (3 m) x 3/4 in (19 mm)

511387 25 ft (7.6 m) x 3/4 in (19 mm)

Working Pressure 2750 psi (190 bar, 19.0 MPa)

Couplings are 3/8 npsm (fbe)

947233 3 ft (0.9 m) x 1/4 in (6 mm)

947076 6 ft (1.8 m) x 1/4 in (6 mm)

947077 10 ft (3 m) x 1/4 in (6 mm)

947078 15 ft (4.6 m) x 1/4 in (6 mm)

947079 25 ft (7.6 m) x 1/4 in (6 mm)

947080 50 ft (15.2 m) x 1/4 in (6 mm)

Working Pressure 2250 psi (155 bar, 15.5 MPa)
Couplings are 3/8 npt (mbe)

947475 2 ft (0.6 m) x 3/8 in (10 mm)

947081 6 ft (1.8 m) x 3/8 in (10 mm)

947082 10 ft (3 m) x 3/8 in (10 mm)

947083 15 ft (4.6 m) x 3/8 in (10 mm)

947084 25 ft (7.6 m) x 3/8 in (10 mm)

947085 50 ft (15.2 m) x 3/8 in (10 mm)

Working Pressure 2000 psi (138 bar, 13.8 MPa)
Couplings are 1/2 npt (mbe)

947086 6 ft (13 m) x 1/2 in (13 mm)

947087 10 ft (3 m) x 1/2 in (13 mm)

947089 25 ft (7.6 m) x 1/2 in (13 mm)

Ram Pump Accessories

Air Controls and Lubrication

104266 **Air Regulator**
For President and Monark pumps 1/2 npt(fbe).

106149 **Air Line Filter**
1/2 npt(f) for President and Monark pumps.

106150 **Air Line Filter**
3/4 npt(f) for Senator, Bulldog and King pumps.

107142 **Air Valve**
Relieves trapped air pressure at pump inlet. For President and Monark pumps. 1/2 npt(m) inlet x 1/2 npt(f) outlet.

107141 **Air Valve**
Relieves trapped air pressure at pump inlet. For Senator, Bulldog and King pumps. 3/4 npt(m) inlet x 3/4 npt(fbe) outlet.

110146 **Air Filter**
1 oz. (28.4 ml) bowl. 1/4 npt.

110148 **Air Lubricator**
1 oz. (28.4 ml) bowl. 1/4 npt

200033 **Neoprene Core Air Hose**
1/4 npt x 6 ft (182.9 cm).

205712 **Air Pressure Regulator Kit**
For Senator and Bulldog pumps. Includes air regulator and gauge, air valve and manifold with swivel inlet. 3/4 npt(fbe).

206197 **Air Regulator**
For President and Monark pumps. 1/2 npt(fbe).

207651 **King Air Regulator Kit**

210657 **Fluid Drain Valve**
Relieve fluid pressure in hose and valve, 1/4 npt(m).

310658 **Fluid Drain Valve**
Relieve fluid pressure in hose and valve, 3/8 npt(m).

210659 **Fluid Drain Valve**
Relieve fluid pressure in hose and valve, 1/4 npt x 3/8 npt(m).

214848 **Air Line Lubricator**
1/2 npt(fbe).

214849 **Air Line Lubricator**
3/4 npt(fbe).

223815 **Air Pressure Regulator Kit**
For Monark and President pumps. Includes air regulator and gauge, air valve and manifold with swivel inlet. 3/4 npt(fbe).

223894 **Pump Tube Repair Kit**

224040 **Pump Runaway Valve**
3/4 npt(f) both ends.

918306 **2-Regulator**
For Premier air motors. Max. working pressure range: 0 to 125 psi (0 to 8.8 bar, 0 to 0.88 MPa).

C32438 **2-Regulator**
For King, Bulldog and Senator air motors. Max. working pressure range: 0 to 125 psi (0 to 8.8 bar, 0 to 0.88 MPa).

Ram Pump Accessories

Miscellaneous Fluid Accessories

C59518 **Pump Outlet Check Valve Kit**
Includes: elbow, check valve and union.

115559 **Locking Ball Valve**
1 in (2.54 cm) high pressure ball valve 5000 psi (345 bar, 34.5 MPa) with locking handle. Locks in closed position only.

241985 **Hose Kit with Locking Ball Valve**
Includes 10 ft (3.05 m) x 1-1/4 in (3.18 cm) HP hose, 1-1/4 in (3.18 cm) HP ball valve, rated for 5000 psi (345 bar, 34.5 MPa).

222780 **Floor stand for all pumps**
Includes 222776 mounting kit.

Ball Valves

Part No.	Fitting Ends	psi (bar, MPa)	Seals and Seats
C07063	3/4 npt(f)	4500 (305, 30.5)	Delrin Ball Seal, Viton Spindle Seal
C07048	1/2 npt(f)	5800 (395, 39.5)	Acetal Ball Seal, Viton Spindle Seal
C07043	1/4 npt(f)	7250 (490, 49.0)	Acetal Ball Seal, Viton Spindle Seal

Check Valves

Part No.	Fitting Ends	psi (bar, MPa)	Body Material
C07240	3/4 npt(f)	3000 (204, 20.4)	Carbon Steel
C07070	1 npt(f)	5000 (340, 34.0)	Carbon Steel
C07254	1/4 npt(f/m)	5000 (340, 34.0)	Carbon Steel

Rams and Ram Plates

5 gal (19 l) Rams

237788 **Bare Single-Post Ram**

237561 **Single-Post Ram**
With support for Bulldog and Senator pumps.

237636 **Single-Post Ram**
With support for short versions of Monark and President pumps.

206450 **Single-Post Ram**
With support for high pressure pumps.

222781 **Single-Post Ram**
With support for CM 200 and CM 450 pumps.

241086 **Dual-Post Ram**
With air control assembly.

918405 **Dual-Post Ram**
Without air controls.

55 gal (200 l) Rams

207279 **3 in (7.6 cm) DP Ram, EPDM Wipers**

241252 **3 in (7.6 cm) DP Ram, PVC Wipers**

196078 **3 in (7.6 cm) DP Ram, Neoprene T-Wipers**

233087 **6.5 in (16.5 cm) DP Ram**
Order ram plate separately.

Ram Plates

222812 **CS, 5 gal (19 l) Ram Plate**
With Buna-N wipers.

222909 **SST, 5 gal (19 l) Ram Plate**
With PTFE coated wipers.

235516 **CS, 5 gal (19 l) Ram Plate**
With PTFE coated wipers.

918409 **CS, 5 gal (19 l) Ram Plate**
With Buna-N wipers used for Dura-Flo 900 and Bulldog 55:1 packages.

C58391 **CS, 5 gal (19 l) Ram Plate**
With PVC hose wipers used with CM 800 and CM 1000.

241081 **30 l (7.9 gal) CS Ram Plate**
With Buna-N wipers.

191991 **Bare 55 gal (200 l) CS Ram Plate**

918305 **Bare 55 gal (200 l) CS Ram Plate with Fittings**

241251 **55 gal (200 l) Ram Plate with PVC Wipers**

238929 **55 gal (200 l) Ram Plate with EPDM Wipers**

510313 **55 gal (200 l) Ram Plate with Neoprene T-Wipers**

Ram Pump Accessories

Wipers and Wiper Kits for Ram Plates

5 gal (19 l) Plates

184420 **Flat-Style Wiper, Buna-N**

184421 **Polyethlyene Lower Wiper**

184552 **PTFE-Coated Nitrile, Flat Wiper**

184551 **Polyethlene Backk-Up for 184420, 184552**

C03064 **PVC Hose Wiper Kit**

30 L (7.9 gal) Plates

194146 **Flat-Style Wiper, Buna-N**

194147 **Polyethlene Lower Wiper**

55 Gal (200 l) Plates

C03059 **Includes Hose Wipers and Bands**

918312 **Includes EDPM Hose Wipers and Bands**

C03228 **Includes Buna-N (Neoprene) Hose Wipers and Bands**

236726 **Neoprene T-Wiper Kit for Ambient Plates**

165601 **White Neoprene Bandless Wiper**

Ram Accessories

918439 **Ram Repair Kit for 5 Gal (19 l) Dual-Post Ram**

918430 **Low-Level Kit for 5 Gal (19 l) Dual-Post Ram**
Includes beacon light.

918414 **Mobile Platform Kit**

C31197 **Hose Support Kit for 5 Gal (19 L) Dual-Post Ram**

224137 **Pneumatic Elevator Cart**

918478 **Pneumatic Low-level Shut-Off Kit for 3 in (7.6 cm) Dual-Post Ram**
Includes limit switch, valves and mounting brackets for 55 gal (200 l) 3 in (7.6 cm) dual-post ram.

947518 **Low Level Warning Kit**
Includes limit switches and air horn for 3 in (7.6 cm) dual-post ram.

206537 **Drum Clamp Kit**
For 3 in (7.6 cm) dual-post ram.

918468 **Dual Ram Changeover Control**
For 3 in (7.6 cm) dual-post ram includes limit switches and controls.

918393 **Dual Ram Changeover Control**
For 6.5 in (16.5 cm) dual-post rams. All pneumatic controls.

C32463 **Drum-Centering (Saddle) Clamp for 6.5 in (16.5 cm) Dual-Post Ram**

918395 **Heavy-Duty Drum Hold-Down Clamp**
Attaches to 6.5 in (16.5 cm) dual-post ram.

918397 **“Clam Shell” Drum Holder**
Reinforces fiber drums attaches to 6.5 in (16.5 cm) dual-post ram.

918461 **Hose Support Kit**
Includes large spring and bracket. Attaches to crossbar of 6.5 in (16.5 cm) dual-post ram.

918394 **Low Level Drum Kit**
Attaches to 6.5 in (16.5 cm) ram. Provides visual signal when drum is empty.

918396 **Low Level Shut-Off Kit**
Shuts off air motor when drum is empty. Attaches to 6.5 in (16.5 cm) dual-post ram.

243785 **Air Control Kit for 6.5 in (16.5 cm) Dual-Post Ram.**

223689 **Plastic Shields, 5 Gal (19 l) Size**
10 per pack. Protects plate and simplifies clean-up.

222792 **Plastic Shields, 55 Gal (200 l) Size**
10 per pack.

222776 **Mounting Kit**
Used to mount CM 450 through CM 2100 to floor stand, ram or inductor.

224829 **Mounting Kit for CM 200**

Uni-Drum™ 1200

300 Gallon (1200 l) Tote Containers

Uni-Drum 1200 packages supply sealants from bulk containers.

Features and Benefits

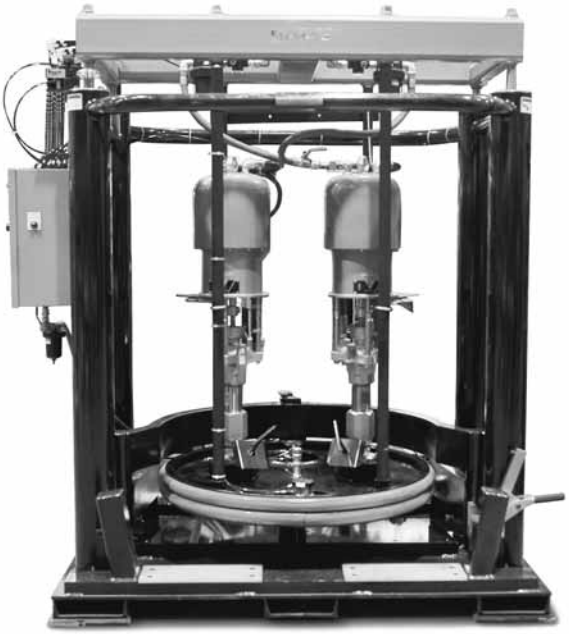
- Minimizes drum change-over time
- Reduces ram pump and tote container floor space requirement
- Reduces material waste with a flat bottom surface follower plate
- Provides fast tote changes and guarantees drum alignment

Ram Plate Features and Benefits

- Neoprene rubber wiper rings: Durable wiper is assembled to the ram plate by 3/4 in (19.1 mm) banding strap that keeps the wiper firmly and securely attached to the plate.
- Strategically located vent valves: Allow the ram plate to exit the drum in a smooth and trouble-free operation while remaining clean and maintenance-free.
- Shock-absorbing exhaust restrictors: Maintain smooth exit of the ram plate.
- Specially designed pump mounting collar: Designed to anchor the pump to the ram plate to assure trouble-free operation of the pumps and the plate. Also allows for quick pump change-out during routine maintenance.
- Manual bleed valves: Located near the pump inlet to assist in quick priming of the pumps.
- Vent valve reservoir: Allows compatible solution or water for water-based materials, to cover the vent valve and prevent drying of materials.

Typical Application

- Feed system for high-volume sealant applications



C59784
20:1 King

Uni-Drum 1200

300 Gallon (1200 l) Tote Containers

Technical Specifications

Cycles per gallon:

- 20:1 King/Dura-Flo 2400 . . . . . 6.5
- 56:1 King/Dura-Flo 900 . . . . . 18.0
- 65:1 King/Check-Mate 800 21
- 34:1 Premier/Dura-Flo 2400 . . . . . 6.5
- 45:1 Premier/Dura-Flo 1800 . . . . . 8.7
- 67:1 Premier/Dura-Flo 1200 . . . . . 12.5

Maximum operating temperature . . . . . 150° F (65.5° C)

Maximum air inlet pressure . . . . . 100 psi (7.0 bar, 0.70 MPa)

Fluid outlet size:

- Standard Uni-Drum . . . . . 1-1/4 npt(f)

Air inlet size . . . . . 3/4 npt(f)

Physical dimensions of ram assemblies

- Ram down . . . . . 76 in W x 51 in D x 85 in H (193 cm W x 130 cm D x 215 cm H)
- Ram up . . . . . 76 in W x 51 in D x 141 in H (193 cm W x 130 cm D x 358 cm H)
- Ram stroke . . . . . 56 in (143 cm)

Weight . . . . . 3900 lbs (1769 kg)

Pump Assembly Specifications

Air motor

- King . . . . . 207647 (manual 306968)
- Premier* . . . . . 222800 (manual 308213)

Stroke length . . . . . 4.75 in (120 mm)

Instruction manual 309169

*Requires C58-472 Shroud Kit

20:1 King
Maximum fluid outlet pressure: 1800 psi (126 bar, 12.6 MPa)
Maximum fluid flow @ 50 cpm: 7.7 gpm (29.1 lpm)
Single Units: C59784 LH Unit; C59785 RH Unit

56:1 King
Maximum fluid outlet pressure: 5000 psi (345 bar, 34.5 MPa)
Maximum fluid flow @ 60 cpm: 3.4 gpm (13 lpm)
Single Units: C58607 LH Unit; C58608 RH Unit

34:1 Premier
Maximum fluid outlet pressure: 3400 psi (235 bar, 23.5 MPa)
Maximum fluid flow @ 60 cpm: 9.2 gpm (34 lpm)
Single Units: C58461 LH Unit; C58462 RH Unit

45:1 Premier
Maximum fluid outlet pressure: 4500 psi (310 bar, 31.0 MPa)
Maximum fluid flow @ 60 cpm: 6.9 gpm (26 lpm)
Single Units: C59778 LH Unit; C59779 RH Unit

45:1 Premier with Carbide Lower
Maximum fluid outlet pressure: 4500 psi (310 bar, 31.0 MPa)
Maximum fluid flow @ 60 cpm: 6.9 gpm (26 lpm)
Single Units: C59793 LH Unit; C59794 RH Unit

67:1 Premier
Maximum fluid outlet pressure: 4690 psi (323 bar, 32.3 MPa)
Maximum fluid flow @ 60 cpm: 4.6 gpm (17.2 lpm)
Single Units: C58338 LH Unit; C58601 RH Unit:

Uni-Drum 1200

300 Gallon (1200 l) Tote Containers

1

Ordering Information

970152 **Tandem 20:1 King Ram Pumps, Pneumatic Crossover**
Includes: (1) dual pump stand assembly, dual King inline pumps with double ball lowers, dual air motor air controls, mastic regulator, manifold and ball valve on inlet.

970157 **Tandem 20:1 King Ram Pumps, Pneumatic Crossover and Enhanced Depressurization**
Includes: (2) 4-post Uni-Drum rams, 300 gal (1200 l) follower plates, pneumatic crossover control, outlet check valves, 10 ft (3 m) fluid dispense hoses with shutoff valves and automatic depressurization.

970153 **Tandem 56:1 King Ram Pumps, Pneumatic Crossover**
Includes: (1) dual pump stand assembly, dual King inline pumps with Dura-Flo lowers, dual air motor air controls, mastic regulator, manifold and ball valve on inlet.

970158 **Tandem 56:1 King Ram Pumps, Pneumatic Crossover and Enhanced Depressurization**
Includes: (2) 4-post Uni-Drum rams, 300 gal (1200 l) follower plates, pneumatic crossover control, outlet check valves with 10 ft (3 m) fluid dispense hoses and automatic depressurization.

970123 **Tandem 34:1 Premier Ram Pumps, Pneumatic Crossover and Enhanced Depressurization**
Includes: (2) 4-post Uni-Drum rams, 300 gal (1200 l) follower plates, pneumatic crossover control, outlet check valves, 10 ft (3 m) fluid dispense hoses with shutoff valves and automatic depressurization.

970151 **Tandem 34:1 Premier Ram Pumps, Pneumatic Crossover**
Includes: (2) 4-post Uni-Drum rams, 300 gal (1200 l) follower plates, pneumatic crossover control, outlet check valves and 10 ft (3 m) fluid dispense hoses with shutoff valves.

970188 **Tandem 34:1 Premier Ram Pumps, Pneumatic Crossover and Enhanced Depressurization with Tungsten Balls**
Includes: (2) 4-post Uni-Drum rams, 300 gal (1200 l) follower plates, pneumatic crossover control, outlet check valves and 10 ft (3 m) fluid dispense hose with shutoff valves and automatic depressurization.

970155 **Tandem 45:1 Premier Ram Pumps, Pneumatic Crossover and Enhanced Depressurization**
Includes: (2) 4-post Uni-Drum rams, 300 gal (1200 l) follower plates, pneumatic crossover control, outlet check valves, 10 ft (3 m) fluid dispense hoses with shutoff valves and automatic depressurization.

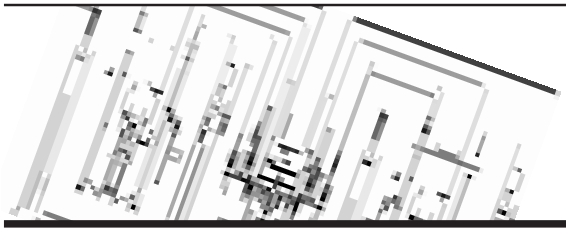
970140 **Tandem 45:1 Premier Carbide Ram Pumps, Pneumatic Crossover and Enhanced Depressurization**
Includes: (2) pump lowers with carbide balls and seats, 4-post Uni-Drum rams, 300 gal (1200 l) follower plates, pneumatic crossover control, outlet check valves, 10 ft (3 m) fluid dispense hoses with shutoff valves and automatic depressurization.

970141 **Tandem 45:1 Premier Carbide Ram Pumps, Pneumatic Crossover**
Includes: (2) pump lowers with carbide balls and seats, 4-post Uni-Drum rams, 300 gal (1200 l) follower plates, pneumatic crossover control, outlet check valves and 10 ft (3 m) fluid dispense hoses with shutoff valves.

970065 **Tandem 67:1 Premier Ram Pumps, Pneumatic Crossover**
Includes: (2) 4-post Uni-Drum rams, 300 gal (1200 l) follower plates, pneumatic crossover control and outlet check valves with 10 ft (3 m) fluid dispense hoses with shutoff valves

970066 **Tandem 67:1 Premier Ram Pumps, Pneumatic Crossover and Depressurization**
Includes: (2) 4-post Uni-Drum rams, 300 gal (1200 l) follower plates, pneumatic crossover control, outlet check valves with 10 ft (3 m) fluid dispense hoses with shutoff valves and automatic depressurization

970154 **Tandem 67:1 Premier Ram Pumps, Pneumatic Crossover and Enhanced Depressurization**
Includes: (2) 4-post Uni-Drum rams, 300 gal (1200 l) follower plates, pneumatic crossover control, outlet check valves, 10 ft (3 m) fluid dispense hoses with shutoff valves and automatic depressurization



Uni-Drum™ 1000

1000 Liter Tote Containers

Uni-Drum 1000 are designed to work with 1000 liter bulk supply containers.

Features and Benefits

- Tandem station - each ram with 2 cylinder, 1 limit switch, 1 pump and 1 flat follower plate
- Pneumatic crossover in a cabinet
- Double filter station
- Automatic switch-off if low pressure is detected (pipe leakage)
- Manual depressurization at the pump and the filter

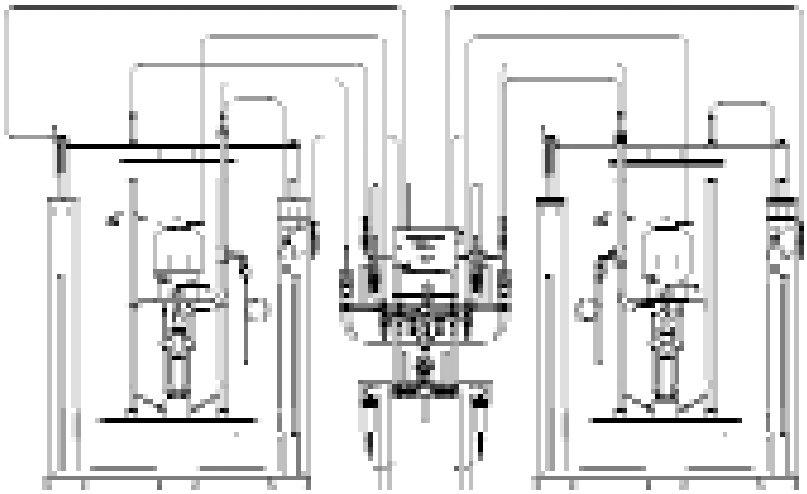
Typical Fluids Handled

- Medium viscous materials, typically PVC

Typical Application

- For systems where underbody material is sprayed and sealing beads are applied to a car body

970252
Tandem 20:1 King Uni-Drum 1000



Uni-Drum 1000

1000 Liter Tote Containers

1

Technical Specifications

Part No.	Pump Model	Displacement Pump Model	Ratio	Maximum Fluid Working Pressure	Maximum Pump Air Input Pressure
970252	Quiet King® 1000 liter size	Dura-Flo™ 2400	20:1	1800 psi (122 bar, 12.2 MPa)	90 psi (6.1 bar, 0.6 MPa)
970253	Quiet King 1000 liter size	Severe Duty™ Displacement Pump	10:1	900 psi (61 bar, 6 MPa)	90 psi (6.1 bar, 0.6 MPa)
970254	Premier™ 1000 liter size	Dura-Flo 2400	34:1	3400 psi (231 bar, 23 MPa)	100 psi (7 bar, 0.7 MPa)
241608 (left outlet) **241607 (right outlet)**	Quiet King 1000 liter size	Dura-Flo 2400	20:1	1800 psi (122 bar, 12.2 MPa)	90 psi (6.1 bar, 0.6 MPa)
241606 (center outlet)	Quiet King 1000 liter size	Severe Duty Displacement Pump	10:1	900 psi (61 bar, 6 MPa)	90 psi (6.1 bar, 0.6 MPa)
241598 (left outlet) **241498 (right outlet)**	Premier 1000 liter size	Dura-Flo 2400	34:1	3400 psi (231 bar, 23 MPa)	100 psi (7 bar, 0.7 MPa)

Uni-Drum 1000

1000 Liter Tote Containers

Ordering Information

970252 **Tandem 20:1 King Ram Pumps, Pneumatic Crossover and Manual Depressurization**
Includes: (2) dual-post rams, 1000 l follower plates, pneumatic crossover control, manual depressurization, outlet check valves, dual filter bank and fluid control valving. CE marked.
Single units: 241498 LH unit, 241598 RH unit.

970253 **Tandem 10:1 King Ram Pumps with Pneumatic Crossover and Manual Depressurization and Roller Conveyor**
Includes: (2) dual-post rams, 1000 l follower plates, pneumatic crossover control, manual depressurization, outlet check valves, dual filter bank, fluid control valving and roller conveyor for end loading. CE marked. Single units: 241608 LH, 241607 RH unit.

970254 **Tandem 34:1 Premier Ram Pumps with Pneumatic Crossover and Manual Depressurization**
Includes: (2) dual-post rams, 1000 l follower plates, pneumatic crossover control, manual depressurization, outlet check valves, dual filter bank and fluid control valving. CE marked.
Single unit 241606 (center outlet).

Accessories for Uni-Drum 1200 and Uni-Drum 1000 Supply Units

C58581 **Manual Depressurization Module**
Includes: electrical and pneumatic controls for depressurization, return valves and hoses.

C59780 **Automatic Enhanced Depressurization Module**
Includes: electrical and pneumatic controls for depressurization, pump runaway valves, 7-day timer, return valves and hoses for (2) Uni-Drums.

970126 **Filter Bank, 5000 psi (345 bar, 34.5 MPa)**
Includes: (2) HP filter assemblies for by-pass with frame and stand assembly; inlet and outlet pressure gauges and isolation shut-off valves.

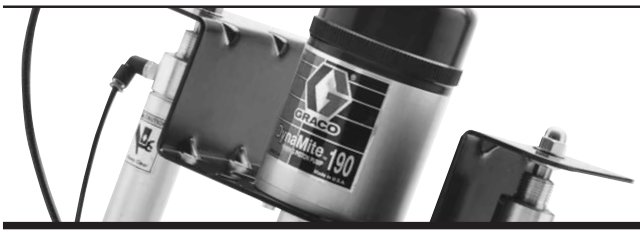
233085 **Follower Plate Kit**
Conversion Kit to upgrade existing 300 gallon (1135 l) Uni-Drum 1200 follower plate. Includes plate assembly with wipers, vent valves and junction box components.

241596 **Filter Module for Uni-Drum 1000**
CE marked. Filter station with manual despressurization.

516715 **Replacement Filter**
For part number 970126.

515221 **Replacement Filter**
For part number 241596.

C57693 **Replacement Filter**
For part number 970125.



DynaMite™ 190

Single Component Mini Extruders

DynaMite 190 is ideal for dispensing viscous materials from small containers.

Features and Benefits

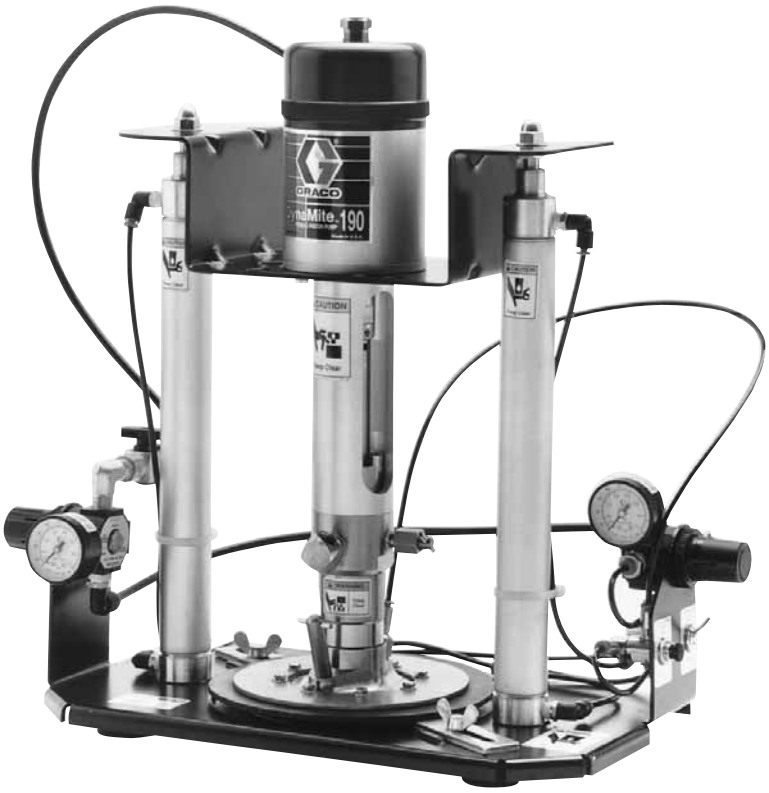
- Extrudes viscous material from their original, 1 qt (0.95 l) or 1 gal (3.79 l) source
- Compact and lightweight
- Highly precise fluid delivery
- Built tough for rugged conditions

Typical Applications

- Dispensing viscous fluids and pastes
- Manual or automatic valve applications
- Small manufacturing workcells
- Industrial workbench applications

Typical Fluids Handled

- Adhesives
- Encapsulants
- Greases
- Colorants
- Potting compounds
- Sealants
- Inks



DynaMite 190
235871 with 224908
Wiper Plate

DynaMite 190

Single Component Mini Extruders

Technical Specifications

Maximum fluid outlet pressure	850 psi (58.4 bar, 5.8 MPa)
Maximum fluid flow	.20 oz/min. (0.59 lpm)
Fluid viscosity range	10,000 to 600,000 cps
Volume per stroke	0.17 oz (5.0 cc)
Pump cycles per 1 gal (3.8 l)	.376.5
Maximum recommended pump speed	
Intermittent duty	60 cpm
Continuous duty	40 cpm
Maximum operating temperature	140°F (60°C)
Maximum air inlet range	25 to 100 psi (1.8 to 7 bar, 0.18 to 0.7 MPa)
Fluid inlet size	1 gal (3.8 ls) or 1 qt (0.95 l) cans
Fluid outlet size	1/4 npt(f)
Air inlet size	1/4 npt(f)
Wetted materials	304 and 17-4 pH SST, PTFE, Viton®, acetal
Weight	16.1 lbs (7.2 kg)
Width	14.0 in (356 mm)
Depth	8.25 in (210 mm)
Maximum height	26.5 in (673 mm) with ram cylinder extended
Instruction manual	308302

Ordering Information

235871 **DynaMite 190**
Pump unit without wiper plate.
Order wiper plate separately.

224923 **Wiper Plate 1 qt (1 kg)**
For DynaMite 190 Pump Unit.

224908 **Wiper Plate 1 gal (3 kg)**
For DynaMite 190 Pump Unit

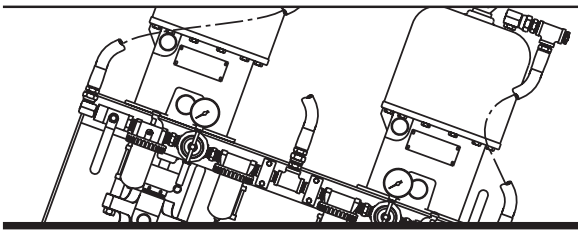
Accessories

235877 **DynaMite 190 Dispense Valve**
Pistol grip style.

235871 **DynaMite 190 Dispense Valve**
Without handle for fixture mounting

For information on dispense valves, see section 2.

Wiper Plate Poly Shields (sets of 10)
223948 For 1 gal (3 kg)



Booster Modules

Features and Benefits

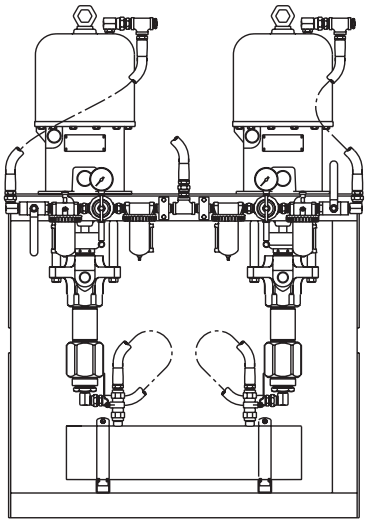
- Increases fluid pressure from bulk-feed systems for consistent performance
- Choice of pressure/flow output
- Redundant pump for back-up or to feed dual lines

Typical Applications

- Automotive paint shops

Typical Fluids Handled

- PVC sealers
- Sound deadeners



970121

Booster Modules

Ordering Information

970202 **Booster with 45:1 Premier Pump**
Includes Dura-Flo lower with air motor controls, ball valve on inlet.

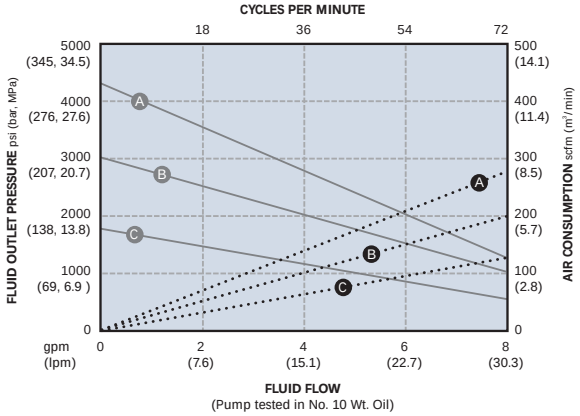
970266 **Booster with 45:1 Premier Pump**
CE marked. Includes Dura-Flo lower, with dual pumps, air motor controls and ball valve on inlet.

970122 **Booster with 45:1 Premier Pump**
Includes Triple pumps, air motor controls and ball valve on inlet.

970121 **Booster with 56:1 King Pump**
Dual pump system includes air motor controls.

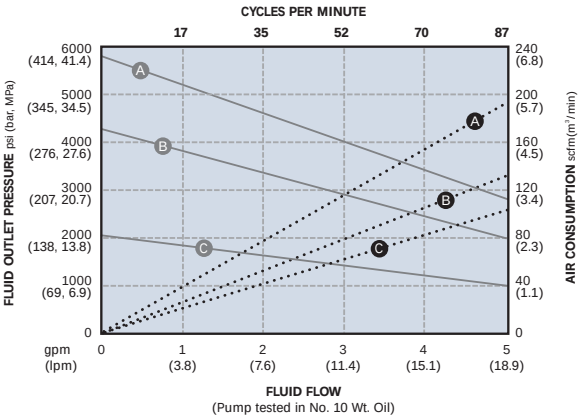
Performance Charts

45:1 Premier

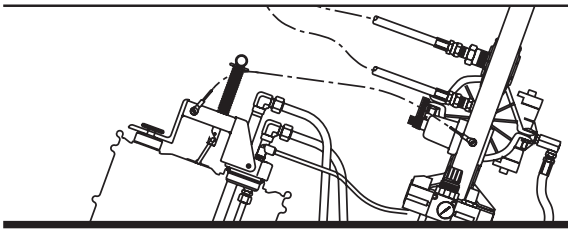


AIR PRESSURES	LEGEND
(A) = @ 4100 psi (283 bar, 28.3MPa)	Air Consumption ....
(B) = @ 3000 psi (207 bar, 20.7 MPa)	Fluid Flow ————
(C) = @ 1800 psi (124 bar, 12.4 MPa)	

56:1 King



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)	



Primer Modules

Bulk Supply and Manual Brush

Features and Benefits

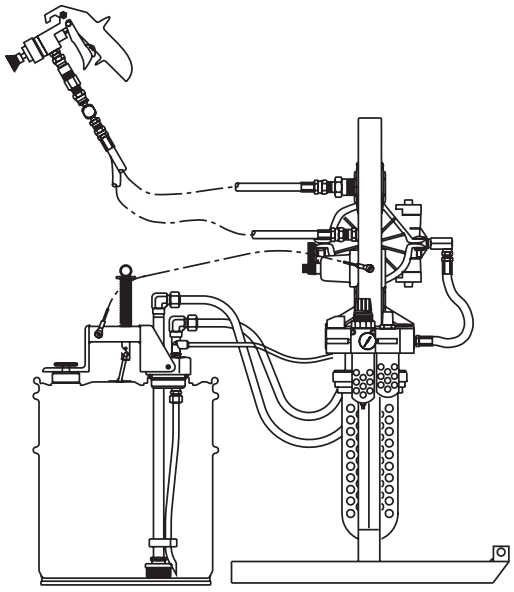
- Brush-applicator or gun-apply kits available
- Protects primers from moisture and premature curing
- Circulates primer to prevent settling

Typical Applications

- Windshield urethane primer

Typical Fluids Handled

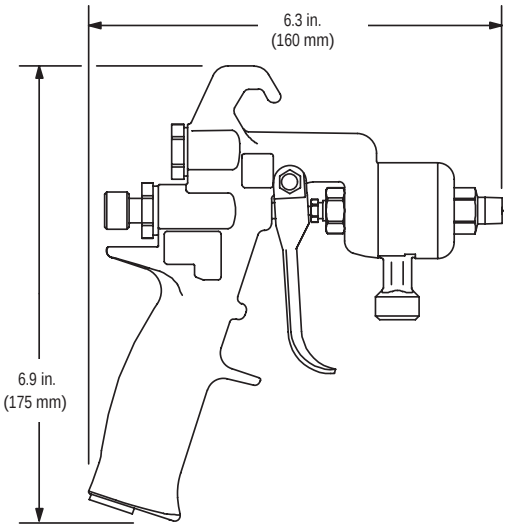
- Moisture-cure black primer for windshields



970246 shown
Primer Module

Primer Modules

Bulk Supply and Manual Brush



Primer Gun 241778

Maximum Working Fluid Pressure	100 psi (7 bar, 0.7 MPa)
Fluid Operating Temperature Range	32°F to 140°F (0°C to 60°C)
Weight	17.1 oz. (485 g)
Fluid Inlet	1/4–18 npsm (R1/4–19) compound thread
Wetted Parts	316 and 17–4 PH Stainless Steel, Polyetheretherketone (PEEK), Ultra High Molecular Weight Polyethylene

Primer Modules

Bulk Supply and Manual Brush

Ordering Information

970246 **Manual APS 100 Dispense Package**
Includes: 5 gal (19 l) pail cover with siphon and return tubes, desiccant air dryer, diaphragm pump, pump/filter mounting stand, 25 ft (7.5 m) dual hose kit for dispense and return and pistol grip manual flow gun with brush nozzle.

970172 **Primer Refill Module**
Includes: Cradle for 5 gal (19 l) black prime pail and stand with refill hose.

970180 **Manual Gravity Feed Dispense Package**
Includes: 1/2 gal (1.9 l) fluid container; dessicant air dryer; hanging bracket to mount fluid container and air dryer; 8 ft (2.4 m) material supply hose and manual dispense gun with brush nozzle.

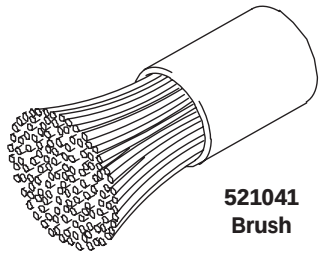
Accessories

241778 **Primer Gun Assembly for 970180 and 970246**

521041 **Brush for 970180 and 970246**

518891 **Filter**

239663 **Swivel**, Fluid, 1/4-npsm (f) x 1/4-npt (m)



521041
Brush

2:1 Standard

Air-Operated Piston Transfer Pump

Features and Benefits

- Air-powered for high reliability and low cost
- Delivery up to 2.5 gpm (9.46 lpm)
- Divorced-style drum for leak-free operation
- Mountings available for wall mount configuration

Typical Applications

- Foam chemical supply
- Spray gun supply
- Dispensing valve supply
- Cleaning chemical supply
- Fluid transfer

Typical Fluids Handled

- Solvents
- Adhesives
- Resins
- Catalysts
- Chemicals

2:1 Standard
223954

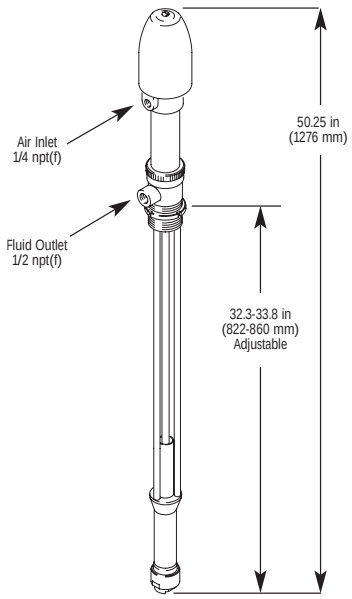
2:1 Standard
Air-Operated Piston Transfer Pump

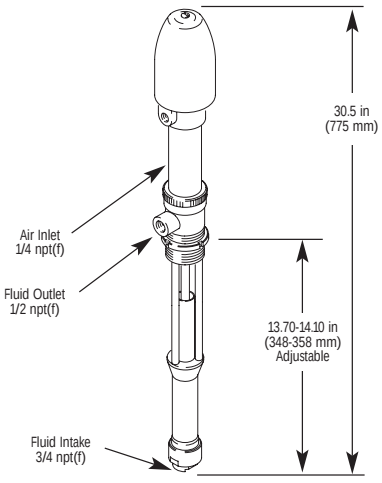
1

Technical Specifications

Maximum fluid outlet pressure	360 psi (25 bar, 25 MPa)
Maximum pump speed	100 cpm
Pump cycles per gallon (3.8 l)	40
Maximum air input pressure	180 psi (12.6 bar, 1.26 MPa)
Maximum operating temperature	280°F (138°C)
Typical sound level	60 dBa
Fluid outlet	1/2 npt
Air inlet size	1/4 npt
Weight	11.5 lbs (5.22 kg)
Instruction Manual	307026

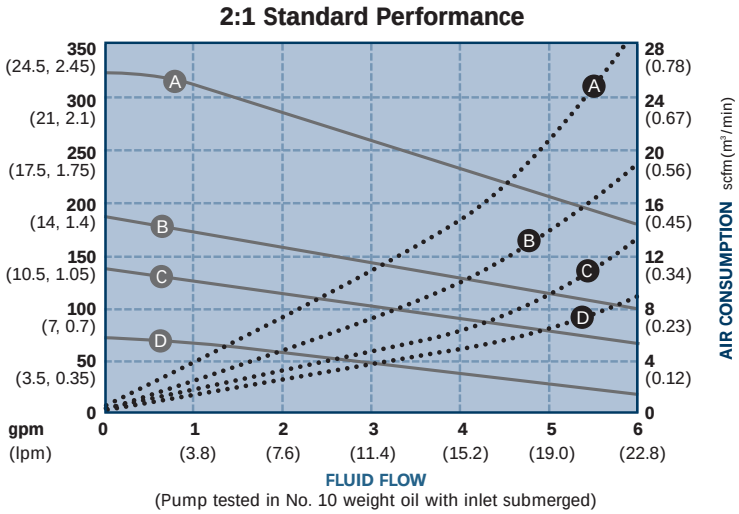
Dimensions





2:1 Standard
Air-Operated Piston Transfer Pump

Dimensions



(Pump tested in No. 10 weight oil with inlet submerged)

AIR PRESSURES	LEGEND
(A) = at 170 psi (8 bar, 0.8 MPa)	Air Consumption
(B) = at 100 psi (7 bar, 0.7 MPa)	Fluid Flow
(C) = at 70 psi (4.8 bar, 0.48 MPa)	
(D) = at 35 psi (2.4 bar, 0.24 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, C or D – 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 or D– based on your air inlet pressure) then follow to right axis to read air consumption.

Example

To obtain 3 gpm (11.4 lpm) at approximately 150 psi (10.3 bar, 1.0 MPa) you will need 100 psi (7 bar, 0.7 MPa) of air pressure. The air consumption will be approximately 7 scfm.

SIZE AND MATERIALS OF CONSTRUCTION		
Part Number	**Construction**	**Packing**
223954	Stubby/SST	T/PE
226040	Drum/SST	T

N = Neoprene
L = Leather
T = PTFE
SST = 304 Stainless Steel
CS = Carbon Steel
PE = Polyethylene

5:1 Monark®

1

Air-Operated Piston Transfer Pump

Features and Benefits

- Handles applications ranging from cleaning to corrosive fluid transfer
- Air-powered for high reliability and low cost
- Delivery up to 2.5 gpm (9.46 lpm) at up to 900 psi (62 bar, 6.2 MPa)
- Stainless steel or carbon steel models to suit every production application

Typical Applications

- Fluid transfer and supply for application equipment
- Paint circulating
- Cleaning chemical supply

Typical Fluids Handled

- Solventborne paints (CS models)
- Waterborne paints (SST models)
- Texture coatings
- Cleaning fluids
- Adhesives and sealants

5:1 Monark
218956

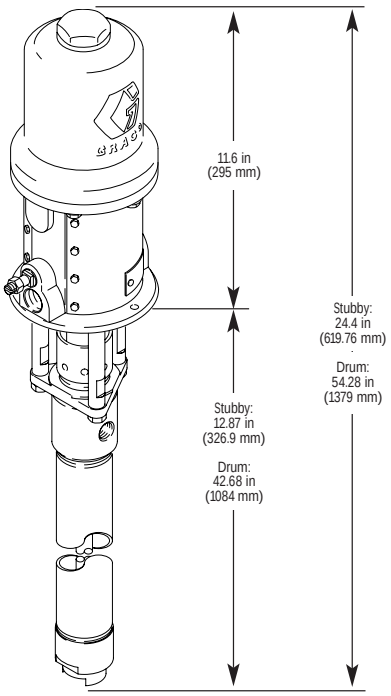
5:1 Monark

Air-Operated Piston Transfer Pump

Technical Specifications

Maximum fluid working pressure	600 psi (41 bar, 4.1 MPa)
Maximum pump speed	66 cpm
Pump cycles per gal (3.8 l)	28
Maximum air input pressure	120 psi (8.4 bar, 0.84 MPa)
Maximum operating temperature	180°F (82°C)
Typical sound level	65 dBa
Air inlet	3/8 in (3.18 mm)
Fluid outlet	3/4 in (19.05 mm) Drum
	1/2 in (12.7 mm) Stubby
Weight	30 lbs (13.61 kg) Drum
	20 lbs (9.07 kg) Stubby
Instruction Manuals	307044 Drum
	308117 Stubby

Dimensions



5:1 Monark

Air-Operated Piston Transfer Pump

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Performance Chart

How to use this chart:

Step 1: Locate the required fluid flow rate along bottom axis of chart, below.

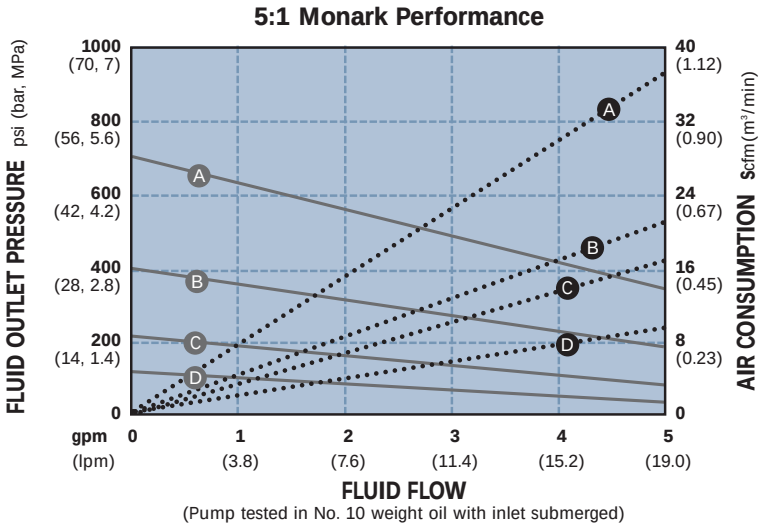
Step 2: Follow vertical line to the intersection with the solid curve (A, B, C or D – based on your air inlet pressure).

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 or D – based on your air inlet pressure) then follow to right axis to read air consumption.

Example

To obtain 2 gpm (7.5 lpm) at approximately 325 psi (22.4 bar, 2.2 MPa) you will need 100 psi (7 bar, 0.7 MPa) of air pressure. The air consumption will be approximately 8 scfm.



(Pump tested in No. 10 weight oil with inlet submerged)

AIR PRESSURES	LEGEND
(A) = at 180 psi (12 bar, 1.2 MPa)	Air Consumption ····
(B) = at 100 psi (7 bar, 0.7 MPa)	Fluid Flow ——
(C) = at 70 psi (4.8 bar, 0.48 MPa)	
(D) = at 40 psi (2.7 bar, 0.27 MPa)	

Ordering Information

SIZE AND MATERIALS OF CONSTRUCTION		
Part Number	**Construction**	**Packing**
218956	Drum/CS	T
224343	Stubby/SST	UHMWPE/T
224345	Stubby/SST	UHMWPE/N
224350	Drum/SST	UHMWPE/T

N = Neoprene
L = Leather
T = PTFE

SST = 304 Stainless Steel
CS = Carbon Steel
PE = Polyethylene

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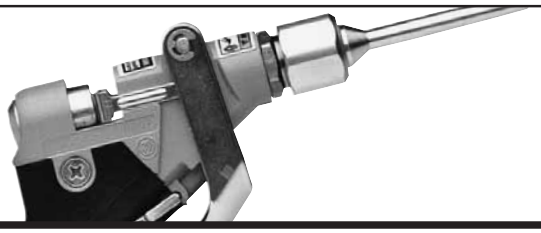


Ultra-Lite™ 4000 and 4000 SD

Severe-Duty Pistol Grip Flow Guns

Ultra-Lite 4000 guns feature ergonomic design and operating pressure to 4000 psi (276 bar; 27.6 MPa).

Features and Benefits

- Precise control of low-to-medium viscosity materials
- Designed for light trigger pull and easy handling
- Changeable tips for a variety of dispensing needs

Typical Application

- Industrial and automotive single component sealant dispensing

Typical Fluids Handled

- Low abrasive fluids
- PVC sealer
- Waterborne adhesives (with abrasive fillers for SD)
- Silicone and solvent-borne materials (with abrasive fillers for SD)

235627
Ultra-Lite 4000 with C00047 nozzle (not included)

Ultra-Lite 4000 and 4000 SD

Severe-Duty Pistol Grip Flow Guns

Technical Specifications

Maximum fluid outlet pressure	4000 psi (276 bar; 27.6 MPa)
Flow rate @ 1000 psi (70 bar; 7.0 MPa)	332 gpm*
Maximum trigger force	
@ 0 psi (0 bar; 0 MPa)	1.5 lbs (0.68 kg)
@ 1000 psi (70 bar; 7.0 MPa)	4 lbs (1.8 kg)
Fluid outlet size	Flange or 1/4 npt(m)
Fluid inlet size	1/4 npt(f)
Weight	15.5 oz (439 gm)
Dimensions	8.05 in x 1.2 in x 5.9 in (20.5 cm x 3.0 cm x 15.0 cm)
Pressure tube	Stainless steel
Pressure tube I.D.	0.187 in (47.5 mm)
Valve seat diameter	0.200 in (50.8 mm)
Needle seat type	Titanium nitride SST, 6.5° tapered
Needle seat type (SD)	Titanium nitride SST, 7.5° tapered
Head/handle angle	150°
Wetted materials	Aluminum, SST, polyurethane, Viton®
Instruction manual	308253

* This flow rate was achieved using PVC sealer dispensed through a 0.030 in diameter orifice nozzle. Actual flow rates will vary depending on material type, fluid pressure and nozzle size.

Ordering Information

Ultra-Lite 4000 Flow Guns

235627 **Ultra-Lite 4000**
Pistol grip flow gun

237607 **Ultra-Lite 4000 SD**
Severe-Duty pistol grip flow gun

237649 **Ultra-Lite 4000 SD with Swivel**
Severe-Duty pistol grip flow gun.
Inlet thread: 37° SAE; Inlet in-line swivel: 1/2-20 UNF (m) mounted on gun inlet.

Kits

970167 **Pistol Grip Manual Extrude Kit**
Includes: 3/4 npt ball valve, 3/8 npt mastic regulator, 3/8 in (9.5 mm) x 25 ft (7.6 m) dispense hose, 1/4 in (6.4 mm) x 6 ft (1.8 m) whip hose, Z-swivel and Ultra-Lite 4000 SD pistol grip flow gun.

Repair Kits

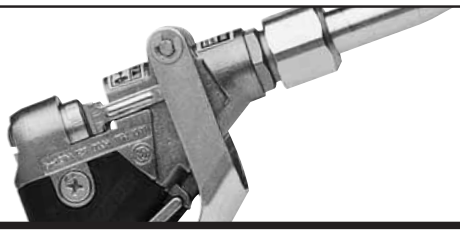
235875 **Ultra-Lite PTFE Packing**
For use with fluids which are not compatible with polyurethane or Viton® packings. Contains PTFE seals and O-rings.

235869 **20° Taper Needle (for low abrasives)**
For higher flow with controlled opening. Includes seat, 20° tapered needle, O-ring for seat and needle seal.

235658 **Ultra-Lite 4000 Repair Kit**
Includes: seat, 6.5° tapered needle, O-ring for seat, seal for needle and hex nut.

237596 **Ultra-Lite 4000 SD Repair Kit**
Includes: seat, 7.5° tapered carbide needle, O-ring for seat, seal for needle, hex nut.

Viton® is a registered trademark of DuPont



Ultra-Lite™ 6000

Pistol Grip Flow Gun

Ultra-Lite 6000 is an operator-friendly gun for dispensing high viscosity material at operating pressures to 6000 psi (414 bar; 41.4 MPa).

Features and Benefits

- Precise control of highly viscous material
- 150° head/handle angle is more comfortable for operator
- Changeable tips for a variety of dispensing needs
- Lightweight with convenient trigger pull

Typical Applications

- Automotive or industrial sealant and adhesive applications
- High flow rate requirements
- Abrasive fluid requirements

Typical Fluids Handled

- Rubber-based sealers
- Waterborne adhesives
- Silicone and solvent-borne materials

235628
Ultra-Lite 6000 with C00009 nozzle (not included)

Ultra-Lite 6000
Pistol Grip Flow Gun

Technical Specifications

Maximum fluid outlet pressure	6000 psi (414 bar; 41.4 MPa)
Fluid inlet size	1/2 npt(f)
Fluid outlet size	Flange or 1/4 npt(m)
Pressure tube	Stainless steel
Pressure tube I.D.	0.332 in (8.1 mm)
Valve seat diameter	0.187 in (4.7 mm)
Needle seat type	Carbide ball
Head/handle angle	150°
Weight	22 oz (620 gm)
Dimensions	8.05 in x 1.2 in x 5.9 in (20.5 cm x 3 cm x 15 cm)
Wetted materials	SST, polyurethane, Viton®
Instruction manual	308253

Viton® is a registered trademark of Du Pont

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Ordering Information

Ultra-Lite 6000 Flow Guns

235628 **Ultra-Lite 6000**
Pistol grip flow gun, carbide ball and seat.

243775 **Ultra-Lite 6000**
Tapered needle and seat for controllable flow.

Ultra-Lite 6000 Kits

970077 **Manual Dispense Kit**
Designed for use on pipe manifold system for multiple dispensing locations. Maximum working pressure: 5000 psi (345 bar; 34.5 MPa). Includes: 3/4 npt ball valve, 3/4 npt mastic regulator, 1/2 in (12.7 mm) x 10 ft (3 m) and 3/8 in (9.5 mm) x 5 ft (1.5 m) dispense hose, straight swivel, Ultra-Lite 6000 manual flow gun and 4 mm (0.158 in) nozzle.

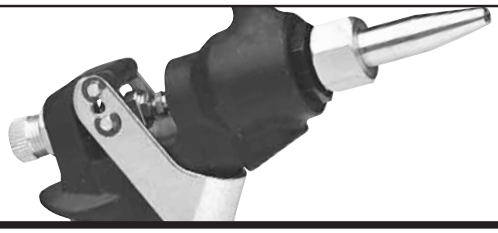
C59619 **Ultra-Lite Dispense Kit**
Includes Ultra-Lite 6000, straight swivel, 15 ft x 0.51 in (4.5 m x 1.2 cm) neoprene high pressure hose and 1-1/4 in x 1/2 in fitting.

Repair Kits

235829 **Ultra-Lite 6000 Repair Kit**
Repair kit for 235628. Includes carbide seat, and urethane seal.

237596 **Ultra-Lite 6000 Repair Kit**
Repair kit for 243775. Includes needle, seat and urethane seal.

235875 **Ultra-Lite PTFE Packing**
For use with fluids which are not compatible with polyurethane or Viton® packings. Contains PTFE seals and O-rings.



Pistol Grip Dispense Guns

Pistol Grip Flow Guns

Graco manufactures a number of pistol grip flow guns to meet the needs of a variety of end-users.

Features and Benefits

- Dispenses on demand
- Lightweight, rugged design
- Numerous design selections for internal cut-off
- 120° head/handle or 90° head/handle angle

Typical Applications

- Automotive and industrial adhesives and sealants
- Low-to-high flow rate requirements
- In-line handle requirements

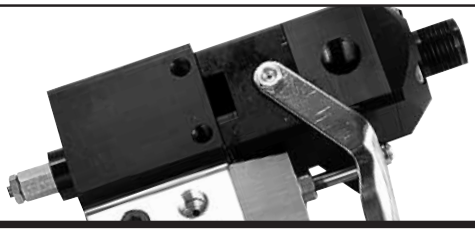
Typical Fluids Handled

- Rubber-based fluids
- Caulks
- Sealants
- Adhesives

C27020 Pistol Grip with C00007 nozzle (not included)

Ordering Information and Technical Specifications

Part No.	Description	Inlet npt(f)	Outlet npt (m)	Working Pressure
C27020	Hardened Ball and Seat Repair Kit: C27028	0.5 in	.25 in or flange	2500 psi (172 bar; 17.2 MPa)
C27031	2-Stage Trigger for lighter pull Repair Kit: C27028	0.5 in	.25 in or flange	2500 psi (172 bar; 17.2 MPa)
C27067	Advanced Piston Design/ Controlled Flow Repair Kit: C27070	0.5 in	.25 in or flange	2500 psi (172 bar; 17.2 MPa)
207945	Carbon Steel Housing Repair Kit: 210532	0.5 in	.25 in or flange	6000 psi (414 bar; 41 MPa)
915547	90º Head/Handle Angle	0.25 in flange	flange only	3600 psi (248 bar; 24.8 MPa)
915507	90º Head/Handle Angle	0.25 in flange	flange only	5000 psi (345 bar; 34 MPa)



1K Ultra-Lite™

Precision Dispense Valve for Quality Bead Dispensing

1K Ultra-Lite valves are top-of-the-line, lightweight valves designed for long service.

Features and Benefits

- Lightweight and compact
- Lubricated packings for longer seal life
- Severe-Duty needle and seat
- Eliminates snake-head and material drip
- Adjustable forward travel to reduce material surge
- Manual and automatic versions available
- Pistol grip version provides pilot on/off signal to control pump

965767
Internal Air Switch

Typical Applications

- Railcar sealing
- Truck trailer sealing
- Marine container sealing
- Product assembly for wood windows and doors

Typical Fluids Handled

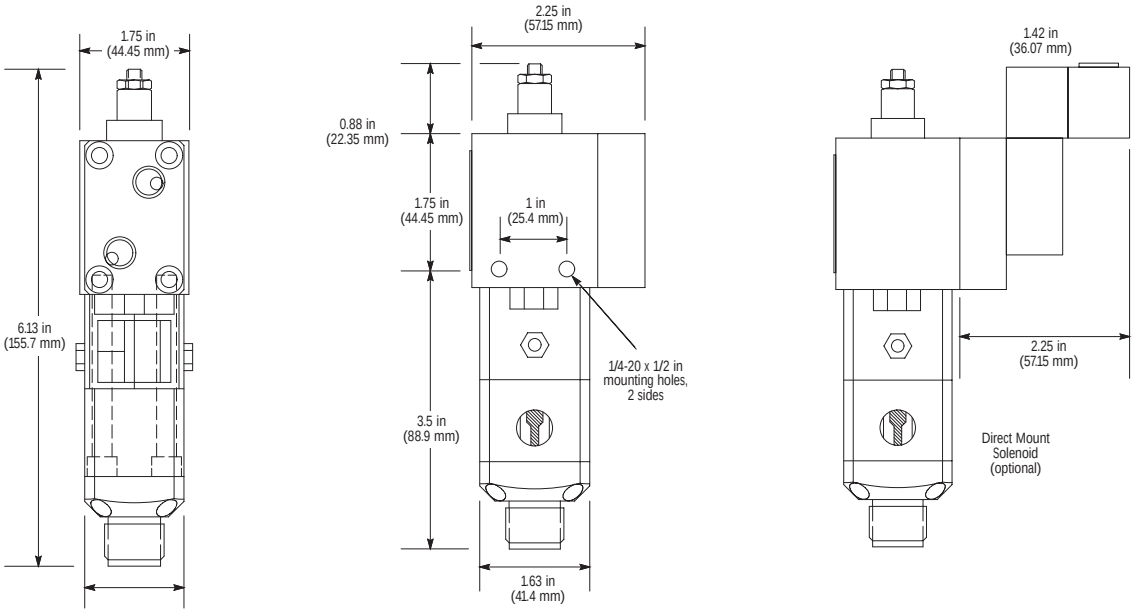
- Epoxies
- Silicones
- Polysulfides
- Urethanes
- Butyl

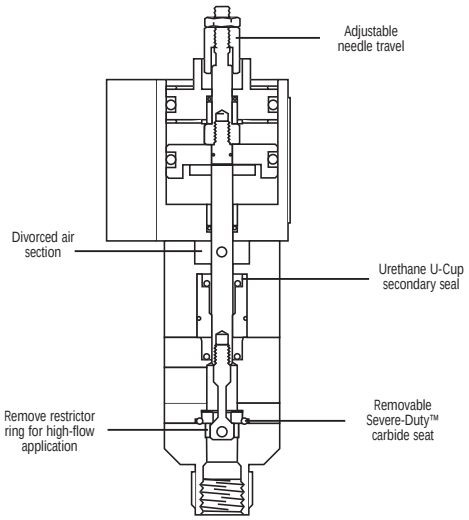
965768
Electric Switch

1K Ultra-Lite™

Precision Dispense Valve for Quality Bead Dispensing

Dimensions





Technical Specifications

Maximum fluid outlet pressure . . . .4000 psi (276 bar; 28 MPa)

Fluid viscosity range . . . . . 20 to 1 million cps

Maximum cylinder air pressure . . . .120 psi (8.4 bar; 0.84 MPa)

Fluid inlet size . . . . . 1/4 npt(f)

Fluid outlet size . . . . . 1/4 npt(f) and 3/4-16 unf(m)

Air inlet size . . . . . 1/8 npt(f)

Shaft sealing fluid section . . . . . dual seal isolation chambers with Zirk fittings

Air cylinder . . . . . divorced

Wetted materials

Aluminum . . . . . Aluminum, 303 SST, 17-4 ph SST, C2 carbide, hard chrome, ethylene propylene, Parker Polymite™, PTFE

SST 303 SST, 17-4 ph SST, C2 carbide, hard chrome, ethylene propylene, Parker Polymite™, Du Pont PTFE

Weight

Aluminum . . . . . 1.43 lbs (0.65 kg)

SST . . . . . 2.07 lbs (0.94 kg)

Handle kit . . . . . 0.77 lbs (0.35 kg)

Instruction manual 308876

Polymite® is a registered trademark of Parker. All other trademarks mentioned herein are the property of their respective owners.

1K Ultra-Lite™

Precision Dispense Valve for Quality Bead Dispensing

Ordering Information

965767 **Hand-held with Internal Air Switch**
Aluminum Wetted Parts

965768 **Hand-held valve with Electric Switch for Remote Operation**
Aluminum wetted parts

Air Signal Accessories

104661 **Quick Exhaust Valve**
1/8 npt(f) inlet and outlet, 1/4 npt(f) exhaust. Used to speed up opening or closing action of the 1K Ultra-Lite

104632 **Pump Pilot Valve**
1/2 npt(f) line ports, 1/8 npt(f) pilot port. 3-way air piloted air valve to turn air powered proportioning pump on with hand gun signal

4-Way Solenoids and Solenoid Accessories

626144 **Manifold**
To direct mount solenoid to 1K Ultra-Lite Valve.

551317 **24 Volt dc Solenoid**
For use with 626144 Manifold

551348 **24 Volt dc Solenoid**
Remote mount, 1/8 npt(f) ports

551350 **24 Volt dc Din Plug**
With screw terminals for above solenoids

Plastic Tube Fittings to Connect Air Signals

Tube OD	1/8 npt(m) Straight	1/8 npt(m) 90° Swivel
1/8 in	**598329**	
5/32 in	**104172**	**598140**
1/4 in		**597151**

Tube OD	1/4 npt(m) Straight	1/4 npt(m) 90° Swivel
5.32 in	**598252**	**598327**
5/32 in	**104165**	**598156**

Plastic Tubing for Air Signal Lines

513063 1/8 O.D. Nylon
514607 5/32 O.D. Nylon
513231 1/4 O.D. Nylon

Kits

949631 **Conversion Kit**
Pneumatic 4-way valve with housing, handle, and trigger and other parts necessary to convert 965766 automatic valve to a hand-held valve

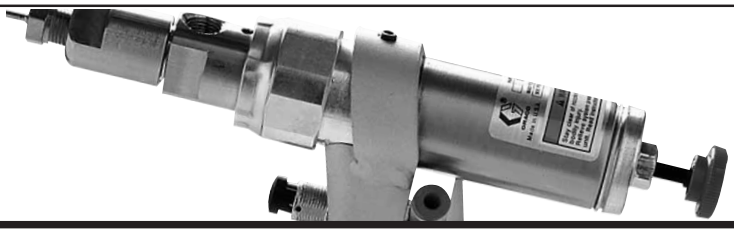
949632 **Conversion Kit**
Electric switch style handle kit to convert 965766 to a hand-held valve

570267 **Seal Kit**
Polymite main packing (standard)

570268 **Rebuild Kit (includes 570267 Seal Kit)**
Polymite main packing (standard)

570299 **Seal Kit**
PTFE main packing (optional)

570300 **Rebuild Kit (includes 570299 Seal Kit)**
PTFE main packing (optional)



DynaMite™

Manual Dispense Valve

DynaMite valves are used with DynaMite 190 for small-scale assembly operations.

Features and Benefits

- Precise bead/dot diameter and positioning for improved quality and less rework in manual or automated applications
- Wetted parts are made of SST, PTFE, and acetal to provide wide fluid compatibility
- Valve can be converted from manual trigger (pistol grip) actuation to fixtured automated actuation

Typical Applications

- Crack sealing and joint filling
- Assembly of small parts

Typical Fluids Handled

- Colorants
- Potting compounds
- Greases
- Encapsulants
- Inks

235877
DynaMite Pistol Grip, Manual
(needle not included)

DynaMite
Manual Dispense Valve

Technical Specifications

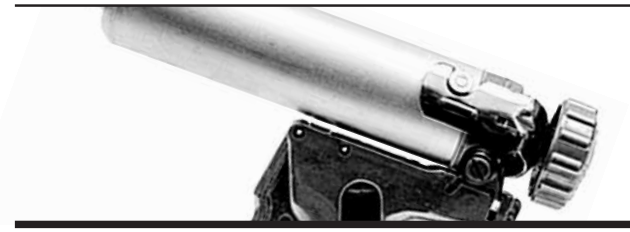
Fluid inlet size . . . . . 1/8 npt(f)
Fluid outlet size . . . . . 1/8 npt(f)
Air inlet size
- Bare unit . . . . . 1/8 npt(f)
- For pistol grip . . . . . 10-32 unc(f)
- Both include 5/32 in (4 mm) diameter tube fitting

Maximum air inlet pressure range . . . . . 40 to 100 psi (2.8 to 7 bar; 0.28 to 0.7 MPa)
Maximum fluid inlet pressure . . . . . 900 psi (62 bar; 6.2 MPa)
Wetted parts . . . . . 302 and 17-4 passivated SST, PTFE, acetal
Maximum length, w/o dispense needle . . . . . 6.75 in (171.5 mm)
Weight
- Bare unit . . . . . 13 oz (37 g)
- With pistol grip . . . . . 18 oz (51 g)

Instruction manual 308266

Ordering Information

235877	**DynaMite Pistol Grip Manual Dispense Valve**



950 Series

Sealant Guns

950 series sealant guns replace caulk guns in high-volume operations.

Features and Benefits

- All metal rugged construction
- Knob is permanently captured onto the gun body
- Pistol grip or palm grip
- Air-powered or manual-operated

Palm Grip with 6 oz. Cartridge

Typical Applications

- Dispensing sealants from 2.5, 6 and 12 oz. (73.9, 177.4 and 354.8 ml) cartridges

Pistol Grip with 6 oz. (177.4 ml) Cartridge

Typical Fluids Handled

- Silicones
- Acrylics

950 Series
Sealant Gun

Technical Specifications

Maximum fluid outlet pressure . . . . . 100 psi (7 bar; 0.7 MPa)
Fluid outlet size . . . . . 1/4 npt(f)
Wetted parts . . . . . Polyethylene

Ordering Information

C04074 2.5 oz. (73.9 ml) Palm Grip Gun
C04076 2.5 oz. (73.9 ml) Pistol Grip Gun
C04087 6 oz. (177.4 ml) Palm Grip Gun
C04090 6 oz. (177.4 ml) Pistol Grip Gun
C04068 12 oz. (354.8 ml) Pistol Grip Gun

Manual-Operated Sealant Gun Kits

C05213 **Gun Kit**
For 2.5 oz. (73.9 ml) and 6 oz. (177.4 ml) cartridges.

C05212 **Gun Kit**
For 2.5 oz., 6 oz. or 12 oz. (73.9, 177.4 and 354.8 ml) cartridges.

Accessories

Hansen Brand Inlet Connectors

C04038 0.125 in ID x 5 ft. (1.52 m) air hose with male Q.D. inlet

C04026 0.125 in ID x 10 ft. (3.04 m) air hose with male Q.D. inlet

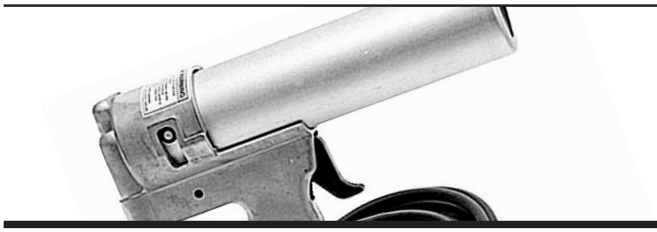
C04033 1/4 npt(f) Q.D. for above hoses.

C04079 Trigger Assembly

12 oz (354.8 ml) Retainer

6 oz (177.4 ml) Retainer

2.5 oz (73.9 ml) Retainer



Power Caulk™

Model 12020-M

2

Features and Benefits

- Trigger-actuated, fast shut-off prevents dripping
- For use with plastic or fiber cartridges
- Converts for use with aluminum cartridges

Typical Application

- Dispensing sealants from 10 oz. (295.7 ml) and 29 oz. (857.6 ml) cartridges

Typical Fluids Handled

- Silicones
- Acrylics
- Urethanes

C27098
Model 12020-M

Power Caulk
Model 12020-M

Technical Specifications

Maximum air operating pressure . . . . . 80 psi (5.5 bar; 0.55 MPa)
Size . . . . . .1/10th gal (378.5 ml)
Cartridge . . . . . 10 oz. (0.29 l)
Construction . . . . . Aluminum
Air inlet size . . . . . 1/4 npt(m)
Air hose . . . . . 10 ft. (3 m) long

Ordering Information

C27098 **Model 12020-M**
1/10th gal (378.5 ml) Power Caulk Gun

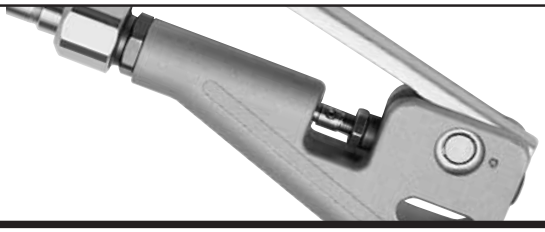
Repair Kits
C27100 **For model 12020-M Seal Kit**

Note: Handles or barrels are not available individually as repair items.

Accessories

Sleeve and Spacer for aluminum cartridges

C27108 **Sleeve**
C27116 **Spacer**



In-Line Flow Guns

In-line flow guns are ideal for dispensing onto horizontal surfaces.

Features and Benefits

- Precise control of low viscosity sealant and adhesive materials
- Accepts flanged or threaded tips for a variety of dispensing needs
- Selectable trigger lock and hanger slot for operator convenience
- 240199 has lowest trigger force and weight in its class
- 204355 has rugged, lightweight design

Typical Applications

- Automotive interior/exterior seam sealing
- Automotive after-hem seam sealing
- Industrial sealant and adhesive bonding

Typical Fluids Handled

- PVC sealers with glass or plastic filler
- Low to high abrasive fluids
- Waterborne and solvent-borne materials
- Most fluids up to 150,000 cps

240199
Ultra-Lite In-Line Flow Gun
(nozzle not included)

In-Line Flow Guns

Technical Specifications

	240199	204355
Maximum working pressure	3400 psi (235 bar; 23.5 MPa)	3000 psi (210 bar; 21.0 MPa)
Needle Seat Type	Carbide ball	Carbide ball
Fluid flow at 2000 psi (138 bar; 13.8 MPa)	158 oz/min (4.5 lpm)	176 oz/min (4.8 lpm)
Valve seat diameter	0.125 in (3.2 mm)	0.187 in (4.75 mm)
Trigger force at 2000 psi (138 bar; 13.8 MPa)		
Breakaway	2.2 lbs (1.0 kg)	–
Sustaining	3.2 lbs (1.45 kg)	–
Fluid outlet size	flange and 1/4 npt(m)	flange and 1/4 npt(m) or 3/8 in nps (m)
Fluid inlet size	1/4 npt(f)	3/8 npt (f)
Weight	11.6 oz (328 gm)	2 lbs. (900 gm)
Dimensions	5.9 in x 2.6 in (15.0 cm x 6.6 cm)	9.25 in x 5.25 in (23.5 cm x 13.3 cm)
Wetted parts	Carbide, aluminum, SST, polyethylene, Viton®	Carbide, aluminum

Ordering Information

In-Line Flow Guns

240199 **Ultra-Lite In-Line Flow Gun**
With Ball End Needle.

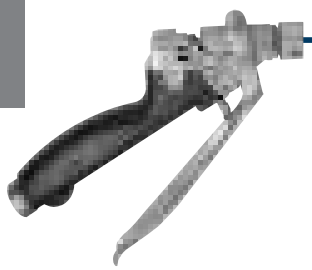
204355 **In-Line Flow Gun**

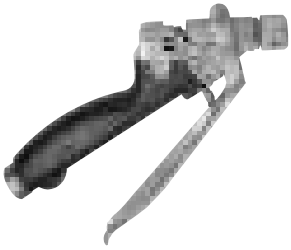
In-Line Flow Gun Repair Kits

240206 **Ultra-Lite Repair Kit (for ball end gun)**
For use with Ultra-Lite In-Line Flow Gun with ball end needle (240199). Includes carbide seat, ball needle, o-ring, seal.

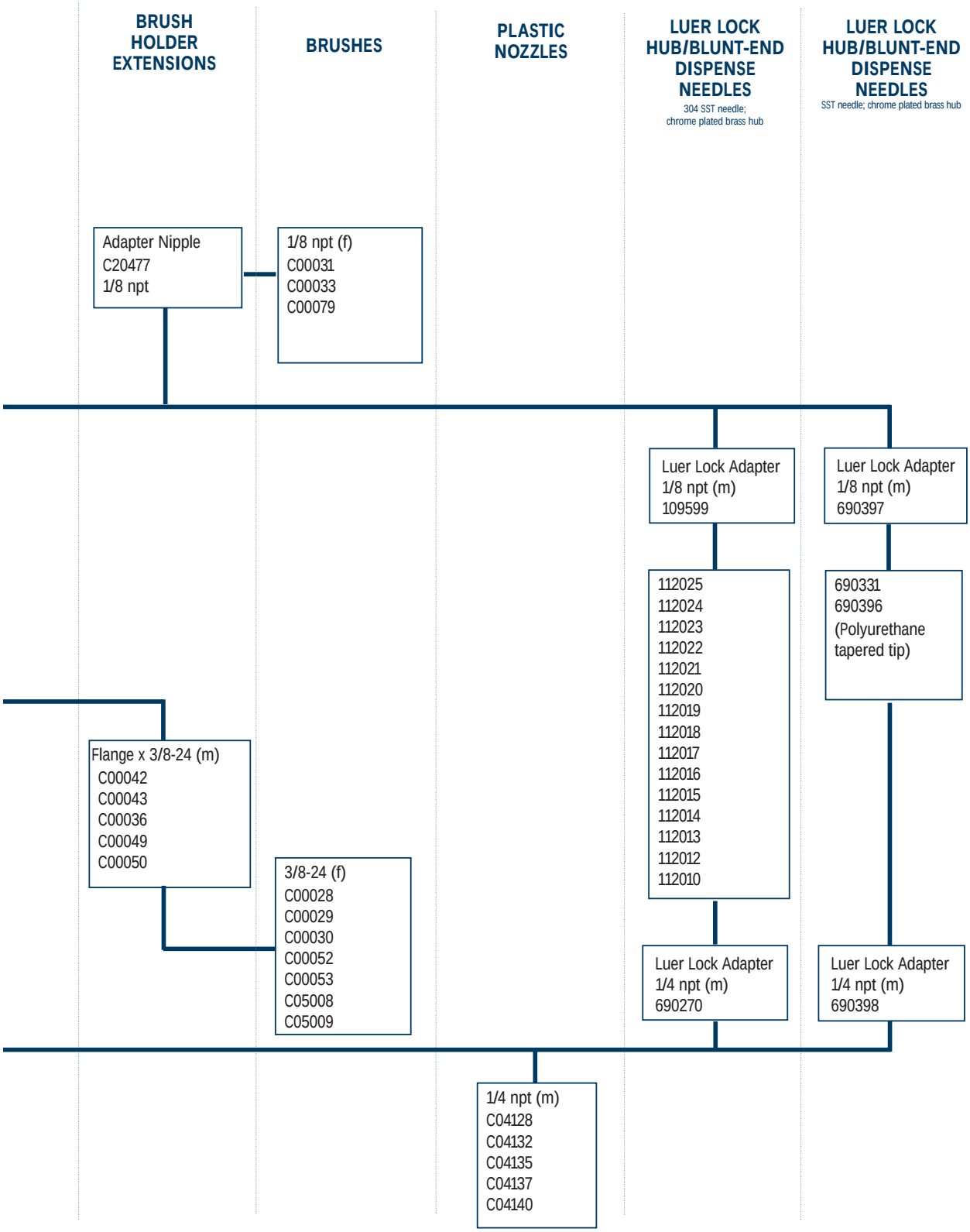
207160 **Flow Gun Repair Kit**
For use with 204355. Includes packings, gaskets, valve stem and valve seat.

Tip and Needle Selection Chart





DISPENSE VALVES	FLANGE ADAPTERS	STRAIGHT TIP METAL NOZZLES	BENT TIP METAL NOZZLES	METAL RIBBON NOZZLES	304 SST BLUNT-END DISPENSE NEEDLES
	C00060 length: 1 in thread: 5/16-24 in(f)	5/16-24 in C00067 C00096	5/16-24 in C02057 C00096 C08089 C08090	5/16-24 in C00069 C08092	1/8 npt (m) 112007 112006 112005 112004 112003 112002 112001 112000
		1/8 npt (m) 607665 161505 164799 / C17009		1/8 npt (m) C01025	
	168683 length: 1/2 in thread: 1/8 npt (f)				
		C02048 12-32 (f) requires adapter: C17007 1/8 npt x 12-32)			
	C00062 length: 1 in thread: 1/4 npt (m)				
		Flange C00005 C00006 C00007 C00008 C00009 C00010 C00011 C00012 C00013 C00014 C00024 C00044 C00046 C00047 C02050	Flange C00048 C00051 C00058 C02047 C02051 C04113	Flange C00052 C00053 C01001	
		1/4 npt (m) C08088 C08188 C32003			1/4 npt (m) 690399 690403 690405 690406


BRUSH HOLDER EXTENSIONS
BRUSHES
PLASTIC NOZZLES
LUER LOCK HUB/BLUNT-END DISPENSE NEEDLES
304 SST needle; chrome plated brass hub
LUER LOCK HUB/BLUNT-END DISPENSE NEEDLES
SST needle; chrome plated brass hub
Adapter Nipple
C20477
1/8 npt
1/8 npt (f)
C00031
C00033
C00079
Luer Lock Adapter
1/8 npt (m)
109599
Luer Lock Adapter
1/8 npt (m)
690397
112025
112024
112023
112022
112021
112020
112019
112018
112017
112016
112015
112014
112013
112012
112010
690331
690396
(Polyurethane tapered tip)
Flange x 3/8-24 (m)
C00042
C00043
C00036
C00049
C00050
3/8-24 (f)
C00028
C00029
C00030
C00052
C00053
C05008
C05009
Luer Lock Adapter
1/4 npt (m)
690270
Luer Lock Adapter
1/4 npt (m)
690398
1/4 npt (m)
C04128
C04132
C04135
C04137
C04140

Accessories

Manual Dispense Valves

Silicone Sealant Applicator

948065 Includes 1/4 turn shut-off valve, 4.5 ft. wand, joint-ball tip (0.125" diameter outlet), and 3/4 in nps (m) swivel inlet

Straight-Tip Metal Nozzles

Used for general purpose bead or drop dispensing applications with manual or automatic flow guns. Flange nozzles fit Ultra-Lite and Pyles flow guns with standard nuts provided unless an adapter is noted in the following table. Note: not recommended for use with hot melt guns except where noted.

Part Number	Inlet Size	Length	Orifice	Adapter needed or other note
C00005	flange	1.656 in (42.06 mm)	0.187 in (4.75 mm)	
C00006	flange	2 in (50.08 mm)	0.125 in (3.17 mm)	
C00007	flange	2 in	0.093 in (2.3 mm)	
C00008	flange	2 in	0.25 in (6.3 mm)	
C00009	flange	2 in	0.172 in (4.3 mm)	
C00010	flange	2 in	0.062 in (1.5 mm)	
C00011	flange	2 in	0.375 in (9.5 mm)	
C00012	flange	2 in	0.156 in (3.9 mm)	
C00013	flange	2 in	0.046 in (1.1 mm)	
C00014	flange	2.5 in (63 mm)	0.031 in (0.7 mm)	
C00024	flange	2.5 in	0.062 in (1.5 mm)	
C00044	flange	2.5 in	0.062 in (1.5 mm)	
C00046	flange	2.5 in	0.093 in (2.3 mm)	
C00047	flange	2.5 in	0.125 in (3.17 mm)	
C00080	flange	3.5 in (88 mm)	0.125 in (3.17 mm)	
C02050	flange	5.5 in (140 mm)	0.062 in (1.5 mm)	
C00067	5/16-24 (m)	1.72 in (43 mm)	0.064 in (1.62 mm)	C00060
C00096	5/16-24 (m)	1.97 in (50 mm)	0.113 in (2.8 mm)	C00060
C02048	12-32 (f)	1.125 in (31 mm)	0.062 in (1.5 mm)	C17007
C08182	1/4 npt (m)	1.73 in (43.94 mm)	0.079 in (2 mm)	OK with hot melt gun
C08176	1/4 npt (m)	1.73 in (43.94 mm)	0.098 in (2.5 mm)	OK with hot melt gun
C08088	1/4 npt (m)	3 in (76 mm)	0.157 in (4 mm)	OK with hot melt gun
C08188	1/4 npt (m)	2 in (50 mm)	0.125 in (3.17 mm)	OK with hot melt gun
C32003	1/4 npt (m)	3 in (76 mm)	0.125 in (3.17 mm)	OK with hot melt gun
607665	1/8 npt (m)	2 in (50 mm)	0.125 in (3.17 mm)	168683 OK with hot melt gun
161505	1/8 npt (m)	2 in (50 mm)	0.09 in (2.28 mm)	168683
164799	1/8 npt (m)	2.125 in (52.97 mm)	0.055 in (1.39 mm)	168683 OK with hot melt gun
C17009	1/8 npt (m)	1.121 in (28.47 mm)	0.125 in (3.17 mm)	168683 OK with hot melt gun
C08064	1/8 npt (m)	1.22 in (31 mm)	0.18 in (4.57 mm)	168683 OK with hot melt gun

Accessories

Manual Dispense Valves

Bent-tip nozzles

For bead or drop dispensing where target area is more difficult to reach. Flange connections require no adapter. Other fittings require the adapter noted below. None of the nozzles in the following table should be used with hot melt guns.

Part Number	Inlet Size	Length	Orifice	Tip Angle	Adapter
C00048	flange nozzle	2.41 in (61.21 mm)	0.32 in (8.13 mm)	30º	
C00051	flange nozzle	3.44 in (87.38 mm)	0.125 in (3.17 mm)	30º	
C00058	flange nozzle	4.38 in (111.25 mm)	0.093 in (2.36 mm)	30º	
C02047	flange nozzle	3.12 in (79.25 mm)	0.125 in (3.17 mm)	45º	
C02051	flange nozzle	5.25 in (133.35 mm)	0.062 in (1.57 mm)	15º	
C02057	5/16-24 (m)	1.93 in (49 mm)	0.006 in (0.15 mm)	45º	C00060
C04113	flange nozzle	3.5 in (88.9 mm)	0.062 in (1.57 mm)	30º	
C08089	5/16-24 (m)	1.94 in (49.28 mm)	0.046 in (1.17 mm)	45º	C00060
C08090	5/16-24 (m)	2.41 in (61.21 mm)	.46 x 0.093 in 1.17 x 2.36 mm	15º	C00060
C00052	flange nozzle	2.62 in (66.55 mm)	.003 x 0.25 in 0.76 x 6.35 mm	30º	

Ribbon nozzles

For dispensing ribbon beads with manual or automatic flow guns. Flange inlets require no adapter; otherwise use the adapter noted. Do not use with hot melt guns except where noted.

Part Number	Inlet size	Length	Orifice	Tip Angle	Adapter or comment
C00052	flange nozzle	2.68 in (68.1 mm)	0.006 x 0.25 in 0.15 x 6.35 mm	30º	
C01001	flange nozzle	4 in (101.6 mm)	0.006 x 0.25 in 0.15 x 6.35 mm	straight	
C00069	5/16-24 (m)	2.26 in (57.4 mm)	0.045 x 0.31 in 1.14 x 7.87 mm	30º	C00060
C01025	1/8 npt (m)	2.44 in (62 mm)	0.093 x 0.38 in 2.36 x 9.65 mm	straight	168683 Can be used with hot melt guns
C08092	5/16-24 (m)	2.62 in (66.55 mm)	0.06 x 0.22 in 0.15 x 5.59 mm	straight	C00060

Accessories

Manual Dispense Valves

Stainless Steel Blunt-End Dispense Needles

For precision bead or drop deposit. All are 2.35 in (59.69 mm) in length and are constructed of 304 stainless steel. Do not use with hot melt guns.

Part Number	Inlet Size	Inner Diameter (wire gauge)	Outer Diameter	Adapter
112007	1/8 npt (m)	0.150 in (3.81 mm) (7)	0.180 in (4.57 mm)	168683
112006	1/8 npt (m)	0.135 in (3.43 mm) (8)	0.165 in (4.19 mm)	168683
112005	1/8 npt (m)	0.106 in (2.69 mm) (10)	0.134 in (3.40 mm)	168683
112004	1/8 npt (m)	0.094 in (2.39 mm) (11)	0.120 in (3.05 mm)	168683
112003	1/8 npt (m)	0.085 in (2.16) mm (12)	0.109 in (2.77 mm)	168683
112002	1/8 npt (m)	0.071 in (1.80) mm (13)	0.095 in (2.41 mm)	168683
112001	1/8 npt (m)	0.063 in (1.60 mm) (14)	0.083 in (2.11 mm)	168683
112000	1/8 npt (m)	0.047 in (1.19 mm) (16)	0.065 in (1.65 mm)	168683
690399	1/4 npt (m)	0.150 in (3.81 mm) (7)	0.180 in (4.57 mm)	
690403	1/4 npt (m)	0.085 in (2.16 mm) (12)	0.109 in (2.77 mm)	
690405	1/4 npt (m)	0.063 in (1.60 mm) (14)	0.083 in (2.11 mm)	
690406	1/4 npt (m)	0.047 in (1.19 mm) (16)	0.065 in (1.65 mm)	

Straight-Tip Disposable Plastic Nozzles

For bead or drop dispensing of fast-curing material. These nozzles can be trimmed to different lengths to meet specific requirements. Do not use with hot melt. No adapter needed; all have 1/4 npt (m) inlet.

Part number	Length	Orifice
C04128	4 in (101.6 mm)	1/8 in (3.17 mm)
C04137	2.5 in (63.50 mm)	1/8 in (3.17 mm)
C04140	2.5 in (63.50 mm)	1/16 in (1.59 mm)
C04132	4 in (101.60 mm)	1/16 in (1.59 mm)
C04135	4 in (101.60 mm)	1/32 in (0.79 mm)
C51172	3 in (76.20 mm)	0.45 in (11.43 mm)

Brush Extensions

Flange inlet extensions extend the reach of brushes. All have 1/4 npt (m) (6.35 mm) orifice and 30º extension angle. To use with brushes with 1/8 npt (f) inlet, use pipe nipple C20477 between adapter and brush.

Part number	Length
C00042	4 in (101.6 mm)
C00043	6 in (152.4 mm)
C00036	10 in (254 mm)
C00050	5-13/15 in (147.64 mm)
C00049	10 in (254 mm)

Accessories

Manual Dispense Valves

Luer Lok Hub/Blunt-End Dispense Needles

For dispensing drops of adhesive. Luer Lock hubs and needles are quick-disconnect and are used instead of threaded needles when fast-drying or fast-curing material is being dispensed.

The following tips are used with either 1/8 npt (m) adapter 109599 or 1/4 npt (m) adapter 690270, depending upon the valve outlet connection. Tips are 2 in (50.8 mm) long:

Part Number	Outer Diameter (inches)	Inner diameter (inches)
112009	0.018	0.010
112010	0.022	0.012
112012	0.028	0.016
112013	0.032	0.020
112014	0.036	0.023
112015	0.043	0.027
112016	0.050	0.033
112017	0.059	0.041
112018	0.065	0.047
112019	0.072	0.054
112020	0.083	0.063
112021	0.095	0.071
112022	0.109	0.085
112023	0.120	0.094
112024	0.134	0.106
112025	0.165	0.135

The following tips are used with either 1/8 npt (m) adapter (690397) or 1/4 npt (m) adapter 690398, depending upon the valve outlet connection:

690331 0.063 ID x 1/2 in long

690396 0.016 ID x 1.5 in long. This tip has a polyethylene tapered tip

Accessories

Manual Dispense Valves

Brushes

For applying wet films of lower viscosity material using manual flow guns. Do not use with hot melt guns.

Part number	Material	Inlet size	Length	Orifice	Dimensions	Adapter
C00028	horse hair	3/8-24 (f)	1.5 in (38.1 mm)	0.125 in (3.17 mm)	5/8 x 7/8 in (15.88 x 22.23 mm)	brush extension
C00029	horse hair	3/8-24 (f)	1.75 in (44.45 mm)	0.125 in (3.17 mm)	5/8 x 7/8 in (15.88 x 22.23 mm)	brush extension
C00030	nylon bristle	3/8-24 (f)	1.75 in (44.45 mm)	0.125 in (3.17 mm)	5/8 x 7/8 in (15.88 x 22.23 mm)	brush extension
C00031	crimped nylon	1/8 npt (f)	1.75 in (44.45 mm)	0.125 in (3.17 mm)	5/8 x 7/8 in (15.88 x 22.23 mm)	168683
C00033	horse hair	1/8 npt (f)	1.75 in (44.45 mm)	0.188 in (4.78 mm)	5/8 x 7/8 in (15.88 x 22.23 mm)	168683
C00079	crimped SST	3/8-24 (f)	1.5 in (38.1 mm)	0.125 in (3.17 mm)	3/4 x 7/8 in (19.05 x 22.23 mm)	brush extension
C02052	nylon bristle	3/8-24 (f)	3.25 in (82.55 mm)	0.188 in (4.78 mm)	1-3/8 x 1-3/8 in (34.92 x 34.92 mm)	brush extension
C05008	nylon bristle	3/8-24 (f)	1.75 in (44.45 mm)	0.125 in (3.17 mm)	1-1/2 x 1 in (28 x 24.5 mm)	brush extension
C05009	horse hair	3/8-24 (f)	1.75 in (44.45 mm)	0.125 in (3.17 mm)	5/8 x 5/8 in (15.88 x 15.88 mm)	brush extension
521041	horse hair	1/8 npt (f)	1.88 in (47.75 mm)	0.125 in (3.17 mm)	5/8 x 7/8 in (15.88 x 22.23 mm)	168683

Swivels

C20838 Straight Swivel
Zinc-plated steel, Viton packings. Max. working pressure: 3000psi (207 bar, 20.7MPa), 3/4 npt (f) x 3/4 npt (m).

207947 Straight Swivel
Zinc-plated steel, urethane packings. Maximum working pressure: 6000 psi (414 bar; 41.4 MPa). 1/2 npt(f) x 1/2 npt(m).

239963 Straight Swivel
Zinc-plated steel, leather packings. Maximum working pressure: 3000 psi (207 bar; 20.7 MPa). 1/4 npt(f) x 1/4 npt(m).

223341 Straight Swivel
Zinc-plated steel, PTFE packings. Maximum working pressure: 3600 psi (248 bar; 24.8 MPa). 1/4 npt(f) x 1/4 npt(m).

207948 Z-Swivel
Zinc-plated steel, urethane packings. Maximum working pressure: 6000 psi (414 bar; 41.4 MPa). 1/2 npt(f) x 1/2 npt(m).

202577 Z-Swivel
Zinc-plated steel, leather packings. Maximum working pressure: 8000 psi (552 bar; 55.2 MPa). 1/4 npt(f) x 1/4 npt(m).

223340 Z-Swivel
Zinc-plated steel, PTFE packings. Maximum working pressure: 8000 psi (552 bar, 55.2 MPa). 1/4 npt(f) x 1/4 npt(m).

Note: Z-Swivels are not intended for use with abrasive materials.

Automatic Dispense Valve Selection Guide

Valve Style	Part Number	Working Pressure	Fluid Inlet	Fluid Outlet	Air to Open	Air to Close (6)	Description	Replaces	Service Manual
EnDure™ (1)	244910 (2)	3500 psi 238 bar	1/2" npt (f)	5/8-18 (m) retainer nut with 1/8 npt (f)	1/8" npt (f)	1/8" npt (f)*	Ambient or water-circulated temperature conditioning, 200ºF (95ºC) max. operating temperature	918512, C27340	309376
	244961 (2)	3500 psi 238 bar	1/2" npt (f)	5/8-18 (m) retainer nut with 1/8 npt (f)	1/8" npt (f)	1/8" npt (f)*	120 volt electrically heated, 6 pin round connection. 200ºF (95ºC) max. operating temperature	194485 (Precision Flo systems)	
	244962 (2)	3500 psi 238 bar	1/2" npt (f)	5/8-18 (m) retainer nut with 1/8 npt (f)	1/8" npt (f)	1/8" npt (f)*	240 volt electrically heated, 8 pin square connection. 200ºF (95ºC) max. operating temperature	243694, 243696 hot melt valves where operating temperature is less than 200ºF	
	244908 (3)	3500 psi 238 bar	1/2" npt (f)	5/8-18 (m) retainer nut with 1/8 npt (f)	1/8" npt (f)	1/8" npt (f)*	120 volt electrically heated, 6 pin round connection. 400ºF (204ºC) max. operating temperature	C34068, 918483 hot melt valves	
	244909 (3)	3500 psi 238 bar	1/2" npt (f)	5/8-18 (m) retainer nut with 1/8 npt (f)	1/8" npt (f)	1/8" npt (f)*	240 volt electrically heated, 8 pin square connection. 400ºF (204ºC) max. operating temperature	243694, 243696 hot melt valves where operating temperature is between 200º and 400ºF	
	245184 (4)	3500 psi 238 bar	1/2" npt (f)	1/2 npt (m)	1/8" npt (f)	1/8" npt (f)*	120 volt electrically heated, 6 pin round connection. 400ºF (204ºC) max. operating temperature	C34079 hot melt valves	
	244951 (4)	3500 psi 238 bar	1/2" npt (f)	1/2 npt (m)	1/8" npt (f)	1/8" npt (f)*	240 volt electrically heated, 8 pin square connection. 400ºF (204ºC) max. operating temperature	243695 hot melt valve	
Auto Plus (1)	233670	4000 psi 276 bar	3/8" npt (f) on manifold	7/8-14 with tip nut	1/8" npt (f)	spring	Compact valve designed for streaming or spray applications. Ambient or temperature conditioned. 140ºF (60ºC) max. operating temperature	918623	308813
Ultra Lite™ (1)	965766	4000 psi 276 bar (5)	1/4" npt (f)	1/4" npt (f) or 3/4 - 16 flange	1/8" npt (f)	1/8" npt (f)	Snuff-back valve with SST body. Adjustable-opening needle for Precision Dispense	n/a	308876
	965786	4000 psi 276 bar (5)	1/4" npt (f)	1/4" npt (f) or 3/4 - 16 flange	1/8" npt (f)	1/8" npt (f)	Snuff-back valve with aluminum body. Adjustable-opening needle for precision dispense	n/a	
	243482	4000 psi 276 bar (5)	1/4" npt (f)	1/4" npt (f) or 3/4 - 16 flange	1/8" npt (f)	1/8" npt (f)	Stainless steel wetted parts. 45º outlet, for use with Precision Swirl orbiter. Non-adjusting needle.	n/a	
	243666	4000 psi 276 bar (5)	1/4" npt (f)	1/4" npt (f) or 3/4 - 16 flange	1/8" npt (f)	1/8" npt (f)	Precision Flo control valve, machine mount applications. Non-adjusting needle	n/a	

Automatic Dispense Valve Selection Guide

Valve Style	Part Number	Working Pressure	Fluid Inlet	Fluid Outlet	Air to Open	Air to Close (6)	Description	Replaces	Service Manual
High Pressure Dispense	918533*	4000 psi 276 bar	1/4" npt (f)	1/4"	1/8" npt (f)	1/8" npt (f)	Ball seat valve with multiple mounting options	n/a	310549
	918535*	4000 psi 276 bar	1/4" npt (f)	1/4" - 16 (m)	1/8" npt (f)	1/8" npt (f)	Snuff-back valve. Includes C04137 nozzle. Multiple mounting options	n/a	310549
	918537*	5000 psi 345 bar	1/2" npt (f)	1/2"	1/4" npt (f)	1/4" npt (f)	Ball seat valve. Mounts to 3/4" square bar.	n/a	310550
	918539*	5000 psi 345 bar	3/4" npt (f)	3/4"	1/4" npt (f)	1/4" npt (f)	Ball seat valve. Mounts to 1" square bar	n/a	310551
	918623*	3700 psi 255 bar	1/4" npt (f)	1/4"	1/8" npt (f)	1/8" npt (f)	Ball seat valve. Light weight (< 1 lb.). 275ºF (135ºC) maximum operating temperature.	n/a	310557
	918625*	3700 psi 255 bar	1/4" npt (f)	7/8 - 14	/8" npt (f)	1/8" npt (f)	Ball seat valve. Accepts spray nozzle assembly and tip. 275ºF (135ºC) maximum operating temperature.	n/a	310557
	918512	3500 psi 241bar	1/2" npt (f)	1/8" or 3/4 - 16 (m)	1/8" npt (f)	1/8" npt (f)*	Snuff-back valve for ambient applications. Adaptable for streaming	n/a	310538
	918483	3500 psi 241bar	1/2" npt (f)	5/8" - 18 thread	1/8" npt (f)	1/8" npt (f)*	Snuff-back valve for warm melt and hot melt applications. 400ºF (204ºC) maximum operating temperatures. 120 VAC	n/a	310538
	918637	3500 psi 241bar	1/2" npt (f)	extrusion nozzle or stream tip	1/8" npt (f)	1/8" npt (f)*	Snuff-back valve for temperature conditioned applications.140ºF(60ºC) maximum operating temperature.	n/a	310539
	C34068	3500 psi 241bar	1/2" npt (f)	1/8" or 3/4 - 16 (m)	1/8" npt (f)	1/8" npt (f)*	Ball-seat valve for hot melt applications. 400ºF (204ºC) maximum operating temperature. 120 VAC with 6-pin round connector	n/a	310538
	C34079	3500 psi 241bar	1/2" npt (f)	1/2 npt (m)	1/8" npt (f)	1/8" npt (f)*	Ball-seat valve for hot melt applications. 400ºF (204ºC) maximum operating temperature. 120 VAC with 6-pin round connector	n/a	310538
	243694	3500 psi 241bar	1/2" npt (f)	1/8" or 3/4 - 16 (m)	1/8" npt (f)	1/8" npt (f)*	Ball-seat valve for hot melt applications. 400ºF (204ºC) maximum operating temperature. 240 VAC with 8-pin square connector	n/a	310538
	243695	3500 psi 241bar	1/2" npt (f)	1/2 npt (m)	1/8" npt (f)	1/8" npt (f)*	Ball-seat valve for hot melt applications. 400ºF (204ºC) maximum operating temperature. 240 VAC with 8-pin square connector.	n/a	310538

Automatic Dispense Valve Selection Guide

Valve Style	Part Number	Working Pressure	Fluid Inlet	Fluid Outlet	Air to Open	Air to Close (6)	Description	Replaces	Service Manual
Standard Duty	205435	3000 psi 210 bar	3/8" npt (m)	3/8" npt (m)	1/4" npsm(m)	spring Stainless steel	tip seal gun, includes tip and needle.	n/a	306715
	207440	3000 psi 210 bar	3/8" npt (m)	3/8" npt (m)	1/4" npsm(m)	spring	205435 with carbide ball and seat	n/a	306715
	205612	3000 psi 210 bar	3/8" npt (m)	3/8" npt (m)	1/4" npsm(m)	spring	205435 without tip and needle	n/a	306715
12000 Series	C27130	2400 psi 165 bar	1/4"	1/4" orifice	1/8" npt (f)	1/8" npt (f)	Snuff-back valve with EPDM seals	n/a	n/a
	C27134	2400 psi 165 bar	1/4"	1/4" orifice	1/8" npt (f)	1/8" npt (f)	Snuff-back valve with Viton seals	n/a	n/a
	C27151	2400 psi 165 bar	1/4"	1/4" or flange	1/8" npt (f)	spring	Base seal valve	n/a	n/a
	C27340	2400 psi 165 bar	1/4"	1/4" or flange	1/8" npt (f)	1/8" npt (f)	Larger inlet	n/a	n/a
	C27142	2400 psi 165 bar	1/4"	.093 in orifice	1/8" npt (f)	spring	Tip seal gun, includes nozzle	n/a	n/a

Notes:

(1) EnDure and AutoPlus valves are used with mounting manifold, which includes all fluid and electrical connections. Mounting manifold for AutoPlus valve is 244930. EnDure valves are shipped with mounting manifold. See Graco instruction manual 309376 for details.

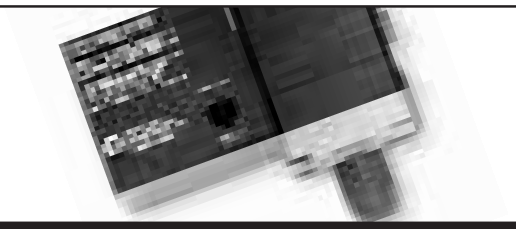
(2) Base valve (fluid and air section) for these models is 244535

(3) Base valve for these models is 244907

(4) Base valve for these models is 244937

(5) Maximum outlet pressure for Ultra-Lite valves is 2000 psi. Using above these pressures could cause premature needle/seat failure. See Graco manual 308876.

(6) Valves marked with * in this column have redundant spring closure. If air supply is lost valve will close.



EnDure™ Valves

Automatic Dispense Valves

2

EnDure Valves offer high reliability for high pressure, high flow sealant and adhesive dispensing applications

Features and Benefits

- Dual Seal design means that 2 seals need to fail before leakage occurs
- Primary seal is harder than typical snuff-back valve for use with abrasive materials
- Snuff-back style for non-drip performance and less rework
- Air operated with spring-assisted closing means no leakage if air supply is lost
- Manifold mounted for easy repositioning after service

Typical Applications

- Structural bonding
- Anti-Flutter mastics
- Glass bonding
- Interior/Exterior seam sealing
- Window manufacturing

Typical Fluids Handled

- PVC
- Epoxy
- Silicone
- Anti-Flutter Mastic

244910
EnDure™ Automatic Dispense Valve

EnDure™ Valves

Automatic Dispense Valves

Technical Data

Maximum working fluid pressure . . . . . .3500 psi (241 bar; 24.1 MPa)

Maximum static fluid pressure . . . . . .5000 psi (345 bar; 34.5 MPa)

Maximum working dry air pressure . . . . . .120 psi (8.3 bar; 0.83 MPa)

Maximum working temperature: standard seals in models 244535, 244910, 244961, 244962 . . . . . .200˚F (95˚C)

high-temp. seals in models 244907, 244908, 244909, 244937, 244951, 245184 . . . . . .400˚F (204˚C)

Material inlet on inlet manifold: . . . . . .1/2 npt(f)

Air inlets (open and closed) . . . . . .1/8 npt

Weight (automatic dispense valve plus manifold) . . . . . .4 lb (1.8kg)

Ordering Information

EnDure Valve complete with mounting manifold

244910 **Ambient or Temperature Conditioned Applications**

Used for temperatures to 200ºF (95ºC) in ambient applications or where water-circulated temperature conditioning is used. Outlet connection is either 5/8-18 male thread or retainer nut with 1/8 npt (f).

244961 **120V Electric Heat Model, temperatures to 200ºF (95ºC)**

Used for heat-only applications. Manifold includes a 150W heater and a 120V, 6 pin round connection. Outlet connection is either 5/8-18 male thread or retainer nut with 1/8 npt (f).

244962 **240V Electric Heat Model, temperatures to 200ºF (95ºC)**

Used in heat-only applications. Manifold includes a 200W heater and a 240V, 8 pin square connector. Outlet connection is either 5/8-18 male thread or retainer nut with 1/8 npt (f).

244908 **120V Electric Heat Model, temperatures to 400ºF (204ºC)**

Same as 244961 with higher temperature seal kit.

244909 **240V Electric Heat Model, temperatures to 400ºF (204ºC)**

Same as 244962 with higher temperature seal kit.

245184 **120V Electric Heat Model with 1/2 npt (m) outlet**

Same as 244908 with different outlet connection.

244951 **240V Electric Heat Model with 1/2 npt (m) outlet**

Same as 244909 with different outlet connection.

EnDure base valves and manifolds

244535 Base valve for models 244910, 244961, and 244962

244907 Base valve for models 244908 and 244909

244937 Base valve for models 244951 and 245184

198235 Mounting manifold for ambient/temperature conditioned valve

198236 Electrical manifold for electrically heated models (Note: additional hardware needed for connection. See manual 309376)

197843 Mounting block for electrically heated models

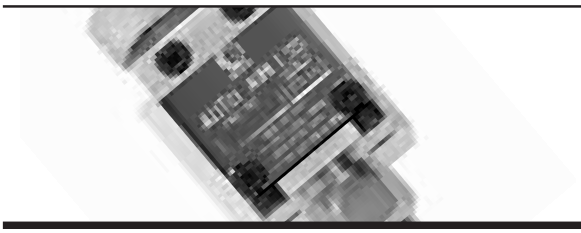
Adapters and Repair Kits

197504 Alternate nosepiece for valve outlet, to fit inlet swivel of PrecisionSwirl™ orbiter. To mount the orbiter also requires the following parts: 197842 (45º nosepiece), 198323 (orbiter nut), and 198324 (fitting between nosepiece and orbiter

617585 Streaming adapter: to allow outlet nut to retain 270xxx stream tips or 182xxx fan tips.

245195 Repair kit: includes standard duty seals, needle, and seat

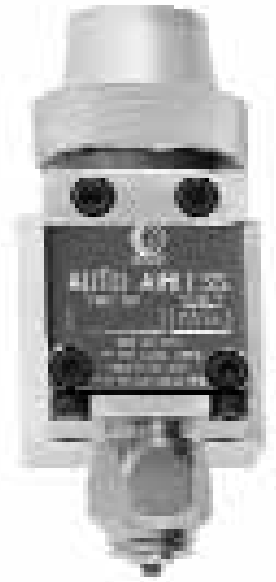
245196 Repair kit for high temperature (400ºF) valves: includes high temperature seals, needles, and seat



AutoPlus™ Valves

For Sealant Dispensing

AutoPlus offers the combination of compact design and long life for streaming, spray, and extrusion applications



Features and Benefits

- Proven, long-lasting design
- Compact: weighs only 2 pounds and has small profile for easy mounting
- Manifold mounted: valve can be serviced and returned to the exact location on the tool
- Wide choice of streaming and spray tips available for custom application
- Can be used for both ambient and temperature conditioned applications
- Low-cost repair kits mean low cost of ownership

Typical Applications

- streaming
- spraying
- extrusion

Typical Fluids

- Polyvinyl Chloride (PVC)
- Epoxies
- Silicone
- Urethane

AutoPlus™ Valves
For Sealant Dispensing

Technical Data

Maximum working fluid pressure . . . . . .4000 psi (280 bar; 028 MPa)

Maximum working air pressure . . . . . .100 psi (7 bar; 0.7 MPa)

Maximum working fluid temperature . . . . . .140˚F (60˚C)

Maximum air cylinder actuation pressure . . . . . .70 psi (0.49 MPa, 4.9 bar)

Weight . . . . . .2 lb. (895 g)

Wetted Parts . . . . . .SST, Carbide, Ultra-high Molecular Weight Polyethylene, Delrin, PEEK, Chemically-resistant Fluoroelastomer, PTFE

Ordering Information

233670 Auto-Plus Valve for Sealant and Adhesive Dispensing. Flange outlet for accepting stream, fan, and shower tips

244930 Mounting manifold for 233670

Accessories and Repair Kits

198316 Accessory nut which allows Auto-Plus Valve to accept extrusion tips

239896 Fluid Repair Kit: includes gaskets and o-rings for fluid section

241480 Air Seal Repair Kit: includes o-rings and gaskets for air section

239807 Fluid needle assembly

233671 Valve seat

Spray, Shower, and Stream Tips

Shower Tip

C08224 Outlet has 60.02 in (0.53 mm) orifices

Streaming Tips

Part number	Orifice Size
270025	0.025 in (0.635 mm)
270027	0.027 in (0.686 mm)
270029	0.029 in (0.736 mm)
270031	0.031 in (0.787 mm)
270035	0.035 in (0.889 mm)
270037	0.037 in (0.940 mm)
270039	0.039 in (0.991 mm)
270041	0.041 in (1.041 mm)
270043	0.043 in (1.092 mm)
270059	0.059 in (1.500 mm)

Spray Tips

Part Number	Orifice Size	Fan Width at 12 in (300 mm)
182421	0.021 in (0.533 mm)	8-10 in (200-250 mm)
182521		10-12 in (250-300 mm)
182621		12-14 in (300-350 mm)
182721		14-16 in (350-400 mm)
182821		16-18 in (400-450 mm)
182423	0.023 in (0.584 mm)	8-10 in (200-250 mm)
182523		10-12 in (250-300 mm)
182623		12-14 in (300-350 mm)
182723		14-16 in (350-400 mm)
182823		16-18 in (400-450 mm)
182425	0.025 in (0.635 mm)	8-10 in (200-250 mm)
182525		10-12 in (250-300 mm)
182625		12-14 in (300-350 mm)
182725		14-16 in (350-400 mm)
182825		16-18 in (400-450 mm)
182427	0.027 in (0.686 mm)	8-10 in (200-250 mm)
182627		12-14 in (300-350 mm)
182429	0.029 in (0.737 mm)	8-10 in (200-250 mm)
182629		12-14 in (300-350 mm)
182829		16-18 in (400-450 mm)
182431	0.031 in (0.787 mm)	8-10 in (200-250 mm)
182631		12-14 in (300-350 mm)
182831		16-18 in (400-450 mm)
182435	0.035 in (0.889 mm)	8-10 in (200-250 mm)
182535		10-12 in (250-300 mm)
182635		12-14 in (300-350 mm)
182439	0.039 in (0.991 mm)	8-10 in (200-250 mm)
182539		10-12 in (250-300 mm)
182639		12-14 in (300-350 mm)
182443	0.043 in (1.041 mm)	8-10 in (200-250 mm)
182543		10-12 in (250-300 mm)
182643		12-14 in (300-350 mm)
182943		18-20 in (450-500 mm)
182947	0.047 in (1.194 mm)	18-20 in (450-500 mm)

1K Ultra-Lite™ Valves

Precision Dispense Valve for Quality Bead Laying

1K Ultra-Lite valve combines durable design with precision performance.

Features and Benefits

- Eliminates snake-head and material drip
- Adjustable forward travel to reduce material surge
- Manual and automatic versions available.
- Lubricated packings for longer seal life
- Severe-Duty needle and seat
- Lightweight and compact

Machine Mount
965766 SST
965786 Aluminum

Typical Applications

- Railcar sealing
- Truck trailer sealing
- Marine container sealing
- Product assembly in wood, window, and door
- Automatic bead laying with robot or XY tables

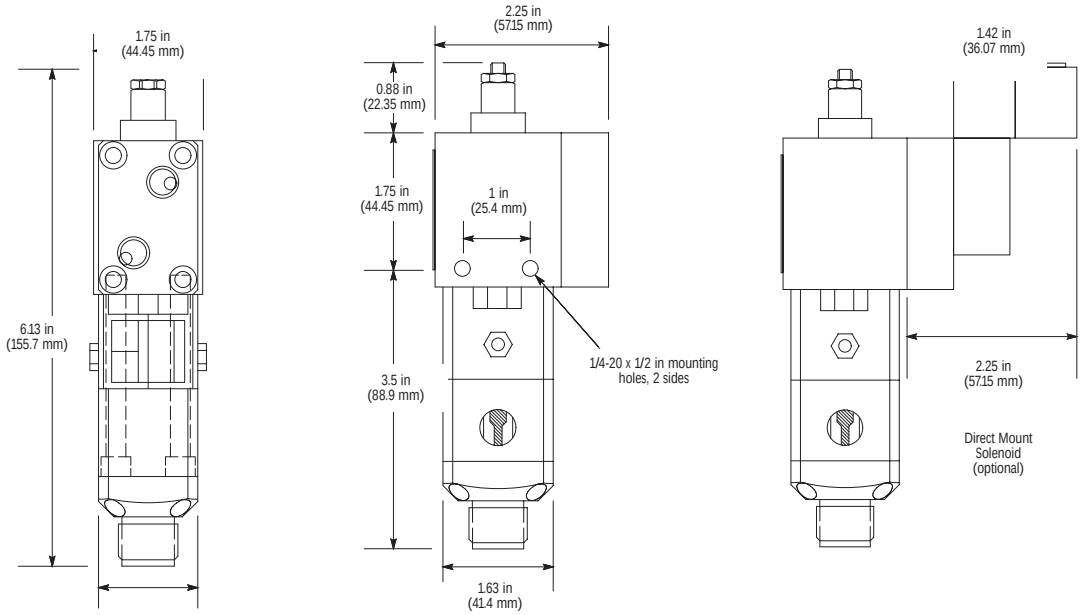
Typical Fluids Handled

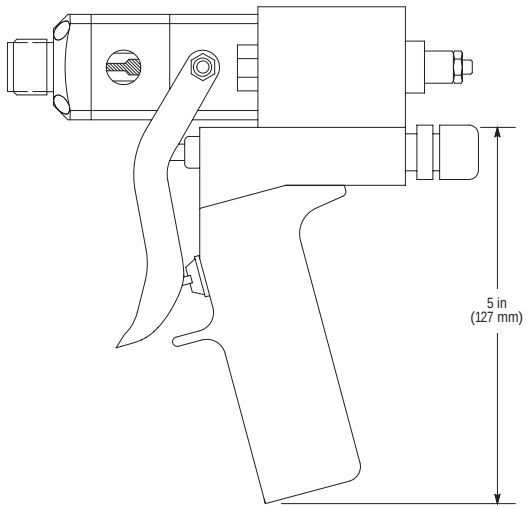
- Epoxies
- Silicones
- Polysulfides
- Urethanes
- Butyl

1K Ultra-Lite™

Precision Dispense Valve for Quality Bead Laying

Dimensions





Technical Specifications

Maximum fluid outlet pressure . . .4000 psi (276 bar; 27.6 MPa)
Fluid viscosity range . . . . . 20 to 1 million cps
Maximum cylinder air pressure . . . .120 psi (8.4 bar; 0.84 MPa)
Fluid inlet size . . . . . 1/4 npt(f)
Fluid outlet size . . . . . 1/4 npt(f) and 3/4-16 unf(m)
Air inlet size . . . . . 1/8 npt(f)
Shaft sealing fluid section . . . . . dual seal isolation chambers with Zirk fittings
Air cylinder . . . . . divorced
Wetted materials
- Aluminum . . . . . Aluminum, 303 SST, 17-4 ph SST, C2 carbide, hard chrome, ethylene propylene, Parker Polymite™, PTFE, SST 303 SST, 17-4 ph SST, C2 carbide, hard chrome, ethylene propylene, Parker Polymite™, Du Pont PTFE

Weight
- Aluminum . . . . . 1.4 lbs (0.65 kg)
- SST . . . . . 2.1 lbs (0.94 kg)
- Handle kit . . . . . .77 lb (0.35 kg)

Instruction manual 308876

1K Ultra-Lite™

Precision Dispense Valve for Quality Bead Laying

Ordering Information

965766 **Machine Mount 1K Ultra-Lite Dispense Valve**
SST wetted parts

965786 **Machine Mount 1K Ultra-Lite Dispense Valve**
Aluminum wetted parts

243482 **Machine Mount 1K Ultra-Lite Dispense Valve**
SST wetted parts, includes 45º outlet for use with PrecisionSwirl orbiter.

243666 **Machine Mount 1K Ultra-Lite Straight Connection for PrecisionFlo Applications (Non-Swirl)**
SST wetted parts, non-adjusting fluid needle

Accessories

Plastic Tube Fittings to Connect Air Signals

Tube OD	1/8 npt(m) Straight	1/8 npt(m) 90° Swivel
1/8 in	**598329**	
5/32 in	**104172**	**598140**
1/4 in		**597151**

Tube OD	1/4 npt(m) Straight	1/4 npt(m) 90° Swivel
5.32 in	**598252**	**598327**
5/32 in	**104165**	**598156**

Plastic Tubing for Air Signal Lines

513063 1/8 O.D. Nylon
514607 5/32 O.D. Nylon
513231 1/4 O.D. Nylon

Air Signal Accessories

104661 **Quick Exhaust Valve**
1/8 npt(f) inlet and outlet, 1/4 npt(f) exhaust. Used to speed up opening or closing action of the 1K Ultra-Lite

104632 **Pump Pilot Valve**
1/2 npt(f) line ports, 1/8 npt(f) pilot port. 3-way air piloted air valve to turn air powered pump on with hand gun signal

4-Way Solenoids and Solenoid Accessories

626144 **Manifold**
To direct mount solenoid to 1K Ultra-Lite Valve.

551317 **24 Volt dc Solenoid**
For use with 626144 Manifold

551348 **24 Volt dc Solenoid**
Remote mount, 1/8 npt(f) ports

551350 **24 Volt dc Din Plug**
With screw terminals for above solenoids

Kits

949631 **Conversion Kit**
Pneumatic 4-way valve with housing, handle, and trigger and other parts necessary to convert 965766 to a hand-held valve

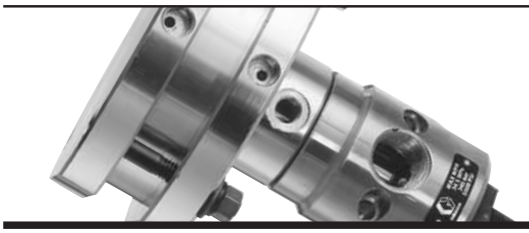
949632 **Conversion Kit**
Electric switch style handle kit to convert 965766 to a hand-held valve

570267 **Seal Kit**
Polymite main packing (standard)

570268 **Rebuild Kit (includes 570267 Seal Kit)**
Polymite main packing (standard)

570299 **Seal Kit**
PTFE main packing (optional)

570300 **Rebuild Kit (includes 570299 Seal Kit)**
PTFE main packing (optional)



Automatic Dispense Valves

Features and Benefits

- Automatic valves use ball needle/seat design or snuff-back design
- Available in a variety of sizes and pressure ranges to fit your application requirements
- Double acting valves ensure fast cycling and positive shut-off
- Spring-close valves will shut if air pressure is lost
- Snuff-back valves prevent dripping by pulling material back into tip

Typical Applications

- Structural bonding
- Anti-flutter mastic
- Glass bonding
- Interior/exterior seam sealing
- Underbody/rocker spray coating
- Robot or pedestal mount

Typical Fluids Handled

- Epoxy
- PVC
- Urethane
- Sealants
- Structural adhesives

918539
Automatic Dispense Valve

Automatic Dispense Valves

Ordering Information | Technical Specifications

918533 - Ambient Extrusion Valve, 1/4 npt(f)

Typical Application: Extruding sealer; anti-flutter mastic

The round body design of this valve allows multiple mounting options for robotic and automated applications. This valve accepts a yoke style bracket or 3/8 in (10 mm) diameter rod. The one-piece body ensures repeatability in nozzle positioning when removing and reinstalling the dispense valve. The nozzle and seat are all metal construction for long life dispensing low abrasive materials. The valve accepts a wide variety of threaded extrusion nozzles.

Maximum working pressure . . . . 4000 psi (276 bar; 27.6 MPa)
Material inlet . . . . . 1/4 npt(f)
Air inlet . . . . . 1/8 npt
Wetted parts . . . . . SST, aluminum, Viton®
Repair kit 918534
Instruction manual 310549

Viton® is a registered trademark of Du Pont.

918533

918535 - Ambient Snuff Back Extrusion Valve

Typical Application: Extruding sealer; anti-flutter mastic

The round body design of this valve allows multiple mounting options for robotic and automated applications. This valve accepts a yoke style bracket or 3/8 in (10 mm) diameter rod. The one-piece body ensures repeatability in nozzle positioning when removing and reinstalling the dispense valve. The nozzle and seat are all metal construction for long life dispensing low abrasive materials. The valve accepts a wide variety of threaded extrusion nozzles.

Maximum working pressure . . . . .4000 psi (276 bar; 27.6 MPa)
Maximum air inlet pressure . . . . . .150 psi (10.4 bar; 1.04 MPa)
Fluid inlet size . . . . . .1/4 npt(f)
Fluid outlet size . . . . . .3/4-16 (m)
Air cylinder ports . . . . . .(2) 1/8 npt(f)
Weight . . . . . .1.5 lbs (0.68 kg)
Temperature . . . . . .140°F (60°C)
Dimensions . . . . . .5.19 in x 2.2 in (132 mm x 56 mm)
Depth . . . . . .Round
Wetted parts . . . . . .CS, aluminum, polymite, Viton
Mounting . . . . . .(3) #10-24 holes (1) 3/8 in (9.5 mm) diameter rod
Instruction Manual 310549

918535

Automatic Dispense Valves

Ordering Information | Technical Specifications

918537 - Automatic Dispense Valve, 1/2 npt(f)

Typical Application: Dispense valve for automatic depressurization

The body of this fluid valve is slotted to mount to a 3/4 in (19 mm) square bar using two 1/4 in (6.4 mm) socket head screws. The valve's large porting design allows high flow rate of viscous materials such as PVC sealers and heat cure epoxy.

Maximum working pressure . . . . 5000 psi (345 bar; 34.5 MPa)
Material inlet . . . . . 1/2 npt(f)
Air inlet . . . . . 1/4 npt
Wetted parts . . . . . .SST, aluminum, Viton
Repair kit 918538
Instruction manual 310550

918537

918539 - Automatic Dispense Valve, 3/4 npt(f)

Typical Application: Applying urethane sealant to glass

The body of this fluid valve is slotted to mount to a 1 in (25 mm) square bar using two 5/16 in (7.9 mm) socket head screws. The valve's large porting design allows high flow rates of high viscosity materials such as urethane sealant.

Maximum working pressure . . . . 5000 psi (345 bar; 34.5 MPa)
Material inlet . . . . . 3/4 npt(f)
Air inlet . . . . . 1/4 npt
Wetted parts . . . . . stainless steel, aluminum, Viton
Repair kit 918540
Instruction manual 310551

918539

918623 - Automatic Extrusion Valve, 1/4 npt(f) outlet

Typical Application: Extruding sealer; anti-flutter mastic

The square body design of this valve allows multiple mounting options for robotic and automated applications. The one-piece body ensures repeatability in nozzle positioning when removing and reinstalling the dispense valve. The nozzle and seat are all metal construction for long life dispensing low abrasive materials. The valve accepts a wide variety of threaded extrusion nozzles.

Maximum working pressure . . . . 3700 psi (255 bar; 25.5 MPa)
Maximum air inlet pressure . . . . . 150 psi (10.3 bar; 1.03 MPa)
Maximum operating temperature . . . . . 275˚F (135˚C)
Fluid inlet size . . . . . 1/4 npt(f)
Fluid outlet size . . . . . 1/4 npt(f)
Air inlet size (2 ports) . . . . . 1/8 npt(f)
Weight . . . . . 0.92 lbs (0.42 kg)
Wetted parts Aluminum, carbon steel, tungsten carbide, chrome plate, Viton rubber, thermoplastic polyester
Repair kit 918624
Instruction manual 310557

918623

Automatic Dispense Valves

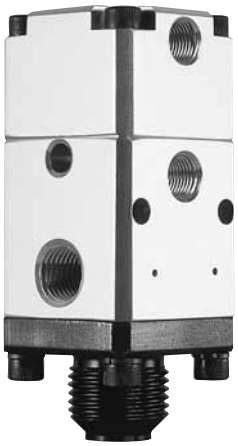
Ordering Information | Technical Specifications

918625
Automatic Spray Valve, 7/8-14 UNF-2A(m) outlet

Typical Application:
Streaming or spraying coating materials

The square body design of this valve allows multiple mounting options for robotic and automated applications. The one-piece body ensures repeatability in nozzle positioning when removing and reinstalling the dispense valve. The nozzle and seat are all metal construction for long life dispensing low abrasive materials. The valve accepts a 7/8-14 RAC spray nozzle assembly and tip.

Maximum working pressure . . . . 3700 psi (255 bar; 25.5 MPa)
Maximum air pressure . . . . . 150 psi (10.3 bar; 1.03 MPa)
Maximum operating temperature . . . . . 275˚F (135˚C)
Fluid inlet . . . . . 1/4 npt(f)
Fluid outlet . . . . . 7/8-14 UNF-2A(m)
Wetted parts Aluminum, carbon steel, tungsten carbide, chrome plate, Viton rubber, thermoplastic polyester
Repair kit 918626
Instruction manual 310557



918625

918512
Ambient Snuff Back Extrude/Streaming Valve

Typical Application: Streaming adhesives

This unique valve is designed for streaming most low-to-medium viscosity materials up to 350,000 cps. The square body valve is divorced design and easily mounts to a bracket for interfacing to robot wrists, pedestal mounts and automation fixtures. The cylinder is double acting and spring loaded for fail-safe closing requirements. The nozzle seal is elastomeric for easy maintenance and long life with low abrasive materials. Includes 1/8 npt(f) nozzle adapter. With the addition of a streaming tip adapter (617585) and tip, this valve is adaptable for streaming.

Maximum working pressure . . . . .3000 psi (207 bar; 20.7 MPa)
Maximum air inlet pressure . . . . . .150 psi (10.4 bar; 1.04 MPa)
Fluid inlet size . . . . . .1/2 npt(f)
Fluid outlet size . . . . . .1/8 npt(f) and 3/4-16 (m)
Air cylinder ports . . . . . .(2) 1/8 npt(f)
Weight . . . . . .4 lbs (1.8 kg)
Temperature . . . . . .140°F (60°C)
Fail-safe spring . . . . . .Yes
Dimensions . . . . . .6.3 in x 1.75 in x 2 in (160 mm x 44 mm x 51 mm)
Wetted parts . . .SST, aluminum, UHMWPE, Viton®, Brass, Hytrel
Mounting . . . . . .(2) 1/4-20 holes
Instruction Manual 31054

918512

Automatic Dispense Valves

Ordering Information | Technical Specifications

918637
Temperature Conditioned Snuff Back Extrude/Stream Dispense Valve

Typical Application: Streaming or extruding adhesives

This unique valve is designed for streaming or extruding most low-to-medium viscosity materials up to 350,000 cps. The square body valve is divorced design and easily mounts to a bracket for interfacing to robot wrists, pedestal mounts, and automation fixtures. The valve includes the manifold (Part No. 918525) which is used for mounting to the automation bracket, routing the temperature conditioning tubing, and allows easy removal of the dispense valve. The cylinder is double-acting and spring-loaded for fail-safe closing requirements. The nozzle seal is elastomeric for easy maintenance and long life with low abrasive materials. Must order 1/8 npt(f) extrusion nozzle adapter (C32089) or streaming tip adapter (617585) and tip (270xxx).

Maximum working pressure	3500 psi (241 bar; 24.1 MPa)
Maximum air inlet pressure	150 psi (10.4 bar; 1.04 MPa)
Fluid inlet size	1/2 npt(f)
Fluid outlet size	Extrude nozzle and stream tip
Air cylinder ports	(2) 1/8 npt(f)
Temperature conditioning inlet	(1) 1/4 npt(f)
Temperature conditioning outlet	(4) 1/8 npt(f)
Weight	4.4 lbs (2 kg)
Temperature	140°F (60°C)
Fail-safe spring	Yes
Dimensions	6.91 in x 2.25 in x 4.62 in (175 mm x 57.2 mm x 117.5 mm)
Wetted parts	SST, aluminum, UHMWPE, Viton®, Brass, Hytrel
Mounting	(4) 1/4-20 holes
Sensor	(1) 1/8 npt(f) port
Instruction Manual	310539

918483

Heated Snuff Back Extrude/Stream Dispense Valve

Typical Application: Extruding and streaming heated adhesives

This unique valve is designed for extruding most low-to-medium viscosity hot melt materials up to 350,000 cps. The square body valve is divorced design and easily mounts to a bracket for interfacing to robot wrists, pedestal mounts and automation fixtures. The cylinder is double acting and spring loaded for fail-safe closing requirements. The nozzle seal is elastomeric for easy maintenance and long life with low abrasive materials. Includes 1/8 npt(f) nozzle adapter. With the addition of a streaming tip adapter (617585) and tip (270xxx), this valve is adaptable for streaming.

Maximum working pressure	3500 psi (241 bar; 24.1 MPa)
Maximum air inlet pressure	150 psi (10.4 bar; 1.04 MPa)
Fluid inlet size	1/2 npt(f)
Fluid outlet size	1/8 npt(f) and 3/4-16 (m)
Air cylinder ports	(2) 1/8 npt(f)
Weight	4 lbs (1.8 kg)
Temperature	400°F (205°C)
Fail-safe spring	Yes
Dimensions	6.0 in x 4.5 in x 2.1 in (152 mm x 114 mm x 53 mm)
Wetted parts	SST, aluminum, PTFE, Viton®, Brass
Mounting	(2) 1/4-20 holes
Sensor	100 ohm, RTD
Heater	150 watt, 120 volt
Instruction Manual	310538

918627

918483

Automatic Dispense Valves

Ordering Information | Technical Specifications

Standard-Duty Dispense Valves

Maximum working pressure: 3000 psi (210 bar; 21.0 MPa). Orifice tip: 1/8 in (3.1 mm). Other tips available from 1/16 to 1/3 in (1.5 to 8.4 mm). Fluid inlet: 3/8 npt(m). Optional fluid inlet (plugged): 1/4 npt(f). Air inlet: 1/4 npsm(m). Fluid outlet: 3/8 npt(m). Includes 0.125 in (3.1 mm) tip and needle. Instruction Manual: 306715.

205435 Air controlled. 400 Series SST wetted parts. For use with non-abrasive material.
207440 Same as 205435 except with Tungsten carbide ball and valve. For use with abrasive material.
205612 Same as 205435 less tip and needle.

Packings

181524 UHMWPE packings for 205435 and 205612
164116 Leather packings for 205435 or 205612
Choose either (2) 181524 and (1) 164116 (standard) or (3) 164116
181520 UHMWPE packings for 207440
166250 Leather packings for 207440
Choose either (2) 181523 and (1) 166258 or (3) 116258
Needle/Seat Sets for 205435 and 205612

Needle/Seat Options

Size	Seat	Needle
0.062 in	164746	181525
0.125 in	164747	181525
0.187 in	164748	181526
0.250 in	164749	181526
0.312 in	164750	181526

Ordering Information

12000 Series Base Seal Dispensing Valves

Maximum working pressure : 2400 psi
Inlet: 1/4 npt except where noted
Outlet: See table

Nozzle not included

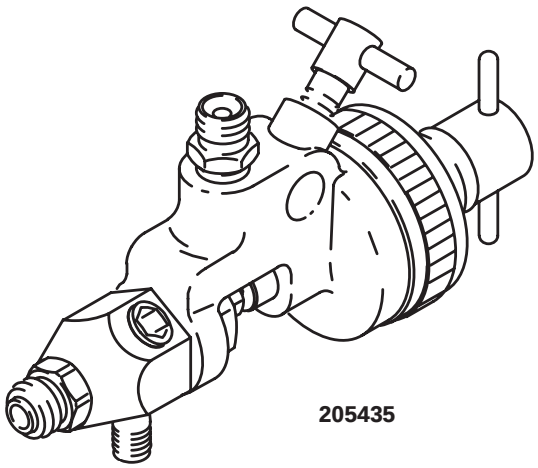
C27151 Single, Air-Actuated Valve
C27146 Seal Repair Kit
C27340 Double, Air-Operated Valve
Material inlet: 1/2 in (12.6 mm)
C27342 Seal Repair Kit

Nozzle included

C27142 Single, Air-Actuated Valve
Orifice nozzle: 0.093 in
C27146 Seal Repair Kit

Nozzle Mounted Gun for Automation

C27130 Double, Air-Operated Valve
Orifice nozzle: 0.25 in EP seals.
C27131 Seal Repair Kit
C27134 Same as C27-130 except with Viton seals.
C27135 Seal Repair Kit



205435

Accessories
For Automatic Valves

Accessories

C20023 **Mounting Bolt**
7/16-20 x 3/4 long

Nozzles See Manual Applicator Accessory Section

513468 **Foot Switch**
Four way air valve, foot-actuated, safety-guarded.
Air inlet: 1/4 npt(f).
Normally open outlet: 1/4 npt(f).
Normally closed outlet: 1/4 npt(f).

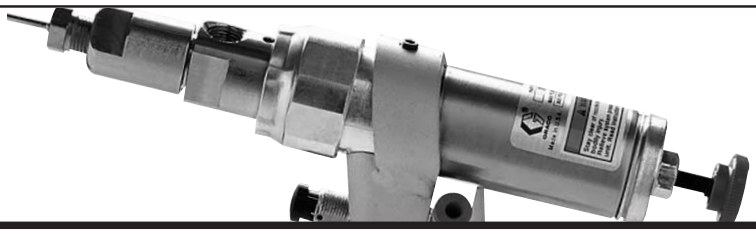
104658 **Quick Exhaust Valve**
Optimizes no drip shut-off. Inlet 10-32 unf. Outlet 10-32 un(m).

Solenoids Kits
These kits are used to allow double-acting automatic valves to be opened using a remote signal, e.g., from a robot or X-Y table.

C58942 **120 VAC**
Includes air tubes, fittings and muffler.

C59038 **24 VAC Solenoid Kit**

243703 **240 VAC Solenoid Kit**



DynaMite™

Precision Dispense Valve

Features and Benefits

- Precise bead/dot diameter and positioning for improved quality and less rework in manual or automated applications
- Wetted parts are made of SST, PTFE, and acetal to provide wide fluid compatibility
- Valve can be converted from manual trigger (pistol grip) actuation to fixtured automated actuation

Typical Applications

- Crack sealing and joint filling
- Small product assembly

Typical Fluids Handled

- Adhesives
- Sealants
- Colorants
- Potting compounds
- Greases
- Encapsulants
- Inks

235877
DynaMite Dispense Valve, Manual

DynaMite™
Precision Dispense Valve

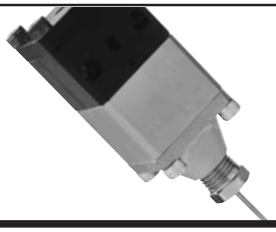
Technical Specifications

Fluid inlet size . . . . . 1/8 npt(f)
Fluid outlet size . . . . . 1/8 npt(f)
Air inlet size
  Bare unit . . . . . 1/8 npt(f)
  For pistol grip . . . . . 10-32 unc(f)
  Both include 5/32 in (4 mm) diameter tube fitting
Maximum air inlet pressure range . . . . . 40 to 100 psi (2.8 to 7 bar; 0.28 to 0.7 MPa)
Maximum fluid inlet pressure . . . . . 900 psi (62 bar; 6.2 MPa)
Wetted parts . . . . . 302 and 17-4 passivated SST, PTFE, acetal
Maximum length, w/o dispense needle . . . 6.75 in (171.5 mm)
Weight
  Bare unit . . . . . 13 oz (37 g)
  With pistol grip . . . . . 18 oz (51 g)
Instruction manual 308266

Ordering Information

224906 **DynaMite Dispense Valve, Automatic**

235877 **DynaMite Dispense Valve, Manual**



DDV™

Diaphragm Dispense Valve

2

Features and Benefits

- Reverse-acting design provides no-drip shut-off
- Diaphragm rear seal allows for completely leak-free operation
- Compact size makes the unit adaptable for installation in even the most confined areas, or ganging of multiple valves

Typical Applications

- Apply moisture cure materials precisely
- Electrical potting applications
- Product assembly
- Encapsulantation

Typical Fluids Handled

- Adhesives
- Potting compounds
- Encapsulants
- Sealants
- Plastisols
- Lubricants
- Greases

692022
Diaphragm Dispense Valve

DDV

Diaphragm Dispense Valve

Technical Specifications

Max. fluid inlet pressure . . . . . 1000 psi (7 MPa, 70 bar)
Max. air inlet pressure . . . . . 120 psi (0.8 MPa, 8 bar)
Min. air inlet pressure . . . . . 60 psi (0.4 MPa, 4 bar)
Fluid inlet . . . . . 1/4 npt(f)
Air inlets (requires 4 way air valve) . . . . . (2) 10-32 un(f)
Dimensions . . . . . 3.11 in L x 1.38 in W x 1.38 in D
(80 mm L x 35 mm W x 35 mm D)
Weight . . . . . 14 oz (0.4 kg)
Mounting . . . . . (2) 0.27 in (7 mm) diameter thru holes
Wetted parts . . . . . 300 Series SST, 18-8 SST, PTFE

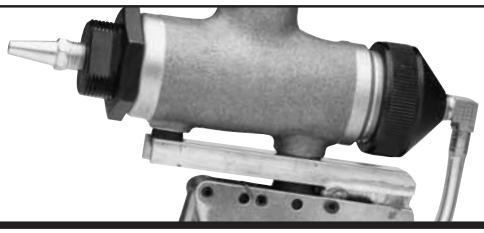
Ordering Information

692022 **Diaphragm Dispense Valve**

Accessories

104658 **Quick Exhaust Valve**
Optimizes no-drip shut-off feature.
Inlet: 10-32 un(f). Outlet: 10-32 un(m).

513468 **Foot Switch**
Four way air valve, foot-actuated, safety-guarded.
Air inlet: 1/4 npt(f).
Normally open outlet: 1/4 npt(f).
Normally closed outlet: 1/4 npt(f).



AMV™

Automatic Metering Valve

AMV provides accurate dispensing on a repetitive basis. Shot size range is 0.2 - 4.0 cc.

Features and Benefits

- Air-operated, single-acting metered shot valve
- Dispenses up to 60 shots per minute or more
- Change shot size quickly and easily
- Special snuffer action prevents dripping
- Numerous models to select from

Typical Applications

- Dispensing of adhesives and other fluids where a precise amount needs to be deposited

Typical Fluids Handled

- Urethanes
- Epoxies
- Silicones

C02-026 shown
Model 482-HA
Nozzle not included

AMV™
Automatic Metering Valve

Technical Specifications

Maximum operating
fluid pressure . . . . . 3200 psi (220 bar; 22.0 MPa)
Minimum operating
fluid pressure . . . . . 50 psi (3.4 bar; 0.34 MPa)
Material inlet . . . . . 1/4 npt(f)
Air supply inlet . . . . . 1/8 npt(f)
Material outlet
Most models . . . . . 1/8 npt(f)
Model 482-E and 482-DA . . . . . .1/4 npt(f)
Mounting hold . . . . . .7/16 - 20 unf-2B
Minimum air supply pressure . . . . . .50 psi (3.4 bar; 0.34 MPa)
Shot size . . . . . 0.2 cc to 4 cc per shot

Ordering Information

C02021 **AMV Model 482-B**
7/8-18 nef externally threaded material inlet boss and 7/16-20 unf mounting hole

C02022 **AMV Model 482-C**
7/16-20 unf mounting hole only

C02025 **AMV Model 482-E**
Model 482-C with 1/4 npt(f) fluid outlet

C02026 **AMV Model 482-HA**
Model 482-C with trigger-actuated pistol grip handle

C02027 **AMV Model 482-MS**
Model 482-B with seal fluid reservoir and 7/16-20 mounting bolt for moisture sensitive fluids

C02078 **AMV Model 482-DA**
Model 482-C with double-acting (air-open, air-close) air cylinder and 1/4 npt(f) outlet

Repair Kits

C02023 **Seal Repair Kit for all models except C02078**

C02080 **Seal Repair Kit for C02078**

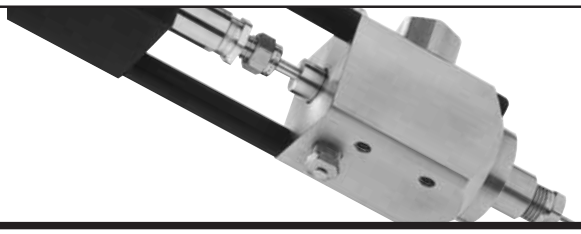
3 Piece Matched Needle Sets

C02036 Fits C02021, C02022, C02025, C02026, C02027, C02078

C02-022
Model 482-C
Nozzle not included

C02078
Model 482-DA
Nozzle not included

2



MMV™

Micro Metering Valve

MMV is used for accurate shot metering during small parts assembly and encapsulation.

Features and Benefits

- Positive displacement design provides high accuracy and repeatability, regardless of viscosity and fluid inlet pressure variations
- Threaded stroke limiter on the back of the air cylinder makes shot size easily adjustable
- Simple, all-pneumatic operation
- Minimal retained volume in dispense chamber assures fluid inventory exchange

Typical Applications

- Apply beads and drops for assembly applications
- Electrical potting and encapsulation

Typical Fluids Handled

- Adhesives
- Potting compounds
- Encapsulants
- Sealants
- Plastisols
- Lubricants

MMV™
Micro Metering Valve

Technical Specifications

Max. fluid inlet pressure . . . . . 100 psi (7 bar; 0.7 MPa)
Max. air inlet pressure . . . . . 100 psi (7 bar; 0.7 MPa)
Fluid inlet . . . . . 3/8 npt(f)
Fluid outlet . . . . . 1/4 npt(f)
Air inlets (requires 4 way air valve) . . . . . (2) 1/8 npt(f)
Dimensions . . . . . 9.25 in L x 1.75 in W x 2.9 in D
(235 mm L x 44.5 mm W x 73.7 mm D)
Weight . . . . . 2.9 lbs (1.32 kg)
Mounting . . . . (2) 1/4-20 UNC threaded, 5 in (12.5 mm) deep

Ordering Information

692-125 MMV 125
Shot range: 0.025-0.201 cc

692-250 MMV 250
Shot range: 0.100-0.804 cc

692-500 MMV 500
Shot range: 0.400-3.21 cc

Notes

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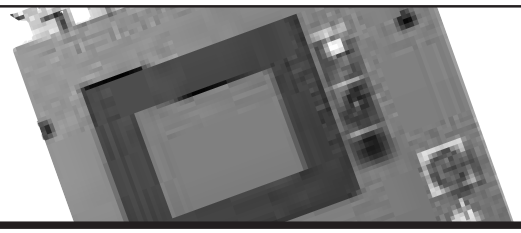


PrecisionFlo™ XL

Sealant & Adhesive Dispensing Systems

Precision Flo XL provides real time, closed-loop bead control for a wide variety of sealants and adhesives. Choice of 2 user interfaces: Color touch screen or EZ Key Interface.

Features and Benefits

- Supports a variety of application methods: spray, stream, PrecisionSwirl
- Integrated flow meters provide real-time feed back to adjust dispense pressure
- Fast response times insure accurate delivery of material for less rework
- Pneumatic and electric metering modules available for different levels of control
- Choice of user interfaces available give the user the level of sophistication needed for a particular operation
- Controls ambient, temperature-conditioned, and heated applications so almost any fluid can be controlled

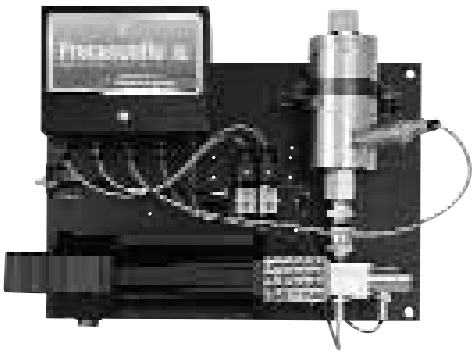
Typical Applications

- Automotive body shop applications
- Automotive paint shop applications
- Industrial bead dispense applications
- Industrial and automotive applications which use PrecisionSwirl

Typical Fluids Handled

- Polyvinyl chloride (PVC)
- Epoxy
- Liquid-Applied Sound Deadeners
- Silicones

PrecisionFlo XL control with color touch screen interface



PrecisionFlo linear servo meter

PrecisionFlo™ XL

Sealant & Adhesive Dispensing System

Technical Specifications

For technical specifications for all PrecisionFlo XL components, please refer to the appropriate service manual.

PrecisionFlo XL 309364
Cartridge Regulator 308647
Mastic Regulator 307517
Electric Regulator 309382
AutoPlus Valve 308813
EnDure Valve 244910
1K Ultra-Lite Valve 308876

PrecisionFlo™ XL

Sealant & Adhesive Dispensing System

All Precision FloXL Systems are ordered using the PrecisionFlo XL Configurated Order Form. Select components using the instructions below and enter your choice on the order form.

Code A Configuration

Option 1 PrecisionFlo XL Module: Choose Option 1 when configuring a complete module, which includes a control panel and fluid control equipment. Feed pumps are not included, and must be ordered separately.

Option 2 Electrical Enclosure only: Choose Option 2 to order an electrical enclosure only. You will receive only an electrical enclosure; you will supply the fluid control components. But make the rest of the choices on the configurator as if you were ordering a complete module. The electrical enclosure will be configured to control the components that you select and be loaded with the proper software at the factory.

Code B Enclosure

Option N Back Plane Only: Choose Option N when the PrecisionFlo XL controls will be integrated into a user specified enclosure, for example a control panel for a robot. The back plane will be factory tested and loaded with software. The back plane will include a pre-wired cable receptacle plate for testing. This plate can be used if applicable, or replaced by the user if required. The User Interface selected in Code D will be shipped separate for integration into the user specified enclosure, along with the key switch for interface operation.

Option 1 Rotary Switch Disconnect: Choose Option 1 to order an electrical enclosure with a rotary power disconnect switch. The electrical enclosure is CE marked.

Option 2 Knife Switch Disconnect: Choose Option 2 to order an electrical enclosure with a knife switch power disconnect. The electrical enclosure is CE marked.

Code C Cables

Option 1 All cables included: choose Option 1 to receive the cable set appropriate for the configured system.
Operations Cable, PrecisionFlo XL Enclosure to Fluid Plate, 60 ft. (18.3 m).
Motor Cable, PrecisionFlo XL Enclosure to Fluid Plater, 60 ft. (18.3 m) (supplied when PrecisionFlo Linear Motor option is chosen in Code H).
PrecisionSwirl Cable, 55 ft. (16.8 m) (supplied when the PrecisionSwirl and orbiter extension cable options are chosen in Coades LA and LB). See Code LB for cable choices.
Analog Robot I/O Cable, PrecisionFlo XL Enclosure to Robot Enclosure, 40 ft. (12.2 m) (supplied when 24 VDC or 120 VAC interface option is chosen in Code F).
Digital Robot I/O Cable, PrecisionFlo XL Enclosure to Robot Enclosure, 40 ft. (12.2 m) (supplied when 24 VDC or 120 VAC interface option is chosen in Code F).

Option 2 No cables included: Choose Option 2 to receive no cables. This option should be selected if a different length cable is required by the specific installation. Cables can be ordered separately from Graco. See the PrecisionFlo XL Manual 309364 for cable construction guidelines and mating connector information.

Code D User Interface

Option 1 Easy Key User Interface: Choose Option 1 to receive the easy key user interface. The easy key user interface is a monochrome, backlit display with a membrane keypad. The display is capable of controlling all of the standard PrecisionFlo XL features.

Option 2 Touch Screen User Interface: Choose Option 2 to receive the touch screen user interface. The touch screen user interface incorporates a color touch screen. The display has all of the same features as the touch screen controller, plus I/O monitoring, a real-time oscilloscope for valve timing, additional data and fault logging capabilities, and more.

Option 3 Remote Mount Advanced User Interface: Choose Option 3 to receive the touch screen user interface in a remote mounted enclosure. This option is used when the mounting area for the controller is limited.

Code E Primary Voltage

Option 1 110-120 VAC: Choose Option 1 when 110-120 VAC is available for control power. Acceptable power supply range is 85-164 VAC, 50 to 60 Hz, single phase. Do not choose this option if selecting temperature conditioning or electric heat in code G.

Option 2 220-240 VAC: Choose Option 2 when 220-240 VAC is available for control power. Acceptable power supply range is 200-240 VAC, 50 to 60 Hz, single phase. The enclosure will come with an internal transformer prewired for this primary voltage.

Option 3 400-480 VAC: Choose Option 3 when 400-480 VAC is available for control power. Acceptable power supply range is 400-480 VAC, 50 to 60 Hz, single phase. The enclosure will come with an internal transformer prewired for this primary voltage

PrecisionFlo™ XL

Sealant & Adhesive Dispensing System

Code F Robot I/O Interface Options

Option 1 24 VDC: Choose Option 1 when the desired interface signal wiring is 24 VDC. The PrecisionFlo XL controller will supply interface power. When this option is chosen, a 24 VDC I/O communications card will be installed in the PrecisionFlo XL controller. This option also includes an I/O Interface cable and an Analog cable to the robot enclosure if Code C, Option1 was also chosen.

Option 2 120 VAC: Choose Option 2 when the desired interface signal wiring is 120 VAC. The PrecisionFlo XL controller will supply interface power. When this option is chosen, a 120 VAC I/O communications card will be installed in the PrecisionFlo XL controller. This option also includes an I/O Interface cable and an Analog cable to the robot enclosure if Code C, Option1 was also chosen.

Option 3 DeviceNet: Choose Option 3 when the I/O interface communications will be on a DeviceNet network. When this option is chosen, the PrecisionFlo XL controller is equipped with a DeviceNet communications card. No cable is included with this option; the user must install the DeviceNet network cable. The network communication is used for robot I/O signals and analog speed command only.

Option 4 Interbus: Choose Option 4 when the I/O interface communications will be on an Interbus network. When this option is chosen, the PrecisionFlo XL controller is equipped with an Interbus communications card. No cable is included with this option; the user must install the Interbus network cable. The network communication is used for robot I/O and analog speed command signals only.

Option 5 Profibus: Choose Option 5 when the I/O interface communications will be on a Profibus network. When this option is chosen, the PrecisionFlo XL controller is equipped with a Profibus communications card. No cable is included with this option; the user must install the Profibus network cable. The network communication is used for robot I/O and analog speed command signals only.

Option 6 ControlNet: Choose Option 6 when the I/O interface communications will be on a ControlNet network. When this option is chosen, the PrecisionFlo XL controller is equipped with a ControlNet communications card. No cable is included with this option; the user must install the ControlNet network cable. The network communication is used for robot I/O and analog speed command signals only.

Code G Temperature Control

Option N None - Ambient: Choose Option N when the sealant or adhesive is to be run at room temperature. No heating or cooling.

Option 1 Temperature Conditioned – Heat and Cool (50Hz): Choose Option 1 when the sealant or adhesive will require temperature conditioning with heating and cooling capabilities and the primary supply voltage will be 50 Hz. The temperature conditioning option includes a conditioning module integrated with the PrecisionFlo XL controls. The temperature functions including set points, alarm values and actual temperature will be viewed on and controlled from the PrecisionFlo XL user interface. The fluid components of the module will be temperature conditioned, including the Supply Hose, Fluid Plate, Dispense Hose and Dispense valve. The standard Supply Hose is a Coaxial hose within a hose design, while the other system components are temperature condition jacketed. If other than the standard hoses are required, choose None for the hose option(s) in Code M and Code N. The controls are CE and ETL marked.

Option 2 Temperature Conditioned – Heat Only (50Hz): Choose Option 2 when the sealant or adhesive will require temperature conditioning with heating capabilities only, and the primary supply voltage will be 50 Hz. Same control features as Option 1. The controls are CE and ETL marked.

Option 3 Temperature Conditioned – Heat and Cool (50Hz): Choose Option 3 when the sealant or adhesive will require temperature conditioning with heating and cooling capabilities and the primary supply voltage will be 50 Hz. Same control features as Option 1. The controls are CE and ETL marked.

Option 4 Temperature Conditioned – Heat Only (60Hz): Choose Option 4 when the sealant or adhesive will require temperature conditioning with heating capabilities only, and the primary supply voltage will be 60 Hz. Same control features as Option. The controls are CE and ETL marked.

Option 5 Electrically Heated (50/60Hz): Choose Option 5 when the sealant or adhesive will require electric heating capabilities only. The electric heat option includes an electrically heated enclosure integrated with the PrecisionFlo XL controls. The temperature functions including set point, alarm values and actual temperature will be viewed on and controlled from the PrecisionFlo XL user interface. The fluid components of the module will be heated electrically, including the Supply Hose, Fluid Plate, Dispense Hose and Dispense valve. The supply hoses are heated with electrically traced hose, while the fluid plate is heated with an infrared heater integrated into the fluid plate. The controls are CE and ETL marked.

PrecisionFlo™ XL

Sealant & Adhesive Dispensing System

Notes:

(1) If selecting option 1-5, do not pick option 1 in Code E (110-120 VAC). Temperature conditioning and electric heat require minimum 200 VAC.

(2) Temperature conditioning system (Options 1-4) will condition and maintain all components (i.e. hoses, regulators, meters) up to 140ºF. Operating range 60ºF to 140ºF.

(3) The electric heat system will control 4 zones up to 175ºF.

(4) A heat/cool temperature conditioning system is required to maintain temperature below ambient.

(5) Temperature control is not available with dual plate Options 6 and 7 of Code H.

Code H Fluid Module

There are seven different fluid plate choices available on the PrecisionFlo XL module, those fluid plate choices combined with the four options for a flow meter in Code J, gives you 28 different combinations available for fluid metering. All of the fluid modules are designed to meter and control single component materials.

PrecisionFlo Linear Motor

Option 1 Low Viscosity (PVC): Choose Option 1 to receive the PrecisionFlo linear motor controlling a tapered needle and seat designed for low viscosity materials less than 100,000 cps.

Option 2 Med/High Viscosity (Hem): Choose Option 2 to receive the PrecisionFlo linear motor controlling a tapered needle and seat designed for medium to high viscosity materials between 100,000 cps and 500,000 cps.

Option 3 Med/High Viscosity-Integrated Regulator: Choose Option 3 for high viscosity fluids, where the pressure required to feed material to the system would exceed 3500 psi (241 bar) in a static state. This will allow the material to be supplied at a high pressure up to the inlet of the fluid plate, where it can be regulated down to 3500 psi (241 bar) or below before entering the PrecisionFlo fluid plate.

Precision Regulator

Option 4 Low Viscosity (1/2"): Choose Option 4 to receive the Graco 3/8" pneumatic cartridge style regulator, designed for low viscosity of typical sealants and adhesives. This regulator is also ideal for higher flow rates of low viscosity water-based materials.

Option 5 Med/High Viscosity (3/4"): Choose Option 5 to receive the Graco 3/4" pneumatic mastic regulator, designed for higher viscosity sealants and adhesives.

Dual Precision Regulators

Option 6 Low Viscosity (1/2"): Choose Option 6 to receive the Graco 3/8" pneumatic cartridge style regulator, designed for lower viscosity sealants and adhesives. This regulator is also ideal for higher flow rates of low viscosity water-based materials. This option will configure the hardware with two fluid plates. Both fluid plates will be controlled by independent real-time flow loops within the single PrecisonFlo XL controls. The flow meter choice in Code J will apply to both fluid plates if this option is chosen. Temperature control is not available with this option.

Option 7 Med/High Viscosity (3/4"): Choose Option 7 to receive the Graco 3/4" pneumatic mastic regulator, designed for higher viscosity sealants and adhesives. This option will configure the hardware with two fluid plates. Both fluid plates will be controlled by independent real-time flow loops within the single PrecisonFlo XL controls. The flow meter choice in Code J will apply to both fluid plates if this option is chosen. Temperature control is not available with this option.

Code J Flow Meter

Option N None – Pressure regulation only: Choose Option N when the application requires closed loop control on pressure only. No flow meter will be included.

Option 1 Spur Gear Meter (30-2000 cc/min): Choose Option 1 when the sealant or adhesive being controlled is able to run through a spur gear meter. This option will integrate the Graco G3000 flow meter into the fluid module. This flow meter is well suited for sealants with dynamic viscosity of 1000 to 50,000 cps and which are formulated with fillers of less than 3 mil. Verify pressure drop by testing.

Option 2 Helical (30-3000 cc/min): Choose Option 2 when the sealant or adhesive being controlled is able to run through a helical gear meter. This flow meter is well suited to most sealants and adhesives from 10,000 cps to 200,000 cps, and can be used with higher viscosity materials (up to 500,000 cps) at lower flow rates.

Option 3 Non-Intrusive (100-5000 cc/min): Choose Option 3 when the sealant or adhesive being controlled requires a non-intrusive flow meter. The non-intrusive flow meter is a straight tube design without any gears or moving parts. This flow meter is well suited to most abrasive or corrosive sealants and adhesives. The flow meter requires remote stationary mounting from the fluid plate. This meter can be used with a wide material viscosity range, from 20,000 to 500,000 cps.

PrecisionFlo™ XL

Sealant & Adhesive Dispensing System

Code K Dispense Valve

Option N None: Choose Option N when the application requires a valve other than one to choose from below, or to use an existing valve.

Option 1 Compact – Stream/Spray: Choose Option 1 when the application requires streaming or spraying. This option will equip the module with a compact manifold mount valve. The valve outlet accepts 270xxx streaming tips or 182xxx series flat spray tips. The manifold will be temperature conditioned if this option is chosen in Code G. It can't be electrically heated.

Option 2 Snuff Back – Stream/Extrude/Swirl: Choose Option 2 when the application requires streaming, extruding or PrecisionSwirl. This option will equip the module with a larger valve capable of delivering higher flow rates with more viscous sealants and adhesives. The valve is manifold mounted to provide quick and easy repair. The valve is designed to accept streaming tips, extrusion tips, or Graco's PrecisionSwirl orbiter. The manifold will be heated or temperature conditioned based on the temperature option chosen in Code G.

Option 3 1K Valve – 45° Outlet: Choose Option 3 when the application requires PrecisionSwirl and a 45° outlet configuration. It is a smaller and lower pressure version of Option 2. This option will equip the module with the 1K ambient dispense valve, designed to connect directly to the PrecisionSwirl orbiter. The valve is available for ambient applications only, and can be used only when the back pressure from the Precision Swirl tip will not exceed 2000 psi (138 bar).

Notes: All tips must be ordered separately.

Code LA Swirl Options

Option N None: Choose this option if the PrecisionSwirl orbiter is not being purchased

Option 1 Narrow Pattern: This option allows for smaller width patterns. Typical pattern ranges are from 3/16" to 1/2". Actual pattern widths depend on the fluid being dispensed and other application parameters.

Option 2 Wide Pattern: This option allows for larger width patterns. Typical pattern ranges are from 1/2" to 2 1/2". Actual pattern widths depend on the fluid being dispensed and other application parameters.

Note: The swirl orbiter is water jacketed if temperature-conditioning option is chosen in Code G. If electric heat is chosen, the orbiter is insulated only.

Code LB Swirl Extension Cable

When a PrecisionSwirl package is chosen under code LA, a standard 55' (16.8m)cable is included. This cable provides power to the orbiter, and is designed to go from the control panel to the orbiter. When the PrecisionSwirl orbiter is used on a robot or moving automation, it is highly recommended that an extension cable be used in addition to the provided cable. The movement of automation can cause extreme wear on a cable, the extension cable can be quickly and easily replaced if a problem should occur. Choose the length of the extension cable based on the configuration of the robot/automation, choosing a length that will extend from the PrecisionSwirl back to the rear of the robot/automation.

Option N None: Choose this option if the PrecisionSwirl is not being purchased or is pedestal mounted.

Option 1 Extension Cable 6 ft. (1.8 m): This option provides a 6 ft. extension cable.

Option 2 Extension Cable 9 ft. (2.7 m): This option provides a 9 ft. extension cable

Option 3 Extension Cable 15 ft. (4.6 m): This option provides a 15 ft. extension cable

Code M Fluid Supply Hose

Choose a supply hose from the choices below. Based on the temperature selection in Code G, the hose will be ambient, temperature condition coaxial or electrically heated. Electrically heated hoses are 3000 psi maximum pressure and have a PTFE core. Ambient and temperature conditioned hoses are rated for 5000 psi maximum pressure and have a Neoprene core.

Option N None: Choose Option N when the application requires a supply hose length or inner diameter other than one to choose from below.

Option 1 This option provides a 10' (3.1m)1" I.D. hose.

Option 2 This option provides a 20' (6.1m) 1" I.D. hose.

PrecisionFlo™ XL

Sealant & Adhesive Dispensing System

Code N Fluid Dispense Hose

Choose a dispense hose from the choices below. Based on the temperature selection in Code G, the hose will be ambient, temperature condition jacketed or electrically heated. Electrically heated hoses are 3000 psi maximum pressure and have a PTFE core. Ambient and temperature conditioned hoses are rated for 5000 psi maximum pressure and have a Neoprene core.

Option N None: Choose Option N when the application requires a dispense hose length or inner diameter other than one to choose from below.

Option 1 6 ft. x 1/2 in.: This option provides a 6 ft. (1.8m) x 1/2 in. I.D. hose.

Option 2 6 ft. x 5/8 in.: This option provides a 6ft.(1.8m) x 5/8in. I.D. hose.

Option 3 10 ft. x 1/2 in.: This option provides a 10 ft. (3.0m) x 1/2 in. I.D. hose.

Option 4 10 ft. x 5/8 in.: This option provides a 10 ft. (3.0m) x 5/8 in. I.D. hose.

Code P Language

The language of the user interface is to be selected from the choices below. The language will be preset at the factory. The language may also be changed or selected by the user.

Option E English

Option F French

Option G German

Option I Italian

Option J Japanese

Option K Korean

Option P Portuguese

Option S Spanish

Configured Product Order Form—PrecisionFlo XL

For Graco Use
S/R #_____
System #_____

Fax completed form and Purchase Order to Graco Customer Service:

Fax (800) 334-6955 North America, (612) 623-6884 International

Account Number: _____ PO Number: _____Date: _____

Ship To:
Attn:

Bill To:
Attn:

Typical Model Number: XL-A-1-2-1-2-2-4-2-3-2-N-N-2-1-E

Model	Product Description	List Price
XL-A	PrecisionFlo Metering Module	
Code A	**Configuration**	**Amount**
1	PrecisionFlo XL Module	
2	Electrical Enclosure Only	
Code B	**Enclosure**	**Amount**
N	Back plane only	
1	Rotary switch power disconnect	
2	Knife switch power disconnect	
Code C	**Cables**	**Amount**
1	All cables included	
2	No cables included	
Code D	**User Interface**	**Amount**
N	None – to be linked to another	
1	Standard User Interface	
2	Advanced User Interface	
3	Remote mounted Advanced User Interface	
Code E	**Primary Voltage (single phase)**	**Amount**
1	110-120 Volts	
2	220-240 Volts	
3	400-480 Volts	
Code F	**Robot I/O Interface Options**	**Amount**
1	24VDC	
2	120V	
3	DeviceNet	
4	InterBus	
5	Profibus	
6	ControlNet	
Code G	**Temperature Control**	**Amount**
N	None - Ambient	
1	Temperature Conditioned (50 Hz) Heat and Cool	
2	Temperature Conditioned (50 Hz) Heat Only	
3	Temperature Conditioned (60 Hz) Heat and Cool	
4	Temperature Conditioned (60 Hz) Heat Only	
5	Electrically Heated (50/60 Hz)	
Code H	**Fluid Module**	**Amount**
	PrecisionFlo Linear Motor	
1	Low Viscosity (PVC)	
2	Med/High Viscosity (Hem)	
3	Med/High Viscosity – Integrated Regulator (Hem)	
	Precision Regulator	
4	Low Viscosity (3/8" reg)	
5	Med/High Viscosity (3/4" reg)	
	Dual Precision Regulators (2 Fluid Plates)	
6	Low Viscosity (3/8" reg)	
7	Med/High Viscosity (3/4" reg)	

Model	Product Description	List Price	
Code J	**Flow Meter**	**Single**	**Dual**
N	None – Pressure regulation only		
1	Spur: G3000		
2	Helical: 400 – 2000 cc/min		
3	Non-Intrusive – Mounted remotely		
Code K	**Application – Valve**	**Single**	**Dual**
N	None (Choose none to use other valve)		
1	Compact – Stream/Spray (Auto-Plus valve)		
2	Snuff Back – Stream/Extrude/Swirl (Big Blue)		
3	1K Valve – 45 Degree Outlet		
Code LA	**Swirl Options (Tool Mount Only)**	**Single**	**Dual**
N	None		
1	Narrow Pattern (Widths from .187 - .5")		
2	Wide Pattern (Widths from .5" – 2.5")		
Code LB	**Orbiter Extension Cable Options**	**Single**	**Dual**
N	None		
1	Extension Cable, 6'		
2	Extension Cable, 9'		
3	Extension Cable, 15'		
Code M	**Supply Hose**	**Single**	**Dual**
N	None		
1	10' (1" ID)		
2	20' (1" ID)		
Code N	**Dispense Hose**	**Single**	**Dual**
N	None		
1	6' x 1/2" I.D.		
2	6' x 5/8" I.D.		
3	10' x 1/2" I.D.		
4	10' x 5/8" I.D.		
Code O	**Language**		
E	English		
F	French		
G	German		
I	Italian		
J	Japanese		
K	Korean		
P	Portuguese		
S	Spanish		

ORDER INFORMATION—Not intended for quoting purposes. Purchase Order must accompany order. No verbal orders accepted.

XL-A- ___ - ___ - ___ - ___ - ___ - ___ - ___ - ___ - ___ - ___ - ___ - ___ - ___ - ___ - ___ - ___
A - B - C - D - E - F - G - H - J - K - LA - LB - M - N - O

Note: Orders Cancelled prior to shipment are subject to a 25% restocking fee. Configured products are not returnable.

Order Quantity _____ **x List Price (each)** _____ **= Total US List Price $** _____

Standard Delivery (accepted order to ship date) 4-6 weeks.

Note: For complete PrecisionFlo XL configurator order form and instructions, order Graco form #305483.

Accessories

PrecisionFlo™ XL Sealant & Adhesive Dispensing System

Accessories and Repair Kits

233681	Fluid Section Repair Kit, electric metering valve, low flow applications
233682	Fluid Section Repair Kit, electric metering valve, high flow applications
198082	Pressure Sensor
244669	Pressure Sensor Amplifier Board
551348	Solenoid Valve
195942	Regulator (Voltage to Pressure)
617418	Flow meter (SRZ-40) with sensor
196840	Sensor only for 617418
239716	Flow meter (G3000) with sensor
239719	G3000 meter only
239717	Sensor for G3000 meter only
198391	Coriolis Flow Meter
197199	Cable for pulse signal, used with Coriolis meter
197173	Flow meter plate for Coriolis meter

Cables

233125	Extension cable to connect to PrecisionSwirl™, 6 feet (1.8 m)
233124	Extension cable to connect to PrecisionSwirl™, 9 feet (3.3 m)
233123	Extension cable to connect to PrecisionSwirl™, 15 feet (4.6 m)
617870	Primary cable from PrecisionFlo XL control box to fluid plate

Upgrade Kits for PrecisionFlo and PrecisionFlo Plus models

233681	Fluid Section Repair Kit. low flow applications (requires 244923 when installed the first time)
233682	Fluid Section Repair Kit, high flow applications (requires 244923 when installed the first time)
233678	Complete upgrade kit for low flow application. Includes motor and closer mechanism in addition to fluid section repair kit
233679	Complete upgrade kit for high flow application. Includes motor and closer mechanism in addition to fluid section repair kit

PrecisionSwirl™

Orbital Applicator Module

Features and Benefits

- Provides a circular loop “swirl” bead pattern
- Swirl pattern has uniform bead profile and consistent edges
- Increased tip standoff simplifies robot programming
- Swirl pattern can be varied along the bead path
- Swirl orbital applicator has no dynamic seals
- Dispenses open or closed, wide or narrow pattern
- Defined edge control
- Tool-mounted and gun-mounted options available
- Add to PrecisionFlo XL to build a complete fluid handling system

Typical Applications

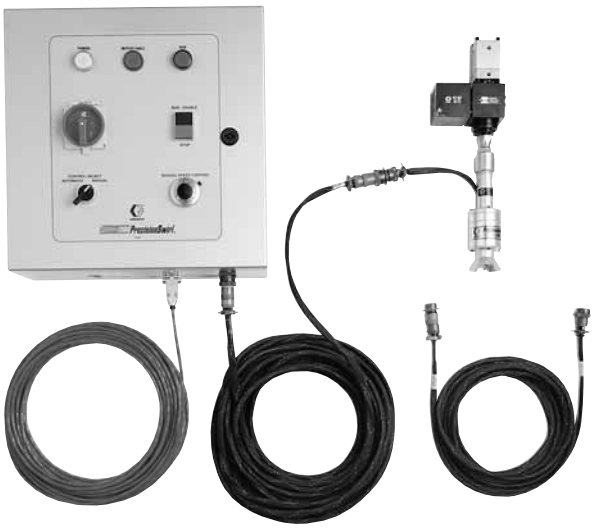
- Hem flange adhesive bonding
- Structural adhesive bonding
- Body panel reinforcement
- PVC seam sealing
- After hem sealing
- Liquid mask sealing
- Underbody sound-deadeners

Typical Fluids Handled

- Heat cure epoxy
- PVC plastisol
- Expandable sealers
- Liquid-applied sound deadeners (LASD)

PrecisionSwirl Control Panel

PrecisionSwirl Applicator



21.3 m (69.88 ft) Cable Set (918590 shown)

PrecisionSwirl™

Orbital Applicator Module

Technical Specifications

Control Panel

Input power . . . . . 85-264 VAC, 50/60 Hz, 1 phase
Output power . . . . . proprietary PWM voltage to the motor, less than 24V
Automatic control analog input (speed adjustment) . . . . . 0-10 Vdc or 0-5 Vdc
Auto control relay contact rating . . . . . 3 amps at 30 VDC
Weight . . . . . 10.7 kg

Swirl Orbital Applicator

Input power . . . . . proprietary PWM voltage to the motor, less than 24V
Motor torque . . . . . 1.5 oz.-inches
Maximum motor speed . . . . . 24,000 rpm
Maximum operating pressure . . . . . 3500 psi (241 bar; 24.1 MPa)
Fluid inlet . . . . . 3/4-16 37° JIC female swivel
Nozzle attachment . . . . . #10-32 proprietary connection
Wetted parts . . . . . stainless steel, nickel alloy, brazing alloy, epoxy, EPDM rubber
Noise level . . . . . sound pressure level – 67 dBa
Weight . . . . . 0.7 kg

Temperature Conditioned Dispense Valve

Maximum fluid working pressure . . . . . 3500 psi (241 bar; 24.1 MPa)
Maximum working dry air pressure . . . . . 144 psi (10 bar; 1 MPa)
Material inlet (to conditioning manifold) . . . . . 1/2 npt
Air inlet . . . . . 1/8 npt(m)
Conditioning fluid inlet/outlet . . . . . (2 ports) 1/4 npt
(4 ports) 1/8 npt
Wetted parts . . . . . stainless steel, aluminum, UHMWPE, Viton®,
black oxide coated CS, Hytrel elastomer
Maximum temperature rating . . . . . 60°C (140°F)
Weight . . . . . 2 kg (4.4 lbs) approximately
Instruction manuals
PrecisionSwirl 310554
Temperature Conditioned Dispense Valve 310539

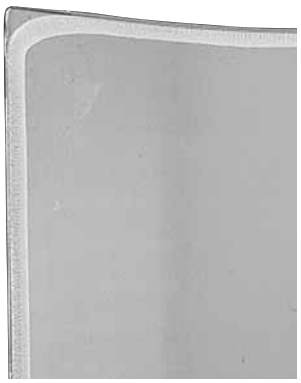
Viton® is a registered trademark of Du Pont.

PrecisionSwirl™

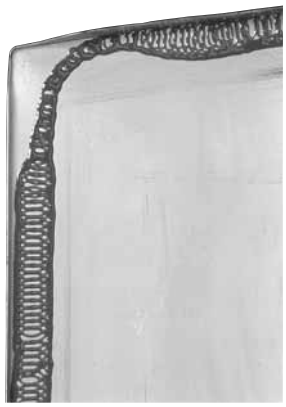
Orbital Applicator Module

PrecisionSwirl Applications

Select various bead profiles in the corner and on the straightaways with PrecisionSwirl.
Note: these are just a few of the many applications that can be accomplished with PrecisionSwirl.



Consistent width



Swirl pattern narrowing in the corner

Width and thickness of swirl are controlled with flow rate, analog signal, or application speed.

SWIRL PATTERNS

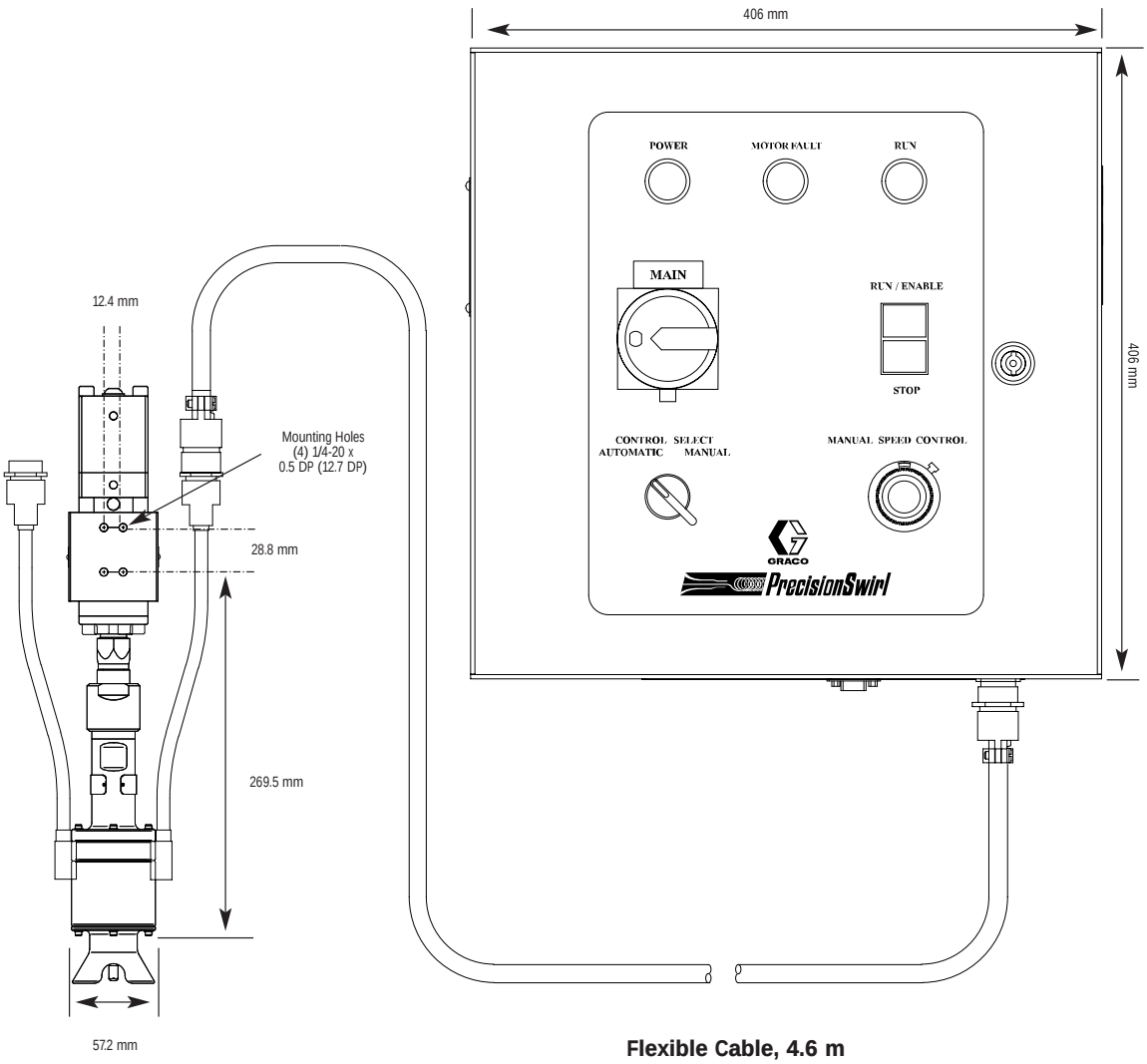
Narrow Pattern

Wide Pattern

PrecisionSwirl™

Orbital Applicator Module

PrecisionSwirl Dimension Drawing



Flexible Cable, 4.6 m
Coupled to 16.8 m standard cable

PrecisionSwirl™

Orbital Applicator Module

Ordering Information

243402 **Tool-Mounted Dispensers**
With narrow pattern coupler (0.012 in. [0.3 mm])

243403 **Tool-Mounted Dispensers**
With wide pattern coupler (0.028 in. [0.7 mm])

243396 **Gun-Mounted Dispensers**
With narrow pattern coupler

236397 **Tool-Mounted Dispensers**
With wide pattern coupler

918616 **PrecisionSwirl Control Assembly**
Bare model only. Order appropriate cables to connect to dispenser

Accessories

Swirl Dispense Tips

Part No.	Size	Part No.	Size
918610	0.012	**918611**	0.035
918601	0.015	**918612**	0.039
918603	0.019	**918613**	0.043
918605	0.023	**918614**	0.047
918607	0.027	**241813**	0.051
918608	0.031	**241814**	0.055
		241816	0.070

PrecisionSwirl Modules

918590 Includes motor cable assembly 4.7 m (15.4 ft), motor cable assembly 16.8 m (55.1 ft), robotic interface cable 12.2 m (40.0 ft), snuff-back dispense valve, PrecisionSwirl orbital dispenser, and PrecisionSwirl control assembly.

241658 Includes motor cable assembly 4.7 m (15.4 ft), motor cable assembly 16.8 m (55.1 ft), robotic interface cable 12.2 m (40.0 ft), PrecisionSwirl orbital dispenser, and PrecisionSwirl control assembly.

Extension Cable

233123 15 ft. (4.6 m)
233124 9 ft. (2.7 m)
233125 6 ft. (1.8 m)
Connects PrecisionSwirl orbital applicator to motor cable.

617870 **Motor Cable, 55 ft. (16.8 m)**
Connects PrecisionSwirl control panel to extension cable or directly to orbital applicator.

617829 **Robot Interface Cable, 40 ft. (12.2 m)**
Connects PrecisionSwirl control panel to robot control panel. Accepts a 0-10 volt signal to adjust RPM.

617830 **Deflector**

196039 **Small Profile Retainer**
Replaces standard nozzle guard. Allows easier access to tight locations.

196160 **Teach Adapter**
Replaces nozzle guard during robot path teaching.

PrecisionFlo Plus Solution Options

Robot Interface Kits

A Robot Interface Kit is required for PrecisionFlo Plus metering packages. Select a 24 or 120 VAC kit.

918634 **120 VAC Robot Interface Kit**
Includes kit for interfacing to a 120V robot control.

918635 **24 VAC Robot Interface Kit**
Includes kit for interfacing to a 24V robot control.

617824 **120 VAC Relay**
Alternate Control Box relay for operation with 120V robot control. (24 volt is standard).

Repair Kits

241479 **Swirl Motor Assembly**
Order bearing and coupler separately

918620 **Swirl Tube**

241569 **Tool Kit**
Includes various tools required for servicing the Swirl applicator and tube bearing.

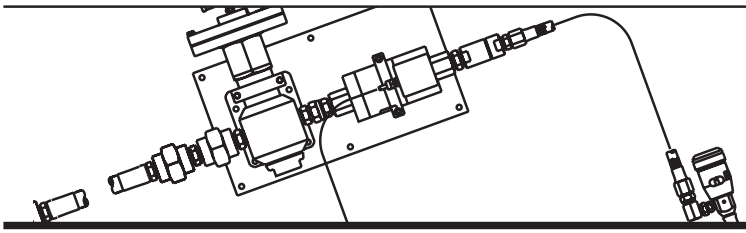
241466 **Tube Bearing Coupler Assembly**
Wide pattern tool kit (241569) required for replacement.

243256 **Tube Bearing Coupler Assembly**
Narrow pattern.

918620 **Tube Support Bearing Repair Kit**
With wide-pattern coupler. Includes 241466, O-ring, seal, and tube assembly.

293437 **Tube Bearing Repair Kit**
With narrow-pattern coupler. Includes 243256, O-ring, seal, and tube assembly.

243647 **Bellows Seal Kit**



VVM™

Volume Verification Meter

VVM provides real-time monitoring of dispensing processes.

Features and Benefits

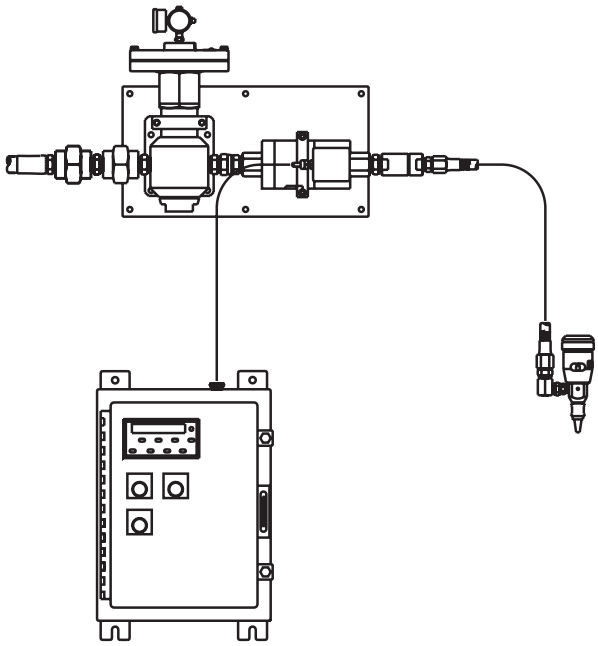
- Simple on/off robotic interface with constant flow rate
- Setable volume verification
- Alarm output for deviation from preset values

Typical Applications

- Anti-flutter mastic dispensing
- Hem flange adhesive bonding
- Structural adhesive bonding
- Body sealing dispensing
- Interior/exterior seam sealing
- Underbody deadener/rocker coating

Typical Fluids Handled

- PVC sealant
- Epoxy adhesives
- Body sealants
- Waterborne deadener



970040

VVM™
Volume Verification Meter

Technical Specifications

Mastic Regulator:

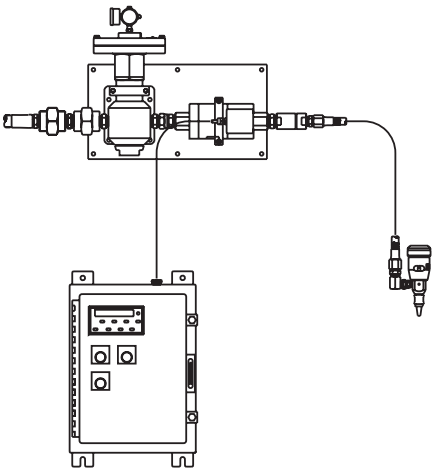
Outlet operating pressure range . . . . . 250 to 4500 psi (17 to 310 bar; 1.7 to 31 MPa)
Maximum fluid inlet pressure . . . . . 5000 psi (344 bar; 34.4 MPa)
Maximum flow rate . . . . . 3000 cc/min. (0.77 gal./min.)
Inlet (1) . . . . . 3/4 npt(f) at side
Outlets (2) . . . . . 3/4 npt(f) at side and bottom
Weight . . . . . 17.7 lbs (7.9 kg)
Wetted parts . . . . . zinc-plated CS, brass, SST, Buna-N, urethane, tungsten carbide
Instruction manual (mastic regulator) 307517

This chart shows the approximate air pressure needed to regulate the air operated regulator to a given fluid outlet pressure.

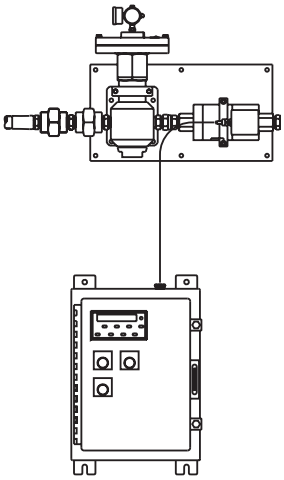
Air Pressure			Regulated Fluid Outlet Pressure		
psi	bar	kPa	psi	bar	MPa
10	0.7	70	500	35	3.5
15	1.0	100	800	55	5.5
20	1.4	140	1100	76	7.6
25	1.7	170	1300	90	9.0
30	2.1	210	1600	110	11.0
40	2.8	280	2100	145	145
50	3.5	350	2700	186	18.6
60	4.2	420	3200	221	22.1
70	4.9	490	3800	262	26.2
80	5.6	560	4300	296	29.6

VVM™

Volume Verification Meter



Pre-assembled package for the typical extrusion application



VVM module for integration into a unique or user specified application

3

Ordering Information:

Volume Verification Meter/Mastic Regulators

Part No.	Description
970007	**VVM/Mastic Regulator, Ambient** Includes: fluid hoses, mastic regulator with volume verification, and automatic snuff back dispense valve with nozzle. Designed for use with materials that can be applied within low fluctuating plant temperatures from 70-95°F (21-35°C).
970015	**VVM/Mastic Regulator, Ambient** Includes: fluid hoses, mastic regulator with volume verification, and automatic snuff back dispense valve with nozzle. Includes power valve on flow meter outlet. Designed for use with materials that can be applied within low fluctuating plant temperatures from 70-95°F (21-35°C).
C59617	**VVM/Mastic Regulator, Ambient** Includes: mastic regulator with volume verification. Designed for use with materials that can be applied within low fluctuating plant temperatures from 70-95°F (21-35°C).

VVM™
Volume Verification Meter

Temperature Conditioned Modules - Heating and cooling, water traced components

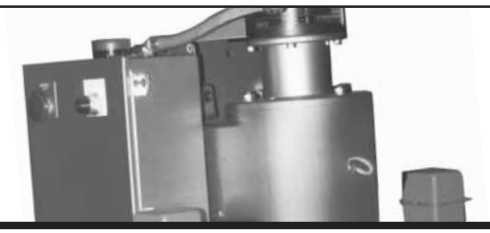
Part No.	Description
970006	**VVM/Mastic Regulator, Temperature Conditioned** Includes: filter, temperature conditioner with fluid hoses, mastic regulator with volume verification, and temperature conditioned automatic snuff back dispense valve with nozzle. Designed for use with materials that require controlled application temperatures ranging from 60-150°F (16-66°C).
C59607	**VVM/Mastic Regulator, Temperature Conditioned** Includes: temperature conditioned mastic regulator with volume verification. Designed for use with materials that require controlled application temperatures ranging from 60-150°F (16-66°C).

Heated Modules - Electrically Heated

Part No.	Description
970008	**VVM/Mastic Regulator, Heated** Includes: 4-zone control panel, heated fluid hoses, heated mastic regulator with volume verification, and heated automatic snuff back dispense valve with nozzle. Designed for use with materials that can be applied using heat only to condition the material above the plant ambient temperature from 90-150°F (32-66°C)
C59608	**VVM/Mastic Regulator, Heated** Includes: heated mastic regulator with volume verification. Designed for use with materials that can be applied using heat only to condition the material above the plant ambient temperature from 90-150°F (32-66°C).

Accessories

Part No.	Description	Technical Specifications
C59547	Single Filter Module	Max. inlet pressure: 5000 psi (34.5 MPa, 345 bar) 1" npt (f) inlet, 1" npt (f) outlet, 30 mesh filter
C59725	Dual Filter module	Max. inlet pressure: 5000 psi (34.5 MPa, 345 bar) 1-1/4" npt (f) inlet, 1" npt (f) outlet, 30 mesh filter
C59603	Temperature Conditioner Includes: 1" x 20' water jacketed hose, 6' zippered hose jacket, VVM jacket, sensor and fittings	Single zone temperature conditioning unit
515217	Filter Repair Kit	Seal kit for filter housing
515220	Filter Element	50 mesh, fits C59547 and C59725
515221	Filter Element	40 mesh, fits C59547 and C5972
515222	Filter Element	30 mesh, fits C59547 and C59725
515224	Filter Element	.060 stab point, fits C59547 and C59725
516715	Filter Element	.040 stab point, fits C59547 and C59725



Gear Meter

Continuous Bead Control

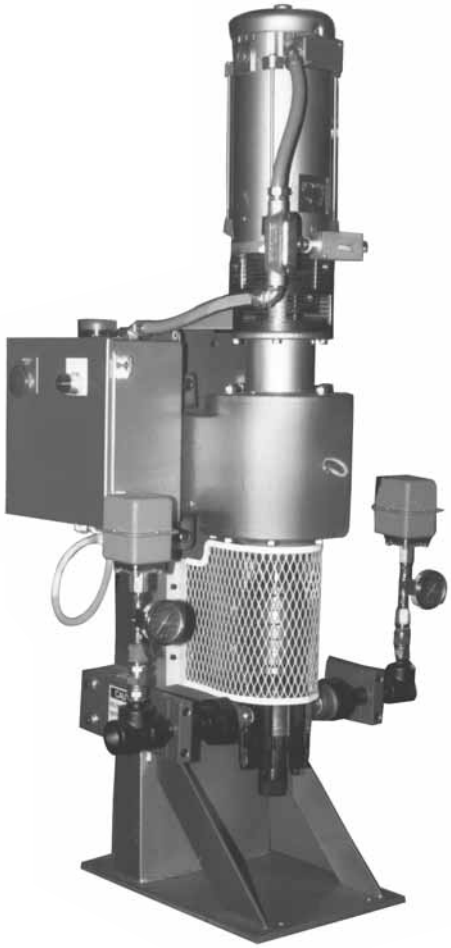
Gear meters are used to control bead dispense where application control is most critical.

Features and Benefits

Continuous bead flow means faster production cycle times since you eliminate the need to reload material typically required by shot meter systems. Fewer components (such as inlet and outlet valves and linear position sensors) result in less system maintenance

No speed ramp-up or ramp-down required to initiate or to stop dispensing. The unit's motor control may be interfaced to a robot controller to provide superior bead quality at varying dispense rates. Outlet pressure transducer indicates sufficient supply and outlet overpressure preventing production losses and quality problems.

System controls can be specified to be as simple as a relay panel or customized to incorporate any programmable logic controller.



Typical Applications

- Automotive glass bonding
- Headliner assembly

Typical Fluids Handled

- Urethane windshield sealants
- Structural epoxies

Gear Meter

Continuous Bead Control

Technical Specifications

Control Unit

Height . . . . . 64 in. (1626 mm)
Width . . . . . 38 in. (965 mm)
Depth . . . . . 12 in. (305 mm)
Weight . . . . . 450 lbs. (204 kg)
Electrical requirements . . . . . 480 volt, 1 phase, 15 FLA

Mechanical Gear Meter

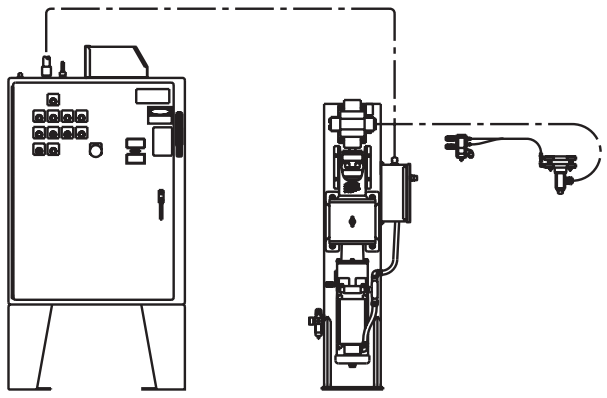
Height . . . . . 59 in. (1500 mm)
Width . . . . . 26 in. (660 mm)
Depth . . . . . 23 in. (585 mm)
Weight . . . . . 550 lbs. (250 kg)
Air pressure required . . . . . 0 to 2 scfm at 60 psi (4.1 bar; 0.41 MPa)
Flow rate range . . . . . 0 to 90 $in.^3$/min. (0 to 2.29 m^3/min.)
Material viscosity range . . . . . 100,000 to 5,000,000 cps
Max. fluid inlet pressure . . . . . 5000 psi (345 bar; 34.5 MPa)
Fluid inlet port . . . . . 1-1/2 npt(f)

Outputs Available (120 VAC)

- Sealer Ready
- Sealer in Cycle
- Sealer Maintenance Required

Inputs Available (120 VAC)

- Robot Dispense
- 0-10 VDC Analog Signal



970176 shown

Package Ordering Information

Servo Gear Meters

Includes: servo gear meter module, main control panel, high pressure SST braid fluid dispense hose, and 3/4 npt automatic dispense valve. Supply pumps not included.

970175	Bottom Inlet/Outlet
970176	Top Inlet/Outlet
970177	Horizontal Inlet/Outlet
970194	**Horizontal Mount – Heated Components** Includes: 4-zone temperature control panel, heated fluid hose, automatic dispense valve with nozzle.

Accessories

C51172 **Urethane Dispense Nozzle**
M-shaped side outlet. 3 in. (7.62 cm) length with gauge guard, 1/4 npt(f)

C57519 **Urethane Dispense Nozzle**
Triangle-shaped, 1/2 in. (1.27 cm) base x 1/2 in. (1.27 cm) height, 3 in. (7.62 cm) length, 1/4 npt (f)

Regulators

Features and Benefits

- The air pilot regulator can be mounted directly onto the diaphragm actuator or remotely, as most convenient to the operation.
- Controls the pressure to dispensing devices or protects the components from excessive pressure which may be developed by the supply pumps.
- Accepts up to 5000 psi (345 bar; 34.5 MPa) upstream pressure and will regulate from 500 to 3500 psi (34 to 241 bar; 3.4 to 24.1 MPa) downstream pressure.
- Provides simple on-off robotic interface with constant flow rate.
- Ambient and heated models available

Typical Applications

- Body Shop - Structural Adhesive Bonding, Body Sealing
- Stamping Plant – Anti-Flutter (extrude or mastic drop), Hem Flange Bonding
- Paint Shop – Seam sealing – Underbody, Interior, Exterior, Underbody Deadener Spray, Anti-Chip Spray
- Industrial

Application Methods

- Extrude
- Stream
- Spray
- Shower
- Swirl

Typical Fluids Handled

- Silicone
- PVC
- Epoxy

961635
Ambient Mastic Regulator

918447
Heated Mastic Regulator

Regulators
Technical Data

	Models 238894, 238893	Models 961635, C58318	Models 918447, 243700	Model 903958
Regulated Fluid Pressure Range	500 to 4000 psi (34 to 276 bar)	250 to 4000 psi (17 to 310 bar)	500 to 4000 psi (34 to 276 bar)	high range (standard): 1000 to 4500 psi (70 to 310 bar) with low range spring kit: 400 to 1000 psi (28 to 70 bar)
Maximum Fluid Inlet Pressure	6000 psi (414 bar)	5000 psi (344 bar)	5000 psi (344 bar)	5000 psi (344 bar)
Maximum Fluid Temperature	120ºF (49ºC)	140ºF (60ºC)	400ºF (204ºC)	140ºF (60ºC)
Wetted Parts	304, 316, and 17-4 passivated stainless steel, nickel-and cobalt-bound tungsten carbide, PTFE	zinc-plated carbon steel, brass, stainless steel, Buna-N, urethane, tungsten carbide	zinc-plated carbon steel, brass, stainless steel, Viton, tungsten carbide 303, 304, and 316 stainless steel, UHMWPE, ethylene propylene rubber, PTFE	zinc-plated carbon steel, brass, stainless steel, Buna-N, urethane, tungsten carbide
Fluid Diaphragms	PTFE with Hytrel backing	Nylon Neoprene	Nylon Neoprene	Nylon Neoprene
Weight	7.0 lb (3.2 kg)	17.75 lb (8.1 kg)	18.0 lb (8.2 kg)	13.5 lb (6.1 kg)

3

Air Requirements for Air-Operated Regulators (Models 238893 and 238894)

The following table shows the approximate air pressure needed to regulate the air-operated regulator to a given fluid outlet pressure.

AIR PRESSURE REGULATED			FLUID OUTLET PRESSURE		
psi	MPa	bar	psi	MPa	bar
28	0.19	1.9	1000	7	69
49	0.34	3.4	2000	14	138
70	0.48	4.8	3000	21	207
90	0.62	6.2	4000	28	276

Regulators

Ordering Information

Air-Operated Ambient Carbon Steel and Stainless Steel Regulators

238894 3/8 npt(f) Ported Regulator with Stainless Steel Body
Regulated pressure 500 to 4000 psi (34 to 276 bar; 3.4 to 27.6 MPa). Includes fluid regulator gauge.

238893 Same as 238894 with EZ Flush Plug (238896) instead of fluid gauge.

244734 Same as 238893 with 1/2 npt(f) inlet and outlet. Includes ports for pressure sensors.

961635 3/4 npt(f) Ported Regulator with Carbon Steel Body
Regulated pressure 500 to 4500 psi (34 to 310 bar; 3.4 to 31 MPa). Includes fluid pressure gauge (102814).

C58318 Same as 961635 with stainless steel body.

244740 3/4 npt(f) regulator with SST body and parts for pressure sensors.

Air-Operated Heated Carbon Steel Regulators

918447 120 VAC Heated Regulator
Includes: 300W heater and 6-pin round plug. 3/4 npt(f) ports.

243700 240 VAC Heated Regulator
Includes: 400W heater and 8-pin square connector.

Spring-Operated Carbon Steel Regulator

903958 3/4 in. npt(f) Regulator with Carbon Steel Body
Regulated pressure 1000 to 4500 psi (69 to 310 bar; 7 to 31 MPa).

Accessories and Repair Kits

238747 Fluid Diaphragm Repair Kit for 238893, 238894 and 244734

238748 Cartridge Repair Kit for 238893, 238894 and 244704

918448 Repair Kit for Ambient Mastic Regulators 961635 and 903958

233131 Repair Kit for Heated Mastic Regulators 243700 and 918447

113654 Fluid Pressure Gauge
Maximum pressure 5000 psi (345 bar; 34.5 MPa); 1/4 in. npt(m); requires bushing 100615.

521079 Low-Range Conversion Spring
Replaces spring in 903958 to allow regulated pressure from 400 to 1000 psi (28 to 69 bar; 2.8 to 7 MPa).

915587 Spring to Air Conversion Kit
Converts 903958 from spring to air-operated regulator.

C06234 Bleed Valve
Adjustable air regulator bleed for improved fluid pressure accuracy.

C59588 Mounting Bracket for 961635, 918447, 243700, 903958 and C58318. Requires (2) 100133 lock washers, (2) 100307 3/8 in. nuts and C20458 U-Bolt.

Compensators

Heated and Ambient

Pressure compensating valves are designed to operate in conjunction with the displacement pump to eliminate material flow variances caused by piston pump changeover and unbalanced lowers.

Features and Benefits

- Bead Control - Graco pressure compensating valves provide consistent bead control even during stall-out conditions, which helps eliminate the initial surge of material at the point of dispense.
- Viscosity Flexibility - Graco pressure compensating valves are available in two pressure ratio ranges (23:1 and 51:1), satisfying a wide range of medium-to-high viscosity material applications.
- Rugged Reliability - Key wear points are hard chrome coated for maximum useful life. A good choice for abrasive materials.
- Ambient and heated models available.

Typical Applications

- Automated Bead Dispense

Typical Fluids Handled

- Silicone
- Butyl Mastics
- Urethanes

243206

Compensators
Heated and Ambient

Technical Specifications

Mounting . . . . . 73 in. (1850 mm)
Fluid inlet . . . . . 1 npt(f)
Maximum fluid inlet pressure . . . . . 5000 psi (340 bar; 34.0 MPa)
Maximum recommended pressure drop . . . . . .300 psi (21 bar; 2.1 MPa)
Fluid outlet . . . . . 1 npt(f)
Air inlets . . . . . 1/4 npt(f)
Maximum air inlet pressure . . . . . 100 psi (7 bar; 0.7 MPa)
Fluid Repair Kit 233082
Instruction Manual 309133

Ordering Information

All models include mounting brackets and regulators
Ambient Pressure Compensating Valve

243655 23:1 Ambient

243654 51:1 Ambient

Heated Pressure Compensating Valve

Includes 400W Heater and 6-pin electrical connector

243658 23:1 Heated 120V

243206 51:1 Heated 120V

Includes 400W Heater and 8-pin electrical connector

243656 23:1 Heated 240V

243657 51:1 Heated 240V

Accessories

233082 Repair kit for all compensating valves ordered after March, 2000

243464 Upgrade kit for 19:1 compensating valves ordered before March, 2000

115982 3 oz. (0.09 liter) grease cartridge

551189 Grease gun (for flushing grease out of the packing area)

244021 **Connector Accessory Kit**
Mates Graco compensator to non-Graco heat control. Note: Control-end connector is provided by and wired by customer.

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4

Hydra-Mate™

Plural-Component Proportioning / Dispensing Unit

Hydra-Mate provides accurate proportioning of high viscosity, wide ratio materials.

Features and Benefits

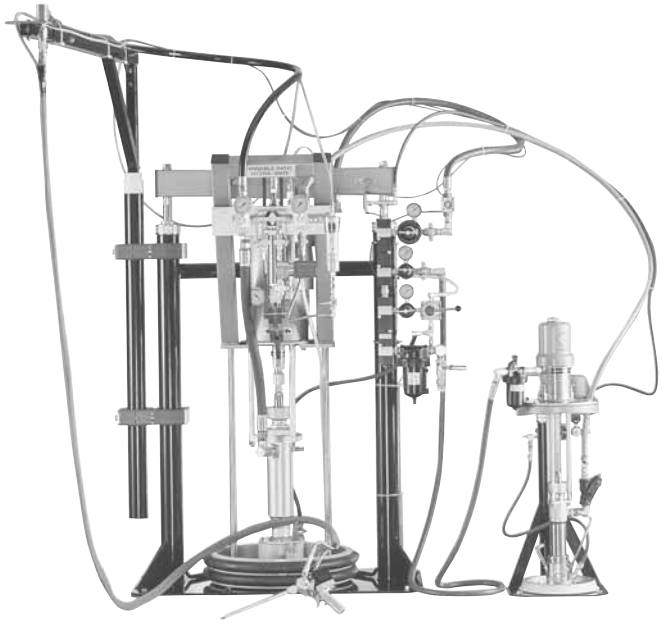
- Maximizes material savings by keeping mixed material to a minimum
- Delivers a consistent, high-output flow of material, ensuring line speed and proper curing
- Versatile and flexible with material ratios

Typical Applications

- Insulated glass sealant
- Aerospace sealants
- Curtain wall structural sealant

Typical Fluids Handled

- Silicones
- Polysulfides
- Polyurethanes



Hydra-Mate Proportioner with Pump-Fed Catalyst and 2K Ultra-Lite Gun

Hydra-Mate

Plural-Component Proportioning / Dispensing Unit

Technical Specifications

Maximum working pressure . . . . . 3500 psi (206 bar; 20.6 MPa)
Fluid inlet base . . . . . 55 gal. (208 liter) ram plate/priming piston pump
Fluid inlet catalyst . . . . . 3/4 npt(f)
Fluid outlet base . . . . . 1 npt(f)
Fluid outlet catalyst . . . . . 1/4 npt(m)
Air inlet size . . . . . 3/4 npt(m) 10 ft (3 m) hose
Height . . . . . 63 in. (1.6 m) lowered
102 in. (2.59 m) raised
Weight . . . . . 1,100 lb. (499 kg)
Width x Depth . . . . . 50 in. x 40 in. (127 cm x 101.6 cm)
Typical size . . . . . 62 in. x 50 in. x 77 in. O.D. (158 cm x 127 cm x 196 cm O.D.)
Weight . . . . . .822 lb. (307 kg)
Wetted parts . . . . . Zinc plated carbon steel, aluminum ram plate, nitrile rubber wipers, chrome, stainless steel, UHMWE polyethylene PTFE, nylon, buna-N

Fluid inlet
- Pump feed . . . . . .5 gal. (19 liter) pail ram plate to double ball pump
- Pressure pot feed . . . . . Pour 5 gal. (19 liter) pail into tank liner; tank lid has pick-up tube

Fluid outlet
- Pump feed . . . . . 3/4 in. (1.91 cm) x 10 ft (3 m) Moisture-Lok hose w/ swivel fitting to fit proportioner
- Pressure pot feed . . .3/8 in. (0.95 cm) x 10 ft (3 m) Moisture-Lok hose with fittings to connect to proportioner

Fluid return
- Pump feed . . . . . 1/4 in. (0.64 cm) x 10 ft (3 m) Moisture-Lok hose
- Pressure pot feed . . . . . 1/4 in. (0.64 cm) x 10 ft (3 m) Moisture-Lok hose

Air inlet
- Pump feed . . . . . 1/2 in. (1.28 cm) x 10 ft (3 m) Air hose to pump with air line lubricator
- Pressure pot feed . . . . . 1/4 (0.64 cm) in. x 10 ft (3 m) Air hose to tank with desiccant filter to dry air to -45° F (-42.78° C) dewpoint

Fluid filtration
- Pump feed . . . . . 20 mesh Y-Line strainer
- Pressure pot feed . . . . . 60 mesh “T” strainer

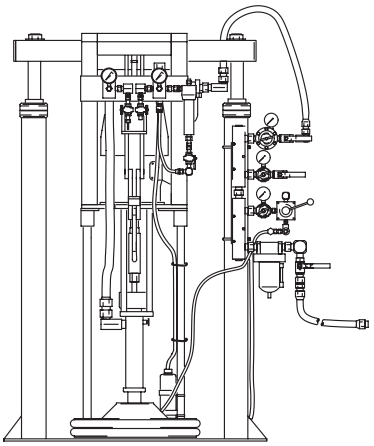
Hydra-Mate

Plural-Component Proportioning / Dispensing Unit

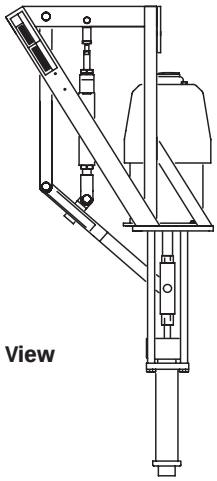
Ordering Information
Configured Product Hydra-Mate Series

A complete Hydra-Mate system is created by picking one option from each of five different categories on the Hydra-Mate Configured Product Order Form. These options will be assembled into a complete system at the Graco factory.

Following is a brief explanation of each option. A configured product order form can be found at the end of this section.



Front View



Side View

Proportioner Module Selection (Code A)

The application's fluid material, required pressure range and mix ratio determine the appropriate proportioner for a complete Hydra-Mate system. All proportioners come complete with a dual-post 55 gal. (208 liter) pneumatic drum ram, air motor, severe-duty base and catalyst metering pumps, fluid outlet manifolds, fluid gauges, overpressure relief valves and complete air controls.

4

Use the chart below to select the recommended proportioner:

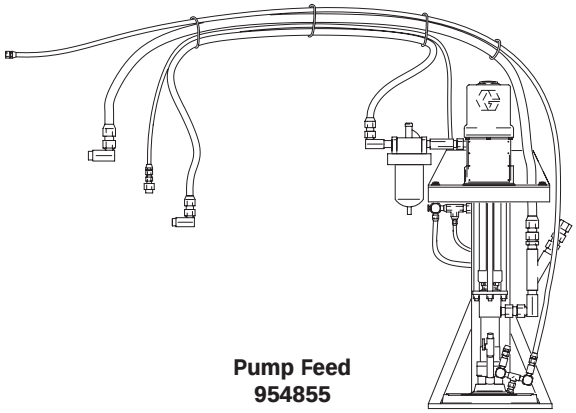
Air Motor Size	Module Part #	Pressure Ratio	Mix Ratio Range by Vol.	Typical Fluids Handled		
				Urethane	Silicone	Polysulfide
Bulldog®	**953100**	25:1	7:5:1 to 16:5:1	X		X
Bulldog	**570312**	25:1	3:7:1 to 8:1	X		X
King™	**954900**	50:1	7:5:1 to 16:5:1		X	X
Quiet King	**965760**	50:1	7:5:1 to 16:5:1		X	X
King	**965580**	50:1	6:5:1 to 13:5:1		X	X

Hydra-Mate

Plural-Component Proportioning / Dispensing Unit

Curative Feed Module Selection (Code B)

The catalyst feed module supplies the curative to the slave meter on the proportioner. Depending on the type of catalyst used in the application, you will need either a pump feed or a pressure pot feed module.



Pump Feed
954855

Recommended for:

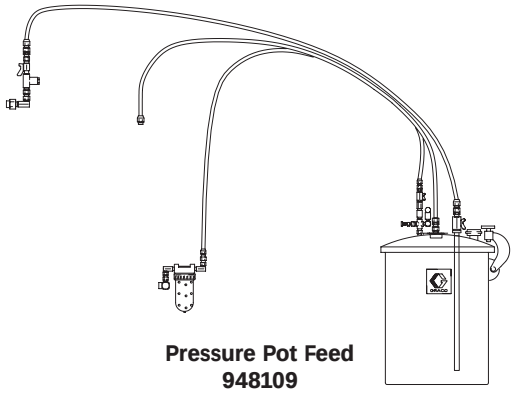
Light paste type catalysts used with silicones and polysulfides.

Module description:

5:1 Monark® double-ball pump on a single post 5 gal. (19 liter) pail ram.

Wetted parts:

Stainless steel, chrome, zinc-plated carbon steel, PTFE, nitrile rubber wipers, nylon, iron strainer.



Pressure Pot Feed
948109

Recommended for:

Easily pourable catalysts used with polyurethanes.

Module description:

5 gal. (19 liter) (nominal) ASME stainless steel pressure tank with desiccant dry air supply..

Wetted parts:

Stainless steel, zinc plated steel, polyolefin, PTFE, polyethylene liner, aluminum strainer.

Hydra-Mate

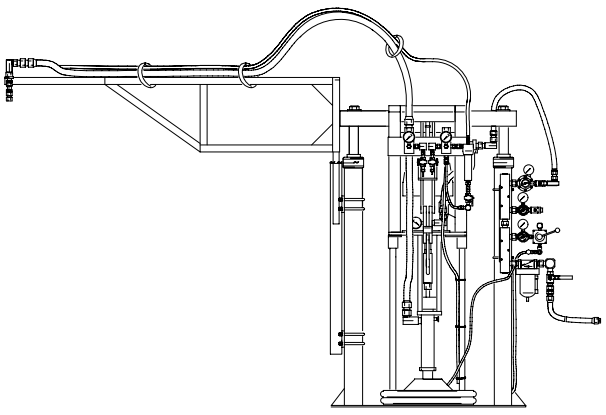
Plural-Component Proportioning / Dispensing Unit

Dispense Hose Kit Module Selection (Code C)

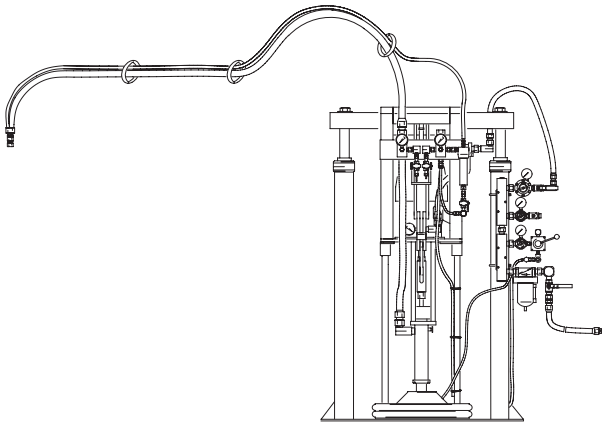
The dispense kit hose module is available as either a 10 ft (3 m) hose kit or a boom kit with hoses. The boom kits includes base and catalyst hoses, fittings, brackets and the boom assembly. Two sections form the boom: a stanchion assembly and an arm assembly. The stanchion assembly clamps to to the post of a 55 gal. (208 liter) 3 in. (76 mm) dual post ram and holds a bearing. The arm assembly drops into this stanchion bearing and is free to swivel. The length of the arm is adjustable between 5 ft (1.5 m) to 7 ft (2 m).

Use the chart below to select the recommended dispense kit:

Module Part #	Includes Boom	Resin Hose Syn. Rubber.	Catalyst Hose PTFE Core	Fluid Handled Polysulfide	Silicone	Urethane
570293	X	1 in. x 10 ft (3 m)	1/4 in. x 12 ft (3.66 m)		X	X
570039	X	1 in. x 10 ft (3 m)	3/8 in. x 12 ft (3.66 m)	X		
570342		1 in. x 10 ft (3 m)	1/4 in. x 12 ft (3.66 m)		X	X
570381		1 in. x 10 ft (3 m)	3/8 in. x 12 ft (3.66 m)	X		



Boom Kit with Hoses



10 ft. (3 m) Hose Kit

Hydra-Mate

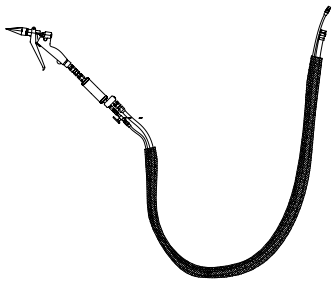
Plural-Component Proportioning / Dispensing Unit

Mix and Dispense Gunning Kits Module Selection (Code D)

The mix and dispense module is designed to connect to either the boom kit or hose kit. This module is available as either a base purge or a disposable mixer gun kit. Each gun kit is equipped with a 10 ft (3 m) hose bundle. The dispensing hose kit module and the mix and dispense gunning kit module provide a combined hose length of 20 ft (6.1 m).

Base Purge Gun Kits

Base purge gun kits have a small mix manifold, with a catalyst injector valve and a catalyst shut-off valve. The two fluids are put into a static mixer at the base of the dispense gun. The mixed sealant flows through a gun swivel and the Ultra-Lite™ 6000 flow gun. There is a cleanable mixer inside the handle of the gun. When the job is complete, the catalyst is bypassed, and base material purges the mixed sealer from the mixer and gun.

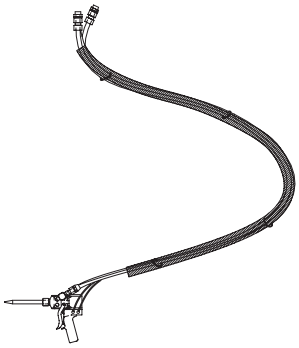


Base Purge Gun Kit

The static mixer is available as either a tri-core mixer or a flexible hose mixer. Tri-core mixers can be disassembled and cleaned, and the plastic mix elements can be replaced. The tri-core kits come with all the spare elements needed for four rebuilds. Flexible hose mixers are typically purged for 2-8 weeks and then replaced. The flexible hose kits include two spare hose mixers.

Disposable Mixer Gun Kit

Disposable mixer gun kits use the 2K Ultra-Lite dispense gun with plastic disposable mixers. This gun kit option eliminates the waste of purging, but requires the mixer to be mounted in front of the gun. Mixed sealant must still be cleaned from any adapters or gunning blocks.



Disposable Mixer Gun Kit Air Motor Pilot Circuit

The disposable mixer gun kit also contains a pilot valve for the proportioner air motor. This valve allows the dispense gun trigger to pilot the pump on and off. This results in less pressure surge when triggering, and the ability to run the King proportioners at a slightly higher flow rate without the stall pressures exceeding the maximum limit.

4

Use the chart below to select the recommended gunning kit:

Module	Base Purge		Disposable 2K-UL	Fluid Handled		
Part #	Flexible Mixer	Tri-Core Mixer	Mixer	Polysulfide	Silicone	Urethane
570292	X			X		
570294	X				X	
570295	X					X
570382		X		X		
570383		X			X	
570384		X				X
570184			X	X		
570304			X		X	
570225			X			X

Hydra-Mate

Plural-Component Proportioning / Dispensing Unit

Ratio Check Kit (Code E)

Ratio check kits attach to the ratio check valves on the proportioner outlet blocks. These kits provide restriction on the pumps, which simulates the pressure and flow rate normally experienced when dispensing through a mixer and gun. Without the proper restriction the pumps will run continuously and not give accurate ratio checks. The same ratio kit is used for all materials.

Accessories

222101 **Standard packing repair kit**

686604 **"Block Stack" packing kit**
Allows pump to run at lower input air pressures

512613 **Rupure Discs**
Burst if catalyst fluid pressure becomes too high.

236726 **T-Wiper kit**

Spare catalyst injector valves

These are restrictive check valves used to create back pressure on the catalyst. Use the chart below to select the recommended valves:

Part #	Typically Used With	Size Code	Used on Gun Kits
948291	Polysulfide	0.125 in	570184
948258	Silicone	# 35/0.110 in	570294, 570383, 570304
947937	Urethane	# 40/0.090 in	570295, 570384
570251	Urethane	# 42/0.085 in	570225

Reference Material

309000 2K Ultra-Lite Instruction Manual

308253 Ultra-Lite 6000 Valve Instruction Manua

684038 Configurator order form

307982 Displacement Pump Instruction Manual

Hydra-Mate

Plural-Component Proportioning / Dispensing Unit

Hydra-Mate™ Configured Product Order Form

Typical Model Number: VRHM-E-A-B-C-D-E

Model	Product Description		U.S. List Price	
VRHM-E	Variable Ratio Hydra-Mate			
Code A	**Proportioner Pump Modules**	**Module Number**	**Add**	
1	25:1 Bulldog, #7 Slave 7.5-16.5:1 Mix	953100		
2	25:1 Bulldog, #1 Slave 3.7-8.0:1 Mix	570312		
3	50:1 King, #7 Slave 7.5-16.5:1 Mix	954900		
4	50:1 Quiet King, #7 Slave 7.5-16.5:1 Mix	965760		
5	50:1 King, #5 Slave 6.5-13.5:1 Mix. T-Wipers on 55 Ram	965580		
Code B	**Curative Feed Modules**	**Module Number**	**Add**	
1	5:1 Monark on 5 Gallon Ram Kit	954855		
2	5-Gallon (20-Liter) Pressure Tank Kit	948109		
N	None			
Code C	**Boom and/or Hose Kits to Supply Gun Kits (Code D)**	**Module Number**	**Add**	
1	Boom Kit with 10 ft (3 m) hoses to end for silicone or urethane	570293		
2	Boom Kit with 10 ft (3 m) hoses to end for polysulfide	570039		
3	10 ft (3 m) Hose Extension Kit for silicone or urethane	570342		
4	10 ft (3 m) Hose Extension Kit for polysulfide	570381		
N	None			
Code D	**Mix and Dispense Kits (connects to one of Code C)**	**Module Number**	**Add**	
1	Base Purge Flexible Mixer polysulfide 10 ft (3 m) hoses	570292		
2	Base Purge Flexible Mixer silicone 10 ft (3 m) hoses	570294		
3	Base Purge Flexible Mixer urethane 10 ft (3 m) hoses	570295		
4	Base Purge Tri-Core Mix polysulfide 10 ft (3 m) hoses	570382		
5	Base Purge Tri-Core Mix silicone 10 ft (3 m) hoses	570383		
6	Base Purge Tri-Core Mix urethane 10 ft (3 m) hoses	570384		
7	2K-UL Disposable Mixer polysulfide 10 ft (3 m) hoses	570184		
8	2K-UL Disposable Mixer silicone 10 ft (3 m) hoses	570304		
9	2K-UL Disposable Mixer urethane 10 ft (3 m) hoses	570225		
N	None			
Code E	**Accessories**	**Module Number**	**Add**	
1	Ratio Check Nozzle Kit for silicones and polysulfides	233415		
N	None			

Ordering Information (Not intended for quoting purposes. Purchase order must accompany order. No verbal orders accepted).

Model Number: VRHM-C- – – – –

Code A B C D E

Note: Orders cancelled prior to shipment are subject to a 25% restocking fee. Configured products are not returnable.

Order Quantity: _____ x List Price (each)_____ = Total List Price_____

Distributor Requested Ship Date: _____
(Please contact Graco Customer Service for delivery information)

Print Name: _____ Signature: _____ Date: _____

Note: For the full Hydra-Mate configured order form and instructions, order Graco form 684038.

8900 Proportioner

Plural Component Fixed & Variable

8900 Proportioner provides precise, positive displacement metering using double-acting cylinders.

Features & Benefits

- Dependable, production-proven operation
- Rugged, reliable heavy-duty components
- Fixed or adjustable ratio versatility
- Continuous, “on-demand” or adjustable shot-size dispensing
- Modular system configurations for customizing to suit your needs

Typical Applications

- Polysulfide sealants for aerospace industry
- Epoxies for product assembly

Typical Fluids Handled

- Polysulfide
- Silicone
- Urethane
- Epoxy

Variable Ratio 8900

8900 Proportioner

Plural Component Fixed & Variable

8900 Information and Specifications

How the 8900 Works

The 8900 proportioner uses fluid inlet pressure to continuously reciprocate two connected cylinders. This fluid pressure is usually provided by two pumps which supply consistent pressure to the proportioner cylinders. As the major volume cylinder (base) and minor volume cylinder (catalyst) reciprocate, they positively displace the two material components on ratio to the outlet ports. Specially-sized hoses connect the proportioner to a choice of mixers to ensure ratio accuracy. Static mixers are incorporated into the system to deliver a homogeneous mix of base and catalyst.

System Components:

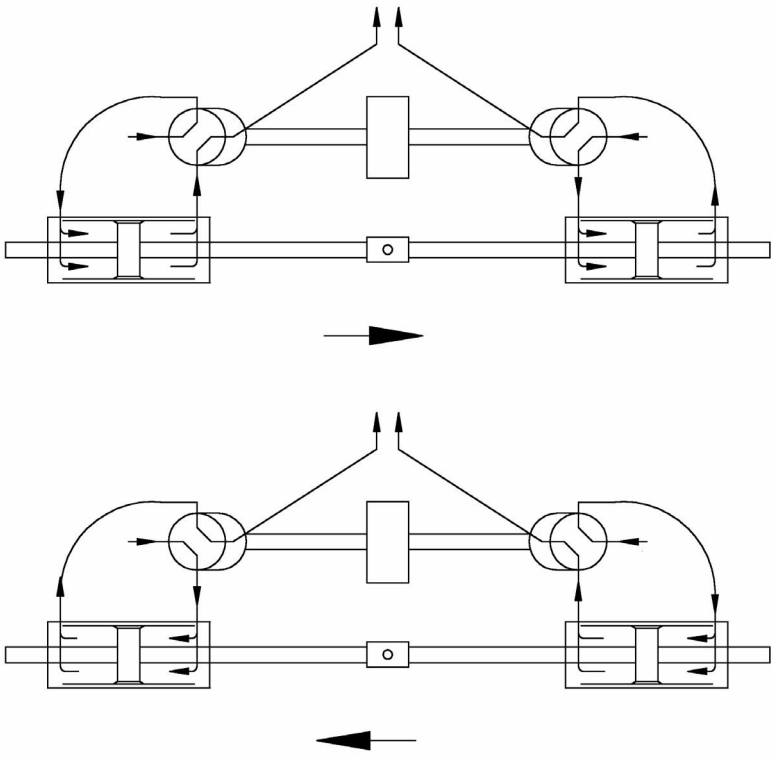
A complete system is assembled by selecting four equipment modules.

Each system includes the following components:

- Fixed or variable ratio power valved passive proportioner module
- Pump feed module for base material
- Pump feed module for catalyst material
- Mix/dispense module

Choose one of each component, plus any accessories to complete a modular system.

Double Action Proportioner Operation



8900 Proportioner

Plural Component Fixed & Variable

Proportioner Module Selection

The material ratio of the application is used to determine the ideal proportioner for the complete system. Depending on the application, you will need either a Fixed Ratio Proportioner or a Variable Ratio Proportioner.

Fixed Ratio Proportioner Systems

Fixed Ratio Proportioner systems are available for mix by the following volume ratios: 1:1, 2:1, 2.5:1, 4:1, 5:1, and 10:1.

Variable Ratio Proportioner Systems

All other volume ratios require a Variable Ratio Proportioner. Select a Variable Ratio Proportioner with the material ratio closest to the lower limit out of the four available models (Example: if a 3.62 ratio is required, choose 2:1 to 8:1 system). Following this guideline will ensure a longer stroke on the slave cylinder.

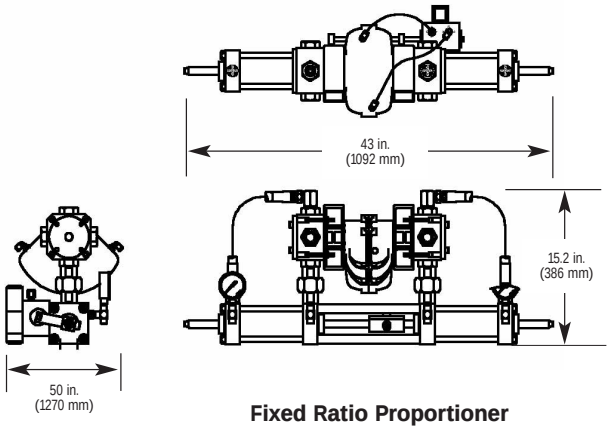
Cylinders

All 8900 proportioners use two of four available cylinders:

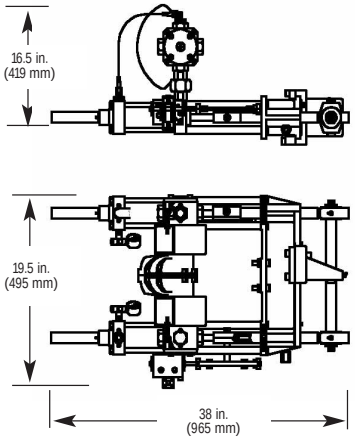
Cylinder Size	Effective Area In.² (cm²)	Output Per Full 5 in. Stroke
# 1000	6.627	.143 gal. (543 cc)
# 500	3.313	.072 gal. (271 cc)
# 250	1.657	.036 gal. (136 cc)
# 100	0.663	.014 gal. (54.3 cc)

Technical Specifications

Maximum working fluid pressure . . . . 2500 psi (172 bar; 17.2 MPa)
Approximate weight
  Fixed Ratio Proportioner . . . . . 350 lb. (158.75 kg)
  Variable Ratio Proportioner . . . . . 450 lb. (204.11 kg)
Dimensions
  Fixed Ratio Proportioner . . . . .15.2 in. H x 43 in. W x 11.6 in. D (386 mm x 1092 mm x 295 mm)
  Variable Ratio Proportioner . . . .16.5 in. H x 38 in. W x 19.5 in. D (419 mm x 965 mm x 495 mm)
Fluid inlet connections . . . . . 3/4 npt(f)
Fluid outlet connections . . . . . 3/4 npt(f)
Wetted parts . . . . . 303 and 17-4 PH SST, PTFE, aluminum, plated carbon steel, Hytrel®



Fixed Ratio Proportioner



Variable Ratio Proportioner

8900 Proportioner

Plural Component Fixed & Variable

Feed Module for Base & Catalyst Selection

The ideal pump feed modules for the Base and the Catalyst materials are determined by two factors:

- The size of the material containers
- The working pressure needed to pump the materials

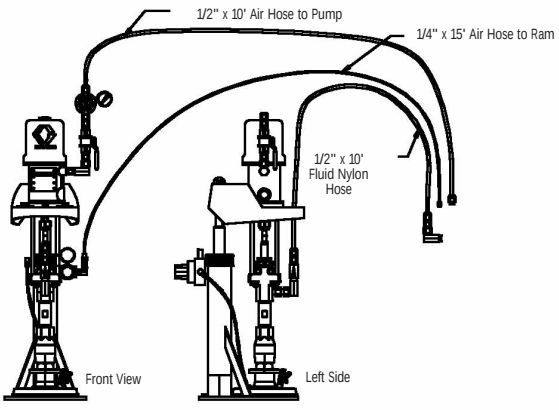
Use the following chart to select the most appropriate pump for the application:

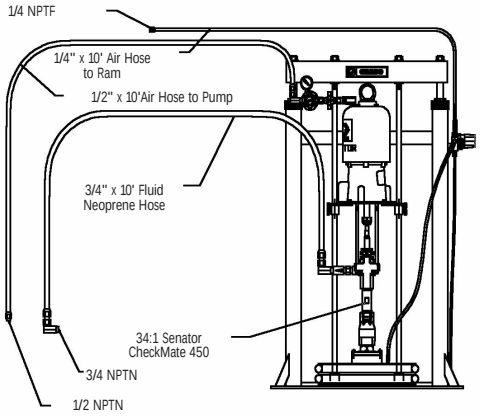
Container Size	Material Characteristics	Module Choice
1 gal. (3.8 liter)	Medium viscosity (self-leveling, 50 K - 200 K)	**H**
5 gal. (18.9 liter)	Medium viscosity (pourable grade, 50 K - 200 K)	**J or K** (installation preference)
	High viscosity, non-abrasive (200 k - 2 m)	**A or C**
	High viscosity, abrasive (200 k - 2 m)	**B**
55 gal. (208 liter)	Medium Viscosity (pourable grade, 50 K - 200 K)	**G**
	High Viscosity (200 k - 2 m)	**D, E, or F ***

A) President 20:1 on 5G Ram (965571)
B) Senator 34:1 on 5G Ram (965597)
C) Monark 23:1 on 5G Ram (570142)
D) President 20:1 on 55 G Drum (570144)
E) Senator 34:1 on 55G Ram (965572)
F) Bulldog 31:1 on 55G Ram (570141)

* Choose pump based on maximum flow and production requirements. Consult your authorized Graco distributor for guidance in selecting the appropriate pump.

Feed Modules for Base and Catalyst Supply





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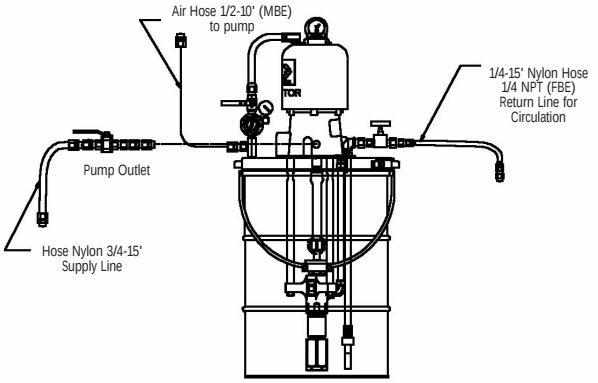
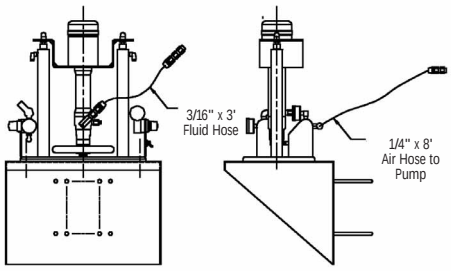
8900 Proportioner

Plural Component Fixed & Variable

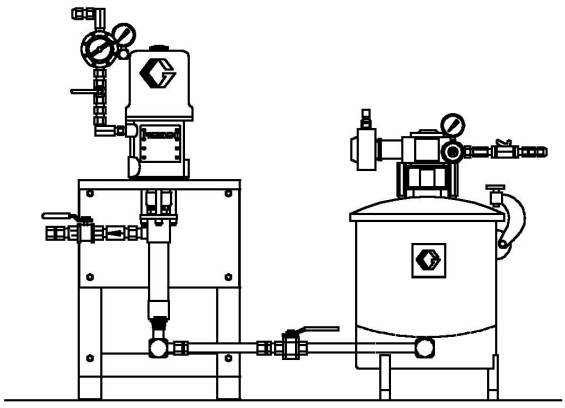
Feed Module for Base & Catalyst Selection



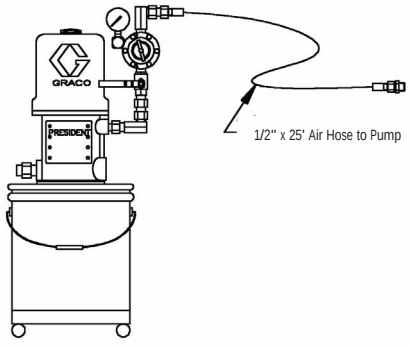
G) Senator 20:1 on 55 gal. (208 liter) Drum Cover & Elevator (570309)



H) Dynamite 9:1 1gal. (3.8 liter) Can Ram with U-Bolts to mount to Ram Tube or Stanchion (570249)



J) 10 gal. (38 liter) Press Tank with 15:1 Booster (570037)



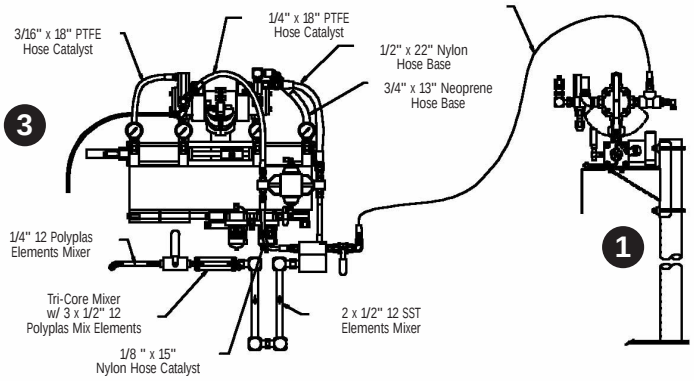
K) President 10:1 5 gal. (18.9 liter) Pail Cover (570264)

8900 Proportioner

Plural Component Fixed & Variable

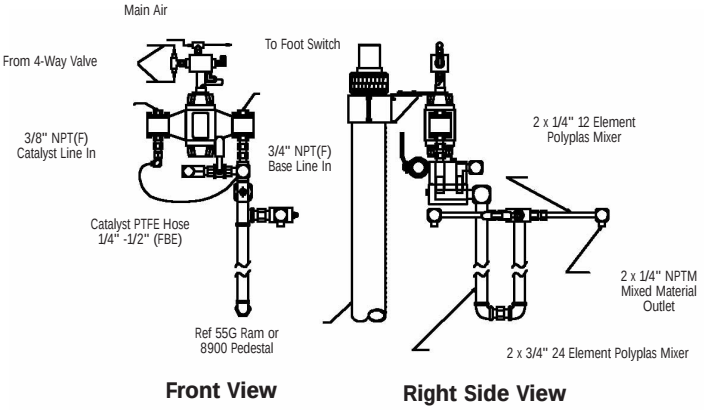
Mix Kit Selection

Choose a Cartridge Fill Module (1 - 3), 2K UL Gun Module (4 - 7) or High Volume Mix (8 - 9) based on cell layout and application requirements.

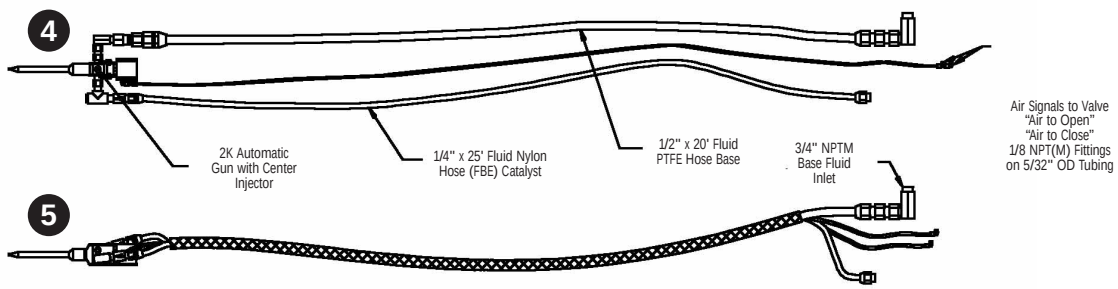


1) Cartridge Fill Medium Viscosity Wide Ratio (570248)

3) Brush Grade Cartridge Fill Wide Ratio (570358)



2) Cartridge Fill High Viscosity Wide Ratio (570318)



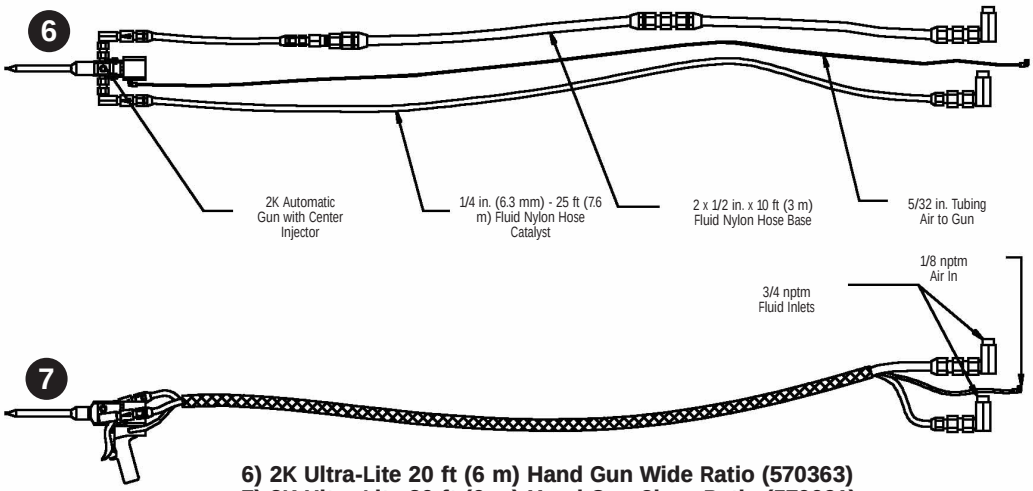
4) 2K Ultra-Lite 20 ft (6 m) Automatic Wide Ratio (570144)

5) 2K Ultra-Lite 20 ft (6 m) Automatic Close Ratio (570362)

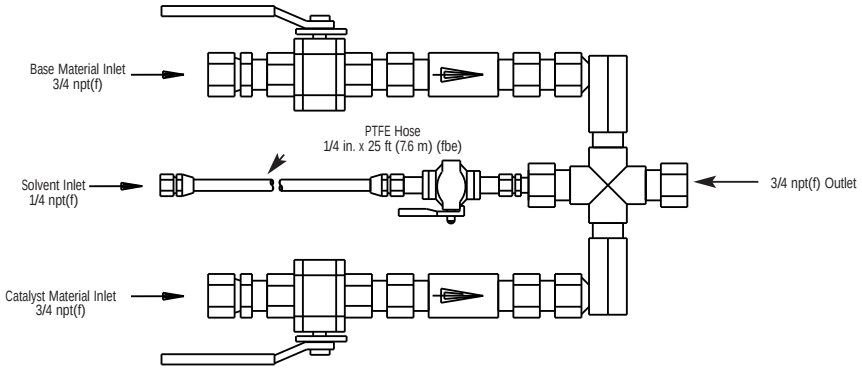
8900 Proportioner

Plural Component Fixed & Variable

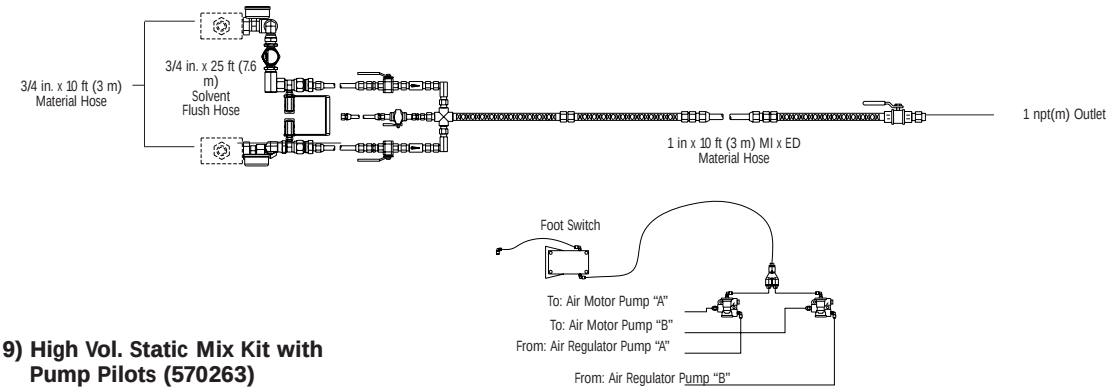
Mix Kit Selection



6) 2K Ultra-Lite 20 ft (6 m) Hand Gun Wide Ratio (570363)
7) 2K Ultra-Lite 20 ft (6 m) Hand Gun Close Ratio (570091)



8) High Vol. Static Mix Manifold (570391)



9) High Vol. Static Mix Kit with Pump Pilots (570263)

8900 Proportioner

Plural Component Fixed & Variable

Mix Kit Selection Summary

Technical Data

Code	Dispense Valve	Mixer	Hoses	Wetted Parts
1	Dual Outlet through Diverter Valve	2x 1/2 in. el SST + Tri-Core Mixer (3x 1/2 in. 12 polyplas mix elements) + 2x 1/4 in. 12 polyplas elements	18 in. x 15 in. nylon (catalyst)	Polyplas, PTFE, 303 SST plated CS, aluminum
2	Dual Outlet through Diverter Valve	2x 3/4 in. 24 el + 2x 1/4 in. 12 el Polyplas elements mixer	1/4 in. x 12 in. PTFE (catalyst)	Polyplas, PTFE, 303 SST plated CS, aluminum
3	1K Ultra-Lite Automatic Gun	Tri-Core Mixer 3x 1/2 in. 12 polyplas mix elements + 2x 1/2 in. SST elements + 2x 1/4 in. 32 polyplas elements mixers	1/4 in. x 12 in. PTFE (catalyst)	Polyplas, PTFE, 303 SST plated CS, aluminum, 17-4 ph SST, C2 carbide, hard chrome, ethylene propylene, Parker Polymite
4	2K Ultra-Lite Automatic Gun	3/8 in. ID 24 plastic elements disposable mixer	12 in. x 20 in. PTFE (base), 14 in. x 25 ft nylon (catalyst)	PTFE, 303 SST, 17-4 ph SST, C2 carbide, hard chrome, ethylene propylene, Parker Polymite
5	2K Ultra-Lite Automatic Gun	3/8 in. ID 24 plastic elements disposable mixer	12 in. x 20 in. PTFE (base), 14 in. x 25 ft nylon (catalyst)	See Code 4
6	2K Ultra-Lite Hand Gun	3/8 in. ID 30 plastic elements disposable mixer	2x 12 in. x 10 ft nylon (base), 14 in. x 25 ft. nylon (catalyst)	See Code 4
7	2K Ultra-Lite Hand Gun	See Code 6	See Code 6	See Code 4
8	None	None	1/4 in. 25 ft PTFE (solvent)	Plated carbon steel
9	1 in. Ball Valve	3 x 1 in. 12 elements pipe mixer, 1800 psi maximum working pressure	3/4 10 ft. neoprene 1 in. 10 ft (mixed material) 1/4 in. 25 ft PTFE (solvent)	330 SST, plated carbon steel, Neoprene, PTFE

Mounting Type Selection

Choose stanchion (S) or none (N) if mounting the 8900 Proportioner on a 55 gal (200 liter) feed module.

8900 Proportioner

Plural Component Fixed & Variable

Accessories

626698 Structural steel tubes (4 in. x 6 in.) for mounting two 55 gal. (200 liter) ram feed modules side by side. Could be used as stationary or portable unit (with added casters). Order two tubes (626698).

570264 President 10:1 mounted on a 5 gal. (19 liter) pail. Used for solvent flush of mix kit assembly.

570310 **Low-level shut-off kit**
For proportioner drum ram when used with 2K Ultra-Lite disposable mixer gun kits. Mounts to ram air cylinders and works with the motor air pilot valve.

Repair Kits for Major and Minor Metering Cylinders

Size	Meter Repair Kit	Cup (Order 2)	Ratio Cylinder	Ratio Kit*
#1000	C24166	C05032	C23136	C23041
#500	C24166	C23350	C23200	C23087
#250	C24166	C23318	C23171	C23067
#100	C24166	C22282	C23137	C23042

* Ratio kit includes: ratio cylinder, cup (qty. 2), spacer and back-up (qty. 2)

4

Repair Kits for All Proportioners

For Part Number	Repair Kit	Replacement Parts
Actuator C24046		C24047
4-Way Valve, 3/16 in. C24039	C07067	C07069 Trunion 3/16 in. inside port
4-Way Valve, 5/8 in. C24029	C07067	C07068 Trunion 5/8 in. inside port

Configured Product Order Form—8900 Proportioner

Fax completed form and Purchase Order to Graco Customer Service:
Fax **(800) 334-6955** North America
(612) 623-6884 International

For Graco Use
S/R #_____
System #_____

Account Number: _____ PO Number: _____ Date: _____

Ship To:
Attn:

Bill To:
Attn:

Model Code and Pricing Information—Refer to the latest price book for the most current pricing and fill in appropriate blanks.

Typical Model Number: 8900-C- 1 - D - C - 2 - N			
Model	**Product Description**		**List Price**
8900-B	Power Valved Passive Proportioner		
Code A	**Proportioner Selection ("A" Cyl./"B" Cyl.)**		Add
1	1:1 Fixed (1000/1000)	570371	$
2	2:1 Fixed (1000/500)	570372	
3	2:5:1 Fixed (250/100)	570373	
4	4:1 Fixed (1000/250)	570374	
5	5:1 Fixed (500/100)	570375	
6	10:1 Fixed (1000/100)	570376	
A	1:1 to 4:1 Variable (500/500)	570377	
B	2:1 to 8:1 Variable (500/250)	570378	
D	5:1 to 20:1 Variable (500/100)	570380	
Code B	**Pump Feed Module Selection for Base**		Add
A	20:1 President on 5 Gal. Ram	965571	$
B	34:1 Senator on 5 Gal. Ram	965597	
C	23:1 Monark on 5 Gal. Ram	570142	
D	20:1 President on 55 Gal. Ram	570114	
E	34:1 Senator on 55 Gal. Ram	965572	
F	31:1 Bulldog on 55 Gal. Ram	570141	
G	20:1 Senator on 55 Gal. Drum	570309	
H	9:1 Dynamite 1 Gal. Can Ram	570249	
J	10 Gal. Press Tank w/ 15:1 Booster	570037	
K	10:1 President 5 Gal. Pail Cover	570264	
N	None		N/C

Code C	**Pump Feed Module Selection for Catalyst**		Add
A	20:1 President on 5 Gal. Ram	965571	$
B	34:1 Senator on 5 Gal. Ram	965597	
C	23:1 Monark on 5 Gal. Ram	570142	
D	20:1 President on 55 Gal. Ram	570114	
E	34:1 Senator on 55 Gal. Ram	965572	
F	31:1 Bulldog on 55 Gal. Ram	570141	
G	20:1 Senator on 55 Gal. Drum	570309	
H	9:1 DynaMite 1 Gal. Can Ram	570249	
J	10 Gal. Press Tank w/ 15:1 Booster	570037	
K	10:1 President 5 Gal. Pail Cover	570264	
N	None		N/C
Code D	**Mix Kit Selection**		Add
1	Cart Fill Medium Vis Wide Ratio	570248	$
2	Cart Fill High Vis Wide Ratio	570318	
3	Brush Grade Cart Fill Wide Ratio	570358	
4	2K Ultra-Lite 20' Auto Wide Ratio	570144	
5	2K Ultra-Lite 20' Auto Close Ratio	570362	
6	2K Ultra-Lite 20' Hand Gun Wide Ratio	570363	
7	2K Ultra-Lite 20' Hand Gun Close Ratio	570091	
8	High Vol. Static Mix Manifold	570391	
9	High Vol. Static Mix Kit w/ Pump Pilots	570263	
N	None		N/C
Code E	**Mounting Type Selection**		Add
S	Stanchion	570071	$
N	None (mount on 3" 55 Gal. Ram)		N/C
	List Price (each)		$

Order Information—Not intended for quoting purposes. Purchase Order must accompany order. No verbal orders accepted.

Model Number 8900-C- ___-___-___-___-___
Code: A B C D E

Note: Orders Cancelled prior to shipment are subject to a 25% restocking fee. Configured products are not returnable.

Order Quantity _____ **X List Price (each)** _____ **= Total Price** _____

Distributor Requested Ship Date: _____
(Please contact Graco Customer Service for Delivery Information)

Print Name:_____ Signature:_____ Date:

Note: For the full 8900 Proportioner configured order form and instructions, order Graco form 684041.

4

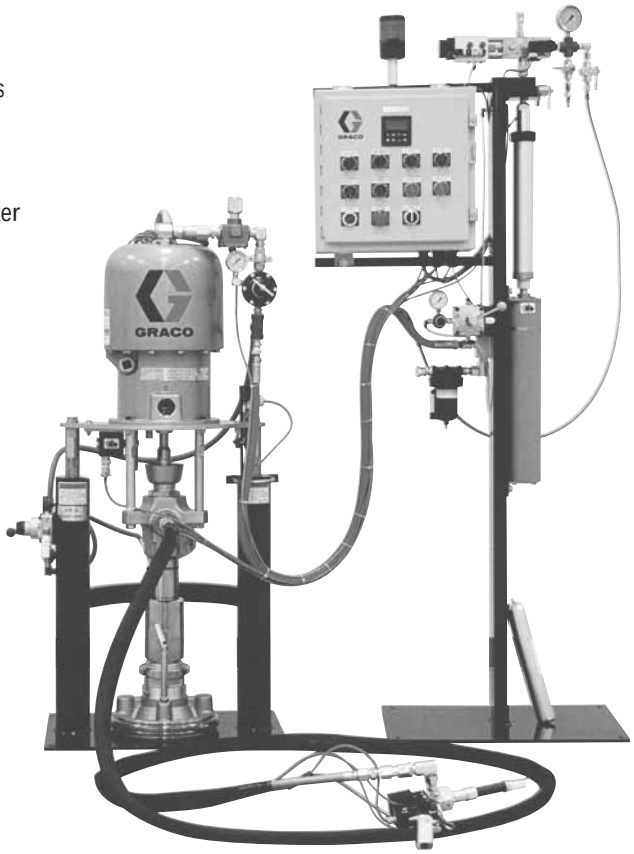
Precision Dose™

Dispense System

PrecisionDose is used to inject booster fluid into slow-curing adhesives and sealants.

Features and Benefits

- 1K urethane or modified silane structural adhesives have a booster fluid metered in for quick green strength
- 1-3% injection by firing 1/10 cc shots into the mixer with a Severe Duty™ Precision Dose valve
- King® 65:1 Check-Mate™ Severe Duty adhesive pump with encoder to monitor pump flow
- PLC controls and monitors system
- Simple ratio checking



4

Typical Applications

- Bonding in the assembly of trucks, buses, trailers, RVs and prefabricated homes

Typical Fluids Handled

- Urethanes
- Modified Silane Polymers

Precision Dose™
Dispense System

How Precision Dose Works

Precision Dose pumps, meters, mixes and dispenses a variety of boosted sealant and adhesive products. Adhesive is pumped from a pail or drum to a dual-dispense gun. Booster paste is injected into the center of a disposable mixer on the gun outlet. Each time the gun's trigger is engaged an electric switch closes, activating the air-operated gun and positive-displacement adhesive pump. This pump sends pulses to the control box processor, which fires a severe-duty precision-dosing valve that injects metered shots into the disposable mixer. When the trigger is released, the gun valve closes, and the air motor stops.

System Components

A complete system is assembled by selecting three equipment modules.

Each system includes the following components:

- Material feed module
- Booster feed module
- Dispense hose/applicator

Choose one of each component, plus any accessories to complete a modular system.

Technical Specifications

Urethane Supply Module

Maximum working air pressure . . . . 90 psi (6.2 bar; 0.62 MPa)
Maximum working fluid pressure . 5850 psi (403 bar; 4.03 MPa)
Dimensions, ram down
5 gal. (19 liter) pail . . . . . .24 in. W x 18 in. D x 572 in. H (61 cm W x 45 cm D x 214 cm H)
55 gal. (200 liter) drum . . . . . .59 in. W x 29 in. D x 68.2 in. (150 cm W x 74 cm D x 173 cm H)
Dimensions, ram up
5 gal. (19 liter) pail . . . . . .24 in. W x 18 in. D x 72.2 in. H (61 cm W x 45 cm D x 252 cm H)
55 gal. (200 liter) drum . . . . . .59 in. W x 29 in. D x 108.2 in. H 150 cm W x 74 cm D x 275 cm H
Fluid outlet size . . . . . 3/4 npt (f)
Air inlet size . . . . . 3/4 npt (f)

Urethane Supply Module, continued

Floor mount dimensions
5 gal. (19 liter) pail supply . . . . . D 22 in. W x 16 in. D (55.9 cm W x 40.6 cm)
55 gal. (200 liter) drum supply . . . . . .42 in. W x 25 in. D (106.7 cm W x 63.5 cm D)
Approximate weight
5 gal. (19 liter) pail supply . . . . . 600 lb. (273 kg)
55 gal. (200 liter) drum supply . . . . . 800 lb. (363 kg)

Booster Stand and Control Panel

Electrical power requirements . . . 120 VAC, or WOVAC 1 phase, 50-60 Hz, 2 A; 230v 50-60 Hz 1 phase
Ambient temperature range . . . . . .40-120° F (5-50°C)
Dimensions . . . . . 31 in. W x 18 in. D x 72 in. H (79 cm W x 46 cm D x 183 cm H)
Weight* . . . . . 150 lb. (68 kg)
Floor mount dimensions* . . . . . .22 in. W x 16 in. D (55.9 cm W x 40.6 cm D)

Booster Supply Module

Maximum working air pressure . . . . .90 psi (6.2 bar; 0.62 MPa)
Maximum working fluid pressure . . . .500 psi (34 bar; 3.4 MPa)
Dimensions, ram down
5 gal. (19 liter) pail feed . . . . . .18 in. W x 18 in. D x 42 in. H (46 cm W x 46 cm D x 107 cm H)
Dimensions, ram up
5 gal. (19 liter) pail feed . . . . . .18 in. W x 18 in. D x 61 in. H (46 cm W x 46 cm D x 155 cm H)
Floor mount dimensions
5 gal. (19 liter) pail feed . . . . . .18 in. W x 18 in. D x 42 in. H (46 cm W x 46 cm D x 155 cm H)
Approximate weight
5 gal. (19 liter) pail feed . . . . . 125 lb. (57 kg)

Hose/Applicator Module Dispense Valve

Maximum fluid pressure . . . . . 3000 psi (207 bar; 20.7 MPa)
Maximum air pressure . . . . . 120 psi (8 bar; 0.08 MPa)
Fluid inlet size . . . . . 1/4 npt (f)
Fluid outlet size . . . . . G-1/2 (f)
Air open inlet size . . . . . 1/8 npt (f)
Air close inlet size . . . . . 1/8 npt (f)
Approximate weight . . . . . 1.43 lb. (650 g)

* Note: dimensions and weight are without mounting hardware, cables, hoses, etc.

Precision Dose™
Dispense System

Material Feed Module Selection (Code A)

The amount of material to be used determines the ideal feed module for the complete system. Depending on the application, you will need either a 5 gal. (19 liter) or a 55 gal. (200 liter) module. Both feed modules supply adhesive with a King™ 65:1 Check-Mate™ Severe Duty, priming-piston, dual-action reciprocating pump.

5 gallon (19 liter) feed module

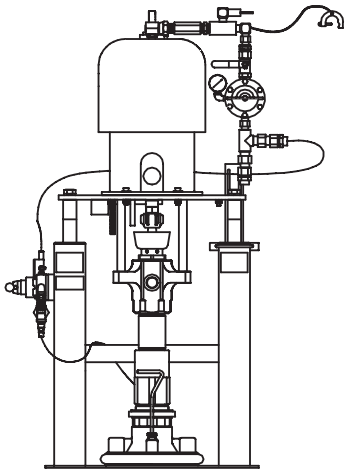
The pump is mounted on a 3 in. (76 mm) dual-post pail ram which will accept 5 gal. (19 liter) or 6 gal. (23 liter) hobbocks and includes:

- Solenoid valve and muffler
- Low-level switch and mounting hardware
- Encoder assembly with bearings
- Gear rack for for counting pump movement pulses

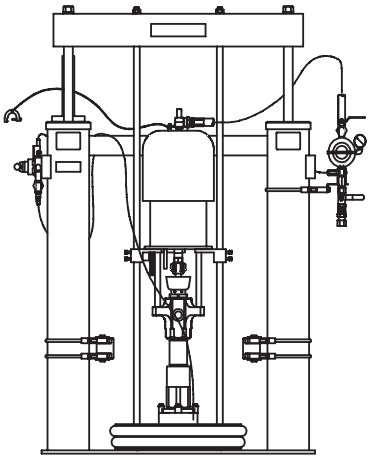
55 gallon (200 liter) feed module

The pump is mounted on a 6.5 in. (165 mm) dual-post pneumatic drum ram and includes the following:

- Solenoid valve and muffler
- Low-level switch and mounting hardware
- Encoder assembly with bearings
- Gear rack for for counting pump movement pulses
- Safety shield



65:1 King 5 gal. (19 liter) pail supply



65:1 King 55 gal. (200 liter) drum supply

Precision Dose™
Dispense System

Booster Feed Module Selection (Code B)

The booster feed module is available for use with a 20 fluid oz (600 ml) sausage pack pressure tube (S) or or a 5 gal. (19 liter) pail pump (P). The material feed module determines which booster feed module you should select: the 20 fluid oz (600 ml) feed module is recommended for use with the 5 gal. (19 liter) supply module, and the 5 gal. (19 liter) feed module is recommended for the 55 gal. (200 liter) supply module. Each booster feed module consists of a booster supply, control box, dosing valve, booster stand and the interconnecting cables, tubing and hoses.

Booster Supply

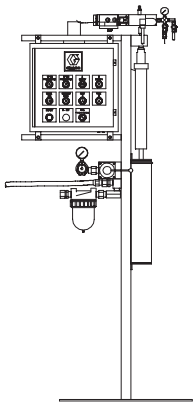
The booster supply delivers the booster paste from either a sausage pack pressure tube or a 5 gal. (19 liter) pail pump to the dosing valve.

Control Box

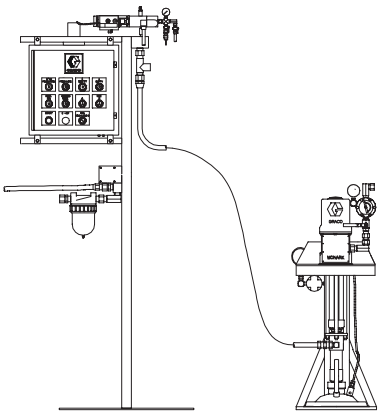
The control box contains a computer processor that controls all aspects of the Precision Dose system. This processor monitors the guns, encoder, adhesive and booster low-level switches and the booster low- and high-pressure switches. In addition, the processor controls the booster dosing valve, dispense valve, adhesive pump motor and the system alarms.

Dosing Valve

The dosing valve is an air-operated, positive-displacement, double-check valve that contains a purge valve for loading. The solenoid is direct-mounted for high-speed cycling. The valves outlet manifold is equipped with high- and low-pressure switches, a pressure gauge, ratio check assembly and selector valves.



(S) - 20 fluid oz (600 ml) sausage pack feed



(P) - 5 gal. (19 liter) pail feed

Precision Dose™
Dispense System

Hose/Applicator Module Selection (Code C)

The hose applicator module is comprised of an adhesive hose, booster paste hose, 2K Ultra-Lite® dispense valve and the necessary air tubing and cables. The module is available with either a manual or automatic applicator, and with hoses in 15 ft. (4.6 m) or 25 ft. (7.6 m) lengths. Both the manual and automatic applicators include a 2K Ultra-Lite dispense valve. The manual applicators have a pistol-grip trigger kit added to the valve. This trigger activates an electric switch that sends a signal back to the controller to open the valve and start the pump.

Adhesive Hose

The adhesive hose is 3/4 in. ID to within 5 ft. (1.5 m) from the dispense valve, where the width narrows to 1/2 in. ID. This hose is made of high-pressure synthetic-rubber core hose and is designed for use with moisture-cure materials.

Booster Paste Hose

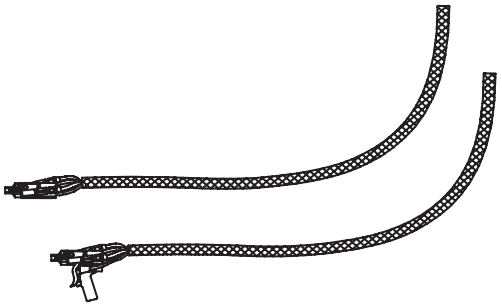
The booster paste hose is a 1/4 in. ID PTFE core with a stainless steel braid cover.

2K Ultra-Lite Dispense Valve

The 2K Ultra-Lite dispense valve is a disposable, air-operated mixer-type valve that requires no flushing. The valve has Severe Duty needles and seats, dual-lubricated shaft seals and a snuff-back action that ensures a clean cut-off and no dripping. In addition, the valve is equipped with fittings, an inlet booster check valve, a hose swivel, center-injection booster nozzle and a removable outlet for cleaning. The outlet pieces are PTFE-plated for easy adhesive clean-up.

Electrical Voltage Selection (Code D)

Select either a 120 volt 50/60 Hz or a 230 volt Hz single phase power as required.



(15A, 15M) 15 ft. (4.6 m)
Hose with automatic or manual valve kit

(25A) 25 ft. (7.6 m)
Hose with automatic or manual valve kit

Precision Dose Dispense System Ordering Information

Configured Product Order Form—Precision Dose

Fax completed form and Purchase Order to Graco Customer Service:
Fax (800) 334-6955 North America
(612) 623-6884 International

For Graco Use
S/R #_____
System #_____

Account Number: _____ PO Number: _____ Date: _____

Ship To:	Bill To:
Attn:	Attn:

Typical Model Number: PDOS-D-D-P-25M

Model	Product Description	List Price
PDOS-B	Precision Dose	
Code A	**Material Feed Module**	
D	55-Gallon Drum (570154)	
P	23-Liter pail (570153)	
Code B	**Booster Feed Module**	**Add**
P	23-Liter pail (965741)	
S	Sausage Pack (965740)	
Code C	**Dispense Hose/Applicator Module**	**Add**
15M	15 ft., manual (570152)	
15A	15 ft., automatic (570368)	
25M	25 ft., manual (570216)	
25A	25 ft., automatic (570173)	
Code D	**Supply Voltage. All packages CE marked.**	**Add**
120	120 Volt 50/60 Hz single phase	N/C
230	230 Volt 50/60 Hz single phase	N/C
	Total of all options = List Price (each)	

Order Information—Not intended for quoting purposes. Purchase Order must accompany order. No verbal orders accepted.

Model Number PDOS-D- ___-___-___ ___ ___-___ ___ ___
Code: A B C D

Note: Orders Cancelled prior to shipment are subject to a 25% restocking fee. Configured products are not returnable.

Order Quantity _____ **x List Price (each)** _____ **= Total US List Price $** _____

Standard Delivery (accepted order to ship date) 4-6 weeks.

Print Name: _____ Signature: _____ Date: _____

Note: For the full Precision Dose configured order form and instructions, order Graco form 684039.

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1:1 Extruder™

Supply, Metering and Dispense System for 5 Gallon (19 Liter) Pails

Features and Benefits

- Repeatability: accurately load each anchoring hole as needed to anchor your dowel bars securely and consistently.
- Ratio accuracy: mixes material precisely, conforming to material manufacturer specs and eliminating the risk of off-ratio material.
- Production efficiency: mix material as you need it, minimizing material waste and disposal hassles associated with solvent flushing
- Precise material handling: eliminates manual mixing and the risks of inadequate working time with quick-curing materials.
- Return-on-investment: the 1:1 Extruder pays for itself in material cost savings by using bulk containers instead of cartridges.
- Rugged reliability: built tough for the rigors of contractor and industrial applications.

Typical Applications

- Construction
- Product Assembly

Typical Fluids Handled

- Silicones
- Epoxies
- Acrylics

1:1 Extruder™

Supply, Metering and Dispense System for 5 Gallon (20 Liter) Pails

Technical Specifications

Mix ratio by volume . . . . . 1:1 (Fixed)
Air motor . . . . . President™
Air motor diameter . . . . . 4-1/4 in. (10.8 cm)
Air inlet size . . . . . 1/2 npt(f)
Air inlet pressure range . . . . . 40 to 108 psi (2.8 to 7.5 bar; 0.28 to 0.75 MPa)
Air consumption . . . . . 10 cfm
Pump lowers (2) . . . . . Check-Mate™ 200
Fluid power ratio 22:1
Maximum fluid pressure . . . . . 2375 psi (160 bar; 16.0 MPa)
Follower plates (2) . . . . . 5 gal. (19 liter) wiper
Fluid outlets [A+B] . . . . . 1/2 npt(f)
Wetted parts
Carbon steel models . . . . . carbon steel, stainless steel, ductile iron, zinc and nickel-plated, PTFE and UHMWPE (Ultra High Molecular Weight Polyethylene)
Stainless steel models . . . . . stainless steel, PTFE, polyethylene, PTFE-coated rubber
Ram elevator . . . . . .dual 3 in. (7.6 cm) post
Pail holders (2) . . . . . 2 in. (5.1 cm) pneumatic lift

Ordering Information

1:1 Extruder Proportioning Unit Module
Includes outlet checks and fluid gauges.

965119 Carbon Steel Model

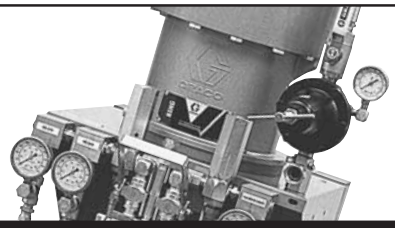
570135 Stainless Steel Model

Bill of Material for Complete System

(Carbon steel, Nylon hose)

Quantity	Description	Part #
1	1:1 Extruder	**965119**
2	Hose 3/8 in. x 25 ft.	**214703**
2	Inlet check valve	**501867**
2	90° Swivel 3/8 npsm(f) x 1/4" npt(f)	**162803**
1	2K Ultra-Lite pistol-grip gun	**965535**
1	Retaining nut	**512291**
1	Disposable mixer	**512016**
1	Air Pilot Valve*	**104632**

***Select appropriate air lines and fittings to link 2K gun to air pilot valve. See information with 2K Ultra-Lite valve.**



Fixed Ratio Hydra-Cat®

Mechanical Proportioner

High volume mechanical proportioner that replaces the manual pre-mixing of plural component materials and reduces the cost of wasted paint and labor.

Features and Benefits

- Severe Duty™ lowers for wear resistance and durability
- Two- and three-lower designs achieve a wide variety of mix ratios
- Two-lower design for a consistent 1:1 mix ratio.
- Three-lower design provides mix ratios above 1:1 for balanced pumping
- Provides accurately mixed and proportioned material on demand
- Reduces material and solvent waste

Durable long-life King air motor

4

Typical Applications

- Plural component materials
- Protective coatings
- Farm and construction equipment
- Truck and bus
- General metal fabrication
- Foam and elastomerics

Durable and accurate Hydra-Cat pump lowers

Typical Coatings Applied

- Epoxies
- Polyurethanes
- Waterbornes
- Acid-catalyzed wood finishing materials
- Stains, lacquers and varnishes
- Sealants and adhesives

Fixed Ratio Hydra-Cat Configurated Product

Fixed Ratio Hydra-Cat
Mechanical Proportioner

The Hydra-Cat is a dispensing system that will proportion and mix two-component fluids. The fixed ratio proportioners accurately pump and proportion two-component materials by powering two or three positive displacement pump lowers from a common air motor. This assures that the stroke rate and stroke length of all pump lowers are identical, providing constant proportioning. The mix ratio is fixed by selecting compatible sets of two or three lowers.

Fixed Ratio Hydra-Cat can be ordered as a package or a custom-configured unit by choosing all desired options to be factory-integrated. Use configurator form number 309002 to configure your custom package.

Fixed Ratio Hydra-Cat Options

MOTOR TYPE

Note: Graco air motors can be combined with various lowers to achieve a wide range of air-to-fluid pressure ratios.

Air Motors	Effective Area Sq. in. (Sq. cm)	Fluid Pressure Range	Flow Rates @ 40 cpm
President	14.19 (91.55)	500-2500 psi (3.4-17.2 MPa, 34-172 bar)	0.75-4.16 gpm (2.8-15.75 lpm)
Bulldog	38.48 (248.26)	1300-3000 psi (8.9-20.7 MPa, 89-207 bar)	1.5-4.62 gpm (5.7-17.5 lpm)
King	78.54 (506.71)	2600-3000 psi (17.9-20.7 MPa, 179-207 bar)	2.73-4.62 gpm (10.3-17.5 lpm)
Hydraulic Motors			
Viscount I	1.48 (9.55)	500-2671 psi (3.4-18.4 MPa, 34-184 bar)	0.73-3.89 gpm (2.7-14.7 lpm)
Viscount II	4.9 (31.61)	1500-3000 psi (10.3-20.7 MPa, 103-207 bar)	3.35-4.62 gpm (12.7-17.5 lpm)

PUMP LOWER TYPE

Two Lower Design (1:1 Mix Ratio Only)

The Fixed Ratio Hydra-Cat uses two identically sized lowers driven by a common air motor through a connecting yoke. Using one lower each for the base and catalyst components achieves a consistent 1:1 mix ratio and provides balanced pumping forces to prevent premature packing wear.

Three Pump Lower Design (1:1 to 6.4:1 Mix Ratio)

The Fixed Ratio Hydra-Cat uses two identically sized outer lowers joined by a manifold to pump one component while a third (center) lower pumps the second component. In this manner, lowers of various sizes can be selected to provide a wide variety of mix ratios while maintaining balanced pumping forces and optimum packing life.

Lower Identification	Effective Area Sq. In. (sq. cm)	Lower Part No.
(President 10:1)	1.476 (9.53)	215932
(Bulldog 30:1)	1.248 (8.05)	901878
(President 15:1)	0.884 (5.70)	215930
0	0.884 (5.70)	948640
1	0.740 (4.77)	948641
2	0.553 (3.57)	222012
2 (w/wiper blade)	0.553 (3.57)	222012
5	0.443 (2.86)	222015
7	0.370 (2.39)	222017
9	0.277 (1.79)	222019
(Bulldog 10:1)	3.540 (22.80)	206792
(Monark 5:1)	1.478 (9.54)	217339
(Bulldog 40:1)	0.875 (5.65)	946196

Fixed Ratio Hydra-Cat®

Mechanical Proportioner

MIX MANIFOLD OPTIONS

The mix manifold incorporates two materials and mixes them thoroughly using a 12 in. static mixer. Mix manifolds can be mounted locally on the Hydra-Cat or mounted remotely, closer to the application, in order to reduce material and solvent waste. All manifolds include a 12 in. SST mixer with 32 plastic elements, except 240225, which uses a SST mixer element.

Local Standard Manifold (CS)	241692	3000 psi (207 psi, 20.7 MPa)	1/4 port size
Local Control Mixer Manifold (SST)	241808	3000 psi (207 psi, 20.7 MPa)	1/2 port size
Remote Mounted Manifold (CS)	241809	5000 psi (345 psi, 34.5 MPa)	3/8 port size
Remote Mounted Manifold (SST)	240225	5000 psi (345 psi, 34.5 MPa)	1/2 port size

Mounting Options

BARE PROPORTIONER

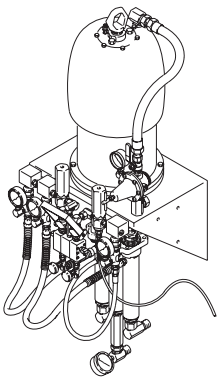
Bare proportioners consist of an air motor assembled with two or three lowers. Bare proportioners require a mix manifold, shut-off valves and other installation hardware as described in wall-mount and floor-stand proportioners.

WALL-MOUNT

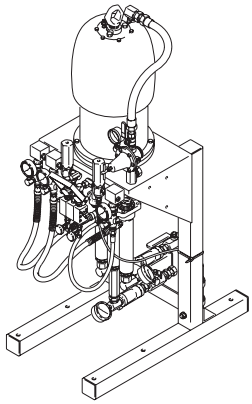
Wall-mounted proportioners consist of a bare proportioner, mix manifold, shut-off valves, gauges, inlet kit (supply) and wall bracket. These proportioners may require other system accessories such as feed systems, applicators and manifolds. Wall mount proportioners can be mounted directly on a wall or attached to the side of a supply tank or other piece of equipment for convenient installation.

FLOOR-STAND

Floor-stand proportioners consist of a bare proportioner, mix manifold, shut-off valves, gauges, inlet kit and floor-stand. These proportioners may require other system accessories such as supply systems, applicators and manifolds. Floor-stand proportioners are completely free standing. They can be made portable by mounting them on a four-wheel cart designed to accommodate all system components.



Fixed Ratio Hydra-Cat Wall-Mount



Fixed Ratio Hydra-Cat Floor-Stand

Fixed Ratio Hydra-Cat
Mechanical Proportioner

How to Select a Hydra-Cat

1. SELECT A MIX RATIO

The mix ratio is usually specified by the material manufacturer.

Note: Ratios other than those shown can often be configured on a special basis. Contact Graco Technical Assistance for details.

2. SELECT PRESSURE RATIO OR MAX PRESSURE

Select a pressure ratio that will allow the proportioner to deliver the required amount of fluid pressure for the application. This is determined by material viscosity and setup parameters.

3. SELECT A FLOW RATE

From the possible choices of fluid to air ratio, select one that exceeds the total flow requirements of the application device(s) by approximately 30%. This provides an adequate application factor for such variables as tip or nozzle wear and pump/motor characteristics.

Fixed Ratio Hydra-Cat Packages

1:1 MIX RATIO

Fluid to Air Ratio	Fluid Flow gpm	Fluid Flow lpm	Lower ID Code	Air Motor	Stand	Wall	Bare
13:1	1.5	5.7	2 • 2	President	231618	231593	231643
19:1	1.0	3.8	7 • 7	President	231620	231595	231645
35:1	1.8	6.7	2 • 2	Bulldog	231865	231836	231897

2:1 MIX RATIO

Fluid to Air Ratio	Fluid Flow gpm	Fluid Flow lpm	Lower ID Code	Air Motor	Stand	Wall	Bare
13:1	1.5	5.7	777	President	231632	231607	231657
23:1	2.6	10.0	222	Bulldog	231876	231847	231908
35:1	1.8	6.7	777	Bulldog	231878	231849	231910

3:1 MIX RATIO

Fluid to Air Ratio	Fluid Flow gpm	Fluid Flow lpm	Lower ID Code	Air Motor	Stand	Wall	Bare
26:1	2.3	8.9	272	Bulldog	231880	231851	231912

4:1 MIX RATIO

Fluid to Air Ratio	Fluid Flow gpm	Fluid Flow lpm	Lower ID Code	Air Motor	Stand	Wall	Bare
10:1	1.9	7.2	292	President	231638	231613	231663
28:1	2.2	8.4	292	Bulldog	231883	231854	231915
35:1	3.5	13.4	050	King	231291	231286	231668

1:1 MIX RATIO – HYDRAULIC-POWERED

Pressure Ratio	Fluid Flow gpm	Fluid Flow lpm*	Lower ID Code	Air Motor	Stand	Wall	Bare
1.7:1	3.3	12.5	—	Viscount II	—	—	217337

Fixed Ratio Hydra-Cat
Mechanical Proportioner

Product Configurator Form

Typical Model Number: FRHC - E - A - H22 - B1 - 3 - 18 - 18 - 11

Model	Product Description	U.S. List Price
FRHC	Fixed Ratio Hydra-Cat	
Code B	**Air or Hydraulic Powered**	**Add**
A	Air (see table FA for air-powered Hydra-Cats)	
B	Hydraulic (see table FH for hydraulic-powered Hydra-Cats)	
Code CCC	**Table Reference Number** – is determined from the table reference number found on the appropriate air (FA) or hydraulic (FH) table.	**Add**
	From Selection Table	$1,500.00
Code DD	**Motor Type** – is determined from the motor code column found on the appropriate air (FA) or hydraulic (FH) table.	**Add**
	P1 President® (207352)	$1,565.00
	B1 Bulldog® (208356)	$2,340.00
	K1 King® (207647)	$2,890.00
	V1 Viscount® I (948699)	$1,570.00
	V2 Viscount II (235345)	$3,640.00
Code E	**Number of Lowers** – is determined from the number of lowers column found on the appropriate air (FA) or Hydraulic (FH) table.	**Add**
	2 (2) Lowers	$1,400.00
	3 (3) Lowers	$1,800.00
Code FF	**"A" Component Lowers** – is determined from the "A" component lowers column on the appropriate reference table. If "3" is loaded in Code E then add the additional cylinder cost in the space provided. It should be the same as is entered in Code FF.	**Add**
	01 (10:1 President) Cylinder (215932)	$1,895.00
	03 (15:1 President) Cylinder (215930)	$1,645.00
	11 (10:1 Bulldog) Cylinder (206792)	$3,110.00
	12 (5:1 Monark) Cylinder (217339)	$1,870.00
	13 (30:1 Bulldog) Cylinder (901878)	$3,330.00
	14 (#0) Cylinder (948640)	$2,040.00
	15 (#1) Cylinder (948641)	$2,120.00
	16 (#2) Cylinder (222012)	$1,125.00
	17 (#2) Cylinder with Scraper (239388)	$1,520.00
	18 (#5) Cylinder (222015)	$1,125.00
	19 (#5 SST) Cylinder (948195)	$4,100.00
	20 (#7) Cylinder (222017)	$1,125.00
	21 (#7 SST) Cylinder (948197)	$4,710.00
	22 (#9) Cylinder (222019)	$1,125.00
	23 (40:1 Bulldog) Cylinder (946196)	$2,940.00

Model	Product Description	U.S. List Price
	Add additional cylinder charge from Code FF if Code E selection indicates that (3) cylinders are selected.	
Code GG	**"B" Component Lowers** – is determined from the "B" component lowers column on the appropriate reference table.	**Add**
	01 (10:1 President) Cylinder (215932)	$1,895.00
	03 (15:1 President) Cylinder (215930)	$1,645.00
	11 (10:1 Bulldog) Cylinder (206792)	$3,110.00
	12 (5:1 Monark) Cylinder (217339)	$1,870.00
	13 (30:1 Bulldog) Cylinder (901878)	$3,330.00
	14 (#0) Cylinder (948640)	$2,040.00
	15 (#1) Cylinder (948641)	$2,120.00
	16 (#2) Cylinder (222012)	$1,125.00
	17 (#2) Cylinder with Scraper (239388)	$1,520.00
	18 (#5) Cylinder (222015)	$1,125.00
	19 (#5 SST) Cylinder (948195)	$4,100.00
	20 (#7) Cylinder (222017)	$1,125.00
	21 (#7 SST) Cylinder (948197)	$4,710.00
	22 (#9) Cylinder (222019)	$1,125.00
	23 (40:1 Bulldog) Cylinder (946196)	$2,940.00
Code HH	**Mixed Manifold Options** – is determined from the "Mix Manifold Options" table.	**Add**
00	None	No Charge
11	Standard Manifold, CS (241692)	$1,270.00
21	Control Mixer Manifold, SST (241808)	$2,600.00
31	Remote Mounted Manifold, CS (241809)	$1,560.00
41	Remote Mounted Manifold, SST (240225)	$4,830.00
Code J	**Mounting Configuration**	**Add**
O	No Mounting Hardware Included	No Charge
W	Wall Mounted Hardware	$174.00
S	Standing Hardware	$550.00

Fax completed form and Purchase Order to Graco Customer Service.
Toll-Free Fax (877) 340-6427 - North America
(612) 623-6884 - International

Ordering Information (Not intended for quoting purposes. Purchase order must accompany order. No verbal orders accepted).
Note: Codes DD, E, FF and GG are copied from the appropriate table after Codes BB and CCC are selected.

FRHC - E - ____ - ___ ___ ___ - ___ ___ - ___ - ___ ___ - ___ ___ - ___ ___ - ___ ___ **SAE Application (397)**
Code B CCC DD E FF GG HH J ___ **Industrial Application**

Note: Orders cancelled prior to shipment are subject to a 25% restocking fee. Configured products are not returnable.

Order Quantity_____ x List Price (each) _____ = Total List Price _____

Distributor Requested Ship Date _____
(Please contact Graco Customer Service for delivery information)

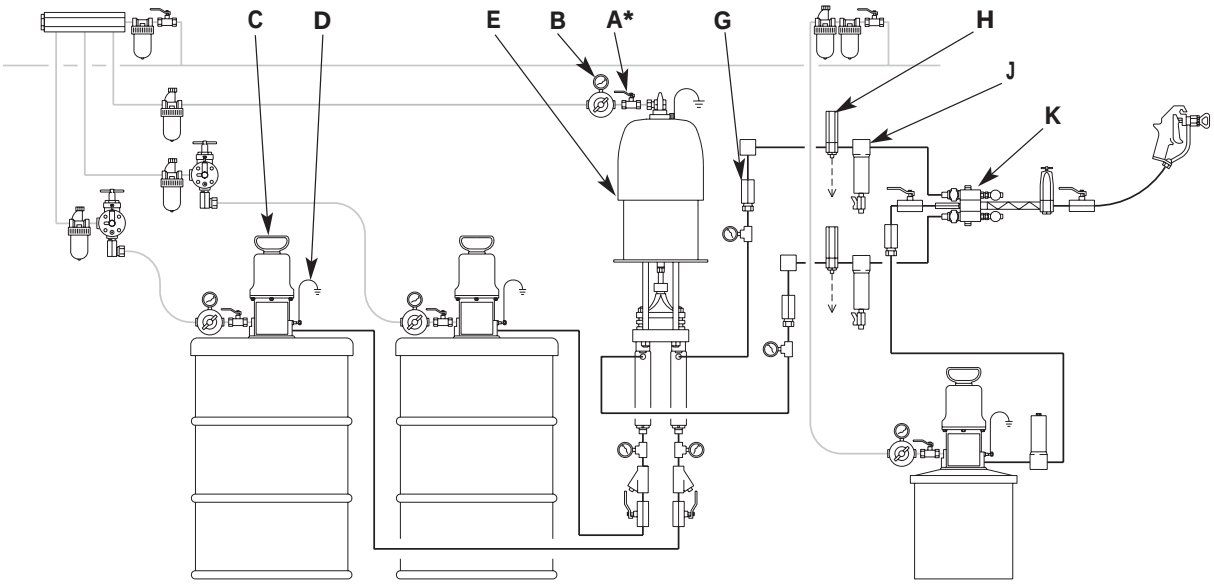
Print Name _____ Signature _____ Date _____

Note: For the full Fixed-Ratio Hydra Cat configured order form and instructions, order Graco form 309002.

Fixed Ratio Hydra-Cat
Mechanical Proportioner

System Setup

TWO DISPLACEMENT PUMPS WITH FEED PUMPS



Key

A	Bleed-Type Master Air Valve	**E**	Proportioning Pump	**J**	Fluid Filter (Optional)
B	Pump Air Regulator	**F**	Fluid Pressure Gauge	**K**	Mixer Manifold
C	Feed Pump	**G**	Check Valve	**L**	Fluid Shutoff Valve
D	Ground Wire	**H**	Automatic Pressure Relief Valve	**M**	Solvent Pump
				N	Fluid Strainer

***Part of proportioner assembly**

Fixed Ratio Hydra-Cat
Mechanical Proportioner

Ordering Information

To complete your configured HydraCat Model Number please follow these instructions.

Step 1. Select whether your HydraCat will be air-operated or hydraulic-operated. Enter an A for Air Operated or B for Hydraulic. Select the corresponding following table for all future selections. Table FA = air operated. Table FH = hydraulic operated. Enter the appropriate letter above the code B in the Order Information section located on the bottom of the first page (Configured Product Order Form).

	x							
FRHC - E	B	CCC	DD	E	FF	GG	HH	J

Note: once you've determined the correct reference table you must proceed as follows to select the best proportioner to meet your application requirements.

Required Information: Mix Ratio, Fluid Pressure, & Flow Required

Step 2. Identify the applicable mix ratio to narrow down the rows in the reference table that meet this requirement.

Step 3. Look at the pressure and flow rate combinations available for the ratio identified in Step 2. Select the best pressure/flow rate combination requirements based on materials of construction. This should further narrow down the number of HydraCats that meet the application. In many cases there may only be one appropriate CCC selection in which case you've identified a specific solution.

If there are multiple rows that meet the customer's requirements with the same ratio, pressure and flow rate listed, review the wetted part compatibility option for the "A" and "B" components. Once you've selected compatible wetted parts, you've narrowed down the HydraCat solution to a single entry represented by the CCC table reference code. Enter these three letters above code CCC in the order information selection area on the Configured Product Order Form.

	x	xxx						
FRHC - E	B	CCC	DD	E	FF	GG	HH	J

If no combinations are available it's likely that our standard product offerings do not meet the application requirements.

Step 4. Using the table reference number "CCC" which you have identified in steps 1-3, fill in the next four codes (DD, E, FF, and GG) in the order information portion of the Configured Product Order Form.

Note: stainless steel cylinders do not necessarily have all stainless steel wetted areas.

	x	xxx	xx	x	xx	xx	xx	x
FRHC - E	B	CCC	DD	E	FF	GG	HH	J

Step 5. Using the Mixed Manifold Options table select the appropriate item and enter the two digit number above the HH code on the Configured Product Order Form.

	x	xxx	xx	x	xx	xx	xx	
FRHC - E	B	CCC	DD	E	FF	GG	HH	J

Step 6. Select a mounting configuration (O, W, or S) and enter the letter above the J code on the Configured Product Order Form.

	x	xxx	xx	x	xx	xx	xx	x
FRHC - E	B	CCC	DD	E	FF	GG	HH	J

Once completed, please Fax or mail your order form to the number or address located on the Product Configurator Form.

Fixed Ratio Hydra-Cat

Mechanical Proportioner

Table FA - Fixed Ratio, Air-Powered Hydra-Cat

To Determine Code "CCC"			Code "CCC"	Code "DD"	Code "E"	Code "FF"			Code "GG"		
Lookup Parameters				***See Motor Table***		***See Pump Lower Table***					
						"A" Component Lower(s)			"B" Component Lowers		
Mix Ratio	Max Pressure (psi)	Fluid Flow at 40 cpm (gpm)	Table Reference Number	Air Motor Code	Number of Lowers	Lower(s) Code	Wetted Parts	Packing Material	Lower Code	Wetted Parts	Packing Material
1.00	480	3.99	A02	P1	2	01	SST	PTFE	01	SST	PTFE
1.00	800	2.40	A05	P1	2	14	CS	Tef/UH	14	CS	Tef/UH
1.00	959	2.00	A11	P1	2	15	CS	Tef/UH	15	CS	Tef/UH
1.00	1281	1.50	A14	P1	2	16	CS	PTFE	16	CS	PTFE
1.00	1281	1.50	A15	P1	2	17	CS	CFTEF	17	CS	CFTEF
1.00	1281	1.50	A16	P1	2	16	CS	PTFE	17	CS	CFTEF
1.00	1281	1.50	A17	P1	2	17	CS	CFTEF	16	CS	PTFE
1.00	1302	4.62	A20	B1	2	12	SST	PTFE	12	SST	PTFE
1.00	1602	1.20	A22	P1	2	18	CS	PTFE	18	CS	PTFE
1.00	1602	1.20	A23	P1	2	19	SST	PTFE	19	SST	PTFE
1.00	1918	1.00	A24	P1	2	20	CS	PTFE	20	CS	PTFE
1.00	1918	1.00	A25	P1	2	21	SST	PTFE	21	SST	PTFE
1.00	2169	2.78	A26	B1	2	14	CS	Tef/UH	14	CS	Tef/UH
1.00	2561	0.75	A30	P1	2	22	CS	PTFE	22	CS	PTFE
1.00	2600	2.32	A33	B1	2	15	CS	Tef/UH	15	CS	Tef/UH
1.00	3000	1.73	A37	B1	2	16	CS	PTFE	16	CS	PTFE
1.00	3000	1.73	A38	B1	2	17	CS	CFTEF	17	CS	CFTEF
1.00	3000	1.73	A39	B1	2	16	CS	PTFE	16	CS	PTFE
1.00	3000	1.73	A40	B1	2	17	CS	CFTEF	16	CS	PTFE
1.00	3000	2.78	A41	K1	2	14	CS	Tef/UH	14	CS	Tef/UH
1.20	873	2.20	B01	P1	3	18	CS	PTFE	15	CS	Tef/UH
1.20	873	2.54	B02	P1	3	19	SST	PTFE	15	CS	Tef/UH
1.20	2367	2.20	B03	B1	3	18	CS	PTFE	15	CS	Tef/UH
1.20	2367	2.20	B04	B1	3	19	SST	PTFE	15	CS	Tef/UH
1.25	711	2.70	C01	P1	3	16	CS	PTFE	14	CS	Tef/UH
1.25	711	2.70	C02	P1	3	17	CS	CFTEF	14	CS	Tef/UH
1.25	1423	1.35	C03	P1	3	22	CS	PTFE	18	CS	PTFE
1.25	1423	1.56	C04	P1	3	22	CS	PTFE	19	SST	PTFE
1.25	1929	3.12	C05	B1	3	16	CS	PTFE	14	CS	Tef/UH
1.25	1929	3.12	C06	B1	3	17	CS	CFTEF	14	CS	Tef/UH
1.34	1097	1.75	D01	P1	3	20	CS	PTFE	16	CS	PTFE
1.34	1097	1.75	D02	P1	3	20	CS	PTFE	17	CS	CFTEF
1.34	1097	1.75	D03	P1	3	21	SST	PTFE	16	CS	PTFE
1.34	1097	1.75	D04	P1	3	21	SST	PTFE	17	CS	CFTEF
1.34	2974	1.75	D05	B1	3	20	CS	PTFE	16	CS	PTFE
1.34	2974	1.75	D06	B1	3	20	CS	PTFE	17	CS	CFTEF
1.34	2974	1.75	D07	B1	3	21	SST	PTFE	16	CS	PTFE
1.34	2974	1.75	D08	B1	3	21	SST	PTFE	17	CS	CFTEF
1.50	768	2.50	E01	P1	3	16	CS	PTFE	15	CS	Tef/UH
1.50	768	2.50	E02	P1	3	17	CS	CFTEF	15	CS	Tef/UH
1.50	1536	1.25	E03	P1	3	22	CS	PTFE	20	CS	PTFE
1.50	1536	1.25	E04	P1	3	22	CS	PTFE	21	SST	PTFE
1.50	2082	2.50	E05	B1	3	16	CS	PTFE	15	CS	Tef/UH
1.50	2082	2.50	E06	B1	3	17	CS	CFTEF	15	CS	Tef/UH
1.60	985	1.95	F01	P1	3	18	CS	PTFE	16	CS	PTFE
1.60	985	1.95	F02	P1	3	18	CS	PTFE	17	CS	CFTEF
1.60	985	1.95	F03	P1	3	19	SST	PTFE	16	CS	PTFE
1.60	985	1.95	F04	P1	3	19	SST	PTFE	17	CS	CFTEF
1.60	2672	1.95	F05	B1	3	19	SST	PTFE	16	CS	PTFE
1.60	2672	1.95	F06	B1	3	19	SST	PTFE	17	CS	CFTEF
1.60	2672	2.25	F07	B1	3	18	CS	PTFE	16	CS	PTFE

Fixed Ratio Hydra-Cat

Mechanical Proportioner

Table FA - Fixed Ratio, Air-Powered Hydra-Cat

To Determine Code "CCC"			Code "CCC"	Code "DD"	Code "E"	Code "FF"			Code "GG"		
Lookup Parameters				***See Motor Table***		***See Pump Lower Table***					
						"A" Component Lower(s)			"B" Component Lowers		
Mix Ratio	Max Pressure (psi)	Fluid Flow at 40 cpm (gpm)	Table Reference Number	Air Motor Code	Number of Lowers	Lower(s) Code	Wetted Parts	Packing Material	Lower Code	Wetted Parts	Packing Material
1.60	2672	2.25	F08	B1	3	18	CS	PTFE	17	CS	CFTEF
1.67	599	3.70	G01	P1	3	15	CS	Tef/UH	14	CS	Tef/UH
1.67	1199	1.60	G02	P1	3	21	SST	PTFE	18	CS	PTFE
1.67	1199	1.85	G03	P1	3	20	CS	PTFE	18	CS	PTFE
1.67	1199	1.85	G04	P1	3	20	CS	PTFE	19	SST	PTFE
1.67	1199	1.85	G05	P1	3	21	SST	PTFE	19	SST	PTFE
1.67	1626	3.70	G06	B1	3	15	CS	Tef/UH	14	CS	Tef/UH
1.67	3000	1.60	G07	B1	3	20	CS	PTFE	18	CS	PTFE
1.67	3000	1.60	G08	B1	3	21	SST	PTFE	18	CS	PTFE
1.67	3000	1.85	G09	B1	3	20	CS	PTFE	19	SST	PTFE
1.67	3000	1.85	G10	B1	3	21	SST	PTFE	19	SST	PTFE
1.67	2986	3.20	G11	K1	3	15	CS	Tef/UH	14	CS	Tef/UH
2.00	533	4.16	H01	P1	3	14	CS	Tef/UH	14	CS	Tef/UH
2.00	639	3.00	H02	P1	3	15	CS	Tef/UH	15	CS	Tef/UH
2.00	854	2.25	H03	P1	3	16	CS	PTFE	16	CS	PTFE
2.00	854	2.25	H04	P1	3	17	CS	CFTEF	17	CS	CFTEF
2.00	854	2.25	H05	P1	3	17	CS	CFTEF	16	CS	PTFE
2.00	854	2.25	H06	P1	3	16	CS	PTFE	17	CS	CFTEF
2.00	1068	1.80	H07	P1	3	18	CS	PTFE	18	CS	PTFE
2.00	1068	1.80	H08	P1	3	19	SST	PTFE	18	CS	PTFE
2.00	1068	2.08	H09	P1	3	18	CS	PTFE	19	SST	PTFE
2.00	1068	2.08	H10	P1	3	19	SST	PTFE	19	SST	PTFE
2.00	1278	1.50	H11	P1	3	21	SST	PTFE	20	CS	PTFE
2.00	1278	1.50	H12	P1	3	21	SST	PTFE	21	SST	PTFE
2.00	1278	1.74	H13	P1	3	20	CS	PTFE	20	CS	PTFE
2.00	1278	1.74	H14	P1	3	20	CS	PTFE	21	SST	PTFE
2.00	1446	3.60	H15	B1	3	14	CS	Tef/UH	14	CS	Tef/UH
2.00	1708	1.12	H16	P1	3	22	CS	PTFE	22	CS	PTFE
2.00	1733	3.47	H17	B1	3	15	CS	Tef/UH	15	CS	Tef/UH
2.00	2315	2.60	H18	B1	3	16	CS	PTFE	16	CS	PTFE
2.00	2315	2.60	H19	B1	3	17	CS	CFTEF	17	CS	CFTEF
2.00	2315	2.60	H20	B1	3	17	CS	CFTEF	16	CS	PTFE
2.00	2315	2.60	H21	B1	3	16	CS	PTFE	17	CS	CFTEF
2.00	2895	2.08	H22	B1	3	18	CS	PTFE	18	CS	PTFE
2.00	2895	2.08	H23	B1	3	19	SST	PTFE	18	CS	PTFE
2.00	2895	2.08	H24	B1	3	18	CS	PTFE	19	SST	PTFE
2.00	2895	2.08	H25	B1	3	19	SST	PTFE	19	SST	PTFE
2.00	2656	3.60	H26	K1	3	14	CS	Tef/UH	14	CS	Tef/UH
2.00	3000	3.47	H27	K1	3	15	CS	Tef/UH	15	CS	Tef/UH
2.00	3000	1.50	H28	B1	3	21	SST	PTFE	20	CS	PTFE
2.00	3000	1.50	H29	B1	3	21	SST	PTFE	21	SST	PTFE
2.00	3000	1.74	H30	B1	3	20	CS	PTFE	20	CS	PTFE
2.00	3000	1.74	H31	B1	3	20	CS	PTFE	21	SST	PTFE
2.00	3000	2.73	H32	K1	3	16	CS	PTFE	16	CS	PTFE
2.40	564	3.93	J01	P1	3	14	CS	Tef/UH	15	CS	Tef/UH
2.40	1130	1.70	J02	P1	3	18	CS	PTFE	20	CS	PTFE
2.40	1130	1.70	J03	P1	3	19	SST	PTFE	20	CS	PTFE
2.40	1130	1.96	J04	P1	3	18	CS	PTFE	21	SST	PTFE
2.40	1130	1.96	J05	P1	3	19	SST	PTFE	21	SST	PTFE
2.40	1531	3.40	J06	B1	3	14	CS	Tef/UH	15	CS	Tef/UH
2.40	2812	3.93	J07	K1	3	14	CS	Tef/UH	15	CS	Tef/UH
2.40	3000	1.70	J08	B1	3	18	CS	PTFE	20	CS	PTFE
2.40	3000	1.70	J09	B1	3	19	SST	PTFE	20	CS	PTFE
2.40	3000	1.96	J10	B1	3	18	CS	PTFE	21	SST	PTFE
2.40	3000	1.96	J11	B1	3	19	SST	PTFE	21	SST	PTFE

Fixed Ratio Hydra-Cat

Mechanical Proportioner

Table FA - Fixed Ratio, Air-Powered Hydra-Cat

To Determine Code "CCC"			Code "CCC"	Code "DD"	Code "E"	Code "FF"			Code "GG"		
Lookup Parameters				***See Motor Table***		***See Pump Lower Table***					
						"A" Component Lower(s)			"B" Component Lowers		
Mix Ratio	Max Pressure (psi)	Fluid Flow at 40 cpm (gpm)	Table Reference Number	Air Motor Code	Number of Lowers	Lower(s) Code	Wetted Parts	Packing Material	Lower Code	Wetted Parts	Packing Material
2.50	915	2.43	K01	P1	3	16	CS	PTFE	18	CS	PTFE
2.50	915	2.43	K02	P1	3	17	CS	CFTEF	18	CS	PTFE
2.50	915	2.43	K03	P1	3	16	CS	PTFE	19	SST	PTFE
2.50	915	2.43	K04	P1	3	17	CS	CFTEF	19	SST	PTFE
2.50	2481	2.10	K05	B1	3	16	CS	PTFE	18	CS	PTFE
2.50	2481	2.10	K06	B1	3	17	CS	CFTEF	18	CS	PTFE
2.50	2481	2.10	K07	B1	3	16	CS	PTFE	19	SST	PTFE
2.50	2481	2.10	K08	B1	3	17	CS	CFTEF	19	SST	PTFE
2.67	698	3.18	M01	P1	3	15	CS	Tef/UH	16	CS	PTFE
2.67	698	3.18	M02	P1	3	15	CS	Tef/UH	17	CS	CFTEF
2.67	1395	1.37	M03	P1	3	20	CS	PTFE	22	CS	PTFE
2.67	1395	1.37	M04	P1	3	21	SST	PTFE	22	CS	PTFE
2.67	1892	3.18	M05	B1	3	15	CS	Tef/UH	16	CS	PTFE
2.67	1892	3.18	M06	B1	3	15	CS	Tef/UH	17	CS	CFTEF
3.00	960	2.00	P01	P1	3	16	CS	PTFE	20	CS	PTFE
3.00	960	2.00	P02	P1	3	17	CS	CFTEF	20	CS	PTFE
3.00	960	2.00	P03	P1	3	16	CS	PTFE	21	SST	PTFE
3.00	960	2.00	P04	P1	3	17	CS	CFTEF	21	SST	PTFE
3.00	2604	2.00	P05	B1	3	16	CS	PTFE	21	SST	PTFE
3.00	2604	2.00	P06	B1	3	17	CS	CFTEF	21	SST	PTFE
3.00	2604	2.31	P07	B1	3	16	CS	PTFE	20	CS	PTFE
3.00	2604	2.31	P08	B1	3	17	CS	CFTEF	20	CS	PTFE
3.20	610	3.15	Q01	P1	3	14	CS	Tef/UH	16	CS	PTFE
3.20	610	3.15	Q02	P1	3	14	CS	Tef/UH	17	CS	CFTEF
3.20	1220	1.57	Q03	P1	3	18	CS	PTFE	22	CS	PTFE
3.20	1220	1.57	Q04	P1	3	19	SST	PTFE	22	CS	PTFE
3.20	1653	3.64	Q05	B1	3	14	CS	Tef/UH	16	CS	PTFE
3.20	1653	3.64	Q06	B1	3	14	CS	Tef/UH	17	CS	CFTEF
3.20	3000	1.57	Q07	B1	3	18	CS	PTFE	22	CS	PTFE
3.20	3000	1.57	Q08	B1	3	19	SST	PTFE	22	CS	PTFE
3.20	3000	3.64	Q09	K1	3	14	CS	Tef/UH	16	CS	PTFE
3.20	3000	3.64	Q10	K1	3	14	CS	Tef/UH	17	CS	CFTEF
3.34	738	2.60	R01	P1	3	15	CS	Tef/UH	18	CS	PTFE
3.34	738	2.60	R02	P1	3	15	CS	Tef/UH	19	SST	PTFE
3.34	2001	2.60	R03	B1	3	15	CS	Tef/UH	18	CS	PTFE
3.34	2001	2.60	R04	B1	3	15	CS	Tef/UH	19	SST	PTFE
4.00	640	3.47	S01	P1	3	14	CS	Tef/UH	18	CS	PTFE
4.00	640	3.47	S02	P1	3	14	CS	Tef/UH	19	SST	PTFE
4.00	767	2.50	S03	P1	3	15	CS	Tef/UH	21	SST	PTFE
4.00	767	2.89	S04	P1	3	15	CS	Tef/UH	20	CS	PTFE
4.00	1025	2.17	S05	P1	3	16	CS	PTFE	22	CS	PTFE
4.00	1025	2.17	S06	P1	3	17	CS	CFTEF	22	CS	PTFE
4.00	1736	3.47	S07	B1	3	14	CS	Tef/UH	18	CS	PTFE
4.00	1736	3.47	S08	B1	3	14	CS	Tef/UH	19	SST	PTFE
4.00	2080	2.50	S09	B1	3	15	CS	Tef/UH	21	SST	PTFE
4.00	2080	2.89	S10	B1	3	15	CS	Tef/UH	20	CS	PTFE
4.00	2778	2.17	S11	B1	3	16	CS	PTFE	22	CS	PTFE
4.00	2778	2.17	S12	B1	3	17	CS	CFTEF	22	CS	PTFE
4.00	3000	3.47	S13	K1	3	14	CS	Tef/UH	18	CS	PTFE
4.00	3000	3.47	S14	K1	3	14	CS	Tef/UH	19	SST	PTFE
4.79	662	3.35	T01	P1	3	14	CS	Tef/UH	20	CS	PTFE
4.79	662	3.35	T02	P1	3	14	CS	Tef/UH	21	SST	PTFE
4.79	1795	3.35	T03	B1	3	14	CS	Tef/UH	20	CS	PTFE
4.79	1795	3.35	T04	B1	3	14	CS	Tef/UH	21	SST	PTFE

Fixed Ratio Hydra-Cat

Mechanical Proportioner

Table FA - Fixed Ratio, Air-Powered Hydra-Cat

To Determine Code "CCC"			Code "CCC"	Code "DD"	Code "E"	Code "FF"			Code "GG"		
Lookup Parameters				***See Motor Table***		***See Pump Lower Table***					
						"A" Component Lower(s)			"B" Component Lowers		
Mix Ratio	Max Pressure (psi)	Fluid Flow at 40 cpm (gpm)	Table Reference Number	Air Motor Code	Number of Lowers	Lower(s) Code	Wetted Parts	Packing Material	Lower Code	Wetted Parts	Packing Material
5.34	808	2.37	U01	P1	3	15	CS	Tef/UH	22	CS	PTFE
5.34	2190	2.37	U02	B1	3	15	CS	Tef/UH	22	CS	PTFE
6.40	692	2.77	V01	P1	3	14	CS	Tef/UH	22	CS	PTFE
6.40	1876	2.77	V02	B1	3	14	CS	Tef/UH	22	CS	PTFE

Fixed Ratio Hydra-Cat

Mechanical Proportioner

Table FH - Fixed Ratio, Hydraulic-Powered Hydra-Cat

To Determine Code "CCC"			Code "CCC"	Code "DD"	Code "E"	Code "FF"			Code "GG"		
Lookup Parameters				***See Motor Table***		***See Pump Lower Table***					
						"A" Component Lower(s)			"B" Component Lowers		
Mix Ratio	Max Pressure (psi)	Fluid Flow at 40 cpm (gpm)	Table Reference Number	Air Motor Code	Number of Lowers	Lower(s) Code	Wetted Parts	Packing Material	Lower Code	Wetted Parts	Packing Material
1.00	501	3.89	A02	V1	2	12	SST	PTFE	12	SST	PTFE
1.00	501	3.89	A03	V1	2	01	SST	PTFE	01	SST	PTFE
1.00	834	2.34	A05	V1	2	14	CS	Tef/UH	14	CS	Tef/UH
1.00	1000	1.95	A13	V1	2	15	CS	Tef/UH	15	CS	Tef/UH
1.00	1336	1.46	A16	V1	2	16	CS	PTFE	16	CS	PTFE
1.00	1336	1.46	A17	V1	2	17	CS	CFTEF	17	CS	CFTEF
1.00	1336	1.46	A18	V1	2	16	CS	PTFE	16	CS	PTFE
1.00	1336	1.46	A19	V1	2	17	CS	CFTEF	17	CS	PTFE
1.00	1670	1.17	A20	V1	2	18	CS	PTFE	18	CS	PTFE
1.00	1670	1.17	A21	V1	2	19	SST	PTFE	19	SST	PTFE
1.00	2000	0.97	A22	V1	2	20	CS	PTFE	20	CS	PTFE
1.00	2000	0.97	A23	V1	2	21	SST	PTFE	21	SST	PTFE
1.00	1500	4.62	A24	V2	2	12	SST	PTFE	12	SST	PTFE
1.00	2671	0.73	A26	V1	2	22	CS	PTFE	22	CS	PTFE
1.20	910	2.14	B01	V1	3	18	CS	PTFE	15	CS	Tef/UH
1.20	910	2.14	B02	V1	3	19	SST	PTFE	15	CS	Tef/UH
1.25	742	2.63	C01	V1	3	16	CS	PTFE	14	CS	Tef/UH
1.25	742	2.63	C02	V1	3	17	CS	CFTEF	14	CS	Tef/UH
1.25	1484	1.31	C03	V1	3	22	CS	PTFE	18	CS	PTFE
1.25	1484	1.31	C04	V1	3	22	CS	PTFE	19	SST	PTFE
1.34	1144	1.70	D01	V1	3	20	CS	PTFE	16	CS	PTFE
1.34	1144	1.70	D02	V1	3	20	CS	PTFE	17	CS	CFTEF
1.34	1144	1.70	D03	V1	3	21	SST	PTFE	16	CS	PTFE
1.34	1144	1.70	D04	V1	3	21	SST	PTFE	17	CS	CFTEF
1.50	801	2.43	E01	V1	3	16	CS	PTFE	15	CS	Tef/UH
1.50	801	2.43	E02	V1	3	17	CS	CFTEF	15	CS	Tef/UH
1.50	1602	1.22	E03	V1	3	22	CS	PTFE	20	CS	PTFE
1.50	1602	1.22	E04	V1	3	22	CS	PTFE	21	SST	PTFE
1.60	1028	1.90	F01	V1	3	18	CS	PTFE	16	CS	PTFE
1.60	1028	1.90	F02	V1	3	18	CS	PTFE	17	CS	CFTEF
1.60	1028	1.90	F03	V1	3	19	SST	PTFE	16	CS	PTFE
1.60	1028	1.90	F04	V1	3	19	SST	PTFE	17	CS	CFTEF
1.67	625	3.12	G01	V1	3	15	CS	Tef/UH	14	CS	Tef/UH
1.67	1251	1.56	G02	V1	3	20	CS	PTFE	18	CS	PTFE
1.67	1251	1.56	G03	V1	3	20	CS	PTFE	19	SST	PTFE
1.67	1251	1.56	G04	V1	3	21	SST	PTFE	18	CS	PTFE
1.67	1251	1.56	G05	V1	3	21	SST	PTFE	19	SST	PTFE
1.67	3000	3.70	G06	V2	3	15	CS	Tef/UH	14	CS	Tef/UH
2.00	556	3.51	H01	V1	3	14	CS	Tef/UH	14	CS	Tef/UH
2.00	667	2.92	H02	V1	3	15	CS	Tef/UH	15	CS	Tef/UH
2.00	890	2.19	H03	V1	3	16	CS	PTFE	16	CS	PTFE
2.00	890	2.19	H04	V1	3	17	CS	CFTEF	17	CS	CFTEF
2.00	890	2.19	H05	V1	3	16	CS	PTFE	17	CS	CFTEF
2.00	890	2.19	H06	V1	3	17	CS	CFTEF	16	CS	PTFE
2.00	1114	1.75	H07	V1	3	18	CS	PTFE	18	CS	PTFE
2.00	1114	1.75	H08	V1	3	18	CS	PTFE	19	SST	PTFE

Fixed Ratio Hydra-Cat

Mechanical Proportioner

Table FH - Fixed Ratio, Hydraulic-Powered Hydra-Cat

To Determine Code "CCC"			Code "CCC"	Code "DD"	Code "E"	Code "FF"			Code "GG"		
Lookup Parameters				***See Motor Table***		***See Pump Lower Table***					
						"A" Component Lower(s)			"B" Component Lowers		
Mix Ratio	Max Pressure (psi)	Fluid Flow at 40 cpm (gpm)	Table Reference Number	Air Motor Code	Number of Lowers	Lower(s) Code	Wetted Parts	Packing Material	Lower Code	Wetted Parts	Packing Material
2.00	1114	1.75	H09	V1	3	19	SST	PTFE	18	CS	PTFE
2.00	1114	1.75	H10	V1	3	19	SST	PTFE	19	SST	PTFE
2.00	1333	1.46	H11	V1	3	20	CS	PTFE	20	CS	PTFE
2.00	1333	1.46	H12	V1	3	20	CS	PTFE	21	SST	PTFE
2.00	1333	1.46	H13	V1	3	21	SST	PTFE	20	CS	PTFE
2.00	1333	1.46	H14	V1	3	21	SST	PTFE	21	SST	PTFE
2.00	1781	1.09	H15	V1	3	22	CS	PTFE	22	CS	PTFE
2.00	2762	4.16	H16	V2	3	14	CS	Tef/UH	14	CS	Tef/UH
2.00	3000	3.47	H17	V2	3	15	CS	Tef/UH	15	CS	Tef/UH
2.40	589	3.31	J01	V1	3	14	CS	Tef/UH	15	CS	Tef/UH
2.40	1178	1.65	J02	V1	3	18	CS	PTFE	20	CS	PTFE
2.40	1178	1.65	J03	V1	3	18	CS	PTFE	21	SST	PTFE
2.40	1178	1.65	J04	V1	3	19	SST	PTFE	20	CS	PTFE
2.40	1178	1.65	J05	V1	3	19	SST	PTFE	21	SST	PTFE
2.40	2924	3.93	J06	V2	3	14	CS	Tef/UH	15	CS	Tef/UH
2.50	954	2.04	K01	V1	3	16	CS	PTFE	18	CS	PTFE
2.50	954	2.04	K02	V1	3	17	CS	CFTEF	18	CS	PTFE
2.50	954	2.04	K03	V1	3	16	CS	PTFE	19	SST	PTFE
2.50	954	2.04	K04	V1	3	17	CS	CFTEF	19	SST	PTFE
2.67	728	2.68	M01	V1	3	15	CS	Tef/UH	16	CS	PTFE
2.67	728	2.68	M02	V1	3	15	CS	Tef/UH	17	CS	CFTEF
2.67	1455	1.34	M03	V1	3	20	CS	PTFE	22	CS	PTFE
2.67	1455	1.34	M04	V1	3	21	SST	PTFE	22	CS	PTFE
3.00	1001	1.95	P01	V1	3	16	CS	PTFE	20	CS	PTFE
3.00	1001	1.95	P02	V1	3	17	CS	CFTEF	20	CS	PTFE
3.00	1001	1.95	P03	V1	3	16	CS	PTFE	21	SST	PTFE
3.00	1001	1.95	P04	V1	3	17	CS	CFTEF	21	SST	PTFE
3.20	636	3.07	Q01	V1	3	14	CS	Tef/UH	16	CS	PTFE
3.20	636	3.07	Q02	V1	3	14	CS	Tef/UH	17	CS	CFTEF
3.20	1273	1.53	Q03	V1	3	18	CS	PTFE	22	CS	PTFE
3.20	1273	1.53	Q04	V1	3	19	SST	PTFE	22	CS	PTFE
3.20	3000	3.64	Q05	V2	3	14	CS	Tef/UH	16	CS	PTFE
3.20	3000	3.64	Q06	V2	3	14	CS	Tef/UH	17	CS	CFTEF
3.34	770	2.53	R01	V1	3	15	CS	Tef/UH	18	CS	PTFE
3.34	770	2.53	R02	V1	3	15	CS	Tef/UH	19	SST	PTFE
4.00	668	2.92	S01	V1	3	14	CS	Tef/UH	18	CS	PTFE
4.00	668	2.92	S02	V1	3	14	CS	Tef/UH	19	SST	PTFE
4.00	800	2.44	S03	V1	3	15	CS	Tef/UH	20	CS	PTFE
4.00	800	2.44	S04	V1	3	15	CS	Tef/UH	21	SST	PTFE
4.00	1069	1.82	S05	V1	3	16	CS	PTFE	22	CS	PTFE
4.00	1069	1.82	S06	V1	3	17	CS	CFTEF	22	CS	PTFE
4.00	3000	3.47	S07	V2	3	14	CS	Tef/UH	18	CS	PTFE
4.00	3000	3.47	S08	V2	3	14	CS	Tef/UH	19	SST	PTFE
4.79	690	2.82	T01	V1	3	14	CS	Tef/UH	20	CS	PTFE
4.79	690	2.82	T02	V1	3	14	CS	Tef/UH	21	SST	PTFE
4.79	3000	3.35	T03	V2	3	14	CS	Tef/UH	20	CS	PTFE
4.79	3000	3.35	T04	V2	3	14	CS	Tef/UH	21	SST	PTFE
5.34	842	2.31	U01	V1	3	15	CS	Tef/UH	22	CS	PTFE
6.40	722	2.70	V01	V1	3	14	CS	Tef/UH	22	CS	PTFE

Fixed Ratio Hydra-Cat

Mechanical Proportioner

Table FH - Fixed Ratio, Hydraulic-Powered Hydra-Cat

To Determine Code "CCC"			Code "CCC"	Code "DD"	Code "E"	Code "FF"			Code "GG"		
Lookup Parameters				***See Motor Table***		***See Pump Lower Table***					
						"A" Component Lower(s)			"B" Component Lowers		
Mix Ratio	Max Pressure (psi)	Fluid Flow at 40 cpm (gpm)	Table Reference Number	Air Motor Code	Number of Lowers	Lower(s) Code	Wetted Parts	Packing Material	Lower Code	Wetted Parts	Packing Material
2.00	1114	1.75	H09	V1	3	19	SST	PTFE	18	CS	PTFE
2.00	1114	1.75	H10	V1	3	19	SST	PTFE	19	SST	PTFE
2.00	1333	1.46	H11	V1	3	20	CS	PTFE	20	CS	PTFE
2.00	1333	1.46	H12	V1	3	20	CS	PTFE	21	SST	PTFE
2.00	1333	1.46	H13	V1	3	21	SST	PTFE	20	CS	PTFE
2.00	1333	1.46	H14	V1	3	21	SST	PTFE	21	SST	PTFE
2.00	1781	1.09	H15	V1	3	22	CS	PTFE	22	CS	PTFE
2.00	2762	4.16	H16	V2	3	14	CS	Tef/UH	14	CS	Tef/UH
2.00	3000	3.47	H17	V2	3	15	CS	Tef/UH	15	CS	Tef/UH
2.40	589	3.31	J01	V1	3	14	CS	Tef/UH	15	CS	Tef/UH
2.40	1178	1.65	J02	V1	3	18	CS	PTFE	20	CS	PTFE
2.40	1178	1.65	J03	V1	3	18	CS	PTFE	21	SST	PTFE
2.40	1178	1.65	J04	V1	3	19	SST	PTFE	20	CS	PTFE
2.40	1178	1.65	J05	V1	3	19	SST	PTFE	21	SST	PTFE
2.40	2924	3.93	J06	V2	3	14	CS	Tef/UH	15	CS	Tef/UH
2.50	954	2.04	K01	V1	3	16	CS	PTFE	18	CS	PTFE
2.50	954	2.04	K02	V1	3	17	CS	CFTEF	18	CS	PTFE
2.50	954	2.04	K03	V1	3	16	CS	PTFE	19	SST	PTFE
2.50	954	2.04	K04	V1	3	17	CS	CFTEF	19	SST	PTFE
2.67	728	2.68	M01	V1	3	15	CS	Tef/UH	16	CS	PTFE
2.67	728	2.68	M02	V1	3	15	CS	Tef/UH	17	CS	CFTEF
2.67	1455	1.34	M03	V1	3	20	CS	PTFE	22	CS	PTFE
2.67	1455	1.34	M04	V1	3	21	SST	PTFE	22	CS	PTFE
3.00	1001	1.95	P01	V1	3	16	CS	PTFE	20	CS	PTFE
3.00	1001	1.95	P02	V1	3	17	CS	CFTEF	20	CS	PTFE
3.00	1001	1.95	P03	V1	3	16	CS	PTFE	21	SST	PTFE
3.00	1001	1.95	P04	V1	3	17	CS	CFTEF	21	SST	PTFE
3.20	636	3.07	Q01	V1	3	14	CS	Tef/UH	16	CS	PTFE
3.20	636	3.07	Q02	V1	3	14	CS	Tef/UH	17	CS	CFTEF
3.20	1273	1.53	Q03	V1	3	18	CS	PTFE	22	CS	PTFE
3.20	1273	1.53	Q04	V1	3	19	SST	PTFE	22	CS	PTFE
3.20	3000	3.64	Q05	V2	3	14	CS	Tef/UH	16	CS	PTFE
3.20	3000	3.64	Q06	V2	3	14	CS	Tef/UH	17	CS	CFTEF
3.34	770	2.53	R01	V1	3	15	CS	Tef/UH	18	CS	PTFE
3.34	770	2.53	R02	V1	3	15	CS	Tef/UH	19	SST	PTFE
4.00	668	2.92	S01	V1	3	14	CS	Tef/UH	18	CS	PTFE
4.00	668	2.92	S02	V1	3	14	CS	Tef/UH	19	SST	PTFE
4.00	800	2.44	S03	V1	3	15	CS	Tef/UH	20	CS	PTFE
4.00	800	2.44	S04	V1	3	15	CS	Tef/UH	21	SST	PTFE
4.00	1069	1.82	S05	V1	3	16	CS	PTFE	22	CS	PTFE
4.00	1069	1.82	S06	V1	3	17	CS	CFTEF	22	CS	PTFE
4.00	3000	3.47	S07	V2	3	14	CS	Tef/UH	18	CS	PTFE
4.00	3000	3.47	S08	V2	3	14	CS	Tef/UH	19	SST	PTFE
4.79	690	2.82	T01	V1	3	14	CS	Tef/UH	20	CS	PTFE
4.79	690	2.82	T02	V1	3	14	CS	Tef/UH	21	SST	PTFE
4.79	3000	3.35	T03	V2	3	14	CS	Tef/UH	20	CS	PTFE
4.79	3000	3.35	T04	V2	3	14	CS	Tef/UH	21	SST	PTFE
5.34	842	2.31	U01	V1	3	15	CS	Tef/UH	22	CS	PTFE
6.40	722	2.70	V01	V1	3	14	CS	Tef/UH	22	CS	PTFE

Fixed Ratio Hydra-Cat

Mechanical Proportioner

Hydra-Cat Motor Table

Motor Code "DD"	Description	Power Source	Max. Stroke Length		Effective Area		Motor Reference Number	Manual Number
			Inches	cm	Sq. Inch	Sq. cm		
P1	President	Air	4.0	10.79	14.19	91.55	207352	306982
B1	Bulldog	Air	4.75	12.06	38.48	248.26	208356	307049
K1	King	Air	4.75	12.06	78.54	506.71	207647	306968
V1	Viscount I	Hydraulic	4.00	10.16	1.48	9.55	948699	307654
V2	Viscount II	Hydraulic	4.69	11.91	4.90	31.61	235345	307158

Hydra-Cat Pump Lower Table

Pump Lower Codes "FF" & "GG"	Stroke Length		Pressure Rating		Effective Area		Wetted Material	Packing Material	Lower Reference Number	Manual Number
	(Inches)	(cm)	(psi)	(bar)	(Sq Inch)	(Sq cm)				
01	4.25	10.79	1500	103.42	1.476	9.53	SST	PTFE	215932	307430
03	4.25	10.79	2000	137.89	0.884	5.70	CS	PTFE	215930	307431
11	4.75	12.06	1000	68.94	3.54	22.80	SST	PTFE	206792	306821
12	4.75	12.06	1500	103.42	1.478	9.43	SST	PTFE	217339	307430
13	4.75	12.06	3000	206.84	1.248	8.08	CS	PTFE/Poly	901878	
14	4.75	12.06	3000	206.84	0.884	5.70	CS	PTFE/UH	948640	684004
15	4.75	12.06	3000	206.84	0.74	4.77	CS	PTFE/UH	948641	684004
16	4.75	12.06	3000	206.84	0.554	3.57	CS	PTFE	222012	307944
17	4.75	12.06	3000	206.84	0.554	3.57	CS	CFPTFE	239388	307944
18	4.75	12.06	3000	206.84	0.443	2.86	CS	PTFE	222015	307944
19	4.75	12.06	3000	206.84	0.443	2.86	SST	PTFE	948195	
20	4.75	12.06	3000	206.84	0.37	2.39	CS	PTFE	222017	307944
21	4.75	12.06	3000	206.84	0.37	2.39	SST	PTFE/UH	948197	
22	4.75	12.06	3000	206.84	0.277	1.79	CS	PTFE	222019	307944
23	4.75	12.06	4000	275.79	0.875	5.65	CS	PTFE	946196	

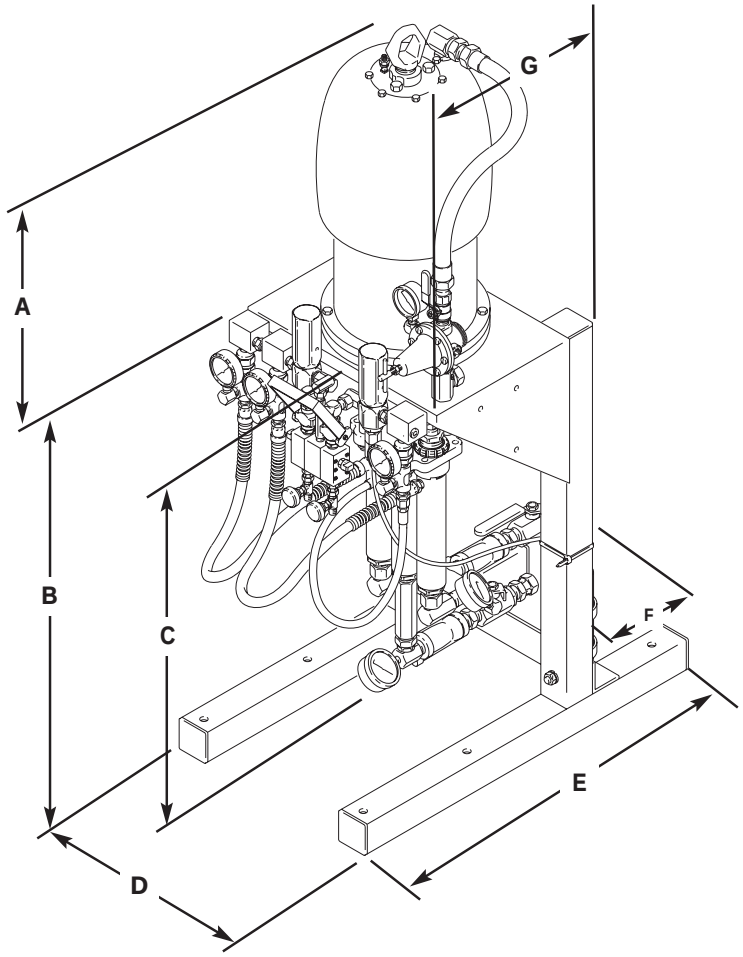
Hydra-Cat Mix Manifold Options

Code "HH"	Description	Mounting Location	Wetted Material	Pressure Rating		Manifold Reference Number
				(psi)	(bar)	
00	None	N/A	N/A	N/A	N/A	N/A
11	Standard Manifold, CS 1/4" Ported	Local	CS	3000	207	241692
21	Remote Mixer Manifold, CS 1/2" Ported	Remote	SST	3000	207	241808
31	Remote Mounted Manifold, CS 3/8" Ported	Remote	CS	3000	345	241809
41	Remote Mounted Manifold, SST 1/2" Ported	Remote	SST	5000	207	240225

Note: All manifolds come with a 3/4" SST Mixer with 32 plastic elements. (#41 uses a SST Mixer Element)

Fixed Ratio Hydra-Cat
Mechanical Proportioner

Dimensions and Approximate Weights



Dimensions

A	Determined by air motor
B	32-3/4 in. (832 mm)
C	28-1/4 in. (718 mm)
D	17-3/4 in. (451 mm)
E	30-1/4 in. (768 mm)
F	11 in. (279 mm)
G	12-1/2 in. (318 mm)

Weights

Motor Code	Weight (lb./kg)
P1	183/83
B1	240/109
K1	256/116
V1	199/90
V2	277/126

Fixed Ratio Hydra-Cat
Mechanical Proportioner

Technical Specifications

Air operating range . . . . . 40 to 100 psi (3 to 7 bar, 0.3 to 0.7 MPa)
Maximum fluid outlet pressure . . . . . 3000 psi (204 bar, 20.4 MPa)
Maximum fluid inlet pressure* . . . . . 750 psi (51 bar, 5.1 MPa)
Maximum recommended cycle rate . . . . . 40 cpm
Air consumption @ 100 psi (7 bar; 0.7 MPa), 40 cpm . . . . . President: 20 scfm (0.56 m^3/min.)
Bulldog: 60 scfm (1.7 m^3/min.)
King: 110 scfm (3.1 m^3/min.)
Wetted Parts . . . . . stainless steel, carbon steel, chrome plating, tungsten carbide, PTFE

***To ensure accurate mix ratios when pressure feeding, inlet fluid pressure should not exceed 25% of the outlet fluid pressure.**

Note: When using proportioners having an air-to-fluid pressure ratio above 30:1, inlet air pressure must be regulated below 100 psi (0.7 MPa, 7 bar) to limit fluid outlet pressure to a maximum of 3000 psi (20.4 MPa, 204 bar).

Fixed Ratio Hydra-Cat
Mechanical Proportioner

Accessories

STAINLESS STEEL LOWERS

Allow conversion of any Standard Series Hydra-Cat to 304 SST/PTFE packing lower construction.

Lower ID	Effective Cylinder Area Sq in. (sq mm)	Part No.
5	0.443 (286)	948195
7	0.370 (239)	948197

CONVERSION/REPAIR KITS

Lower ID	PTFE w/CS Gland	PTFE/ UHMWPE w/CS Gland	PTFE w/SST Gland	PTFE/ UHMWPE w/SST Gland
0	—	948650	—	949383
1	—	948651	—	949384
2	236597	222236	—	—
5	236598	222237	948195	—
7	236595	222234	948197	—
9	236596	222235	—	—

501095 **Inlet Valve Spring Load Conversion**
Use with higher viscosity materials to provide faster inlet check valve closing. For use with pressure feed proportioners only.

GUNS AND TIPS

Alpha Plus Air-Assisted Airless Gun
Maximum working pressure: 4000 psi (276 bar, 27.6 MPa,)
243573 with standard spray tip
243576 with RAC Tip

238591 **Silver Plus Gun**
Maximum working pressure: 5000 psi (345 bar, 34.5 MPa). 4-finger gun with Heavy-Duty RAC IV Tip.

GHDxxx **HD RAC Tip**

965022 **2K Mix Gun**
Maximum working pressure: 3000 psi (207 bar, 20.7 MPa). Coatings enter the gun separately and are mixed together in the gun. Designed for plural component materials with very short setup times.

235463 **Silver Plus Gun**
Maximum working pressure: 5000 psi (345 bar, 34.5 MPa) 2-finger gun with RAC IV Tip.

HOSES

Whip Hose
Maximum working pressure: 5000 psi (345 bar, 34.5 MPa). 1/4 in. ID (0.63 cm), 1/4 npsm(fbe).
214912 3 ft. (0.91 m)
214913 6 ft. (1.83 m)

Nylon Fluid Hose
Maximum working pressure: 5000 psi (345 bar, 34.5 MPa). 3/8 in. ID (9.5 mm ID), 3/8 npt(m) x 3/8 npt(f).
238395 24.6 ft. (7.5 m)
238396 49.2 ft. (15 m)
238397 98.4 ft. (30 m)

Maximum working pressure: 5000 psi (345 bar, 34.5 MPa). ID 1/2 in. (12.7 mm), 1/2 npt(fbe).
238716 24.6 ft. (7.5 m)
238717 49.2 ft. (15 m)
238718 98.4 ft. (30 m)

CONTROLS AND VALVES

224040 **Pump Runaway Valve**
Used to stop pump if pump runs dry and exceeds set speed.

Bleed-Type Air Valve
110224 3/8 in. npt(fbe)
110225 1/2 in. npt(fbe)
110226 3/4 in. npt(fbe)

Check Valves
Maximum working pressure: 3000 psi (20.6 MPa, 206 bar).
501867 1/4 in. npt (mbe)
501684 3/8 in. npt(mbe)
501603 1/2 in. npt(mbe)

Fluid Regulators
222121 Maximum working pressure: 1500 psi (103 bar, 10.3 MPa). Regulated range: 500-1200 psi (34-83 bar, 3.4-8.3 MPa). 1.5 gpm (5.7 lpm), SST.
238890 Maximum working pressure: 6000 psi (413 bar, 41.3 MPa). Regulated range: 500-3000 psi (34-207 bar, 3.4-20.7 MPa). 2 gpm (7.5 lpm), SST.
206661 Maximum working pressure: 3000 psi (207 bar, 20.7 MPa). Regulated range: 1000-3000 psi (69-207 bar, 6.9-20.7 MPa). 3.5 gpm (13.25 lpm), CS.

Fixed Ratio Hydra-Cat
Mechanical Proportioner

Accessories, continued

Fluid Ball Valves

210657 1/4 in. npt(mbe).
5000 psi (345 bar, 34.5 MPa), CS.

240410 3/8 in. npt(mbe).
5000 psi (345 bar, 34.5 MPa), SST.

237073 **Optional Safety Relief Valves**
3750 psi (259 bar, 25.9 MPa).

ADAPTERS AND FITTINGS

Agitators

224854 Drum bung-mounted Twistork, CS.

236760 Drum bung-mounted Twistork, siphon, SST.

231414 Heavy-duty back geared with drum cover, elevator and siphon kit, SST.

Fluid Heaters – Viscon²

Maximum working pressure: 5000 psi (345 bar, 34.5 MPa). UL and CSA approved.

220522 120V, 16.5 amp

220523 240V, 9.6 amp

220254 480V, 4.8 amp

222307 220-240V, 9.6 amp

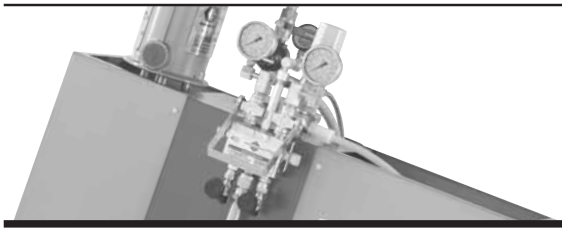
FILTERS

Fluid Filters

218029 14 sq in. (90.3 sq cm), 5000 psi (345 bar, 34.5 MPa), CS.

Replacement Screen Filter Elements

3 Pack	25 Pack	
238435	**238436**	30 mesh (595 micron)
238437	**238438**	60 mesh (250 micron)
238439	**238440**	100 mesh (149 micron)



Variable Ratio Hydra-Cat®

Mechanical Proportioner

High value variable ratio proportioner that replaces the manual pre-mixing of plural component materials and reduces the cost of wasted paint and labor.

Features and Benefits

- Provides accurately mixed and proportioned materials on demand
- Variable ratio settings allow adjustment to meet requirements and to fine-tune required ratio
- High reliability design for minimum maintenance and maximum up-time
- Easy to use mix manifold allows control of main fluid and catalyst material

Typical Applications

- Plural component materials
- Protective coatings
- Farm and construction equipment manufacturing and refinishing
- Truck and bus manufacturing and refinishing
- General metal fabrication
- Foam and elastomerics

Typical Coatings Applied

- Epoxies
- Polyurethanes
- Waterbornes
- Acid-catalyzed wood finishing materials
- Stains, lacquers and varnishes
- Sealants and adhesives

Variable Ratio Hydra-Cat Monark Unit Configurated Product

4

Variable Ratio Hydra-Cat

Mechanical Proportioner

The Hydra-Cat is a dispensing system that will proportion and mix two-component fluids. The variable ratio proportioners accurately pump and proportion two-component materials by powering two positive displacement pump lowers from a common air motor. Custom order Variable Ratio Hydra-Cat by choosing all desired options to be factory-integrated. Use configurator form 309025 to configure your custom package.

Variable Ratio Hydra-Cat Options

MOTOR TYPE

Air Motors	Effective Area Sq. in. (Sq. cm)	Fluid Pressure Range	Flow Rates
Monark	7.0 (45.6)	239-459 psi (16-32 bar, 1.6-3.2 MPa)	1.5-4.62 gpm (5.7-17.5 lpm)
President	14.19 (91.6)	480-3000 psi (33-207 bar, 3.3-20.7 MPa)	0.58-3.99 gpm (2.2-15.1 lpm)
Bulldog	38.48 (248.26)	2044-2700 psi (140-186 bar, 14-18.6 MPa)	2.21-2.95 gpm (8.4-11.2 lpm)
Hydraulic Motors			
Viscount I	1.48 (9.55)	837-2455 psi (58-169 bar, 5.8-16.9 MPa)	0.81-3.11 gpm (3-11.8 lpm)

Lower Type

VARIABLE RATIO TWO-LOWER DESIGN

- The proportioner achieves the ratio variability based on physical lower size and the position of the secondary lower relative to the pivot point on the rocker arm
- Moving the secondary lower will change the output stroke and therefore the volumetric relationship of the primary and secondary lowers
- A scale on the rocker arm is used to get close to the desired range - a ratio check is required to verify that the desired ratio is correct
- Adjustments of the ratio are done by moving the secondary lower - the farther from the pivot point, the more volume the lower will deliver
- As the secondary lower moves farther from the pivot point, the system will deliver less pressure
- Select an operation point that gives the required ratio and pressure range where the secondary lower is in the farthest setting from the pivot point
- This allows for the longest stroke possible on the secondary lower and the minimal number of changeovers, which increases ratio accuracy

Lower Identification	Effective Area Sq. In. (sq. cm)	Lower Part No.	Instruction Manual
(President 10:1)	1.476 (9.53)	215932	307430
(Bulldog 30:1)	1.248 (8.05)	901878	
(President 15:1)	0.884 (5.70)	215930	307431
0	0.884 (5.70)	948640	
1	0.740 (4.77)	948641	
2	0.554 (3.57)	222012	307944
5	0.443 (2.86)	222015	307944
7	0.370 (2.39)	222017	307944
9	0.277 (1.79)	222019	307944
(President 15:1)	0.884 (5.70)	217529	

Variable Ratio Hydra-Cat
Mechanical Proportioner

Variable Ratio Hydra-Cat Options, continued

MIX MANIFOLD OPTIONS

The mix manifold incorporates two materials and mixes them thoroughly using a 12 in. static mixer. Mix manifolds can be mounted locally on the Hydra-Cat or mounted remotely, closer to the application, in order to reduce material and solvent waste.

- Standard Manifold (CS)
- Control Mixer Manifold (SST)
- Remote Mounted Manifold (CS)
- Remote Mounted Manifold (SST

How to Select a Hydra-Cat

1. SELECT A MIX RATIO

The mix ratio is usually specified by the material manufacturer.

Note: Ratios other than those shown can often be configured on a special basis. Contact Graco Technical Assistance for details.

2. SELECT PRESSURE RATIO OR MAX PRESSURE

Select a pressure ratio that will allow the proportioner to deliver the required amount of fluid pressure for the application. This is determined by material viscosity and setup parameters.

3. SELECT A FLOW RATE

Select one fluid-to-air ratio that exceeds the total flow requirements of the application device(s) by approximately 30%. This provides an adequate application factor for such variables as tip or nozzle wear and pump/motor characteristics.

Proportioner Assembly

- Pumping unit creates pressure and pumps material at designated volumetric ratio
- Separated material moves into mixing manifold and is blended with a static mixer
- Mixed material is delivered to applicator and sprayed
- Proportioner mixes only material required to complete the job
- After spraying, material is shut off and solvent pumped through mixed material line only
- Unit can remain unused for a length of time
- Restart unit simply by opening material lines and flushing out solvent
- Waste is eliminated and a better mix accuracy is ensured

How Proportioner Creates Ratio

- Lower fluid sections of pump are mechanically linked together
- Ratio is selected by matching volumetric output of cylinders and position on lever arm
- Outputs of cylinders are fed into mixing manifold for use at applicator

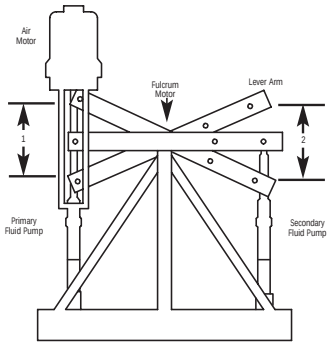
Variable Ratio Hydra-Cat

Mechanical Proportioner

FIGURE A
VARIABLE RATIO HYDRA-CAT IN MINIMUM RATIO POSITION

- Air motor is connected directly to primary fluid pump
- Each full stroke of air motor creates full stroke in primary fluid pump
- Air motor is also connected to secondary fluid pump by lever arm, which is supported at fulcrum like a teeter-totter.
- In the Min-Set position, the stroke of the primary fluid pump (1) is equal to the stroke of the secondary fluid pump (2).

Figure A
1 = Primary Stroke 4 in. (102 mm)
2 = Secondary Stroke in Minimum Ratio Position



If setting is at Min-Set:
- Mix ratio will be at a minimum
- Pressure ratio will be at a minimum
- Flow Rate will be at a maximum

FIGURE B
VARIABLE RATIO HYDRA-CAT IN MAXIMUM RATIO POSITION

- Secondary fluid pump was moved closer to the fulcrum
- In the Max-Set position, air motor and primary fluid pump still make full stroke (1), but secondary fluid pump now makes shorter stroke (3) which is less than 25% of original stroke length.
- By moving the secondary fluid pump closer to or farther from the fulcrum, any ratio in the basic range can be obtained.

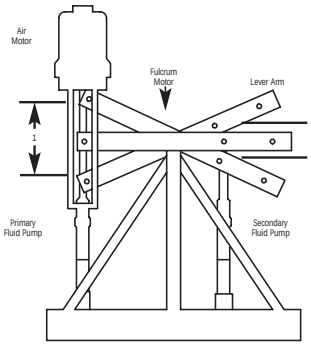


Figure B
1 = Primary Stroke 4 in. (102 mm)
3 = Secondary Stroke in Maximum Ratio Position

If setting is at Max-Set:
- Mix ratio will be at a maximum
- Pressure ratio will be at a maximum
- Flow Rate will be at a minimum

Variable Ratio Hydra-Cat
Mechanical Proportioner

Product Configurator Form
Typical Model Number: VRHC - B - A - A13 - P1 - 2 - 21 - 21 - 12

Model	Product Description	U.S. List Price
VRHC-A	Variable Ratio Hydra-Cat	
Code B	**Air or Hydraulic Powered**	**Add**
A	Air (see table 1 VA for air powered Hydra-Cats)	
B	Hydraulic (see table 2 VH for hydraulic powered Hydra-Cats)	
Code CCC	**Table Reference Number** – is determined from the table reference number found on the appropriate air (VA) or hydraulic (VH) table.	**Add**
	From Selection Table	$3,000.00
Code DD	**Motor Type** – is determined from the motor code column found on the appropriate air (VA table 1) or hydraulic (VH table 2).	**Add**
	M1 Monark® (205997)	$912.00
	P1 President® (207352)	$1,565.00
	B1 Bulldog® (208356)	$2,340.00
	V1 Viscount® I (948699)	$1,570.00
Code FF	**"A" Component Lower** – is determined from the "A" component lowers column on the appropriate reference table.	**Add**
	01 (10:1 President) Cylinder (215932)	$1,895.00
	03 (President 15:1) Cylinder (215930)	$1,645.00
	13 (30:1 Bulldog) Cylinder (901878)	$3,330.00
	14 (#0) Cylinder (948640)	$2,040.00
	15 (#1) Cylinder (948641)	$2,120.00
	16 (#2) Cylinder (222012)	$1,125.00
	17 (#2) Cylinder with Scraper (239388)	$1,520.00
	18 (#5) Cylinder (222015)	$1,125.00
	19 (#5 SST) Cylinder (948195)	$4,100.00
	20 (#7) Cylinder (222017)	$1,125.00
	21 (#7 SST) Cylinder (948197)	$4,710.00
	22 (#9) Cylinder (222019)	$1,125.00
	24 (President 15:1) Cylinder (217529)	$1,735.00

Model	Product Description	U.S. List Price
Code GG	**"B" Component Lower** – is determined from the "B" component lowers column on the appropriate reference table.	**Add**
	01 (10:1 President) Cylinder (215932)	$1,895.00
	03 (President 15:1) Cylinder (215930)	$1,645.00
	13 (30:1 Bulldog) Cylinder (901878)	$3,330.00
	14 (#0) Cylinder (948640)	$2,040.00
	15 (#1) Cylinder (948641)	$2,120.00
	16 (#2) Cylinder (222012)	$1,125.00
	17 (#2) Cylinder with Scraper (239388)	$1,520.00
	18 (#5) Cylinder (222015)	$1,125.00
	19 (#5 SST) Cylinder (948195)	$4,100.00
	20 (#7) Cylinder (222017)	$1,125.00
	21 (#7 SST) Cylinder (948197)	$4,710.00
	22 (#9) Cylinder (222019)	$1,125.00
	24 (President 15:1) Cylinder (217529)	$1,735.00
Code HH	**Manifold Options** – is determined from the "Mix Manifold Options" table.	**Add**
00	None	
11	Standard Manifold, CS (241692)	$1,270.00
21	Control Mixer Manifold SST	$2,600.00
31	Remote Mounted Manifold, CS (241808)	$1,560.00
41	Remote Mounted Manifold, SST (240225)	$4,830.00

Fax completed form and Purchase Order to Graco Customer Service.
Toll-Free Fax (877) 340-6427 - North America
(612) 623-6884 - International

4

Ordering Information (Not intended for quoting purposes. Purchase order must accompany order. No verbal orders accepted).
Note: Codes DD, E, FF and GG are copied from the appropriate table after Codes BB and CCC are selected.

VRHC - B - ____ - ___ ___ ___ - ___ ___ - 2 - ___ ___ - ___ ___ - ___ ___
Code B CCC DD E FF GG HH

___ **SAE Application (397)**
___ **Industrial Application**

Note: Orders cancelled prior to shipment are subject to a 25% restocking fee. Configured products are not returnable.

Order Quantity_____ x List Price (each) _____ = Total List Price _____

Distributor Requested Ship Date _____
(Please contact Graco Customer Service for delivery information)

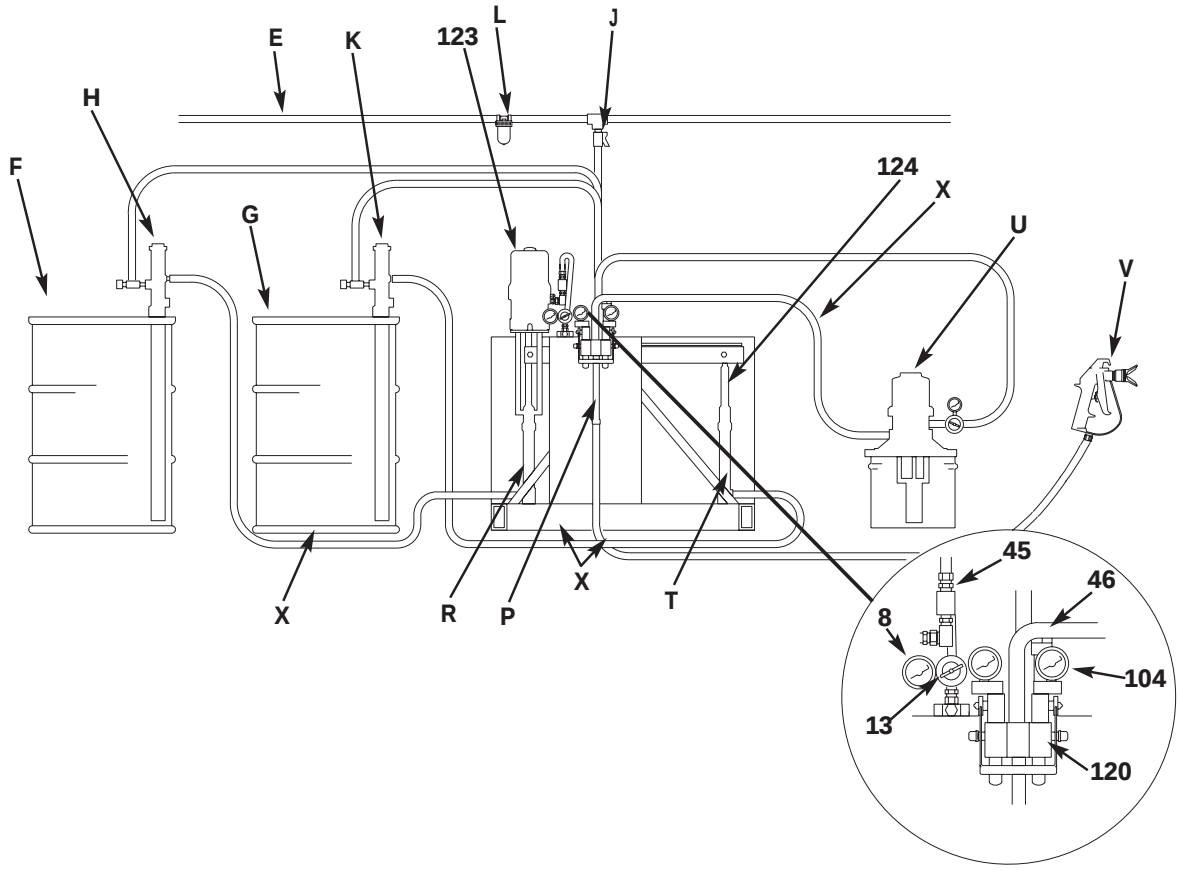
Print Name _____ Signature _____ Date _____

Note: For the full Variable-Ratio Hydra Cat configured order form and instructions, order Graco form 309025.

Variable Ratio Hydra-Cat
Mechanical Proportioner

Airless Spray Dispensing System

FOR LIGHT VISCOSITY FLUIDS



4

Key

E	Air Supply	**P**	Static Mixer	**13**	Air Regulator
F	Base Supply	**R**	Primary Pump Inlet	**45**	Bleed-Type Master Air Valve
G	Catalyst Supply	**T**	Secondary Pump Inlet	**46**	Pressure Relief Valve
H	Base Supply Pump	**U**	Solvent Pump	**104**	Pressure Gauge
J	Air Shutoff Valve	**V**	Airless Spray Gun	**120**	Mixer Manifold
K	Catalyst Supply Pump	**X**	Grounded Fluid Hose	**123**	Air Motor
L	Air Line Filter	**8**	Air Pressure Gauge	**124**	Secondary Proportioning Pump (Slave)

Variable Ratio Hydra-Cat
Mechanical Proportioner

Ordering Information

To complete your configured HydraCat Model Number please follow these instructions.

Step 1. Select whether your HydraCat will be air-operated or hydraulic-operated. Enter an A for Air Operated or B for Hydraulic. Select the corresponding following table for all future selections. Table VA = air operated. Table VH = hydraulic operated. Enter the appropriate letter above the code B in the Order Information section located on the bottom of the first page (Configured Product Order Form).

	x			2			
VRHC - B	B	CCC	DD	E	FF	GG	HH

Note: once you've determined the correct reference table you must proceed as follows to select the best proportioner to meet your application requirements.

Required Information: Mix Ratio, Fluid Pressure, & Flow Required

Step 2. Identify the applicable mix ratio to narrow down the rows in the reference table that meet this requirement.

Step 3. Look at the pressure and flow rate combinations available for the ratio identified in Step 2. Select the best pressure/flow rate combination requirements based on materials of construction. This should further narrow down the number of HydraCats that meet the application. In many cases there may only be one appropriate CCC selection in which case you've identified a specific solution.

If there are multiple rows that meet the customer's requirements with the same ratio, pressure and flow rate listed, review the wetted part compatibility option for the "A" and "B" components. Once you've selected compatible wetted parts, you've narrowed down the HydraCat solution to a single entry represented by the CCC table reference code. Enter these three letters above code CCC in the order information selection area on the Configured Product Order Form.

	x	xxx		2			
VRHC - B	B	CCC	DD	E	FF	GG	HH

If no combinations are available it's likely that our standard product offerings do not meet the application requirements.

Step 4. Using the table reference number "CCC" which you have identified in steps 1-3, fill in the next four codes (DD, E, FF, and GG) in the order information portion of the Configured Product Order Form.

	x	xxx	xx	2	xx	xx	xx
VRHC - B	B	CCC	DD	E	FF	GG	HH

Step 5. Using the Mixed Manifold Options table select the appropriate item and enter the two digit number above the HH code on the Configured Product Order Form.

	x	xxx	xx	x	xx	xx	xx
VRHC - B	B	CCC	DD	E	FF	GG	HH

Note: Feed systems and applicators are the responsibility of the qualified Hydra-Cat distributor. Technical Assistance may be able to help define these needs. Design and installation are the responsibility of the Hydra-Cat distributor.

Once completed, please Fax or mail your order form to the number or address located on the Product Configurator Form.

Variable Ratio Hydra-Cat

Mechanical Proportioner

Table VA - Variable Ratio, Air-Powered Hydra-Cat

Minimum Set Position			Maximum Set Position			Code CCC	Code DD	CODE FF "A" Component Lower			CODE GG "B" Component Lowers		
Mix Ratio	Max Pressure (PSI)	Fluid Flow at 40 CPM (GPM)	Mix Ratio	Max Pressure (PSI)	Fluid Flow at 40 CPM (GPM)	Table Reference Number	Air Motor Code	Wetted Parts	Packing Material	Lower Code	Wetted Parts	Packing Material	Lower Code
1.00	239	4.62	4.50	391	2.83	A01	M1	SST	PTFE	01	SST	PTFE	01
1.00	480	3.99	4.50	786	2.44	A04	P1	SST	PTFE	01	SST	PTFE	01
1.00	803	2.39	4.50	1314	1.46	A06	P1	CS	PTFE	3	CS	PTFE	3
1.00	803	2.39	4.50	1314	1.46	A07	P1	CS	PTFE	3	SST	TEF/LEATH	24
1.00	803	2.39	4.50	1314	1.46	A08	P1	SST	TEF/LEATH	24	SST	TEF/LEATH	24
1.00	1281	1.50	4.50	2096	0.91	A09	P1	CS	PTFE	16	CS	PTFE	16
1.00	1602	1.20	4.50	2621	0.73	A12	P1	CS	PTFE	18	CS	PTFE	18
1.00	1833	1.00	4.50	3000	0.61	A14	P1	CS	PTFE	20	CS	PTFE	20
1.00	1218	1.50	4.50	2096	0.91	A15	P1	CS	PTFE	17	CS	PTFE	17
1.00	800	2.40	4.50	1309	1.46	A19	P1	CS	PTFE H	14	CS	TEF/UH	14
1.00	959	2.00	4.50	1659	1.22	A20	P1	CS	TEF/UH	15	CS	TEF/UH	15
1.20	1745	1.10	5.39	2702	0.71	B01	P1	CS	PTFE	18	CS	PTFE	20
1.20	872	2.20	5.40	1350	1.42	B06	P1	CS	TEF/UH	14	CS	TEF/UH	15
1.25	1423	1.35	5.63	2175	0.88	C03	P1	CS	PTFE	16	CS	PTFE	18
1.34	2001	0.87	6.02	3000	0.58	D02	P1	CS	PTFE	20	CS	PTFE	22
1.50	1536	1.25	6.74	2231	0.86	E03	P1	CS	PTFE	16	CS	PTFE	20
1.60	987	1.94	7.19	1409	1.36	F03	P1	CS	PTFE	3	CS	PTFE	16
1.60	987	1.94	7.19	1409	1.36	F04	P1	SST	TEF/LEATH	24	CS	PTFE	16
1.60	1971	0.97	7.20	2813	0.68	F06	P1	CS	PTFE	18	CS	PTFE	22
2.00	1069	1.79	8.99	1445	1.33	G06	P1	CS	PTFE	3	CS	PTFE	18
2.00	1069	1.79	8.99	1445	1.33	G08	P1	SST	TEF/LEATH	24	CS	PTFE	18
2.00	1708	1.12	9.01	2305	0.83	G10	P1	CS	PTFE	16	CS	PTFE	22
2.40	1132	1.69	10.76	1469	1.31	H05	P1	CS	PTFE	3	CS	PTFE	20
2.40	1132	1.69	10.76	1469	1.31	H07	P1	SST	TEF/LEATH	24	CS	PTFE	20
2.40	2044	2.95	10.81	2650	2.27	H09	B1	CS	TEF\POLY	13	CS	PTFE	16
3.00	2172	2.77	13.51	2696	2.23	J01	B1	CS	TEF\POLY	13	CS	PTFE	18
3.19	1222	1.57	14.38	1501	1.28	K03	P1	CS	PTFE	3	CS	PTFE	22
3.19	1222	1.57	14.38	1501	1.28	K04	P1	SST	TEF/LEATH	24	CS	PTFE	22
3.34	368	1.83	15.03	449	1.50	M01	M1	SST	PTFE	01	CS	PTFE	18
3.59	2265	2.66	16.18	2727	2.21	N01	B1	CS	TEF\POLY	13	CS	PTFE	20
4.80	2396	2.51	21.61	2767	2.18	P01	B1	CS	TEF\POLY	13	CS	PTFE	22
5.34	403	1.67	24.03	459	1.47	Q01	M1	SST	PTFE	01	CS	PTFE	22

Variable Ratio Hydra-Cat

Mechanical Proportioner

Table VH - Variable Ratio, Hydraulic-Powered Hydra-Cat

Minimum Set Position			Maximum Set Position			Code CCC	Code DD	CODE FF "A" Component Lower			CODE GG "B" Component Lowers		
Mix Ratio	Max Pressure (PSI)	Fluid Flow at 40 CPM (GPM)	Mix Ratio	Max Pressure (PSI)	Fluid Flow at 40 CPM (GPM)	Table Reference Number	Hydraulic Motor Code	Wetted Parts	Packing Material	Lower Code	Wetted Parts	Packing Material	Lower Code
1.00	837	2.33	4.50	1370	1.42	A02	V1	CS	PTFE	3	SST	TEF/LEATH	24
1.00	837	2.33	4.50	1370	1.42	A03	V1	SST	TEF/LEATH	24	SST	TEF/LEATH	24
1.00	1336	1.46	4.50	2186	0.89	A04	V1	CS	PTFE	16	CS	PTFE	16
1.00	1251	2.34	4.50	2048	1.43	A05	V1	CS	TEF/UH	14	CS	TEF/UH	14
1.00	1500	1.95	4.50	2455	1.19	A06	V1	CS	TEF/UH	15	CS	TEF/UH	15
1.20	1364	2.14	5.40	2112	1.38	A07	V1	CS	TEF/UH	14	CS	TEF/UH	15
1.25	1484	1.31	5.63	2269	0.86	BO1	V1	CS	PTFE	16	CS	PTFE	18
1.50	1602	1.22	6.74	2327	0.84	C01	V1	CS	PTFE	16	CS	PTFE	20
1.60	1029	1.89	7.19	1470	1.33	C03	V1	CS	PTFE	3	CS	PTFE	16
1.60	1029	1.89	7.19	1470	1.33	C04	V1	SST	TEF/LEATH	24	CS	PTFE	16
1.67	940	3.11	7.53	1326	2.21	D01	V1	SST	PTFE	01	SST	TEF/LEATH	24
2.00	1115	1.75	8.99	1507	1.29	E01	V1	CS	PTFE	3	CS	PTFE	18
2.00	1115	1.75	8.99	1507	1.29	E03	V1	SST	TEF/LEATH	24	CS	PTFE	18
2.00	1781	1.09	9.01	2405	0.81	E05	V1	CS	PTFE	16	CS	PTFE	22
2.40	1180	1.65	10.76	1532	1.27	F01	V1	CS	PTFE	3	CS	PTFE	20
2.40	1180	1.65	10.76	1532	1.27	F03	V1	SST	TEF/LEATH	24	CS	PTFE	20
3.19	1275	1.53	14.38	1565	1.25	H01	V1	CS	PTFE	3	CS	PTFE	22
3.19	1275	1.53	14.38	1565	1.25	H02	V1	SST	TEF/LEATH	24	CS	PTFE	22

Variable Ratio Hydra-Cat

Mechanical Proportioner

Hydra-Cat Motor Table

Motor Code "DD"	Description	Power Source	Max. Stroke Length		Effective Area		Motor Reference Number	Manual Number
			Inches	cm	Sq. Inch	Sq. cm		
P1	President	Air	4.0	10.79	14.19	91.55	207352	306982
B1	Bulldog	Air	4.75	12.06	38.48	248.26	208356	307049
K1	King	Air	4.75	12.06	78.54	506.71	207647	306968
V1	Viscount I	Hydraulic	4.00	10.16	1.48	9.55	948699	307654

Hydra-Cat Pump Lower Table

Pump Lower Codes "FF" & "GG"	Stroke Length		Pressure Rating		Effective Area		Wetted Material	Packing Material	Lower Reference Number	Manual Number
	(Inches)	(cm)	(psi)	(bar)	(Sq Inch)	(Sq cm)				
01	4.25	10.79	1500	103.42	1.478	9.53	SST	PTFE	215932	307430
03	4.25	10.79	2000	137.89	0.884	5.70	CS	PTFE	215930	307431
11	4.75	12.06	1000	68.94	3.54	22.80	SST	PTFE	206792	306821
12	4.75	12.06	1500	103.42	1.478	9.53	SST	PTFE	217339	307430
13	4.75	12.06	3000	206.84	1.248	8.05	CS	PTFE/Poly	901878	
14	4.75	12.06	3000	206.84	0.884	5.70	CS	PTFE/UH	948640	684004
15	4.75	12.06	3000	206.84	0.74	4.77	CS	PTFE/UH	948641	684004
16	4.75	12.06	3000	206.84	0.554	3.58	CS	PTFE	222012	307944
17	4.75	12.06	3000	206.84	0.554	3.58	CS	CFPTFE	239388	307944
18	4.75	12.06	3000	206.84	0.443	2.86	CS	PTFE	222015	307944
19	4.75	12.06	3000	206.84	0.443	2.86	SST	PTFE	948195	
20	4.75	12.06	3000	206.84	0.37	2.39	CS	PTFE	222017	307944
21	4.75	12.06	3000	206.84	0.37	2.39	SST	PTFE/UH	948197	
22	4.75	12.06	3000	206.84	0.277	1.79	CS	PTFE	222019	307944
23	4.75	12.06	4000	275.79	0.875	5.65	CS	PTFE	946196	

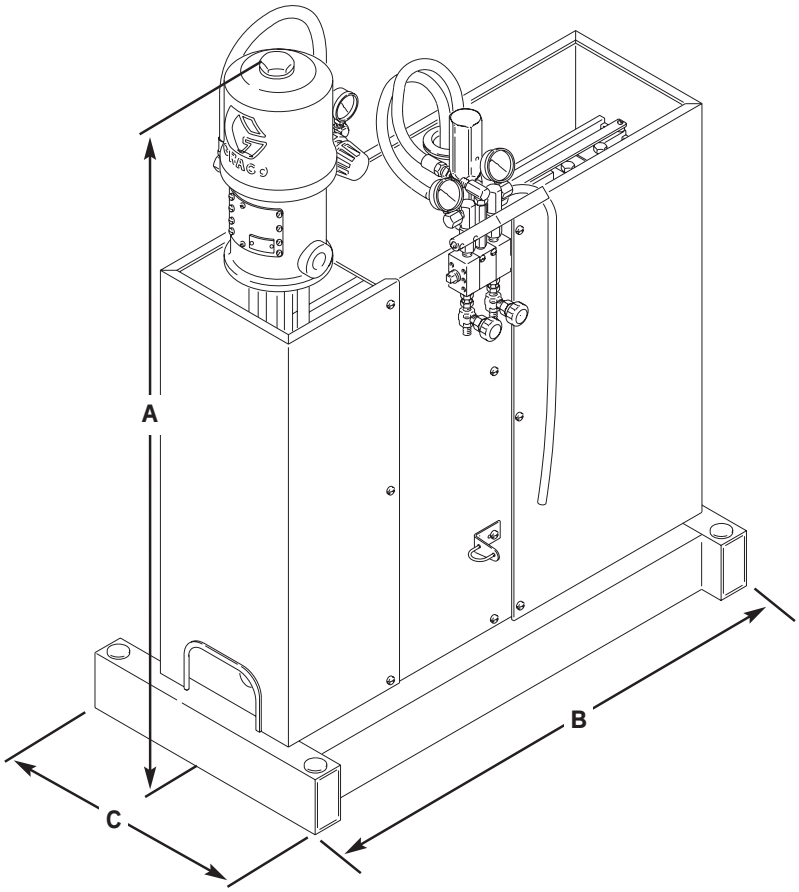
Hydra-Cat Mix Manifold Options

Code "HH"	Description	Mounting Location	Wetted Material	Pressure Rating		Manifold Reference Number
				(psi)	(bar)	
00	None	N/A	N/A	N/A	N/A	N/A
11	Standard Manifold, CS 1/4" Ported	Local	CS	3000	207	241692
21	Remote Mixer Manifold, CS 1/2" Ported	Remote	SST	3000	207	241808
31	Remote Mounted Manifold, CS 3/8" Ported	Remote	CS	3000	345	241809
41	Remote Mounted Manifold, SST 1/2" Ported	Remote	SST	5000	207	240225

Note: All manifolds come with a 1/2" SST Mixer with 32 plastic elements. (#41 uses a SST Mixer Element)

Variable Ratio Hydra-Cat
Mechanical Proportioner

Dimensions and Approximate Weights



Dimensions

A Determined by air motor

B 35 in. (889 mm)

C 18 in. (457 mm)

Weights

Motor Code	Weight (lb../kg)
P1	183/83
B1	240/109
K1	256/116
V1	199/90
V2	277/126

Variable Ratio Hydra-Cat
Mechanical Proportioner

Accessories

STAINLESS STEEL FLUID PUMPS

Allows conversion of standard series Hydra-Cat to 304 SST/PTFE fluid pump construction. Fluid pumps are dimensionally interchangeable with standard carbon steel, Severe Duty™ pumps.

Lower ID	Effective Cylinder Area Sq in. (sq mm)	Part No.
President 10:1	1.476 (953)	215932 (SST)
President 15:1	0.884 (570)	217529
#5	0.443 (286)	948195
#7	0.370 (239)	948197

CONVERSION/REPAIR KITS

Lower ID	PTFE w/CS Gland	PTFE/ UHMWPE w/CS Gland	PTFE w/SST Gland	PTFE/ UHMWPE w/SST Gland
–	—	—	—	215336
Bulldog 30:1	—	—	—	948242
President 15:1	—	—	—	218559
#0	—	948650	948750	949383
#1	—	948651	948751	949384
#2	236597	222236	948192	949379
#5	236598	222237	948195	949380
#7	236595	222234	948197	949381
#9	236596	222235	948199	949302

501095 **Inlet Valve Spring Load Conversion**
Used to provide spring bias for closing foot valve on 2 thru 9 Hydra-Cat pumps. Use with higher viscosity materials to provide faster check valve closing. For use with pressure feed proportioners only.

4

Variable Ratio Hydra-Cat
Mechanical Proportioner

Accessories (continued)

GUNS AND TIPS

Alpha Plus™ Air-Assisted Airless Gun
Maximum working pressure:
4000 psi (276 bar, 27.6 MPa)
243573 with standard spray tip
243576 with RAC Tip

235463 Silver Plus Gun
Maximum working pressure:
5000 psi (345 bar, 34.5 MPa)
2-finger gun with RAC IV Tip.

238591 Silver Plus Gun
Maximum working pressure:
5000 psi (345 bar, 34.5 MPa)
4-finger gun with Heavy-Duty RAC IV Tip.

GHDxxx HD RAC Tip

965022 2K Mix Gun
Maximum working pressure: 3000 psi (207 bar, 20.7 MPa). Coatings enter the gun separately and are mixed together in the gun. Designed for plural component materials with very short setup times.

HOSES

Whip Hose
Maximum working pressure: 5000 psi
(345 bar, 34.5 MPa).
1/4 in ID (0.63 cm), 1/4 npsm(fbe).
214912 3 ft. (0.91 m)
214913 6 ft. (1.83 m)

Nylon Fluid Hose
Maximum working pressure: 5000 psi
(345 bar, 34.5 MPa).
3/8 in. ID (9.5 mm ID), 3/8 npt(m) x 3/8 npt(f).
238395 24.6 ft. (7.5 m)
238396 49.2 ft. (15 m)
238397 98.4 ft. (30 m)

Maximum working pressure: 5000 psi
(345 bar, 34.5 MPa).
1/2 in. ID (12.7 mm ID), 1/2 npt(fbe).
238716 24.6 ft. (7.5 m)
238717 49.2 ft. (15 m)
238718 98.4 ft. (30 m)

CONTROLS AND VALVES

224040 Pump Runaway Valve

Bleed-Type Air Valve
110224 3/8 in. npt(fbe)
110225 1/2 in. npt(fbe)
110226 3/4 in. npt(fbe)

Check Valves
Maximum working pressure: 3000 psi
(206 bar, 20.6 MPa).
501867 1/4 in. npt (mbe)
501684 3/8 in. npt(mbe)
501603 1/2 in. npt(mbe)

Fluid Regulators
222121 Maximum working pressure: 1500 psi (103 bar, 10.3 MPa). Regulated range: 500-1200 psi (34-83 bar, 3.4-8.3 MPa). 1.5 gpm (5.7 lpm), SST.
238890 Maximum working pressure: 6000 psi (413 bar, 41.3 MPa). Regulated range: 500-3000 psi (34-207 bar, 3.4-20.7 MPa). 2 gpm (7.5 lpm), SST.
206661 Maximum working pressure: 3000 psi (207 bar, 20.7 MPa). Regulated range: 1000-3000 psi (69-207 bar, 6.9-20.7 MPa). 3.5 gpm (13.25 lpm), CS.

Fluid Ball Valves
210657 1/4 in. npt(mbe)
5000 psi (345 bar, 34.5 MPa), CS.
240410 3/8 in. npt(mbe)
5000 psi (345 bar, 34.5 MPa), SST.

237073 Optional Safety Relief Valves
3750 psi (259 bar, 25.9 MPa).

ADAPTERS AND FITTINGS

Agitators
224854 Drum bung-mounted Twistork, CS
236760 Drum bung-mounted Twistork, siphon, SST
231414 Heavy-duty back geared with drum cover, elevator and siphon kit, SST

Fluid Heaters – Viscon²
Maximum working pressure: 5000 psi (345 bar, 34.5 MPa). UL and CSA approved.
220522 120V, 16.5 amp
220523 240V, 9.6 amp
220254 480V, 4.8 amp
222307 220-240V, 9.6 amp

FILTERS

Fluid Filter
218029 14 sq. in. (90.3 sq. cm), 5000 psi (344 bar, 34.4 MPa), CS

Replacement Screen Filter Elements

3 Pack	25 Pack	
238435	238436	30 mesh (595 micron)
238437	238438	60 mesh (250 micron)
238439	238440	100 mesh (149 micron)

2K Monitor

Mechanical Proportioners

The 2K Monitor works in connection with a variety of flow meters to monitor flow in mechanical proportioners, thus assuring on-ratio performance.

Features and Benefits

- Provides the highest level of ratio assurance for mechanical proportioning systems
- Adaptable to virtually any plural-component proportioning equipment
- Insensitive to pressure fluctuations that generate false alarms on other systems
- Provides material use reports and maintenance schedules

Typical Applications

- Ratio monitoring for mechanical proportioners such as Variable Ratio Hydra-Cat

Typical Fluids Handled

- Paints
- “Waterless” flexible laminating urethanes
- Epoxies

User interface is easy to program

Can be used with a wide variety of meters

2K Monitor
233061, Non-Hazardous Location
233062, Intrinsically Safe - Meter Located in Hazardous Area

4

2K Monitor

Mechanical Proportioners

Technical Specifications

User interface
- Display . . . . . 4 x 20 character LCD display
- Key pad . . . . . Membrane keypad with 24 keys, 12 of which are illuminated with LEDs

Mix ratio range . . . . . 0.25 to 99.99:1

Mix ratio tolerance range . . . . . 1% minimum (user selectable)

Minimum flow rate . . . . . 50 cc/min. with G3000 meter. . . . . .Using higher viscosities and/or appropriate accessory meters . . . . . .can enable system for flow rates as low as 10cc/min.

Air supply pressure range . . . . . 80-125 psi (5.5-9 bar, 0.6-0.9 MPa) . . . . . .filtration required for atomizing air quality desired

Fluid filtration required for flowmeter . . . . . 100 mesh (149 micron) minimum

Viscosity range of fluids . . . . . 20 to 30,000 cps with G3000 meters . . . . . .Heavier viscosities can be proportioned with use of optional meters and hardware. . . . . .Meters must be selected for the appropriate resolution resolution and . . . . . .pressure drop at the process flow rate with that viscosity fluid.

Wetted parts
- G3000 meters . . . . . 303, 304, 17-4 stainless steel; tungsten carbide . . . . . .(with nickel binder), Chemrez, PTFE, CV75

Using other flow meters with the 2K Monitor
- Maximum Hz signal . . . . . 20 KHz
- Minimum input voltage . . . . . 18 Vdc
- Maximum input voltage . . . . . 30 Vdc

Maximum power requirement . . . . . 50 watts

Power supply voltage range . . . . . 85-265 VAC, 50-60 Hz, single phase

Communication
- Printer (standard) RS-232
- Network/PC (optional with kit) RS-485
- Network communication protocol . . . . . Modbus

Cable lengths
- Printer
  - Standard . . . . . 10 ft. (3.05 m)
  - Maximum . . . . . 50 ft. (15.2 m)
- Network Cable
  - Minimum . . . . . none
  - Total cable maximum length . . . . . 4000 ft. (1220 m)

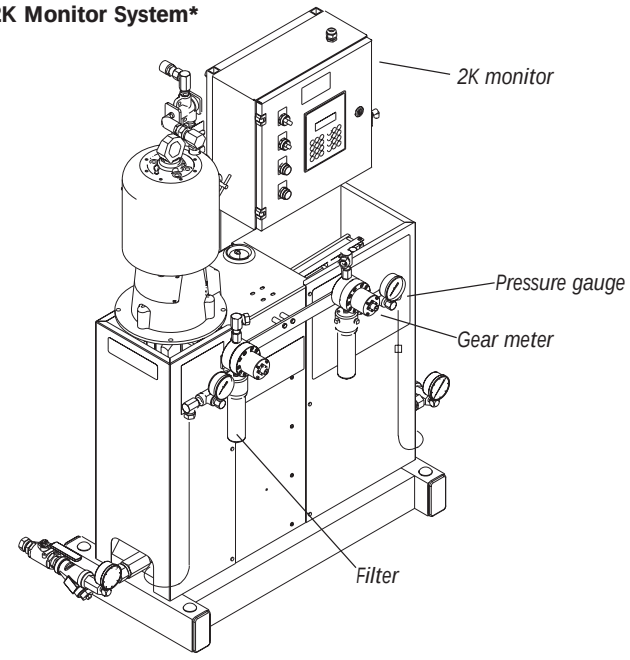
2K Monitor
Mechanical Proportioners

Technical Specifications, continued

Display Parameters
- Grand totalizer
  - Selectable units . . . . . L, gal
  - Count . . . . . Up
  - Maximum displayed value . . . . . Non-volatile memory 99999999 L or 2642079 gal
- Batch totalizer
  - Selectable units . . . . . L, gal
  - Count direction . . . . . Up
  - Maximum displayed value . . . . . Non-volatile memory 99999.9 L or 26420.1 gal
- Job totalizer
  - Selectable units . . . . . cc, oz.
  - Count direction . . . . . Up
  - Maximum displayed value . . . . . 999999 cc or 33806 oz.
  - Reset . . . . . Manual
- Flow rate
  - Display update time . . . . . 1 second
- Background lighting
  - No activity shut-off time . . . . . 10 minutes

4

2K Monitor System*



*Fluid sections shown not included with 2K Monitor

2K Monitor

Mechanical Proportioners

Measuring and Reporting

The 2K Monitor will confirm the ratio accuracy and provide a reliable record of material use. This information can be used to keep records of total material use costs and for environmental reporting purposes.

The 2K Monitor measures:

- Total Volume of Components A and B
- Total Volume of A + B Mixture
- Flow Rate of Components A and B
- Flow Rate of A + B Mixture
- Total Job Volume (preset)
- Total Batch Volume (preset)
- Grand Total Volume (non- preset)

The 2K Monitor is capable of the following reporting functions:

- Output ratio warnings
- Output ratio alarms (shutdown)
- Report printout
- Communication with PC data reporting software

Communications

RS-232 **Printer (standard)**

RS-485 **Network/PC**
For Lengths of 50 ft. (15.2 m) or more.

Modbus **Network Communication Protocol**

Ordering Information

Order monitors, meters and cables to build a complete system.

233061 **2K Monitor**
Flow meters installed in non-hazardous areas.

233062 **2K Monitor**
Intrinsically safe unit. Flow meters installed in hazardous area.

Flow Meters

Order flow meters separately. Verify meter selection with Graco technical assistance.

239716 **G3000**
4000 psi (275 bar, 27.5 MPa) WP, 0.02 to 1.06 gpm (0.07-4 lpm).

235592 **PPM 3550**
2000 psi (138 bar, 13.8 MPa) WP, 0.1 to 5.5 gpm (0.38-20.8 lpm).

617418 **Helical Flow Meter**
4050 psi (279 bar, 27.9 MPa) WP, 0.1 to 11.0 gpm (0.38-41.6 lpm).

Flow Meter Cables

948920 **6 ft. (1.8 m) cable**

948922 **25 ft. (7.6 m) cable**

948924 **50 ft. (15.2 m) cable**

948926 **100 ft. (30.4 m) cable**

Accessories

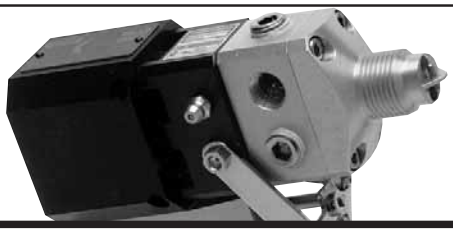
218029 **In-Line Filter**

949709 **Check Valves**

104632 **Piloted Valve**
Shuts down air motor when alarm sounds.

241263 **Printer Kit**

514037 **Printer Paper**



2K Ultra-Lite Valve

Automatic & Manual Two Component Applicators

Graco's 2K Ultra-Lite Valve dispenses a wide range of two component (2K) adhesives and sealants for virtually every application.

The valve fluid passages can dispense 2K metered fluids into a low-cost disposable mixer selected for your operation. Combined with high quality metering, this gives you the best mixed material quality available for your product.

The Graco 2K Ultra-Lite Valve is designed as one portion of a total solution for your 2K operation. This valve can be combined with a fixed or variable ratio Hydra-Cat, Hydra-Mate, or 8900 Meter to create an efficient 2K system in order to reduce the operating cost of your line. Contact your Graco representative for details.

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Features and Benefits

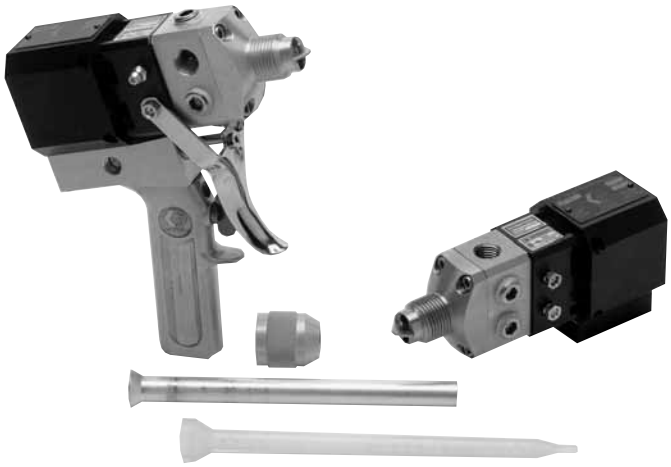
- Severe-Duty™ needles and seats for longer operating life
- Lubricated packings for longer seal life
- Lightweight construction reduces operator/machinery fatigue
- Compact size for small X-Y tables, working areas and robots
- No purging or flushing which reduces waste disposal cost
- Handle kit provides easy conversion from automatic to manual
- Aluminum or Stainless Steel housings to handle most materials
- Wide ratio models available with center injection

Typical Applications

- Dispensing potting compounds into electrical hardware and components
- Dispensing gasketing materials onto plastic, metal or glass substrates
- Dispensing structural adhesives to replace fasteners or welds
- Dispensing two part sealants in assembly or fabricating operations

Typical Fluids Handled

- Acrylic
- Butyl
- Epoxy
- Polysulfide
- Silicone
- Urethane



2K Ultra-Lite Valve

Automatic & Manual Two Component Applicators

Technical Specifications

Maximum fluid inlet pressure	3000 psi (21 MPa, 210 bar)
Fluid viscosity range	20 cps to 1 million cps
Fluid ratio range	1:1 to 20:1
Fluid inlet ports: resin (2), catalyst (2)	1/4 npt(f)
Snuffer action fluid section	dual seal isolation chambers with Zerk fittings
Maximum cylinder air pressure	120 psi (0.8 MPa, 8 bar)
Air inlet ports: (1) open, (1) close	1/8 npt(f)
Divorced air cylinder	dual piston cylinder, EP O-rings
Pistol grip kits	
Pneumatic handle kit	single line, 120 psi (0.83 MPa, 8.3 bar max, 1/8 npt(f) inlet
Electric handle kit	24 VDC or 120 VAC, 3 amp max
Severe-Duty™ components	
Shafts (2)	hard chrome over 303 SST
Snuffer needles (2)	hardened 17-4pH SST
Seats (2)	reversible, solid C2 carbide inserts
Shaft seals (2) (std)	high density Parker Polymyte™
Shaft seals (optional)	UHMWPE or PTFE
Size of 2K Ultra-Lite valve	
Automatic	6.07 in. L x 1.75 in. W x 2.00 in. H 154 mm L x 45 mm W x 51 mm H
Manual	6.07 in. L x 1.75 in. W x 6.96 in. H 154 mm L x 45 mm W x 177 mm H
Weights	
Aluminum	1.43 lb. (0.65 kg)
SST	2.07 lb. (0.94 kg)
Pistol grip handle kit	0.77 lb. (0.35 kg)
Wetted parts	
Aluminum	aluminum, 303 SST, 17-4pH SST, C2 carbide hardchrome, ethylene propolyene, Parker Polymyte, PTFE SST 303 SST, 17-4 pH SST, C2 carbide, hard chrome, ethylene propolyene, Parker Polymite™, PTFE
Mounting holes	0.25 dia. holes (2) thru cylinder for 1/4 screws (2) spaced 1.375 in. (35 mm) apart
Instruction manual	684009

Parker Polymyte™ is a registered trademark of Parker Hannifin Corp.
Viton® is a registered trademark of Du Pont.

2K Ultra-Lite Valve

Automatic & Manual Two Component Applicators

Ordering Information

Automatic 2K Ultra-Lite Valves

965533 with Aluminum Housing

965534 with Stainless Steel Housing

570145 with Aluminum Housing, Wide Ratio

Pistol Grip with Pneumatic Switch 2K Ultra-Lite Valves

965535 with Aluminum Housing

965536 with SST Housing

570182 with Aluminum Housing, Wide Ratio

Pistol Grip with Electric Switch 2K Ultra-Lite Valves

965537 with Aluminum Housing

965538 with Stainless Steel Housing

Precision Dose 2K Valves

570151 Automatic wide ratio valve with PTFE coated nose and internal thread for mixer

949632 Electric handle kit for 570151

4

Accessories

Plastic Tubing Air Lines

514607 5/32 in. (4 mm) OD nylon

513231 1/4 in. (6 mm) OD nylon

104661 **Quick Exhaust Valve**
Inlet and outlet: 1/8 npt(f). Exhaust: 1/4 npt(m). To speed up opening or closing action of the 2K Ultra-Lite Valve

104632 **Pump Pilot Valve**
Line ports: 1/2-in. npt(f). Pilot port: 1/8 npt(f). Three-way air piloted air valve to turn air-powered proportioning pump on with hand gun signal.

501459 **Toggle Switch**
Allows air pilot valve to be bypassed when purging 2K gun or charging lines. 10-32 female port threads. Requires a 593538 (1/8 npt(f)) be installed on air pilot valve.

Plastic Tube Fittings (connects air lines to valve)

Tube OD	1/8 npt(m) Straight	1/8 npt(m) 90° Swivel	Tube Tee
5/32 in.	598329	598140	101931
1/4 in.	104172	597151	111167
Tube OD	**1/4 npt(m) Straight**	**1/4 npt(m) 90° Swivel**	**Tube Tee**
5/32 in. (4 mm)	598252	598327	
1/4 in. (6 mm)	104165	598156	

Solenoids (Four-way valves to operate 2K Ultra-Lite)

551348 24V DC solenoid remote mount (1/8 npt(f) ports).

551350 24V DC din plug with screw terminals for above solenoids.

Inlet Check Valves

Maximum working pressure: 3000 psi (21 MPa, 210 bar)

501867 1/4 npt (m x m). 303 SST with PTFE O-ring poppet (2 psi crack pressure)

501684 3/8 npt (m x m). 303 sst with PTFE O-ring poppet (2 psi crack pressure)

949709 3/8 npt (m x m). Carbon steel carbide seat (50 psi crack pressure)

949710 3/8 npt (m x m). Carbon steel carbide seat (100 psi crack pressure)

Pistol Grip Kits

949631 **Pneumatic Handle Kit**
Attaches to any automatic 2K Ultra-Lite valve. Includes handle, trigger and 4-way valve inside handle.

949632 **Electric Handle Kit**
Attaches to any automatic 2K Ultra-Lite valve. Includes handle, trigger, cable with connector and switch inside handle.

626611 **Ratio Check Outlet Adapter**
For non wide ratio valves. Splits flow to collect in individual cups. Uses mixer retaining nut (512292).

551351 **Short Throw Spacer**
Added under the air piston in the valve to limit how far the fluid needles push open. It reduces the amount of material surge when the valve opens, and reduces the amount of snuff-back available. Used for dispensing low flow small diameter beads.

551327 **Nightcap**
Plastic cap to cover nose piece outlet when valve is not in use. Disposable.

Note: Wide Ratio Valves
These valves come with a center injection nozzle in the outlet nose piece and a "shower head" dispersion tip. These techniques offer more efficient mixing in applications where the mix ratio is greater than 10:1 and the minor volume is much lower viscosity than the major volume. Using this technique requires that the nozzle tip be cleaned daily.

2K Ultra-Lite Valve

Automatic & Manual Two Component Applicators

Repair Kits

949633 **Fluid Section Seal Kit.**
Standard repair kit for most valves. Consists of O-rings and seals for the fluid section of the valve.

949930 **Fluid Section Seal Kit**
Includes PTFE shaft seals.

949634 **Valve Rebuild Kit**
Standard repair kit for most valves. Consists of needles, seats, bearings, O-rings and seals for the air cylinder and fluid section.

949931 **Valve Rebuild Kit**
Includes PTFE shaft seals

626058 **Restrictor for Nose Piece**
1/8 in. (0.125 in.) ID.

626059 **Restrictor for Nose Piece**
3/64 in. (0.047 in.) ID; uses O-ring (103154).

Optional Main Fluid Needle Packings

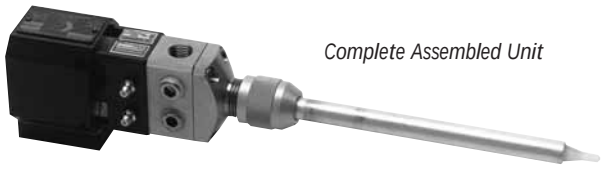
551193 **Reinforced PTFE U-cup with 302 SST spreader.**
Retaining Nuts

512290 **Fits up to 3/8 OD mixers or jackets**

512291 **Fits 1/2 OD mixer, or jacket from 1/4 ID mixers**

512292 **Fits 5/8 OD mixer, or jacket from 3/8 ID mixers**

Disposable Mixer and Retaining Nut



Complete Assembled Unit

4

Disposable Mixers

ID	OD	Part No.	No. of Elements	Part No.	No. of Elements	Part No.	No. of Elements
3/16	0.30	551337	16	551338	24	551339	32
1/4	3/8	512012	16	512013	24	512014	32
3/8	1/2			512016	24	512017	30
1/2	5/8	512287	18	512288	24	512289	30
1/2	5/8					551979	36

Optional Mixer Jackets

	Jacket. Part No.	Fits Mixer. Part No.	Jacket Part No.	Fits Mixer Part No.	Jacket Part No.	Fits Mixer Part No.
Fits 0.30 OD Mixer	551340	551337				
1/2 OD fits 3/8 OD			512293	512013	512294	512014
5/8 OD fits 1/2 OD			C55866	512016	512008	512017
Fits 5/8 OD Mixer	512296	512287	512297	512288	512298	512289

Jackets for mixers are one piece including a retaining nut. All jackets are aluminum except the ones for 5/8 in. OD mixers which are steel.

Plural Component Gun

Manual Airless Spray Gun

Features and Benefits

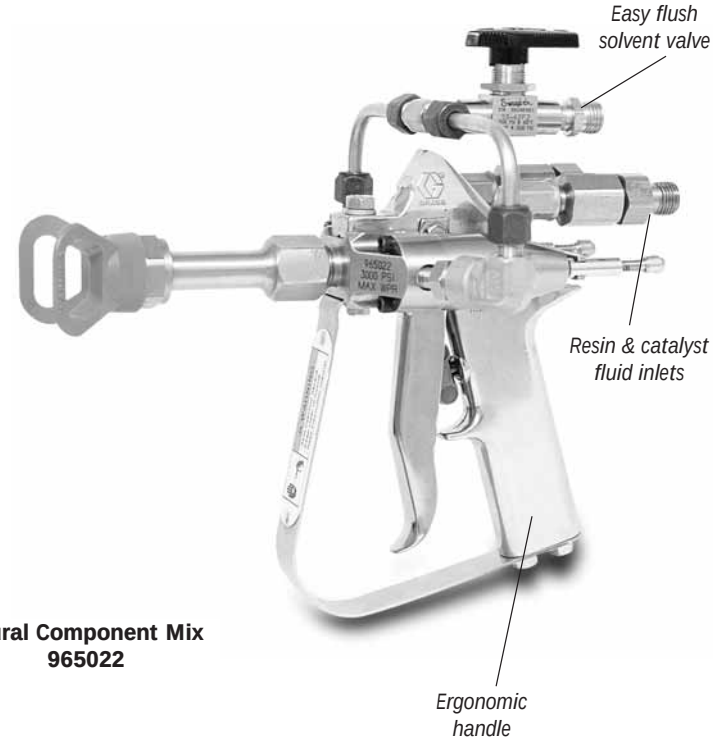
- Applies Plural-Component coatings with pot life of under one minute
- Solvent valve flushes gun quickly and easily

Typical Applications

- Tank and pipe linings
- Structural steel and corrosion protection

Typical Coatings Applied

- Plural component coatings
- Coatings with very short pot lives
- High solids polyurethanes
- High solids epoxies



Plural Component Mix 965022

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Plural Component Mix
Manual Gun

Technical Specifications

Maximum working pressure	3000 psi (20.6 MPa, 206 bar)
Fluid orifice size	0.090 in. (2.3 mm)
Wetted parts	Stainless steel (303 or 304), Ethylene-Polypropylene, Tungsten Carbide, PTFE, Polyurethane, Polyethylene
Fluid inlet size (catalyst and resin)	1/4 npsm(m)
Weight	4.375 lb.. (2 kg)
Height	8 in. (204 mm)
Length	9 in. (229 mm)
Instruction manual	684002

Ordering Information

965022 **Plural Component Mix Gun**
Includes standard (non-reversing) DripLess™ Tip Guard
Spray tip and mixer not included.

Accessories

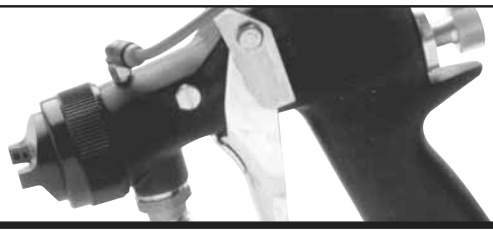
Static Mixers
11/16 - 16 UN(f) x 11/16 - 16 UN(m)
947492 2 in. (50.8 mm) Stainless Steel
947512 3 in. (76.2 mm) Stainless Steel

237858 **RAC IV Tip Retainer**
11/16 - 16 UN

949097 **Repair Kit**

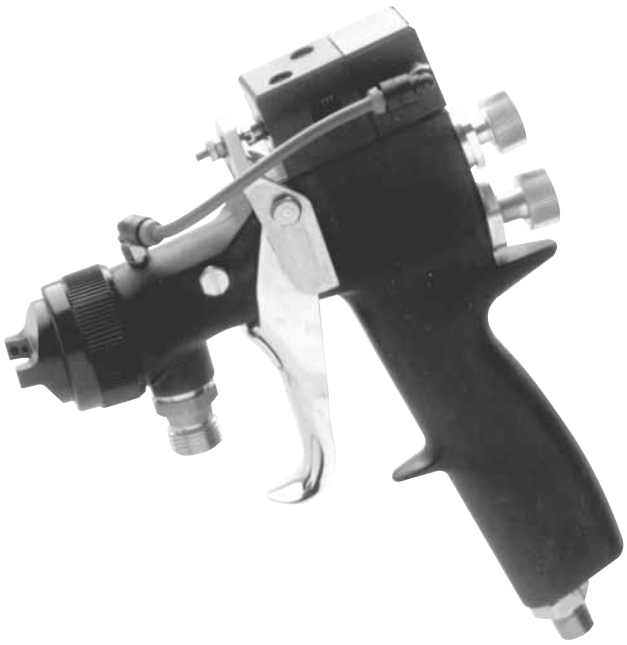
239663 **Gun/Hose Swivel**
Maximum working pressure: 5800 psi (40 MPa, 400 bar).
1/4 npsm(m) x 1/4 npsm(f).

214700 **Whip Hose**
Maximum working pressure: 3000 psi (20.6 MPa, 206 bar).



Optimiser 2K™

External Mix Two-Component Spray Gun



Features and Benefits

- The Optimiser 2K delivers superior atomization by pre-atomizing the catalyst and then introducing it to the adhesive.
- The Optimiser 2K injects catalyst from both of its pattern air horns into the path of the adhesive spray. This ensures uniform distribution of catalyst throughout the spray pattern. Adhesive and catalyst are also more thoroughly mixed.
- The Optimiser 2K is made of a lightweight composite material that reduces operator fatigue yet is tough enough for the rigors of industrial use.
- Catalyst pre-atomizing valve is centered on top of the gun body, providing excellent side-to-side balance in a slim package.
- The wetted parts of the Optimiser 2K are compatible with both the waterborne adhesive and activator components.

Typical Applications

- Furniture Assembly
- Carpet Bonding
- Upholstered Foam Build-up

Typical Fluids Handled

- Water-borne Latexes which are coagulated with a Acidic “Activator.”

Optimiser 2K

External Mix Two-Component Spray Gun

Technical Specifications

Adhesive inlet . . . . . 3/8 npsm(m)
Catalyst inlet . . . . . 1/8 npt(f)
Max. adhesive inlet pressure . . . . . 100 psi (0.7 MPa, 7 bar)
Max. catalyst inlet pressure . . . . . 100 psi (0.7 MPa, 7 bar)
Max. air inlet pressure . . . . . 100 psi (0.7 MPa, 7 bar)
Weight . . . . . 17.5 oz. (0.5 kg)
Wetted parts
Adhesive and catalyst . . . . . 300 series stainless steel, acetal, nylon, UHMWPE
Catalyst only . . . . . Buna-N, nickel-plated brass, anodized aluminum (air cap only)

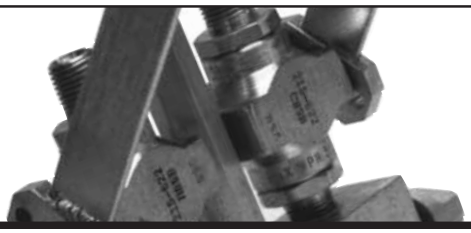
Ordering Information

949239 Optimiser 2K
With 0.055 in. (1.397 mm) fluid nozzle, PEEK tip needle assembly.

Accessories

236124 Needle Assembly
With 0.055 in. (1.397 mm) stainless steel needle.

949285 Optimiser 2K Repair Kit



Plural Component

Mix Manifolds

Features and Benefits

- Simultaneous on-off control of two liquid flow streams
- Combines two liquids into one flow streamer
- Accepts a variety of static mixers
- Rugged design
- Solvent flush capability
- Prevention of premature introduction of base and catalyst materials within the control manifold.

Typical Applications

- As component of 2K mechanical proportioning system

Typical Fluids Handled

- Urethane
- Polyester
- Epoxy

Plural Component
Mix Manifolds

Technical Specifications and Ordering Information

Part No.	Materials Used	Inlet(s)	Outlet(s)	Wetted Parts	Max. Working Pressure psi (MPa, bar)	Notes	Manual Number
207861	Medium volume: epoxy, urethane, and polyester.	1/4 npt(m)	1/2 npt(m)	Carbon steel, stainless steel, nylon, PTFE, Delrin	3000 (21.0, 210)		306992
215626	High volume: urethane, epoxy. Medium viscosity.	3/8 npt(m) Solvent: 1/4 npt(m)	1/2 npt(m)	Carbon steel, stainless steel, nylon, PTFE, Delrin	3000 (21.0, 210)	Features flush through the check valve design and no internal A to B contact. Plugged outlet ports for ratio check capability.	307400

Accessories
Check Valve

Used in static mix manifold. Exposed poppet design for easy flushing. Stainless steel with PTFE seal. Maximum operating pressure: 3000 psi (210 bar, 21.0 MPa). Cracking pressure: 4.5 psi (0.35 bar, 0.035 MPa).

501951 1/8 npt(m)
501867 1/4 npt(m)
501684 3/8 npt(m)
501603 1/2 npt(m)
904334 Check Valve Tool
To disassemble check valves 501951 and 501867 for repairs.

Fluid Mixers

Mixers for Two-Part Materials

Features and Benefits

- Graco mixers — merging resin and catalyst materials together accurately
- Mixes a variety of viscosities
- Superior solvent flushing
- Available in permanent or disposable

948315
Gun Inlet Mixer

Typical Applications

- Three styles available for your application needs:
  - In-line static mixers
  - Gun inlet mixers
  - Gun outlet mixers

Typical Fluids Handled

- Urethane
- Polyester
- Epoxy

Fluid Mixers

Mixers for Two-Part Materials

In-line Mixers

In-line mixers are used in a fluid line prior to the spray or extrusion gun, typically mounted to the outlet of the mix manifold. Base and catalyst materials are supplied to the in-line static mixer separately and then mixed.

Pipe Mixers For Low to High Viscosity

These mixers are used when materials have a wide range of viscosities, flow rates and applications.

Part Number	511353	511352	512524	512506	511354	512099	512028
Inlet/Outlet	1/4 npt(m)	3/8 npt(m)			1/2 npt(m)	3/4 npt(m)	
Element Diameter* in in.(cm)	1/4 (6.4)	3/8 (9.5)		1/2 (12.7)		3/4(19.1)	
No. of Elements	32	12	18	30	12	12	24
Element Material*	Plastic	SST	Plastic	Plastic	SST	SST	
Housing Material	SST		SST		SST	SST	
Max. Working Pressure psi (bar)	950 (65)			3000 (204)	2700 (184)	2800-(190)	
Length in in. (cm)	8.6 (21.8)	9.5 (24.1)	8.0 (20.3)	13.1 (33.3)	11.0 (27.9)	14.8 (37.6)	31.5 (80.0)

* Elements are removable.

Tube Mixers For Low to Medium Viscosity

Tube mixer elements are permanently brazed to the housing to prevent low viscosity material by-pass: these tubes are not removable for cleaning. These mixers are not recommended for use with high viscosity materials requiring base purging. Tube mixers require special end fittings and can be series connected to increase mixing capabilities.

Part Number	500639		500586	
Tube size in. (mm)	3/8 (9.5)		1/2 (12.4)	
Number of Elements	27		32	
Element Diameter* in. (mm)	.305 (7.75)		430 (10.92)	
Element Material*	SST		SST	
Housing Material	SST		SST	
Max. Working Pressure psi (bar)	3600 (245)		2800 (190)	
Length in. (cm)	14 (35.6)		24.7 (62.0)	
Tube Fittings (Required)				
Part Number	502-170	512-863	502-172	500-584
Fitting End	3/8" npt(m)	3/8" npt(f)	1/2" npt(m)	1/2" npt(f)

Fluid Mixers

Mixers for Two-Part Materials

U-Tube Mixers

U-Tube Strata Mixers are designed for compact, high pressure mixing of two component fluids. The U-Tube Mixer Assembly consists of dual element, high density polyethylene cartridges inserted in a metal tube. End caps are clamped to the ends of 2 parallel tubes. One end cap has the inlet and outlet ports. The other end cap has a U-shaped port.

5/8" U-Tube Mixer

Part Number	C26236	C26183
Mixer Tube Size (ID)	5/8	5/8
Number of Elements	28	72
Dual Cartridge Needed	C26184	C26213
Housing Material	Steel	Steel
Max. WPR PSI (bar)	2000 (135)	2000 (135)
Tilt	60°	90°
Inlet	1/4 npt(f)	1/4 npt(f)
Outlet	1/4 npt(f)	1/4 npt(f)

Spare Parts

C26184	5/8 in. 2 element cartridge
C20734	5/8 in. U-Tube seal ring

Stratamix™ Mixers

For In-Line and Gun Outlet Mounting

Stratamix mixers are designed for high pressure mixing of two component fluids. Mixing is achieved with the use of convoluted elements within the hose or tubular housing. The elements repeatedly separate and fold the material until complete mixing is achieved. The Stratamix uses a dual element disposable cartridge made of virgin polyethylene. Carbon steel housing is available upon request.

5/8" Stratamix Mixers

Part Number	C26171	C26183
Mixer Tube Size (ID)	5/8	1
Number of Elements	12	6
Dual Cartridge Needed	C26184	C26213
Housing Material	CS	CS
Max. WPR PSI (bar)	2000 (135)	2000 (135)
Length in In. (cm)	14 in.	13.74 in.
Inlet	3/8 in. npt(m)	3/4 in. npt(m)
Outlet	3/8 in. npt(m)	3/4 in. npt(m)

Fluid Mixers

Mixers for Two-Part Materials

Gun Inlet Mixers

Flexible Mixers For Low to High Viscosity

These mixers consist of a number of mix elements permanently assembled into a specially-designed nylon core hose. Flexible mixers provide high pressure capabilities in a low cost package.

Part Number	948315	948097	948208
Number of Elements	24	36	48
Element Diameter*	1/2 in. (12.7 cm)	1/2 in. (12.7 cm)	1/2 in. (12.7 cm)
Element Material	Plastic	Plastic	Plastic
Housing Material	Nylon Hose	Nylon Hose	Nylon Hose
Max. Working Pressure PSI (bar)	3500 (238)	3500 (238)	3500 (238)
Length	16.9" (42.9 cm)	21.8" (55.4 cm)	27.7" (70.4 cm)
Hose Inlet/Outlet	1/2" npt(m)	1/2" npt(m)	1/2" npt(m)

*Elements are not removable.

Tri-Core Mixers For Low to High Viscosity

These mixers have three internal passages connected within the end caps that create a serpentine flow path. This path, even though short in length, provides high mixing capabilities.

Part Number	948081
Number of Elements	36
Element Diameter*	1/2 in. (12.7 cm)
Element Material*	Plastic
Housing Material	Aluminum
Max. Working Pressure PSI (bar)	3000 (204)
Length in Inches (cm)	7.8 (19.8)
Inlet/Outlet	1/2" npt(mxf)

* Elements (512-519) are removable.

Fluid Mixers

Mixers for Two-Part Materials

Gun Outlet Mixers

Gun-mounted static mixer. Gun-mounted mixers mount directly to two-component spray or dispense guns. Base and catalyst materials are supplied to the static mixer separately and then mixed.

Disposable Mixers

ID	OD	Part No.	No. of Elements	Part No.	No. of Elements	Part No.	No. of Elements
3/16	0.30	551337	16	551338	24	551339	32
1/4	3/8	512012	16	512013	24	512014	32
3/8	1/2			512016	24	512017	30
1/2	5/8	512287	18	512288	24	512289	30
1/2	5/8					551979	36

Optional Mixer Jackets

	Jacket. Part No.	Fits Mixer. Part No.	Jacket Part No.	Fits Mixer Part No.	Jacket Part No.	Fits Mixer Part No.
Fits 0.30 OD Mixer	551340	551337				
1/2 OD fits 3/8 OD			512293	512013	512294	512014
5/8 OD fits 1/2 OD			C55866	512016	512008	512017
Fits 5/8 OD Mixer	512296	512287	512297	512288	512298	512289

Jackets for mixers are one piece including a retaining nut. All jackets are aluminum except the ones for 5/8 in. OD mixers which are steel.

Permanent Gun-Mounted Mixers For Low to Medium Viscosity

These mixers are used in airless or air-assisted airless spray application. They can be used with two component spray guns. These mixers attach directly to a spray gun outlet fitting and will accept a standard spray tip assembly.

Part Number	947492	947512
Number of Elements	12	16
Element Diameter* in in. (cm)	7/16 (11.1)	7/16 (11.1)
Element Material*	SST	SST
Element Style	Simpson™	Simpson™
Housing Material	SST	SST
Max. working Pressure PSI (bar)	3000(204)	3000(204)
Length in in. (cm)	2.0 (5.1)	3.0 (7.6)
Inlet/Outlet	11/16"-16 unf(mxf)	11/16"-16 unf(mxf)

*Elements are removable.

Table of Contents
Hot Melt Equipment

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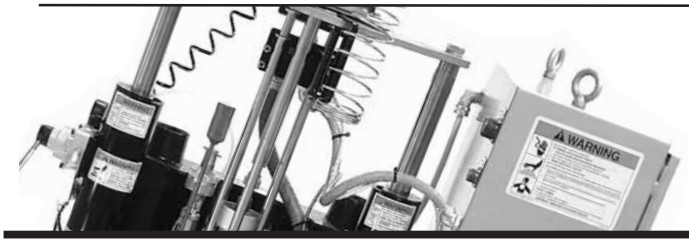


Therm-O-Flow® Mini-5™

5 Gallon (19 Liter) 15:1 President Heated Ram Pumps

Features and Benefits

- Fluid pump section with Severe-Duty™ construction for long life in abrasive materials
- Tightenable packing seals are designed for extra long life to stop leaks
- 5 gallon (19 liter), 3 in. (76 mm) dual post ram cylinders provide high pump loading and flow rate capability
- High output per cycle reduces wear for longer life and lower repair costs

Typical Applications

- Feeding automatic and robotic applicators directly from fiber or steel pails (extruding, swirl pattern, coating)
- Dispensing heated sealants and adhesives to one or more manual operator dispensing stations (sealing, product assembly)

Typical Fluids Handled

- Butyl rubber
- Ethylene vinyl acetate (EVA)
- Polyurethane reactive (PUR)
- Pressure sensitive adhesives (PSA)

Therm-O-Flow Mini-5

Therm-O-Flow® Mini 5

5 Gallon (19 Liter) 15:1 President Heated Ram Pumps

Technical Specifications

Recommended air operating range . . . . . 40 to120 psi (2.8 to 8.4 bar; 0.28 to 0.84 MPa)

Maximum recommended pump speed . . . . . 70 cpm 2 gpm (8 lpm) delivery

Air requirements . . . . . approx. 3 cfm for each 15 psi (1 bar; 0.1 MPa) needed to pump 1 gallon (3.78 liter) of fluid. (See example below)

Maximum pump discharge pressure . . . . . 1800 psi (126 bar; 12.6 MPa)

Air inlet size . . . . . 1/2 npt(m)

Fluid outlet size . . . . . 1/2 npt(f)

Wetted parts . . . . . carbon steel; chrome over SST; PTFE

Weight (ram pump package) . . . . . 650 lbs (295 kg)

Instruction manual

15:1 ram pump packages 310534

5 gal. (19 liter), 3 in. (76 mm) global ram 310525

15:1 President 306936

Air Requirements Example:
If air pressure to pump is 75 psi (5 bar; 0.5 MPa) and pump is delivering 0.1 gpm (0.4 lpm), the air volume required is 5 x 0.1 gpm x 3 cfm = 1-1/2 cfm.

Pump Package Ordering Information

All packages include 5 gal. (19 liter) 3 in. (76 mm) dual post ram on casters, 2 regulator air control, TFE coated ram plate with air valve blow off, and 3 zone PID temperature control panel.

918532 **15:1 President Therm-O-Flow**
Mini-5 Ram Pump, 240 volt

918522 **15:1 President Therm-O-Flow**
Mini-5 Ram Pump, 480 volt

C58805 **15:1 President Therm-O-Flow**
918532 with 0.51 in. x 10 ft. (3 m) heated hose and bottom-feed manual dispense gun

C58630 **15:1 President Therm-O-Flow**
918532 with 0.51 in. x 10 ft. (3 m) heated hose and bottom-feed manual dispense gun

Accessories

918430 **Low-Level Pail Kit**
Lights a red beacon signal when the pail is empty.

C31197 **Hose Support Kit**
Used for second hose exiting the pump.

918433 **Pump Proximity Switch Kit**
Includes proximity switch and pump rod mounting bracket to monitor pump movement for duration timers.

C78167 **7 Day Timer Kit**

Repair Kits

918439 **Ram Repair Kit**
Kit contains O-rings, retaining rings, piston and bumper for 5 gal. (19 liter), 3 in. (76 mm) dual post ram.

C31065 **Wiper Seal Replacement Kit**
Contains silicone coated round wiper seal with internal spring for 5 gal. (19 liter) ram plate.

918424 **Pump Repair Kit**
For heated 15:1 President pump.

Therm-O-Flow® 5

5 Gallon (19 Liter) Heated Ram Pumps for 31:1 Bulldog and 65:1 King

Features and Benefits

- Fluid pump section with Severe-Duty™ construction for long life in abrasive materials
- Latest technology is used for seals and uses an extra long life pump rod packing to prevent leaks
- 5 gal. (19 liter), 3 in. (76 mm) dual post ram cylinders provide high pump loading and flow rate capability
- High output per cycle reduces wear for longer life and lower repair costs
- Floating piston seal and flow-through priming plate improve pump loading of high viscosity materials

Typical Applications

- Feeding automatic and robotic applicators directly from fiber or steel pails (extruding, streaming, coating)
- Dispensing heated sealants and adhesives to one or more manual operator dispensing stations (sealing, structural bonding)

Typical Fluids Handled

- Butyl rubber
- Ethylene vinyl acetate (EVA)
- Polyamide
- Polyurethane reactive (PUR)
- Pressure sensitive adhesives (PSA)
- Warm melt sealers

Therm-O-Flow® 5

5 Gallon (19 Liter) Heated Ram Pumps for 31:1 Bulldog and 65:1 King

Technical Specifications

Displacement pump effective area 1.24 in.2 (8 cm2)
Volume per cycle 11.7 in.3 (192 cm3)
Pump cycles per 1 gal. (3.8 liters) 21
Fluid flow at 60 cpm . . . . . 2.8 gpm (10.6 lpm)
Max. fluid working pressure . . . . .
  31:1 Bulldog . . . . . 3100 psi (215 bar; 21.5 MPa)
  65:1 King . . . . . 5850 psi (400 bar; 40.0 MPa)
Max. air input pressure
  31:1 Bulldog . . . . . 100 psi (7 bar; 0.7 MPa)
  65:1 King . . . . . 90 psi (6.3 bar; 0.63 MPa)
Max. pump operating temperature . . . . . 400°F (204°C)
Air motor piston effective area
  31:1 Bulldog 38 in.2 (248 cm2)
  65:1 King 78.5 in.2 (506 cm2)
Stroke length . . . . . 4.75 in. (120 mm)
Air inlet size . . . . . 3/4 in. npsm(f)
Fluid outlet size . . . . . 1 in. npt(f)
Wetted parts . . . . . carbon steel; chrome; zinc; and nickel-plating; 304, 316, 440, and 17-4 PH grades of SST; alloy steel; ductile iron; PTFE; glass-filled PTFE
Weight (ram pump package) . . . . . 750 lbs (315 kg)
Displacement pump weight . . . . . 81 lbs (37 kg)
Instruction manuals
  19:1 and 31:1 heated ram pump packages 310528
  Heated 55 gallon (200 liter) pump lowers 310530
  Bare displacement pump lower 308570
  5 gallon (19 liter), 3 in. (76 mm) global ram 310525

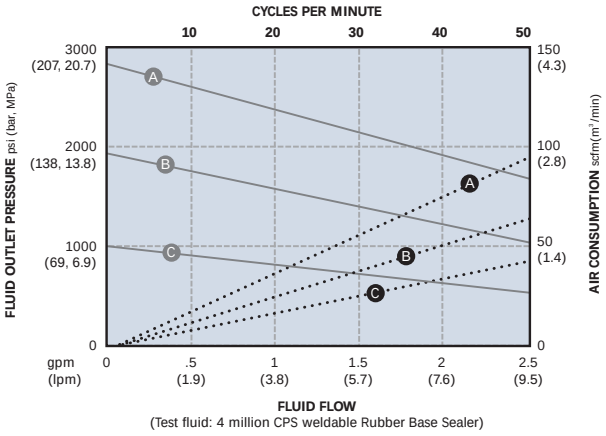
Dimensions for Therm-O-Flow 5 Pumps

Height, full down . . . . . 57.9 in (1470 mm)
Height, full up . . . . . 72.5 in. (1842 mm)
Overall width of unit . . . . . 40 in. (1016 mm)
Height of electrical control panel above base plate . . . . . 42 in. (1067 mm)
Depth of electrical control panel only . . . . . 21 in. (533 mm)

Therm-O-Flow® 5

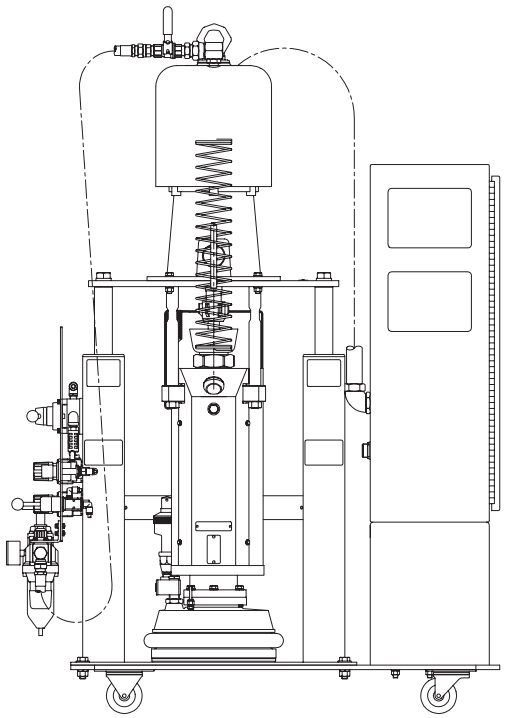
5 Gallon (20 Liter) Heated Ram Pumps for 31:1 Bulldog and 65:1 King

Performance Chart: 31:1 Bulldog

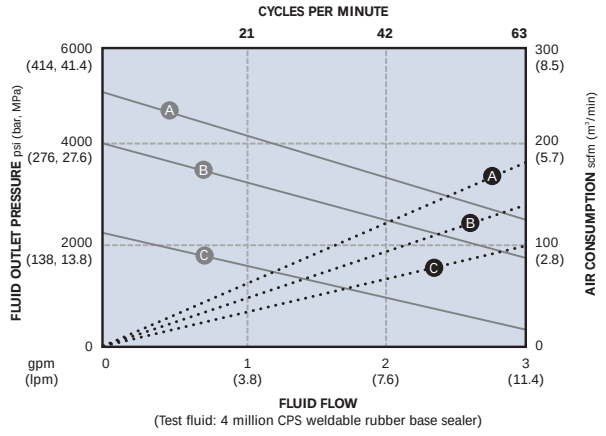


(Test fluid: 4 million CPS weldable Rubber Base Sealer)

AIR PRESSURES	LEGEND
(A) = @ 100 psi (6.2 bar, 0.6 MPa)	Air Consumption ....
(B) = @ 70 psi (4.8 bar, 0.5 MPa)	Fluid Flow ————
(C) = @ 40 psi (2.8 bar, 0.3 MPa)	



Performance Chart: King 65:1



(Test fluid: 4 million CPS weldable rubber base sealer)

AIR PRESSURES	LEGEND
(A) = @ 90 psi (6.2 bar, 0.6 MPa)	Air Consumption ....
(B) = @ 70 psi (4.8 bar, 0.5 MPa)	Fluid Flow ————
(C) = @ 40 psi (2.8 bar, 0.3 MPa)	

Therm-O-Flow® 5

5 Gallon (19 Liter) Heated Ram Pumps for 31:1 Bulldog and 65:1 King

Ram Pump Module Ordering Information

All packages include 5 gallon (19 liter), 3 in. (76 mm) dual post ram, heated hose support kit, 4 regulator air control, PTFE-coated smooth ram plate with air valve blow off, and 4 zone PID temperature control panel.

918344 31:1 Bulldog Therm-O-Flow 5 Ram Pump 480 volt

918437 31:1 Bulldog Therm-O-Flow 5 Ram Pump 240 volt

918593 31:1 Bulldog Therm-O-Flow 5 Ram Pump with Finned Plate 480 volt

C59398 65:1 King Therm-O-Flow Ram Pump 480 volt

Accessories

918430 **Low Level Pail Kit**
Lights a red beacon signal when the pail is empty.

C31197 **Hose Support Kit**
Use for a second hose exiting the pump.

C31197 **Hose Support Kit**
Mounts to ram tie bar to protect hose from heated surfaces and moving parts.

Repair Kits

918439 **Ram Repair Kit**
Kit contains O-rings, retaining rings, piston and bumper for 5 gal. (19 liter), 3 in. (76 mm) dual post ram.

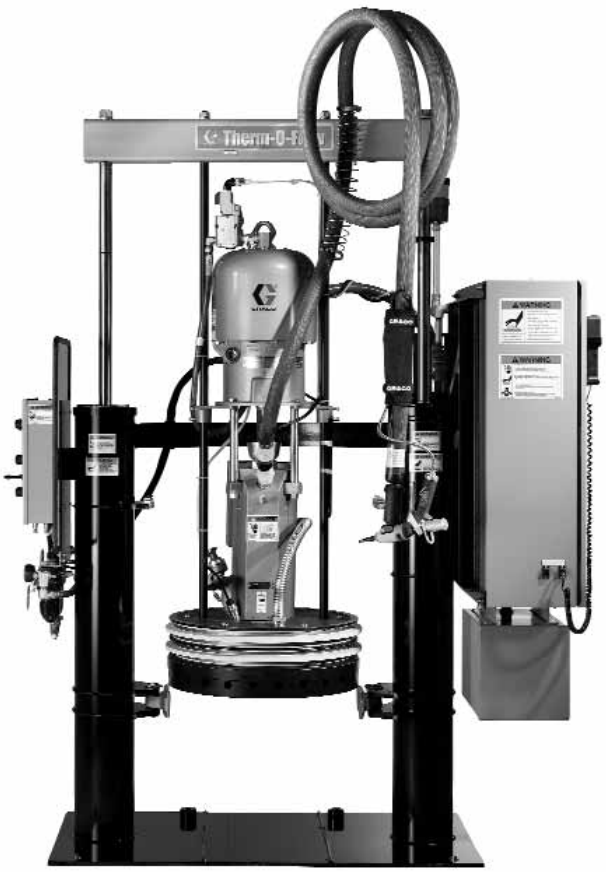
C31065 **Wiper Seal Replacement Kit**
Contains silicone coated round wiper seal with internal spring for 5 gal. (19 liter) ram plate.

Therm-O-Flow® Plus 55

55 gal. (200 Liter) Heated Ram

Features and Benefits

- New fluid pump section with Severe-Duty™ construction for extended life
- Latest-technology seals extra-long life pump-rod packings prevent leaks
- Large 6.5 in. (165 mm) ram cylinders increase pump loading and flow rate capability by 40%
- High-output per cycle reduces wear for longer life and fewer repair costs
- Floating-piston seal and flow-through priming plate improve pump loading of high viscosity materials
- Optional MegaFlo™ high melt-rate platen also reduces material loss



Typical Applications

- Feeding automatic and robotic applicators directly from fiber or steel drums (extruding, streaming, coating)
- Dispensing heated sealants and adhesives to one or more manual operator dispensing stations (sealing, product assembly)
- Transferring raw materials in the formulation of hot melt products
- Transferring materials for filling drums, pails, caulking tubes or chubs

Typical Fluids Handled

- Butyl rubber
- Ethylene vinyl acetate (EVA)
- Polyamide
- Polyurethane reactive (PUR)
- Pressure sensitive adhesives (PSA)
- Polyisobutylene (PIB)
- Warm melt sealers

Therm-O-Flow Plus 55

55 gal. (200 Liter) Heated Ram

Therm-O-Flow Plus Technical Specifications

Displacement pump effective area . . . . . 1.24 in.^{2} (8 cm^2)
Volume per cycle . . . . . 11.7 in.^{3} (192 cm^3)
Pump cycles per 1 gal. (3.8 liters) 21
Fluid flow at 60 cpm . . . . . 2.8 gpm (10.6 lpm)
Max. fluid working pressure
19:1 Senator . . . . . 2280 psi (157 bar; 15.7 MPa)
31:1 Bulldog . . . . . 3100 psi (215 bar; 21.5 MPa)
65:1 King (pump only, without accessories) . . . . . 5850 psi (400 bar; 40.0 MPa)
Max. air input pressure
19:1Senator . . . . . 120 psi (8.4 bar; 0.84 MPa)
31:1 Bulldog . . . . . 100 psi (7 bar; 0.7 MPa)
65:1 King . . . . . 60 psi (6.3 bar; 0.63 MPa)
Max. pump operating temperature . . . . . 400°F (204°C)
Air motor piston effective area
19:1Senator . . . . . 24 in.^{2} (154 cm^2)
31:1 Bulldog . . . . . 38 in.^{2} (248 cm^2)
65:1 King . . . . . 78.5 in.^{2} (506 cm^2)
Stroke length . . . . . 4.75 in. (120 mm)
Air inlet size . . . . . 1/2 npsm(f)
Pump Fluid outlet size . . . . . 1 npt(f)
Wetted parts . . . . . carbon steel; brass chrome; zinc; and nickel-plating; 304, 316, 440, and 17-4 PH grades of SST; alloy steel; ductile iron; PTFE; glass-filled PTFE
Weight . . . . . 1200 lbs (545 kg)
Displacement pump weight . . . . . 81 lbs (37 kg)

Instruction manuals

65:1, 31:1, 19:1 heated ram pump packages 309085
Bare displacement pump lower 308570
165 mm global ram module 310523
Therm-O-Flow Plus electrical controls 309100

Therm-O-Flow Plus machines and complete configured packages carry the CE mark.

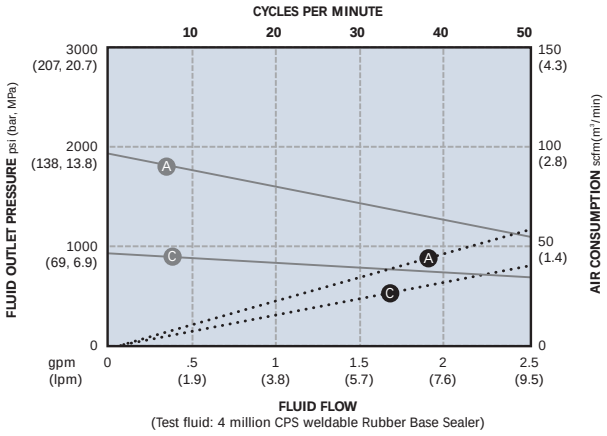
Power Requirements
Compressed air (see chart on next page) . . . . . 25-50 scfm typical
Electricity
Voltage (as selected) . . . . . 220/240 3 phase & 50/60 Hz
380/400 3 phase & 50/60 Hz
470/490 3 phase & 50/60 Hz
575 3 phase & 50/60 Hz
Peak Consumption*
With standard melt grid . . . . . 24.5 KVa
With MegaFlo melt grid . . . . . 27.5 KVa
With smooth melt grid . . . . . 24.5 KVa

*** Includes drum melt grid, pump and a 5KVa transformer for the 230 volt hoses and accessories.**

Therm-O-Flow Plus 55

55 gal. (200 Liter) Heated Ram

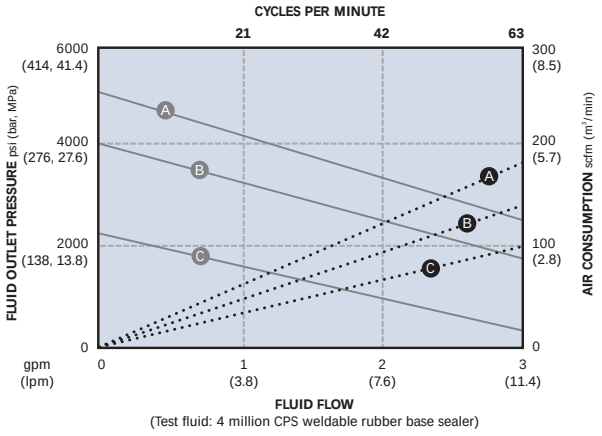
Performance Chart: 19:1 Senator



(Test fluid: 4 million CPS weldable Rubber Base Sealer)

AIR PRESSURES	LEGEND
(A) = @ 120 psi (8.3 bar, 0.8 MPa)	Air Consumption ....
(B) = @ 100 psi (7 bar, 0.7 MPa)	Fluid Flow ————
(C) = @ 70 psi (4.8 bar, 0.5 MPa)	

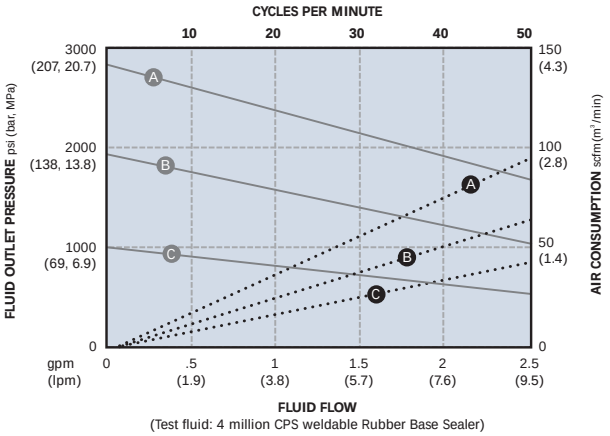
Performance Chart: 65:1 King



(Test fluid: 4 million CPS weldable rubber base sealer)

AIR PRESSURES	LEGEND
(A) = @ 90 psi (6.2 bar, 0.6 MPa)	Air Consumption ....
(B) = @ 70 psi (4.8 bar, 0.5 MPa)	Fluid Flow ————
(C) = @ 40 psi (2.8 bar, 0.3 MPa)	

Performance Chart: 31:1 Bulldog



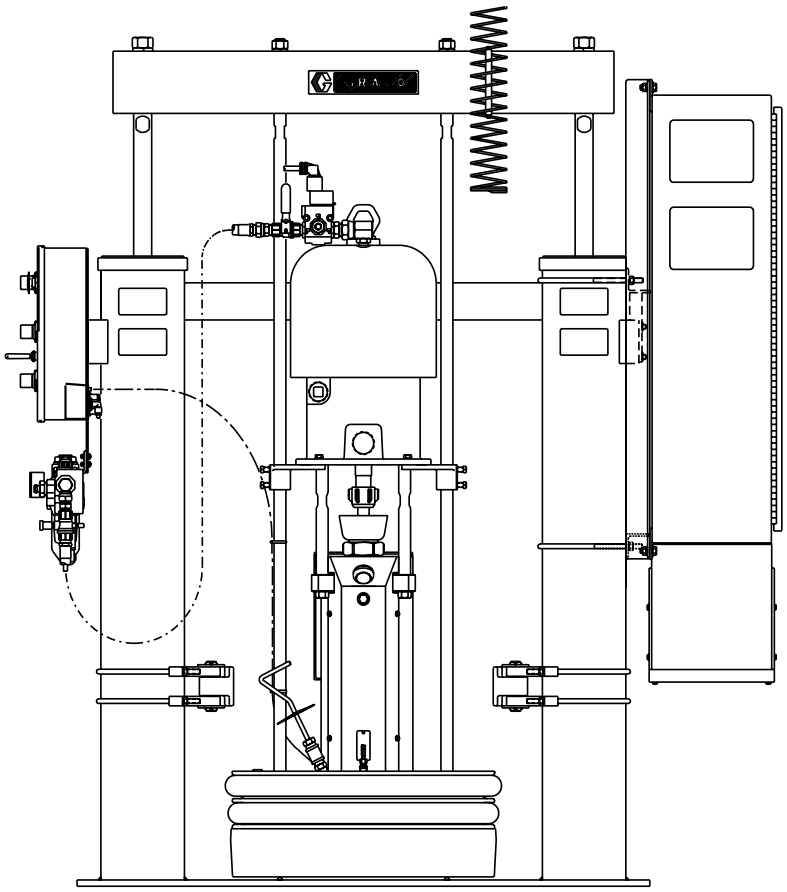
(Test fluid: 4 million CPS weldable Rubber Base Sealer)

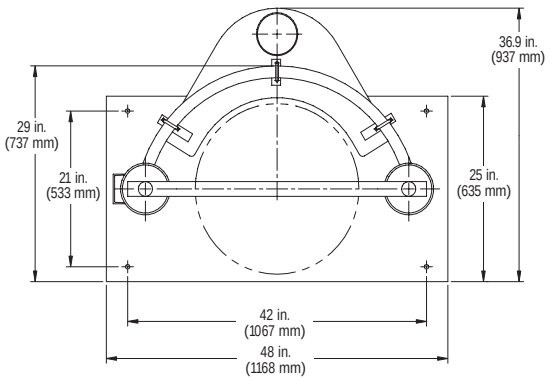
AIR PRESSURES	LEGEND
(A) = @ 100 psi (6.2 bar, 0.6 MPa)	Air Consumption ....
(B) = @ 70 psi (4.8 bar, 0.5 MPa)	Fluid Flow ————
(C) = @ 40 psi (2.8 bar, 0.3 MPa)	

Therm-O-Flow Plus 55

55 gal. (200 Liter) Heated Ram

Dimensions for Therm-O-Flow Plus 55





Height, full down . . . . . 68.2 in. (1732 mm)
Height, full up . . . . . 108.2 in. (2748 mm)
Overall width of unit . . . . . 61.5 in. (1562 mm)
Height of electrical control panel
above base plate . . . . . 46.8 in. (1189 mm)
Depth of electrical control panel only . . . . . 25.4 in. (646 mm)
Width of electrical control panel only . . . . . 10 in. (254 mm)

Therm-O-Flow Plus 55

55 gal. (200 Liter) Heated Ram

Selecting a Therm-O-Flow Plus System:

Choose options on the Therm-O-Flow Plus Configurated Order Form to build the system best-suited to your needs. Descriptions of the various options follow:

Motor Module Selection (Code A)

The material type and usage rate determine the ideal pump for the complete system. The air motor delivers the required power ratio of fluid pressure out to air pressure in. Depending on the application, you will need either a 19:1 Senator, 31:1 Bulldog or 65:1 King air motor. (Pressure/flow charts are shown on the previous page.)

Senator 19:1

The 19:1 Senator is used with materials that have the following requirements: relatively low viscosities of up to 50,000 cps, low flow rates of up to 5 lbs (2.3 kg) per minute, short hose lengths of up to 15 ft. (4.5 m) and fluid pressures of up to 1500 psi (103 bar; 10.3 MPa).

Bulldog 31:1

The 31:1 Bulldog is ideal for materials that have a low- to medium- viscosity of up to 200,000 cps, medium flow rates between 5-10 lbs (2.3 to 4.5 kg) per minute, hose lengths of up to 25 ft. (7.6 m) and fluid pressures of up to 2500 psi (172 bar; 17.2 MPa).

King 65:1

The 65:1 King is used with materials that have a medium- to high-viscosity of up to 2 M cps, high flow rates at a minimum of 8 lbs (3.6 kg) per minute and long hose lengths of 20 ft. (6 m) and more. This motor is best when fluid pressures of up to 4000 psi (276 bar; 27.6 MPa) are required.

Each of these motors is also available with a Quiet Air Motor. Use the chart below to help you select the appropriate motor for your system:

Material	19:1 Senator	31:1 Bulldog	65:1 King
Butyl rubber		X	X
Polyurethane reactive (PUR)	X	X	
Polyisobutylene (PIB)		X	X
Ethylene vinyl acetate	X	X	
Polymide	X	X	
Pressure sensitive adhesive	X	X	X
Warm melt sealers	X	X	

Therm-O-Flow Plus 55

55 gal. (200 Liter) Heated Ram

Heated Platen Selection (Code B)

The application's flow rates and the material used are the main considerations for selecting the heated platen. The heated platen is available in three styles: the standard fin design, the MegaFlo™ plate and the smooth bottom plate.

Standard Fin Design

The standard fin design is recommended for normal flow rates and for warm- and hot-melt materials.

MegaFlo Plate (US Patent No. 6,076,705)

For most applications, the MegaFlo plate is the platen of choice. The MegaFlo plate increases the heat transfer of warm- and hot-melt materials and allows higher flow rates of the melted material. The convex design of the plate reduces the amount of material left on the bottom of the container. This plate is also preferred for low flow rates when heat history or charring of the material is a concern.

MegaFlo Plate

Smooth Bottom

The smooth bottom plate is designed for use with materials that need to be cleaned often or don't need to be melted before pumping. This plate delivers low melt rates when used with hot-melt materials, but may be suitable for warm melt materials. Consult your Graco SAE specialist for more information.

Drum Ram Style Selection (Code C)

The heated platen style and the material used are the main considerations for selecting the drum ram style. Therm-O-Flow Plus is available with either a pneumatic ram or a hydraulic ram assembly. Both are mounted on 6.5 in. (165 mm) cylinders.

Pneumatic 6.5 in. (165 mm) Ram Assembly

The pneumatic ram is the standard assembly for Therm-O-Flow Plus units outfitted with the MegaFlo platen. This ram is compatible with most hot- and warm-melt materials.

Hydraulic 6.5 in. (165 mm) Ram Assembly

The hydraulic ram is the ideal choice for applications that use high-viscosity materials requiring higher flow rates. This ram has a higher downward force on the material than the pneumatic ram. The increased feed pressure in the drum allows some materials to be pumped at a higher flow rate. The added ram pressure is especially useful for materials which are high viscosity, but don't need to "melt" before being pumped.

Therm-O-Flow Plus 55

55 gal. (200 Liter) Heated Ram

Heat Control Selection — Supply Voltage *(Code D)*

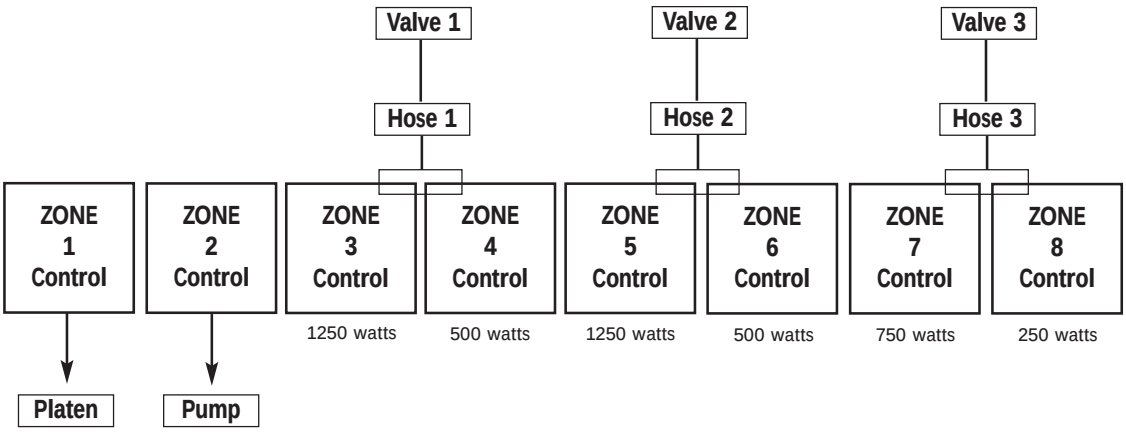
Choose the heat control that uses the voltage compatible with the power available at the installation site.

Supply voltage	Full-load amps Standard platen	Full-load amps MegaFlo platen
220/240 VAC	70 amps	80 amps
380/400 VAC	42 amps	48 amps
470/490 VAC	35 amps	40 amps
570/590 VAC	29 amps	32 amps

Based on 8-zone control with all zones used to maximum capacity.

Heat Control Selection — Number of Heat Controls (Code E)

The Therm-O-Flow Plus can be ordered with six or eight heat zones. Zones 1 and 2 are always used for the heated drum platen and the heated pump. Zones 3 and 4, 5 and 6, and optional zones 7 and 8, are available as paired zones through a 16 pin connector. The heated hoses have a 16-pin connector on the inlet end cable, and an 8-pin connector on the outlet end cable. All heated valves, manifolds and heaters are equipped with an 8-pin matching connector. Accessory cables are available for other possible combinations.



Therm-O-Flow Plus 55

55 gal. (200 Liter) Heated Ram

Drum Unloader Options Selection (Code F)

Select up to five options or (N) for none.

Important: Only one option for Codes 5, 6 and 7 may be chosen.

Advanced Pendant Control with 7-Day Timer for Preheating

(Code F1) A communication pendant that plugs into the main control box. The unit can then be set to turn on (pre-heat) and turn off at specific times for each day of the week. The pendant also allows you to easily set parameters for all heat zones, such as the set point, alarms, PID values and individual zone on/off control.

Low-Level Kit

(Code F2) An adjustable limit switch is mounted to the drum ram. The switch lights a warning beacon mounted over the unit when the drum level gets low. Contact terminals are also available in the control box for user interface.

Pump Inactivity Kit

(Code F3) A proximity switch is mounted on the pump to sense movement. A timer is included in the control box. If the unit hasn't been used in the pre-set period of time, the heating circuits will automatically turn off.

Vent Hood Kit

(Code F4) The vent hood kit is a shroud which mounts to the rear of the ram assembly. This shroud extracts fumes from the hot fluid which may be present when changing drums. (Note: Required exhaust tubing and exhaust fan not included.)

Drum Clam Shell

(Code F5) This option is a steel shell which clamps around the outside of fiber drums, reinforcing the drums for use on the drum ram.

Heavy-Duty Drum Clamp

(Code F6) The heavy-duty drum clamp is a 4 in. (101 mm) heavy, steel-hinged band-clamp which centers, supports and holds the drum during the removal of the ram platen from the drum. (Note: Not recommended for fiber drums.)

Ram Post Saddle-Type Drum Clamps

(Code F7) These are swivel-type drum clamps that enter the drum when it is slid into place. This option is also used to assist in drum hold-down with chimed drums.

Crossover Control Selection (Code G)

(Code G) Dual Unloader Crossover Control
Select (1) option when a dual crossover kit is needed or (N) for none. Do not order Code F1 (Pendant) or Code F2 (Low Level Kit) when choosing Code G. They are included with this option.

Therm-O-Flow Plus 55

55 gal. (200 Liter) Heated Ram

Hose Kit Selection Guide (Code H)

1. Each hose is defined as a kit and it will get assembled with the right fittings. The hose might feed a dispense gun, or a control device which feeds another hose kit(s), or it might feed nothing.
2. Each hose kit is represented as a 3-letter code. The 1st letter designates where the hose originates. The 2nd letter is the hose. The 3rd letter is where the hose ends..
3. Hose kit pricing equals the hose price, plus the end of hose device price, plus the extension cable price (if needed for connecting to hose position 3, or 4). Fittings provided as part of the hose kit are included at no additional charge. Calculate hose kit prices on the Configured Product Order Form.
4. Hose kits #1 and #3 are paired, as are hose kits #2 and #4. That is, hose kit #3 will begin where hose kit #1 ends.
5. Enter hose kit codes and prices on page 1 of the order sheet. Also enter total price for miscellaneous accessories.
6. Fax pages 1 and 2 to Graco customer service when you place your order.
7. Hose kits will be assembled on your machine, the fittings will be insulated, and everything will be tested.

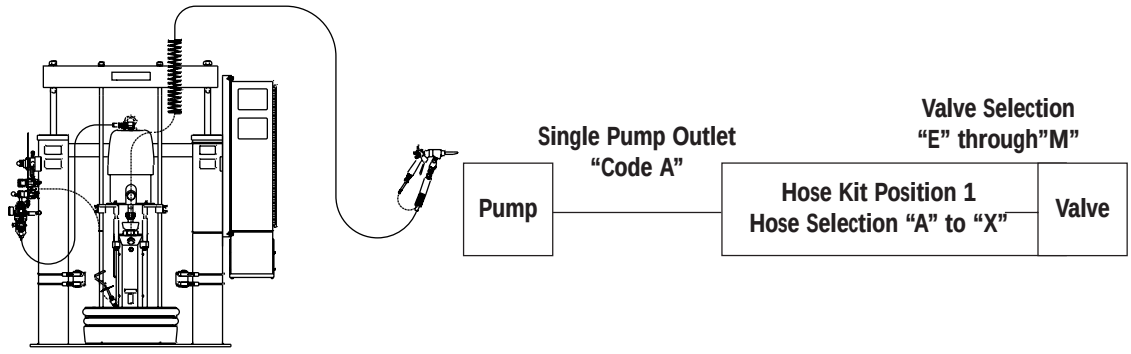
Therm-O-Flow Plus 55

55 gal. (200 Liter) Heated Ram

Hose Kit Selection (Code H)

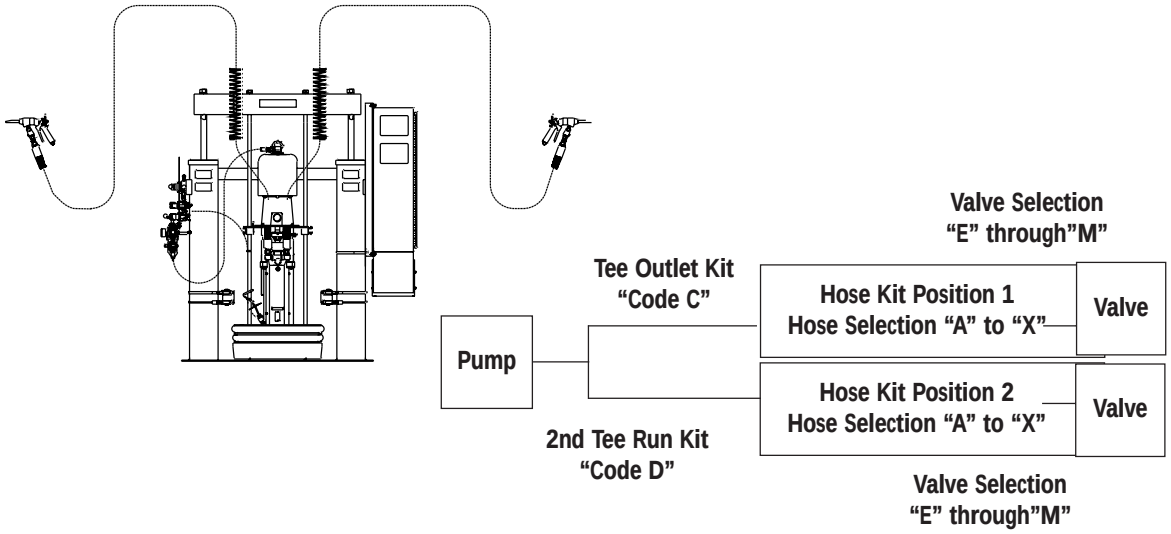
Select hose kits for your system by positions 1, 2, 3 and 4 using the following gun layout kit examples.

1. Single Hose and Valve



Example:	AKG	NNN	NNN	NNN
	Position 1	Position 2	Position 3	Position 4

2. Two Hoses with Two Valves

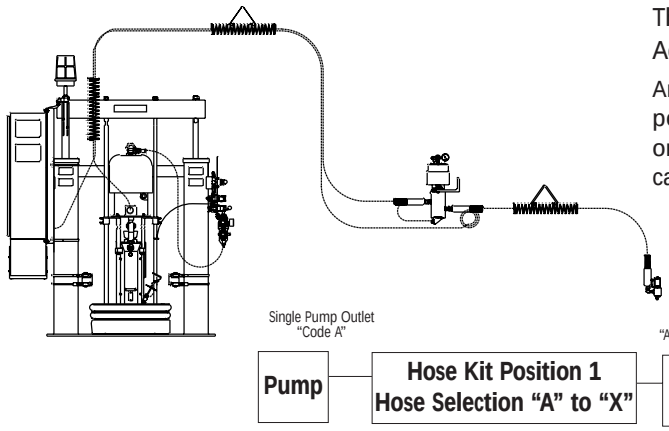


Example:	CKG	DKG	NNN	NNN
	Position 1	Position 2	Position 3	Position 4

Therm-O-Flow Plus 55

55 gal. (200 Liter) Heated Ram

3. Hose to Compensator or Regulator, and Whip Hose to Dispense Valve

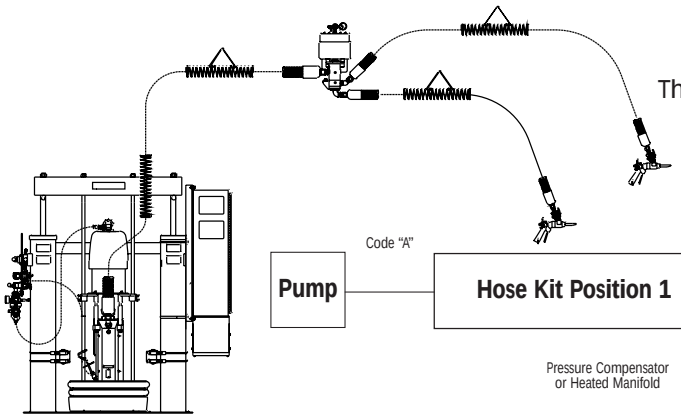


This gun kit is shown with (2) C34130 Accessory Hose Hangers.

An extension cable to power the hoses and valves in position 3 or 4 is automatically included in the order. If headers are ordered (XXM), appropriate cables are added for the extra heat zones.

Example:	APB	NNN	BHJ	NNN
	Position 1	Position 2	Position 3	Position 4

4. Hose to Compensator/Distribution Manifold and 2 Whip Hoses to 2 Dispense Guns



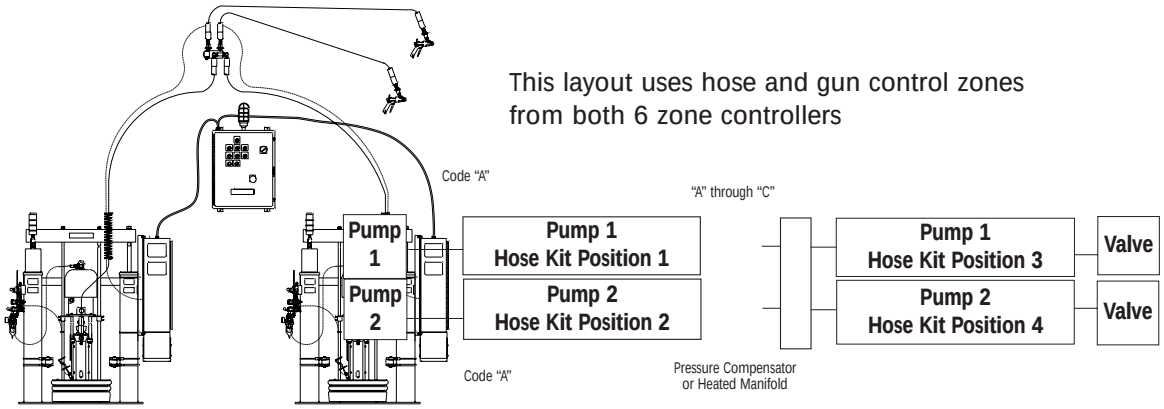
This example requires code E2 for 8 heat zones

Example:	AUC	NNN	DHE	DHE
	Position 1	Position 2	Position 3	Position 4

Therm-O-Flow Plus 55

55 gal. (200 Liter) Heated Ram

5. Dual Pump Four Hose Layout, shown with 2 Whip Hoses and 2 Valves



Example:	AUC	AUN	DHE	DHE
	Position 1	Position 2	Position 3	Position 4

5

Therm-O-Flow Plus 55

55 gal. (200 Liter) Heated Ram

Accessories

233095 **Automatic Crossover Kit**
Switches operation of one pump to a second pump. Includes low level switches, lights and control for preheat and automatic drum change-over; 230 volt AC.

233096 **Low Level Drum Signal Kit**
Includes switch and bracket and lights a red beacon when drum is empty.

918461 **Hose Support Kit for 6.5 in. (165 mm) Ram**
Includes hose spring support and bracket to prevent hose kinks. Use for second heated hose.

C34130 **Hose Hanger Kit**
Includes hose spring support and bracket for hanging.

243697 **Heated Manifold**
Includes (2) 3/4 npt(f) inlet check valves, 1 npt 4-ported manifold, (2) 1 in. npt(f) outlet gate valves, mounting bracket, 400 W 230 VAC heaters, RTD sensor and 8 pin connector box.

233097 **Inactivity Timer Kit**
Set to shut off unit if there is no pump activity within a given time.

918397 **Drum Clam Shell**
Used to reinforce fiber drums when on the pump ram.

918395 **Heavy Duty Drum Clamp**
Centers, supports, and holds drum during ram removal.

C32463 **Saddle Clamps**
Locates drum on base for raising and lowering of rams.

243275 **Drip Tray Kit**
Includes drip tray shield and two brackets which mount on the ram cylinders to catch material drips when changing drums.

115694 **Drip Tray Shield**
Used with 243275, to retain any material drips from heated plates.

243279 **55 Gallon Heated Ram Plate Wiper Ring Kit**
Tee wiper silicone 65-450ºF (18º – 232ºC)

C31007 **55 Gallon Heated Ram Plate Wiper Ring Kit**
“Tire” wipers.

Part Number	Accessory Controllers and Cables
243698	2-Zone (self tuning PID) control box. Zones are 1250 W each. Includes 230 volt plug, (2) 16 pin connectors. 11 amp. Note: Cable needed to connect to remote devices.
243699	4-Zone (self tuning PID) control box for adding two hoses (up to 25 ft.) and two heated accessories. Zones are 1250 W or 500 W. Includes 230 volt plug, (2) 16 pin connectors. 15.5 amp. Note: Cable needed to connect to remote devices.
196313	15 ft. cable, 16 pin to 16 pin extension cable. Runs between controller and heated hose.
196314	25 ft. cable, 16 pin to 16 pin extension cable. Runs between controller and heated hose.
196315	15 ft. cable, 16 pin to 8 pin extension cable. Runs between controller and heated accessory.
196316	25 ft. cable, 16 pin to 8 pin extension cable. Runs between controller and heated accessory.
196317	25 ft. cable, 16 pin to (2) 8 pin extension cable. Runs between controller and heated devices.
196318	50 ft. cable, 16 pin to (2) 8 pin extension cable. Runs between controller and heated devices.

Part Number	Miscellaneous Accessories
C58942	120 volt AC solenoid kit for heated double-acting air-operated valves. Includes solenoid, 24 in. (61 cm) high temp. Air tubes, air fittings and muffler.
C59038	24 volt DC solenoid kit for heated double-acting air-operated valves. Includes solenoid, 24 in. (61 cm) high temp. Air tubes, air fittings and muffler.
918461	Hose support spring kit. Mounts to cross bar on hydraulic-powered 6.5 in. (16.5 cm) standard ram.
C34130	Hose hanger spring kit. Mounted by customer to hang hose overhead without kinking.
243703	240 volt AC solenoid kit for heated double-acting air-operated valves. Includes solenoid, 24 in. (61 cm) high temp. Air tubes, air fittings and muffler.

Therm-O-Flow Plus 55

55 gal. (200 Liter) Heated Ram Ordering Information

Configured Product Order Form—Therm-O-Flow Plus

Fax completed form and Purchase Order to Graco Customer Service:

Fax **(800) 334-6955 North America**
(612) 623-6884 International

Typical Model Number: HM55-D-2-2-1-1-3-1-2-N-N-N-N-CEG-DEG-NNN-NNN

Model	Product Description	List Price
HM55-D	55-gal/200-litre Hot Melt Drum Unloader Base Price	$
Code A	Power Ratio (Fluid Out/Air In)	Add
1	19:1 Senator™ Standard Air Motor	$
2	19:1 Senator™ Quiet Air Motor	$
3	31:1 Bulldog™ Standard Air Motor	$
4	31:1 Bulldog™ Quiet Air Motor	$
5	65:1 King™ Standard Air Motor	$
6	65:1 King™ Quiet Air Motor	$
N	None	$
Code B	Heated Platen Style	Add
1	Standard Fin Design Heated Drum Platen	$
2	MegaFlo™ High Flow Heated Drum Platen	$
3	Smooth Bottom No Fin Heated Drum Platen	$
N	None	$
Code C	Drum Ram Style	Add
1	6.5" Cylinder Dual Post Pneumatic (100 psi) Drum Ram with Controls	$
2	6.5" Cylinder Dual Post Air Powered Hydraulic (200 psi) Drum Ram	$
N	None	$
Code D	Heat Control Supply Voltage	Add
1	220/240 VAC 50/60 Hz 3 phase	$
2	380/400 VAC 50/60 Hz 3 phase	$
3	470/490 VAC 50/60 Hz 3 phase	$
4	570/590 VAC 50/60 Hz 3 phase	$
N	None J-Box only for customer connection	
Code E	Number of Heat Zones Available	Add
1	6 Heat Zones (platen, pump, 2 hoses, 2 accessories)	
2	8 Heat Zones (platen, pump, 3 hoses, 3 accessories)	
N	None	
Code F	Drum Unloader Options (select up to 5 or select None for each space)	Add
1	Advanced Pendant Control with 7-Day Timer	$
2	Low Level Kit	$
3	Pump Inactivity Switch Kit	$
4	Vent Hood Kit	$
5	Drum Clam Shell*	$
6	Heavy Duty Drum Clamp*	$
7	Drum Ram Post Saddle Clamps*	$
N	None	
	*pick only one of 5, 6, and 7	
	Single Unloader Sub-Total each	$

Code	Product Description	List Price
Code G	Cross-Over Control	Add
1	Dual Unloader Cross-Over Control Kit	$
N	None	$
	Total List Price for Unloader(s) and Cross-Over Equipment Note: A second identical unloader is ordered automatically when Cross-Over Control option is ordered. Verify Unloader Total is 2x Unloader Sub-Total if Cross-Over Option is ordered.	$

Code H	Application Kits (define from page 2)	Add
___ or NNN	Hose Kit Position One	$
___ or NNN	Hose Kit Position Two	$
___ or NNN	Hose Kit Position Three	$
___ or NNN	Hose Kit Position Four	$

Miscellaneous Accessories to add to order

Qty	Description	Part No.	Extended Price

Total List Price of Hose Kits and Accessories $

Note: All packages carry the CE mark.

Order Information — Not intended for quoting purposes. Purchase Order must accompany order. No verbal orders accepted.

Model Number HM55-D – [A]_[B]_[C]_[D]_[E]_[F]_[F]_[F]_[F]_[F]_[G]_[H]_[H]_[H]_[H]
Code:

Note: Orders Cancelled prior to shipment are subject to a 25% restocking fee. Configured products are not returnable.

Order Quantity _____ x List Price (each) _____ = Total US List Price $_____

Standard Delivery (accepted order to ship date) 4-6 weeks.

Print Name: _____ Signature: _____ Date: _____

Note: Therm-O-Flow Plus configured order form and instruction manual is Graco form #684052.

Therm-O-Flow Plus 55

55 gal. (200 Liter) Heated Ram

What Device Is Hose Fed From?		Code
Single Pump Outlet.	From 1"npt(f) with 45 deg to jic(m)	"A"
Pressure Comp. Valve.	From 1"npt(f) to straight jic(m)	"B"
Tee Outlet Kit.	From 1"npt(f) thru tee to 90 deg jic(m)	"C"
Manif. Kit or 2nd tee run.	From 1"npt(f) with 90 deg to jic(m)	"D"
Htd. Mastic Pres. Reg.	From 3/4"npt(f) to straight jic(m)	"E"

Heated Hose Selection

Part No.	Max. Press.	Dash Size	Actual ID x Length	JIC(f) Ends	Code
115865	1500psi	(-6)	.41" ID x 10 ft.	9/16-18	"A"
115873	3000psi	(-8)	.41" ID x 10 ft.	3/4-16	"B"
115874	3000psi	(-8)	.41" ID x 15 ft.	3/4-16	"C"
115868	1500psi	(-10)	.51" ID x 6 ft.	7/8-14	"D"
115869	1500psi	(-10)	.51" ID x 10 ft.	7/8-14	"E"
115870	1500psi	(-10)	.51" ID x 15 ft.	7/8-14	"F"
115871	1500psi	(-10)	.51" ID x 20 ft.	7/8-14	"G"
115875	3000psi	(-10)	.51" ID x 6 ft.	7/8-14	"H"
115876	3000psi	(-10)	.51" ID x 10 ft.	7/8-14	"J"
115877	3000psi	(-10)	.51" ID x 15 ft.	7/8-14	"K"
115878	3000psi	(-10)	.51" ID x 20 ft.	7/8-14	"L"
115879	3000psi	(-10)	.51" ID x 25 ft.	7/8-14	"M"
None					"N"
115880	3000psi	(-12)	.62" ID x 10 ft.	1 1/16-12	"P"
115881	3000psi	(-12)	.62" ID x 15 ft.	1 1/16-12	"Q"
115882	3000psi	(-12)	.62" ID x 20 ft.	1 1/16-12	"R"
115883	3000psi	(-12)	.62" ID x 25 ft.	1 1/16-12	"S"
115884	3000psi	(-16)	.87" ID x 6 ft.	1 5/16-12	"T"
115885	3000psi	(-16)	.87" ID x 10 ft.	1 5/16-12	"U"
115886	3000psi	(-16)	.87" ID x 15 ft.	1 5/16-12	"V"
115887	3000psi	(-16)	.87" ID x 20 ft.	1 5/16-12	"W"
115888	3000psi	(-16)	.87" ID x 25 ft.	1 5/16-12	"X"

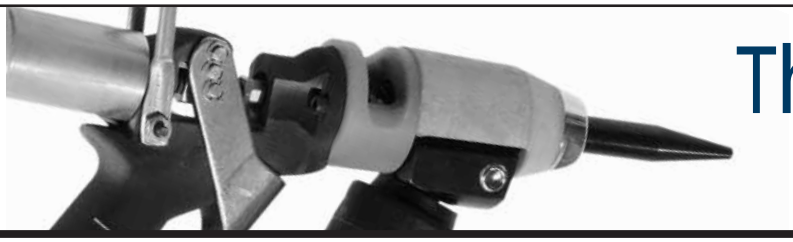
Notes:
1. 1500 psi rated hoses can only be ordered with the 19:1 Senator packages.
2. Device selections A, B, & C can only be ordered with .51 ID and larger feed hoses.
3. Low Flow device selections E, F, G, & H cannot be ordered with .87" ID hose.
4. Choosing hand gun electric switch selection F or H will allow the pump to be piloted on/off from the gun trigger connected to zone 4 or 6. (see #6 below)
5. Each hose has a 2 zone 16 pin connector in, and a 1 zone 8 pin connector out. Each end of hose device has a 8 pin connector in.
6. The standard six zone control box uses the heat control zones as follows.
   Zone 1: Drum platen.
   Zone 2: Fluid pump.
   Zone 3: Hose 1 up to 1250 watts (25 ft.).
   Zone 4: Valve or Header up to 500 watts.
   Zone 5: Hose 2 up to 1250 watts (25 ft.).
   Zone 6: Valve or Header up to 500 watts.
7. The optional 8 eight zone control box adds:
   Zone 7: Hose 3 up to 750 watts (15 ft.).
   Zone 8: Valve up to 250 watts.

Ex: ACE (No Dashes) makes a single hose kit from the pump to a top inlet hand gun.

Code	Select End of Hose Device	Part No.
"A"	240V 23:1 Heated Pressure Compensator Valve (400 watts)	243656
"B"	240V 51:1 Heated Pressure Compensator Valve (400 watts)	243657
"C"	Heated Distribution Manifold (1"npt) (400 watts)	243697
"D"	Heated Air Operated Mastic Pressure Reg. (400 watts)	243700
"E"	Manual Gun with Top Feed Swivel (1/2"nptf) (200 watts)	243702
"F"	Manual Gun Top Feed w/elec switch	243688
"G"	Manual Gun with Bottom Feed Swivel (1/2"nptf)	243608
"H"	Manual Gun Bottom Feed w/elec switch	243609
"J"	Air Operated Heated Dispense Valve	243694
"K"	Air Operated High Flow Heated Dispense Valve (200 watts)	243695
"L"	Air Operated Snuff-Back Heated Dispense Valve	243696
"M"	45 inch Distribution Header w/valve (2 heat zones) (200 watts/500 watts)	243701
"N"	None	

Price Work Sheets

Hose Kit Position One Code ___ ___ ___	Part No.	Price
Hose Price		$
Device Price		$
Total for Kit One		$
Hose Kit Position Two Code ___ ___ ___	Part No.	Price
Hose Price		$
Device Price		$
Total for Kit Two		$
Hose Kit Position Three Code ___ ___ ___	Part No.	Price
Hose Price		$
Device Price		$
Extension Cable 196314 (25' / 7.6m)		$
Total for Kit Three		$
Hose Kit Position Four Code ___ ___ ___	Part No.	Price
Hose Price		$
Device Price		$
Extension Cable 196314 (25' / 7.6m)		$
Total for Kit Four		$



Therm-O-Flow®

Dispense Applicators - Manual and Automatic

Features and Benefits

- Precise temperature control from PID control panel
- Piston-actuated ball and seat design for positive shutoff
- Rugged all metal construction
- Light trigger pull

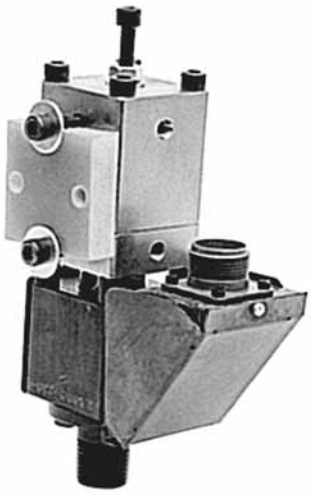
Typical Applications

- Vapor barrier dispensing
- Insulating glass dispensing
- Product assembly

Typical Fluids Handled

- Hot melt adhesives
- Warm melt materials
- Heat expandable materials
- Heated epoxy or urethane

243609
Manual Hot Melt Flow Gun



Air-Operated Automatic
Hot Melt
Dispense Valve
(C34079)

Therm-O-Flow®
Dispense Applicators

Technical Specifications

	Manual Gun	Automatic Valve
Heater voltage	120V/240 V	120V/240V
Heater wattage	100W/200W	150W
Maximum working pressure	3500 psi (170 bar; 17.0 MPa)	3500 psi (170 bar; 17.0 MPa)
Maximum temperature	400°F (204°C)	400°F (204°C)
Sensor type	100 ohm RTD	100 ohm RTD
Fluid inlet/outlet	3/8 npt(f)/1/4 npt(f)	1/2 npt(f)/varies

Ordering Information

120V Manual & Automatic Guns
for Therm-O-Flow 5 and Therm-O-Flow 55

C34005 **Bottom Inlet Manual Gun**

C34007 **Bottom Inlet Manual Gun**
with electric switch

C34002 **Top Inlet Manual Gun**

C50018 **Top Inlet Manual Gun**
with electric switch

All manual guns include swivel, nozzle and 6-pin electrical connector. Inlet is 7/8-14(m).

C34068 **Air-Operated Heated Dispense Valve**
1/8 npt(f) outlet

C34079 **Air-Operated Heated High-Flow Dispense Valve**
1/2 npt(m) outlet

244908 **EnDure™ Hot Melt Snuff Back Valve**
1/2 npt(f) fluid outlet

918483 **Air-Operated Heated Snuff Back Valve**
1/2 npt(f) fluid outlet

243265 **Heated 45 in. (114 cm) Header for Roll Coating Machines**
Includes: C34079 and heated distribution manifold with 4 drops

240V Manual & Automatic Guns for Therm-O-Flow Plus 55

Fluid inlet on swivel is 1/4 npt(f), fluid outlet is 1/4 npt(f).

245197 **Bottom Inlet Manual Gun**

245798 **Bottom Inlet Manual Gun**
with electric switch

245200 **Top Inlet Manual Gun**

245199 **Top Inlet Manual Gun**
with electric switch

All manual guns include swivel, nozzle and pin electrical connector.

243694 **Air-Operated Heated Dispense Valve**
1/8 npt(f) outlet

243695 **Air-Operated Heated High-Flow Dispense Valve**
1/2 npt(m) outlet

244909 **EnDure™ Hot Melt Snuff-Back Valve**
1/2 npt(f) fluid outlet

243701 **Heated 45 in (114 cm) Header for Roll Coating Machines**
Includes: 243695 and heated distribution manifold with 4 drops

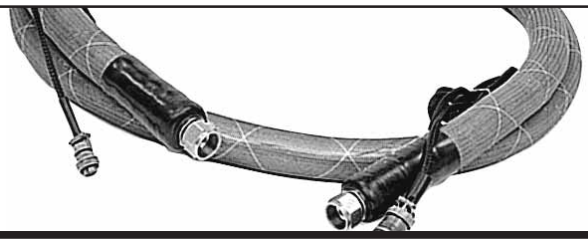
Accessories & Repair Kits

C32002 **Repair Kit for 120V and 240V Manual Guns**
Includes: needle seal and O-rings.

C34080 **Repair Kit for C34079**

918520 **Repair Kit for 918483, 243696**

C27342 **Repair Kit for 243694, 243695, C34068**



Heated Hoses and Fittings

Hot Melt Accessories

Heated hoses provide an added measure of temperature control when dispensing adhesives and sealants.

Features and Benefits

- PTFE core prevents material build-up and loss of flow
- 100 ohm resistance heaters for accurate temperature control
- Stainless steel braid core for reliability at high pressure

Typical Applications

- As a component of a complete Therm-O-Flow or Therm-O-Flow Plus system
- To provide temperature conditioning to ambient materials

Typical Fluids Handled

- Butyl hot melt
- Urethane hot melts
- Pressure sensitive hot melts

Heated Hoses and Fittings

Ordering Information

High Pressure Hoses

Rated for pressures up to 3000 psi (207 bar; 21 MPa) at 400°F (204°C).

120 VAC Hoses: For Therm-O-Flow 5 gal. (19 liter) and 55 gal. (200 liter) systems.

Part Number	Length	I.D.	Fitting
C34099	10 ft. (3 m)	0.41 in.	3/4-16 JIC(f)
C34108	15 ft. (4.6 m)	0.41 in.	3/4-16 JIC(f)
C34086	6 ft. (1.8 m)	0.51 in.	7/8-14 JIC(f)
C34093	10 ft. (3 m)	0.51 in.	7/8-14 JIC(f)
C34102	15 ft. (4.6 m)	0.51 in.	7/8-14 JIC(f)
C34109	20 ft. (6.1 m)	0.51 in.	7/8-14 JIC(f)
C34115	25 ft. (7.6 m)	0.51 in.	7/8-14 JIC(f)
C34094	10 ft. (3 m)	0.62 in.	1-1/16-12 JIC(f)
C34104	15 ft. (4.6 m)	0.62 in.	1-1/16-12 JIC(f)
C34110	20 ft. (6.1 m)	0.62 in.	1-1/16-12 JIC(f)
C34116	25 ft. (7.6 m)	0.62 in.	1-1/16-12 JIC(f)
C34088	6 ft. (1.8 m)	0.87 in.	1-5/16-12 JIC(f)
C34227	10 ft. (3 m)	0.87 in.	1-5/16-12 JIC(f)
C34106	15 ft. (4.6 m)	0.87 in.	1-5/16-12 JIC(f)
C34112	20 ft. (6.1 m)	0.87 in.	1-5/16-12 JIC(f)
C34117	25 ft. (6.1 m)	0.87 in.	1-5/16-12 JIC(f)

240 VAC Hoses: For Therm-O-Flow Plus 55 gal. (200 liter) systems and PrecisionFlo XL heat-only systems.

Part Number	Length	I.D.	Fitting
115902	6 ft. (1.8 m)	0.41 in.	3/4-16 JIC(f)
115873	10 ft. (3 m)	0.41 in.	3/4-16 JIC(f)
115874	15 ft. (4.6 m)	0.41 in.	7/8-14 JIC(f)
115875	6 ft. (1.8 m)	0.51 in.	7/8-14 JIC(f)
115876	10 ft. (3 m)	0.51 in.	7/8-14 JIC(f)
115877	15 ft. (4.6 m)	0.51 in.	7/8-14 JIC(f)
115878	20 ft. (6.1 m)	0.51 in.	7/8-14 JIC(f)
115879	25 ft. (7.6 m)	0.62 in.	1-1/16-12 JIC(f)
115903	6 ft. (1.8 m)	0.62 in.	1-1/16-12 JIC(f)
115880	10 ft. (3 m)	0.62 in.	1-1/16-12 JIC(f)
115881	15 ft. (4.6 m)	0.62 in.	1-1/16-12 JIC(f)
115882	20 ft. (6.1 m)	0.62 in.	1-1/16-12 JIC(f)
115883	25 ft. (7.6 m)	0.62 in.	1-1/16-12 JIC(f)
115884	6 ft. (1.8 m)	0.87 in.	1-5/16-12 JIC(f)
115885	10 ft. (3 m)	0.87 in.	1-5/16-12 JIC(f)
115886	15 ft. (4.6 m)	0.87 in.	1-5/16-12 JIC(f)
115887	20 ft. (6.1 m)	0.87 in.	1-5/16-12 JIC(f)
115888	25 ft. (7.6 m)	0.87 in.	1-5/16-12 JIC(f)

Heated Hoses and Fittings

Ordering Information

Low Pressure Hoses

Rated for pressures up to 1500 psi (103 bar; 10.3 MPa) at 400°F (204°C).

C34xxx Hoses are 120 VAC Hoses for Therm-O-Flow 5 gal. (19 liter) and 55 gal. (200 liter) systems. 115xxx are 240 VAC hoses for Therm-O-Flow Plus 55 Gal (200 liter) systems.

Part Number	Length	I.D.	Fitting
C34097	10 ft. (3 m)	0.012 in.	9/16-18 JIC(f)
C34113	20 ft. (6.1 m)	0.012 in.	9/16-18 JIC(f)
C34118	25 ft. (7.6 m)	0.012 in.	9/16-18 JIC(f)
115865	10 ft. (3 m)	0.312 in.	9/16-18 JIC(f)
115866	20 ft. (6.1 m)	0.312 in.	9/16-18 JIC(f)
115867	25 ft. (7.6 m)	0.312 in.	9/16-18 JIC(f)

Accessories for Heated Hoses

Accessory Control Boxes

For controlling temperature of hoses and other heated devices. These can be added to existing Therm-O-Flow and Therm-O-Flow Plus systems or they can be used alone for temperature conditioning applications.

Part Number	Description
C07462	120 VAC Control Box (2) 750W Heated Zones Includes: (2) 14-pin connectors which accept the plug from 120 VAC hoses. Order 14-pin to 6-pin cable to connect to heated applicators and other heated devices.
C59555	120 VAC Control Box; (4) Heated Zones Includes: (2) 14-pin connectors and (2) 6-pin connectors. Hose wattage ratings are 1000W and 500W. Applicator wattage ratings are each 150W.
243698	240 VAC Control Box; (2) 1250W Heated Zones Includes: (1) 16-pin connector which accepts plug from 240 VAC heated hoses.
243699	240 VAC Control Box; (4) Heated Zones Includes: (2) 16-pin connectors. Powers (2) hoses to 25 ft. (7.6 m) and (2) heated valves or accessories.

Cables

FOR POWERING REMOTELY-MOUNTED HEATED DEVICES.

Part Number	Voltage	Length	Connection
C07734	120 VAC	10 ft. (3 m)	14-pin to 14-pin
C07738	120 VAC	25 ft. (7.6 m)	14-pin to 14-pin
C07716	120 VAC	10 ft. (3 m)	14-pin to 6-pin
C07474	120 VAC	20 ft. (6.1 m)	14-pin to 6-pin
196313	240 VAC	15 ft. (4.6 m)	16-pin to 16-pin
196314	240 VAC	25 ft. (7.6 m)	16-pin to 16-pin
196315	240 VAC	15 ft. (4.6 m)	16-pin to 8-pin
196316	240 VAC	25 ft. (7.6 m)	16-pin to 8-pin
196317	240 VAC	50 ft. (15.2 m)	16-pin to (2) 8-pin
196318	240 VAC	100 ft. (30.5 m)	16-pin to (2) 8-pin

116159 **Communication Cable**
Lines accessory boxes to main control box.

Adapters

TO CONNECT HOSES TO HEATED DEVICES.

JIC Thread(m)	npt(m) Thread	Straight Adapter	45° Elbow	90° Elbow
9/16-18	1/4			C20676
9/16-18	3/8	C20684	C20654	C20670
3/4-16	3/8	C20585	N/A	C20677
3/4-16	1/2	C20700	C20972	C20678
7/8-14	3/8	C20769	N/A	N/A
7/8-14	1/2	C20703	C20655	C20679
7/8-14	3/4	C20595	C20665	C20687
1-1/16-12	1/2	C20642	N/A	C38006
1-1/16-12	3/4	C20708	C20666	C20681
1-1/16-12	1	C20647	C20635	C20694
1-5/16-12	3/4	C20709	C20651	C20690
1-5/16-12	1	C20586	C20650	C20686

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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.

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