Instructions – Parts List



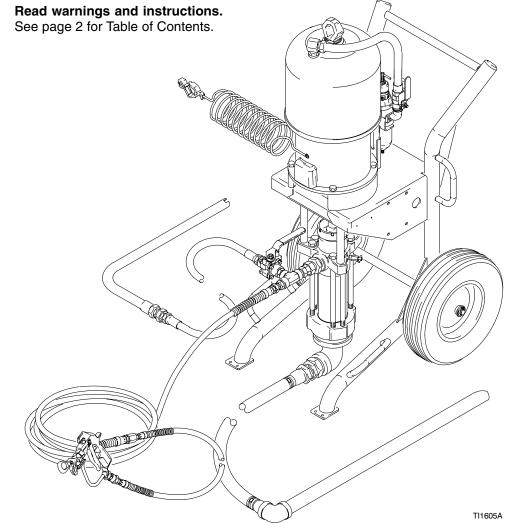
20:1 KING[™] CARBON STEEL **Cart–Mounted Zinc Spray** Package

308081L

Part No. 231131, Series C

2000 psi (14 MPa, 138 bar) Maximum Fluid Working Pressure 100 psi (0.7 MPa, 7 bar) Maximum Air Input Pressure





PROVEN QUALITY. LEADING TECHNOLOGY.



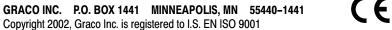


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Symbols

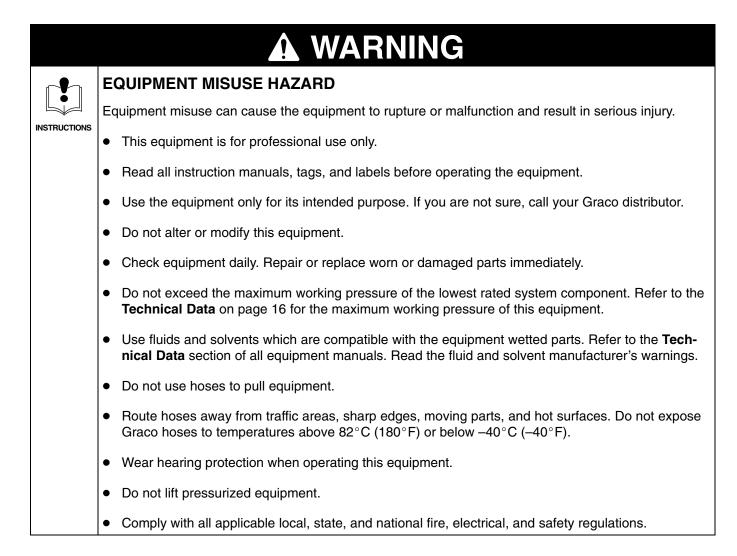
Caution Symbol

Warning Symbol

WARNING

This symbol alerts you to the possibility of serious injury or death if you do not follow the instructions.

This symbol alerts you to the possibility of damage to or destruction of equipment if you do not follow the instructions.



WARNING

	INJECTION HAZARD
6-03	Spray from the gun, leaks or ruptured components can inject fluid into your body and cause extremely serious injury, including the need for amputation. Fluid splashed in the eyes or on the skin can also cause serious injury.
	• Fluid injected into the skin might look like just a cut, but it is a serious injury. Get immediate medi- cal attention.
AMO-	 Do not point the gun at anyone or at any part of the body.
	 Do not put your hand or fingers over the spray tip.
	 Do not stop or deflect leaks with your hand, body, glove or rag.
	• Do not "blow back" fluid; this is not an air spray system.
	 Always have the tip guard and the trigger guard on the gun when spraying.
	Check the gun diffuser operation weekly. Refer to the gun manual.
	 Be sure the gun trigger safety operates before spraying.
	 Lock the gun trigger safety when you stop spraying.
	• Follow the Pressure Relief Procedure on page 9 if the spray tip clogs and before cleaning, checking or servicing the equipment.
	Tighten all fluid connections before operating the equipment.
	 Check the hoses, tubes, and couplings daily. Replace worn or damaged parts immediately. Do not repair high pressure couplings; you must replace the entire hose.
	• Use only Graco approved hoses. Do not remove the spring guard that is used to help protect the hose from rupture caused by kinks or bends near the couplings.
	MOVING PARTS HAZARD
	Moving parts, such as the air motor piston, can pinch or amputate your fingers.
	• Keep clear of all moving parts when starting or operating the pump.
	• Before servicing the equipment, follow the Pressure Relief Procedure on page 9 to prevent the equipment from starting unexpectedly.

A WARNING



FIRE AND EXPLOSION HAZARD

Improper grounding, poor ventilation, open flames or sparks can cause a hazardous condition and result in a fire or explosion and serious injury.

- Ground the equipment and the object being sprayed. Refer to **Grounding** on page 6.
- If there is any static sparking or you feel an electric shock while using this equipment, **stop spraying immediately.** Do not use the equipment until you identify and correct the problem.
- Provide fresh air ventilation to avoid the buildup of flammable fumes from solvents or the fluid being sprayed.
- Keep the spray area free of debris, including solvent, rags, and gasoline.
- Electrically disconnect all equipment in the spray area.
- Extinguish all open flames or pilot lights in the spray area.
- Do not smoke in the spray area.
- Do not turn on or off any light switch in the spray area while operating or if fumes are present.
- Do not operate a gasoline engine in the spray area.

	•	bo not operate a gasonne engine in the spray area.
	T	OXIC FLUID HAZARD
Ô		azardous fluid or toxic fumes can cause serious injury or death if splashed in the eyes or on the skin, haled, or swallowed.
	•	Know the specific hazards of the fluid you are using.
	•	Store hazardous fluid in an approved container. Dispose of hazardous fluid according to all local, state and national guidelines.
	•	Always wear protective eyewear, gloves, clothing and respirator as recommended by the fluid and solvent manufacturer.

General Information

NOTE: Reference numbers and letters in parentheses in the text refer to the callouts in the figures and the parts drawing.

NOTE: Always use Genuine Graco Parts and Accessories, available from your Graco distributor. Refer to the Product Data Sheet for your pump, Form No. 305789. If you supply your own accessories, be sure they are adequately sized and pressure rated for your system.

Fig. 2 is only a guide for selecting and installing system components and accessories. Contact your Graco distributor for assistance in designing a system to suit your particular needs.

Prepare the Operator

All persons who operate the equipment must be trained in the safe, efficient operation of all system components as well as the proper handling of all fluids. All operators must thoroughly read all instruction manuals, tags, and labels before operating the equipment.

Prepare the Site

The King pump requires $180 \text{ scfm} (5.0 \text{ m}^3/\text{min})$ of compressed air while operating at 90 psi (0.6 MPa, 6 bar) air pressure and 60 cycles per minute. Ensure that you have an adequate compressed air supply.

Refer to Fig. 2. Bring a compressed air supply line (A) from the air compressor to the pump location. Be sure all air hoses (A) are properly sized and pressure-rated for your system. Use only electrically conductive hoses. The air hose should have a 3/4 npsm(m) thread.

Install a bleed-type shutoff valve (B) in the air line to isolate the air line components for servicing. Install an air line moisture trap and drain valve (C) to help remove moisture from the compressed air supply.

Keep the site clear of any obstacles or debris that could interfere with the operator's movement.

Have a grounded, metal pail available for use when flushing the system.

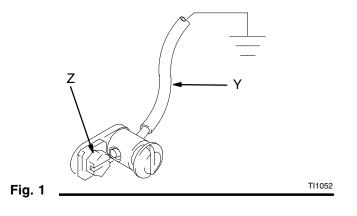
Grounding



FIRE AND EXPLOSION HAZARD Before operating the pump, ground the system as explained below. Also read

the section **FIRE OR EXPLOSION HAZ**-**ARD** on page 4.

1. *Pump:* use the ground wire and clamp (supplied) as shown in Fig. 1. Remove the ground screw (Z) and insert through the eye of the ring terminal at end of ground wire (Y). Fasten the screw back onto the pump and tighten securely. Connect the other end of the wire to a true earth ground.



- 2. *Air and fluid hoses:* use only electrically conductive hoses.
- 3. *Air compressor:* follow manufacturer's recommendations.
- 4. *Spray gun:* ground through connection to a properly grounded fluid hose and pump.
- 5. Fluid supply container: follow your local code.
- 6. *Object being sprayed:* follow your local code.
- 7. Solvent pails used when flushing: follow your local code. Use only metal pails, which are conductive, placed on a grounded surface. Do not place the pail on a nonconductive surface, such as paper or cardboard, which interrupts the grounding continuity.
- 8. To maintain grounding continuity when flushing or relieving pressure, hold a metal part of the spray gun firmly to the side of a grounded *metal* pail, then trigger the gun.

Supplied Components

Refer to Fig. 2.

A red-handled bleed-type master air valve (F) and a fluid return line valve (7) are supplied. These components help reduce the risk of serious injury, including fluid injection and splashing of fluid in the eyes or on the skin, and injury from moving parts if you are adjusting or repairing the pump.

The bleed-type master air valve relieves air trapped between this valve and the pump after the air is shut off. Trapped air can cause the pump to cycle unexpectedly. Locate the valve close to the pump.

The fluid return line valve acts as a fluid drain valve to assist in relieving fluid pressure in the displacement pump, hose, and gun. Triggering the gun to relieve pressure may not be sufficient.

- The red-handled bleed-type master air valve (F) is required in your system to relieve air trapped between it and the air motor when the valve is closed (see the WARNING above). Be sure the bleed valve is easily accessible from the pump, and is located **downstream** from the air filter/regulator (H).
- The air relief valve (38) opens automatically to prevent overpressurization of the pump.
- The fluid return line valve (7) is required in your system to relieve fluid pressure in the hose and gun (see the WARNING at left).
- The suction hose (24) and tube (26) allow the pump to draw fluid from a 5 gallon (19 liter) pail (E).

KEY

SUPPLIED COMPONENTS

- 1 Pump
- 2 Cart
- 7 Fluid Return Line Valve
- 9 Fluid Return Line
- 10 Fluid Return Tube
- 12 Electrically Conductive Fluid Supply Hose
- 13 Coupling
- 14 Electrically Conductive Fluid Whip Hose
- 15 Gun Swivel
- 17 Airless Spray Gun
- 24 Suction Hose
- 26 Suction Tube
- 27 Air Regulation Kit (includes items F and G)
- F Red-Handled Bleed-Type Master Air Valve (required, for pump)
- G Air Line Inlet Swivel
- 35 Ground Wire (required; see page 6 for installation instructions)
- 38 Air Relief Valve (partially hidden)39 Pump Air Hose

35

9

12

15

COMPONENTS YOU MUST SUPPLY Electrically Conductive Air Supply Hose Α В Bleed-Type Master Air Valve (for accessories) Air Line Moisture Trap and Drain Valve С E Grounded 5 Gallon (19 Liter) Pail B С 39 **Detail of Air Line Connection** and Air Regulation Kit (27) 39 G Q F Ø 26 10 Е 14

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24

F

38

17

Fig. 2

13

Pressure Relief Procedure

WARNING



INJECTION HAZARD

The system pressure must be manually relieved to prevent the system from starting or spraying accidentally. Fluid under high pressure can be injected through the skin and cause serious injury. To reduce the risk of an injury from injection, splashing fluid, or moving parts, follow the Pressure Relief Procedure whenever you:

- are instructed to relieve the pressure,
- stop spraying,
- check or service any of the system equipment, •
- or install or clean the spray tips.
- 1. Lock the gun trigger safety.
- 2. Close the red-handled bleed-type master air valve (F, supplied in your system).
- 3. Unlock the gun trigger safety.
- 4. Hold a metal part of the gun firmly to the side of a grounded metal pail, and trigger the gun to relieve pressure.
- Lock the gun trigger safety.
- 6. Open the return line valve (7, supplied in your system), to relieve fluid pressure in the hose and gun.
- 7. Leave the return line valve open until you are ready to spray again.

If you suspect that the spray tip or hose is completely clogged, or that pressure has not been fully relieved after following the steps above, very slowly loosen the tip guard retaining nut or hose end coupling and relieve pressure gradually, then loosen completely. Now clear the tip or hose.

Flush the Pump Before First Use

The pump is tested with lightweight oil, which is left in to protect the pump parts. If the fluid you are using may be contaminated by the oil, flush it out with a compatible solvent. See Flushing on page 11.

Packing Nut/Wet-Cup

Before starting, fill the packing nut (K) 1/3 full with Graco Throat Seal Liquid (TSL) or compatible solvent. See Fig. 3.

To reduce the risk of serious injury whenever you are instructed to relieve pressure, always follow the Pressure Relief Procedure at left.

The packing nut is torqued at the factory and is ready for operation. If it becomes loose and there is leaking from the throat packings, relieve pressure, then torgue the nut as specified in Fig. 3, using the supplied wrench. Do this whenever necessary. Do not overtighten the packing nut.

Using the Airless Spray Gun

Before operating the equipment, read the instruction manual supplied with the gun.

Spray some test patterns before doing any finished work. Refer to the gun manual for detailed information on correct spraying technique.

Circulating Zinc Fluids

- 1. When spraying zinc fluids, close the return line valve (7). Circulation is not required when spraying.
- 2. To circulate fluid back to the supply container while you are not spraying, open the return line valve (7) and lock the gun trigger safety. The pump will continue to run.

To reduce the risk of serious injury whenever you are instructed to relieve pressure, always follow the Pressure Relief Procedure at left.

3. Always relieve pressure before overnight shutdown, when changing spray tips, or when checking or servicing any part of the system. During circulation, some fluid will be present in the gun line and must be relieved.

A CAUTION

To avoid tip-over, the cart must be on a flat and level surface. Failure to follow this caution could result in injury or equipment damage.

Prime the Pump

- 1. See Fig. 3. Remove the tip guard and spray tip from the gun (17). See the gun instruction manual.
- 2. Close the air filter/regulator (H) and bleed-type air valves (B, F).
- 3. Close the return line valve (7).
- 4. Connect the air line to the air inlet swivel (G).
- Check that all fittings throughout the system are 5. tightened securely.
- 6. Place the pump suction tube (26) and the fluid return tube (10) into the fluid supply container.
- 7. Open the bleed-type air valves (B, F).
- 8. Hold a metal part of the gun (17) firmly to the side of a grounded metal pail and hold the trigger open.
- 9. Slowly open the air filter/regulator (H) until the pump starts.
- 10. Cycle the pump slowly until all air is pushed out and the pump and hoses are fully primed.
- 11. Release the gun trigger and lock the trigger safety. The pump should stall against pressure.

Set the Air and Fluid Pressure

WARNING

To reduce the risk of serious injury whenever you are instructed to relieve pressure, always follow the Pressure Relief Procedure on page 9.

- 1. Relieve the pressure. Install the tip guard and spray tip in the gun, as explained in the gun manual.
- 2. Open the air filter/regulator (H) slowly. Use the regulator to control pump speed and fluid pressure. Always use the lowest air pressure necessary to get the desired results. Higher pressures cause premature tip and pump wear.

NOTE: To open the air filter/regulator, turn the T-handle in (clockwise). To close the regulator, turn the handle counterclockwise. To lock the regulator setting, tighten the jam nut.

WARNING

COMPONENT RUPTURE HAZARD



To reduce the risk of overpressurizing

your system, which could cause compo-

nent rupture and serious injury, never exceed the specified Maximum Incoming Air Pressure to the pump (see the Technical Data, on page 16).

3. With the pump and lines primed, and with adequate air pressure and volume supplied, the pump will start and stop as you open and close the gun.

Do not allow the pump to run dry. It will quickly accelerate to a high speed, causing damage. If your pump is running too fast, stop it immediately and check the fluid supply. If the container is empty and air has been pumped into the lines, refill the container and prime the pump and the lines, or flush and leave it filled with a compatible solvent. Eliminate all air from the fluid system.

Shutdown and Care of the Pump

To reduce the risk of serious injury whenever you are instructed to relieve pressure, always follow the **Pressure Relief Procedure** on page 9.

For overnight shutdown, stop the pump at the bottom of its stroke to prevent fluid from drying on the exposed displacement rod and damaging the throat packings. **Relieve the pressure.**

Always flush the pump before the fluid dries on the displacement rod. See **Flushing** below.

Flushing

WARNING



FIRE AND EXPLOSION HAZARD Before flushing, read the section **FIRE OR EXPLOSION HAZARD** on page 4. Be sure the entire system and flushing pails are properly grounded. Refer to **Grounding** on page 6.

Flush the pump:

- Before the first use
- When changing colors or fluids
- Before fluid can dry or settle out in a dormant pump (check the pot life of catalyzed fluids)
- Before storing the pump.

Flush with a fluid that is compatible with the fluid you are pumping and with the wetted parts in your system. Check with your fluid manufacturer or supplier for recommended flushing fluids and flushing frequency.

Never leave water or water-base fluid in the pump overnight. If you are pumping water-base fluid, flush with water first, then with a rust inhibitor such as mineral spirits. Relieve the pressure, but leave the rust inhibitor in the pump to protect the parts from corrosion.

WARNING

To reduce the risk of serious injury whenever you are instructed to relieve pressure, always follow the **Pressure Relief Procedure** on page 9.

- 1. Relieve the pressure.
- 2. Remove the tip guard and spray tip from the gun. See the gun instruction manual.
- 3. Place the suction tube (26) in a container of solvent.
- 4. Close the return line valve (7).
- 5. Hold a metal part of the gun firmly to the side of the grounded *metal* pail.
- 6. Start the pump. Always use the lowest possible fluid pressure when flushing.
- 7. Trigger the gun.
- 8. Flush the system until clear solvent flows from the gun.
- 9. Release the gun trigger and lock the trigger safety. The pump should stall against pressure.
- 10. Place the return line tube (10) in a grounded *metal* pail.
- 11. Open the return line valve (7) and flush the return line until clear solvent flows from the return line tube (10).

12. Relieve the pressure.

- 13. Clean the tip guard and spray tip separately, then reinstall them.
- 14. Clean the inside and outside of the suction tube (26) and return line tube (10).

KEY

- 7 Fluid Return Line Valve
- 9 Fluid Return Line
- 10 Fluid Return Tube
- 12 Electrically Conductive Fluid Supply Hose
- 17 Airless Spray Gun

- 24 Suction Hose
- 26 Suction Tube Main Air Line А
- В
 - Bleed-Type Master Air Valve (for accessories)

Q

F Red-Handled Bleed-Type Master Air Valve (required, for pump) Air Line Inlet Swivel G K Packing Nut/Wet-Cup В **Detail of Air Line Connection** and Air Regulation Kit (27) А G 0 26 10

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24

 Δ

Torque to 100-125 ft-lb (135-169 N.m).

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17

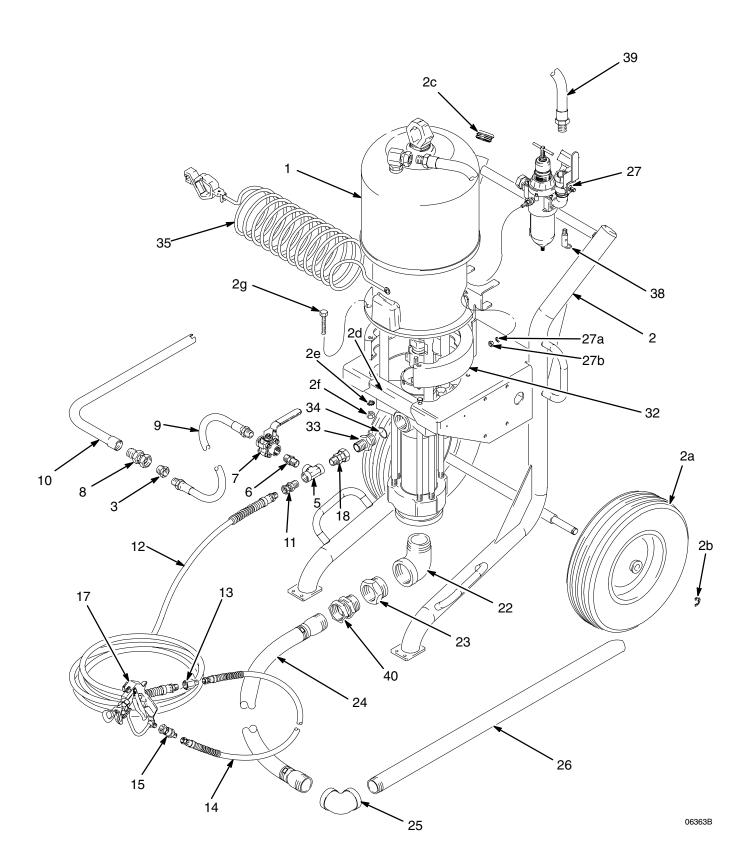
Fig. 3



Parts

Part No. 231131, Series C

20:1 Ratio King[™] Pump with Dura-Flo[™] 2400 Displacement Pump



Parts

Part No. 231131, Series C 20:1 Ratio King[™] Pump with Dura-Flo[™] 2400 Displacement Pump

Ref. No.	Part No.	Description	Qty.	Ref. No.	Part No.	Description	Qty.
1	222832	PUMP, King, 20:1 ratio;		18	113344	UNION, swivel;	
		See manual 308151 for parts	1			1/2 npt(m) x 3/4 npsm(f)	1
2	244530	CART, portable		21	222916	SUCTION KIT	
		Includes replaceable items 2a-2g	1			Includes items 22–26, 40	1
2a	113362	. WHEEL	2	22	100088	. ELBOW, street; 90°;	
2b	113436	. RING, retaining	2			2" npt(m) x 2" npt(f)	1
2c	113361	. CAP	2	23	109505	. BUSHING; 2" npt(m) x 1–1/2" npt(f) 1
2d	191605	. BRACKET	1	24	222914	. HOSE, suction; polyethylene;	
2e	100131	. NUT, full, hex; 3/8–16 unc–2b	4			1–1/2 in. (38 mm) ID;	
2f	100133	. LOCKWASHER; 3/8" size	4			1–1/2" npt (mbe); 8 ft (2.44 m) long	1
2g	100004	. CAPSCREW, hex hd; 3/8-16 unc-2	a;	25	109475	. ELBOW, pipe; 90°; 1–1/2" npt(fbe)	1
		1.25 in. (49 mm) long	4	26	184475	. TUBE, suction; carbon steel;	
3	100896	BUSHING, pipe;				1–1/2" (38 mm) diameter,	
		3/4 npt(m) x 1/2 npt(f)	1			tapered one end; 1–1/2" npt(m);	
5	103475	TEE, pipe; 1/2 npt(f)	1			35.76" (908.4 mm) long	1
6	158491	NIPPLE; 1/2 npt	1	27	244720	AIR REGULATION KIT	
7	102646	BALL VALVE; 1/2 npt (fbe)	1			Includes items 27a–27b	
8	157785	ADAPTER, swivel, straight;				See manual 309341 for parts	1
		3/4 npt(m) x 3/4 npsm(f)	1	27a	108712	. NUT, hex	1
9	235148	HOSE, fluid return; nylon;		27b	107542	. LOCKWASHER	1
		5/8" (16 mm) ID; 1/2 npt (mbe);		31	206994	THROAT SEAL LIQUID;	
		6 ft (1.8 m) long	1			8 oz (0.5 liter); not shown	1
10	165767	TUBE, fluid return; aluminum	1	32	238767	SPACER	1
11	158256	ADAPTER, swivel, straight;		33	184470	FITTING, pump fluid outlet;	
		1/2 npt(m) x 3/8 npsm(f)	1			3/4 npt(m) x M42 x 2.0	1
12	186851	HOSE, fluid; nylon;		34	109213	O-RING; PTFE	1
		3/8" (10 mm) ID; 3/8 npt (mbe);		35	244524	GROUND WIRE AND CLAMP	1
		50 ft (15.2 m) long	1	38	113498	RELIEF VALVE, air;	
13	150287	COUPLING; 1/4 npt(m) x 3/8 npt(f)	1			110 psi (0.8 MPa, 7.6 bar)	1
14	235574	HOSE, fluid; nylon;		39	238374	HOSE, air; 3/4 in. (19 mm) ID;	
		1/4" (6 mm) ID; 1/4 npsm (fbe);				3/4 npt (mbe); 21 in. (533 mm) long	1
		2.4 ft (0.7 m) long	1	40	113864	UNION, swivel; 1–1/2 npt	1
15	189018	SWIVEL, gun	1				
17	238591	AIRLESS SPRAY GUN					
		See manual 308236 for parts	1				

Technical Data

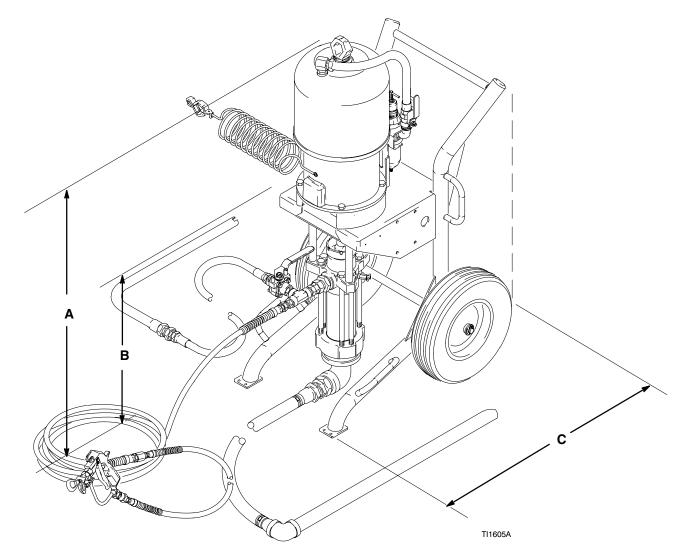
Category	Data
Maximum fluid working pressure	2000 psi (14 MPa, 138 bar)
Maximum air input pressure	100 psi (0.7 MPa, 7 bar)
Ratio	20:1
Pump performance data	See pump manual 308151
Air consumption data	See pump manual 308151
Air inlet size	3/4 npsm(f)
Fluid outlet size (at pump)	3/4 npt(m)
Fluid inlet size	2" npt(f)
Maximum operating temperature	180°F (82°C)
Wetted parts	Pump: See pump manual 308151 Suction Hose and Tube: Nylon, Aluminum Fluid Fittings: Zinc-Plated Malleable Iron, Zinc-Plated Carbon Steel Drain Tube, Fluid Hoses: Nylon

Sound Pressure Levels (dBa)

(tested in accordance with ISO 3744)

		Input Air Pressures at 15 cycles per minute					
Air Motor	40 psi (0.28 MPa, 2.8 bar)	58 psi (0.4 MPa, 4 bar)	70 psi (0.48 MPa, 4.8 bar)	90 psi (0.6 MPa, 6 bar)			
Standard King	79.0 dBa	81.4 dBa	83.0 dBa	90.5 dBa			

Dimensions



Pump Model	A	В	С	Width Across Wheels	Weight
231131	53.6 in. (1361 mm)	28.1 in. (714 mm)	30.7 in. (780 mm)	26 in. (660 mm)	295 lb (134 kg)

Graco Standard Warranty

Graco warrants all equipment manufactured by Graco and bearing its name to be free from defects in material and workmanship on the date of sale by an authorized Graco distributor to the original purchaser for use. With the exception of any special, extended, or limited warranty published by Graco, Graco will, for a period of twelve months from the date of sale, repair or replace any part of the equipment determined by Graco to be defective. This warranty applies only when the equipment is installed, operated and maintained in accordance with Graco's written recommendations.

This warranty does not cover, and Graco shall not be liable for general wear and tear, or any malfunction, damage or wear caused by faulty installation, misapplication, abrasion, corrosion, inadequate or improper maintenance, negligence, accident, tampering, or substitution of non–Graco component parts. Nor shall Graco be liable for malfunction, damage or wear caused by the incompatibility of Graco equipment with structures, accessories, equipment or materials not supplied by Graco, or the improper design, manufacture, installation, operation or maintenance of structures, accessories, equipment or materials not supplied by Graco.

This warranty is conditioned upon the prepaid return of the equipment claimed to be defective to an authorized Graco distributor for verification of the claimed defect. If the claimed defect is verified, Graco will repair or replace free of charge any defective parts. The equipment will be returned to the original purchaser transportation prepaid. If inspection of the equipment does not disclose any defect in material or workmanship, repairs will be made at a reasonable charge, which charges may include the costs of parts, labor, and transportation.

THIS WARRANTY IS EXCLUSIVE, AND IS IN LIEU OF ANY OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO WARRANTY OF MERCHANTABILITY OR WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE.

Graco's sole obligation and buyer's sole remedy for any breach of warranty shall be as set forth above. The buyer agrees that no other remedy (including, but not limited to, incidental or consequential damages for lost profits, lost sales, injury to person or property, or any other incidental or consequential loss) shall be available. Any action for breach of warranty must be brought within two (2) years of the date of sale.

Graco makes no warranty, and disclaims all implied warranties of merchantability and fitness for a particular purpose in connection with accessories, equipment, materials or components sold but not manufactured by Graco. These items sold, but not manufactured by Graco (such as electric motors, switches, hose, etc.), are subject to the warranty, if any, of their manufacturer. Graco will provide purchaser with reasonable assistance in making any claim for breach of these warranties.

In no event will Graco be liable for indirect, incidental, special or consequential damages resulting from Graco supplying equipment hereunder, or the furnishing, performance, or use of any products or other goods sold hereto, whether due to a breach of contract, breach of warranty, the negligence of Graco, or otherwise.

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Graco Information

TO PLACE AN ORDER, contact your Graco distributor, or call one of the following numbers to identify the distributor closest to you: 1–800–367–4023 Toll Free

612–623–6921

612-378-3505 Fax

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