

Husky™ 750 and Husky™ 2000 Surge Suppressors

308703G
ENG

For control of pressure fluctuations and acceleration loss,
preventing cavitation. For professional use only.

120 psi (0.8 MPa, 8 bar) Maximum Air Input Pressure

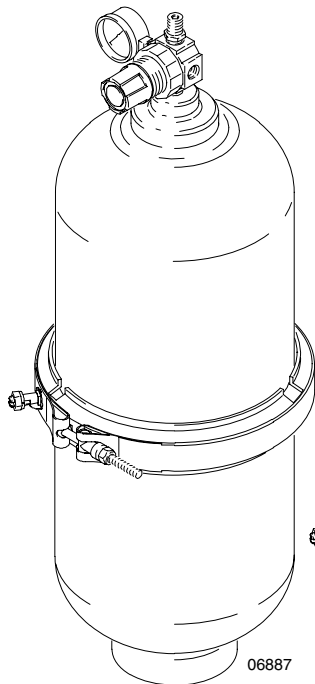
120 psi (0.8 MPa, 8 bar) Maximum Fluid Working Pressure

See the **Model Numbers** on page 12.



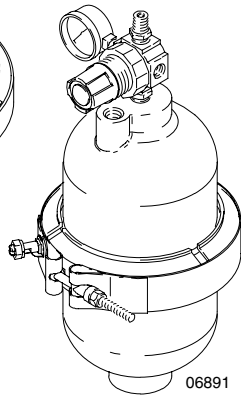
Important Safety Instructions

Read all warnings and instructions in this manual.
Save these instructions.



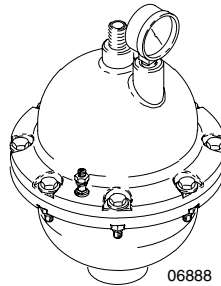
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Model 239088



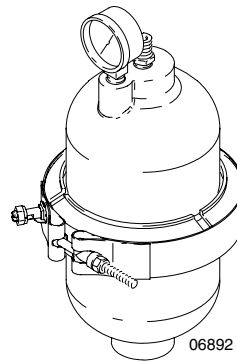
06891

Model 239091



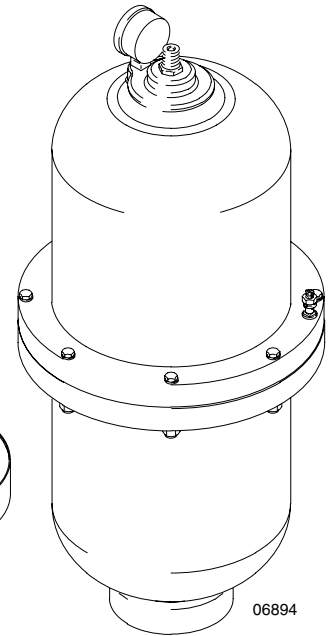
06888

Model 239095



06892

Model 239096



06894

Model 239126

PROVEN QUALITY. LEADING TECHNOLOGY.

Table of Contents

Symbols	2
Warnings	2
Installation	4
Operation	7
Troubleshooting	9
Service	10
Model Numbers	12
Parts Matrix	13
Parts Drawings	14
Dimensions	16
Technical Data	17
Graco Standard Warranty	18
Graco Information	18

Symbols

Warning Symbol



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

Caution Symbol



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

WARNING



INSTRUCTIONS

EQUIPMENT MISUSE HAZARD

Equipment misuse can cause the equipment to rupture or malfunction and result in serious injury.

- This equipment is for professional use only.
- Read all instruction manuals, tags, and labels before operating the equipment.
- Use the equipment only for its intended purpose. If you are not sure, call your Graco distributor.
- Do not alter or modify this equipment. Use only genuine Graco parts and accessories.
- Check equipment daily. Repair or replace worn or damaged parts immediately.
- Do not exceed the maximum working pressure of the lowest rated component in your system. This equipment has a **120 psi (0.8 MPa, 8 bar) maximum working pressure and 120 psi (0.8 MPa, 8 bar) maximum incoming air pressure.**
- **Solvent Compatibility:**
 - Use fluids and solvents which are compatible with the equipment wetted parts.
 - Use only compatible solvents to clean all plastic parts. Many solvents can degrade plastic parts to the point where they could fail.

Refer to the **Technical Data** section of all equipment manuals. Read the fluid and solvent manufacturer's warnings.

- Do not use hoses to pull equipment.
- Do not lift pressurized equipment.
- Comply with all applicable local, state, and national fire, electrical, and safety regulations.
- Do not operate outside the minimum and maximum operating temperature of your surge suppressor unit. See **Minimum and Maximum Operating Temperatures** on page 7.

WARNING



TOXIC FLUID HAZARD

Hazardous fluid or toxic fumes can cause serious injury or death if splashed in the eyes or on the skin, inhaled, 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.
- Pipe and dispose of the exhaust air safely, away from people, animals, and food handling areas. If the diaphragm fails, the fluid is exhausted along with the air.
- **Never** use an acetal pump to pump acids. Take precautions to avoid acid or acid fumes from contacting the pump housing exterior. Stainless steel parts will be damaged by exposure to acid spills and fumes.



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.

- Charge the surge suppressor with compressed air or nitrogen only. **Do not use oxygen. Such use could result in an explosion.**
- Never pump flammable fluids with polypropylene units.
- Ground the equipment. Refer to **Grounding** on pages 4 and 5.
- **Never** use a polypropylene pump or surge suppressor with non-conductive flammable fluids as specified by your local fire protection code. Refer to **Grounding** on pages 4 and 5 for additional information. Consult your fluid supplier to determine the conductivity or resistivity of your fluid.
- If there is any static sparking or you feel an electric shock while using this equipment, **stop pumping 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 pumped.
- Pipe and dispose of the exhaust air safely, away from all sources of ignition.
- Keep the work area free of debris, including solvent, rags, and gasoline.
- Electrically disconnect all equipment in the work area.
- Extinguish all open flames or pilot lights in the work area.
- Do not smoke in the work area.
- Do not turn on or off any light switch in the work area while operating or if fumes are present.
- Do not operate a gasoline engine in the work area.

Installation

Grounding

WARNING



FIRE AND EXPLOSION HAZARD

When pumping flammable fluids, the surge suppressor must be grounded. Before pumping, ground the system as explained below. Also read the section **FIRE OR EXPLOSION HAZARD** on page 3.

*Polypropylene surge suppressors are **not** conductive. Attaching the ground wire to the grounding lug grounds only the clamp or flange (see Fig. 1). When pumping conductive flammable fluids, **always** ground the entire fluid system by making sure the fluid has an electrical path to a true-earth ground.*

To reduce the risk of static sparking, ground the surge suppressor and all other equipment in the pumping area. Check your local electrical code for detailed grounding instructions for your area and type of equipment. **Ground all of this equipment:**

- *Surge suppressor:* Attach a ground wire to the grounding lug (2) as shown in Fig. 1. Connect the clamp end of the ground wire to a true earth ground. *To order a ground wire and clamp, order Part No. 222011.*

NOTE: To connect the ground wire to the surge suppressor, first remove the copper connector from the non-clamp end of the ground wire and discard it, then push the bare wire through the grounding lug on the surge suppressor.

- *Fluid supply container:* Follow your local code.

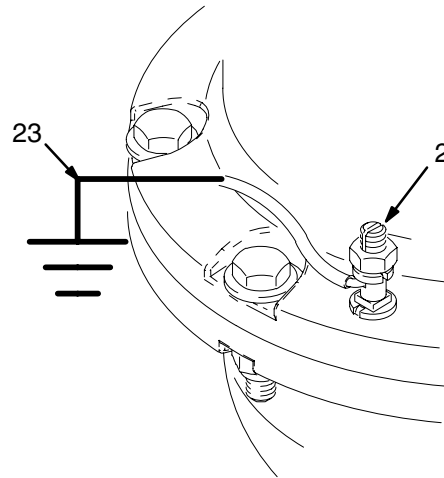


Fig. 1

NOTE: When pumping conductive flammable fluids with a surge suppressor, **always** ground the entire fluid system. See the **WARNING** at left. Fig. 2 shows recommended methods of grounding fluid containers during filling. These are only guides; contact your Graco distributor for assistance in grounding your system.

- *Air compressor:* Follow the manufacturer's recommendations.
- *Solvent pails used when flushing:* Follow your local code. Use only grounded metal pails, which are conductive. Do not place the pail on a non-conductive surface, such as paper or cardboard, which interrupts the grounding continuity.

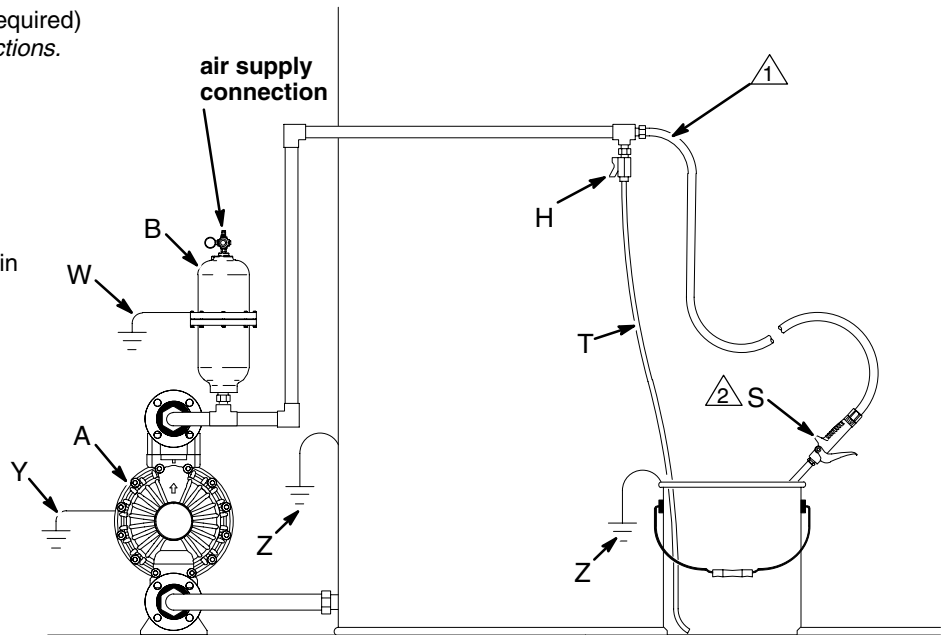
Installation

Grounding a Surge Suppressor

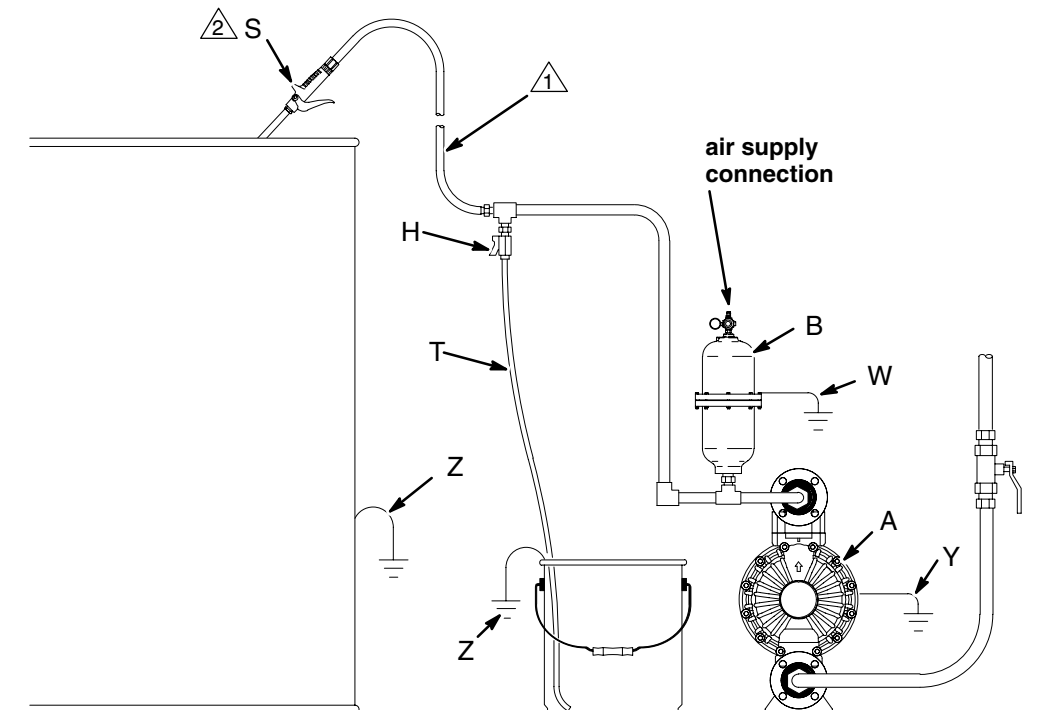
- A Husky pump
- B Husky surge suppressor
- H Fluid drain valve (required)
- S Dispense valve
- T Fluid drain line
- W Surge suppressor ground wire (required)
See page 4 for installation instructions.
- Y Air motor ground wire (required)
- Z Container ground wire (required)

△1 Hose must be conductive.

△2 Dispense valve nozzle must be in contact with the container.



06895



06896A

Fig. 2

Installation

The installations in Fig. 2 are guides for selecting and installing system components. Contact your Graco distributor for assistance in planning a system to suit your needs.

Mounting Automatic and Manual Models

Be sure the mounting surface can support the weight of the pump, surge suppressor, hoses, and accessories, and the stress caused during operation.

- Mount the surge suppressor as close to the pump discharge as possible and upstream of equipment such as valves, meters, filters, and so on. The surge suppressor should be installed within 10 pipe diameters of the pump discharge.
- If you use a flexible connector from the pump to the piping system, the surge suppressor should be mounted to the pump discharge manifold, and the flexible connector should be attached to the surge suppressor tee and system piping.
- Because pressure is equal in all directions, the surge suppressor can be installed in any position, but the vertical position shown in Fig. 2 is recommended for better draining. Fluids with high specific gravity or high viscosity, settling of heavy material, and possible air entrapment further limit the mounting positions other than those shown in Fig. 2.

NOTE: When you mount a plastic surge suppressor, do not overtighten by using a large pipe wrench near the threads of the fluid inlet. The housing may crack if tightened too much. Hand tightening is recommended.

Connecting Automatic Models

- Connect the 1/4-in air supply hose to the 1/4 npt connection on the top of the surge suppressor.
- The air pressure to the surge suppressor must be greater than or equal to the pump discharge and/or system pressure. For equal air pressure, you can use a tee in the pump's air supply line to run an air line to the surge suppressor.
- For models with elastomer bladders, the tee must be located in the pump's air supply line **before** any pump controller or instrumentation such as the filter, regulator, or pump control valve.
- For models with PTFE bellows, the tee must be located in the pump's air supply line **after** any pump controller or instrumentation such as the filter, regulator, or pump control valve.

Connecting Manual Models

- Connect the 1/4-in air supply hose to the brass one-way check valve on the top of the surge suppressor.
- The air pressure to the surge suppressor must be greater than or equal to the pump discharge and/or system pressure. For equal air pressure, you can use a tee in the pump's air supply line to run an air line to the surge suppressor.
- The tee must be located in the pump's air supply line **before** any pump controller or instrumentation such as the filter, regulator, or pump control valve.

Operation

Pressure Relief Procedure

WARNING

PRESSURIZED EQUIPMENT HAZARD

The equipment stays pressurized until pressure is manually relieved. To reduce the risk of serious injury from pressurized fluid, accidental spray from the dispensing device, or splashing fluid, follow this procedure whenever you

- Are instructed to relieve pressure
- Stop pumping
- Check, clean, or service any system equipment
- Install or clean fluid nozzles

1. Stop pumping, and shut off the air to the pump.
2. Relieve pressure in the surge suppressor as follows:
 - For automatic surge suppressors, remove the air pressure gauge, and allow any residual air pressure to escape.
 - For manual surge suppressors, adjust the regulator to relieve the air pressure by dialing down the pressure.

WARNING

TOXIC FLUID HAZARD



Hazardous fluid or toxic fumes can cause serious injury or death if splashed in the eyes or on the skin, inhaled, or swallowed.

- Read **TOXIC FLUID HAZARD** on page 3.
- Use fluids and solvents which are compatible with the equipment wetted parts. Refer to the **Technical Data** section of all equipment manuals. Read the fluid and solvent manufacturer's warnings.

WARNING



FIRE AND EXPLOSION HAZARD

Charge the surge suppressor with compressed air or nitrogen only. **Do not use oxygen.**



Never pump flammable fluids with polypropylene units.

Charging the surge suppressor with oxygen or pumping flammable fluids with polypropylene units could cause a fire or an explosion.

Minimum and Maximum Operating Temperatures

Find the minimum and maximum operating temperatures for your surge suppressor unit in the list below. These temperature limits are stated at zero gauge pressure.

Automatic Husky 750

239095	10° to 180° F (−12° to 82° C)
239096	32° to 175° F (0° to 79° C)
239121	40° to 175° F (4° to 79° C)
239122	32° to 175° F (0° to 79° C)
239123	40° to 220° F (4° to 104° C)
239124	−10° to 350° F (−23° to 176° C)

Automatic Husky 2000

239092	32° to 175° F (0° to 79° C)
239093	32° to 175° F (0° to 79° C)
239126	40° to 175° F (4° to 79° C)
239127	32° to 175° F (0° to 79° C)
239128	40° to 175° F (4° to 79° C)

Manual Husky 750

239090	10° to 180° F (−12° to 82° C)
239091	32° to 175° F (0° to 79° C)
239129	40° to 175° F (4° to 79° C)
239130	32° to 175° F (0° to 79° C)
239131	40° to 220° F (4° to 104° C)
239132	−10° to 350° F (−23° to 176° C)

Manual Husky 2000

239087	32° to 175° F (0° to 79° C)
239088	32° to 175° F (0° to 79° C)
239134	40° to 175° F (4° to 79° C)
239135	32° to 175° F (0° to 79° C)
239136	40° to 175° F (4° to 79° C)

Operation

Charging and Startup

For optimum performance, surge suppressors should be charged to a pressure 2 to 10 psi (0.01 to 0.07 MPa, 0.1 to 0.7 bar) lower than system pressure.

Automatic Models

CAUTION

Automatic surge suppressors must have the air supply connected before you start pumping. Failure to do so could result in the internal air valve puncturing or rupturing the bladder.

The air pressure gauge (1) (See **Parts Drawings** on pages 14 and 15) on automatic surge suppressors remains at zero pressure even after the air line is connected, because the surge suppressor only allows air into the air chamber when it is required to dampen pulsation. After the air supply line is attached to the one-way check valve (8) and air is available, you can start the pump. No further adjustments are necessary.

NOTE: Automatic surge suppressors are not recommended for use as suction stabilizers at the pump inlet or as a surge suppressor at a quick-closing valve. Adjustable surge suppressors should be used for such applications.

Manual Models

CAUTION

Manual surge suppressors must be charged before you start pumping. Failure to do so could result in the internal air valve puncturing or rupturing the bladder.

Before you start the pump, charge the surge suppressor with air line pressure.

1. Start the pump to generate system pressure.
2. As pressure increases to approach working pressure, gradually decrease the regulated air supply pressure into the surge suppressor by adjusting the regulator (4) (See **Parts Drawings** on pages 14 and 15).
3. Wait for up to one minute to allow the system to respond to the adjustment before you make any further adjustments. Generally, pulsation is most effectively minimized when the air supply to the surge suppressor is regulated to 2 to 10 psi (0.01 to 0.07 MPa, 0.1 to 0.7 bar) lower than system pressure.

Troubleshooting

WARNING

To reduce the risk of serious injury whenever you are instructed to relieve pressure, always follow the **Pressure Relief Procedure** on page 7.

Relieve the pressure before checking or servicing the equipment.

Check all possible problems and causes before disassembling the pump.

PROBLEM	CAUSE	SOLUTION
Surge suppressor does not hold pressure.	Manual or automatic models: –Leaking threaded connections –Loose flange bolts or clamp –Failed bladder or bellows –Blocked air line to unit	–Check all threads for leaks. –See Torque Table , page 11. –See Bladder Failure , page 10. –Use 1/4-in air line.
	Automatic models only: –One-way valve at air inlet is installed backwards. –Gauge shows no pressure, and pump is not running.	–Arrow should point toward surge suppressor. –Pressure does not register on gauge until pump is started.
	Manual models only: –Faulty regulator	–Check regulator.
Dampening effect of surge suppressor is not sufficient.	Surge suppressor installed incorrect distance from pump	Surge suppressor should be installed within 10 pipe diameters of pump discharge.
	Improper pressure charge	See Charging and Startup , page 8. Surge suppressor pressure should be 2 to 10 psi (0.01 to 0.07 MPa, 0.1 to 0.7 bar) lower than system pressure.
	Surge suppressor does not hold pressure charge.	See <i>surge suppressor does not hold pressure</i> in PROBLEM column.
	Failed bladder or bellows	See Bladder Failure , page 10.
	Surge suppressor too small for pump	Install larger surge suppressor.
	Automatic models only: Plugged automatic valve	Remove pressure from surge suppressor, and check automatic valve for proper operation as follows: 1. Leave air line attached to top half of surge suppressor. 2. Fill top of surge suppressor with enough water to cover automatic valve. There should be no bubbles. 3. Dump water out, and gently push automatic valve. Air should flow. 4. Replace automatic valve if it is defective.
There is leaking around surge suppressor fluid inlet.	PTFE sealing tape or paste is needed on threads of fluid inlet.	Apply PTFE tape or paste to threads. Do not overtighten plastic models. Hand tightening is recommended.

Service

Bladder Failure

Normal life for bladders can be from a few months to several years, depending upon the harshness of the application. Below are common reasons for failed bladders or bellows:

- *Chemical attack:* Check chemical compatibility charts. Consult your Graco distributor.
- *Cut bladder or bellows:* Check for sharp objects that may have been introduced into the surge suppressor through pumped fluid.
- *Insufficient compressed air charge in surge suppressor during operation:* See **Charging and Startup** on page 8.
- *Surge suppressor too small for the pump:* An undersized surge suppressor will have premature bladder failure. Contact your Graco distributor for assistance in ensuring that you have the correct size surge suppressor.

Replacing Bladder or Bellows

1. Relieve the pressure.

WARNING

To reduce the risk of serious injury whenever you are instructed to relieve pressure, always follow the **Pressure Relief Procedure** on page 7.

2. Remove the clamp band, ring flange, or bolts.
3. Remove the top housing of the surge suppressor.
4. Remove the old bladder or bellows, and replace it with the new bladder or bellows.
Make sure that you properly orient the parts:
 - Install rubber bladders with the concave side facing the top housing, as shown in the **Parts Drawings** on page 14.
 - Install PTFE bellows with the concave side facing the bottom housing, as shown in Model No. 239126 in the **Parts Drawings** on page 15. Install the PTFE encapsulated fluoroelastomer o-rings on each side of the bellows.
5. Replace the top housing of the surge suppressor.
6. Replace the clamp band, ring flange, or bolts, and torque according to the torque specifications in the **Torque Table** on page 11.

Service

Torque Table

Find the proper torque specifications for your surge suppressor unit in the table below. These are the torques to which the clamp band, ring flange, or bolts in bolted units need to be tightened.

KEY: plastic = polypropylene or acetal
 metal = stainless steel
 rubber = fluoroelastomer or Buna-N

Model	Bladder Material	Housing Material	Type of Clamp	Torque
Husky 2000	rubber	plastic	clamp band	45 to 55 in-lb (5.1 to 6.2 N-m)
Husky 2000	rubber	plastic	ring flange	65 to 70 in-lb (7.3 to 7.9 N-m)
Husky 2000	PTFE	plastic	ring flange	90 to 105 in-lb (10.2 to 11.9 N-m)
Husky 2000	rubber	metal and plastic	clamp band	30 to 40 in-lb (3.4 to 4.5 N-m)
Husky 2000	rubber	metal and plastic	ring flange	80 to 85 in-lb (9.0 to 9.6 N-m)
Husky 2000	PTFE	metal and plastic	ring flange	90 to 95 in-lb (10.2 to 10.7 N-m)
Husky 2000	rubber	metal	bolted unit	120 to 130 in-lb (13.6 to 14.7 N-m)
Husky 2000	PTFE	metal	bolted unit	145 to 150 in-lb (16.4 to 16.9 N-m)
Husky 750	rubber	plastic	clamp band	40 to 45 in-lb (4.5 to 5.1 N-m)
Husky 750	rubber	plastic	ring flange	50 to 55 in-lb (5.6 to 6.2 N-m)
Husky 750	PTFE	plastic	clamp band	80 to 85 in-lb (6.8 to 9.6 N-m)
Husky 750	PTFE	plastic	ring flange	85 to 90 in-lb (9.6 to 10.2 N-m)
Husky 750	rubber	metal	bolted unit	80 to 85 in-lb (9.0 to 9.6 N-m)
Husky 750	PTFE	metal	bolted unit	110 to 115 in-lb (12.4 to 13.0 N-m)

Model Numbers

Automatic Husky 750, 3/4-in Surge Suppressors

Polypropylene Wetted Bottom Housing and Non-Wetted Top Housing

239096 with Buna-N bladder
239121 with PTFE bellows
239122 with fluoroelastomer bladder

Stainless Steel Wetted Bottom Housing and Non-Wetted Top Housing

239095 with Buna-N bladder
239123 with PTFE bellows
239124 with fluoroelastomer bladder

Automatic Husky 2000, 2-in Surge Suppressors

Stainless Steel Wetted Bottom Housing, Polypropylene Non-Wetted Top Housing

239093 with Buna-N bladder
239126 with PTFE bellows
239127 with fluoroelastomer bladder

Polypropylene Wetted Bottom Housing and Non-Wetted Top Housing

239092 with Buna-N bladder
239128 with PTFE bellows

Manual Husky 750, 3/4-in Surge Suppressors

Polypropylene Wetted Bottom Housing and Non-Wetted Top Housing

239091 with Buna-N bladder
239129 with PTFE bellows
239130 with fluoroelastomer bladder

Stainless Steel Wetted Bottom Housing and Non-Wetted Top Housing

239090 with Buna-N bladder
239131 with PTFE bellows
239132 with fluoroelastomer bladder

Manual Husky 2000, 2-in Surge Suppressors

Stainless Steel Wetted Bottom Housing, Polypropylene Non-Wetted Top Housing

239088 with Buna-N bladder
239134 with PTFE bellows
239135 with fluoroelastomer bladder

Polypropylene Wetted Bottom Housing and Non-Wetted Top Housing

239087 with Buna-N bladder
239136 with PTFE bellows

Parts Matrix

Replacement Parts for Husky™ 750 and Husky™ 2000 Surge Suppressors, Series A

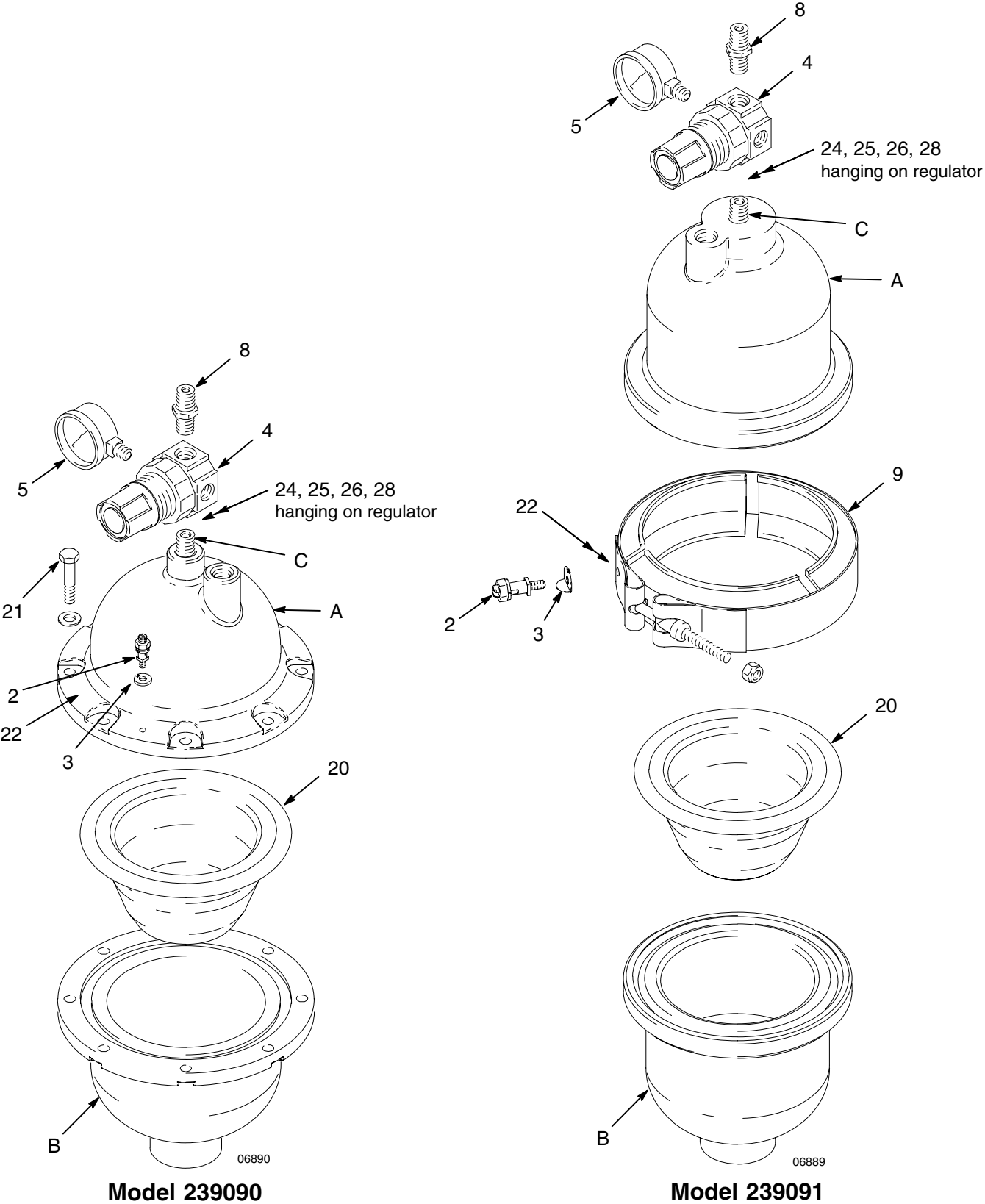
Parts			Surge Suppressor Models																			
			Automatic Husky 750					Automatic Husky 2000					Manual Husky 750					Manual Husky 2000				
			2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NOTE: The quantity of every part in this list is 1 for every model. The X's indicate the parts that are included in each model.																						
Ref																						
No. Part No. Description																						
1 100960 GAUGE, air press.;200 psi (1.4 MPa, 14 bar); 1/4 npt	X	X	X	X	X	X	X	X	X	X	X											
2 104029 LUG, grounding	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
3 104582 WASHER, tab	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
4 110318 REGULATOR, air; 1/4 npt												X	X	X	X	X	X	X	X	X	X	
5 110319 GAUGE, air press., 200 psi (1.4 MPa, 14 bar); 1/8 npt												X	X	X	X	X	X	X	X	X	X	
6 113872 CLAMP, band; SST							X	X		X								X	X		X	
7 113878 BELLOWS, PTFE with o-ring kit									X		X									X	X	
8 113879 VALVE, check	X	X		X		X	X	X		X		X	X	X	X	X	X	X	X	X	X	
9 113880 CLAMP, band; SST		X		X									X		X							
10 113881 FLANGE, ring, with fasteners									X		X									X	X	
11 113882 VALVE ASSY, automatic for rubber bladders							X	X	X	X	X											
13 113884 FLANGE, ring, with fasteners			X											X								
14 113885 BLADDER, Buna-N							X	X										X	X			
15 113886 BELLOWS; PTFE with o-ring kit			X		X									X		X						
16 113887 VALVE ASSY, automatic for rubber bladders	X	X	X	X	X	X																
18 113889 BLADDER; fluoroelastomer										X											X	
19 113890 BLADDER; fluoroelastomer				X		X									X		X					
20 113891 BLADDER, Buna-N	X	X										X	X									
21 113923 BOLT, WASHER, NUT SET	X				X	X						X						X	X			
22 186620 STICKER, grounding symbol	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
24 290306 LABEL, identification	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
25 290322 LABEL, warning	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
26 290323 LABEL, product	X	X	X	X	X	X						X	X	X	X	X	X					
27 290324 LABEL, product							X	X	X	X	X							X	X	X	X	
28 290384 LABEL, caution	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	

Non-Replacement Parts for Husky™ 750 and Husky™ 2000 Surge Suppressors, Series A

- A Top housing (See **Model Numbers** list on page 12 for housing material of each model)
- B Bottom housing (See **Model Numbers** list on page 12 for housing material of each model)
- C Close nipple, SST; 1/4"

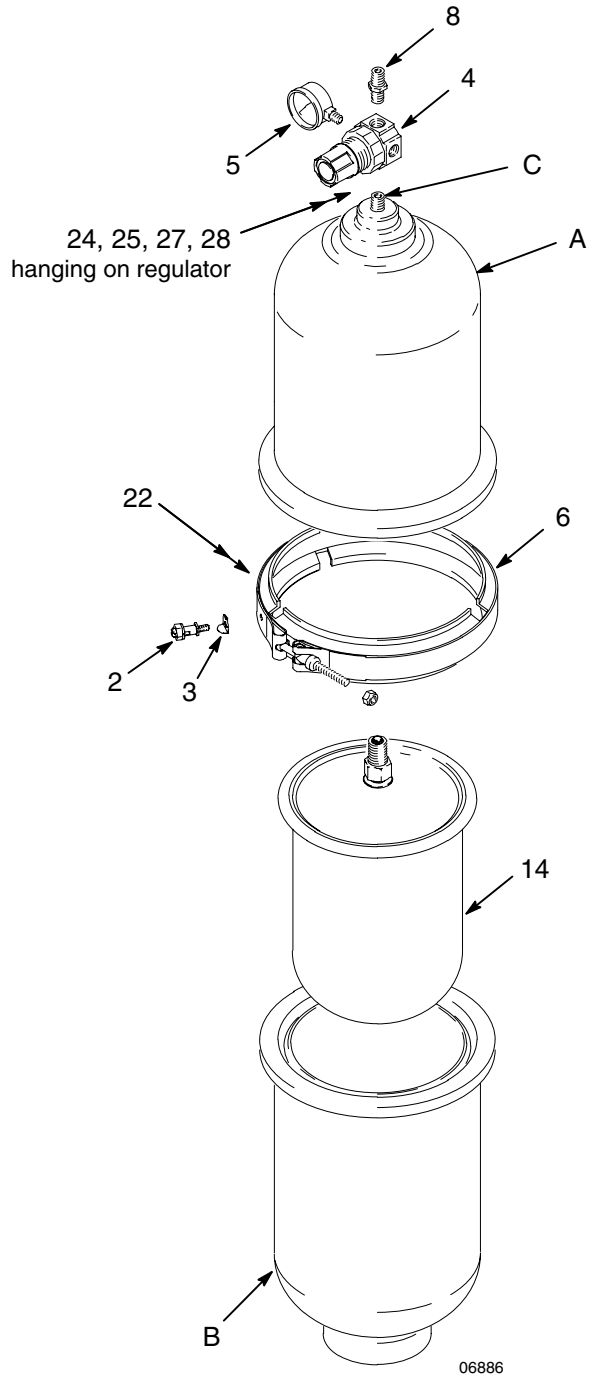
Parts Drawings

(see Parts Matrix on page 13)

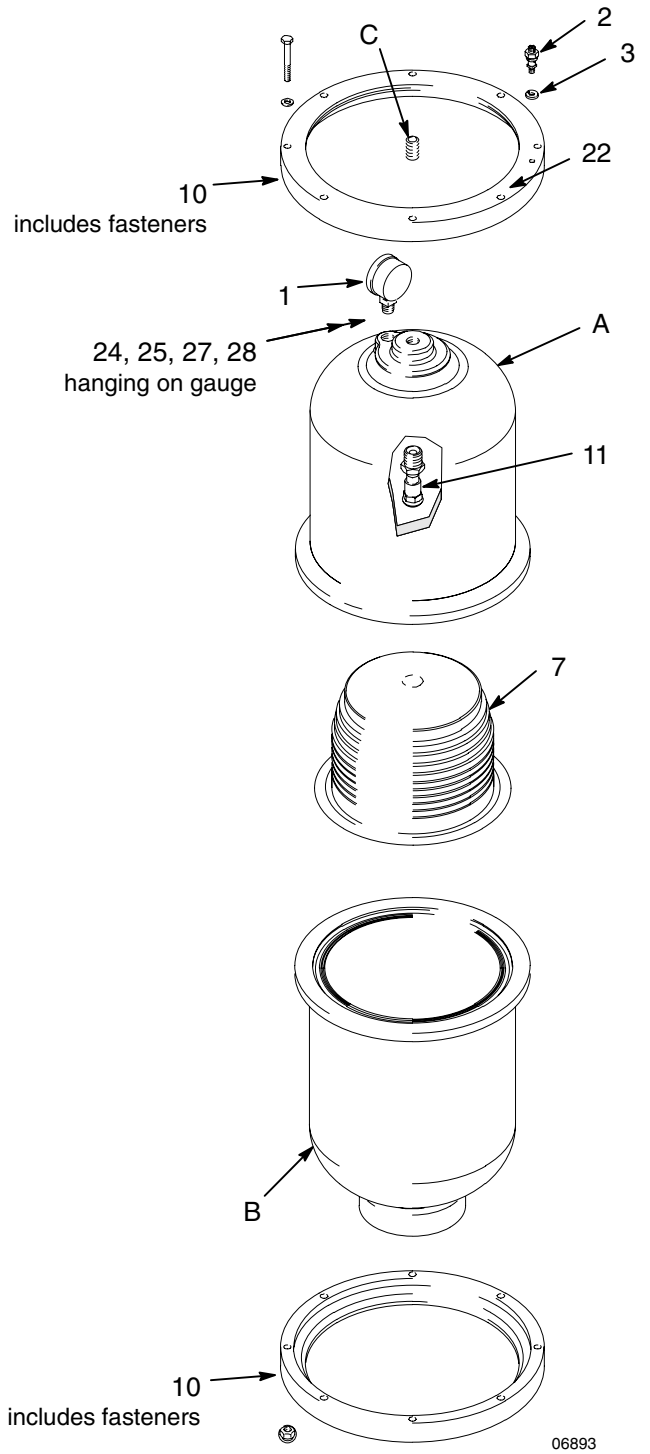


Parts Drawings

(see Parts Matrix on page 13)



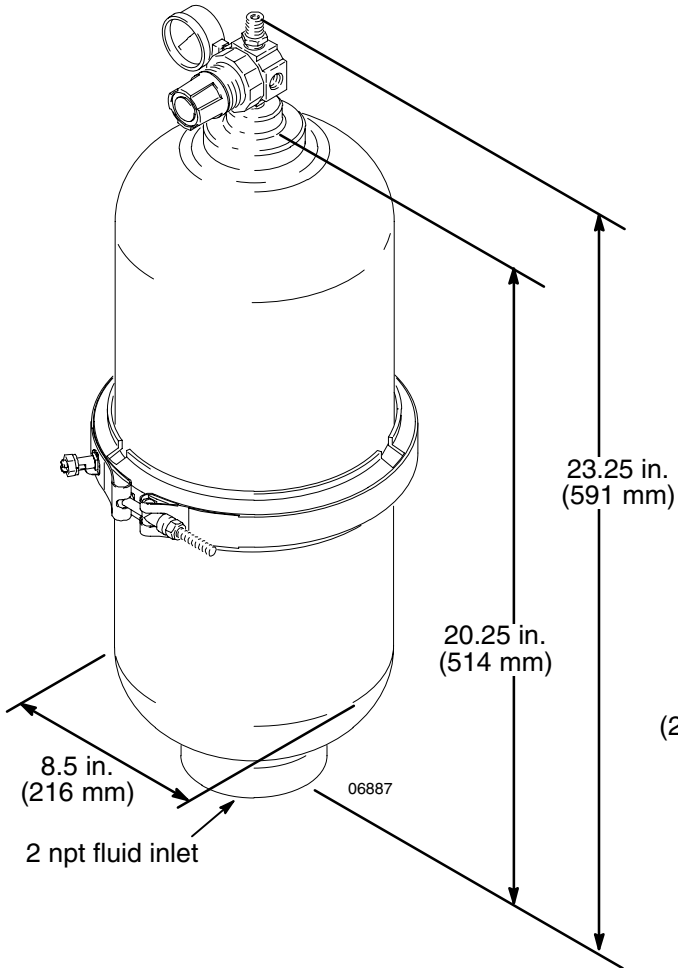
Model 239088



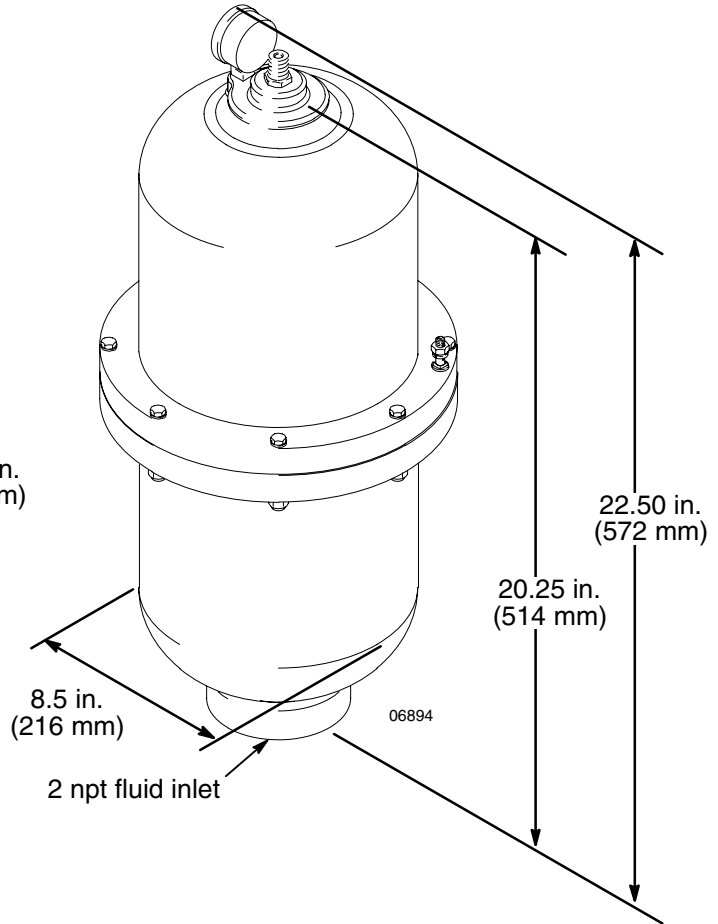
Model 239126

Dimensions

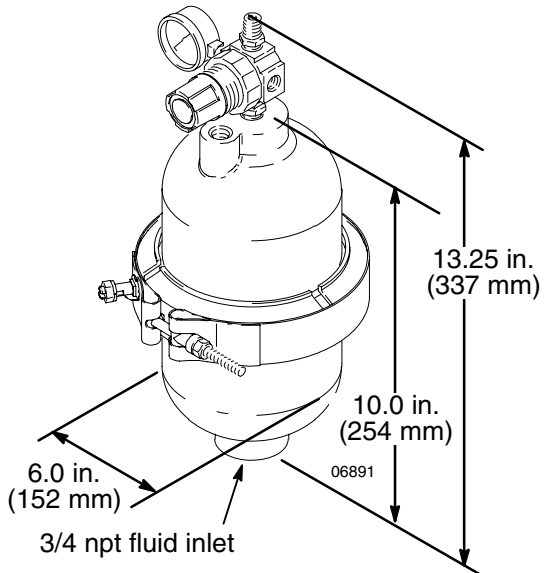
Manual Husky 2000
239088 shown



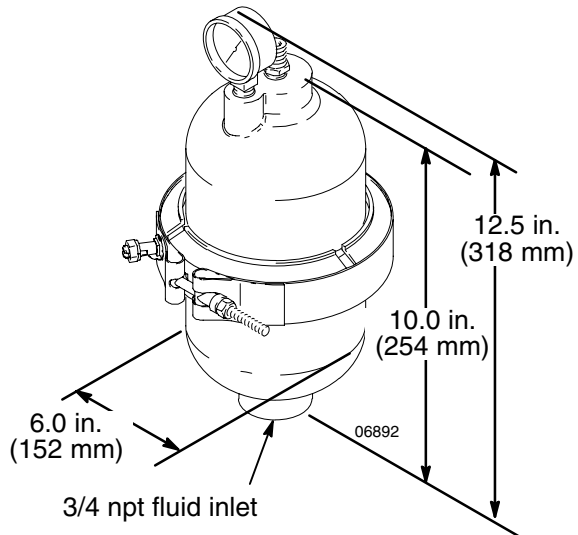
Automatic Husky 2000
239126 shown



Manual Husky 750
239091 shown



Automatic Husky 750
239096 shown



Technical Data

Maximum air input pressure	120 psi (0.8 MPa, 8 bar)
Air line connection	1/4 npt
Fluid Inlet size	
Husky 2000 models	2 npt
Husky 750 models	3/4 npt
Wetted and non-wetted parts	See the Model Numbers list on page 12.
Weight	
Models 239091, 239096, 239121, 239122, 239129, and 239130	9 lb (4.1 kg)
Models 239090, 239095, 239123, 239124, 239131, and 239132	16 lb (7.3 kg)
Models 239088, 239093, 239126, 239127, 239134, and 239135	36 lb (16.3 kg)
Models 239087, 239092, 239128, and 239136	18 lb (8.2 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.

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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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For the latest information about Graco products, visit www.graco.com.

TO PLACE AN ORDER, contact your Graco distributor or call to identify the distributor closest to you:

Phone: 612-623-6921 or **Toll Free:** 1-800-328-0211 **Fax:** 612-378-3505

All written and visual data contained in this document reflects the latest product information available at the time of publication. Graco reserves the right to make changes at any time without notice.

Original instructions. This manual contains English. MM 308703

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