MANUAL ELECTROSTATIC

PRO™ Xs3 and PRO™ Xs4
Air Spray Guns

100 psi (0.7 MPa, 7 bar) Maximum Air Inlet Pressure
100 psi (0.7 MPa, 7 bar) Maximum Working Fluid Pressure

See page 3 for a List of Models

U.S. Patent Pending

For use with Class I Group D spray materials.

For use with Class II 2 G spray materials.

0.24 Mj
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<th>Part No.</th>
<th>Model</th>
<th>Smart Display</th>
<th>Type of Coatings</th>
<th>Operation Manual</th>
</tr>
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<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Standard</td>
<td></td>
</tr>
<tr>
<td>244400</td>
<td>PRO Xs3</td>
<td></td>
<td></td>
<td></td>
</tr>
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<td>244579</td>
<td>PRO Xs3</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>244575</td>
<td>PRO Xs3</td>
<td></td>
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<td>244576</td>
<td>PRO Xs3</td>
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<td>244401</td>
<td>PRO Xs4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>244580</td>
<td>PRO Xs4</td>
<td>X</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Symbols

**Warning Symbol**

![WARNING](image)

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

**Caution Symbol**

![CAUTION](image)

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

**Fire, Explosion, and Electric Shock Hazard**
Improper grounding, poor air ventilation, open flames, or sparks can cause a hazardous condition and result in a fire, explosion, or electric shock.

- Electrostatic equipment must be used only by trained, qualified personnel who understand the requirements in this manual.
- Ground the equipment, all personnel in or close to the spray area, the object being sprayed, and all conductive objects in the spray area. See “Grounding”, page 12.
- Check gun resistance daily. See “Test Gun Resistance” on page 18.
- If there is any static sparking while using the equipment, stop spraying immediately. Identify and correct the problem.
- Provide fresh air ventilation to avoid buildup of flammable or toxic vapors. Interlock the gun air supply to prevent operation unless ventilating fans are on. See “Ventilate the Spray Booth” on page 7.
- Use solvents that comply with local regulations. Flash point should be higher than 100°F (38°C).
- Do not flush with the gun electrostatics on. Do not turn on the gun electrostatics until all solvent is removed from the system.
- Keep the spray area free of debris and rags. Do not store solvent and flammable fluids in the spray area.
- Eliminate all ignition sources such as pilot lights, cigarettes, and static arcs from plastic drop cloths. Do not plug in or unplug power cords or turn lights on or off in the spray area.
- Use only non-sparking tools to clean residue from the booth and hangers.

**Toxic Fluid Hazard**
Hazardous fluids or toxic fumes can cause a serious injury or death if splashed in the eyes or on the skin, swallowed, or inhaled.

- Know the specific hazards of the fluid you are using. Read the fluid manufacturer’s warnings.
- Store hazardous fluid in an approved container. Dispose of the hazardous fluid according to all local, state, and national guidelines.
- Wear appropriate protective clothing, gloves, eyewear, and respirator.
### Equipment Misuse Hazard

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

- This equipment is for professional use only.
- Read all manuals, tags, and labels before operating the equipment.
- Use the equipment only for its intended purpose. If you are uncertain, call your Graco distributor.
- Do not alter or modify equipment. Use only genuine Graco parts and accessories.
- Check the equipment daily. Repair or replace worn or damaged parts immediately.
- Do not exceed the maximum working pressure of the lowest rated system component. Maximum working air and fluid pressure of this equipment is 100 psi (0.7 MPa, 7.0 bar).
- Use fluids and solvents that are compatible with the equipment wetted parts. See the **Technical Data** section of all equipment manuals. Read the fluid and solvent manufacturer’s warnings.
- Route the hoses away from traffic areas, sharp edges, moving parts, and hot surfaces. Do not expose Graco hoses to temperatures above 180°F (82°C) or below -40°F (-40°C).
- Wear hearing protection when operating this equipment.
- Comply with all applicable local, state, and national fire, electrical, and other safety regulations.

### Pressurized Equipment Hazard

Spray from the gun, hose leaks, or ruptured components can splash fluid in the eyes or on the skin and cause serious injury.

- Do not point the spray gun at anyone or at any part of the body.
- Do not stop or deflect fluid leaks with your hand, body, glove, or rag.
- Follow the “**Pressure Relief Procedure**”, page 24, when you stop spraying and before cleaning, checking, or repairing equipment.
- Check hoses and couplings daily. Replace worn, damaged, or loose parts immediately.
- Tighten all fluid connections before each use.
Introduction

How the Electrostatic Air Spray Gun Works

The air hose supplies air to the spray gun. Part of the air operates the turbine and the rest of the air atomizes the fluid being sprayed. The turbine generates power, which is converted by the power cartridge to supply high voltage current to the gun’s electrode.

The pump supplies fluid to the hose and gun, where the fluid is electrostatically charged as it passes the electrode. The charged fluid is attracted to the grounded workpiece, wrapping around and evenly coating all surfaces.

Gun Overview

The electrostatic gun includes the following controls (see Fig. 1).

- **FLUID adjustment valve.** Adjusts fluid rod travel. Use only in low flow conditions, to reduce wear.

- **Fan AIR adjustment valve.** Adjusts fan size and shape.

- **Atomizing air RESTRICTOR valve.** Restricts atomizing air flow. Replace with plug (included) if desired.

- **ES ON/OFF valve.** Turns electrostatics ON (I) or OFF (0).

- **ES INDICATOR (standard gun only).** Green when ES is ON (I).

- **Voltage/current DISPLAY (smart models only).** Shows voltage (V) and current (A). Green=spray, yellow/red=see Troubleshooting, page 23.

- **ES HI/LO switch (smart models only).** Sets voltage to HI or LO (factory settings).

- **LO VOLTAGE adjustment (smart models only).** Remove plug to adjust to four settings.

Fig. 1. Gun Overview
Installation

Install the System

**WARNING**

**Fire, Explosion, and Electric Shock Hazard**

Installing and servicing this equipment requires access to parts which may cause electric shock or other serious injury if work is not performed properly.

- Do not install or service this equipment unless you are trained and qualified.
- Be sure your installation complies with National, State and Local codes for the installation of electrical apparatus in a Class I, Group D or a Class II 2G Hazardous Location.
- Comply with all applicable local, state, and national fire, electrical, and other safety regulations.

Fig. 2 shows a typical electrostatic air spray system. It is not an actual system design. For assistance in designing a system to suit your particular needs, contact your Graco distributor.

**Warning Sign**

Mount warning signs in the spray area where they can easily be seen and read by all operators. An English Warning Sign is provided with the gun.

**Ventilate the Spray Booth**

**WARNING**

**Flammable or Toxic Vapor Hazard**

Provide fresh air ventilation to avoid the buildup of flammable or toxic vapors. Do not operate the gun unless ventilation fans are operating.

Electrically interlock the gun air supply with the ventilators to prevent gun operation without ventilating fans operating. Check and follow all National, State, and Local codes regarding air exhaust velocity requirements.

**NOTE:** High velocity air exhaust will decrease the operating efficiency of the electrostatic system. Air exhaust velocity of 100 ft/min (31 linear meters/minute) should be sufficient.
Fig. 2. Typical Installation

Key

A  Main Air Supply Line
B*  Ventilation Fan Interlock Solenoid Valve
C*  Main Air Supply Shutoff Valve (bleed-type)
D  Pump Air Line Filter/Water Separator
E*  Pump Air Supply Shutoff Valve (bleed-type)
F  Air Line Lubricator
G  Air Pressure Regulator
H  Pump
J*  Pump Ground Wire
K  Fluid Filter
L  Fluid Supply Line Shutoff Valve
M  Fluid Pressure Regulator
N  Fluid Supply Line
O  Gun Air Line Filter/Water Separator
P  Gun Air Supply Line Shutoff Valve
Q*  Air Hose Ground Wire
R*  Graco Grounded Air Hose
S  Electrostatic Air Spray Gun
T  Air Line Drain Valve
U*  Fluid Drain Valve
V  Gun Air Inlet
W  Gun Fluid Inlet

* Required for safe operation. Must be purchased separately. **NOTE:** Solenoid valve (B) is not offered as a Graco accessory.
Connect the Air Line

1. Connect the Graco Grounded Air Supply Hose (R) between the air supply line and the gun’s air inlet (V). The gun air inlet fitting has a left-hand thread. Connect the air supply hose ground wire (Q) to a true earth ground.

2. Install an air line filter/water separator (O) on the gun air line to ensure a dry, clean air supply to the gun. Dirt and moisture can ruin the appearance of your finished workpiece and can cause the gun to malfunction.

3. Install a bleed-type air regulator (G) on the pump and gun air supply lines to control air pressure to the pump and gun.

4. Install a bleed-type air valve (E) on the pump air line to shut off air to the pump. Install an additional bleed-type air valve (C) on the main air line (A) to isolate the accessories for servicing.

5. Install an air shutoff valve (P) on each gun air supply line to shut off air to the gun(s).

Connect the Exhaust Tube

Press the exhaust tube (38) onto the barbed adapter on the bottom of the gun handle. Secure the tube with the clamp (39).
Connect the Fluid Line

1. Before connecting the fluid line (N), blow it out with air and flush it with solvent. Use solvent which is compatible with the fluid to be sprayed.

2. Install a fluid regulator (M) on the fluid line to control fluid pressure to the gun.

3. Install a fluid filter (K) and drain valve (U) at the pump outlet.

4. Connect the fluid line to the 3/8 npsm gun fluid inlet (W).

5. Before running any paint through the spray gun, flush it out with a compatible solvent.

Filter the Fluid

Install a fluid filter (K) to remove particles and sediment which could clog the spray nozzle.

Select a Fluid Nozzle and Air Cap

![WARNING]

Pressurized Equipment Hazard

The fluid drain valve (U) is required in your system to assist in relieving fluid pressure in the displacement pump, hose, and gun. Triggering the gun to relieve pressure may not be sufficient. Install a drain valve close to the pump’s fluid outlet. The drain valve reduces the risk of serious injury, including splashing in the eyes or on the skin.

The gun is supplied with Part No. 197266 Nozzle and 197477 Air Cap. If you require a different size, refer to Table 1 and Table 2, and instruction manual 309419, or consult with your Graco distributor. See “Air Cap/Nozzle Replacement” on page 26.

Table 1: Fluid Nozzles

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Size, mm (in.)</th>
<th>Part No.</th>
<th>Size, mm (in.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>197263</td>
<td>0.75 (.030)</td>
<td>197266</td>
<td>1.5 (.055)</td>
</tr>
<tr>
<td>197264</td>
<td>1.0 (.042)</td>
<td>197267</td>
<td>1.8 (.070)</td>
</tr>
<tr>
<td>197265</td>
<td>1.2 (.047)</td>
<td>197268</td>
<td>2.0 (.080)</td>
</tr>
</tbody>
</table>

Table 2: Air Caps

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Pattern Shape and Length in. (mm)</th>
<th>Recommended Fluids and Production Rates</th>
</tr>
</thead>
<tbody>
<tr>
<td>197477</td>
<td>Round end; 15-17 (381-432)</td>
<td>Light to medium viscosity. Medium to high production.</td>
</tr>
<tr>
<td>197478</td>
<td>Round end; 15-17 (381-432)</td>
<td>Light to medium viscosity. Low to medium production.</td>
</tr>
<tr>
<td>197479</td>
<td>Tapered end; 13-15 (330-381)</td>
<td>Light to medium viscosity. Medium to high production.</td>
</tr>
<tr>
<td>197480</td>
<td>Round end; 16-18 (406-457)</td>
<td>Medium to high viscosity and high solids. Low to medium production.</td>
</tr>
<tr>
<td>197481</td>
<td>Tapered end; 17-19 (432-483)</td>
<td>Medium to high viscosity and high solids. Medium to high production. For use with 2.0 mm nozzle.</td>
</tr>
</tbody>
</table>
**244919 HC Conversion Kit**

Part No. 244919 Conversion Kit is available to convert PRO Xs3 standard coating guns (Part Nos. 244400 and 244579) to high conductivity guns (244575 and 244576).

The kit is for use with fluids with low resistivity values.

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**WARNING**

**Pressurized Equipment Hazard**

To reduce the risk of an injury, follow the “Pressure Relief Procedure” on page 24 before installing this kit.

---

1. Turn the ES ON/OFF valve OFF.
2. Flush and relieve the pressure.
3. Disconnect the fluid and air lines to the gun.
4. Remove the fluid tube (14) and fittings. Refer to the parts drawing for your gun.
5. Remove the fluid inlet bracket (13).
6. Install the new bracket from the kit loosely.
7. Place the spacer (5) in the barrel inlet. Apply Graco dielectric grease (40) to o-ring (49a) and to both threads of fluid fitting (49). Thread the fitting into the barrel inlet. See Fig. 3.
8. Thread the nut (50d) onto the fitting (49). Make sure the ferrules (50c and 50b) are on the tube (50a) and are seated on the fitting (49) before tightening the nut.
9. Slide the tube case (50e) onto the barrel inlet, over the o-ring (49b). The coiled tube (50a) will compress slightly.
10. Insert the end of the coiled tube (50a) into the bracket. Make sure the ferrules (50c, 50b) seat on the bracket. Secure the bracket by tightening the swivel. Tighten the nut (50d).

---

![Fig. 3. HC Conversion Kit](image-url)
Grounding

**WARNING**

**Fire, Explosion, and Electric Shock Hazard**

When operating the electrostatic gun, any ungrounded objects in the spray area (people, containers, tools, etc.) can become electrically charged. Improper grounding can result in static sparking, which can cause a fire, explosion, or electric shock. Follow the grounding instructions below.

The following are minimum grounding requirements for a basic electrostatic system. Your system may include other equipment or objects which must be grounded. Check your local electrical code for detailed grounding instructions. Your system must be connected to a true earth ground.

- **Pump:** ground the pump by connecting a ground wire and clamp as described in your separate pump instruction manual.

- **Electrostatic Air Spray Gun:** ground the gun by connecting the Graco Grounded Air Hose and connecting the air hose ground wire to a true earth ground. See “Check Electrical Grounding”, page 13.

- **Air compressors:** ground the equipment according to the manufacturer’s recommendations.

- **All air and fluid lines** must be properly grounded. Use only grounded hoses with a maximum of 100 feet (30.5 m) combined hose length to ensure grounding continuity.

- **All persons entering the spray area:** shoes must have conductive soles, such as leather, or personal grounding straps must be worn. Do not wear shoes with non-conductive soles such as rubber or plastic. If gloves are worn, cut off fingers or cut out palm area, to ensure your hand contacts the grounded gun handle.

- **Object being sprayed:** keep the workpiece hangers clean and grounded at all times. Resistance must not exceed 1 megohm.

- **The floor of the spray area:** must be electrically conductive and grounded. Do not cover the floor with cardboard or any non-conductive material which would interrupt grounding continuity.

- **Flammable liquids in the spray area:** must be kept in approved, grounded containers. Do not use plastic containers. Do not store more than the quantity needed for one shift.

- **All electrically conductive objects or devices in the spray area:** including fluid containers and wash cans, must be properly grounded.
Check Electrical Grounding

3. Turn off the air and fluid supply to the gun. The fluid hose must not have any fluid in it.

4. Make sure the grounded air hose (R) is connected and the hose ground wire is connected to a true earth ground.

5. Measure the resistance between the gun handle (BB) and a true earth ground (CC). Use an applied voltage of 500 minimum to 1000 volts maximum. The resistance should not exceed 1 megohm. See Fig. 4.

6. If the resistance is greater than 1 megohm, check the tightness of the ground connections and be sure the air hose ground wire is connected to a true earth ground. If the resistance is still too high, replace the air hose.

Fig. 4. Check Gun Grounding

**WARNING**

Fire, Explosion, and Electric Shock Hazard

Megohmmeter Part No. 241079 (AA—see Fig. 4) is not approved for use in a hazardous area. To reduce the risk of sparking, do not use the megohmmeter to check electrical grounding unless:

- The gun has been removed from the hazardous area;
- Or all spraying devices in the hazardous area are turned off, ventilation fans in the hazardous area are operating, and there are no flammable vapors in the area (such as open solvent containers or fumes from spraying).

Failure to follow this warning could cause fire, explosion, and electric shock and result in serious injury and property damage.

1. Have a qualified electrician check the electrical grounding continuity of the spray gun and air hose.

2. Turn the ES ON/OFF valve OFF.
Check Fluid Resistivity

Graco Part No. 722886 Resistance Meter and 722860 Probe are available as accessories to check that the resistivity of the fluid being sprayed meets the requirements of an electrostatic air spray system.

Follow the instructions included with the meter and probe. Readings of 25 megohms-cm and above provide the best electrostatic results.

Check Fluid Viscosity

To check fluid viscosity you will need:

- a viscosity cup
- a stopwatch.

1. Completely submerge the viscosity cup in the fluid. Lift the cup out quickly, starting the stopwatch as soon as the cup is completely removed.

2. Watch the stream of fluid coming from the bottom of the cup. As soon as there is a break in the stream, shut off the stopwatch.

3. Record the fluid type, elapsed time, and size of the viscosity cup.

4. If the viscosity is too high or too low, contact the material supplier. Adjust as necessary.

WARNING

Fire, Explosion, and Electric Shock Hazard

Check the fluid resistivity in a non-hazardous area only. Resistance Meter 722886 and Probe 722860 are not approved for use in a hazardous area.

Failure to follow this warning could cause fire, explosion, or electric shock and result in serious injury and property damage.
Low Voltage Adjustment (Smart Guns Only)

The ES HI/LO switch enables you to switch between full voltage and a lower voltage output. The lower voltage is factory set, but can be adjusted.

1. Set the ES HI/LO switch to LO.

2. Remove the LO VOLTAGE adjustment plug (53). Set the desired voltage, using a small screwdriver to slide switches 1 and 2 ON or OFF, according to Table 3. Also see Fig. 5.

### Table 3: Low Voltage Adjustment

<table>
<thead>
<tr>
<th>Switches</th>
<th>60 kV Guns</th>
<th>85 kV Guns</th>
</tr>
</thead>
<tbody>
<tr>
<td>ON</td>
<td>ON</td>
<td>50</td>
</tr>
<tr>
<td>ON</td>
<td>OFF</td>
<td>40</td>
</tr>
<tr>
<td>OFF</td>
<td>ON</td>
<td>35</td>
</tr>
<tr>
<td>OFF</td>
<td>OFF</td>
<td>30</td>
</tr>
</tbody>
</table>

Fig. 5. Low Voltage Adjustment Switches
Flush the Spray Gun

Flush the gun before changing colors, at the end of the day, before storing, and before repairing the gun.

1. Turn the ES ON/OFF valve OFF.

2. Relieve the pressure.

3. Change the fluid source to solvent, or disconnect the fluid line and connect a solvent supply line to the gun.

4. Point the gun into a grounded metal pail. Flush until clean solvent flows from the gun.

**WARNING**

**Fire, Explosion, and Electric Shock Hazard**

To reduce the risk of fire, explosion, or electric shock, turn the ES ON/OFF valve OFF before flushing the gun.

**CAUTION**

Flush the gun with a non-conductive, compatible solvent. Conductive solvents can cause the gun to malfunction.

Do not use methylene chloride as a flushing or cleaning solvent with this gun as it will damage nylon components.

**WARNING**

**Pressurized Equipment Hazard**

To reduce the risk of an injury, follow the “Pressure Relief Procedure” on page 24 whenever you are instructed to relieve the pressure.

Refer to the gun operation manual (supplied) for Daily Care and Cleaning procedures.
5. Relieve the pressure.

6. Shut off or disconnect the solvent line.

7. Hang the gun from its hook, with the nozzle pointing down.

8. When ready to spray again, reconnect the fluid supply line. Follow the Setup procedure in the Operation Manual.
Electrical Tests

Electrical components inside the gun affect performance and safety. The following procedures test the condition of the power supply (18) and electrode (29), and electrical continuity between components.

Use megohmmeter Part No. 241079 (AA) and an applied voltage of 500 V. Connect the leads as shown.

Test Gun Resistance

1. Flush and dry the fluid passage.

2. Measure resistance between the electrode needle tip (29) and the air swivel (35); it should be 117-137 megohms for the PRO Xs3, and 156-180 megohms for the PRO Xs4. If outside this range, go to the next test. If in range, refer to “Electrical Troubleshooting” on page 23 for other possible causes of poor performance.

**WARNING**

Fire, Explosion, and Electric Shock Hazard

Megohmmeter Part No. 241079 (AA-see Fig. 6) is not approved for use in a hazardous area. To reduce the risk of sparking, do not use the megohmmeter to check electrical grounding unless:

- The gun has been removed from the hazardous area;
- Or all spraying devices in the hazardous area are turned off, ventilation fans in the hazardous area are operating, and there are no flammable vapors in the area (such as open solvent containers or fumes from spraying).

Failure to follow this warning could cause fire, explosion, and electric shock and result in serious injury and property damage.

Fig. 6. Test Gun Resistance
**Test Power Supply Resistance**

1. Remove the power supply (18), page 30.

2. Remove the turbine alternator (19) from the power supply, page 31.

3. Measure resistance from the power supply’s ground strips (EE) to the spring (18b). See Fig. 7.

4. The resistance should be 95-105 megohms for the PRO Xs3, and 135-150 megohms for the PRO Xs4. If outside this range, replace the power supply. If in range, proceed to the next test.

5. If you still have problems, refer to “Electrical Troubleshooting” on page 23 for other possible causes of poor performance, or contact your Graco distributor.

6. Be sure the spring (18b) is in place before reinstalling the power supply.
Test Electrode Resistance

1. Insert a conductive rod (B) into the gun barrel (removed for the power supply test) and against the metal contact (C) in the front of the barrel.

2. Measure the resistance between the conductive rod (B) and the electrode (29). The resistance should be 20-30 megohms. See Fig. 8.

3. If in range, refer to “Electrical Troubleshooting” on page 23 for other possible causes of poor performance, or contact your Graco distributor.

4. Remove the electrode (29), page 27. Measure the resistance between the contact (E) and the electrode wire (F). The resistance should be 20-30 megohms. If out of range, replace the electrode. See Fig. 9.

5. Make sure the metal contact (C) in the barrel, the nozzle contact ring (7a, Fig. 10), and the electrode contact (E) are clean and undamaged.

Fig. 8. Test Electrode Resistance

Fig. 9. Electrode

Fig. 10. Nozzle Conductive O-Ring
WARNING

Electric Shock Hazard

Installing and servicing this equipment requires access to parts which may cause an electric shock or other serious injury if the work is not performed properly. Do not install or repair this equipment unless you are trained and qualified.

WARNING

Pressurized Equipment Hazard

To reduce the risk of an injury, follow the “Pressure Relief Procedure” on page 24 whenever you are instructed to relieve the pressure.

NOTE: Check all possible remedies in the Troubleshooting Chart before disassembling the gun.

Spray Pattern Troubleshooting

NOTE: Some spray pattern problems are caused by the improper balance between air and fluid.

<table>
<thead>
<tr>
<th>Problem</th>
<th>Cause</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluttering or spitting spray.</td>
<td>No fluid.</td>
<td>Refill supply.</td>
</tr>
<tr>
<td></td>
<td>Loose, dirty, damaged nozzle/seat.</td>
<td>Clean or replace nozzle, page 26.</td>
</tr>
<tr>
<td></td>
<td>Air in fluid supply.</td>
<td>Check fluid source. Refill.</td>
</tr>
<tr>
<td></td>
<td>Fluid buildup on air cap or nozzle.</td>
<td>Clean. See Operation Manual.</td>
</tr>
<tr>
<td></td>
<td>Fan air pressure too high.</td>
<td>Decrease.</td>
</tr>
<tr>
<td></td>
<td>Fluid too thin.</td>
<td>Increase viscosity.</td>
</tr>
<tr>
<td></td>
<td>Fluid pressure too low.</td>
<td>Increase.</td>
</tr>
<tr>
<td></td>
<td>Fan air pressure too low.</td>
<td>Increase.</td>
</tr>
<tr>
<td></td>
<td>Fluid too thick.</td>
<td>Reduce viscosity.</td>
</tr>
<tr>
<td></td>
<td>Too much fluid.</td>
<td>Decrease flow.</td>
</tr>
<tr>
<td>Streaks.</td>
<td>Did not apply 50% overlap.</td>
<td>Overlap strokes 50%.</td>
</tr>
<tr>
<td></td>
<td>Dirty or damaged air cap.</td>
<td>Clean or replace, page 26.</td>
</tr>
</tbody>
</table>
## Troubleshooting

### Gun Operation Troubleshooting

<table>
<thead>
<tr>
<th>Problem</th>
<th>Cause</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excessive spray fog.</td>
<td>Atomizing air pressure too high.</td>
<td>Close restrictor valve some, or decrease air pressure as low as possible; minimum 40 psi (0.28 MPa, 2.8 bar) needed at gun for full voltage.</td>
</tr>
<tr>
<td></td>
<td>Fluid too thin.</td>
<td>Increase viscosity.</td>
</tr>
<tr>
<td>“Orange Peel” finish.</td>
<td>Atomizing air pressure too low.</td>
<td>Open atomizing air valve more or increase gun air inlet pressure; use lowest air pressure necessary.</td>
</tr>
<tr>
<td></td>
<td>Poorly mixed or filtered fluid.</td>
<td>Remix or refilter fluid.</td>
</tr>
<tr>
<td></td>
<td>Fluid too thick.</td>
<td>Reduce viscosity.</td>
</tr>
<tr>
<td>Fluid leaks from the fluid packing area</td>
<td>Worn packings or rod.</td>
<td>Replace packings or rod; see page 29.</td>
</tr>
<tr>
<td>Air leaks from the front of the gun</td>
<td>Air valve (21) is not seating properly.</td>
<td>Clean and service air valve; see page 34.</td>
</tr>
<tr>
<td>Fluid leakage from the front of the gun</td>
<td>Worn or damaged packing rod (26).</td>
<td>Replace; see page 29</td>
</tr>
<tr>
<td></td>
<td>Worn fluid seat.</td>
<td>Replace fluid nozzle and/or electrode needle; see pages 26 to 27.</td>
</tr>
<tr>
<td></td>
<td>Loose fluid nozzle (7).</td>
<td>Tighten; see page 26</td>
</tr>
<tr>
<td></td>
<td>Damaged nozzle o-ring (7b).</td>
<td>Replace; see page 26</td>
</tr>
<tr>
<td>Gun does not spray</td>
<td>Low fluid supply.</td>
<td>Add fluid if necessary.</td>
</tr>
<tr>
<td></td>
<td>Damaged air cap (9).</td>
<td>Replace; see page 26</td>
</tr>
<tr>
<td></td>
<td>Dirty or clogged fluid nozzle (7).</td>
<td>Clean; see page 26</td>
</tr>
<tr>
<td></td>
<td>Damaged fluid nozzle (7).</td>
<td>Replace; see page 26</td>
</tr>
<tr>
<td></td>
<td>Damaged fluid adjustment valve (25).</td>
<td>Replace; see page 34</td>
</tr>
<tr>
<td>Dirty air cap</td>
<td>Misaligned air cap (9) and fluid nozzle (7).</td>
<td>Clean fluid buildup off air cap and fluid nozzle seat; see page 26.</td>
</tr>
</tbody>
</table>
## Electrical Troubleshooting

<table>
<thead>
<tr>
<th>Problem</th>
<th>Cause</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor wrap.</td>
<td><strong>ES ON/OFF valve OFF (0).</strong></td>
<td>Turn ON (I).</td>
</tr>
<tr>
<td></td>
<td>Gun air pressure too low.</td>
<td>Check air pressure to gun; minimum 40 psi (0.28 MPa, 2.8 bar) needed at gun for full voltage.</td>
</tr>
<tr>
<td></td>
<td>Atomizing air pressure too high.</td>
<td>Decrease.</td>
</tr>
<tr>
<td></td>
<td>Fluid pressure too high.</td>
<td>Decrease.</td>
</tr>
<tr>
<td></td>
<td>Incorrect distance from gun to part.</td>
<td>Should be 8-12 in. (200-300 mm).</td>
</tr>
<tr>
<td></td>
<td>Poorly grounded parts.</td>
<td>Resistance must be 1 megohm or less. Clean workpiece hangers.</td>
</tr>
<tr>
<td></td>
<td>Fluid leaks from the packing (26d) and causes a short.</td>
<td>Clean the packing rod cavity. Replace the packing rod. See page 29.</td>
</tr>
<tr>
<td></td>
<td>Faulty turbine alternator.</td>
<td>Be sure the plug is in place on the back of the power supply housing. Remove and test the turbine alternator. See page 32.</td>
</tr>
<tr>
<td></td>
<td>The KV HI-LO lever is on LO.</td>
<td>Check the lever actuation; replace if needed.</td>
</tr>
<tr>
<td>ES indicator or voltage/current display is not lit.</td>
<td><strong>ES ON/OFF valve OFF (0).</strong></td>
<td>Turn ON (I).</td>
</tr>
<tr>
<td></td>
<td>No power.</td>
<td>Replace power supply. See page 31.</td>
</tr>
<tr>
<td>Voltage/current display stays red (smart guns only).</td>
<td>Gun too close to part.</td>
<td>Should be 8-12 in. (200-300 mm).</td>
</tr>
<tr>
<td></td>
<td>Check fluid resistivity.</td>
<td>See “Check Fluid Resistivity” on page 14.</td>
</tr>
<tr>
<td>Operator gets mild shock.</td>
<td>Operator not grounded or is near ungrounded object.</td>
<td>See “Grounding” on page 12.</td>
</tr>
<tr>
<td></td>
<td>Gun not grounded.</td>
<td>See “Check Electrical Grounding” on page 13 and “Test Gun Resistance” on page 18.</td>
</tr>
<tr>
<td>Operator gets shock from workpiece.</td>
<td>Workpiece not grounded.</td>
<td>Resistance must be 1 megohm or less. Clean workpiece hangers.</td>
</tr>
</tbody>
</table>

* ES indicator light is off when the gun is triggered.
Repair

Pressure Relief Procedure

2. Turn off the air bleed valves to the fluid source and to the gun.

3. Trigger the gun into a grounded metal waste container to relieve the fluid pressure.

4. Open the pump drain valve, having a waste container ready to catch the drainage. Leave the pump drain valve open until you are ready to spray again.

5. If the nozzle or hose is completely clogged or pressure is not fully relieved, slowly loosen the hose end coupling. Now clear the nozzle or hose.

1. Turn the ES ON/OFF valve OFF.

⚠️ WARNING

Pressurized Equipment Hazard

The system pressure must be manually relieved to prevent the system from starting or spraying accidentally. To reduce the risk of an injury from electric shock, accidental spray from the gun, 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 fluid nozzle.
Prepare the Gun for Service

**NOTE:**

- Check all possible remedies in “Troubleshooting” before disassembling the gun.
- Use a vise with padded jaws to prevent damage to plastic parts.
- Lubricate the power supply o-ring (18a), some packing rod parts (26), and certain fluid fittings with dielectric grease (40), as specified in the text.
- Lightly lubricate o-rings and seals with non-silicone grease. Order Part No. 111265 Lubricant. Do not over-lubricate.
- Only use genuine Graco parts. Do not mix or use parts from other PRO Gun models.
- Air Seal Repair Kit 244781 is available. The kit must be purchased separately. Kit parts are marked with an asterisk, for example (6*).
- Fluid Seal Repair Kit 244911 is available. The kit must be purchased separately. Kit parts are marked with a double asterisk, for example (5**).

1. Flush the gun, page 16.
2. Relieve the pressure, page 24.
3. Disconnect the gun air and fluid lines.
4. Remove the gun from the worksite. Repair area must be clean.
Air Cap/Nozzle Replacement

1. Prepare gun for service, page 25.

2. Remove the retaining ring (27) and air cap (9). See Fig. 11.

3. Point gun up and squeeze trigger while removing the fluid nozzle (7) assembly with the multi-tool (37).

   Fig. 11. Air Cap/Nozzle Replacement

4. Lightly lubricate the o-ring (7b). Install it and the contact ring (7a) on the nozzle (7).

   NOTE: Make sure the electrode needle (29) is finger-tight (page 27).

5. Trigger gun while installing the fluid nozzle (7) with the multi-tool (37). Tighten until the fluid nozzle seats in the gun barrel (1/8 to 1/4 turn past hand-tight).

6. Install the air cap (9) and retaining ring (27). Make sure the u-cup (27a*) is in place with the lips facing forward.


CAUTION
Hold the front end of the gun up and trigger the gun while removing the nozzle to help drain the gun and prevent any paint or solvent left in the gun from entering the air passages.

WARNING
Fire, Explosion, and Electric Shock Hazard
The nozzle contact ring (7a) is a conductive contact ring, not a sealing o-ring. To reduce the risk of sparking or electric shock, do not remove the nozzle contact ring (7a) except to replace it and never operate the gun without the contact ring in place. Do not replace the contact ring with anything but a genuine Graco part.

NOTE: Use non-silicone grease, Part No. 111265, on the small o-ring (7b). Do not over-lubricate. Do not lubricate the contact ring (7a).
Electrode Replacement

1. Prepare the gun for service, page 25.

2. Remove the air cap and nozzle, page 26.

3. Unscrew the electrode (29) with the multi-tool (37). Hold the packing rod end (26h) to prevent it from turning, Fig. 12.

4. Apply low-strength (purple) Loctite® or equivalent thread sealant to the electrode and packing rod threads. Install the electrode finger-tight. Do not overtighten.

5. Install the fluid nozzle and air cap, page 26.


CAUTION

To avoid damaging the plastic threads, be very careful when installing the electrode.

Fig. 12. Electrode Replacement
Fluid Packing Removal

1. Prepare the gun for service, page 25.

2. Remove the air cap and fluid nozzle, page 26.

3. Remove the electrode, page 27.

4. Loosen the trigger screws (8) and trigger (30). See Fig. 13.

5. Remove the packing rod (26), using the multi-tool (37).

![Fig. 13. Fluid Packing Removal]

CAUTION

Clean all parts in non-conductive solvent compatible with the fluid being used, such as xylol or mineral spirits. Use of conductive solvents can cause the gun to malfunction.

6. Check all parts for wear or damage and replace if necessary.
Packing Rod Repair

You may replace the packing rod as individual parts or as an assembly. The assembly is pre-adjusted at the factory.

NOTE: Before installing the fluid packing rod into the gun barrel, make sure the internal surfaces of the barrel are clean. Remove any residue with a soft brush or cloth. Check the inside of the barrel for marks from high voltage arcing. If marks are present, replace the barrel.

To assemble the individual parts:

1. Place the packing nut (26e) and seal (26b**) on the fluid rod (26h). Flats on the packing nut must face the back of the fluid rod. The seal o-ring must face away from the packing nut. See Fig. 14.

2. Fill the inner cavity of the spacer (26g**) with dielectric grease (40). Place the spacer on the fluid rod (26h) in the direction shown. Generously apply dielectric grease to the outside of the spacer.

3. Place the rod packing (26d**), packing spreader (26c**), and housing (26f) on the packing rod (26h).

4. Lightly tighten the packing nut (26e). The packing nut is properly tightened when there is 3 lb (13.3 N) of drag force when sliding the packing housing (26f) assembly along the rod. Tighten or loosen the packing nut as needed.

5. Install the o-ring (26a**) on the outside of housing (26f). Lubricate the o-ring with non-silicone grease, Part No. 111265. Do not over-lubricate.

6. Install the spring (4) against the nut (E) as shown.

7. Install the packing rod assembly (26) into the gun barrel. Using the multi-tool (37), tighten the assembly until just snug.

8. Install the trigger (30) and screws (8).

9. Install the electrode, page 27.

10. Install the nozzle and air cap, page 26.


Fig. 14. Packing Rod
Barrel Removal

1. Prepare the gun for service, page 25.

2. Carefully loosen the nut (32 or 50d) from the bracket fluid fitting (13). Pull the tube (14 or 50a) out of the fitting. Make sure both ferrules and the nut stay with the tube.

3. Loosen the three screws (11).

4. Hold the gun handle (17) with one hand and pull the barrel (16) straight off the handle. See Fig. 15.

---

**CAUTION**

To avoid damaging the power supply (18), pull the gun barrel straight away from the gun handle. If necessary, gently move the gun barrel from side to side to free it from the gun handle.

---

Barrel Installation

1. Be sure the gasket (10*) and grounding spring (55) are in place. Make sure the air holes are aligned properly. Replace if damaged. See Fig. 16.

2. Place the barrel (16) over the power supply (18) and onto the gun handle (17).

3. Tighten the three screws (11) oppositely and evenly (about a half turn past snug).

4. Assemble the fluid tube (14) into the bracket fitting (13). Ensure that the ferrules are in place. Tighten the nut (32).

5. Test gun resistance, page 18.

---

**CAUTION**

Do not over-tighten the screws (11).

---

Fig. 15. Barrel Removal

Fig. 16. Barrel Installation
Power Supply Removal and Replacement

NOTE:

- Inspect the gun handle power supply cavity for dirt or moisture. Clean with a clean, dry rag.
- Do not expose gasket (10) to solvents.

1. Prepare gun for service, page 25.
2. Remove the barrel (16), page 30.

3. Grasp the power supply (18) with your hand. With a gentle side to side motion, free the power supply/alternator assembly from the gun handle (17), then carefully pull it straight out. On Smart Models only, disconnect the flexible circuit (59) from the socket at the top of the handle (17). See Fig. 17.

4. Disconnect the 3-wire connector (GG) from the power supply. Slide the alternator up and off the power supply. Inspect the power supply and alternator for damage. On Smart Models only, disconnect the 6-pin flexible circuit (59) from the power supply.

5. Check the power supply resistance, page 19. Replace if necessary.

NOTE: Before installing the power supply, make sure the o-rings (18a*, 19a*), spring (18b), and pads (19e) are in place.

6. On Smart Models only, connect the 6-pin flexible circuit (59) to the power supply.

7. Connect the 3-wire connector (GG). Slide the alternator (19) down onto the power supply (18).

8. Lubricate the alternator o-ring (19a*) with non-silicone grease, Part No. 111265. Do not over-lubricate.

9. Lubricate the power supply o-ring (18a*) with dielectric grease (40).

10. Insert the power supply/alternator assembly in the gun handle (17). Make sure the ground strips make contact with the handle. On Smart Models only, connect the flexible circuit (59) to the socket at the top of the handle. Push the 6-pin connector into the socket to ensure it is properly connected.

11. Install the barrel (16), page 30.

CAUTION
Be careful when handling the power supply (18) to avoid damaging it.

—维修—

图 17. 电源供应器

警告
小心处理电源供应器（18），以避免损坏。

309292

31
Turbine Alternator Removal and Replacement

**NOTE:** Replace turbine alternator bearings after 2000 hours of operation. Order Part No. 223688 Bearing Kit.

1. Prepare gun for service, page 25.

2. Remove the power supply/alternator assembly, page 31.

3. Disconnect the alternator from the power supply, page 31.

4. Measure resistance between the two outer terminals of the 3-wire connector (GG); it should be 2.5-3.5 ohms. If outside this range, replace the alternator coil.

5. Follow the bearing replacement procedure in the bearing kit manual 308034.

6. Install the alternator on the power supply, page 31.

7. Install the power supply/alternator assembly, page 31.

---

Fluid Tube Removal and Replacement (PRO Xs4 Guns Only)

1. Remove the nut (32) from the bracket (13).

2. Loosen the fitting (1) to remove the fluid tube (14) from the barrel (16).

3. Apply dielectric grease (40) to the threads of the fitting (1), the o-ring (5), and the sleeve (S) of the fluid tube (14).

4. Slide the fitting (1) onto the fluid tube (14) and thread the fitting into the barrel (16).

5. With the ferrules (31) seated to the bracket (13), screw the nut (32) onto the bracket.

---

![Fig. 18. PRO Xs4 Fluid Tube](image-url)
Fan Air Adjustment Valve Repair

1. Prepare the gun for service, page 25.

2. Place a wrench on the flats of the valve assembly (20) and unscrew it from the handle (17).

NOTE: You may replace the valve as an assembly (go to step 9) or as individual parts (steps 3-9).

3. Remove the retaining ring (20a). See Fig. 19.

4. Turn the valve stem (20d) counterclockwise until it comes free from the valve housing (20c).

5. Remove the o-ring (20b).

6. Clean all parts and inspect for wear or damage.

NOTE: Use non-silicone grease, Part No. 111265. Do not over-lubricate.

7. When reassembling the fan air valve (20), lightly lubricate the valve threads and screw the stem (20d) fully into the housing (20c) until bottomed. Install the o-ring (20b*), lubricate, and unscrew the valve stem until the o-ring enters the housing.

8. Reassemble the retaining ring (20a). Unscrew the valve stem from the housing until it is stopped by the retaining ring.

9. Screw the valve assembly (20) into the gun handle, using a wrench on the flats of the housing. Torque to 15-25 in-lb (1.7-2.8 N•m).

Fig. 19. Fan Air Adjustment Valve
Fluid Adjustment Valve Repair

1. Prepare the gun for service, page 25.

2. Remove the fluid adjustment valve (25). It can only be replaced as a complete assembly. See Fig. 20.

3. Screw the valve (25) into the gun handle. Torque to 15-25 in-lb (1.7-2.8 N\(\text{m}\)).

4. Remove the air valve (21) with a pliers. Inspect the seal (21a*) and replace if damaged. Be sure the seal is pressed securely onto the valve so the outer cone is flat.

5. Inspect the u-cup (6*). Do not remove the u-cup unless damaged. If removed, install the new one with its lips facing into the gun handle (17).

6. Install the air valve (21) and spring (15) into the gun handle (17).

7. Install the fluid adjustment valve (25). Torque to 15-25 in-lb (1.7-2.8 N\(\text{m}\)).

8. Install the barrel, page 30.

<table>
<thead>
<tr>
<th>CAUTION</th>
</tr>
</thead>
</table>

When removing the air valve (21) be careful not to damage the seat area.

CAUTION

Clean all parts in non-conductive solvent compatible with the fluid being used, such as xylol or mineral spirits. Use of conductive solvents can cause the gun to malfunction.

Air Valve Repair

1. Prepare the gun for service, page 25.

2. Remove the barrel, page 30.

3. Remove the fluid adjustment valve (25) from the handle (17). Remove the spring (15). See Fig. 21.

4. Remove the air valve (21) with a pliers. Inspect the seal (21a*) and replace if damaged. Be sure the seal is pressed securely onto the valve so the outer cone is flat.

5. Inspect the u-cup (6*). Do not remove the u-cup unless damaged. If removed, install the new one with its lips facing into the gun handle (17).

6. Install the air valve (21) and spring (15) into the gun handle (17).

7. Install the fluid adjustment valve (25). Torque to 15-25 in-lb (1.7-2.8 N\(\text{m}\)).

8. Install the barrel, page 30.

<table>
<thead>
<tr>
<th>CAUTION</th>
</tr>
</thead>
</table>

When removing the air valve (21) be careful not to damage the seat area.

CAUTION

Clean all parts in non-conductive solvent compatible with the fluid being used, such as xylol or mineral spirits. Use of conductive solvents can cause the gun to malfunction.
**Atomizing Air Restrictor Valve Removal and Replacement**

1. Prepare the gun for service, page 25.

2. Remove the atomizing air restrictor valve (23). Inspect the o-ring (23c*). Replace if necessary. See Fig. 22.

3. Install a new atomizing air restrictor valve (23), or disassemble and replace parts individually. The valve protrusion must be oriented to clear the air valve (21) shaft.

**NOTE:** If the atomizing air restrictor valve is not desired, install the supplied plug (47).

4. Torque the valve housing (23a) to 15-20 in-lb (1.7-2.3 N•m).

**Fig. 22. Atomizing Air Restrictor Valve**

---

**ES ON/OFF Valve Repair**

1. Prepare the gun for service, page 25.

2. Loosen the screw (48). Remove the valve.

3. Lubricate the o-rings (22a* and 22b*) with non-silicone grease, Part No. 111265. Do not over-lubricate.

**CAUTION**

Do not over-lubricate parts. Excessive lubricant on the o-rings can be pushed into the gun air passage and blemish the finish on the workpiece.

4. Clean and inspect parts for damage. Replace if necessary.

**NOTE:** The protrusion on the retainer plate (22d) must point upward.

5. Reinstall the valve. Torque the screw (48) to 15-25 in-lb (1.7-2.8 N•m).

**Fig. 23. ES ON/OFF Valve**
Parts

Part No. 244400 60 kV Electrostatic Gun, Series A (items 1-48, 55)

Part No. 244575 60 kV Electrostatic Gun, Series A (items 4-30, 35-55)

Part No. 244401 85 kV Electrostatic Gun, Series A (items 1-48, 55)

See page 37 for detail views of the fluid tube assemblies, alternator (19), fan adjustment valve (20), ES ON/OFF valve (22), and packing rod (26).
<table>
<thead>
<tr>
<th>Ref. No.</th>
<th>Part No.</th>
<th>Description</th>
<th>Qty</th>
<th>Ref. No.</th>
<th>Part No.</th>
<th>Description</th>
<th>Qty</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>110078</td>
<td>FITTING, tube, fluid; used on 244400; includes one each of items 31 and 32</td>
<td>1</td>
<td>17</td>
<td>245290</td>
<td>HANDLE, gun; used on 244400 and 244575</td>
<td>1</td>
</tr>
<tr>
<td>18</td>
<td>245285</td>
<td>HANDLE, gun; used on 244401</td>
<td>1</td>
<td>18</td>
<td>244540</td>
<td>POWER SUPPLY, 60 kV; used on 244400 and 244575; includes 18a-18d</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>185111</td>
<td>SPRING, compression</td>
<td>1</td>
<td>18</td>
<td>103337</td>
<td>. O-RING; Viton®</td>
<td>1</td>
</tr>
<tr>
<td>5**</td>
<td>185120</td>
<td>SPACER, fluid; nylon; used on 244400 and 244575</td>
<td>1</td>
<td>19</td>
<td>244555</td>
<td>TURBINE, alternator; includes 19a-19e</td>
<td>1</td>
</tr>
<tr>
<td>10</td>
<td>102982</td>
<td>O-RING; used on 244401</td>
<td>1</td>
<td>19</td>
<td>223688</td>
<td>. BEARING KIT; includes front and rear bearings and fan</td>
<td>1</td>
</tr>
<tr>
<td>6*</td>
<td>18749</td>
<td>PACKING, u-cup, air valve; uhmwpe</td>
<td>1</td>
<td>19</td>
<td>244577</td>
<td>. COIL</td>
<td>1</td>
</tr>
<tr>
<td>7</td>
<td>197266</td>
<td>NOZZLE; 1.5 mm orifice; includes 7a and 7b</td>
<td>1</td>
<td>19</td>
<td>244557</td>
<td>VALVE, adjustment, fan; includes 20a-20d</td>
<td>1</td>
</tr>
<tr>
<td>7a</td>
<td>111261</td>
<td>. O-RING, conductive</td>
<td>1</td>
<td>19</td>
<td>111745</td>
<td>. RING, retaining</td>
<td>1</td>
</tr>
<tr>
<td>7b</td>
<td>111507</td>
<td>. O-RING; fluoroelastomer</td>
<td>1</td>
<td>19</td>
<td>245567</td>
<td>. STEM, fan valve</td>
<td>1</td>
</tr>
<tr>
<td>8</td>
<td>197369</td>
<td>SCREW, trigger</td>
<td>2</td>
<td>19</td>
<td>101021</td>
<td>. RING, retaining</td>
<td>1</td>
</tr>
<tr>
<td>9</td>
<td>197477</td>
<td>AIR CAP</td>
<td>1</td>
<td>20</td>
<td>244555</td>
<td>. VALVE, air; includes 21a</td>
<td>1</td>
</tr>
<tr>
<td>10*</td>
<td>197517</td>
<td>GASKET, barrel</td>
<td>1</td>
<td>20</td>
<td>106560</td>
<td>. O-RING; fluorocarbon</td>
<td>1</td>
</tr>
<tr>
<td>11</td>
<td>197518</td>
<td>SCREW; socket-hd; 10-24 x 3/4 in. (19 mm)</td>
<td>3</td>
<td>20</td>
<td>111516</td>
<td>. O-RING; CV75</td>
<td>1</td>
</tr>
<tr>
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* Included in Air Seal Repair Kit 244781.
** Included in Fluid Seal Repair Kit 244911.

**NOTE:** Replacement Warning labels, signs, tags, and cards are available at no cost.
Part No. 244579 60 kV Electrostatic Gun, Series A (items 1-48, 51-59)

Part No. 244576 60 kV Electrostatic Gun, Series A (items 1-30, 35-59)

Part No. 244580 85 kV Electrostatic Gun, Series A (items 1-48, 51-59)

See page 41 for detail views of the fluid tube assemblies, alternator (19), fan adjustment valve (20), ES ON/OFF valve (22), and packing rod (26).
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<td>51</td>
<td>244627</td>
<td>SWITCH, ES HI/LO</td>
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<td>49a</td>
<td>116768</td>
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<td>52</td>
<td>111450</td>
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<td>49b</td>
<td>110749</td>
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<td>53</td>
<td>276734</td>
<td>PLUG, LO voltage adjustment</td>
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<td>50</td>
<td>244918</td>
<td>TUBE, fluid; used on 244576; includes 50a-50f</td>
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<td>54</td>
<td>197910</td>
<td>SCREW, pivot</td>
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<td>50a</td>
<td>198302</td>
<td>. TUBE, fluid, coiled</td>
<td>1</td>
<td>55</td>
<td>197624</td>
<td>SPRING, grounding</td>
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<td>50b</td>
<td>111286</td>
<td>. FERRULE, front</td>
<td>2</td>
<td>59</td>
<td>245265</td>
<td>CIRCUIT, flexible</td>
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<td>50c</td>
<td>111285</td>
<td>. FERRULE, back</td>
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<td></td>
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<tr>
<td>50d</td>
<td>112644</td>
<td>. NUT</td>
<td>2</td>
<td></td>
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<td></td>
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<tr>
<td>50e</td>
<td>198270</td>
<td>. CASE, tube</td>
<td>1</td>
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<td></td>
<td></td>
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<tr>
<td>50f</td>
<td>198271</td>
<td>. CAP, end</td>
<td>1</td>
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</tr>
</tbody>
</table>

* Included in Air Seal Repair Kit 244781.

** Included in Fluid Seal Repair Kit 244911.

**NOTE**: Replacement Warning labels, signs, tags, and cards are available at no cost.
Air Line Accessories

**AirFlex™ Flexible Grounded Air Hose**
100 psi (7 bar, 0.7 MPa) Maximum Working Pressure
0.315 in. (8 mm) ID; 1/4 npsm(f) x 1/4 npsm(f) left-hand thread
- 244963 6 ft (1.8 m)
- 244964 15 ft (4.6 m)
- 244965 25 ft (7.6 m)
- 244966 36 ft (11 m)
- 244967 50 ft (15 m)
- 244968 75 ft (23 m)
- 244969 100 ft (30.5 m)

**Standard Grounded Air Hose**
100 psi (7 bar, 0.7 MPa) Maximum Working Pressure
0.315 in. (8 mm) ID; 1/4 npsm(f) x 1/4 npsm(f) left-hand thread
- 223068 6 ft (1.8 m)
- 223069 15 ft (4.6 m)
- 223070 25 ft (7.6 m)
- 223071 36 ft (11 m)
- 223072 50 ft (15 m)
- 223073 75 ft (23 m)
- 223074 100 ft (30.5 m)

**Bleed-Type Master Air Valve**
300 psi (21 bar, 2.1 MPa) Maximum Working Pressure
Relieves air trapped in the air line between this valve and the pump air motor when closed.
- 107141 3/4 npt

**Air Line Shutoff Valve**
150 psi (10 bar, 1.0 MPa) Maximum Working Pressure
For turning air to gun on or off.
- 224754 1/4 npsm(m) x 1/4 npsm(f) left-hand thread.

**Air Line Quick Disconnect**
112534 Swiveling quick disconnect replaces standard air inlet swivel.

**Air Hose Adapter Nipple**
185493 Use to connect multiple air hoses. 1/4 npt x 1/4 npsm left-hand thread.

**Non-Swivel Air Inlet Fitting**
185105 Replaces standard swivel. Left-hand thread.

**Extended Air Inlet Fitting**
189191 Replaces standard swivel to provide extended handle grip area. Left-hand thread.

**Fluid Line Accessories**

**Fluid Hose**
225 psi (14 bar, 1.4 MPa) Maximum Working Pressure
FM Approved; nylon; 3/8 npsm(fbe)
- 215637 1/4 in. (6 mm) ID x 25 ft (7.6 m)
- 215638 1/4 in. (6 mm) ID x 50 ft (15.2 m)

**Fluid Shutoff/Drain Valve**
500 psi (35 bar, 3.5 MPa) Maximum Working Pressure
For turning fluid on or off to the gun and for relieving fluid line pressure at the pump.
- 208630 1/2 npt(m) x 3/8 npt(f); carbon steel and Teflon; for non-corrosive fluids

**Fluid Swivel**
5800 psi (405 bar, 40 MPa) Maximum Working Pressure
115898 1/4 npsm(m) x 1/4 npsm(f)
**Gun Accessories**

**Gun Repair Kits**
- 244781 Air Seal Repair Kit
- 244911 Fluid Seal Repair Kit

**Round Pattern Kits**
Consists of fluid tip, diffuser and air cap.
- 245217 4-6 in. (102-152 mm) diameter
- 245219 8-10 in. (203-254 mm) diameter

**Push/Pull Fan Air Valve**
244912 For quick change of fan size.

**ES Always On Kit**
244913 Replaces inlet fitting with ball valve to shut off air during flushing. Converts ES ON/OFF valve to always ON condition.

**Handle Grips**
- 245263 Medium Grip
- 245264 Large Grip

**Gun Washer Kit**
245270 Use to convert Graco gun washers so they can clean PRO Xs3 and PRO Xs4 air spray guns.

**Pressure Cups**
Includes air regulators for gun atomization air and supply air to pressure cup.
- 244731 1 Quart (0.95 Liter)
- 244732 2 Quart (1.90 Liter)

**Gun Valve Lubricant**
111265 4 oz (113 g) tube of sanitary (non-silicone) lubricant for fluid seals and wear areas.

**Alternator Bearing Kit**
223688 To repair the turbine alternator.

**Cleaning Brush**
105749 For cleaning air cap and fluid nozzle.

**Miscellaneous Accessories**

**Ground Wire and Clamp**
222011 For grounding pump and other components and equipment in the spray area. 12 gauge, 25 ft (7.6 m).

**Megohmmeter**
241079 500 Volt output; 0.01-2000 megohms. *Not for use in hazardous areas.*

**Paint Resistance Meter**
722886 Use with 722860 Paint Probe to measure resistance of paint. *Not for use in hazardous areas.*

**Paint Probe**
722860 Use with 722886 Paint Resistance Meter to measure resistance of paint. *Not for use in hazardous areas.*

**Safety Warning Signs**
180060 English Warning Sign. FM Approved. Available at no charge from Graco.

**Instruction Signs**
- 198309 English Setup Instructions.
- 198319 English Daily Care Instructions.
## Technical Data

<table>
<thead>
<tr>
<th>Category</th>
<th>Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum Working Fluid Pressure</td>
<td>100 psi (0.7 MPa, 7 bar)</td>
</tr>
<tr>
<td>Maximum Working Air Pressure</td>
<td>100 psi (0.7 MPa, 7 bar)</td>
</tr>
<tr>
<td>Minimum Air Pressure at Gun Inlet</td>
<td>40 psi (0.28 MPa, 2.8 bar)</td>
</tr>
<tr>
<td>Maximum Fluid Operating Temperature</td>
<td>120°F (48°C)</td>
</tr>
<tr>
<td>Paint Resistivity Range</td>
<td>3 megohm/cm to infinity</td>
</tr>
<tr>
<td>Short Circuit Current Output</td>
<td>125 microamperes</td>
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<tr>
<td>Voltage Output</td>
<td>PRO Xs3 (244400, 244575): 60 kV</td>
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<tr>
<td></td>
<td>PRO Xs3 (244579, 244576): 30-60 kV</td>
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<tr>
<td></td>
<td>PRO Xs4 (244401): 85 kV</td>
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<td></td>
<td>PRO Xs4 (244580): 40-85 kV</td>
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<tr>
<td>Sound Power (measured per ISO Standard 9216)</td>
<td>at 40 psi (0.28 MPa, 2.8 bar): 90.4 dB(A)</td>
</tr>
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<td>at 100 psi (0.7 MPa, 7 bar): 105.4 dB(A)</td>
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<tr>
<td>Sound Pressure (measured 1 m from gun)</td>
<td>at 40 psi (0.28 MPa, 2.8 bar): 87 dB(A)</td>
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<td>at 100 psi (0.7 MPa, 7 bar): 99 dB(A)</td>
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<tr>
<td>Air inlet fitting, left-hand thread</td>
<td>1/4 npsm(m)</td>
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<tr>
<td>Fluid inlet fitting</td>
<td>3/8 npsm(m)</td>
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<tr>
<td>Gun Weight</td>
<td>PRO Xs3: 25.1 oz (712 g)</td>
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<td></td>
<td>PRO Xs4: 27.8 oz (788 g)</td>
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<tr>
<td>Gun Length</td>
<td>PRO Xs3: 9.7 in. (24.6 cm)</td>
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<tr>
<td></td>
<td>PRO Xs4: 11.1 in. (28.2 cm)</td>
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<tr>
<td>Wetted Parts</td>
<td>Stainless Steel; Nylon, Acetal, Ultra-High Molecular Weight Polyethylene, Fluoroelastomer, PEEK, Tungsten Wire, Polyethylene</td>
</tr>
</tbody>
</table>

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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 or two thousand hours of operation from the date of sale, repair or replace any part of the equipment determined by Graco to be defective. However, any deficiency in the barrel, handle, trigger, hook, internal power supply, and alternator (excluding turbine bearings) will be repaired or replaced for thirty-six months or six thousand hours of operation from the date of sale. 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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1-800-367-4023 Toll Free
612-623-6921
612-378-3505 Fax

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