Tribomatic®
Powder Spray Handgun

Part 104 369A

NORDSON CORPORATION • AMHERST, OHIO • USA

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TRIBOMATIC® POWDER SPRAY HANDGUN AND DIFFUSER

DESCRIPTION

The handgun charges the powder passing through it by the tribo-electric charging method, in which the friction of the powder particles against internal tubes gives the powder a positive charge. The gun picks up a negative charge, which is grounded through the trigger cable and a charge meter in the control console to earth ground.

The handgun has an electrically operated trigger. It is used with the TRIBOMATIC® Mobile Shop System, 19" Gun Control Console, Demo Unit and the Thread Coating System. A now obsolete pneumatically triggered version was used with the AH-1 Lab Unit. The handgun grip houses the trigger and an aluminum plate to ground the operator, preventing the buildup of a potentially dangerous charge.

The diffuser attaches to the handgun grip with an interference fit provided by three O-rings. The powder feed tubing from the pump slips over a barbed tapered connector on the diffuser. The diffuser's purpose is to break up and atomize the powder before it enters the gun by injecting additional air into the powder and air stream.

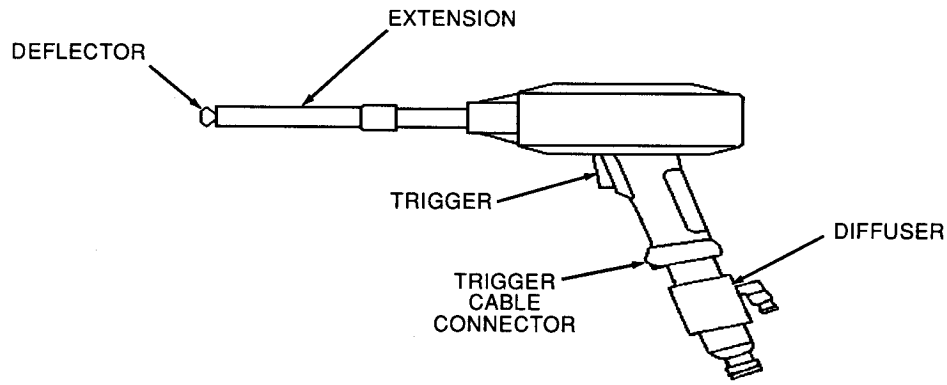

Figure 1 — Tribomatic Powder Spray Handgun

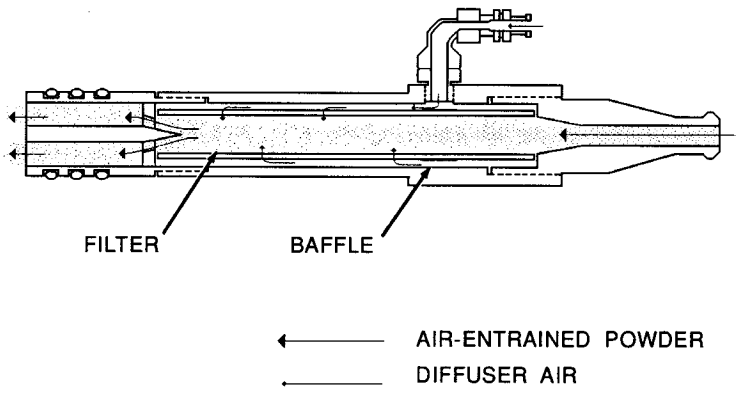

Figure 2 — Handgun Diffuser Operation

INSTALLATION

1. Remove the handgun and diffuser from their packing and install diffuser into handgun grip. Remove spacer and nozzle from their packing and place spacer over end of gun. Install nozzle into end of spacer.

2. Connect diffuser air tubing (4 mm I.D. blue tubing) to diffuser air fitting. Make sure tubing bottoms out in fitting before locking in place with collar.

3. Connect trigger cable to handgun. Note position of internal connector guides and align before pushing together connector halves.

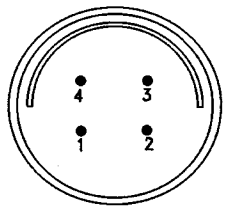

Figure 3 — Connector Pins

Note: When disconnecting electrical trigger cable, grasp one half of connector in each hand and pull gently. Cable half of connector has a sliding sleeve which must move downwards slightly before connectors can be pulled apart.

4. Connect clear powder feed tubing between barbed end of diffuser and powder pump outlet fitting.

Note: Air used for powder spray systems must be clean and dry. Use of coalescent type filters and a refrigerated air drier capable of producing a dewpoint of 39° F (4° C) is recommended.

OPERATING INSTRUCTIONS

WARNING: Make sure all equipment in the spray area is grounded before starting spray operations. Operating without a ground connection will allow a potentially dangerous charge to build up on equipment. Operator, if wearing gloves, should cut away palm of glove to maintain ground contact.

1. Fill hopper two-thirds full of clean, dry powder. Turn fluidizing air regulator knob counterclockwise to shut off air to hopper before turning ON control console main switch.

2. Remove hopper cover and turn on fluidizing air to hopper with main switch (if using AH-1 system with pneumatic trigger, depress trigger). Turn fluidizing air regulator or needle valve knob clockwise while watching powder. Adjust air pressure to properly fluidize powder.

Note: For best results, allow powder to fluidize for a period of time, up to an hour if necessary, before beginning spray operations.

3. Replace hopper cover and secure with latches, if used. Check to ensure powder pump is correctly installed on mounting and that all tubing connections are secure.

4. Aim handgun into booth and depress trigger. Adjust ejector (flow rate) air pressure to approximately 2 bar (29 psi) and diffuser (atomizing) air pressure to approximately 3 bar (43 psi). Test spray and adjust air pressure to minimum required to achieve desired results. Keep air pressures as low as possible to minimize air consumption, powder use, and wear on powder contact surfaces.

PREVENTIVE MAINTENANCE

WARNING: Never blow out handgun with compressed air unless trigger cable, or ground wires, are connected to control console and console is grounded. Without a connection ground, a potentially dangerous charge could build up in gun.

Note: Never blow out diffuser without first disconnecting diffuser air tubing. Powder particles could be blown back into console, damaging gauge or regulator valve.

Periodic Maintenance

1. With trigger cable, or ground wires, connected to gun and console connected to earth ground, remove diffuser and blow out gun with compressed air.

2. Disassemble diffuser and clean. Note position of black tape on diffuser filter and replace so that tape is directly under air inlet when reassembling diffuser.

3. Place end of powder feed tubing in booth and blow out with compressed air.

TROUBLESHOOTING

PROBLEM:

Powder does not flow when gun triggered.

Probable Cause:

1. No air supply, ejector air pressure set too low, or diffuser air pressure too high.

2. Blockage in powder feed system.

3. Poor trigger cable connection, trigger microswitch malfunction or circuit board malfunction.

4. Solenoid valve malfunction.

5. Ejector air pressure regulator malfunction.

Suggested Correction:

1. Check air supply to system. Increase ejector air pressure or decrease diffuser air pressure.

2. Disconnect powder feed tubing at pump, blow out with compressed air. Disassemble pump and diffuser and clean if necessary. Check powder supply in hopper for dampness and replace if necessary. Check air dryer and filters.

3. Check trigger cable connection. Trigger microswitch should click when depressed. Use an ohmmeter to check continuity between pins 1 & 3 with trigger depressed. If trigger switch is good, ohmmeter will show zero ohms. An ohmmeter connected across pins 1 & 4 or 3 & 4 should give a reading of 820 ohms, ± 5 %, with trigger depressed. Refer to Figure 3 for pin designations. Check for 12VDC across trigger leads at circuit board. Replace circuit board if voltage not present.

4. Check for air output from electro-pnuematic solenoid valve when gun is triggered. Replace valve if valve does not open on trigger signal. Voltage across solenoid connector terminals should be 24 VDC when gun is triggered.

5. Check for air output from regulator. Replace regulator if no air flows from regulator with trigger depressed.

PROBLEM:

Powder puffing from gun.

Probable Cause:

1. Ratio of diffuser air to ejector air incorrect.

2. Diffuser filter clogged.

3. Powder feed hose too short.

Suggested Correction:

1. Adjust diffuser to ejector air pressure ratio. Refer to operating instructions.

2. Disassemble diffuser and clean.

3. Install longer powder feed hose.

PROBLEM:

Poor powder charging (no electrostatic wrap or adhesion).

Probable Cause:

1. Ejector air pressure too high.

2. Powder not suitable for tribo charging.

3. Workpiece not properly grounded.

4. Diffuser air pressure too low.

5. Diffuser filter clogged.

Suggested Correction:

1. Reduce ejector air pressure while maintaining proper ejector to diffuser air ratio.

2. Consult with powder manufacturer.

3. Check conveyor rollers and hangers for coating buildup that could affect ground. Resistance between workpiece and earth ground should not exceed one megohm.

4. Increase diffuser air pressure.

5. Remove diffuser from gun, disconnect air tubing and powder feed tubing, and disassemble diffuser. Clean with low pressure compressed air.

PROBLEM:

Inadequate powder flow.

Probable Cause:

1. Wet powder causing blockage in system.

2. Poor fluidization of powder.

3. Ratio of diffuser to ejector air incorrect.

4. Powder feed tubing too long or too short.

Suggested Correction:

1. Check powder in feed hopper for dampness. Check air dryer and filters for proper operation. Clean system components and feed tubing.

2. Increase or decrease fluidizing air pressure. Allow powder enough time to fluidize properly before beginning spray operations.

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3. Adjust diffuser and ejector air pressure settings. Refer to operating instructions.

4. Adjust length of powder feed tubing. Best results are obtained when tubing is between 4-6 meters (13-20 ft.) long.

DISASSEMBLY AND REPAIR

1. Disconnect powder feed tubing, diffuser air tubing, and trigger cable.

2. Remove extension and deflector from gun.

3. Remove diffuser from gun using a twisting motion.

4. Unscrew inlet and outlet connectors from diffuser and remove filter.

5. Unscrew the screws securing the handle to the body and separate handle and body.

The hand guns cannot be disassembled any further. If the internal body tubes are worn, a new body can be ordered and attached to the old handle.

Clean and inspect all components. Do not scrape powder contact parts with a knife or other sharp object. Replace worn parts.

PARTS LISTS

Introduction

This section contains parts lists for the Tribomatic® Electric Trigger Gun and Diffuser.

The number in the **REF.** column indicates the number assigned to the part in the illustration preceding the list. A dash or the code **NS** (Not Shown) is used for parts that are not shown in the illustration.

A letter in the **NOTE** column refers to a note below the parts list which gives additional information concerning that part. Special heed should be given to noted parts.

The six digit number in the **PART NO.** column is the Nordson part number assigned to that particular part. A series of dashes in this column means that the part cannot be ordered separately; it

can only be obtained as part of the assembly or subassembly it is a component of.

The **DESCRIPTION** column gives the Nordson name of the part, together with its dimensions and other physical properties where appropriate, and is the name that should be used when ordering replacement parts. Indented parts are components of assemblies and/or subassemblies.

For example:

REF.	NOTE	PART NO.	DESCRIPTION
1		630 407	Handgun, Complete
2		630 405	• Diffuser
3		630 419	• • Connector, Tubing

If you order item 1, items 2 & 3 will be included.
If you order item 2, item 3 will be included.
If you order item 3, you will receive item 3 only.

The number in the **QTY.** column required per unit or assembly. When the quantity is not applicable, a dash will appear in the column. An **ASR** in the QTY. column means that the quantity required per installation should be ordered.

Note: Names of parts included in an assembly are indented after each assembly or sub-assembly.

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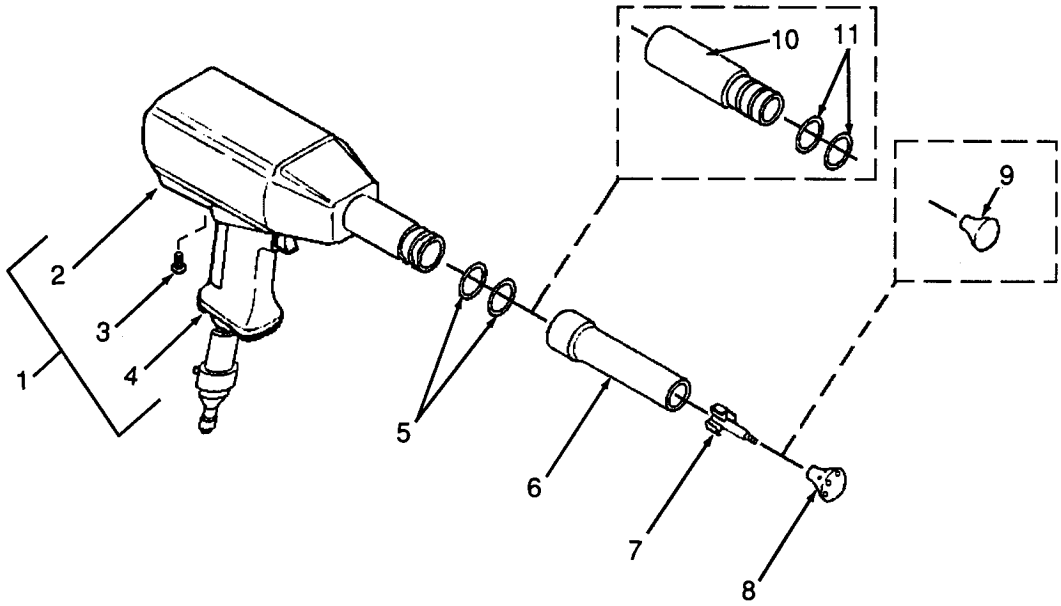

Figure 4 — Electrically Triggered Handgun

Ref.	Note	Part No.	Description	Qty.
		630 407	Gun, Manual, Complete, Electric	1
1	A	630 410	• Handgun, Electric	1
2		630 413	• • Chargetube, Handgun	1
3		630 422	• • • Screw, Handgun, 4mm	4
4		630 411	• • Base, Handgun	1
5		630 414	• O-ring, Handgun	2
6		630 402	• Extension, Handgun	1
7		630 403	• Support, Deflector	1
8		630 404	• Deflector, Pen., 2.5mm	1
9	C	630 191	Deflector, Handgun	1
NS	B	630 425	• Diffuser, Handgun, Straight	1
10	D	630 348	Adapter, Handgun	1
11		630 025	• O-ring, Pump Diffuser	2

Note (A) - If replacing old version of handgun with one piece body, order P/N 630 410 Handgun, Electric, which is a two-piece gun. Thereafter, the chargetube (body) can be replaced separately.
Note (B) - Refer to following page for parts list.
Note (C) - Optional solid deflector. Must be ordered separately.
Note (D) - Optional adapter. Allows automatic gun sprayheads to be used with handgun.

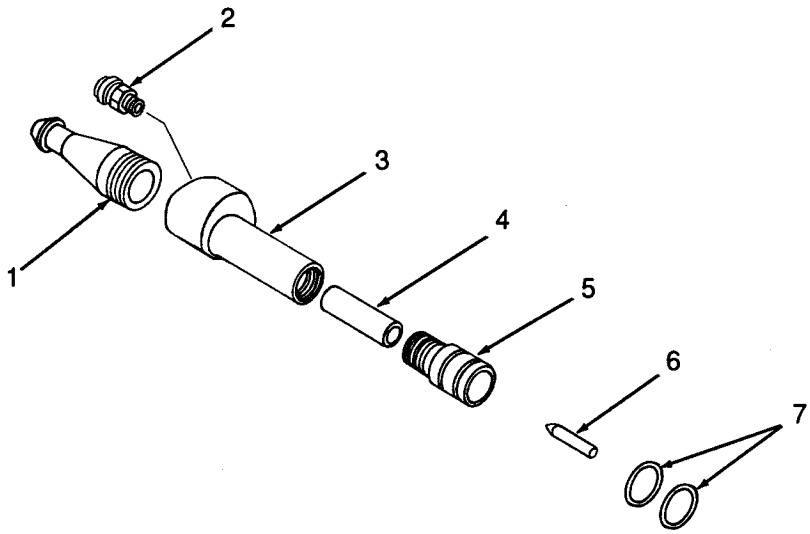

Figure 5 — Handgun Diffuser

Ref.	Note	Part No.	Description	Qty.
-		630 425	Diffuser, Handgun	1
1		630 419	• Connector, Tubing	1
2		630 427	• Fitting, Air, Straight	1
3		630 426	• Housing, Diffuser, Straight	1
4		630 409	• Filter, Handgun	1
5		630 417	• Connector, Gun	1
6		630 416	• Distributor, Flow	1
7		630 415	• O-Ring	2