

RA-20 Rotary Atomizer

Customer Product Manual

Part 237366J02

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Section 1

Safety

Introduction

Read and follow these safety instructions. Task- and equipment-specific warnings, cautions, and instructions are included in equipment documentation where appropriate.

Make sure all equipment documentation, including these instructions, is accessible to persons operating or servicing equipment.

Qualified Personnel

Equipment owners are responsible for making sure that Nordson equipment is installed, operated, and serviced by qualified personnel. Qualified personnel are those employees or contractors who are trained to safely perform their assigned tasks. They are familiar with all relevant safety rules and regulations and are physically capable of performing their assigned tasks.

Intended Use

Use of Nordson equipment in ways other than those described in the documentation supplied with the equipment may result in injury to persons or damage to property.

Some examples of unintended use of equipment include

- using incompatible materials
- making unauthorized modifications
- removing or bypassing safety guards or interlocks
- using incompatible or damaged parts
- using unapproved auxiliary equipment
- operating equipment in excess of maximum ratings

Regulations and Approvals

Make sure all equipment is rated and approved for the environment in which it is used. Any approvals obtained for Nordson equipment will be voided if instructions for installation, operation, and service are not followed.

Personal Safety

To prevent injury follow these instructions.

- Do not operate or service equipment unless you are qualified.
- Do not operate equipment unless safety guards, doors, or covers are intact and automatic interlocks are operating properly. Do not bypass or disarm any safety devices.
- Keep clear of moving equipment. Before adjusting or servicing moving equipment, shut off the power supply and wait until the equipment comes to a complete stop. Lock out power and secure the equipment to prevent unexpected movement.
- Relieve (bleed off) hydraulic and pneumatic pressure before adjusting or servicing pressurized systems or components. Disconnect, lock out, and tag switches before servicing electrical equipment.
- While operating manual spray guns, make sure you are grounded. Wear electrically conductive gloves or a grounding strap connected to the gun handle or other true earth ground. Do not wear or carry metallic objects such as jewelry or tools.
- If you receive even a slight electrical shock, shut down all electrical or electrostatic equipment immediately. Do not restart the equipment until the problem has been identified and corrected.
- Obtain and read Material Safety Data Sheets (MSDS) for all materials used. Follow the manufacturer's instructions for safe handling and use of materials, and use recommended personal protection devices.
- Make sure the spray area is adequately ventilated.
- To prevent injury, be aware of less-obvious dangers in the workplace that often cannot be completely eliminated, such as hot surfaces, sharp edges, energized electrical circuits, and moving parts that cannot be enclosed or otherwise guarded for practical reasons.

High-Pressure Fluids

High-pressure fluids, unless they are safely contained, are extremely hazardous. Always relieve fluid pressure before adjusting or servicing high pressure equipment. A jet of high-pressure fluid can cut like a knife and cause serious bodily injury, amputation, or death. Fluids penetrating the skin can also cause toxic poisoning.

If you suffer a fluid injection injury, seek medical care immediately. If possible, provide a copy of the MSDS for the injected fluid to the health care provider.

The National Spray Equipment Manufacturers Association has created a wallet card that you should carry when you are operating high-pressure spray equipment. These cards are supplied with your equipment. The following is the text of this card:



WARNING: Any injury caused by high pressure liquid can be serious. If you are injured or even suspect an injury:

- Go to an emergency room immediately.
- Tell the doctor that you suspect an injection injury.
- Show him this card
- Tell him what kind of material you were spraying

MEDICAL ALERT—AIRLESS SPRAY WOUNDS: NOTE TO PHYSICIAN

Injection in the skin is a serious traumatic injury. It is important to treat the injury surgically as soon as possible. Do not delay treatment to research toxicity. Toxicity is a concern with some exotic coatings injected directly into the bloodstream.

Consultation with a plastic surgeon or a reconstructive hand surgeon may be advisable.

The seriousness of the wound depends on where the injury is on the body, whether the substance hit something on its way in and deflected causing more damage, and many other variables including skin microflora residing in the paint or gun which are blasted into the wound. If the injected paint contains acrylic latex and titanium dioxide that damage the tissue's resistance to infection, bacterial growth will flourish. The treatment that doctors recommend for an injection injury to the hand includes immediate decompression of the closed vascular compartments of the hand to release the underlying tissue distended by the injected paint, judicious wound debridement, and immediate antibiotic treatment.

Fire Safety

To avoid a fire or explosion, follow these instructions.

- Ground all conductive equipment. Use only grounded air and fluid hoses. Check equipment and workpiece grounding devices regularly. Resistance to ground must not exceed one megohm.
- Shut down all equipment immediately if you notice static sparking or arcing. Do not restart the equipment until the cause has been identified and corrected.
- Do not smoke, weld, grind, or use open flames where flammable materials are being used or stored.
- Do not heat materials to temperatures above those recommended by the manufacturer. Make sure heat monitoring and limiting devices are working properly.

Fire Safety *(contd)*

- Provide adequate ventilation to prevent dangerous concentrations of volatile particles or vapors. Refer to local codes or your material MSDS for guidance.
- Do not disconnect live electrical circuits when working with flammable materials. Shut off power at a disconnect switch first to prevent sparking.
- Know where emergency stop buttons, shutoff valves, and fire extinguishers are located. If a fire starts in a spray booth, immediately shut off the spray system and exhaust fans.
- Shut off electrostatic power and ground the charging system before adjusting, cleaning, or repairing electrostatic equipment.
- Clean, maintain, test, and repair equipment according to the instructions in your equipment documentation.
- Use only replacement parts that are designed for use with original equipment. Contact your Nordson representative for parts information and advice.

Halogenated Hydrocarbon Solvent Hazards

Do not use halogenated hydrocarbon solvents in a pressurized system that contains aluminum components. Under pressure, these solvents can react with aluminum and explode, causing injury, death, or property damage. Halogenated hydrocarbon solvents contain one or more of the following elements:

<u>Element</u>	<u>Symbol</u>	<u>Prefix</u>
Fluorine	F	“Fluoro-”
Chlorine	Cl	“Chloro-”
Bromine	Br	“Bromo-”
Iodine	I	“Iodo-”

Check your material MSDS or contact your material supplier for more information. If you must use halogenated hydrocarbon solvents, contact your Nordson representative for information about compatible Nordson components.

Action in the Event of a Malfunction

If a system or any equipment in a system malfunctions, shut off the system immediately and perform the following steps:

- Disconnect and lock out system electrical power. Close hydraulic and pneumatic shutoff valves and relieve pressures.
- Identify the reason for the malfunction and correct it before restarting the system.

Disposal

Dispose of equipment and materials used in operation and servicing according to local codes.

Section 2

Description

Introduction

The RA-20 rotary atomizer is an electrostatic spray device incorporating an air-powered turbine. It can apply most solvent and waterborne coating materials, including high solids and metallics.

Versions, Options, and System Configurations

The RA-20 rotary atomizer is available in several versions with different electrostatic charging configurations. Options and accessories include solvent and dump valves, cups, nozzles, fluid tubes, and turbine speed display.

Versions

Three versions of the RA-20 rotary atomizer are available:

- cable-fed
- Integral Power Supply (IPS)
- waterborne

The IPS and cable-fed versions charge the coating material as it is sprayed, and are used with solventborne coating materials.

- The cable-fed version uses a remote power supply and high-voltage cable.
- The IPS version includes an internal multiplier.

The waterborne version has no provisions for charging the coating material. The coating material is charged before being pumped to the RA-20 rotary atomizer.

Valve Options

The basic RA-20 rotary atomizer is equipped with a paint valve. Solvent and dump valve kits can be added at the factory or in the field. Possible configurations are:

- paint valve only
- paint and dump valve
- paint and solvent valve
- paint, solvent, and dump valve

Refer to the *Parts* section for kit part numbers.

Nozzles and Cup Options

Nozzles with orifice sizes ranging from 0.020 in. to 0.080 in. are supplied with each RA-20 rotary atomizer. A 2-in. diameter finned cup is standard. Optional smooth and finned 2-in. and 2.5-in. diameter cups as well as premium finish cups are available. Each cup includes a standard distributor. A premium finish cup requires a premium finish distributor. Special distributors for use with emulsion coatings are available. Refer to the *Parts* section for part numbers.

Speed Control Option

To monitor and control turbine speed, you can install the optional fiber-optic module and fiber-optic cable. The cable transmits an optical signal from the rotary atomizer to the fiber-optic module. The fiber-optic module converts the optical signal to an electrical signal.

For open-loop speed controls, the electrical speed signal is routed to an optional RPM indicator. For closed-loop speed controls the speed signal is routed to a PLC controller. In some engineered systems the fiber-optic module is not used: Instead, the fiber-optic circuit board is installed in a control panel along with other system controls.

Refer to the *Parts* section for the fiber optic module, cable, and RPM indicator part numbers.

Open-Loop Speed Controls

Open-loop speed controls use two air pressure regulators. One regulator controls unloaded (no spray) turbine speed. The other controls loaded (spraying) turbine speed. Air from the regulators is routed through a solenoid valve. The solenoid valve switches turbine air from the unloaded regulator to the loaded regulator when the paint valve is triggered.

Closed-Loop Speed Controls

Closed-loop speed controls use a voltage-to-pressure (V-to-P) or current-to-pressure (I-to-P) transducer and a PLC controller to control turbine air pressure at a set point. When the turbine is loaded (spraying) the turbine slows. The speed controls signal the transducer to increase turbine air pressure until turbine speed is at the set point. When the turbine is unloaded (spraying stops) it speeds up. The speed controls signal the transducer to decrease turbine air pressure until turbine speed is at the set point.

Pattern Control Option

An optional pattern control kit is available to be installed on the rotary atomizer. With this kit installed, the rotary atomizer produces a smaller, more uniform spray pattern without compromising transfer efficiency. Refer to the *Pattern Control Kit* instruction sheet for installation and parts information.

System Configurations

Waterborne Application System

Equipment required for a waterborne system includes:

- Waterborne version of the RA-20 rotary atomizer
- Nordson EPS6 electrostatic power supply
- IFC-100 high-voltage cable
- Nordson Iso-Flo voltage-block system

In this system, the electrostatic voltage is generated at the remote power supply and conveyed by the high-voltage cable to the Iso-Flo unit. The Iso-Flo unit charges the coating material and pumps it to the RA-20 rotary atomizer through an insulated hose.

Solventborne Application Systems

Equipment required for a solventborne IPS system includes:

- IPS version of the RA-20 rotary atomizer
- Low-voltage cable
- IPS10 control unit

Equipment required for a solventborne cable-fed system includes:

- Cable-fed version of the RA-20 rotary atomizer
- IFC-100 high-voltage cable
- EPS9 electrostatic power supply

These systems charge the coating material at the atomizer.

Description

See Figure 2-1. A cable-fed version of the RA-20 rotary atomizer is shown.

Turbine

The turbine (14) is air-powered. Turbine air provides the rotating force. Brake air slows or stops the turbine quickly. The turbine shaft (11) floats on a cushion of bearing air as it rotates. A fluid tube (7), inserted through the center of the turbine shaft, provides a straight fluid path through the center of the turbine.

Valves

The paint valve (19) controls the flow of coating material through the RA-20 rotary atomizer. Solvent and dump valves can be added. The valves are air-operated. When the paint valve is triggered, coating material flows through the valve, fluid tube, and nozzle (10), into the cup (8). The distributor (9) spreads the coating material over the inside surface of the cup as a thin film. The turbine spins the cup at high speed. The coating material atomizes as it spins off the edges of the cup. Vector air flowing between the cup and the charge ring (12) shapes the spray pattern.

The solvent valve allows the fluid path and cup to be cleaned quickly. Closing the paint valve and opening the solvent valve allows solvent or cleaning solution to flow through the fluid tube, nozzle, and cup.

The dump valve allows quick color changes by using the new coating material to purge the old material out of the system. The dump valve connects directly to the paint valve. The coating material supply hose is connected directly to the dump valve inlet port. Another fluid hose connects the dump valve outlet port to a waste container. Closing the paint valve and opening the dump valve allows coating material to flow through the dump valve to a waste container.

Optional Turbine Speed Readout

A transmitter assembly (16) is installed in each turbine. It contains a coil and LED. Magnets embedded in the turbine wheel (15) generate a pulsating current in the coil as they rotate past it. The LED converts the current into pulses of visible light.

To use this optical signal, you can install an optional fiber-optic cable and fiber-optic module. The cable transmits the optical signal to the module, which converts it into an electrical signal, which can be transmitted to an optional RPM indicator that displays the turbine speed, or to a PLC controller.

Electrostatics

The cable-fed version of the RA-20 rotary atomizer uses a remote power supply to generate the electrostatic voltage and a high-voltage IFC-100 cable (1) to deliver the voltage to the atomizer. The high resistance of the cable, the barrel resistor (4), and the charge-ring resistors (6) limit current draw from the power supply.

The IPS version of the RA-20 rotary atomizer uses a multiplier with a built-in resistor to generate the electrostatic voltage.

In both the cable-fed and the IPS versions, the rotating cup picks up the voltage from electrodes on the charge ring. The coating material picks up an electrostatic charge as it flows over the inside surface of the cup.

The waterborne version has no electrostatic components. The coating material is charged at the Iso-Flo unit and pumped to the RA-20 rotary atomizer.

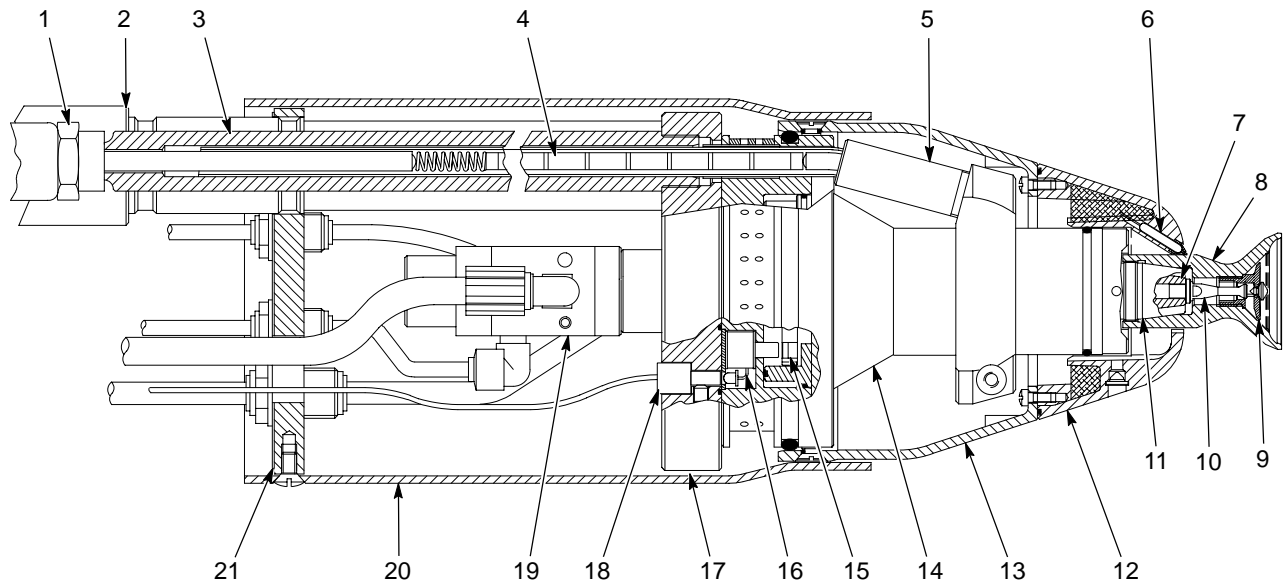


Figure 2-1 RA-20 Rotary Atomizer Components (Cable-Fed Version Shown)

- | | | |
|-------------------------------|-------------------|----------------------------------|
| 1. High-voltage IFC-100 cable | 8. Cup | 15. Turbine wheel |
| 2. Mounting stem | 9. Distributor | 16. Transmitter assembly |
| 3. Cable adapter | 10. Nozzle | 17. Interface plate |
| 4. Barrel resistor | 11. Turbine shaft | 18. Fiber-optic cable (optional) |
| 5. Cable holder | 12. Charge ring | 19. Paint valve |
| 6. Charge ring resistors | 13. Front shroud | 20. Rear shroud |
| 7. Fluid tube | 14. Turbine | 21. Rear mounting plate |

Section 3

Installation



WARNING: Allow only qualified personnel to perform the following tasks. Follow the safety instructions in this document and all other related documentation.

Mounting

NOTE: If the nozzle or the fluid tube needs to be changed before starting production, follow the instructions in the *Repair* section.

1. See Figure 3-1. Remove the oval-head screws (3) and the rear shroud (2).

NOTE: Do not install the rear shroud until the air and fluid tubing, fiber-optic cable (if used), and high-voltage or IPS cable have been connected.

2. Secure the mounting stem (1) to a fixed stand, oscillator, or reciprocator. Use a mounting device that allows vertical and horizontal adjustment of the RA-20 rotary atomizer's position.

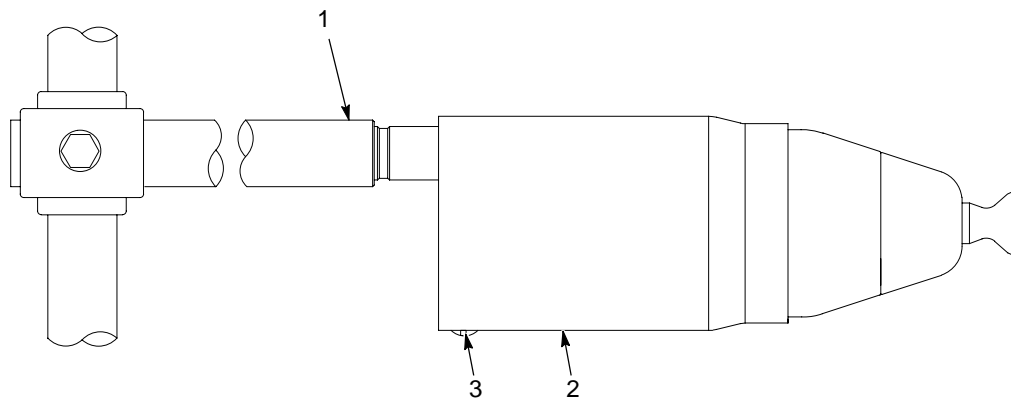


Figure 3-1 RA-20 Rotary Atomizer Mounting

1. Mounting stem

2. Rear shroud

3. Oval-head screws

Air Connections



WARNING: Do not bundle the fluid tubing with the air tubing or cables. Doing so may allow the electrostatic voltage to burn pin holes in the fluid tubing. Failure to observe this warning may result in equipment damage, personal injury, or death.



CAUTION: Operating the RA-20 rotary atomizer without adequately filtering the air supply, or without the specified bearing air pressure, will cause the turbine to fail prematurely, and will void all warranties. Do not install any shutoff valves in the bearing air tubing. Refer to the *Specifications* section for air quality and pressure specifications.

Table 3-1 RA-20 Air Connections

Item	Air Connection	Fitting Size (in.)
1	BEARING (Bearing Air)	1/4
2	SOLVENT TRIG. (Solvent trigger air)	1/4
3	DUMP TRIG. (Dump trigger air)	1/4
4	TURBINE (Turbine air) (see Note below)	3/8
5	PAINT TRIG. (Paint trigger air)	1/4
6	BRAKE (Brake air)	1/4
7	VECT. (Vector air) (see Note below)	3/8

NOTE: The turbine and vector air fittings are for 3/8 in. tubing. If you use 1/2 in. tubing for vector or turbine air, route the tubing as close as possible to the rotary atomizer, then use a 972242 reducer (1/2 in. to 3/8 in.) reducer and a short piece of 3/8 in. tubing to connect to the turbine and vector fittings. 1/2 in. tubing is used for applications where 3/8 in. tubing is too restrictive.

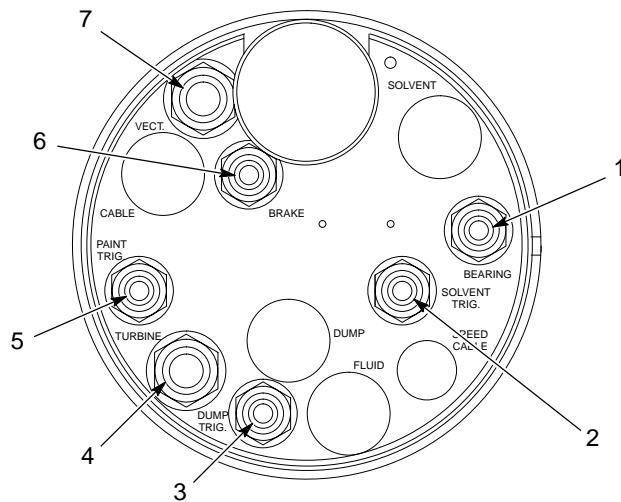


Figure 3-2 Air Connections

Fluid Connections



WARNING: Do not bundle the fluid tubing with the air tubing or cables. Doing so may provide a path that will allow the electrostatic voltage to burn pin holes in the fluid tubing. Failure to observe this warning may result in equipment damage, personal injury, or death.

NOTE: If you are installing Teflon tubing, groove the ends before connecting them to any fittings. Refer to *Using the Grooving Tool* in this section.

Waterborne Systems with Nordson Iso-Flo Unit

See Figure 3-3. Make the following connections, depending on your RA-20 rotary atomizer configuration:

Paint Valve: Route $\frac{3}{8}$ -in. fluid tubing (6) from the Iso-Flo unit through the FLUID hole in the rear mounting plate. Connect the tubing to the elbow fitting on the dump valve (1).

Dump Valve: Route $\frac{3}{8}$ -in. fluid tubing (5) from a waste container through the DUMP hole. Connect the tubing to the straight fitting on the end of the dump valve.

Solvent Valve: Route $\frac{1}{4}$ -in. fluid tubing (4) from the solvent or cleaning solution supply through the SOLVENT hole in the rear mounting plate. Connect the tubing to the elbow fitting on the solvent valve (2).

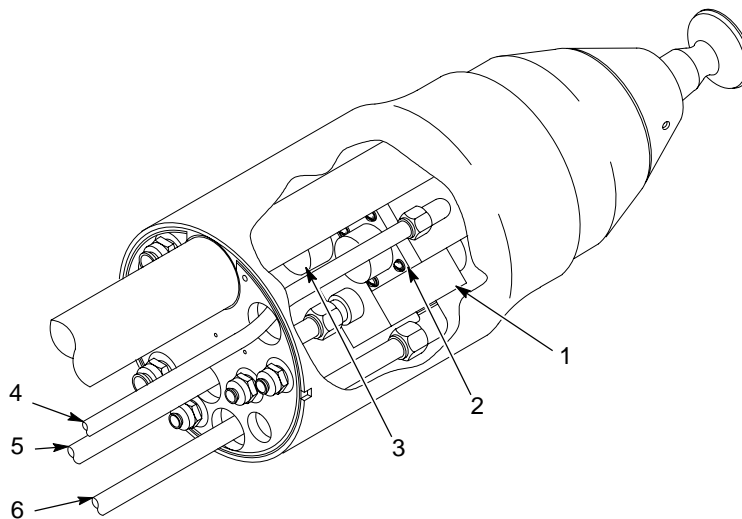


Figure 3-3 Fluid Connections—Waterborne Systems

- | | | |
|------------------|------------------------------------|------------------------------------|
| 1. Dump valve | 3. Paint valve | 5. $\frac{3}{8}$ -in. fluid tubing |
| 2. Solvent valve | 4. $\frac{1}{4}$ -in. fluid tubing | 6. $\frac{3}{8}$ -in. fluid tubing |

Solventborne Systems with Nordson Iso-Flo Unit



WARNING: If you are using solventborne coating materials, all fluid tubing connected to the spray device must be grounded within 4.9 m (16 ft) of the device. Ungrounded tubing can deliver a severe shock, or cause a fire or explosion. Failure to observe this warning may result in equipment damage, personal injury, or death.

See Figure 3-4. Make the following connections, depending on your RA-20 rotary atomizer configuration:

Paint Valve Only

1. Route $\frac{3}{8}$ -in. fluid tubing (6) from a grounding bracket through the FLUID hole in the rear mounting plate. Connect the tubing to the elbow fitting on the paint valve (3).
2. Install another length of $\frac{3}{8}$ -in. tubing between the grounding bracket and the coating material supply.
3. Connect the grounding bracket to a true earth ground.

Paint, Solvent, and Dump Valves

1. Route $\frac{3}{8}$ -in. fluid tubing (6) from a grounding bracket through the FLUID hole in the rear mounting plate. Connect the tubing to the elbow fitting on the dump valve (1).
2. Route $\frac{3}{8}$ -in. fluid tubing (5) from a grounding bracket through the DUMP hole on the rear mounting plate. Connect the tubing to the straight fitting on the end of the dump valve.
3. Route $\frac{1}{4}$ -in. fluid tubing (4) from a grounding bracket through the SOLVENT hole in the rear mounting plate. Connect the tubing to the elbow fitting on the solvent valve (2).
4. Connect $\frac{3}{8}$ -in. and $\frac{1}{4}$ -in. fluid tubing from the coating material supply, solvent supply, and grounded waste container to the appropriate bulkhead fittings on the grounding brackets (7).
5. Connect the grounding brackets to a true earth ground.

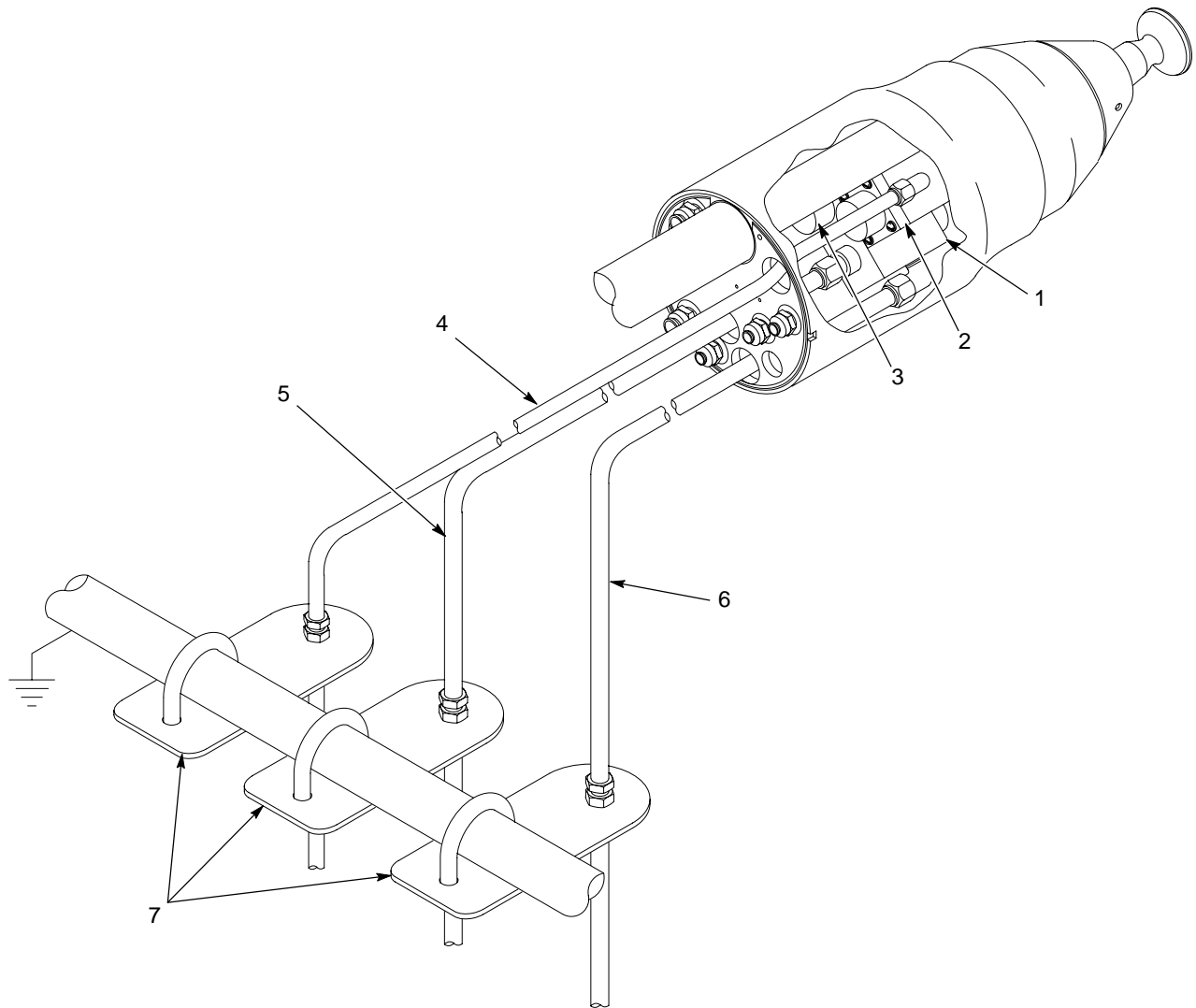


Figure 3-4 Fluid Connections—Solventborne Systems

- | | | |
|------------------|-------------------------|-------------------------|
| 1. Dump valve | 4. 1/4-in. fluid tubing | 6. 3/8-in. fluid tubing |
| 2. Solvent valve | 5. 3/8-in. fluid tubing | 7. Grounding brackets |
| 3. Paint valve | | |

Using the Grooving Tool

Teflon tubing must be grooved before fittings are installed on the ends. Without the groove, the tubing can slip out of the fittings.

See Figure 3-5.

1. Trim the ends of the tubing square.
2. Press down on the grooving tool thumb rest (1) and insert the end of the tubing (3) into the grooving tool as far as it will go. Release the thumb rest.
3. Hold the tubing and rotate the collar (4) in the direction of the arrow (2) four complete revolutions.
4. Press down on the thumb rest and remove the tubing from the tool. Make sure the groove is cleanly cut and free of burrs.

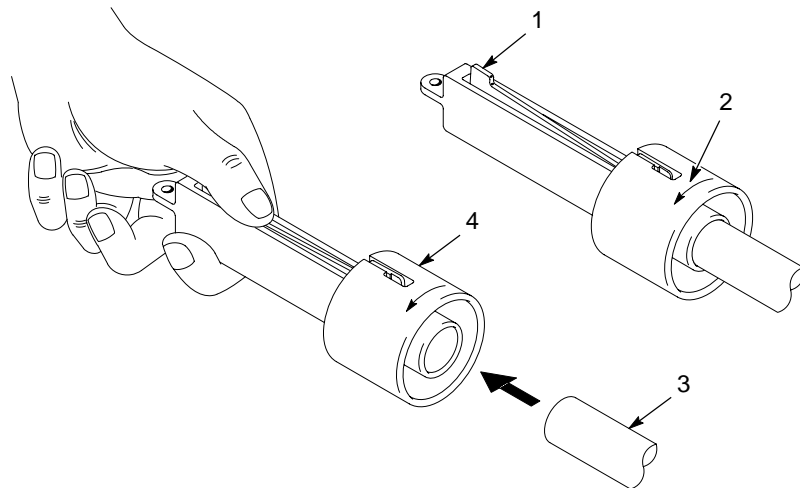


Figure 3-5 Using the Grooving Tool

- | | |
|---------------|-----------|
| 1. Thumb rest | 3. Tubing |
| 2. Arrow | 4. Collar |

Fiber Optic Cable Installation (Optional)

1. Remove the outer cover of the rotary atomizer. Refer to your rotary atomizer manual for procedures.
2. See Figure 3-6. Loosen the set screw (4) and remove the plug from the mounting hole on the interface plate (5).
3. Route $\frac{3}{8}$ in. air tubing (7) between the fiber-optic module and the rotary atomizer to protect the fiber-optic cable.
4. Push the fiber-optic cable (2) through the tubing. You may need to coat the cable with baby powder to get it through the tubing.
5. Guide the end of the fiber-optic cable through the $\frac{3}{8}$ in. bulkhead union (6) included with the cable kit.
6. Route the end of the fiber-optic cable through the threaded hole in the atomizer rear mounting plate (1) labeled SPEED CABLE, then thread the bulkhead union into the hole and plug the tubing into the union.
7. Install the cable ferrule (3) on the end of the cable, then insert the ferrule into the mounting hole in the interface plate (5).
8. Tighten the set screw (4) to secure the ferrule.
9. At the fiber optic module, route the tubing through a strain relief and connect the cable end to the fiber optic module, as described in the Fiber Optic Module manual (P/N 237353).
10. Bundle the cable tubing with the other rotary atomizer air tubing.

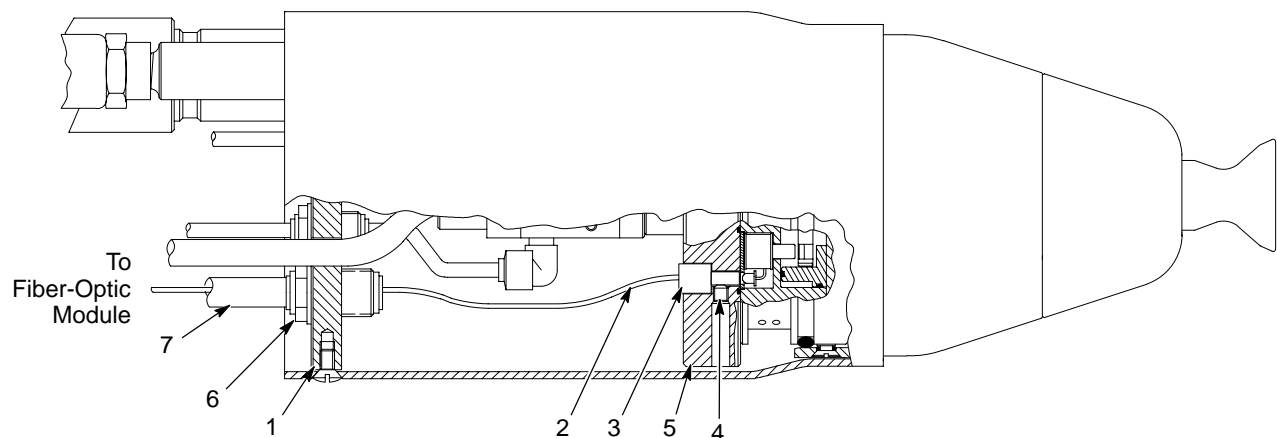


Figure 3-6 Fiber Optic Cable Installation - Rotary Atomizer

- | | | |
|------------------------|--------------------|-------------------------------------|
| 1. Rear mounting plate | 4. Set screw | 6. $\frac{3}{8}$ in. bulkhead union |
| 2. Fiber optic cable | 5. Interface plate | 7. $\frac{3}{8}$ in. air tubing |
| 3. Cable ferrule | | |

Electrostatic Connections

These procedures cover IPS cable and high-voltage cable connections to the RA-20 rotary atomizer. Refer to the manuals for the IPS10 control unit, EPS9 power supply, or the Iso-Flo unit for instructions on connecting the cables to them.

IPS Cable



CAUTION: Two IPS cables are included with the IPS version: a 4.6-m (15-ft) solvent-resistant cable, and a 15.2-m (50-ft) cable. Always connect the 15-ft solvent-resistant cable to the RA-20 rotary atomizer. Use the 50-ft cable as an extension cable to reach the IPS control unit. This will prevent solvent from damaging the extension cable.

1. See Figure 3-7. Route the 15-ft IPS cable (1) through the CABLE hole in the rear mounting plate (2).
2. Connect the cable to the IPS multiplier (6). The multiplier has an extension with a three-pin connector (4) that is visible at the end of the IPS adapter (5). Thread the cable nut (3) onto the adapter and tighten it hand-tight.
3. Connect the 50-ft cable to the 15-ft cable. Connect the other end of the 50-ft cable to the IPS10 control unit. Refer to the control unit manual for instructions.
4. Bundle the cables with the air tubing.

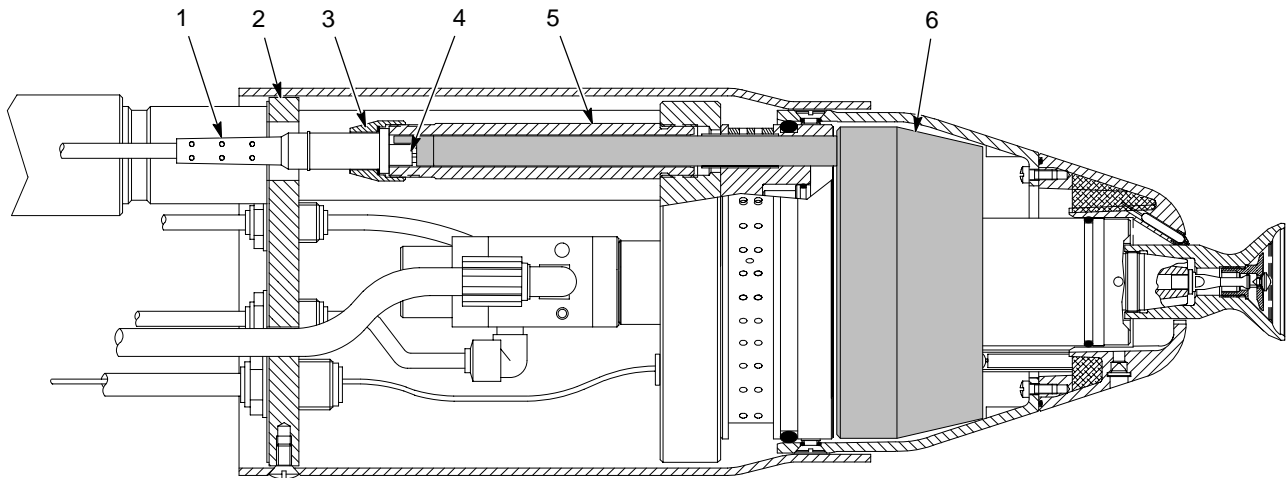


Figure 3-7 IPS Cable Installation

- | | | |
|------------------------|------------------------|-------------------|
| 1. IPS cable | 3. Cable nut | 5. IPS adapter |
| 2. Rear mounting plate | 4. Three-pin connector | 6. IPS multiplier |

High-Voltage Cable



WARNING: Only the Nordson EPS9 power supply and IFC-100 high-voltage cable are approved for use with the RA-20 rotary atomizer. Using an unauthorized power supply or high-voltage cable with the RA-20 rotary atomizer is hazardous and will void any approvals and warranties.



WARNING: High voltage will arc across any air pocket around the contact point between the resistor and the cable end. If the high-voltage cable is removed from the resistor holder, clean the cable end and coat it with dielectric grease before reinstalling it. This will ensure that the contact point remains insulated from air. Failure to follow this warning may result in serious injury.

1. Make sure the untagged end of the cable is clean and dry (tagged end connects to the power supply). Use a clean, lint-free cloth to clean the end of the cable, if necessary.
2. See Figure 3-8. Push the cable extension (2) into the cable adapter (3) until it is pressing against the resistor spring (4).
3. Wipe up any extruded grease.
4. Thread the cable nut (1) onto the adapter. Tighten the nut hand-tight.
5. Route the cable to the power supply. Keep the cable off the floor, and make sure it will not be damaged by moving equipment or the sharp edges of any nearby equipment. Do not bend the cable around a radius of less than 20 cm (8 in.).
6. Connect the tagged end of the cable to the power supply. Refer to the power supply manual for instructions.

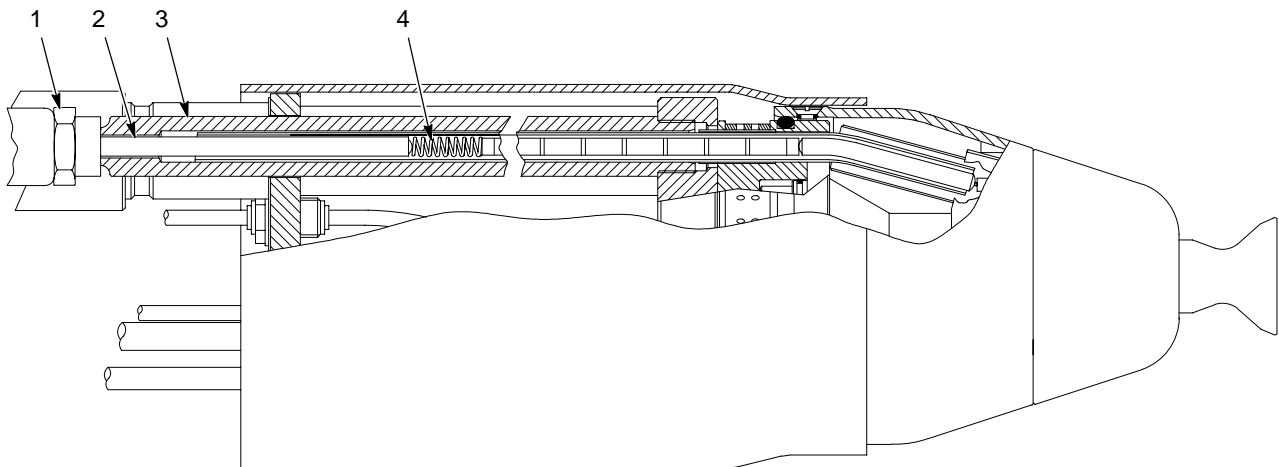


Figure 3-8 High-Voltage Cable

- | | | |
|--------------------|------------------|--------------------|
| 1. Cable nut | 3. Cable adapter | 4. Resistor spring |
| 2. Cable extension | | |

Section 4

Operation



WARNING: Allow only qualified personnel to perform the following tasks. Follow the safety instructions in this document and all other related documentation.



WARNING: This equipment can be dangerous unless it is used in accordance with the rules laid down in this manual.

Flushing



CAUTION: Operating the RA-20 rotary atomizer without adequately filtering the air supply, or without the specified bearing air pressure, will cause the turbine to fail prematurely, and will void all warranties. Do not install any shutoff valves in the bearing air tubing. Refer to the *Specifications* section for air quality and pressure specifications.

Flush new systems and new RA-20 rotary atomizers before starting production. Flushing removes oils and contaminants left in the system components and RA-20 rotary atomizer during manufacturing or installation. Use this procedure when changing colors and before shutting down the system for the night or extended periods.

1. Remove the cup assembly. Refer to *Removing and Installing the Cup Assembly* in this section.
2. Turn on system compressed air and electrical power.
3. Start the spray-booth exhaust fan(s).
4. Supply a solvent or a waterborne cleaning solution compatible with your coating material to the paint valve or dump valve.

NOTE: If the cup assembly is installed on the turbine, turn on turbine air before triggering the paint valve. Unless the turbine is rotating, coating material can, under some conditions, back up behind the cup and flow into the turbine.

5. Trigger the paint valve and let the solvent or cleaning solution flow through the RA-20 rotary atomizer for several seconds.

Flushing *(contd)*

6. Supply coating material to the paint or dump valve. Use the coating material to flush the solvent or cleaning solution out of the RA-20 rotary atomizer as follows:
 - Paint valve only: Trigger the paint valve until the coating material flushes out the solvent or cleaning solution.
 - Paint and dump valves: Trigger the dump valve until the coating material flowing into the waste container is free of all traces of solvent or cleaning material. Then turn off the dump valve and trigger the paint valve to flush out the rest of the solvent or cleaning solution.

Startup



WARNING: High-speed rotating equipment can be hazardous. Do not touch the cup, or stand in front or alongside it, while it is rotating. Do not exceed the maximum speed rating. Failure to observe this warning may result in personal injury or death.



WARNING: People and equipment in the vicinity of high-voltage electrostatic systems can accumulate a dangerous static charge unless they are grounded. Failure to observe this warning may result in equipment damage, personal injury, or death.

1. Install a cup assembly on the atomizer, if not already done. Refer to *Removing and Installing the Cup Assembly* in this section for instructions.
2. Turn on system electrical power and compressed air.
3. Supply coating material to the atomizer.



CAUTION: Bearing air is supplied to the turbine at system air pressure. Do not operate the RA-20 rotary atomizer unless the air pressure is at least 4.8 bar (70 psi), or you will damage the turbine.

4. Check system air pressure. Minimum air pressure is 4.8 bar (70 psi); recommended air pressure is 5.5-7 bar (80-100 psi).
5. Turn on the turbine air and set the turbine speed:
 - If your system has manual speed controls, adjust the UNLOADED regulator until the turbine is rotating at the desired speed.
 - If your system has automatic speed controls, set the turbine speed at the ASC6 controller or system control panel.
6. Trigger the paint valve to spray coating material. Check the turbine speed. If your system has manual speed controls, adjust the LOADED regulator until the turbine is rotating at the desired speed.

7. Turn on vector air and adjust the vector air pressure to obtain the desired spray pattern.
8. Turn on the electrostatic voltage and start production.

Modifying the Spray Pattern

To modify the spray pattern, change the

- vector air pressure
- turbine air pressure (speed)
- fluid pressure
- cup and distributor (refer to *Removing and Installing the Cup Assembly* in this section)
- electrostatic voltage
- cup-to-part distance

Modifying the Flow Rate

To modify the flow rate,

- adjust the fluid pressure
- change the atomizer nozzle or fluid tube (refer to *Removing and Installing the Nozzle and Fluid Tube* in this section)

Shutdown

To shut down the system:

1. Turn off the electrostatic voltage.
2. Flush the atomizer. Refer to *Flushing* in this section.



WARNING: High-speed rotating equipment can be hazardous. Let the turbine coast to a stop, or use brake air to stop it. Do not try to stop the turbine with your hands or by any other means. Failure to observe this warning may result in equipment damage, personal injury, or death.

3. Shut off the turbine air. Use the brake air to stop the turbine, or let it coast to a stop.
4. Remove the cup assembly from the turbine and unscrew the distributor from the cup. Refer to *Removing and Installing the Cup Assembly* in this section.
5. Soak the cup and distributor in a solvent or cleaning solution compatible with your coating material.
6. Shut off system compressed air and electrical power.

Long-Term Shutdown

If the system is being shut down for more than a day, flush the entire system with a compatible solvent or cleaning solution.

Cup Cleaning During Production

If your atomizer has a solvent valve, you can clean the cup periodically by performing the following steps:

1. With the turbine rotating, turn off the paint valve and trigger the solvent valve.
2. Let the solvent or cleaning solution clean the cup, then turn off the solvent valve.
3. Trigger the paint valve. Let the coating material push the solvent out of the atomizer, then resume production.

Removing and Installing the Cup Assembly

Use this procedure to remove, disassemble, and install the cup assembly.



WARNING: Shut off the turbine air, turn off the electrostatic voltage, and relieve the fluid pressure before performing the following tasks. Failure to observe this warning may result in equipment damage, personal injury, or death.

See Figure 4-1.

1. Insert the $\frac{1}{8}$ -in. hex-key ball driver (2), supplied with the RA-20 rotary atomizer, through the hole and duckbill seal in the side of the charge ring (1).
2. Rotate the standard (4) or premium finish (5) cup and push on the driver until it drops into the hole in the turbine shaft.
3. Hold the driver and turn the cup counterclockwise (as viewed from the front) to unscrew it from the turbine shaft.

To disassemble a standard cup, insert the $\frac{5}{16}$ -in. hex-key, supplied with the RA-20 rotary atomizer, through the back of the cup and into the standard distributor (3). Turn the hex-key counterclockwise (as viewed from the back of the cup) to unscrew the distributor from the cup.

To disassemble a premium finish cup, insert the $\frac{5}{16}$ -in. hex-key, supplied with the RA-20 rotary atomizer, through the back of the cup into the retainer (7). Turn the hex-key counterclockwise (as viewed from the back of the cup) to unscrew the retainer from the cup. Remove the premium finish distributor (6) from the rear of the cup.

To assemble the cup and install it on the turbine, perform the preceding steps in reverse. Note that the distributor has left-hand (reverse) threads.

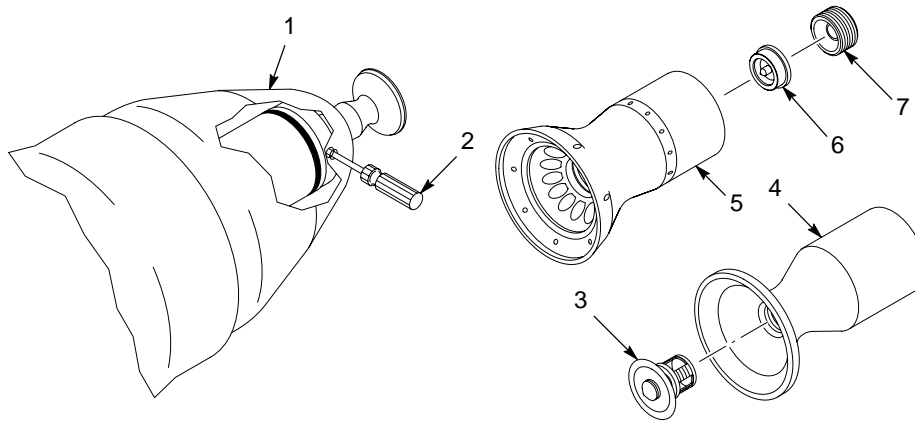


Figure 4-1 Cup Assembly

- | | | |
|-------------------------|-----------------------|-------------------------------|
| 1. Charge ring | 4. Standard cup | 6. Premium finish distributor |
| 2. Hex-key ball driver | 5. Premium finish cup | 7. Retainer |
| 3. Standard distributor | | |

Removing and Installing the Nozzle and Fluid Tube

Nozzles and fluid tubes are available in several different sizes. Changing one or both changes flow rates.



WARNING: Shut off the turbine air, turn off the electrostatic voltage, and relieve the fluid pressure before you perform the following tasks. Failure to observe this warning may result in equipment damage, personal injury, or even death.

Nozzle

See Figure 4-2.

1. Remove the cup assembly (10). Refer to *Removing and Installing the Cup Assembly*.
2. Unscrew the nozzle (9) from the end of the fluid tube (4).
3. Make sure the new nozzle has an O-ring installed. Thread the new nozzle into the fluid tube and tighten it finger-tight. Do not overtighten.
4. Install the cup assembly.

Fluid Tube

See Figure 4-2.

Disassembly

1. Remove the cup assembly (10) and nozzle (9), if not already done. Refer to *Removing and Installing the Cup Assembly*.
2. Remove the oval-head screws (7) and rear shroud (8).
3. Support the turbine (5) with one hand. Remove the two socket-head screws (6) from the interface plate (1) with the $\frac{3}{16}$ -in. hex-key ball driver supplied with the RA-20 rotary atomizer.
4. If the fluid coupling (3) remained in the fluid tube, remove it.
5. Press the fluid tube (4) out of the turbine.

Assembly

1. Press a new fluid tube into the turbine.
2. Remove the O-rings (2) from the interface plate, coat them with O-ring grease, and reinstall them.
3. Coat the O-rings on the fluid coupling with O-ring grease, then install the fluid coupling in the interface plate.
4. Install the turbine onto the interface plate, making sure the fluid coupling slides into the fluid tube. Secure with the two socket-head screws.
5. Install a new nozzle into the end of the fluid tube.
6. Install the cup assembly.
7. Install the rear shroud.

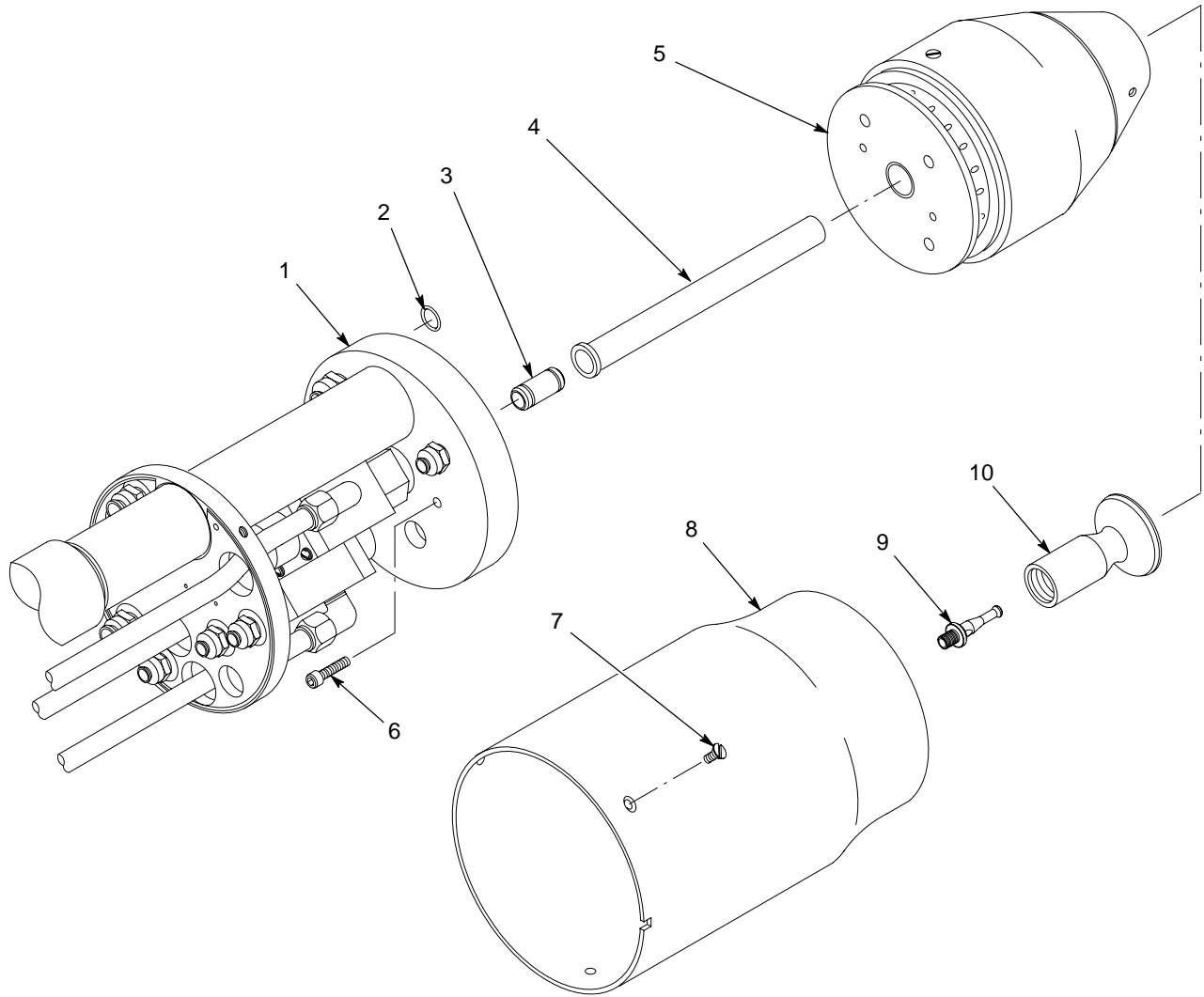


Figure 4-2 Removing and Installing the Nozzle and Fluid Tube

- | | | |
|--------------------|-----------------------|------------------|
| 1. Interface plate | 5. Turbine | 8. Rear shroud |
| 2. O-rings | 6. Socket-head screws | 9. Nozzle |
| 3. Fluid coupling | 7. Oval-head screws | 10. Cup assembly |
| 4. Fluid tube | | |

Maintenance

To keep your system operating at peak efficiency, set up a scheduled maintenance program. Keep the spray area clean and orderly at all times.

Daily

- Clean the cup and distributor.
- Flush the system.
- Wipe any overspray off the atomizer.
- Make sure the compressed air supply is free of oil and water.
- Drain the air filters and check the filter elements. Replace the elements if the pressure drop across the filters exceeds 0.3-1 bar (5-15 psi) or if they become contaminated by oil.

Weekly

- Perform the daily maintenance procedures.
- Remove the rear shroud and check the valve weep holes. Coating material, solvent, or cleaning solution in the weep holes indicates that the valve seals are leaking and may need replacing. Refer to the valve instruction sheets for repair information.

Periodic

All Systems

- Perform resistance checks on the system components with a 500-volt megohmmeter. These checks help maintain transfer efficiency and prevent electrostatic shock, fire, or explosion.
- Check the continuity of all equipment grounds in the spray area. All conductive equipment in the spray area must be grounded. Make sure the coating material supply and waste container (if used) are grounded.
- Check the resistance between the workpieces and ground. Resistance must not exceed one megohm. For best transfer efficiency, resistance should be less than 300 ohms. Strip workpiece hangers regularly.

Refer to Table 4-1 for resistance checks.

RA-20 Rotary Atomizer Cable-Fed Version



WARNING: Turn off electrostatic power supplies and wait at least 3 minutes before removing the high-voltage cable from the atomizer or power supply. After removing the cable, ground the contact on the end. Failure to observe this warning may result in a severe shock.

NOTE: These procedures do not include remote power supply checks. Refer to your power supply manual for additional information.

Table 4-1 Cable-Fed System Checks

NOTE: Refer to the Resistance Checks Diagram, Figure 4-3 for the Views listed in this table.

Check	View	Resistance	Corrective Action If Out of range
1. From charge ring electrodes to power supply end of cable	A	362-468 M Ω	If your reading does not fall within this range, perform checks 2 and 3. If they both pass, remove resistor and check.
2. From charge ring electrodes to contact on back of charge ring	B	39.6-40.4 M Ω	Replace charge ring.
3. From contact end of barrel resistor to spring end	C	142-157 M Ω	Replace resistor.
4. From contact on one end of cable to contact on other end	D	180-270 M Ω	Replace cable.
5. From one cable nut to the other	E	20 Ω maximum	Replace cable.
6. From cable nut to contact, each end	F	Infinite	Replace cable.
7. From cable nut to ground	G	0 Ω	Check cable connection to power supply. If good, replace cable.

RA-20 Rotary Atomizer IPS Version

Check the charge ring resistance. Refer to Table 4-1, procedure 2.

RA-20 Rotary Atomizer Waterborne Version

Check the high-voltage cable resistances. Refer to Table 4-1, procedures 4-7.

Resistance Checks Diagram

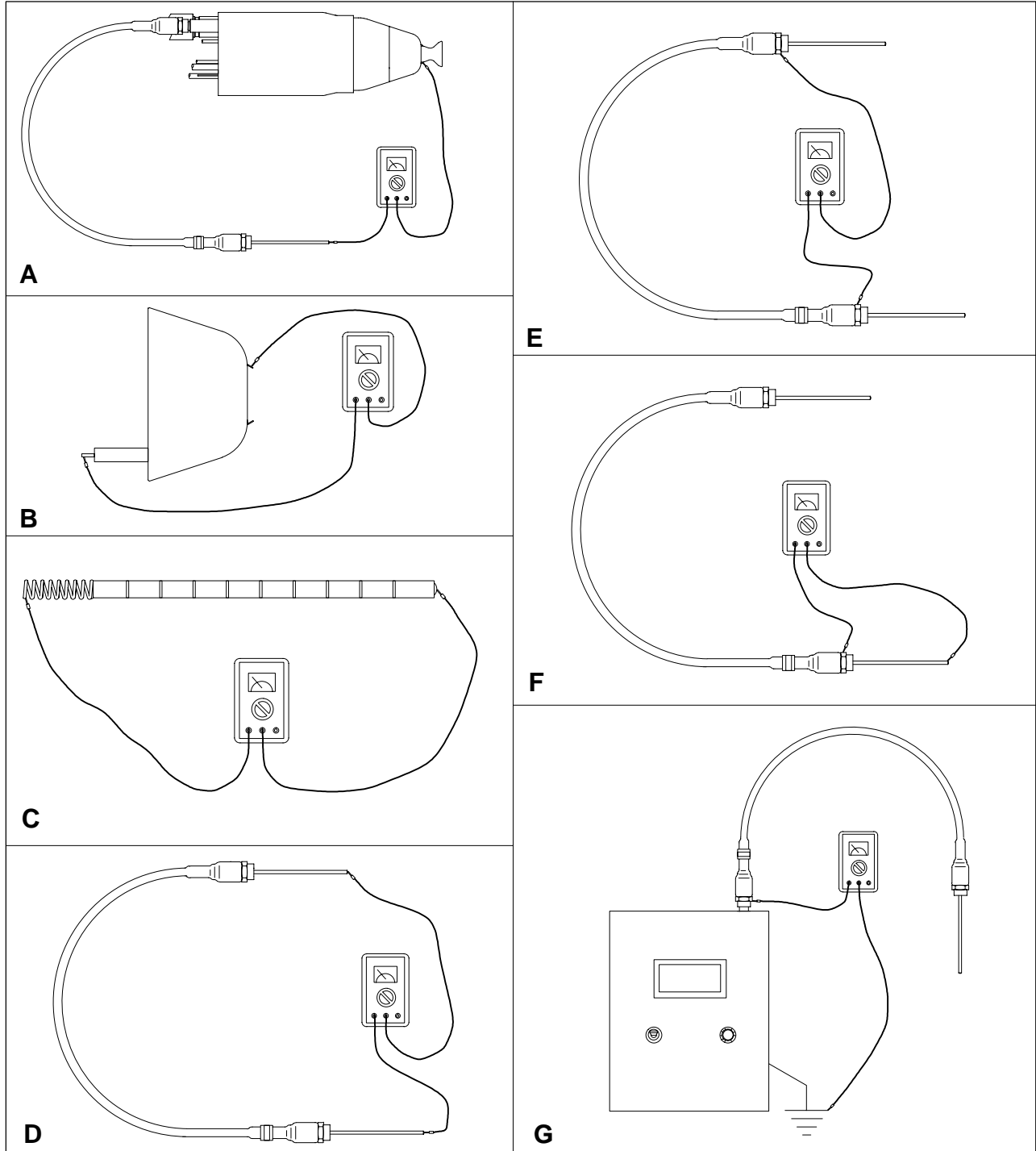


Figure 4-3 Resistance Checks

Section 5

Troubleshooting



WARNING: Allow only qualified personnel to perform the following tasks. Follow the safety instructions in this document and all other related documentation.


These troubleshooting procedures cover only the most common problems. If you cannot solve a problem with the information given here, contact your local Nordson representative for help.

No.	Problem	Page
1.	Poor coating material transfer efficiency	5-1
2.	Coating material wraps back on RA-20 rotary atomizer	5-2
3.	Poor coating material atomization	5-3
4.	Turbine will not rotate, rotates slowly, or oscillates	5-3
5.	No turbine speed control or display	5-3
6.	No spray when coating material turned on	5-4
7.	Pattern cannot be shaped, little or no vector air pressure	5-4
8.	Material will not stop flowing when shut off	5-4
9.	Material leaking from valve weep holes	5-4

Problem	Possible Cause	Corrective Action
1. Poor coating material transfer efficiency	Workpieces not properly grounded	Check the workpiece-to-ground resistance. The resistance must not exceed one megohm. For best transfer efficiency, the resistance should be less than 200 ohms. Strip the hangers and check the conveyor ground.
	Poor coating material formulation	Check the coating material. If necessary, have the manufacturer reformulate the material.
	Booth air flow too high or too low	Adjust the booth air flow.
<i>Continued...</i>		

Problem	Possible Cause	Corrective Action
1. Poor coating material transfer efficiency <i>(contd.)</i>	EPS9 power supply, IPS multiplier, or IPS control unit defective	Check the maximum power supply output with a non-loading kV meter. Refer to the kV meter manual for procedures. EPS6: 60 kV EPS9: 115 kV IPS: 100 kV Check the IPS control unit output (7-21 Vdc) with a volt meter.
	Defective high-voltage cable (cable-fed units)	Check the cable resistance (refer to the maintenance procedures in the <i>Operation</i> section). Replace the cable if it is defective.
	Defective IPS cable	Check the cable continuity from pin to pin. Replace the cable if any leads are open or shorted.
	Defective charge ring	Check the charge ring resistance (refer to the maintenance procedures in the <i>Operation</i> section). Replace the charge ring if it is defective.
	Defective barrel resistor (cable-fed units)	Check the resistor resistance (refer to the maintenance procedures in the <i>Operation</i> section). Replace the resistor if it is defective.
	Poor connections	Check the following connections: <ul style="list-style-type: none"> • EPS9 to high-voltage cable • high-voltage cable to resistor • resistor to charge ring or <ul style="list-style-type: none"> • IPS control unit to IPS cable • IPS cable to IPS multiplier • IPS multiplier to charge ring Repair or replace components as necessary.
2. Coating material wraps back on RA-20 rotary atomizer	Spray booth air velocity too low	Check the air flow through the booth. Increase the exhaust fan speed or replace the filters.
	Insufficient vector air	Increase the vector air pressure.
	Poor coating material formulation	Check the coating material. Reformulate as needed.
	No grounded part in front of atomizer	Reprogram the system controls.

Continued...

Problem	Possible Cause	Corrective Action
3. Poor coating material atomization	Turbine speed too slow	Increase the turbine speed.
	Coating material plugging cup assembly, or cup damaged or unbalanced	Remove, disassemble, and clean the cup assembly. Inspect the parts for damage and replace them if necessary.
	Coating material viscosity incorrect	Change the viscosity. For help, contact your Nordson representative and/or material supplier.
	Flow rate too high	Lower the flow rate by decreasing the fluid pressure or changing the nozzle or fluid tube.
	Coating material not charging	Check the electrostatic system. Refer to the maintenance procedures in the <i>Operation</i> section.
4. Turbine will not rotate, rotates slowly, or oscillates	Air pressure to turbine or air bearings too low or not present	Check the turbine air tubing for kinks or blockages. Check the regulator output. Check the control valves and V-to-P regulator (if used).
	Leaking O-ring in interface plate	Remove the turbine and replace the O-ring.
	Turbine air regulators not set properly (open-loop speed control)	Check the turbine air regulator settings. Refer to the <i>Operation</i> section for instructions.
	Turbine air bearings worn or plugged	Repair or replace the turbine. Water in the bearing air, or coating material backing up behind the cup can plug or damage bearings.
	Cup out of balance or damaged	Check the cup and replace it if necessary.  WARNING: Do not use defective cups. A defective cup can quickly damage the turbine or fail and possibly injure the operator or other nearby personnel.
5. No turbine speed control or display	Defective transmitter assembly	Disconnect the fiber-optic cable from the turbine. Check for visible light at the sensor with the turbine rotating.
	Defective fiber-optic cable	Disconnect the fiber-optic cable from the fiber optic module. Check for visible light at the cable end with the turbine rotating.
	Defective fiber-optic module	Check for the correct output from the module with the turbine rotating. Repair or replace the module. Refer to the fiber-optic module manual.

Continued...

Problem	Possible Cause	Corrective Action
5. No turbine speed control or display (<i>contd.</i>)	Defective rpm indicator, ASC6 controller, or other control unit	Repair or replace the display unit.
	Defective control unit (closed-loop system)	Check for the correct voltage to the V-to-P or I-to-P transducer. Repair or replace the defective component.
	Defective V-to-P or I-to-P transducer (closed-loop system)	Check the transducer for proper operation. Replace it if it is defective.
6. No spray when coating material turned on	Nozzle or fluid tube plugged	Remove the nozzle and fluid tube. Clean or replace them.
	Fluid tubing plugged	Check the tubing for blockages.
	No trigger air to paint valve, or pressure too low	Make sure the trigger air lines are not kinked or plugged. Check the trigger air pressure. Minimum system air pressure is 4.8 bar (70 psi).
	Paint valve malfunctioning or adjusted incorrectly	Disassemble and repair the paint valve. Adjust the valve. Refer to the valve manual.
	Switch, solenoid, or valve in control panel defective	Check the components and replace them if they are defective.
7. Pattern cannot be shaped, little or no vector air pressure	Vector air tubing kinked or plugged	Check the tubing. Replace the tubing if necessary.
	Leaking O-ring in interface plate	Remove the turbine and replace the O-ring.
	Vector air slots plugged; air leaking from charge ring, front shroud seals, or screw holes	Remove the front shroud and charge ring assembly and disassemble it. Inspect all O-rings and the duckbill seal. Replace damaged parts. Clean the slots. Coat all O-rings with O-ring grease before reassembling.
	Sleeve missing from between turbine and interface plate	Install a new sleeve.
	Valve or regulator malfunction	Check the vector air control components and replace them if they are defective.
	8. Material will not stop flowing when shut off	Paint or solvent valve ball and seat worn or valve jammed in open position
Switch or solenoid valve defective		Check the components and replace them if they are defective.
9. Material leaking from valve weep holes	Valve seals worn	Repair or replace the leaking valve.

Section 6

Repair



WARNING: Allow only qualified personnel to perform the following tasks. Follow the safety instructions in this document and all other related documentation.

Introduction

This section provides instructions for disassembling and assembling the RA-20 rotary atomizer. The atomizer can be disassembled without removing it from its mounting. Repair instructions for the valves and the turbine are contained in separate manuals.

NOTE: The numeric callouts in this section match the item numbers in the rotary atomizer's main parts list. Refer to the *Parts* section for complete part descriptions and ordering information. Items in the *Repair* section that are not included with the main rotary atomizer assembly are identified with alphabetic callouts.

Preparation

1. Turn off the electrostatic voltage.
2. Flush the atomizer, then shut off the air, coating material, and solvent or cleaning solution supplies. Relieve the system air and fluid pressure. Drain the fluid tubing.
3. Remove the cup and nozzle. Refer to the *Operation* section for procedures.

Valve Replacement

See Figure 6-1

NOTE: The manifold (D) is used when a dump valve (A), solvent valve (B), or both, are added to the paint valve (6). The manifold does not have to be removed to remove the valves.

Valve Removal

See Figure 6-1.

1. Remove the three oval-head screws (24) securing the rear shroud (2) to the rear mounting plate (3). Slide the shroud off the atomizer.
2. Disconnect the air and fluid tubing from the valve(s).
3. Disconnect the fiber-optic cable (E) (if used) and any air tubing connected to the interface plate (7) connectors (20A, 20B, 21A, 21B) that are in the way.
4. If your atomizer is equipped with paint and solvent valves, loosen the set screw (4) and slide the rear mounting plate back to the shoulder on the mounting stem (1).
5. Loosen the socket-head screws (29, C) in the interface plate or the manifold (D) with the $\frac{3}{16}$ -in. hex-key ball driver supplied with the RA-20 rotary atomizer.
6. Remove the valve(s) from the interface plate or manifold.
7. To remove the dump valve from the paint valve, remove the socket-head cap screws from the side of the valves. Do not lose the O-ring that provides a seal between the valves.

Valve Rebuild

To rebuild the valves, refer to the *RA-20 Paint/Solvent/Dump Valve* instruction sheet.

Valve Installation

Perform the removal steps in reverse to install new or rebuilt valves. Make sure to do the following:

- Reconnect the air and fluid tubing to the valves after installing them in the interface plate or manifold.
- Reconnect the air tubing to the interface plate fittings correctly. Figure 6-1 includes a view of the interface plate. The fittings on the rear mounting plate are labeled.
- Line up the notch in the rear shroud with the identification groove in the rear mounting plate.

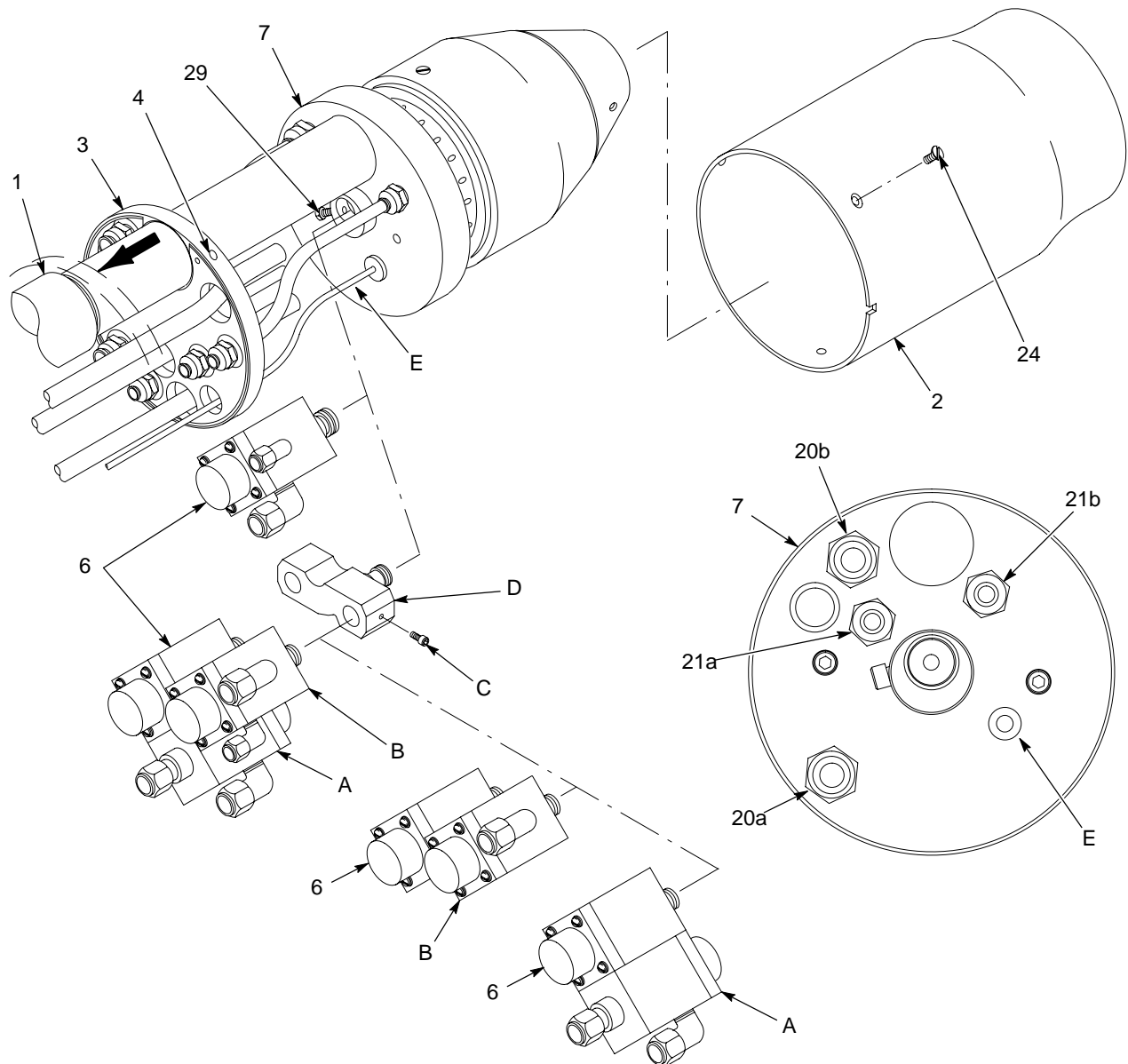


Figure 6-1 Valve Replacement

- | | | |
|------------------------|----------------------------|---------------------------------|
| 1. Mounting stem | 20a. Turbine air connector | A. Dump valve |
| 2. Rear shroud | 20b. Vector air connector | B. Solvent valve |
| 3. Rear mounting plate | 21a. Brake air connector | C. Socket-head screw |
| 4. Set screw | 21b. Bearing air connector | D. Manifold |
| 6. Paint valve | 24. Oval-head screws | E. Fiber-optic cable (optional) |
| 7. Interface plate | 29. Socket-head screw | |

Turbine Replacement

Refer to the *Turbine Disassembly and Repair* instruction sheet for repair procedures and parts information.

Turbine Removal

1. Remove the rear shroud.
2. See Figure 6-2. If your atomizer is equipped with an IPS multiplier, unscrew the cable nut (A) from the IPS adapter (41) and disconnect the IPS cable (44) from the IPS multiplier (42).

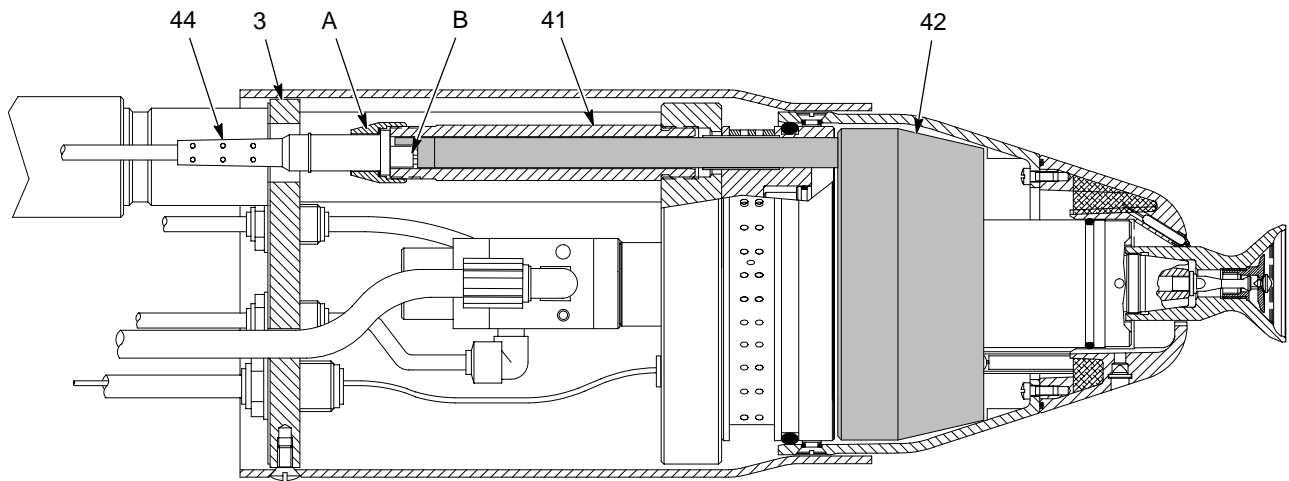


Figure 6-2 Turbine Removal - IPS Cable Version

- | | | |
|------------------------|--------------------|------------------------|
| 3. Rear mounting plate | 42. IPS multiplier | A. Cable nut |
| 41. IPS adapter | 44. IPS cable | B. Three-pin connector |

3. See Figure 6-3. Support the turbine (13) and remove the two socket-head screws (19) from the interface plate (7) with the $\frac{3}{16}$ -in. hex-key ball driver supplied with the RA-20 rotary atomizer.
4. Pull the turbine straight away from the interface plate. If your RA-20 rotary atomizer is an IPS version, be careful not to damage the IPS multiplier extension. If your atomizer is a cable-fed version, the barrel resistor tube is left sticking out of the interface plate.

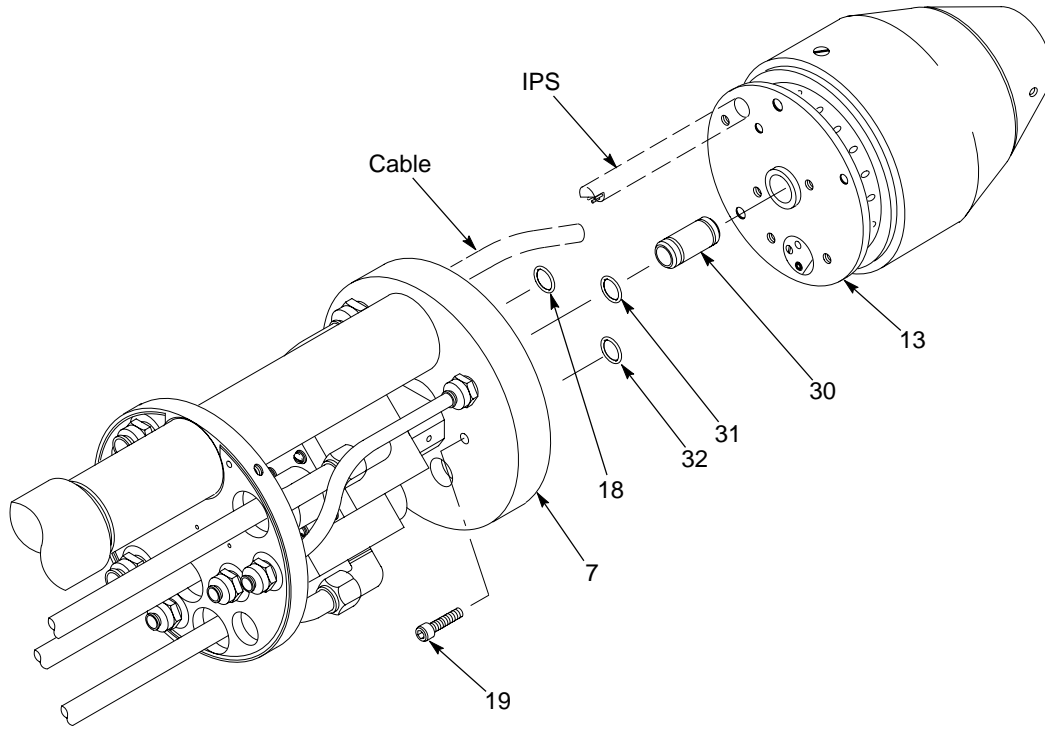


Figure 6-3 Turbine Removal

- | | | |
|--------------------|------------------------|-------------|
| 7. Interface plate | 19. Socket-head screws | 31. O-rings |
| 13. Turbine | 30. Fluid coupling | 32. O-ring |
| 18. O-rings | | |

Turbine Disassembly

1. See Figure 6-3. Inspect the five O-rings (18, 32) installed in the interface plate. Replace them if they are damaged.
2. Remove the fluid coupling (30). Inspect the coupling O-rings (31) and replace them if they are damaged. Coat the O-rings with O-ring grease and install the coupling in the interface plate.
3. See Figure 6-4. Remove the shroud screws (10) and O-rings (11) to remove the front shroud (12) from the turbine (13).
4. Remove the following parts from the turbine in this order:
 - O-ring (35)
 - IPS multiplier (42) or cable holder (42), if used
5. If the charge ring is being replaced, remove the three fillister-head screws (40) securing the front shroud to the charge ring. Separate the charge ring from the front shroud and remove the O-ring (39).
6. Remove the small flat-head screw (B) and the transmitter assembly (A) from the turbine.
7. Remove the following parts from the turbine in this order:
 - flat-head screw (8)
 - exhaust cover (9)
 - four turbine exhaust plugs (17)
 - fluid tube (34)
8. Remove the O-ring (33) and resistor sleeve (27) from the turbine.

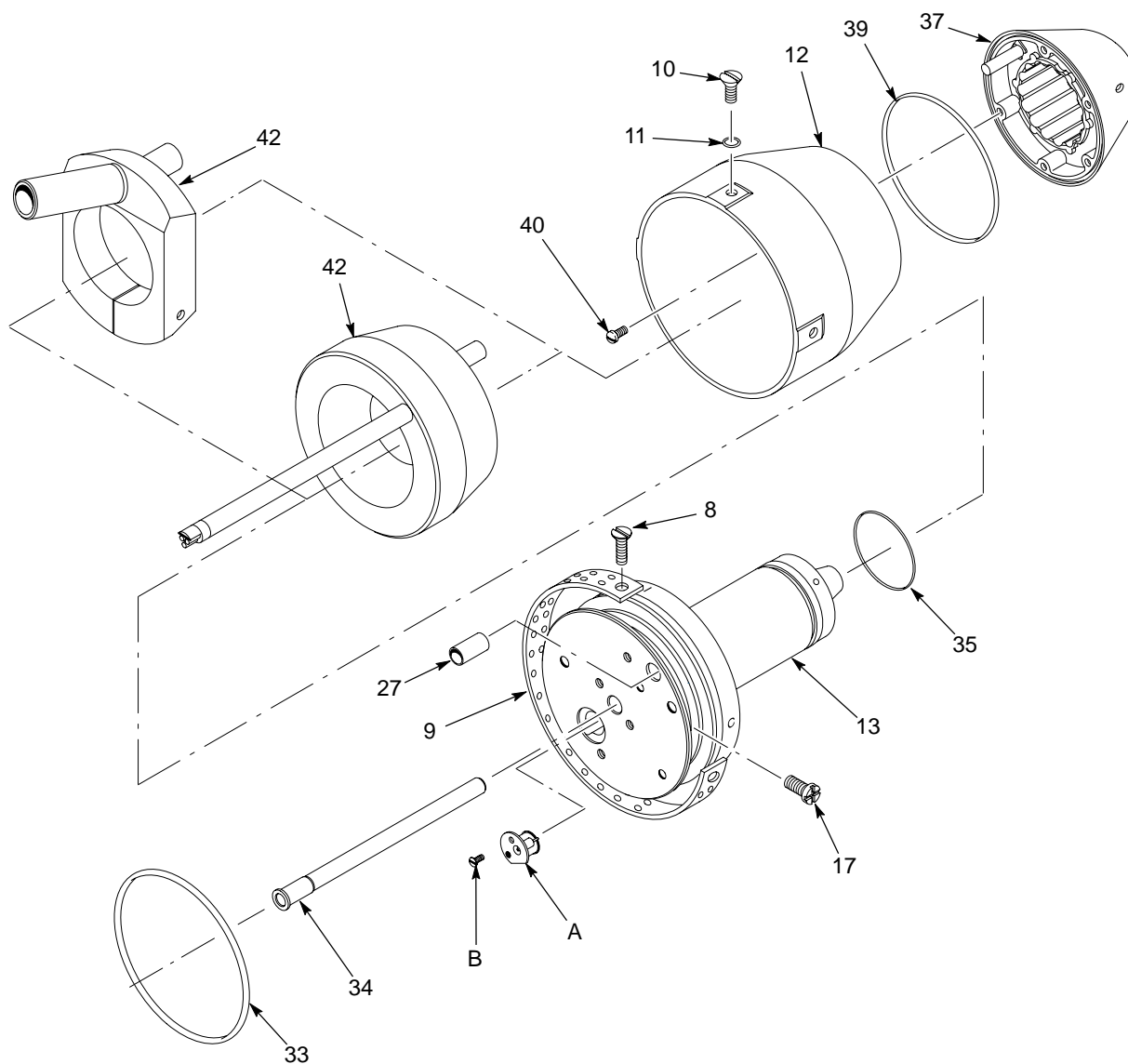


Figure 6-4 Turbine Disassembly

- | | | |
|--------------------|--------------------------|--------------------------------------|
| 8. Flat-head screw | 27. Resistor sleeve | 42. Cable holder (See Figure 7-1.) |
| 9. Exhaust cover | 33. O-ring | 42. IPS multiplier (See Figure 7-3.) |
| 10. Shroud screw | 34. Fluid tube | |
| 11. O-rings | 35. O-ring | A. Transmitter assembly |
| 12. Front shroud | 37. Charge ring | B. Flat-head screw |
| 13. Turbine | 39. O-ring | |
| 17. Exhaust plugs | 40. Fillister head screw | |

Turbine Assembly

NOTE: Coat all O-rings with O-ring grease before installing them.

See Figure 6-4.

1. Install the following parts into the turbine (13) in this order:
 - fluid tube (34)
 - turbine exhaust plugs (17).
 - resistor sleeve (27)
2. Wrap the exhaust cover (9) around the turbine, covering the exhaust plugs. Overlap the ends of the exhaust cover and rotate it until the holes in the ends line up with the hole in the turbine. Secure the exhaust cover to the turbine with the flat-head screw (8).
3. Install the transmitter assembly (A) in the turbine back plate and secure it with the flat-head screw (B).
4. Install a new O-ring (39) in the charge ring (37). Secure the front shroud (12) to the charge ring with the three fillister-head screws (40).
5. Install the IPS multiplier (42) or cable holder (42) onto the turbine.
6. Install new O-rings (33, 35) on the turbine.
7. Install the front shroud and charge ring onto the turbine. Line up the front shroud notch with the marks on the turbine housing as follows:
 - IPS or waterborne version: "I"
 - cable-fed version: "C"

Turbine Installation

1. See Figure 6-4. Secure the front shroud to the turbine with the shroud screws (10) and O-rings (11).
2. See Figure 6-3. Install the turbine (13) on the interface plate (7), making sure the
 - O-rings (18, 32) are coated with O-ring grease and installed in the interface plate
 - fluid coupling (30) slides into the fluid tube
 - IPS multiplier extension slides through the appropriate hole in the interface plate (IPS version)
 - resistor tube slides into the cable holder (cable-fed version)
3. Secure the turbine to the interface plate with the two socket-head screws (19).
4. Connect the IPS cable (if removed) to the IPS multiplier.
5. See Figure 6-1. Install the rear shroud (2).

Service Illustration and Notes

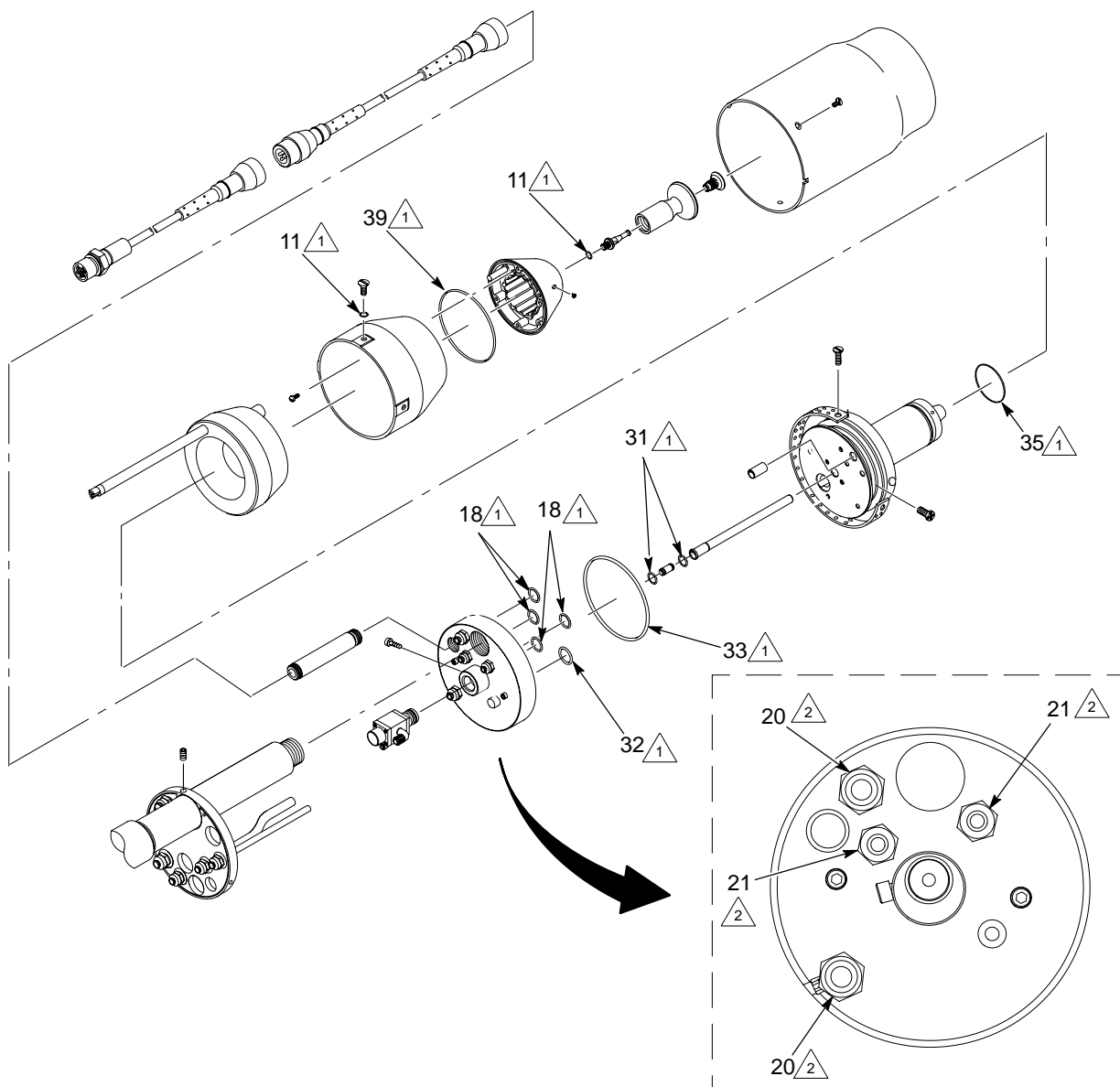


Figure 6-5 Rotary Atomizer Service Notes

NOTE: Keep Teflon tape and O-ring lubricant out of air and fluid paths.

Note	Item	Description
1	11, 18, 31, 32, 33, 35, 39	Coat with O-ring grease before installing.
2	20, 21	Use Teflon tape on all pipe thread connections.

Section 7

Parts

Introduction

To order parts, call the Nordson Finishing Customer Support Center at (800) 433-9319 or contact your local Nordson representative.

Using the Illustrated Parts List

Numbers in the Item column correspond to numbers that identify parts in illustrations following each parts list. The code NS (not shown) indicates that a listed part is not illustrated. A dash (—) is used when the part number applies to all parts in the illustration.

The number in the Part column is the Nordson Corporation part number. A series of dashes in this column (- - - - -) means the part cannot be ordered separately.

The Description column gives the part name, as well as its dimensions and other characteristics when appropriate. Indentions show the relationships between assemblies, subassemblies, and parts.

- If you order the assembly, items 1 and 2 will be included.
- If you order item 1, item 2 will be included.
- If you order item 2, you will receive item 2 only.

The number in the Quantity column is the quantity required per unit, assembly, or subassembly. The code AR (As Required) is used if the part number is a bulk item ordered in quantities or if the quantity per assembly depends on the product version or model.

Letters in the Note column refer to notes at the end of each parts list. Notes contain important information about usage and ordering. Special attention should be given to notes.

Item	Part	Description	Quantity	Note
—	0000000	Assembly	1	
1	000000	• Subassembly	2	A
2	000000	• • Part	1	

Cable-Fed RA-20 Rotary Atomizer

NOTE: Before ordering parts for your rotary atomizer, review the appropriate procedure in the *Repair* and *Installation* sections to make sure you are ordering the correct parts, lubricant, and adhesives to complete the procedure.

See Figure 7-1.

Item	Part	Description	Quantity	Note
—	295360	ATOMIZER, RA-20, cable	1	
1	295342	• STEM, mounting, RA-20	1	
2	295352	• SHROUD, rear, RA-20	1	
3	295356	• PLATE, rear, mounting	1	
4	981213	• SCREW, socket set, 1/4-20 x 0.25 in., cup	3	
5	972225	• ELBOW, male, 3/8-in. tube x 1/4-in. NPT	1	
6	302134	• VALVE, paint/solvent, with packaging/manual	1	A
7	295339	• PLATE, interface, mounting	1	
8	982877	• SCREW, flat head, #10-32 x 0.875 in., nylon	1	
9	189868	• COVER, exhaust, turbine	1	
10	235709	• SCREW, shroud, 1/4-20 in.	2	
11	940092	• O-RING, Viton, black, 7/32 x 11/32 in.	2	B, C
12	235711	• SHROUD, front, RA-20	1	
13	220639	• TURBINE, air, center feed	1	
14	302126	• CUP, 2-in. diameter, with fins, pads, assembly	1	
15	295369	• • DISTRIBUTOR, cup	1	
NS	-----	• • • DEFLECTOR, distributor	1	
16	295382	• NOZZLE, fluid, RA-20, 0.020-in. diameter	1	
16	295384	• NOZZLE, fluid, RA-20, 0.040-in. diameter	1	
16	295385	• NOZZLE, fluid, RA-20, 0.050-in. diameter	1	
16	295388	• NOZZLE, fluid, RA-20, 0.080-in. diameter	1	
11	940092	• • O-RING, Viton, black, 7/32 x 11/32 in.	1	B, C, D
17	230928	• PLUG, turbine exhaust	4	
18	942050	• O-RING, Viton, black, 0.438 x 0.688 x 0.120 in.	4	B
19	981234	• SCREW, socket, 1/4-20 x 1.25 in., zinc	2	
20	972097	• CONNECTOR, male, 3/8-in. tube x 1/4-in. NPTF	2	

NOTE A: Refer to the *RA-20 Paint/Solvent/Dump Valve* instruction sheet for a parts breakdown.

B: Part is included in seal replacement kit, part 295381. Refer to *Seal Kit*.

C: This part is listed multiple times within this assembly. Order the appropriate quantity.

D: O-ring, part 940092, is included with all nozzles.

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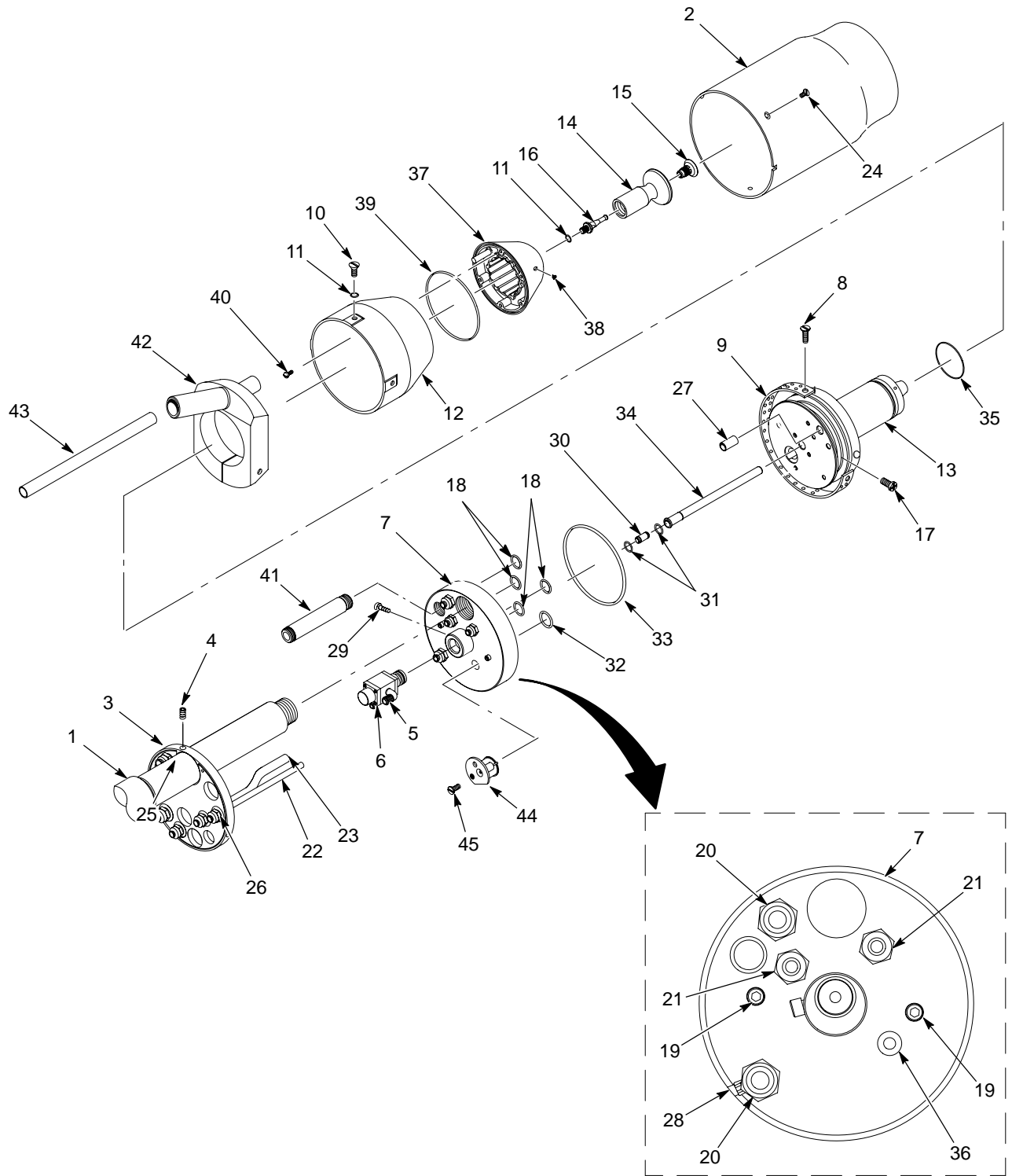


Figure 7-1 Cable-Fed RA-20 Rotary Atomizer

Cable-Fed RA-20 Rotary Atomizer *(contd)*

See Figure 7-2.

Item	Part	Description	Quantity	Note
21	972080	• CONNECTOR, male, 1/4-in. tube x 1/8-in. NPTF	2	
22	900603	• TUBING, polyurethane, 1/4-in. OD, clear	1.4 ft	E
23	900602	• TUBING, polyurethane, 3/8-in. OD, clear	1.0 ft	E
24	982876	• SCREW, oval head, 1/4-20 x 0.50 in., nylon	3	
25	971308	• UNION, bulkhead, 3/8-in. tube x 3/8-in. tube, plastic	2	
26	971273	• UNION, bulkhead, 1/4 in. x 1/4 in., plastic	5	
27	182233	• SLEEVE, resistor	1	
28	981327	• SCREW, socket set, 5/16-18 x 0.312 in., cup, zinc	2	
29	981201	• SCREW, socket head, 1/4-20 x 0.50 in., black	1	
30	295343	• COUPLING, fluid	1	
31	940107	• O-RING, Viton, black, 0.250 x 0.375 in.	2	B
32	940232	• O-RING, Buna-N, 1.063 x 1.188 x 0.063 in.	1	B
33	943520	• O-RING, Buna-N, 4.875 x 5.25 x 0.188 in.	1	B
34	181761	• TUBE, fluid, (0.161 in.), RA-20	1	
35	941351	• O-RING, Buna-N, 1.94 x 2.12 in., 55 duro	1	B
36	295411	• PLUG, fiber optic cable, RA-20	1	
37	230921	• HOUSING, charge ring, with resistors	1	
38	125123	• • SEAL, duckbill valve	1	
39	940453	• O-RING, Viton, black, 4.00 x 4.12 x 0.06 in.	1	B
40	982878	• SCREW, fillister, 10-32 x 0.50 in., nylon	3	
41	295341	• ADAPTER, cable, RA-20	1	
42	230911	• HOLDER, electrostatic, cable assembly	1	
43	302138	• RESISTOR, RA-20, assembly	1	
44	227169	• TRANSMITTER, visible assembly	1	
45	982056	• SCREW, flat, slotted, M3 x 6 mm, zinc	1	
NS	901944	• SCREWDRIVER, 1/8-in. ball point hex, cup removal	1	
NS	901945	• SCREWDRIVER, 3/16-in. ball point hex, turbine/valve removal	1	
NS	233490	• KEY, hex, 5/16 x 3.84 in., distributor removal	1	
NS	169649	• BAG, rotary, cover	1	
NOTE B: Part is included in seal replacement kit, part 295381. Refer to <i>Seal Kit</i> .				
E: Order tubing in one foot increments.				
NS: Not Shown				

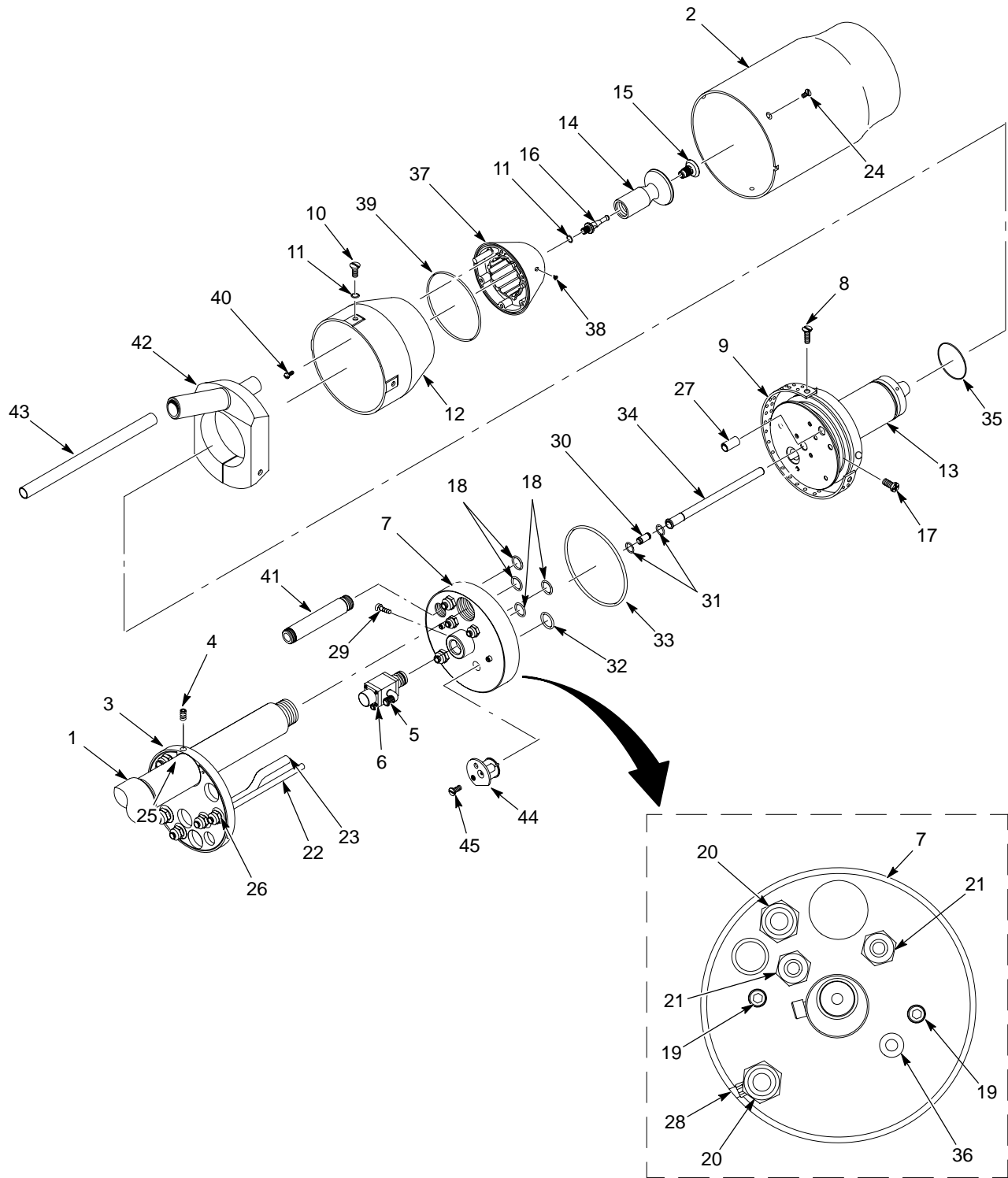


Figure 7-2 Cable-Fed RA-20 Rotary Atomizer

IPS RA-20 Rotary Atomizer

NOTE: Before ordering parts for your rotary atomizer, review the appropriate procedure in the *Repair* and *Installation* sections to make sure you are ordering the correct parts, lubricant, and adhesives to complete the procedure.

See Figure 7-3.

Item	Part	Description	Quantity	Note
—	295359	ATOMIZER, RA-20, IPS	1	
1	295342	• STEM, mounting, RA-20	1	
2	295352	• SHROUD, rear, RA-20	1	
3	295356	• PLATE, rear, mounting	1	
4	981213	• SCREW, socket set, 1/4-20 x 0.25 in., cup	3	
5	972225	• ELBOW, male, 3/8-in. tube x 1/4-in. NPT	1	
6	302134	• VALVE, paint/solvent, with packaging/manual	1	A
7	295339	• PLATE, interface, mounting	1	
8	982877	• SCREW, flat head, #10-32 x 0.875 in., nylon	1	
9	189868	• COVER, exhaust, turbine	1	
10	235709	• SCREW, shroud, 1/4-20 in.	2	
11	940092	• O-RING, Viton, black, 7/32 x 11/32 in.	2	B, C
12	235711	• SHROUD, front, RA-20	1	
13	220639	• TURBINE, air, center feed	1	
14	302126	• CUP, 2-in. diameter, with fins, pads, assembly	1	
15	295369	• • DISTRIBUTOR, cup	1	
NS	-----	• • • DEFLECTOR, distributor	1	
16	295382	• NOZZLE, fluid, RA-20, 0.020-in. diameter	1	
16	295384	• NOZZLE, fluid, RA-20, 0.040-in. diameter	1	
16	295385	• NOZZLE, fluid, RA-20, 0.050-in. diameter	1	
16	295388	• NOZZLE, fluid, RA-20, 0.080-in. diameter	1	
11	940092	• • O-RING, Viton, black, 7/32 x 11/32 in.	1	B, C, D
17	230928	• PLUG, turbine exhaust	4	
18	942050	• O-RING, Viton, black, 0.438 x 0.688 x 0.120 in.	4	B
19	981234	• SCREW, socket, 1/4-20 x 1.25 in., zinc	2	
20	972097	• CONNECTOR, male, 3/8-in. tube x 1/4-in. NPTF	2	

NOTE A: Refer to the *RA-20 Paint/Solvent/Dump Valve* instruction sheet for a parts breakdown.

B: Part is included in seal replacement kit, part 295381. Refer to *Seal Kit*.

C: This part is listed multiple times within this assembly. Order the appropriate quantity.

D: O-ring, part 940092, is included with all nozzles.

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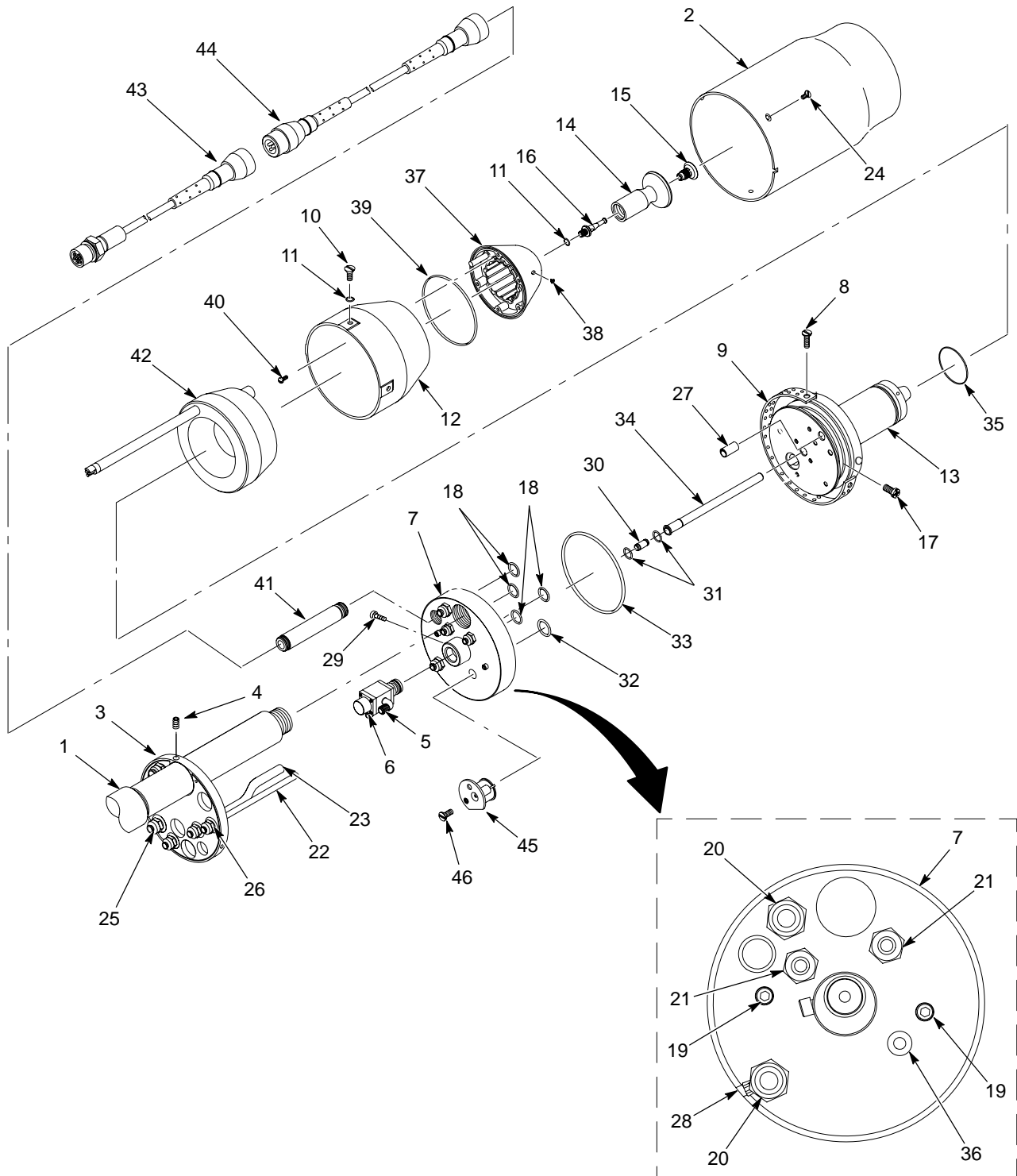


Figure 7-3 IPS RA-20 Rotary Atomizer

IPS RA-20 Rotary Atomizer *(contd)*

See Figure 7-4.

Item	Part	Description	Quantity	Note
21	972080	• CONNECTOR, male, 1/4-in. tube x 1/8-in. NPTF	2	
22	900603	• TUBING, polyurethane, 1/4-in. OD, clear	1.4 ft	E
23	900602	• TUBING, polyurethane, 3/8-in. OD, clear	1.0 ft	E
24	982876	• SCREW, oval head, 1/4-20 x 0.50 in., nylon	3	
25	971308	• UNION, bulkhead, 3/8-in. tube x 3/8-in. tube, plastic	2	
26	971273	• UNION, bulkhead, 1/4 in. x 1/4 in., plastic	5	
27	182233	• SLEEVE, resistor	1	
28	981327	• SCREW, socket set, 5/16-18 x 0.312 in., cup, zinc	2	
29	981201	• SCREW, socket head, 1/4-20 x 0.50 in., black	1	
30	295343	• COUPLING, fluid	1	
31	940107	• O-RING, Viton, black, 0.250 x 0.375 in.	2	B
32	940232	• O-RING, Buna-N, 1.063 x 1.188 x 0.063 in.	1	B
33	943520	• O-RING, Buna-N, 4.875 x 5.25 x 0.188 in.	1	B
34	181761	• TUBE, fluid, (0.161 in.), RA-20	1	
35	941351	• O-RING, Buna-N, 1.94 x 2.12 in., 55 duro	1	B
36	295411	• PLUG, fiber optic cable, RA-20	1	
37	230921	• HOUSING, charge ring, with resistors	1	
38	125123	• • SEAL, duckbill valve	1	
39	940453	• O-RING, Viton, black, 4.00 x 4.12 x 0.06 in.	1	B
40	982878	• SCREW, fillister, 10-32 x 0.5 in., nylon	3	
41	295340	• ADAPTER, connector, IPS	1	
42	183784	• MULTIPLIER, assembly, RA-20	1	
43	142109	• CABLE, Versa Spray, 100 kV, 16 m	1	
44	181730	• CABLE, RA-20/IPS/RA-20R, 15 ft	1	
45	227169	• TRANSMITTER, visible assembly	1	
46	982056	• SCREW, flat, slotted, M3 x 6 mm, zinc	1	
NS	901944	• SCREWDRIVER, 1/8-in. ball point hex, cup removal	1	
NS	901945	• SCREWDRIVER, 3/16-in. ball point hex, turbine/valve removal	1	
NS	233490	• KEY, hex, 5/16 x 3.84 in., distributor removal	1	
NS	169649	• BAG, rotary, cover	1	

NOTE B: Part is included in seal replacement kit, part 295381. Refer to *Seal Kit*.

E: Order tubing in one foot increments.

NS: Not Shown

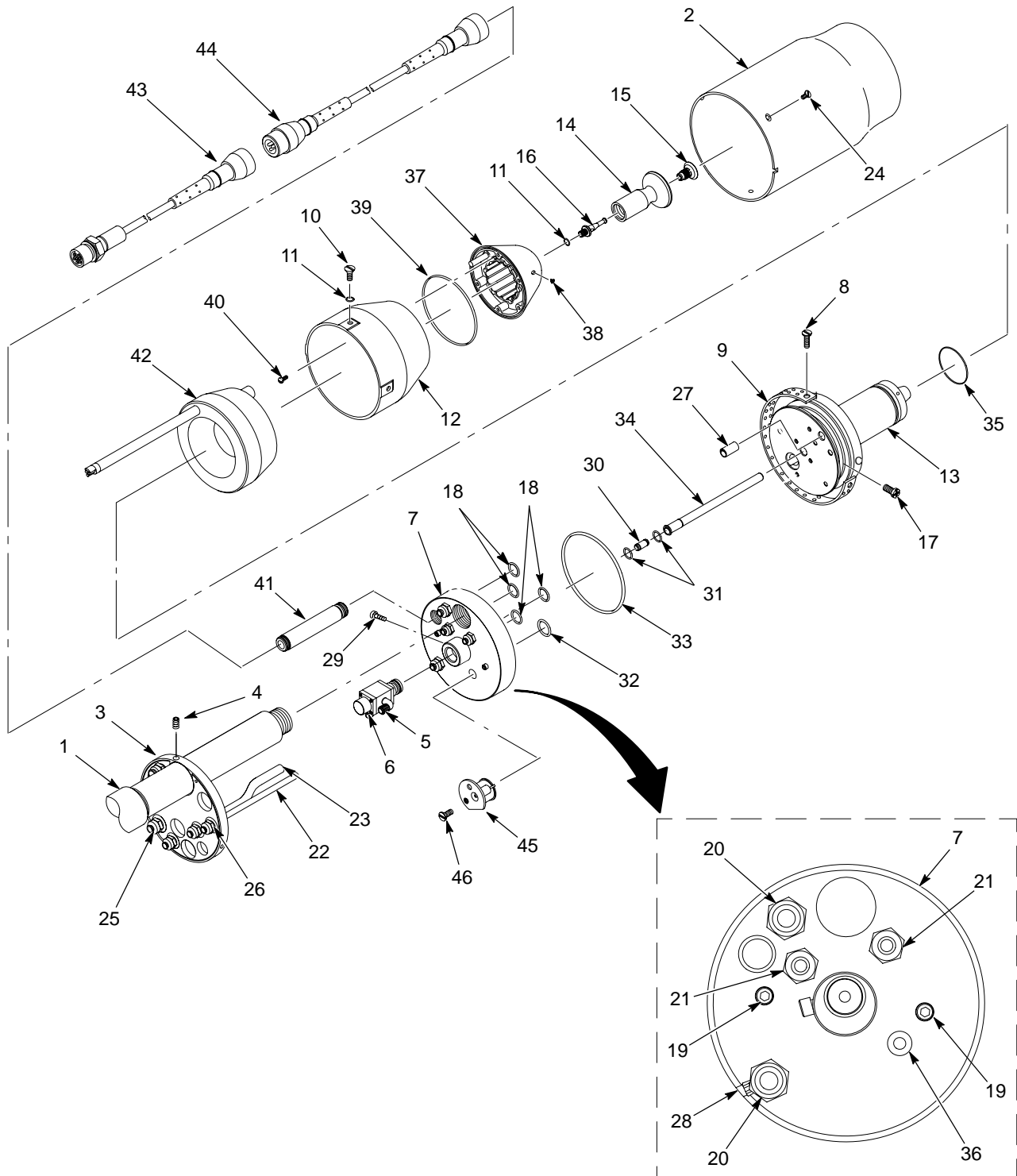


Figure 7-4 IPS RA-20 Rotary Atomizer

Waterborne RA-20 Rotary Atomizer

NOTE: Before ordering parts for your rotary atomizer, review the appropriate procedure in the *Repair* and *Installation* sections to make sure you are ordering the correct parts, lubricant, and adhesives to complete the procedure.

See Figure 7-5.

Item	Part	Description	Quantity	Note
—	295361	ATOMIZER, RA-20, Waterborne	1	
1	295342	• STEM, mounting, RA-20	1	
2	295352	• SHROUD, rear, RA-20	1	
3	295356	• PLATE, rear, mounting	1	
4	981213	• SCREW, socket set, 1/4-20 x 0.25 in., cup	3	
5	972225	• ELBOW, male, 3/8-in. tube x 1/4-in. NPT	1	
6	302134	• VALVE, paint/solvent, with packaging/manual	1	A
7	295339	• PLATE, interface, mounting	1	
8	982877	• SCREW, flat head, #10-32 x 0.875 in., nylon	1	
9	189868	• COVER, exhaust, turbine	1	
10	235709	• SCREW, shroud, 1/4-20 in.	2	
11	940092	• O-RING, Viton, black, 7/32 x 11/32 in.	2	B, C
12	235711	• SHROUD, front, RA-20	1	
13	220639	• TURBINE, air, center feed	1	
14	302126	• CUP, 2-in. diameter, with fins, pads, assembly	1	
15	295369	• • DISTRIBUTOR, cup	1	
NS	-----	• • • DEFLECTOR, distributor	1	
16	295382	• NOZZLE, fluid, RA-20, 0.020-in. diameter	1	
16	295384	• NOZZLE, fluid, RA-20, 0.040-in. diameter	1	
16	295385	• NOZZLE, fluid, RA-20, 0.050-in. diameter	1	
16	295388	• NOZZLE, fluid, RA-20, 0.080-in. diameter	1	
11	940092	• • O-RING, Viton, black, 7/32 x 11/32 in.	1	B, C, D
17	230928	• PLUG, turbine exhaust	4	
18	942050	• O-RING, Viton, black, 0.438 x 0.688 x 0.120 in.	4	B
19	981234	• SCREW, socket, 1/4-20 x 1.25 in., zinc	2	
20	972097	• CONNECTOR, male, 3/8-in. tube x 1/4-in. NPTF	2	

NOTE A: Refer to the *RA-20 Paint/Solvent/Dump Valve* instruction sheet for a parts breakdown.

B: Part is included in seal replacement kit, part 295381. Refer to *Seal Kit*.

C: This item is listed multiple times within this parts list. Order the appropriate quantity.

D: O-ring, part 940092, is included with all nozzles.

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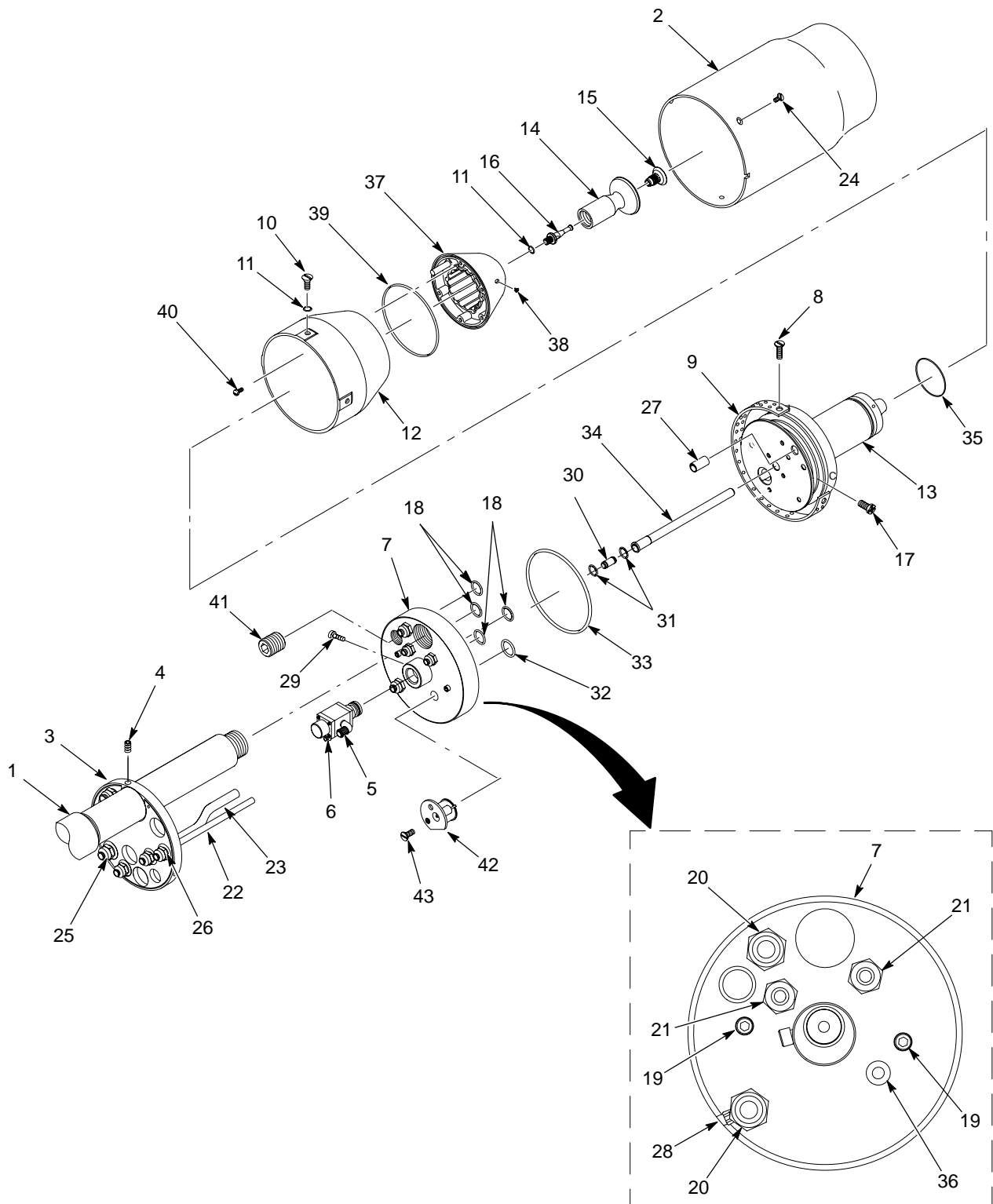


Figure 7-5 Waterborne RA-20 Rotary Atomizer

Waterborne RA-20 Rotary Atomizer *(contd)*

See Figure 7-6.

Item	Part	Description	Quantity	Note
21	972080	• CONNECTOR, male, 1/4-in. tube x 1/8-in. NPTF	2	
22	900603	• TUBING, polyurethane, 1/4-in. OD, clear	1.4 ft	E
23	900602	• TUBING, polyurethane, 3/8-in. OD, clear	1.0 ft	E
24	982876	• SCREW, oval head, 1/4-20 x 0.50 in., nylon	3	
25	971308	• UNION, bulkhead, 3/8-in. tube x 3/8-in. tube, plastic	2	
26	971273	• UNION, bulkhead, 1/4 in. x 1/4 in., plastic	5	
27	182233	• SLEEVE, resistor	1	
28	981327	• SCREW, socket set, 5/16-18 x 0.312 in., cup, zinc	2	
29	981201	• SCREW, socket head, 1/4-20 x 0.50 in., black	1	
30	295343	• COUPLING, fluid	1	
31	940107	• O-RING, Viton, black, 0.25 x 0.375 in.	2	B
32	940232	• O-RING, Buna-N, 1.063 x 1.188 x 0.063 in.	1	B
33	943520	• O-RING, Buna-N, 4.875 x 5.25 x 0.188 in.	1	B
34	181761	• TUBE, fluid, (0.161 in.), RA-20	1	
35	941351	• O-RING, Buna-N, 1.94 x 2.12 in., 55 duro	1	B
36	295411	• PLUG, fiber optic cable, RA-20	1	
37	220640	• HOUSING, ring, charge, Waterborne	1	
38	125123	• SEAL, duckbill valve	1	
39	940453	• O-RING, Viton, black, 4.00 x 4.12 x 0.06 in.	1	B
40	982878	• SCREW, fillister, 10-32 x 0.5 in., nylon	3	
41	238633	• PLUG, port	1	
42	227169	• TRANSMITTER, visible assembly	1	
43	982056	• SCREW, flat, slotted, M3 x 6 mm, zinc	1	
NS	901944	• SCREWDRIVER, 1/8-in. ball point hex, cup removal	1	
NS	901945	• SCREWDRIVER, 3/16-in. ball point hex, turbine/valve removal	1	
NS	233490	• KEY, hex, 5/16 x 3.84 in., distributor removal	1	
NS	169649	• BAG, rotary, cover	1	

NOTE B: Part is included in seal replacement kit, part 295381. Refer to *Seal Kit*.

E: Order tubing in one foot increments.

NS: Not Shown

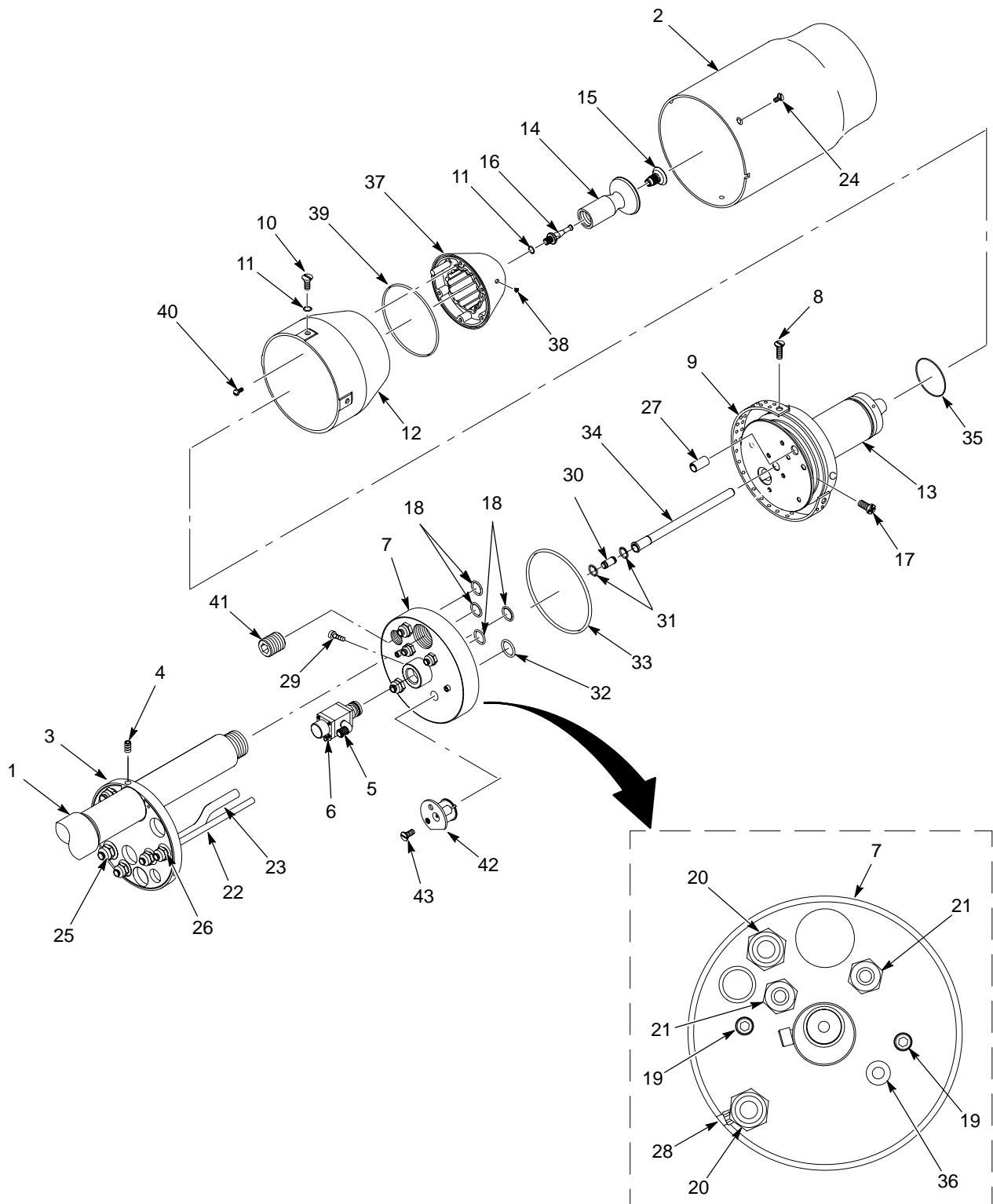


Figure 7-6 Waterborne RA-20 Rotary Atomizer

Seal Kit

See Figures 7-1 through 7-6.

Item	Part	Description	Quantity	Note
—	295381	KIT, seal, replacement, RA-20/RA-20R	1	
11	940092	• O-RING, Viton, black, $7/32 \times 11/32$ in.	3	A
18	942050	• O-RING, Viton, black, 0.438 x 0.688 x 0.120 in.	8	B, C
31	940107	• O-RING, Viton, black, 0.25 x 0.375 in.	2	
32	940232	• O-RING, Buna-N, 1.063 x 1.188 x 0.063 in.	1	
33	943520	• O-RING, Buna-N, 4.875 x 5.25 x 0.188 in.	1	
35	941351	• O-RING, Buna-N, 1.94 x 2.12 in., 55 duro	1	
39	940453	• O-RING, Viton, black, 4.00 x 4.12 x 0.06 in.	1	
NS	941133	• O-RING, Viton, 0.562 x 0.75 x 0.094 in.	1	D
NS	941100	• O-RING, hotpaint, 0.362 x 0.568 x 0.103 in.	3	E

NOTE A: One O-ring is used on the fluid nozzle.
 B: Additional spare O-rings are included.
 C: The RA-20 rotary atomizer uses four O-rings. The RA-20R rotary atomizer uses eight O-rings.
 D: This part is used on the optional valve manifold. Refer to the *RA-20 Paint/Solvent Dump Valve* instruction sheet for more information.
 E: This O-ring is only used on the RA-20R rotary atomizer.

NS: Not Shown

Adhesives, Sealants, and Lubricants

Use these adhesives, sealants, and lubricants when servicing your unit. Refer to *Service Notes* in the *Repair* section of this manual for application instructions.

Part	Description	Quantity
900424	COMPOUND, threadlock, VC 3	1
900223	LUBRICANT, O-ring, Parker (Parker O-Lube), 4 oz	1
900475	TAPE, pipe thread	1

Recommended Spare Parts

Keep the following parts in inventory to avoid unplanned downtime. Quantities listed support a single rotary atomizer. Adjust order quantities based on the number of rotary atomizers in service.

Part	Description	Quantity	Note
295381	KIT, seal, replacement, RA-20/RA-20R	1	A
125123	SEAL, duckbill, valve	4	
189868	COVER, exhaust turbine	1	
220639	TURBINE, air, center feed	1	
295369	DISTRIBUTOR, cup	1	
295xxx	NOZZLE, fluid, RA-20	2	
940092	O-RING, Viton, black, $\frac{7}{32} \times \frac{11}{32}$ in.	2	
302134	VALVE, paint/solvent, with package/manual	1	B
302135	VALVE, RA20 dump, RA20R, trigger	1	B
295393	KIT, RA-20, valve, repair	1	A, B
302136	PISTON, assembly, RA-20 valve	1	A, B
302138	RESISTOR, assembly, solvent	1	
302144	CABLE, IFC, 16 m, RA-20 solvent only	1	
230921	HOUSING, charge ring, with resistors, solvent only	1	
220640	HOUSING, charge ring, waterborne	1	
302126	CUP, 2-in. diameter, with fins, pads, assembly	1	
302130	CUP, 2.5-in. diameter, with fins, pads, assembly	1	
169649	BAG, rotary cover	3	
NOTE A: Refer to <i>Service Kit</i> for a breakdown of parts.			
B: Refer to the <i>RA-20 Paint/Solvent/Dump Valve</i> instruction sheet for a parts breakdown.			

Options

Cups and Distributors

Part	Description	Quantity	Note
321330	CUP, 2-in. diameter, microfin, assembly	1	
302126	CUP, 2-in. diameter, with fins, pads, assembly	1	
302127	CUP, 2-in. diameter, without fins, pads, assembly	1	
321331	CUP, 2.5-in. diameter, microfin, assembly	1	
302130	CUP, 2.5-in. diameter, with fins, pads, assembly	1	
302131	CUP, 2.5-in. diameter, without fins, pads, assembly	1	
335289	CUP, 1.5-in. diameter, with fins/tap, pads, assembly	1	
335301	CUP, 1.5-in. diameter, without fins, pads, tap, assembly	1	
295369	• DISTRIBUTOR, cup	1	A
-----	• • DEFLECTOR, distributor	1	
-----	• • BODY	1	
295390	DISTRIBUTOR, cup, emulsion	1	B

NOTE A: All cups listed here include the distributor cup assembly, part 295369.
 B: Optional distributor cup assembly for use with emulsions. Replaces distributor cup assembly, part 295369.

Premium Finish Cup

The premium finish cup, retainer/distributor, and nozzle must be used together.

Part	Description	Quantity	Note
339733	CUP, 2-in. microfin, pad, premium finish	1	A
339730	RETAINER/DISTRIBUTOR, premium finish	1	
339731	NOZZLE, fluid, 0.090-in. diameter, premium finish	1	
940092	• O-RING, Viton, black, $\frac{7}{32} \times \frac{11}{32}$ in.	1	

NOTE A: Premium finish cup requires retainer/distributor, part 339730, and nozzle, part 339731.

Nozzles

Part	Description	Quantity	Note
295382	NOZZLE, fluid, RA-20, 0.020-in. diameter	1	A
295383	NOZZLE, fluid, RA-20, 0.030-in. diameter	1	
295384	NOZZLE, fluid, RA-20, 0.040-in. diameter	1	A
295385	NOZZLE, fluid, RA-20, 0.050-in. diameter	1	A
295386	NOZZLE, fluid, RA-20, 0.062-in. diameter	1	
295387	NOZZLE, fluid, RA-20, 0.070-in. diameter	1	
295388	NOZZLE, fluid, RA-20, 0.080-in. diameter	1	A
339731	NOZZLE, fluid, 0.090-in. diameter, premium finish	1	B
940092	• O-RING, Viton, black, $\frac{7}{32} \times \frac{11}{32}$ in.	1	C
NOTE A: These nozzles are included with the RA-20.			
B: Premium finish nozzle must be used with premium finish cup, part 339733 and retainer/distributor, part 339730.			
C: All nozzles include the O-ring, part 940092.			

Fluid Tubes

Part	Description	Quantity
181761	TUBE, fluid, RA-20, 0.161-in. diameter orifice	1
168671	TUBE, fluid, RA-20, 0.100-in. diameter orifice	1

Valve and Valve Kits

NOTE: Refer to the *RA-20 Paint/Solvent/Dump Valve* instruction sheet for a parts breakdown.

Part	Description	Quantity	Note
302135	VALVE, RA-20 dump, RA-20R, trigger	1	
302134	VALVE, paint/solvent, with packaging/manual	1	A
295408	KIT, RA-20, solvent valve	1	B
295409	KIT, RA-20, dump valve, RA-20R, trigger	1	
295410	KIT, RA-20, dump and solvent valves	1	
295393	KIT, RA-20, valve repair	1	C
302136	PISTON assembly, RA-20 valve	1	
NOTE A: This part used for both paint and solvent.			
B: This kit adds one valve, part 302134 or part 302135.			
C: This kit repairs one valve, part 302134 or part 302135.			

Accessories

Part	Description	Quantity	Note
297136	POWER UNIT	1	
184260	POWER SUPPLY, EPS-9, current limiter	1	
229934	POWER SUPPLY, EPS6, 120/240	1	
302144	CABLE, IFC, 16 m, RA-20	1	
247730	KIT, cable, fiber optic, RA-20	1	A
295379	• CABLE, fiber optic, RA-20	1	
971308	• UNION, bulkhead, $\frac{3}{8}$ -in. tube x $\frac{3}{8}$ -in. tube, plastic	1	
237602	MODULE, fiber optic, manual	1	A
245271	KIT, installation, speed control, automatic (closed-loop)	1	
120332	• TRANSDUCER, current to pressure	1	
249495	• REGULATOR, air pilot, $\frac{1}{4}$ -in. ports	1	
227173	SENSOR, fiber optic	1	
167917	RESISTOR, fiber optic	1	
169649	BAG, rotary, cover	3	
1020756	KIT, pattern control	1	B
972242	REDUCER, union, $\frac{1}{2}$ -in. tube x $\frac{3}{8}$ -in. tube	AR	C
<p>NOTE A: Use with RPM indicator. Contact your Nordson Corporation representative for part numbers and ordering instructions.</p> <p>B: Kit can be used with the RA-20 and the RA-20R rotary atomizer. Refer to the <i>Pattern Control Kit</i> instruction sheet for installation and part information.</p> <p>C: Use to connect $\frac{1}{2}$-in. tubing to the $\frac{3}{8}$-in. turbine and vector air fittings on the rotary atomizer.</p>			

Section 8

Specifications

NOTE: Specifications are subject to change without notice.

Dimensions

Length (without mounting stem):	428 mm (16.88 in.)
Diameter:	164 mm (6.44 in.)
Weight (without mounting stem):	
Cable version	4.7 kg (10.36 lbs)
IPS version	5.3 kg (11.68 lbs)
Waterborne version	4.4 kg (9.7 lbs)

Fluid Pressure and Flow

Fluid pressure:	0.34-7 bar (5-100 psi)
Flow rate, maximum:	1500 cc/min at 7 bar (50 oz/min at 100 psi)
130 centipoise material at 7 bar (100 psi), 0.080 orifice:	750 cc/min

NOTE: 130 centipoise is approximately

- 53 seconds on Zahn 2
- 15 seconds on Zahn 3
- 43 seconds on Ford 4
- 64 seconds on Fisher 2

Turbine Speed



WARNING: Do not exceed the maximum speed rating for your cup. Failure to observe this warning may damage the turbine, cause the cup to fail, and injure the operator or other nearby personnel.

2-in. cup: 45,000 rpm maximum (continuous operation)
 2¹/₂-in. cup: 40,000 rpm maximum (continuous operation)

Compressed Air

Air Pressure

Bearing air pressure:
 Minimum 4.8 bar (70 psi)
 Recommended 5.5-7 bar (80-100 psi)

Brake air pressure: Plant supply pressure

Air Consumption

Bearing Air Consumption	
5.5 bar (80 psi)	70 l/min (2.5 scfm)
Turbine Air Consumption	
1.9 bar (27.5 psig), 1/2 in. OD tubing, unloaded, with 2 in. cup	283 l/min (10 scfm) at 40,000 rpm
3.0 bar (43 psig), 1/2 in. OD tubing, at 500 cc/min with 2 in. cup	396 l/min (14 scfm) at 40,000 rpm
1.3 bar (18.5 psig), 1/2 in. OD tubing, unloaded, with 2 in. cup	210 l/min (7.4 scfm) at 30,000 rpm
2.0 bar (28.5 psig), 1/2 in. OD tubing, at 500 cc/min with 2 in. cup	283 l/min (10 scfm) at 30,000 rpm
Vector Air Consumption	
3/8 in. OD tubing	254 l/min at 2.7 bar (9scfm at 40 psig)
3/8 in. OD tubing	510 l/min at 5.5 bar (18 scfm at 80 psig)
1/2 in. OD tubing	229 l/min at 0.69 bar (8.1 scfm at 10 psig)
1/2 in. OD tubing	374 l/min at 1.38 bar (13.2 scfm at 20 psig)
1/2 in. OD tubing	504 l/min at 2.7 bar (17.8 scfm at 30 psig)

NOTE: Paint used was 20 seconds on Zahn #2 cup and all air tubing was 30 ft long. The pressure was measured at the beginning of the 30 ft tubing.

Air Quality

Clean and dry, with 99% of 0.1 micron contaminants removed

Spray Pattern Size

203-609 mm (8-42 in.)

NOTE: Pattern size is dependent on fluid pressure, turbine speed, material viscosity, and additional variables.

Electrostatic Voltage

Internal Power Supply (IPS):	100 kV maximum
EPS6 and HD cable:	60 kV maximum
EPS9 and IFC-100 cable:	115 kV maximum

Repair and Cleaning Times

Turbine removal:	1 minute
Cup change:	8-10 seconds
Cup cleaning:	2-3 seconds (approximately)
Color change:	Dependent upon system configuration, size of tubing, fluid pressure, and additional variables

Optional Speed Readout

Magnetic pickup, fiber-optic transmission

DECLARATION of CONFORMITY

PRODUCT:

EPS6 Electrostatic Power Supply used with HD ISO-FLO and RA-20 Waterborne Spray Applicator

APPLICABLE DIRECTIVES:

89/37/EEC (Machinery)
73/23/EEC (Low Voltage Directive)
89/336/EEC (ElectroMagnetic Compatibility Directive)

STANDARDS USED TO VERIFY COMPLIANCE:

EN292 EN50081
EN50059 EN50082
EN50176 EN55014
EN60204

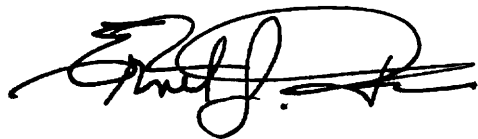
PRINCIPLES:

This product has been manufactured according to good engineering practice.

The product specified conforms to the directive and standards described above.

CERTIFICATIONS:

ISO 9000 — DNV QSC3277
Factory Mutual Certified
ATEX Quality Notification (0771)



Ernest J. Fena, Vice President
Liquid & Container Systems

Date: 19 February 2002



Nordson Corporation • Westlake, Ohio

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DECLARATION of CONFORMITY

PRODUCT:

EPS9 Electrostatic Power Supply used with RA-20 Spray Applicator

APPLICABLE DIRECTIVES:

89/37/EEC (Machinery)
73/23/EEC (Low Voltage Directive)
89/336/EEC (ElectroMagnetic Compatibility Directive)

STANDARDS USED TO VERIFY COMPLIANCE:

EN292 EN50081
EN50050 EN50082
EN50176 EN55014
EN60204

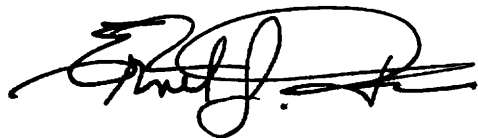
PRINCIPLES:

This product has been manufactured according to good engineering practice.

The product specified conforms to the directive and standards described above.

CERTIFICATIONS:

ISO 9000 — DNV QSC3277
TUV Rheinland — EMC V967468
Factory Mutual Certified
Canadian Standards Association Certified
ATEX Quality Notification (0771)



Ernest J. Fena, Vice President
Liquid & Container Systems

Date: 19 February 2002



Nordson Corporation • Westlake, Ohio

DOC 0-0K
237375C

DECLARATION of CONFORMITY

PRODUCT:

IPS-10A Controller used with IPS RA-20 or RA-20R

APPLICABLE DIRECTIVES:

98/37/EEC (Machinery)
73/23/EEC (Low Voltage Directive)
2004/108/EEC (ElectroMagnetic Compatibility Directive)

STANDARDS USED TO VERIFY COMPLIANCE:

EN12100 EN55011
EN60204 EN50050
EN61000-6-2 EN50176
FM7260

PRINCIPLES:

This product has been manufactured according to good engineering practice.

The product specified conforms to the directive and standards described above.

CERTIFICATIONS:

Factory Mutual Certified
DNV ISO9001:2000



Date: 14 Sept 2007

Joseph Schroeder
Engineering Manager
Finishing Product Development

