

Relius™ Solvent Coating Dispenser Manual

User's Guide



Electronic pdf files of EFD® manuals are also available at www.efd-inc.com/manuals.html

TM

EFD®
A NORDSON COMPANY

Packaging - Processing
Bid on Equipment
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Introduction

You have selected a reliable, high-quality Relius solvent coating dispenser from EFD, the world leader in fluid dispensing. The Relius solvent coating dispenser was designed specifically for industrial dispensing, and will provide you with years of trouble-free, productive service.

This User's Guide will help you maximize the usefulness of your Relius coating dispenser.

Please spend a few minutes to become familiar with the controls and features. Follow our recommended testing procedures. Review the helpful information we have included, which is based on more than 30 years of industrial dispensing experience.

Most questions you will have are answered in this guide. However, if you need assistance, please do not hesitate to contact EFD or your authorized EFD distributor.

In the USA, call 800-556-3484 between 8:30 a.m. and 5:30 p.m. Eastern time.

In Europe, call +44 (0) 1582 666334.

In Asia, call +86 (21) 5854 2345.

In all other areas, call your authorized EFD distributor or +1-401-434-1680.

The EFD Pledge

Thank You!

You have just purchased the world's finest dispensing equipment.

I want you to know that all of us at EFD value your business and will do everything in our power to make you a satisfied customer.

If at any time you are not fully satisfied with our equipment or the support provided by your EFD Product Application Specialist, please contact me personally at 800-556-3484 (US), 401-434-1680 (outside US), or plambert@efd-inc.com.

I guarantee that we will resolve any problems to your satisfaction.

Thanks again for choosing EFD.



Peter Lambert, President

EFD Product Safety Statement

This statement provides personal and equipment safety notices for EFD dispensing products.

CAUTION

The safety messages that follow have CAUTION level hazards. Failure to comply may result in minor or moderate injury.



READ MANUAL

Read manual for proper use of this equipment. Follow all safety instructions. Task- and equipment-specific cautions and instructions are included in equipment documentation where appropriate. Make sure these instructions and all other equipment documents are accessible to persons operating or servicing equipment.



WEAR PROTECTIVE EYEWEAR AND CLOTHING

Always wear protective eyewear and clothing when using compressed air.

Intended Use

Use of EFD 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
- Using incompatible or damaged parts
- Using unapproved auxiliary equipment

Regulations and Approvals

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

Personal Safety

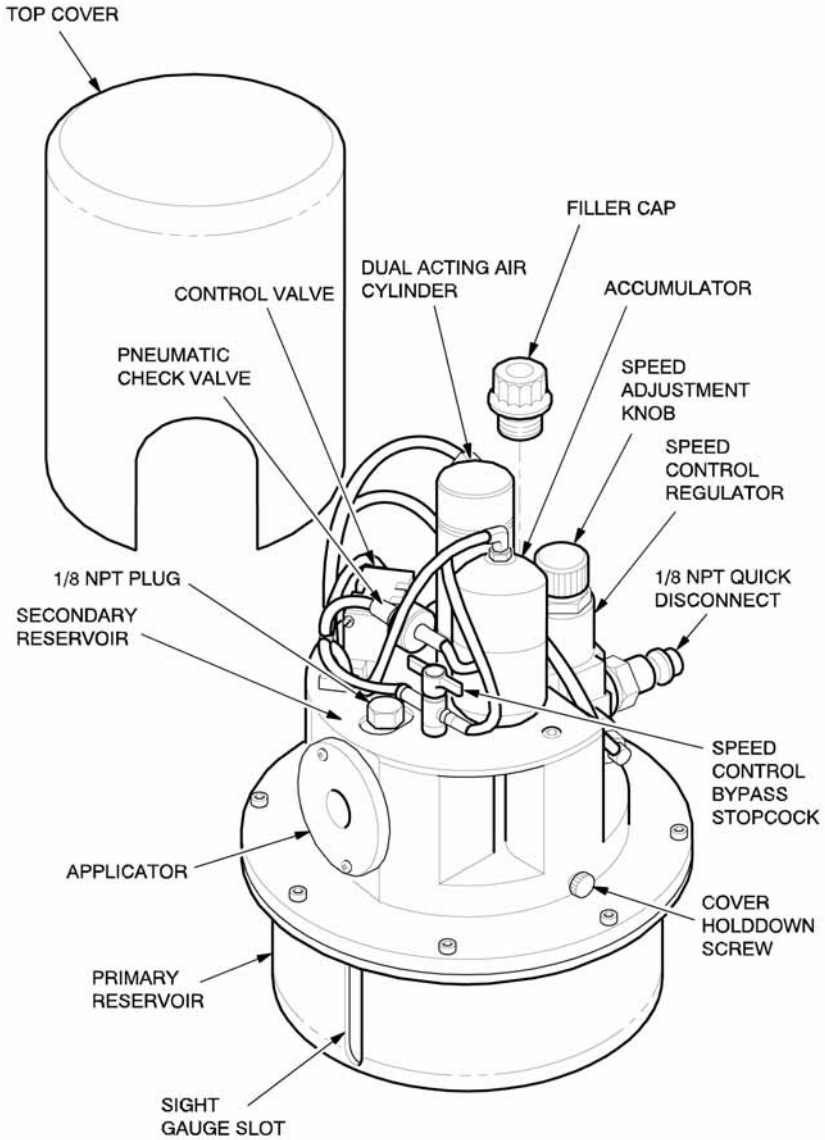
To prevent injury, follow these instructions:

- Do not operate or service equipment unless you are qualified.
- 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 EFD representative for information and advice.

Specifications

Size:	26.0 cm high x 19.7 cm diameter : 10.3" high x 7.8" diameter										
Weight: (dry)	3.7 kg : 8.2 lbs.										
Maximum Solvent Capacity (Usable Volume):	1.0 liters										
Construction:	Anodized aluminum, stainless steel, PTFE, Delrin®, UHMW polyethylene										
Power Requirements:	60-90 psi (4.2-6.3 kgf/cm ²) regulated clean, dry air supply										
Pneumatic Coupling Supplied:	Quick disconnect male plug, 1/8" male NPT (ISO 1/8 28 7/1)										
Air Consumption:	7.2 cc (.44 cu. in) /stroke : 0125 cu meters (.15 cu ft)/hr @ maximum recommended speed)										
Compatible Solvents:	<table> <tr> <td>Cyclohexanone</td> <td>Ethyl Acetate</td> </tr> <tr> <td>Dichloroethane</td> <td>Isopropyl Alcohol</td> </tr> <tr> <td>Dichloromethane</td> <td>Methylethylketone (MEK)</td> </tr> <tr> <td>Dimethylformamide (DMF)</td> <td>Tetrahydrofuran (THF)</td> </tr> <tr> <td>Dimethylsulphoxide</td> <td>Trichloroethane</td> </tr> </table>	Cyclohexanone	Ethyl Acetate	Dichloroethane	Isopropyl Alcohol	Dichloromethane	Methylethylketone (MEK)	Dimethylformamide (DMF)	Tetrahydrofuran (THF)	Dimethylsulphoxide	Trichloroethane
Cyclohexanone	Ethyl Acetate										
Dichloroethane	Isopropyl Alcohol										
Dichloromethane	Methylethylketone (MEK)										
Dimethylformamide (DMF)	Tetrahydrofuran (THF)										
Dimethylsulphoxide	Trichloroethane										
Operating Temperature Range:	10°C to 46°C (50°F to 115°F)										
Dispensing Surface Range:	External Surface: 1.5 mm-20.6 mm (.060"-.812") Internal Surface: 2.0 mm-19.0 mm (.080"-.750") OD/ID Surface: 3.1 mm/2.0 mm-20.6 mm/19.0 mm (.120"/.080"-.812"/.750")										
Dispensing Length Range:	Up to 25.4 mm (1 inch)										
Pump Displacement:	1.0 cc typical										
Maximum Recommended Speed:	7 to 10 strokes per minute (in high range)										
Minimum Recommended Speed:	2-6 strokes per minute (in low range)										
Solvent Volume Applied:	Dependent on component size, length of dispensing, and pump speed										
Minimum Recommended Speed:	2-6 strokes per minute (in low range)										

Exploded View



Operation

Introduction

The Relius solvent coating dispenser consists of two primary subsystems: The pump drive module is 100% pneumatically operated to minimize potential explosion hazards associated with solvent dispensing. Plant line air is coupled to the dispenser with a standard quick disconnect fitting. A dual acting air cylinder is controlled by an air bearing, pneumatically piloted control valve. This bi-directional valve is speed controlled by a precision regulator and a timing circuit consisting of an air accumulator and flow restrictor. This allows repeatable metering of solvent.

The fluid delivery module consists of a primary reservoir, a positive displacement pump, a secondary reservoir, and a solvent applicator. Solvent is transported from the primary reservoir to the secondary reservoir by a fully submerged piston pump. This pump is actuated by the pump drive module described above. The solvent is then gravity fed from the secondary reservoir into the application area. A solvent film is uniformly applied to the desired component by transfer from non-clogging porous materials contained in the applicator.

Solvent Applicator

To assure precise and uniform bonding, a specific dispensing applicator is necessary for each diameter component to be bonded. Your Relius solvent coater has been shipped with one applicator. If you require additional applicators for other components, please contact EFD, Inc.

Setup

Place the dispenser on a flat surface to assure optimum performance. If necessary, the Relius may be placed on a slightly sloping surface. However, care must be taken not to overfill the reservoir.

Filling the Reservoir

The reservoir has a useable capacity of 1.0 liters. To fill with unmixed solvent, first disconnect the air line. Remove the blue dispenser top cover by loosening the two black cover retaining screws on either side and then lift the cover off. Next, unscrew the red filler cap on the pump body.

Using a funnel or similar device, pour solvent into the reservoir while observing the fill level through the sight gauge slot or through the filler hole. Avoid overfilling to minimize solvent spillage.

To fill with mixed solvent, first prepare the mixture in a beaker or like container, then fill the reservoir as described above.

Connecting the Air Line

Connect a regulated compressed air line (delivering clean, dry, non-lubricated air) to the 1/8" male NPT quick disconnect coupling on the back of the dispenser. Set the inlet air pressure to between 60-90 psi (4.2-6.3 kgf/cm²). Lower or higher input pressures may be used if necessary. However, optimal performance will be obtained in the range specified.

If your compressed air lines incorporate couplings incompatible with the one supplied on the regulator, simply remove the male coupling and replace it with a suitable one.

Priming the Dispenser

After connecting the air line, the dispenser will prime itself within a few strokes. Once primed, allow the dispenser to operate for at least one minute to assure the porous materials contained in the applicator are fully wet.

NOTE: If the dispenser will not prime on initial setup, one of the two check valves may have become stuck in transit. To free the check valves, remove the applicator from the dispenser. Next, using a gloved hand, place your index finger over the fluid inlet port inside the applicator opening in the dispenser body. The inlet port is the smaller of the two holes in the applicator opening and is at the top. With this opening occluded, allow the dispenser to stroke several times. This will generally free a stuck valve and the dispenser will then prime normally. If this does not work, please call EFD for further information.

Bonding Components

To apply solvent to the component to be bonded, simply insert the end of the component into the applicator until it "bottoms out" at the back of the applicator. There is no need to rotate the part as wetting will occur completely around the part. Immediately after insertion, remove the component from the applicator and mate it with the other component.

Adjusting the Solvent Delivery Rate

The Relius is designed to operate in one of two pump speed ranges: **LOW RANGE - 2-6 strokes per minute. HIGH RANGE - 7-10 strokes per minute.** To select the low speed range, assure the bypass stopcock is closed (opposite that depicted on page two). To select the high range, open the bypass stopcock so the handle is in line with the stopcock body). **NOTE:** If your part requires a pump speed greater than 10 strokes per minute, the factory can advise you how to make a simple modification which will allow operation up to 30 strokes per minute.

Optimal solvent bonds will generally be achieved by applying a uniform non-excessive film of solvent to one of the components to be bonded. Therefore, it is important to adjust the solvent delivery rate to the components being bonded. To optimize the delivery rate, have an operator bond 10 to 20 components to simulate continuous production conditions. After these are complete, have the operator apply solvent to five more parts. The technician, manufacturing/process engineer or other designated person should then inspect the film of solvent being applied and the completeness of the bond. If insufficient solvent is being applied, turn the speed control regulator knob clockwise until delivery is adequate. If excessive solvent is being applied, slow the pump speed by turning the speed control knob counterclockwise. **NOTE: The speed control regulator is a high resolution device. Therefore, several turns of the knob may be required to make significant speed adjustments.**

You may wish to record the optimum setting to facilitate future adjustments. The pump stroke speed can be quickly determined by counting the number of strokes per minute. Pump stroke speed is directly proportional to solvent delivery rate. As an alternative to counting the number of strokes, a small pressure gauge can be connected to one of the auxiliary output ports of the speed control regulator. Output pressure is directly proportional to pump stroke rate.

Once the optimal setting is made, the speed control adjustment knob may be removed to prevent unauthorized adjustment. To remove the knob, loosen the hex head set screw in the side and lift the knob off the regulator adjustment shaft. Reverse this procedure to replace it.

Controlling Unwanted Capillary Filling

Small inside diameter components are prone to capillary filling during solvent application. Because the solvent delivery rate is fully adjustable on the Relius and due to the design of the porous materials contained in the applicator, capillary action can be minimized or eliminated.

If capillary filling occurs, slow the pump speed until a minimum uniform film of solvent is applied to the part and capillary action ceases. **NOTE: After slowing the pump speed, it will take a few moments for the excess solvent to drain from the porous materials.** Always check the bond before finalizing adjustment.

Replacing the Applicator

To remove and replace an applicator, remove the two screws holding the applicator to the pump body. Grasp the face of the applicator and pull it out. **NOTE: Exercise care when removing the applicator as it likely is wet with solvent.** To replace an applicator, place a new gasket over the applicator (gaskets may be reused a limited number of times) and assure that it is in the upright position. The elongated slot should be on the underside, while the solvent inlet hole is on top. Slide the applicator into the pump body and align the holes. (The holes will not line up if the applicator is upside down). Replace the screws and tighten snugly.

Routine Maintenance

The dispenser should work maintenance free over a long period of time. However, the following routine maintenance is recommended:

Applicator Cleaning

The applicator should be removed periodically and inspected for contamination. If the porous material is excessively dirty, it can be cleaned by submerging it in a container of clean solvent over night and then blowing it dry using a protected compressed air source. **CAUTION: Always wear protective eyewear and clothing when using compressed air.**

If the above steps do not sufficiently clean the porous materials, or if the porous materials are deformed, or the applicator outer surface is damaged, a new applicator will be required.

The applicator gasket may be reused under certain conditions. If solvent leaks around the applicator after replacing it, a new gasket should be installed. Additional gaskets are available from EFD, Inc.

Reservoir Cleaning

The reservoir may require periodic cleaning. It is recommended that the reservoir be removed and cleaned at least twice per year. Refer to part numbers below when cleaning.

To do this, disconnect the air line and completely drain the dispenser. Remove the eight screws holding the reservoir to the pump body. Remove and discard the reservoir liner exercising caution not to spill any remaining solvent. Wipe the pump body clean especially in the screened inlet area. If the inlet screen is excessively contaminated, remove it for thorough cleaning then reinstall. Replace the reservoir liner with a new one (available from EFD, Inc.) and reattach the reservoir to the pump body.

Strainers

The strainers should be periodically checked and cleaned as needed.

Troubleshooting Guide

Trouble	Possible Cause	Solution
Insufficient solvent delivery	Low solvent level	Check solvent level
	Slow pump speed	Remove the top cover and turn the speed control regulator clockwise until sufficient solvent is dispensed.
	Applicator clogged with dissolved plastic	Increase the pump speed for two to three minutes to flush the applicator. Run pump at high speed for five minutes if the dispenser has been turned off for a period of time. Make sure the solvent reservoir is filled with clean, fresh solvent to help expedite the flushing action. Once the applicator is purged, return the pump speed to normal. If the above steps do not work, try soaking the applicator in clean solvent overnight. If the porous material is still clogged, it may be necessary to replace it.
	Check valve is sticking or contaminated	To check, disconnect the line air and remove the top cover and 1/8 NPT plug in the top of the secondary reservoir. Next remove the applicator. Turn the speed control regulator to a slow speed and then reconnect the line air. Place a polyethylene glove over your hand and using your index finger, occlude the secondary reservoir orifice from the inside of the applicator housing. Let the pump stroke two or three cycles. The level in the secondary reservoir should rise rapidly and not drain back into the primary reservoir. If it does drain back, call the factory for instructions on how to correct the problem, or return the unit to EFD.
Excessive solvent delivery	Excessive adhesive applied or capillary filling occurs	Slow the pump speed until the correct amount is dispensed.
		Remove applicator and assure the inlet hole is on top while the elongated drain slot is on the bottom.
Pump will not stroke	Speed control regulator is not turned up enough	Turn the speed control regulator up until the pump starts stroking. If this results in too fast a stroke speed, shift the pump to the low speed range (page 7). If the pump won't start, try disconnecting, then re-connecting the air line.
Dispenser will not prime	Check valve is sticking	Please refer to "Priming the Dispenser" (page 7).
Pump strokes and a double air release is heard	The air pressure is set too high	Check the line air pressure to assure it is set between 60-90 psi (4.2-6.3 kgf/cm ²). If the inlet pressure range is correct, the speed control regulator is set too high. Reduce the speed by turning the adjusting knob on the speed control regulator counterclockwise. If the resulting pump speed is too slow once the "double air release is eliminated", change the dispenser to the high speed range as described in section "Adjusting the Solvent Delivery Rate" on page 7.