



ASYMTEK

IntelliJet

Owner's Manual

Revision 13

Notice

This is a Nordson publication that is protected by copyright. Original copyright date 2016. No part of this document may be photocopied, reproduced, or translated to another language without the prior written consent of Nordson Corporation. The information contained in this publication is subject to change without notice.

Contact Us

We welcome requests for information, comments, and inquiries about our products. Please contact us using the information below:

Nordson Electronic Solutions	
WEBSITE	www.nordson.com/electronics
MAIN OFFICE	2762 Loker Avenue West Carlsbad, CA 92010 USA
INTERNATIONAL OFFICES	There are several global locations to serve you in North America, Asia, Europe, and the Middle East. Visit our website to find your regional office or representative. https://ndsn.tech/ContactUs
ORDER SPARE PARTS	https://ndsn.tech/orderspares
TECHNICAL SUPPORT	https://ndsn.tech/techsupp

Trademarks

Asymtek®, IntelliJet®, Spectrum®, Vantage®, Readiset®, Fluidmove®, and Canvas® are registered trademarks of Nordson Corporation.

Forte™ is a trademark of Nordson Corporation.

Microsoft® and Windows® are registered trademarks of Microsoft Corporation.

Patents

For relative patent information, visit the Nordson patent website: www.nordson.com/electronics-patents.



WARNING!

This product contains chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm.

Table of Contents

1	Introduction	1
1.1	Overview	1
1.2	Typical Applications.....	2
1.3	Specifications	2
1.4	Declaration of Conformity.....	3
2	Safety 5	
2.1	Overview	5
2.2	Safety First	5
2.3	Intended Use	5
2.4	Basic Safety Precautions and Practices	6
	2.4.1 Safety of Personnel	6
	2.4.2 Material Safety	6
	2.4.3 Preventing Equipment and Workpiece Damage	7
2.5	Decommissioning	7
2.6	Disposal.....	8
2.7	Emergency Shutdown	8
2.8	Safety Warning Labels	9
3	Installation and Setup	11
3.1	Overview	11
3.2	Safety First	11
3.3	Unpacking the IntelliJet	11
3.4	Installing the IntelliJet.....	12
3.5	Clearance for Jet and Stinger Cartridges.....	15
3.6	Installing the Fluid Syringe	16
3.7	Software Configuration.....	17
	3.7.1 Fluidmove.....	17
	3.7.2 Canvas Software	23
3.8	IntelliJet Calibration Procedure	26
	3.8.1 Fluidmove Software.....	26
	3.8.2 Canvas Software	30
	3.8.3 Adjusting the Seal Offset Voltage	31
3.9	Calibration Failure	32
3.10	IntelliJet Mini Burn Routine	34
	3.10.1 Fluidmove Software.....	34
	3.10.2 Canvas Software	35
3.11	Sample Application Settings	36
4	Operation	37
4.1	Overview	37
4.2	Safety First	37

4.3	Theory of Operation	37
4.4	Basic Features	38
4.5	Adjustable Features	40
4.5.1	ReadiSet Jet Cartridge Size	40
4.5.2	Fluid Pressure	40
4.5.3	Valve Opening Rate	40
4.5.4	Valve Stroke	40
4.5.5	Valve Closing Rate	40
4.5.6	Valve On Time	40
4.5.7	Cycle Frequency	40
4.5.8	Fluid Temperature	40
4.5.9	Dot and Line Parameters	40
4.6	Running Production	41
5	Maintenance and Service	43
5.1	Overview	43
5.2	Safety First	43
5.3	Routine Maintenance Procedures	44
5.4	Recommended Facility Items	44
5.5	Removing the Jet Cartridge	45
5.6	Cleaning the Jet Cartridge	46
5.6.1	Tested Cleaning Solvents	46
5.6.2	Ultrasonic Bath	46
5.7	Installing the Jet Cartridge	47
5.8	Replacing Jet Cartridge Parts	47
5.9	Replacing Stinger Nozzle	57
5.10	Inspecting the IntelliJet	60
5.11	Replacing the Drive Pin Seal	61
5.12	Replacing the Syringe Holder	63
5.13	Replacing the Heater Interface Board	64
5.14	Replacing the Heater Circuit Board	65
5.15	Removing and Reinstalling the Valve Lever	66
6	Troubleshooting	67
6.1	Overview	67
6.2	Safety First	67
6.3	No Fluid Jetted	68
6.4	Poor Quality Jetting	69
6.5	Setup Variable Based Issues	70
6.6	Component Based Issues	71
6.7	Fluidmove Error Messages	72
6.8	Canvas Error Messages	74
6.9	Troubleshooting Trees	75

7 Parts Replacement 77

 7.1 Overview 77

 7.2 Safety First 77

 7.3 Parts Ordering Information 77

 7.3.1 Placing Your Order 77

 7.3.2 Shipping Instructions 77

 7.4 Warranty 78

 7.5 Credit and Exchanges 78

 7.5.1 Return Material Authorization..... 78

 7.6 Record Keeping..... 78

 7.7 Unpacking and Inspecting Replacement Parts 78

 7.8 Cleaning and Inspection..... 78

 7.9 Spare Parts Kit 79

1 Introduction

1.1 Overview

The Nordson IntelliJet (IJ) Jetting System (Figure 1-1) is a non-contact dispensing valve that provides a unique combination of high-speed fluid delivery, small dot volumes, small stream width, and ease of setup and use. Capable of deposition rates of up to 1000 Hz and sustained rates of 500 Hz average, the IntelliJet is compatible with a wide range of fluids. It features a 30-degree tilt capability and can dispense into narrow gaps with high repeatability and yield. Fluid is dispensed as discrete dots, or as a rapid succession of dots to form a continuous line of fluid.

In addition to incorporating many of the advanced features and innovations of Nordson's previous jets, the IntelliJet offers a unique, long-lasting, two-piece Readiset Jet Cartridge. The Readiset Jet Cartridge is easily removable and is ultrasonic compatible for easy cleaning. Each new IntelliJet ships with two Readiset Jet Cartridges for maximum system up-time.

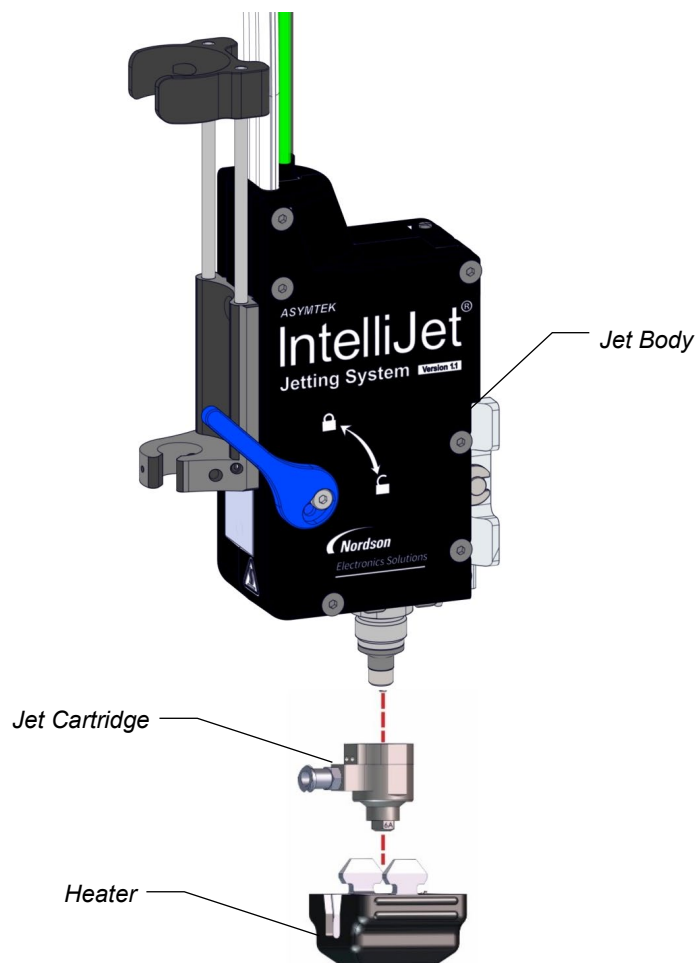


Figure 1-1 IntelliJet

The IntelliJet is compatible with Nordson's Spectrum S2-900, Vantage, and Forte Dispensing systems. Upgrade kits are available for earlier S2-9XX Series Dispensing Systems. The IntelliJet is operated with Nordson's Fluidmove for Windows software (Spectrum S2-900 Dispensing System) or Canvas software (Vantage and Forte Dispensing Systems). Each IntelliJet is manufactured by Nordson under strict manufacturing quality control standards to ensure precise and reliable performance. To obtain optimum performance, read instructions carefully.

1.2 Typical Applications

- Flip Chip Underfill (boat, wafer, strip)
- Conductive Jetting (Silver Epoxy)
- Non-Conductive Dot Jetting (Encapsulation, Precise Coating)
- Emerging Applications

Contact Technical Support for the suitability of the IntelliJet technology for other applications.

1.3 Specifications

Table 1-1 Specifications

Characteristic	Specification
Size	Width: 32.5 mm (1.40 in) Height: 120 mm (9.05 in) Depth: 89 mm (5.11 in)
Weight	650 Grams - Dry (23 Oz)
Feed Tube Assembly	Nylon - Fittings, Polyurethane - Tube
ReadiSet Jet Cartridge	Non-Magnetic Stainless Steel, Ceramic, Epoxy, Ethylene-Propylene (EP), Tungsten Carbide, and Fluoroelastomer.
Heater Assembly Body	6061-T6 Aluminum/Nickel Plated
Heater Boot	ESD Safe Silicone
Syringe Holder	Acetyl/300 Series Stainless Steel
Syringe Size	3, 5, 10, or 30 cc (0.10, 0.17, 0.34, or 1.0 oz)
Feed Tube Assembly Fitting	Female Luer per ANSI/HIMA MD70.1-1983
Maximum Cycle Frequency	1000 Hz @ 50% duty cycle (500 Hz average over 10 second periods or greater).
Recommended Valve Air Cooling Pressure	138 kPa (20 psi)
Air Consumption*	1 SCFM (26 L/min) @ 20 psi
Operating Noise Level	78 dB*
Thermal Control Heater	24 VDC, 24 Watts, 24 Ohms (Ω)
Thermal Control RTD	100 Ohm (Ω), Platinum
Maximum Heater Set Point	100 °C (212 °F)
Approved Jet Cartridge Cleaning Solvents	Acetone, Isopropyl Alcohol (IPA), Methyl Ethyl Ketone (MEK), and Water

*At Maximum Cycle Frequency

1.4 Declaration of Conformity

The equipment described below complies with the appropriate basic safety and health requirements of the listed directives based on its design and type, as delivered by Nordson Corporation. In case of alteration of the equipment, this declaration may lose its validity.

Manufacturer's Name: Nordson Corporation
Manufacturer's Address: 2762 Loker Avenue West
Carlsbad, CA 92010-6603 USA

Authorized Representative in the EU "Technical Manager Europe" is authorized to compile technical file.

Authorized Representative Address in the EU: De Vest 1A
5555XL Valkenswaard
The Netherlands

Machine/Machine Part Description: General Industrial Machinery

Type of Equipment: Dispensing Valve

Product Series Name: IntelliJet

Model Number: _____

Serial Number: _____

Year of Manufacture: _____

Applicable EU Directives:

2014/35/EC Low Voltage Directive and all applicable amendments.

2014/30/EU EMC Directive and all applicable amendments.

Applicable Harmonized Standards:

EN 61010-1:2010 Electrical Equipment for Measurement, Control, and Lab Use Part 1: General Requirements

EN 61000-6-2:2005 Electromagnetic Compatibility-Immunity for Industrial Environments

EN 61000-6-4:2007 Electromagnetic Compatibility-Emission Standard for Industrial Environments

I, the undersigned, hereby declare that the equipment specified above conforms to the above Directives and Standards.

Signature: _____

Date: _____

(Name) Vice President, Electronic Processing
Solutions

Place of Issue: Carlsbad, CA, USA

2 Safety

2.1 Overview

This section is intended to provide basic safety information necessary for operating and servicing the IntelliJet. This section covers the following topics:

- [Intended Use](#)
- [Basic Safety Precautions and Practices](#)
- [Decommissioning](#)
- [Disposal](#)
- [Emergency Shutdown](#)
- [Safety Warning Labels](#)

To further optimize safe operation, precautions and recommended practices are included with the procedures throughout this manual.



WARNING!

Failure to comply with any of the safety recommendations could cause serious injury to the user or damage to the dispensing system.



NOTE

Safety is considered a joint responsibility between the original equipment manufacturer (Nordson) and the end-user (owner). All safety precautions and practices should be in accordance with local regulations and facility policy.

2.2 Safety First

Operation of the IntelliJet involves heat, air pressure, fluid pressure, mechanical and pneumatic devices, electrical power, and the use of hazardous materials. In addition to the safety precautions listed in this manual, refer to the safety section in the applicable dispensing system manual prior to installing and operating the dispensing valve.

2.3 Intended Use

Using Nordson equipment in ways other than those described in the supplied documentation may result in personnel injury or property damage. Examples of unintended equipment use 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

2.4 Basic Safety Precautions and Practices

Compliance with the following recommended precautions and practices reduces the risk of personal injury or damage to property during applicator operation and maintenance.



WARNING! Failure to comply with any of the safety recommendations could cause serious injury to the user or damage to the dispensing system.

2.4.1 Safety of Personnel

- Only trained personnel should perform installation, operation, maintenance, and troubleshooting procedures on the IntelliJet.
- A second person should always be present when performing maintenance on a powered-up system.
- Before performing maintenance or service on the IntelliJet, position it at the front of the dispensing area. This will provide easy access to components and limit exposure to hazardous areas.
- Immediately push the red Emergency Machine Off (EMO) button on your dispensing system if personnel are in danger.
- Unplug power source before performing service or maintenance on the dispensing system.
- Do not wear loose clothing or jewelry while operating the system. Tie back long hair to prevent it from being caught in moving parts.
- Do not touch the moving parts while the dispensing system is operating.
- To prevent burn injury, wear thermal gloves when working around heater tooling and fluid heaters.
- Ensure all facility power sources are safely grounded.
- Routinely inspect all air hoses and electrical cables for damage.
- Ensure power cords and air supply hoses do not cross a walkway or aisle.
- Maintain a clean and orderly work area.
- Remove the IntelliJet completely from the dispensing system and allow the heated parts to cool before performing maintenance.
- Relieve pneumatic pressure before adjusting or servicing pressurized components.

2.4.2 Material Safety

- Follow Safety Data Sheet (SDS) recommendations for the proper handling, cleanup, and disposal of all materials and fluids and their containers (i.e., syringes, cups, reservoirs, etc.) used with the dispensing system.
- Know the SDS recommendations for treatment of injury resulting from exposure to hazardous materials.
- Obtain the SDS from the applicable chemical supplier for chemical substances not provided with the equipment. These chemical substances include those used for processing, maintenance, and service of the equipment.

- Always wear appropriate Personal Protective Equipment (PPE) as recommended by facility safety practices and the material manufacturer's SDS.
- When working with multiple fluids, refer to the SDS to ensure the materials are compatible.
- If possible, save or recycle unused materials. Refer to the SDS before saving or recycling unused materials.
- Do not dispense fluids with a flash point less than 93 °C.
- DO NOT dispense toxic fluids (materials with a TLV of 200 ppm or lower).

2.4.3 Preventing Equipment and Workpiece Damage

- Immediately push the EMO (E-Stop) button if the dispensing system, IntelliJet, or a work piece is in danger of being damaged.
- Use standard Electrostatic Discharge (ESD) precautions when working near sensitive components. Always wear a grounding strap and connect it to the ESD ground before handling workpieces and equipment.
- Perform all recommended maintenance procedures at the suggested intervals.
- Immediately contain and clean up any caustic or conductive fluid spills as recommended in the material manufacturer's SDS.
- If fluid gets into internal portions of the IntelliJet, immediately contact Technical Support.
- Use only replacement parts that are designed for use with the original equipment. See [7.9 Spare Parts Kit](#) for a completed spare parts list.



WARNING!

The IntelliJet is a precision instrument of inherently safe design. The use of any dispensing fluid and the related choice of solvent for cleaning, as well as all associated safety precautions is the responsibility of the end-user. Consult with your fluid supplier for recommendations on personal protective equipment and safety practices.

2.5 Decommissioning

Table 2-1 Recommended Decommissioning Procedures

Component	Disposition
Aluminum Parts	Recycle aluminum panels, shelves, doors, and hardware.
Steel Parts	Recycle any steel parts.
Copper Wiring	Recycle any copper wiring.
Electronic Components	Discard in accordance with local safety/environmental regulations.
Pneumatic Components	Recycle or discard in accordance with local safety/environmental regulations.
Printed Circuit Boards	Discard in accordance with local safety/environmental regulations.
Plastics	Recycle or discard in accordance with local safety/environmental regulations.

2.6 Disposal

Dispose of equipment and materials used in operation and servicing in accordance with local regulations.

Depending on the fluid dispensed and cleaning materials used, the following items may contain substances whose disposal might be regulated:

- Purge/Scale Cups
- Purge Boots
- Dispensing Needles/Nozzles
- Seats
- Luer Fittings
- Fluid Tubes
- Syringes
- Valve Piezo Stack

2.7 Emergency Shutdown

In the event of an emergency or malfunction, press the EMO (E-Stop) button on the dispensing system and perform the following steps:

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

2.8 Safety Warning Labels

Warning labels on your equipment point out areas where personnel must use extreme caution to prevent serious injury and property damage. Table 2-2 shows the warning symbols found on the IntelliJet.



WARNING!

Comply with all safety warning labels on the dispensing system and optional equipment or serious injury to personnel or damage to the dispensing system may occur. Replace worn or damaged labels.

Table 2-2 Safety Warning Symbols

Warning Type	Symbol	Part Number	Hazard
Hot Surface		7207207	Thermal warning labels identify potentially hot components and surfaces. Use extreme caution when working on or around these areas. Can cause severe burns.



Item	Description
1	Hot Surface Label

Figure 2-1 Safety Warning Label Location

3 Installation and Setup

3.1 Overview

The IntelliJet is designed for use on Nordson Spectrum, Vantage, and Forte Series Dispensing Systems. This section includes installation instructions and covers the following topics:

- [Unpacking the IntelliJet](#)
- [Installing the IntelliJet](#)
- [Canvas Software](#)
- [Clearance for Jet and Stinger Cartridges](#)
- [Installing the Fluid Syringe](#)
- [Software Configuration](#)
- [IntelliJet Calibration Procedure](#)
- [Calibration Failure](#)
- [IntelliJet Mini Burn Routine](#)

3.2 Safety First

Operation of the IntelliJet involves air pressure, electrical power, mechanical devices, heat, and the use of hazardous materials. It is essential that every person servicing or operating the IntelliJet fully understands all hazards, risks, and safety precautions. See [Section 2 - Safety](#) for additional information.



WARNING!

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

3.3 Unpacking the IntelliJet

Every care has been taken when packaging your IntelliJet. However, we recommend that you look for obvious damage and verify contents against the packing slip.

Retain the case for storage of the valve and accessories. Retain shipping cartons for future use. If an item needs to be returned to Nordson, obtain a Return Material Authorization (RMA) number from Technical Support, see [7.5.1 Return Material Authorization](#).

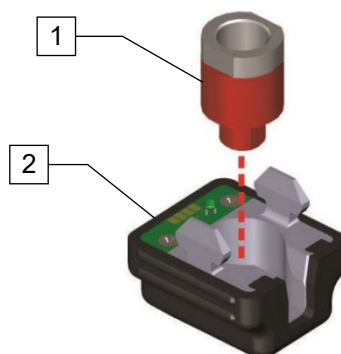
3.4 Installing the IntelliJet

Tools and Materials Needed:

- 4 mm hex wrench

To install the IntelliJet:

1. Remove the red stop tool from the heater assembly (Figure 3-1).
 - > You may want to retain it for shipping purposes.



Item	Description
1	Test Stop Tool
2	Heater Assembly

Figure 3-1 Removing the Test Stop Tool from the Heater Assembly

2. Insert the jet cartridge into the heater assembly (Figure 3-2).



Item	Description
1	Jet Cartridge
2	Heater Assembly
3	Jet Cartridge Inserted in Heater Assembly

Figure 3-2 Inserting the Jet Cartridge into the Heater Assembly



WARNING! Do not remove the black protective boot from the heater assembly. Do not operate if the black boot is not attached. It protects the user from hot parts and improves performance.

3. Attach the heater/jet cartridge assembly to the IntelliJet and lock in place with the blue valve lever or a 4 mm hex wrench (Figure 3-3).
 - > The valve lever should be approximately 10 degrees below horizontal when installing the heater.
 - > Rotate the lever counterclockwise to the vertical lock position.



Figure 3-3 Attaching the Heater/Jet Cartridge Assembly to the IntelliJet

4. Attach the IntelliJet dovetail mount to the dovetail bracket on the Z-axis of the dispensing system and tighten with the 4 mm hex wrench.
5. Make the electrical connections (Figure 3-4).



CAUTION!

DO NOT connect or disconnect the IntelliJet electrical cable while the software is running. Connecting or disconnecting the IJ cable while the software is running may damage the platform electronics.

6. Connect the pneumatic tubes (Figure 3-4).
 - > The black tube connects to valve off and supplies air to the piezo stack for cooling as needed. Valve air pressure should be set to 138 kPa (20 psi).
 - > You should hear a click when the tube is inserted properly.

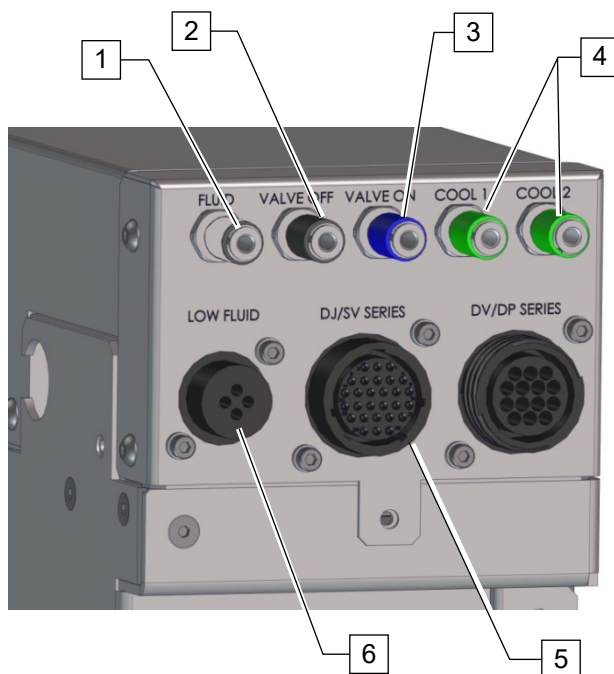


CAUTION! Failure to connect the black hose or turning the air pressure to the wrong setting may result in over-temperature errors and damage to the valve. Clean, dry air must be supplied to the equipment to prevent moisture damage.

- > The green tube connects to Cool 1 and is used for nozzle cooling in elevated temperature environments. Cooling air should be set to 207 to 414 kPa (30 to 60 psi). Refer to the applicable software user guide or online help for software control setup of the nozzle cooler.
7. Verify that the cables and connections are secured adequately to account for the motion of the robot.



NOTE If the heater assembly is not properly installed and the electrical connections are not made, the IntelliJet will not operate.



Item	Description	Item	Description
1	Fluid Air Pressure Connection (Clear)	4	Cooling Air Connections (Green)
2	Valve Air Pressure Connection (Black)	5	IntelliJet Connection
3	NOT USED	6	Low Fluid Sensor Connection

Figure 3-4 Valve Pneumatic and Electrical Connections

3.5 Clearance for Jet and Stinger Cartridges

The following images of the external nozzle tip and heater body dimensions are provided for reference. Users may use these images to perform a general verification that the nozzle and heater body will not present any obstructions or clearance issues for your substrate and any mounted components.

To use the images:

1. Identify the height (mm) of any neighboring substrate height obstructions and the lateral distance of this obstruction from the targeted dispense location (mm).
2. Subtract the programmed dispense gap (distance from the nozzle to substrate) from the obstruction height. Refer to the applicable software user guide for instructions on setting the dispense gap.
3. Use the lateral distance from the targeted dispense location to check along the X-axis of the image (1 mm grid) to verify that the total obstruction height (minus the dispense gap) does not contact the indicated exterior of the nozzle and heater block for the valve.

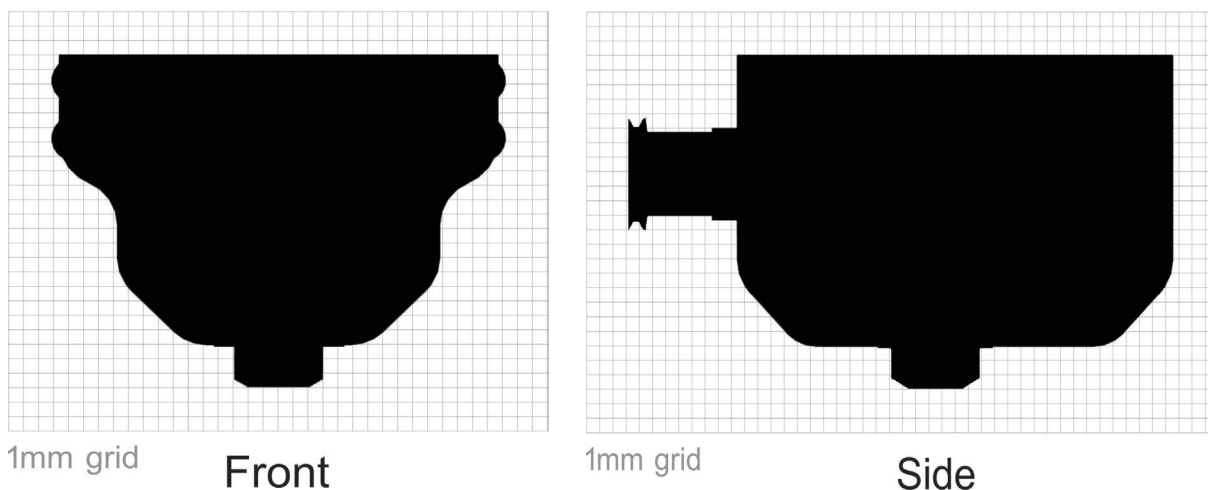


Figure 3-5 External Nozzle Tip Views for Non-Stinger Cartridges

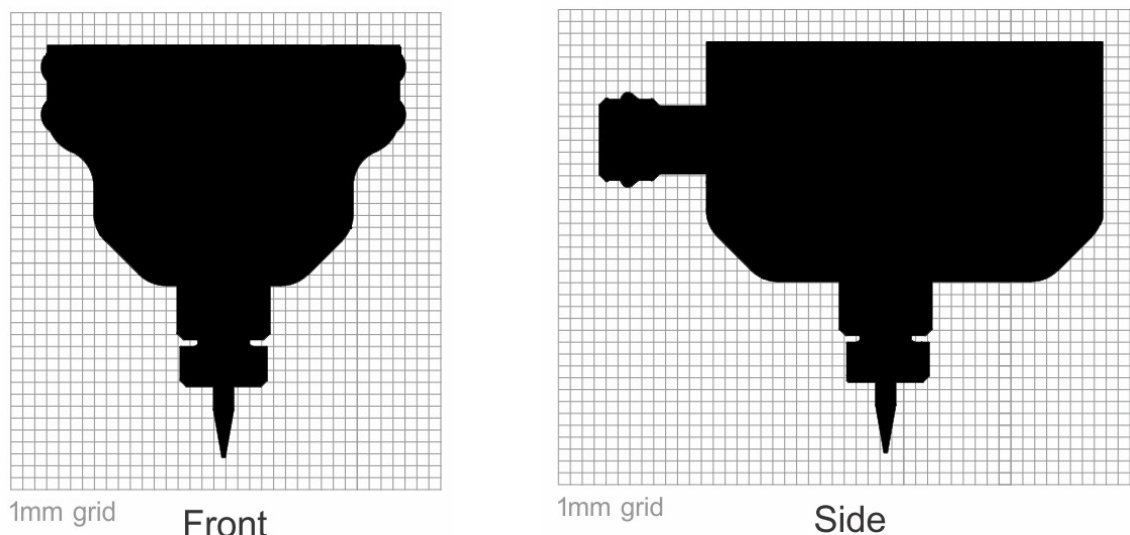
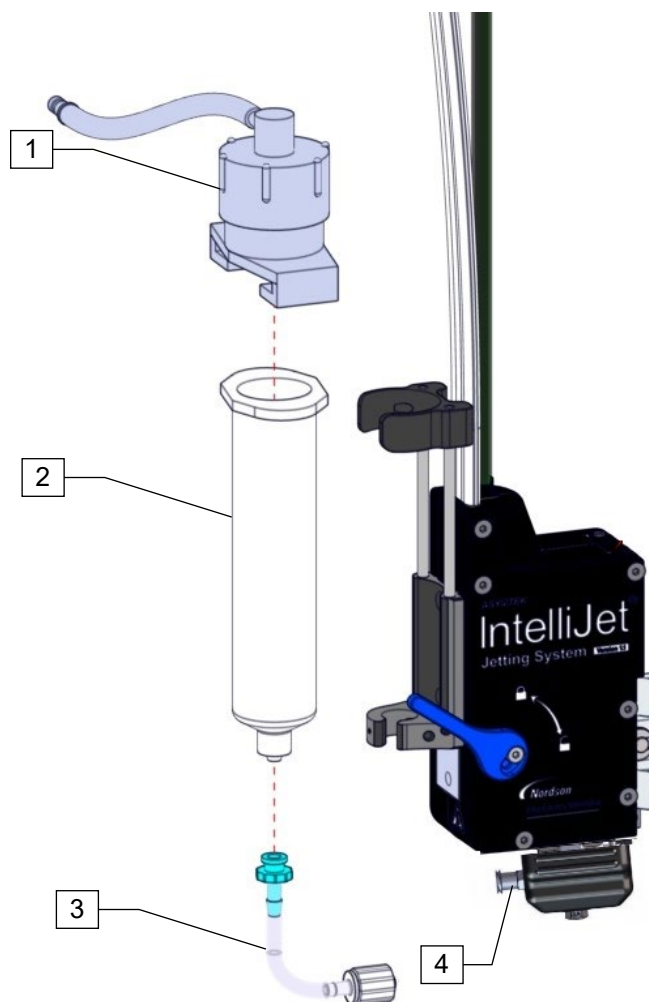


Figure 3-6 External Nozzle Tip Views for Stinger Cartridges

3.6 Installing the Fluid Syringe

To install the fluid syringe (Figure 3-7):

1. Attach a new feed tube assembly to the fluid syringe.
2. Install the fluid syringe on the syringe holder and connect the feed tube assembly to the jet cartridge inlet.
3. Install the receiver head.
4. Connect the clear pneumatic hose from the receiver head to the fluid air pressure connection on the bulkhead.
5. Set the fluid air pressure. Typical values are 35 to 400 kPa (5 to 60 psi) but highly dependent on the application.



Item	Description
1	Receiver Head
2	Fluid Syringe
3	Feed Tube
4	Jet Cartridge Feed Tube Inlet

Figure 3-7 Installing the Fluid Syringe

3.7 Software Configuration

3.7.1 Fluidmove

3.7.1.1 Valve Selection

1. Power on the dispensing system. Refer to the applicable dispensing system Installation, Operations, and Maintenance manual.
2. Verify that "IntelliJet" is selected as the active valve configuration.
 - a. Select **Configuration > Setup Valves** from the Fluidmove Main Window.
 - b. If IntelliJet is already selected, see [3.7.1.2 Valve Settings](#).
 - c. If not selected, select **IntelliJet** in the Active Configuration textbox (Figure 3-8).

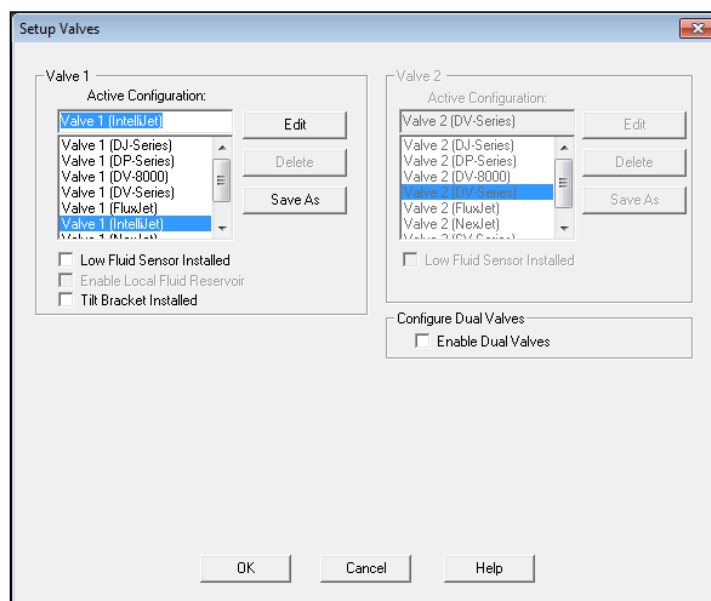


Figure 3-8 Setup Valves Window

3. Select **OK**.
 - > If you changed your valve types, you will be prompted to restart Fluidmove.
4. If prompted to restart Fluidmove, select **Yes**.
 - > You must restart Fluidmove for the changes to take effect.

3.7.1.2 Valve Settings



NOTE If you changed the active valve configuration, you must restart Fluidmove prior to adjusting valve settings.

1. Select **Edit** in the Setup Valves window (Figure 3-8) to open the Valve Settings window.
2. You can view or change the parameters (Figure 3-9).
3. Adjust the settings as desired. See Table 3-2 for a description of settings.
4. Select **OK**.

3.7.1.2.1 General Tab

The General tab allows you to view the valve information such as the valve type, firmware revision, build revision, model number, serial number, and shot counter (Figure 3-9).

Figure 3-9 Valve Settings - General Tab

Table 3-1 General Tab Description

Characteristic	Description
Configuration Name	Identifies the type of valve.
Valve Type	Identifies the type of valve currently selected.
Firmware Rev	Identifies the piezo controller firmware revision.
Build Rev	Identifies the build revision.
Model Number	The IntelliJet model number.
Serial Number	The IntelliJet serial number.
Shot Counter	The number of shots fired by this IntelliJet.
Board Installed	PZD is the type of electronics board that drives the IntelliJet.
Z8 FW Version	Identifies the firmware version on the IntelliJet hardware and is used for troubleshooting purposes.
CPLD Version	

3.7.1.2.2 Settings Tab

The Settings tab is where the cycle frequency, valve on time, valve off time, purge interval, valve stroke, and opening and closing rates and times are adjusted (Figure 3-10).

The screenshot shows the 'Valve 1 Settings' dialog box with the 'Settings' tab selected. The dialog has four tabs: 'General', 'Settings', 'Calibration', and 'Maintenance'. The 'Settings' tab contains the following controls:

- Settings section:**
 - Frequency (Hz): 150 (Max: 1000 Hz)
 - Valve On Time (ms): 5
 - Valve Off Time (ms): 1.66
 - Purge Interval (ms): 6.66
 - ☐ Modify Purge Interval
 - Valve Stroke: 125
 - ☐ Enable PrePurge:
 - Opening Rate: 0.2
 - Opening Time: 0.75
 - Closing Rate: 1
 - Closing Time: 0.15
- Fluid Pressure section:**
 - ☒ Change Default Fluid Pressure Setting
 - Fluid Pressure will be turned on when it is needed. Check this if Vacuum Assisted Prime is in use.
- Status section:**
 - Current Cycle Count: 10
 - Reset button

At the bottom of the dialog are four buttons: OK, Cancel, Apply, and Help.

Figure 3-10 Valve Settings - Settings Tab

Table 3-2 Settings Tab Description

Item	Description
Frequency	The number of times the piezo is energized per second. The max cycle frequency is 1000 Hz @ 50% duty cycle. For applications that require a lower cycle frequency, the setting can be adjusted. If a program is written that jets more than 5000 dots in a 10 second period, the software will pause the program to reduce the duty cycle. If that occurs, the frequency can be lowered to optimize throughput.
Valve On Time	The amount of time that the valve is ON when it dispenses a dot. Minimum recommended time is 0.6 ms. Shorter times may result in unstable dot weights.
Valve Off Time	The amount of time that the valve is OFF between dispensing dots. This value is automatically calculated from the valve cycle frequency and valve on time.
Purge Interval	The time (in milliseconds) between each firing of the valve during a purge. The number of times the valve fires during a purge depends on the purge duration (set in Setup Purge Station on the Configuration Menu) and the purge interval (set here).
Modify Purge Interval	Allows you to change the purge interval.
Valve Stroke	The Valve Stroke should be 50-125. A Valve Stroke of 25-35 may be used for dry cycling. Thicker fluids need more travel and thinner fluids need less travel to dispense properly.
Enable Pre-Purge Rotation	The valve rotates during the purge procedure to make sure there is no fluid residue on the nozzle.
Opening Rate	The speed at which the piezo valve opens. The maximum value is 0.25.
Opening Time	Calculated time interval for the given opening rate.
Closing Rate	The speed at which the piezo valve closes. Dot quality can be adjusted by changing the closing rate. The maximum value is 2.5. It is not recommended to use a setting above 0.5. If the fluid is accumulating, increase the closing rate or increase the heater temperature. If the fluid is splashing, decrease the closing rate or lower the heater temperature.
Closing Time	Calculated time interval for the given closing rate.
Change Default Fluid Pressure Setting	This configures global fluid pressure behavior. When checked, the fluid pressure will only be turned on when dispensing.
Current Cycle Count	Number of shots counted by Fluidmove.

3.7.1.2.3 Calibration Tab

The Calibration tab is where calibration settings are defined. The Calibration tab can also be accessed from the IntelliJet Setup window. This menu allows the user to run multiple iterations of the calibration routine without closing the window and can be used for analysis and troubleshooting of valves and/or cartridges, see [3.8 IntelliJet Calibration Procedure](#).

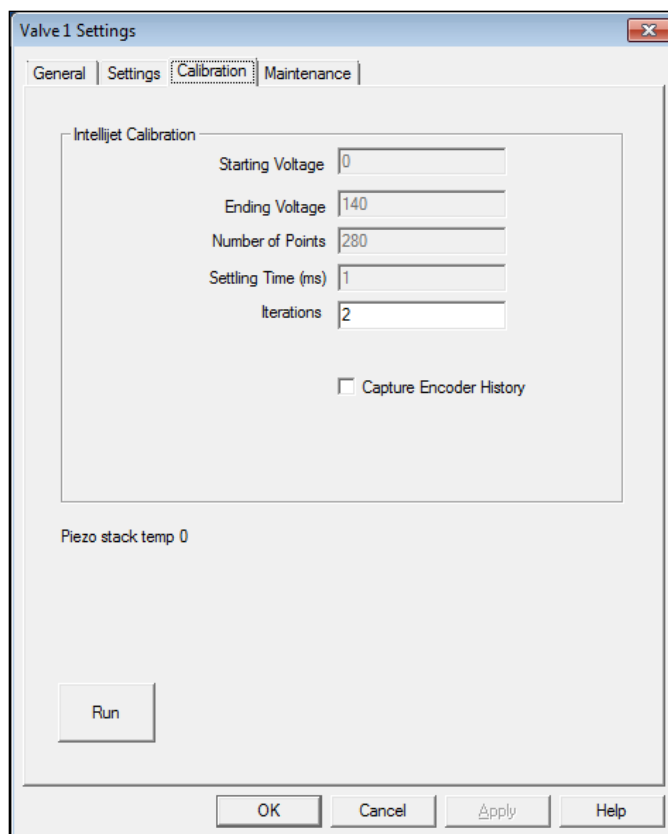


Figure 3-11 Valve Settings - Calibration Tab

Table 3-3 Calibration Tab Description

Item	Description
Starting Voltage	The calibration routine Starting Voltage.
Ending Voltage	The calibration routine Ending Voltage.
Number of Points	The Number of Points during the routine.
Settling Time	The delay time before a measurement is taken.
Iterations	The number of times to run through the calibration routine, 1 to 5.
Capture Encoder History	Saves the individual voltage/encoder readings to a .csv file in the log folder for offline data analysis.
Piezo stack temp	This is the temperature of the piezo stack measured by an internal sensor. This value is shown for reference only. When this value reaches 25 °C, the cooling air is turned on. If this value exceeds 80 °C, an error will occur, and the program will stop to prevent damage to the valve. A value of 255 indicates that the valve is not connected electrically.
Run	Runs the valve calibration routine.

3.7.1.2.4 Maintenance Tab

The Maintenance tab is where you enable automatic calibration maintenance, see [3.8 IntelliJet Calibration Procedure](#) (Figure 3-12).

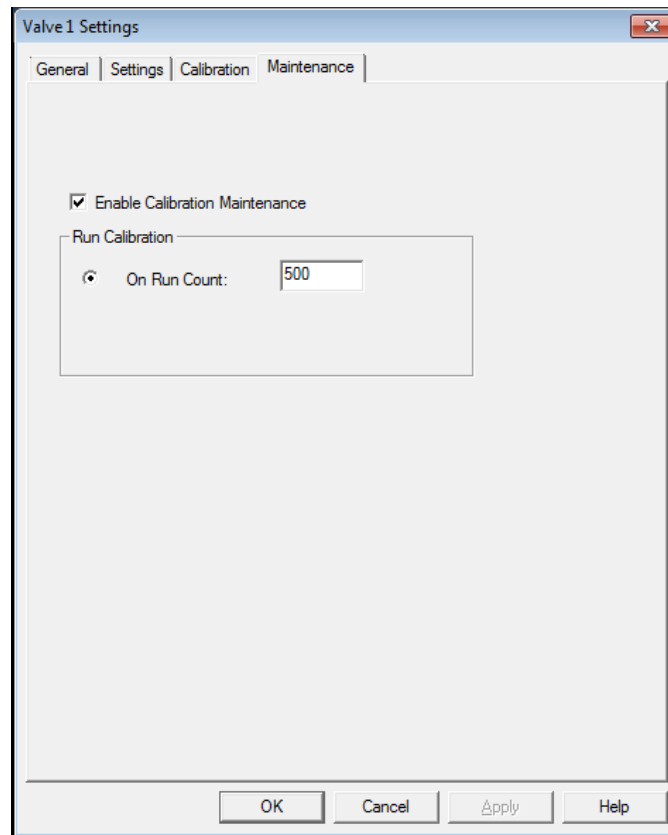


Figure 3-12 Valve Settings - Maintenance Tab

Table 3-4 Maintenance Tab Description

Item	Description
Enable Calibration Maintenance	A checkmark in this box enables automatic calibration maintenance.
On Run Count	A calibration procedure will be performed after the number of runs entered in the On Run Count text box has been completed.

3.7.2 Canvas Software

3.7.2.1 Valve Selection

1. Select the **System**  button on the Navigation Panel.
2. Select **Machine Configuration** on the menu bar.
- > The Machine Configuration window opens (Figure 3-13).

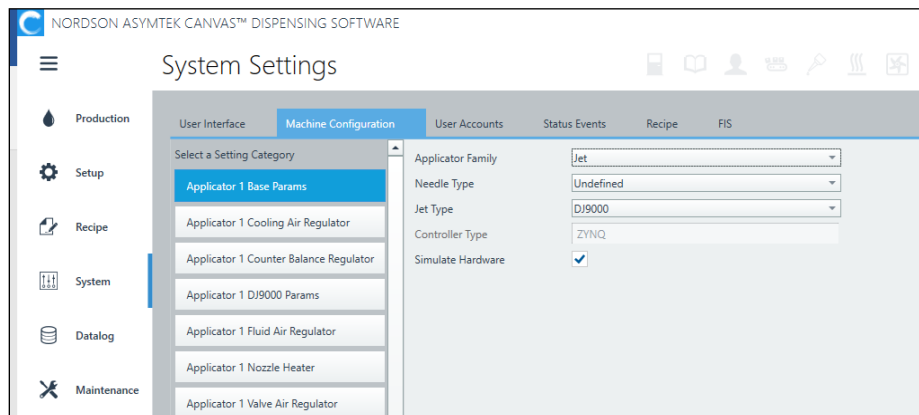


Figure 3-13 System Settings - Machine Configuration

3. Select **Applicator 1 Base Params**.
4. Make sure the Applicator Family is **Jet**.
5. If not, select  and select **Jet** from the list (Figure 3-14).

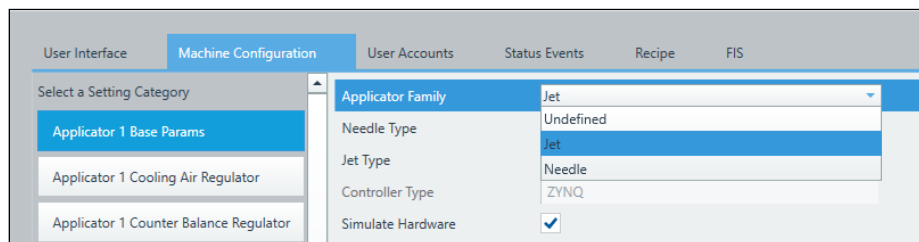


Figure 3-14 Select Applicator Family

6. Make sure the Jet Type is **IJ**.
7. If not, select  and select **IJ** from the list (Figure 3-15).

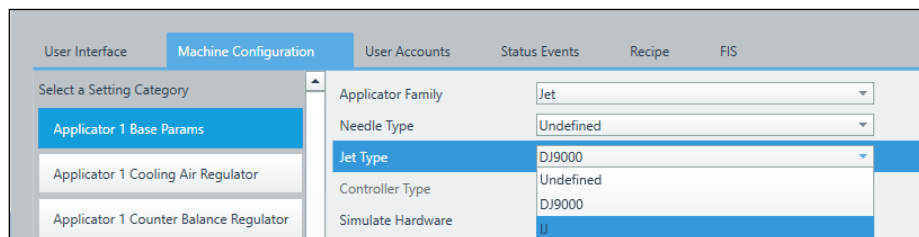


Figure 3-15 Select Jet Type

8. Select **Save** to save changes (Figure 3-16).

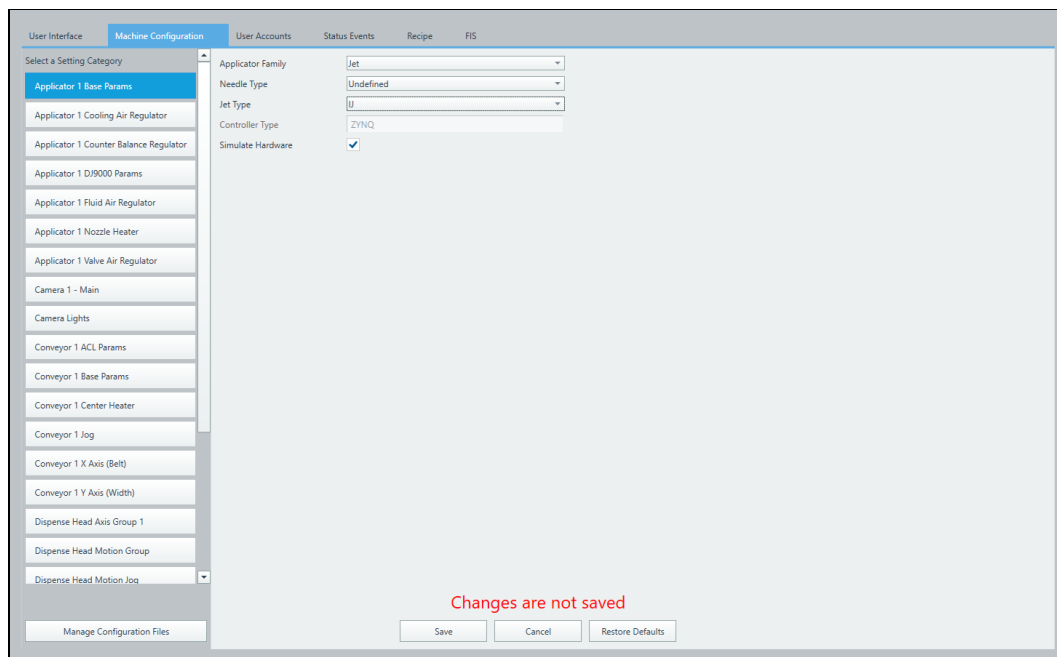


Figure 3-16 Save System Settings

- > You will be prompted to reinitialize now or later. (Figure 3-17).

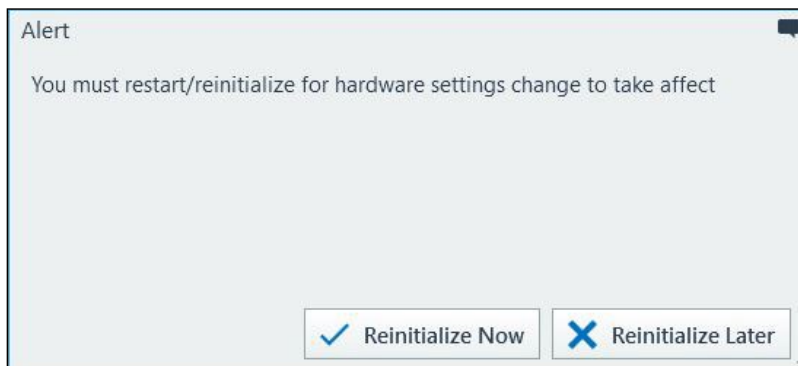
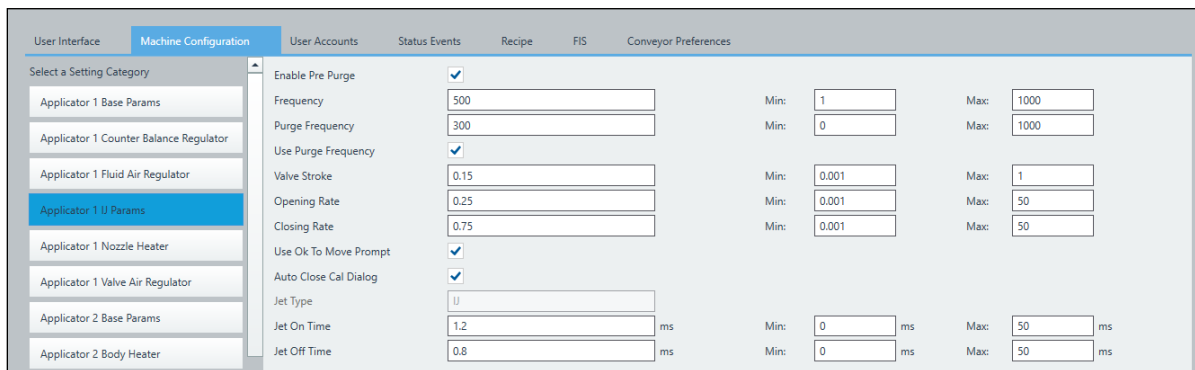


Figure 3-17 Restart Prompt

9. Select **Reinitialize Now** for hardware settings change to take effect.

3.7.2.2 IntelliJet Parameters

1. Select the **System**  button on the Navigation Panel.
2. Select **Machine Configuration** on the menu bar.
 - > The Machine Configuration window opens (Figure 3-18).
3. Select **Applicator 1 IJ Params.**



Item	Description
Enable Pre Purge	Removes excess fluid from the nozzle before performing a purge.
Frequency	The number of times the piezo is energized per second. The max cycle frequency is 1000 Hz @ 50% duty cycle. For applications that require a lower cycle frequency, the setting can be adjusted. If a program is written that jets more than 5000 dots in a 10 second period, the software will pause the program to reduce the duty cycle. If that occurs, the frequency can be lowered to optimize throughput.
Purge Frequency	The time (in milliseconds) between each firing of the valve during a purge. The number of times the valve fires during a purge depends on the purge duration set in Applicator 1 settings. Refer to the <i>Canvas User Guide</i> for more information.
Use Purge Frequency	Activates the purge frequency feature above.
Valve Stroke	The Valve Stroke should be 50-125. A Valve Stroke of 25-35 may be used for dry cycling. Thicker fluids need more travel and thinner fluids need less travel to dispense properly.
Opening Rate	The speed at which the piezo valve opens. The maximum value is 0.25.
Closing Rate	The speed at which the piezo valve closes. Dot quality can be adjusted by changing the closing rate. The maximum value is 2.5. If the fluid is accumulating, increase the closing rate or heater temperature. If the fluid is splashing, decrease the closing rate or lower the heater temperature.
Use OK to Move Prompt	If checked, the user will be prompted to select OK before the dispense head moves to the purge or scale station.
Auto Close Cal Dialog	Automatically closes the calibration window when IntelliJet calibration is complete.
Jet On Time	The amount of time that the valve is ON when it dispenses a dot. Minimum recommended time is 0.6 ms. Shorter times may result in unstable dot weights.
Jet Off Time	The amount of time that the valve is OFF between dispensing dots. This value is automatically calculated from the valve cycle frequency and valve on time.

Figure 3-18 IntelliJet Parameters

3.8 IntelliJet Calibration Procedure

The IntelliJet calibration procedure determines the point at which the cartridge poppet lifts from the seat during the opening part of the stroke. Once this point is established, an additional 40 V (seal voltage offset) is applied to the piezo stack to prevent fluid from leaking out of the cartridge. Seal voltage offset can be adjusted by editing the software configuration files, see [3.8.3 Adjusting the Seal Offset Voltage](#).

Calibration procedures can be run manually, included in a software setup routine, or after a specified number of runs. In addition, the IntelliJet calibration procedure automatically runs after a:

- Machine Restart
- Valve Installation
- Heater Installation
- Valve Setting Change

For best performance, a final calibration should be run before production, but after the cartridge has been vacuum primed and actuated several times.



NOTE It is recommended that you perform a purge procedure after calibration, since gravity may cause fluid to escape during the calibration procedure.

3.8.1 Fluidmove Software

3.8.1.1 Manually Run Calibration

To manually run an IntelliJet calibration procedure:

1. Select **Teach a Program** from the Fluidmove Main Window.
2. Select **Setup > IntelliJet Setup** from the Programming Window menu bar.
 - > The IntelliJet Calibration window opens (Figure 3-19).

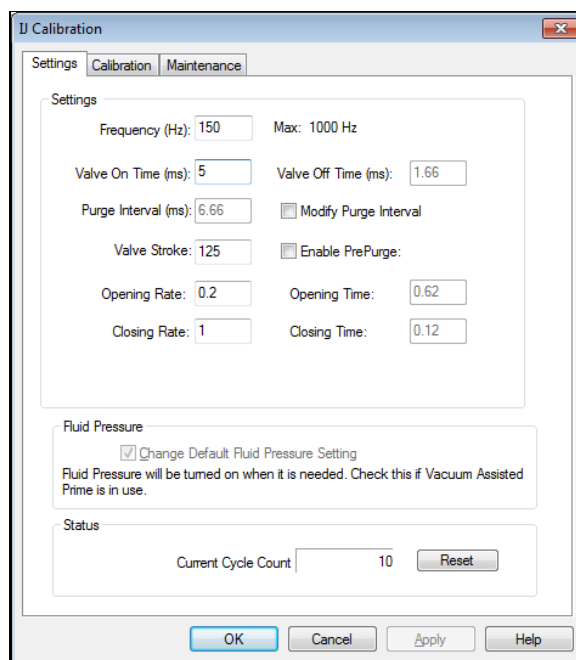


Figure 3-19 IntelliJet Calibration Window - Settings Tab

3. If desired, enter new values and select **Apply**.
 - > This will update the dependent variables (on time, opening/closing rates, etc.), run the calibration routine, but leave the window open, see [3.7.1.2.2 Settings Tab](#).
4. To run the calibration with the current settings, select the Calibration tab (Figure 3-20) and select **Run**, see [3.7.1.2.3 Calibration Tab](#).

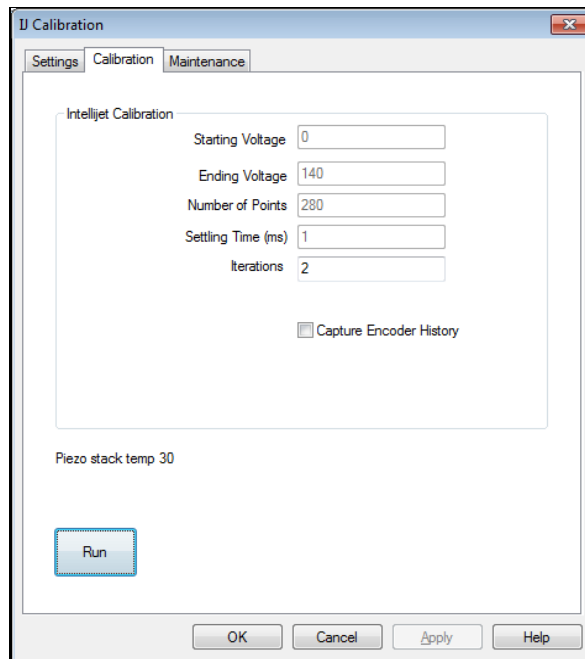


Figure 3-20 IntelliJet Calibration Window - Calibration Tab

5. Select **RUN** to run the calibration routine.
 - > The calibration routine will adjust the valve's motion to the desired stroke and opening/closing rates.
6. Upon successful completion, a Fluidmove message appears displaying the results (Figure 3-21).

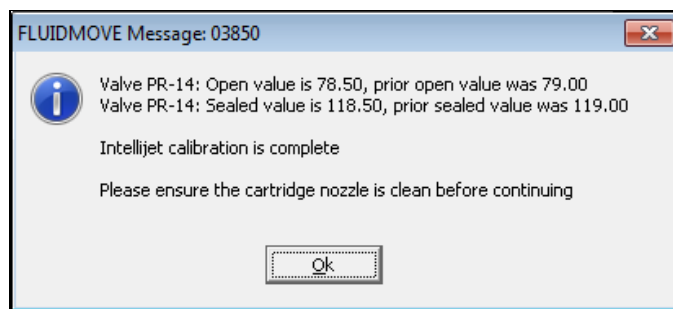


Figure 3-21 Calibration Routine Complete

- > The closed value is the voltage at which the poppet begins to contact the seat.
 - > The sealed value is the closed value plus the additional voltage needed to seal the cartridge from leaking.
 - > The complete calibration results are recorded in the log file (Figure 3-22).
7. For IntelliJets model IJ, if calibration still does not pass, see [3.9 Calibration Failure](#).
 8. For IntelliJets model IJ1.1, perform the following:

- Perform an IntelliJet Rebuild Fire Routine, see [3.10 IntelliJet Mini Burn Routine](#).
- Recalibrate the IntelliJet by performing Step 1 through Step 6.
- If the calibration still does not pass, see [3.9 Calibration Failure](#).

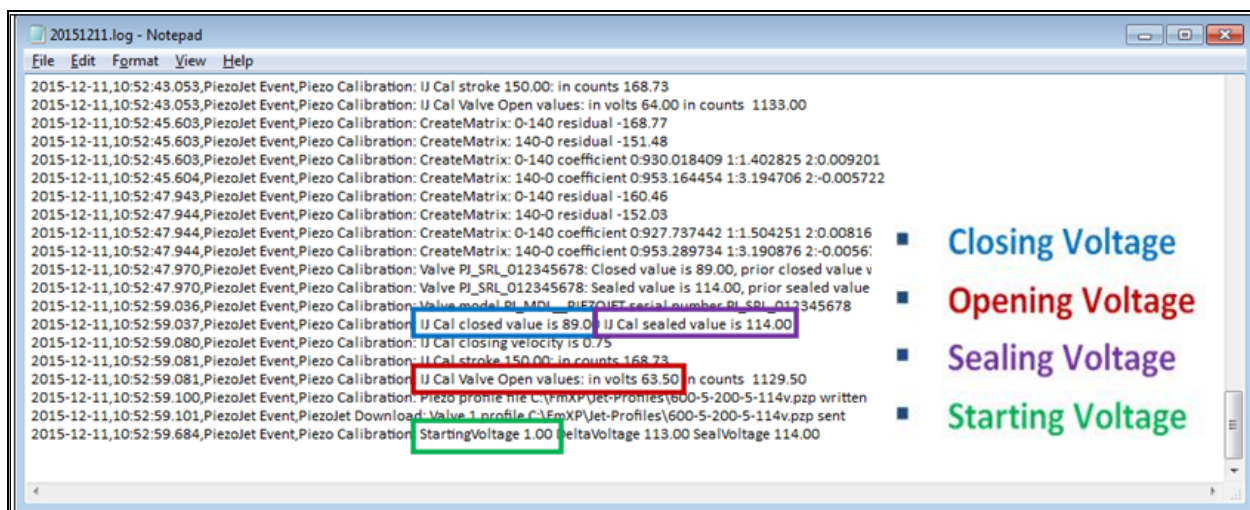


Figure 3-22 Calibration Log File Results

3.8.1.2 Automatically Run Calibration

To automatically run the IntelliJet calibration procedure during a production run:

- Select **Teach a Program** from the Fluidmove Main Window.
- Select **Setup > IntelliJet Setup** from the Programming Window menu bar.
 - The IntelliJet Calibration window opens (Figure 3-20).
- Select the Maintenance tab (Figure 3-23), see [3.7.1.2.4 Maintenance Tab](#).

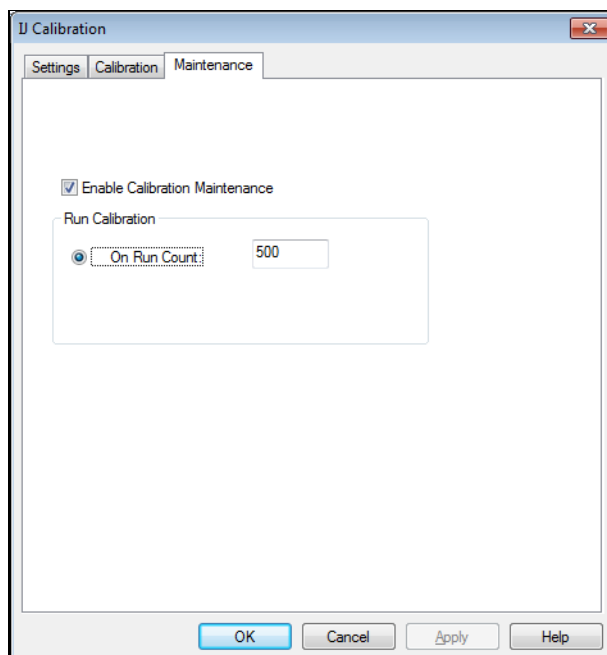


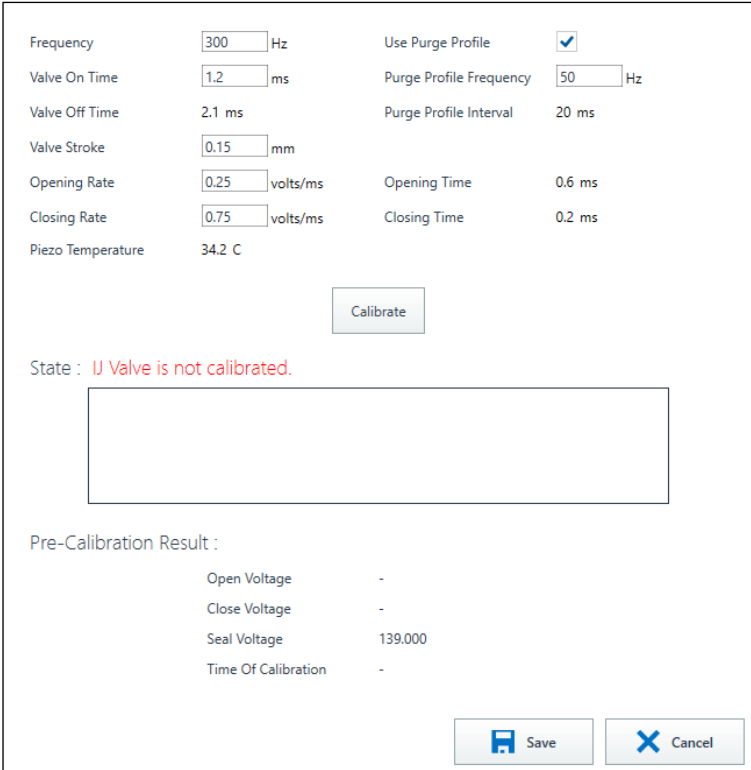
Figure 3-23 IntelliJet Calibration Window - Maintenance Tab

4. Select **Enable Calibration Maintenance**.
5. Select **On Run Count** and enter the number of runs to be completed before a calibration procedure is run.
6. Select **OK**.

3.8.2 Canvas Software

To calibrate the IntelliJet:

1. Select the **Recipe**  button on the Navigation Panel.
 - > The Recipe Editor opens.
2. Select **Dispense > Applicator Settings > IJ Calibration Settings** from the menu bar.
 - > The Calibration window opens (Figure 3-24).
 - > Calibration settings are described in Table 3-5.
3. Select **Calibrate** to start the calibration process.



The calibration window contains the following settings:

Frequency	300 Hz	Use Purge Profile	☒
Valve On Time	1.2 ms	Purge Profile Frequency	50 Hz
Valve Off Time	2.1 ms	Purge Profile Interval	20 ms
Valve Stroke	0.15 mm		
Opening Rate	0.25 volts/ms	Opening Time	0.6 ms
Closing Rate	0.75 volts/ms	Closing Time	0.2 ms
Piezo Temperature	34.2 C		

Below the settings is a **Calibrate** button.

State : IJ Valve is not calibrated.

Pre-Calibration Result :

Open Voltage	-
Close Voltage	-
Seal Voltage	139.000
Time Of Calibration	-

At the bottom right are **Save** and **Cancel** buttons.

Figure 3-24 IntelliJet Calibration

4. Follow the screen prompts.
 - > When the calibration is complete, you receive a message indicating if the calibration passed or failed.
5. If the calibration failed, select **Retry**.
6. For IntelliJet model IJ+, if calibration still does not pass, see [3.9 Calibration Failure](#).
7. For IntelliJet model IJ, perform the following:
 - a. Perform an IntelliJet Mini Burn Routine, see [3.10 IntelliJet Mini Burn Routine](#).
 - b. Recalibrate the IntelliJet, perform Step 1 through Step 6.
 - c. If the calibration still does not pass, see [3.9 Calibration Failure](#).
8. If the calibration passed, select **Save**.

Table 3-5 Canvas Settings Tab Description

Item	Description
Frequency	The number of times the piezo is energized per second. The max cycle frequency is 1000 Hz @ 50% duty cycle. For applications that require a lower cycle frequency, the setting can be adjusted. If a program is written that jets more than 5000 dots in a 10 second period, the software will pause the program to reduce the duty cycle. If that occurs, the frequency can be lowered to optimize throughput.
Valve On Time	The amount of time that the valve is ON when it dispenses a dot. Minimum recommended time is 0.6 ms. Shorter times may result in unstable dot weights.
Valve Off Time	The amount of time that the valve is OFF between dispensing dots. This value is automatically calculated from the valve cycle frequency and valve on time.
Valve Stroke	The Valve Stroke should be 50-125. A Valve Stroke of 25-35 may be used for dry cycling. Thicker fluids need more travel and thinner fluids need less travel to dispense properly.
Enable Pre-Purge Rotation	The valve rotates during the purge procedure to make sure there is no fluid residue on the nozzle.
Opening Rate	The speed at which the piezo valve opens. The maximum value is 0.25.
Opening Time	Calculated time interval for the given opening rate.
Closing Rate	The speed at which the piezo valve closes. Dot quality can be adjusted by changing the closing rate. The maximum value is 2.5. It is not recommended to use a setting above 0.5. If the fluid is accumulating, increase the closing rate or increase the heater temperature. If the fluid is splashing, decrease the closing rate or lower the heater temperature.
Closing Time	Calculated time interval for the given closing rate.

3.8.3 Adjusting the Seal Offset Voltage

Seal voltage offset can be adjusted by editing the software configuration files. Increasing the sealing voltage may shorten the life of the valve or cartridge. Decreasing the voltage may cause leaking or material accumulation.



WARNING!

DO NOT modify the software configuration files unless trained to do so. An error in this file can cause your system to run erratically or not at all. Contact Technical Support for assistance.

3.8.3.1.1 Fluidmove Software

Seal offset voltage can be modified in the FmConfig.ini file under Valve 1 (IntelliJet) > IJ Seal Voltage Offset

3.8.3.1.2 Canvas Software

Seal offset voltage can be modified in the DeviceConfig_Dispenser.ini file under IJ Calibration Settings <Seal Voltage Offset>.

3.9 Calibration Failure

3.9.1.1 Low Voltage Error

If the cartridge calibration voltage is below the minimum value of 45 V, the software will display a Calibration Failed message indicating that the current calibration voltage is less than the minimum voltage.

Low calibration voltage is usually caused by cartridge wear but may be due to valve actuator wear. The Gold Hard Stop tool is used to determine which part is problematic, see [3.9.1.3 Identifying the Failed Part](#).

3.9.1.2 High Voltage Error

The minimum and maximum voltage that can be applied to the piezo stack is 0 to 140 V. The maximum calibration voltage is 85 V. If the cartridge calibration voltage is above the maximum value of 85 V, the software will display a Calibration failed message indicating that the current voltage is greater than the maximum voltage.

High calibration voltage is usually caused by cartridge wear but may be due to valve actuator wear. The Gold Hard Stop tool is used to determine which part is problematic, see [3.9.1.3 Identifying the Failed Part](#).

3.9.1.3 Identifying the Failed Part

The IntelliJet valve should be tested with a clean gold hard stop tool.

**WARNING!**

Cartridges may be dirty, worn, or damaged which could cause a false failure of the IntelliJet.

Prior to running the calibration, inspect the inside and outside of the gold hard stop tool are free from cured fluid and is not damaged (Figure 3-25).

**WARNING!**

Ensure the gold hard stop tool is free from cured fluid and not damaged.

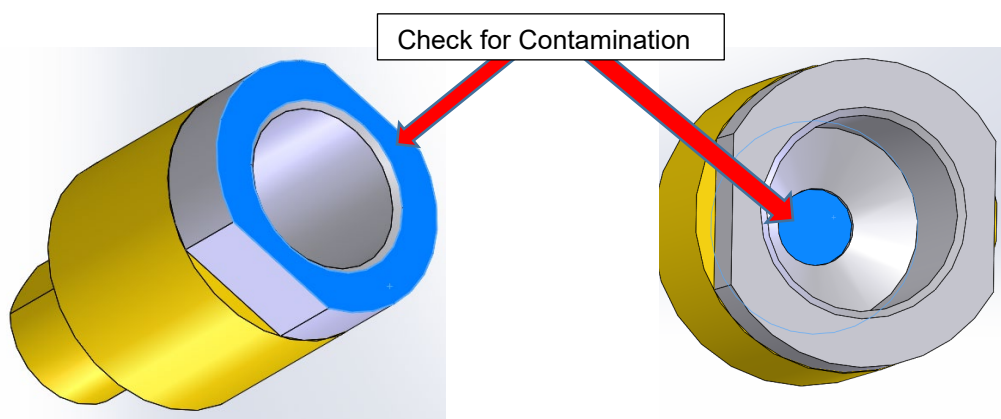


Figure 3-25 Gold Hard Stop Tool Inspection

Prior to running calibration, inspect the valve body surface (blue highlighted area) is free from cured fluid and is not damaged (Figure 3-26).

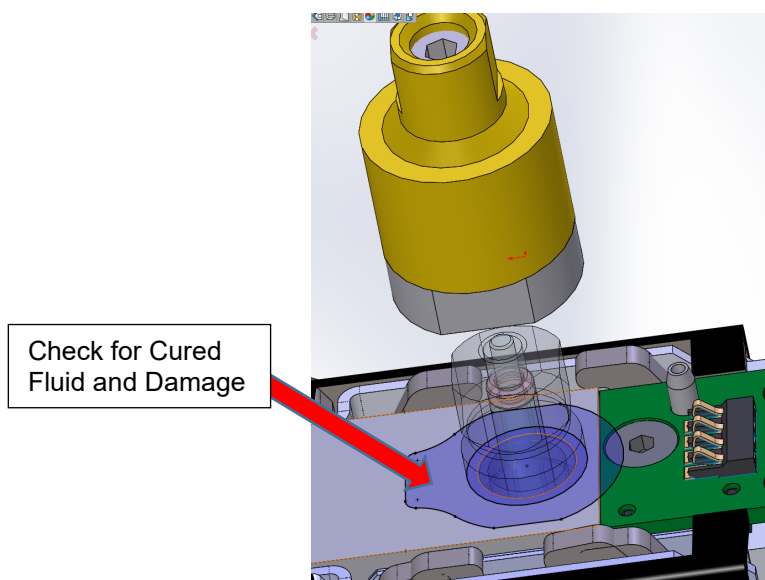


Figure 3-26 Valve Body Surface Inspection

To identify the failed part, you can replace the cartridge with the optional gold hard stop tool (Figure 3-27) and rerun the calibration.



NOTE DO NOT use the red hard stop tool for the calibration. That part is used only for protection during shipping (Figure 3-28).

If you receive a low voltage error and the calibration routine passes with the gold hard stop tool, the cartridge is probably closing too soon. If the calibration routine fails, there is likely a problem with the valve.

If you receive a high voltage error, and the calibration routine passes with the gold hard stop tool, the cartridge is probably causing the error. If the calibration procedure fails, the valve may have experienced a significant amount of wear.



Figure 3-27 Gold Hard Stop Tool

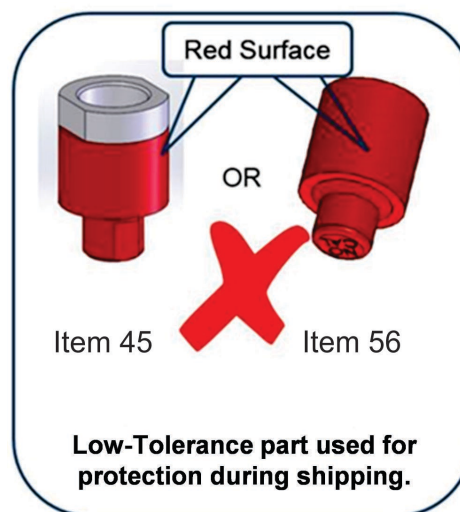


Figure 3-28 Red Hard Stop Tool

3.10 IntelliJet Mini Burn Routine

The IntelliJet mini burn routine allows a brief cycling of the IntelliJet in the event of a calibration failure. Cycling the IntelliJet momentarily can reset the IntelliJet mechanics, which may allow the valve to pass calibration.

3.10.1 Fluidmove Software

To run the IntelliJet mini burn routine (Figure 3-29):

1. Select **Tools** from the Fluidmove Main window.
2. Select **Diagnostics** from the Tools window.
 - > The Fluidmove Diagnostics window opens.
3. Select **IJ Mini Burn Routine** from the Fluidmove Diagnostics window.
4. Perform an IntelliJet calibration procedure, see [3.8.1 Fluidmove Software](#).

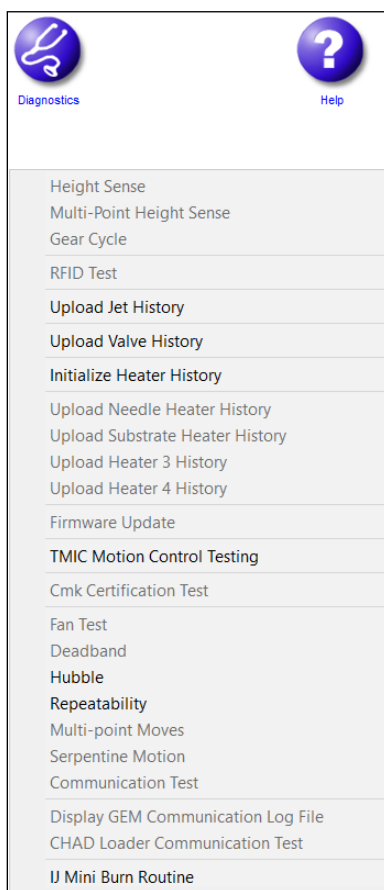


Figure 3-29 IntelliJet Mini Burn Routine

3.10.2 Canvas Software

If there are two applicators, this procedure can be used for Applicator 1 and Applicator 2.

 **NOTE** To run the IntelliJet mini burn correctly in Canvas, the recipe must be open and in wet mode.

To run the IntelliJet mini burn routine (Figure 3-30):

1. Select **Maintenance** from the Canvas Main screen.
2. Select **Applicators** from the Maintenance screen.
3. Select **IJ Mini Burn Applicator 1**.
4. Select **Run**.
5. Perform an IntelliJet calibration procedure, see [3.8.2 Canvas Software](#).

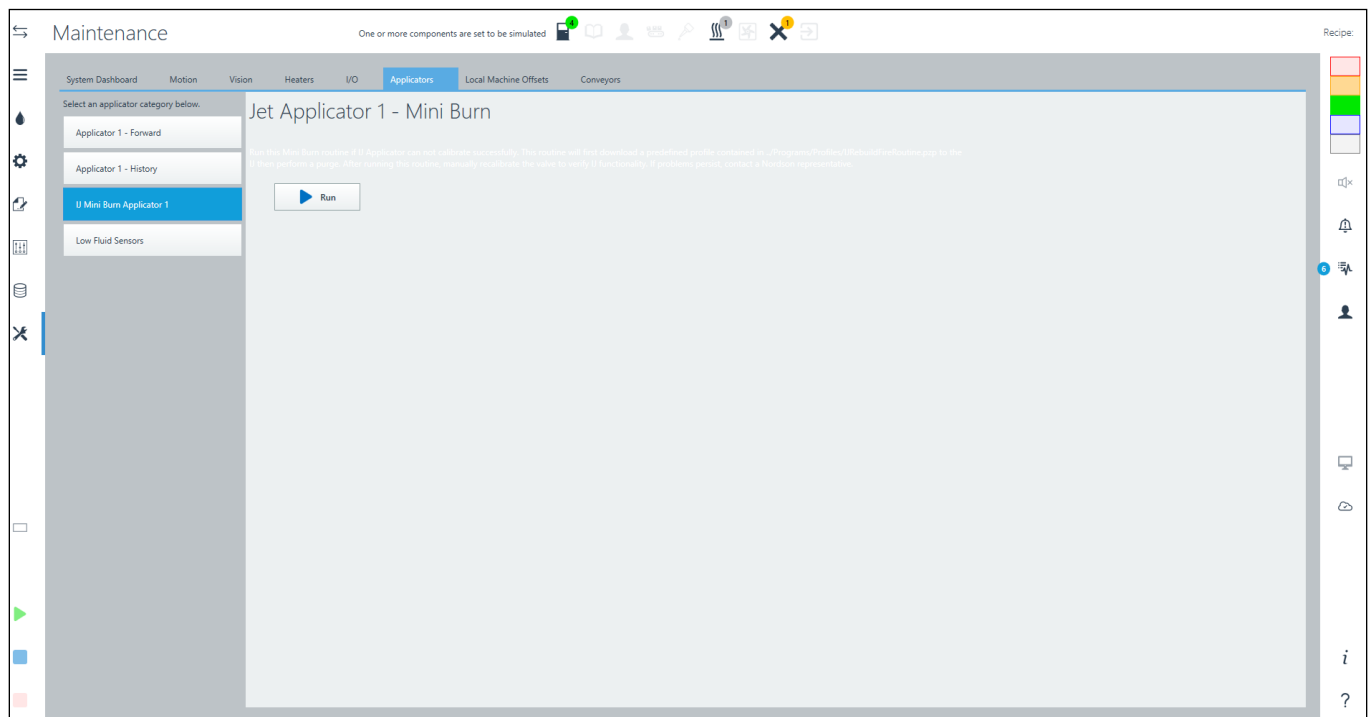


Figure 3-30 IntelliJet Mini Burn Routine

3.11 Sample Application Settings

See Table 3-6 for a list of settings that affect IntelliJet performance. Values are application dependent. Refer to the applicable software user guide or Online Help for detailed software instructions. A column is provided for you to record your current settings.

Table 3-6 Software Settings

Category	Parameter	Units	Current Settings
Fluid Pressure		KPa (psi)	
Valve Pressure		KPa (psi)	
Valve Settings/Parameters	Frequency	Hz	
	Valve On Time	ms	
	Valve Stroke		
	Opening Rate		
	Closing Rate		
	Pre-purge Spacing	(0.1 mil)	
	Pre-purge Delay	ms	
Purge Parameters	Vacuum Shutoff Delay Vacuum Pre-Shutoff Delay		
Calibrated Process Jetting			
Pot Life /Low Fluid Check			
Machine Offset Parameters	Setup Files		
Setup Heater	Set Point, Other Settings	°C	
Dot Parameters	Settling Time Down Speed, Accel Gap, # Shots, MS Delta Dwell, Retract Dist Retract Speed, Accel Post Dwell Time		
Line Parameters	Down Speed, Accel Gap, Speed, Wt-Ctrl Speed Accel Dist, Decel Dist Retract Dist Retract Speed, Accel Control Mode Shot Time Interval		

4 Operation

4.1 Overview

This section provides IntelliJet operating procedures. For complete system operating procedures, refer to the applicable dispensing system Installation, Operations, and Maintenance manual. This section contains the following topics:

- [Theory of Operation](#)
- [Basic Features](#)
- [Adjustable Features](#)
- [Running Production](#)

4.2 Safety First

Operation of the IntelliJet involves air pressure, electrical power, mechanical devices, heat, and the use of hazardous materials. It is essential that every person servicing or operating the IntelliJet fully understands all hazards, risks, and safety precautions. See [Section 2 - Safety](#) for additional information.



CAUTION!

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

4.3 Theory of Operation

The IntelliJet is a normally open valve that uses piezo motion to control the closing profile. The valve opens when the piezo relaxes and springs push open. Voltage to the piezo pushes a pin closed. The pin pushes a poppet to eject a dot. The IntelliJet design optimizes pin firing speed (capability) and minimizes stress on components.

Multiple droplets, fired in succession, can be used to form larger dispense volumes and lines, when combined with the motion of the dispensing system robot. In addition, the IntelliJet is equipped with a heater assembly that assures a constant fluid temperature.

The IntelliJet works in conjunction with the Fluidmove and Canvas dispensing software. Fluid pressure is only applied to the syringe if a successfully calibrated cartridge is installed, see [3.8 IntelliJet Calibration Procedure](#).

4.4 Basic Features

Basic features of the IntelliJet are shown in Figure 4-1.

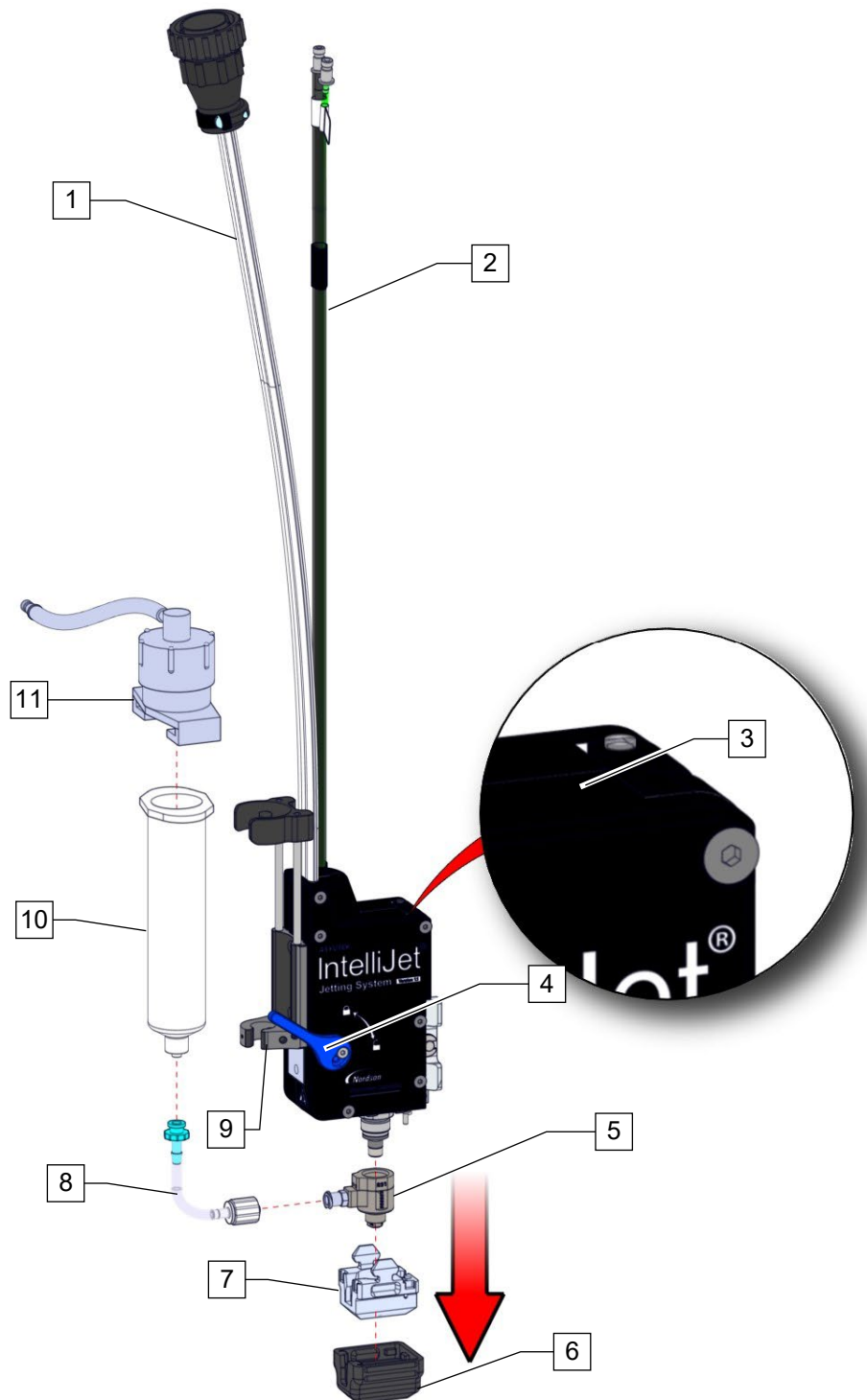


Figure 4-1 Basic Features

Table 4-1 IntelliJet Features

Item	Name	Description
1	Power Cable	The power/communications cable connects to the dispensing system bulkhead (Figure 3-4).
2	Pneumatic Tubes	The black pneumatic hose connects to the Valve Off connection and the green pneumatic hose connects to Cool 1 connection on the dispensing system bulkhead. The pneumatic hoses supply air to keep the fluid and valve components at the desired temperature (Figure 3-4).
3	Status LED	The Status LED displays the valve status. • GREEN (flashing at 0.5 hz) - No errors; software is running. • AMBER (flashing at 0.5 hz) - No data from PDHC. • RED (flashing at 0.5 hz) - Non-volatile memory failed. • RED (flashing at 5 hz) - Temperature too high or RTD failed.
4	Release Lever	Opening the Release Lever lets you remove the heater/jet cartridge assembly. The Release Lever can be mounted on either side of the valve, see 5.15 Removing and Reinstalling the Valve Lever .
5	ReadiSet Jet Cartridge	The ReadiSet Jet Cartridge is a removable module that contains the fluid path, seat, nozzle, and poppet. It is available in different sizes depending on application requirements, see <i>ReadiSet Jet Cartridge Addendum</i> .
6	Heater Boot	The Heater Boot allows the heater to be held while hot and protects the user from burns.
7	Heater Assembly	The Heater Assembly heats the fluid in the cartridge to the desired temperature for the specific application. The temperature is set in the applicable software. Refer to the applicable dispensing software manual for detailed information.
8	Feed Tube Assembly	The Feed Tube Assembly connects the jet cartridge to the fluid syringe.
9	Syringe Holder	The Syringe Holder is standard and is available in the following sizes: 5 cc, 10 cc, 30 cc, 3 oz, and 6 oz.
10	Fluid Syringe	The Fluid Syringe (reservoir) contains the fluid to be dispensed. The IntelliJet supports 3, 5, 10, 30, or 55 cc size syringes.
11	Receiver Head	The Receiver Head mounts on the syringe and connects to the fluid air connection on the dispensing system bulkhead (Figure 3-4).

4.5 Adjustable Features

The following features affect performance of the IntelliJet and are typically adjusted to fit your application. Contact Technical Support for additional information.

4.5.1 Readiset Jet Cartridge Size

Jet cartridge geometries are typically the main factors controlling jetted volume. The jet cartridge size is determined based on the application and fluid properties. The remaining parameters are adjusted in accordance with the jet cartridge choice. Jet cartridge sizes are listed in *Readiset Jet Cartridge Addendum*.

4.5.2 Fluid Pressure

Fluid pressure should be set so that fluid fills the seat but should not be influential in pushing the fluid through the seat and nozzle. In general, higher fluid pressure results in a larger volume of material jetted.

4.5.3 Valve Opening Rate

The valve opening rate controls how quickly the valve opens. It is set to a default maximum value. If air is ingested during the jetting process when dispensing a low viscosity fluid, the valve opening rate can be reduced.

4.5.4 Valve Stroke

Valve stroke defines how much the valve opens between each dispense.

4.5.5 Valve Closing Rate

The valve closing rate helps control dot break off. If the dots are accumulating, increase the closing rate. If satellites are forming, decrease the closing rate.

4.5.6 Valve On Time

The time that fluid flows through the jet cartridge. In general, longer valve on time produces a larger dot and shorter valve on time produces a smaller dot. The minimum recommended valve on time is 0.6 msec. Shorter on times may be used with low viscosity fluids but may result in unstable performance.

4.5.7 Cycle Frequency

Cycle frequency is the number of times the piezo is energized per second. The maximum cycle frequency is 1000 Hz (50% duty cycle or 5000 shots in 10 seconds). The setting can be adjusted for applications that require a lower cycle frequency.

4.5.8 Fluid Temperature

Fluid temperature often influences fluid viscosity and flow characteristics. In general, higher fluid temperature results in a larger volume of material jetted.



NOTE If the heater assembly is not properly installed and the electrical connections are not made, the IntelliJet will not operate.

4.5.9 Dot and Line Parameters

In addition to the IntelliJet hardware configuration and settings, dot and line parameters are set in the applicable software program to control the size and quality of dots and lines dispensed. For information on dispense parameters, refer to the applicable software user guide or Online Help.

4.6 Running Production

1. Install the fluid syringe, see [3.6 Installing the Fluid Syringe](#).
2. Verify that the valve pressure is set to 138 kPa (20 psi).
 - > Valve air pressure is used to cool the valve.
3. Adjust the fluid pressure to 30 to 400 kPa (5 to 60 psi), depending on the fluid viscosity.
4. Verify the appropriate temperature control settings. Refer to the applicable software user guide or Online Help for instructions.
 - > Allow time for the temperature to reach its set point.
5. Perform a setup routine. Refer to the applicable software user guide or Online Help for instructions.
 - > The setup routine primes the jet cartridge, calibrates the nozzle to camera offset, verifies fluid operation, and runs the auto valve calibration.
 - > The setup routine should be performed after a valve change, hardware change, or location adjustment.

5 Maintenance and Service

5.1 Overview

Performing the recommended maintenance and service procedures increases the life of your IntelliJet and ensures high quality dispensing performance for every production run. Some service procedures require special tools. These tools may be ordered through Technical Support.

This section contains the following topics:

- [Routine Maintenance Procedures](#)
- [Inspecting the IntelliJet](#)
- [Recommended Facility Items](#)
- [Replacing the Drive Pin Seal](#)
- [Removing the Jet Cartridge](#)
- [Replacing the Syringe Holder](#)
- [Cleaning the Jet Cartridge](#)
- [Replacing the Heater Interface Board](#)
- [Installing the Jet Cartridge](#)
- [Replacing the Heater Circuit Board](#)
- [Replacing Jet Cartridge Parts](#)
- [Removing and Reinstalling the Valve Lever](#)
- [Replacing Stinger Nozzle](#)

5.2 Safety First

Operation of the IntelliJet involves air pressure, electrical power, mechanical devices, heat, and the use of hazardous materials. It is essential that every person servicing or operating the IntelliJet fully understands all hazards, risks, and safety precautions. See [Section 2 - Safety](#) for additional information.



WARNING!

Allow only qualified personnel to perform the following tasks. Follow the safety instructions in this document and all other related documentation. Obtain and read Safety Data Sheets (SDS) for all materials used.

5.3 Routine Maintenance Procedures

Routine maintenance procedures and required intervals are listed in Table 5-1.

Table 5-1 Routine Maintenance Procedures

Task	Frequency	Instructions
Clean the Jet Cartridge	Every Shift	See 5.6 Cleaning the Jet Cartridge .
Replace the Poppet Seal	Every Shift (8-12 hours)	See 5.6 Cleaning the Jet Cartridge .
Replace Drive Pin Seal on IntelliJet 1.1	7 days	See 5.11 Replacing the Drive Pin Seal .
Replace Drive Pin Seal Retainer	Monthly	See 5.11 Replacing the Drive Pin Seal .

5.4 Recommended Facility Items

In addition to the supplied accessories and tools, it is recommended that the following items are available at your facility.

- Personal Protective Equipment recommended in applicable SDS
- Bench lamp and Magnifier set
- Ultrasonic Cleaning System
- Air-gun and compressed, dry air
- Appropriate fluid collection and disposal container
- Solvent appropriate for the fluid used (See manufacturer's recommendations)
- Disposable towels, cleaning swabs, and brushes

5.5 Removing the Jet Cartridge

To remove the jet cartridge:

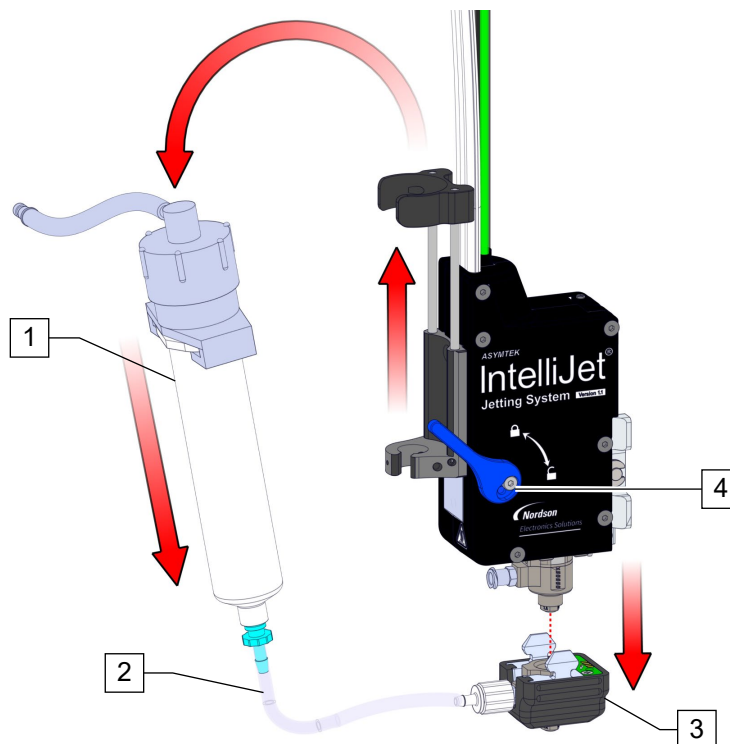
1. Position the IntelliJet at the front of the dispensing area.
2. Turn the heater assembly off and allow it to cool.



WARNING!

Do not remove the black protective boot from the heater assembly. Do not operate if the black boot is not attached. It protects the user from hot parts and improves performance.

3. If the release lever is mounted on the right side, disengage the heater/jet cartridge assembly by rotating the release lever 90° clockwise.
4. Pull down on the heater/jet cartridge assembly until it unsnaps from the lever mechanism.
 - > Remove the jet cartridge, feed tube, and fluid syringe together (Figure 5-1).
 - > Do not separate the jet cartridge and fluid syringe prior to removal from the IntelliJet.
5. Remove the jet cartridge from the heater assembly by sliding it out.
6. Remove the feed tube assembly and fluid syringe from the jet cartridge and discard them into an approved receptacle.
7. Inspect the IntelliJet body and heater assembly for the presence of fluid.



Item	Description	Item	Description
1	Fluid Syringe	3	Heater/Jet Cartridge Assembly
2	Feed Tube	4	Release Lever

Figure 5-1 Removing the Jet Cartridge from the IntelliJet

5.6 Cleaning the Jet Cartridge

5.6.1 Tested Cleaning Solvents

- Acetone
- Methyl Ethyl Ketone (MEK)
- Isopropyl Alcohol (IPA)
- Water



NOTE The cartridge should be cleaned daily or after each production run as necessary.



WARNING!

The solvents listed above, at ambient room temperature (22 °C), are known to be compatible with the Readiset Jet Cartridge. Additional solvents may be used but should be checked for performance with cartridge seals. Cleaning solvents may be flammable. Set up away from heat and/or flammable sources that may cause fire (i.e. no smoking, no sparks, etc.). Use in a well-ventilated area. DO NOT inhale fumes. Wear appropriate safety gloves and safety glasses. Refer to the cleaning solvents SDS.

5.6.2 Ultrasonic Bath

To clean the jet cartridge in an ultrasonic bath:

1. Remove the jet cartridge from the heater assembly (Figure 5-2).



WARNING!

The cartridge may be hot. Wear safety gloves to prevent burns.

2. Separate the jet cartridge upper and lower assemblies (Figure 5-3).



Figure 5-2 Remove Cartridge from Heater Assembly

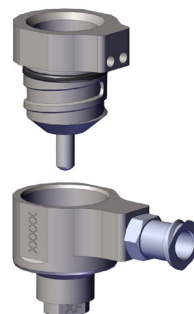


Figure 5-3 Separate Upper and Lower Assemblies

3. Wipe the fluid off each half.
4. Use a cotton swab to clean the fluid passage.
5. Place the cartridge parts in an ultrasound friendly container (i.e. glass or metal beaker) with new cleaning solvent and immerse the container in an ultrasound bath for 5 minutes.
6. Remove the cartridge from the ultrasonic cleaning container and discard the cleaning fluid.
7. Repeat Step 5 and Step 6 with new cleaning solvent.
8. Inspect the parts for cleanliness.
9. Inspect the O-rings and seals for wear.
10. Dry the parts and blow air through the nozzle with an air gun.
11. Reassemble the cartridge.

5.7 Installing the Jet Cartridge

To install the jet cartridge:

1. Insert the cartridge into the heater and snap the heater into the heater clamps.
2. If the lever is mounted on the right side (standard), rotate the lever 90° counterclockwise until it is pointing straight up. The operator will feel the lever lock into place.

5.8 Replacing Jet Cartridge Parts

The Readiset Jet Cartridge features the following replaceable and/or interchangeable parts. See [Section 7 - Parts Replacement](#) for ordering instructions and *Readiset Jet Cartridge Addendum* for part numbers.

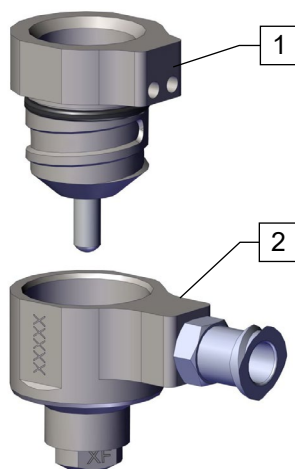
The following procedure applies to both style cartridges.

Tools and Materials Needed:

- Isopropyl Alcohol (IPA)
- Poppet Insertion Tool Assy (Item 16)
- Poppet Seal Insertion Tool
- Seal Removal Tool (Item 14)
- 1/4 inch Wrench (customer supplied)

To remove the poppet seal:

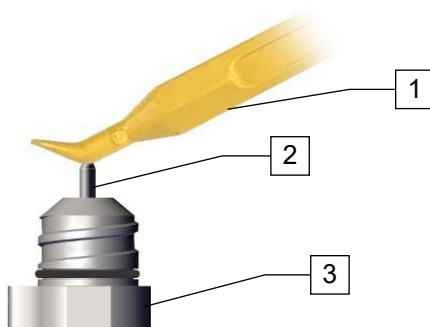
1. Remove the jet cartridge from the IntelliJet, see [5.5 Removing the Jet Cartridge](#).
2. Separate the jet cartridge upper assembly from the lower assembly by rotating the upper assembly counterclockwise (Figure 5-4).



Item	Description
1	Upper Assembly
2	Lower Assembly

*Figure 5-4 Jet Cartridge Assemblies
(Non-Stinger Nozzle Shown)*

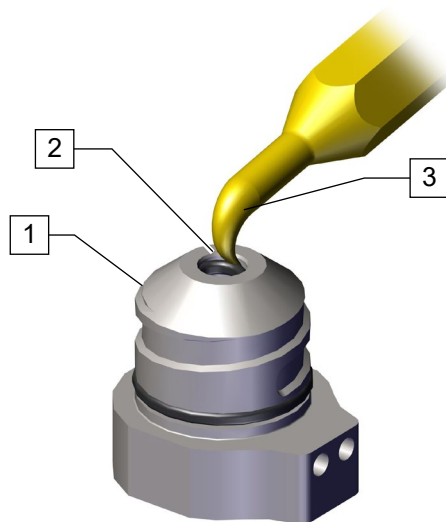
3. Use the seal removal tool and press the poppet down through the flow insert to remove the poppet and poppet springs (Figure 5-5).



Item	Description
1	Seal Removal Tool
2	Poppet
3	Flow Insert

Figure 5-5 Poppet Removal

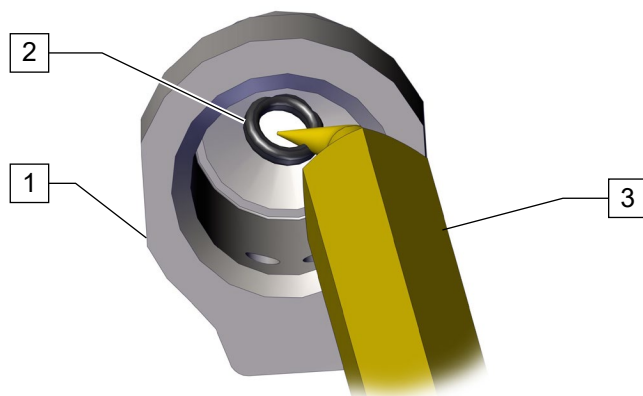
4. Utilize the “hook end” of the seal removal tool and position the seal removal tool between the top of the poppet seal and the poppet seal groove (Figure 5-6).
5. Push the back end of the seal removal tool down while prying the poppet seal out of the poppet seal groove.



Item	Description
1	Flow Insert
2	Poppet Seal
3	Seal Removal Tool

Figure 5-6 Poppet Seal Removal (1)

6. Rotate the flow insert and utilize the opposite end of the seal removal tool to remove the poppet seal and discard poppet seal (Figure 5-7).



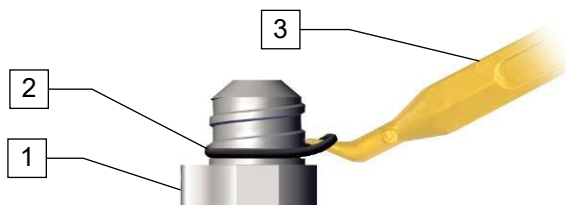
Item	Description
1	Flow Insert
2	Poppet Seal
3	Seal Removal Tool

Figure 5-7 Poppet Seal Removal (2)

7. Clean any residual fluid.

To remove the chamber seal:

1. Remove the jet cartridge from the IntelliJet, see [5.5 Removing the Jet Cartridge](#).
2. Separate the jet cartridge upper assembly from the lower assembly by rotating the upper assembly counterclockwise (Figure 5-4).
3. Use the seal removal tool to remove the chamber seal by maneuvering the seal removal tool under the chamber seal and pull up to remove (Figure 5-8).



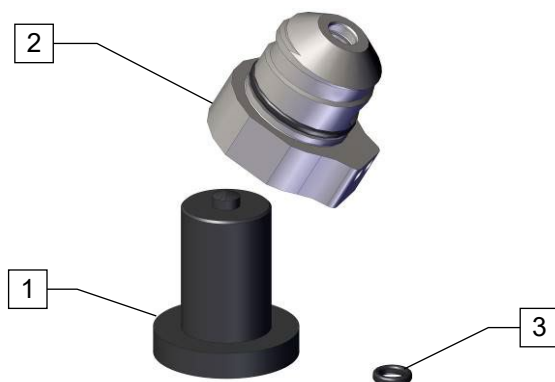
Item	Description
1	Flow Insert
2	Chamber Seal
3	Seal Removal Tool

Figure 5-8 Chamber Seal Removal

4. Clean any residual fluid.

To replace the poppet seal:

1. For RS cartridges, place the poppet seal insertion tool on a flat surface (Figure 5-9).
2. For RS cartridges, set the flow insert onto the poppet seal insertion tool.



Item	Description
1	Poppet Seal Insertion Tool
2	Flow Insert
3	Poppet Seal

Figure 5-9 Seal Insertion Tool Setup

3. For RS and RT cartridges, apply several drops of isopropyl alcohol on a new poppet seal (Figure 5-10).

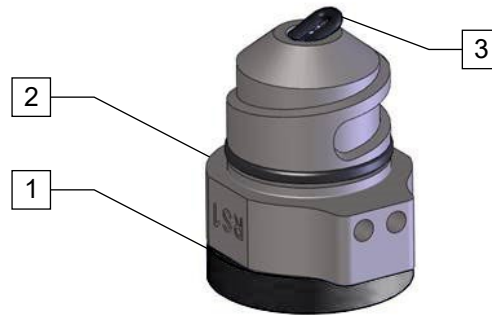
**WARNING!**

Follow the Safety Data Sheet (SDS) recommendations for all fluids used with the dispensing system. The SDS provides material usage instructions, disposal instructions, and safety precautions.

Special care should be taken when handling seals. If seals are damaged, the dispensing valve may leak or fail prematurely.

Do not use lubricants on the seals.

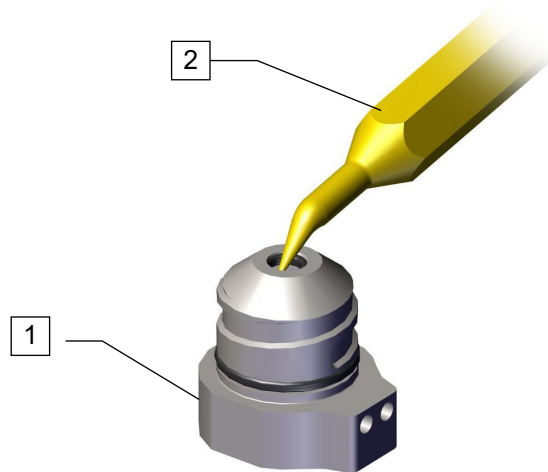
4. For RS and RT cartridges, squeeze the poppet seal with your fingers and place the poppet seal on the end of the flow insert (Figure 5-10).



Item	Description
1	Poppet Seal Insertion Tool
2	Flow Insert
3	Poppet Seal

Figure 5-10 Installing Poppet Seal

5. Use the seal removal tool to fully seat and center the poppet seal (Figure 5-11).



Item	Description
1	Flow Insert
2	Seal Removal Tool

Figure 5-11 Poppet Seal Replacement

6. Remove the seal insertion tool from the flow insert.

To replace the chamber seal:

1. Apply several drops of isopropyl alcohol on the chamber seal (Figure 5-12).



WARNING! Follow the Safety Data Sheet (SDS) recommendations for all fluids used with the dispensing system. The SDS provides material usage instructions, disposal instructions, and safety precautions.

Special care should be taken when handling seals. If seals are damaged, the dispensing valve may leak or fail prematurely.

Do not use lubricants on the seals.

2. Slide the chamber seal over the bottom of the flow insert to the base (Figure 5-12).

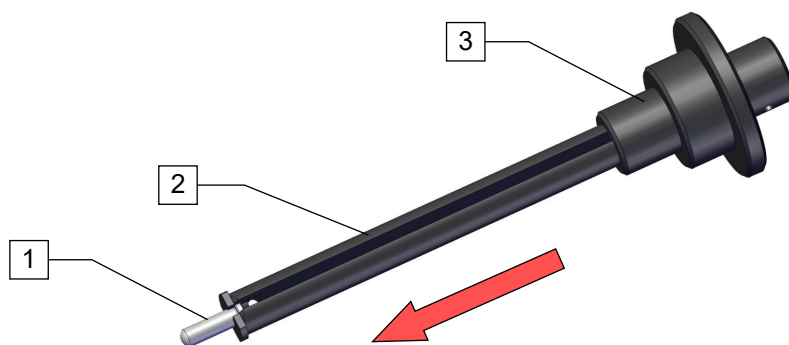


Item	Description
1	Flow Insert
2	Chamber Seal
3	Base

Figure 5-12 Installing the Chamber Seal

To install the poppet:

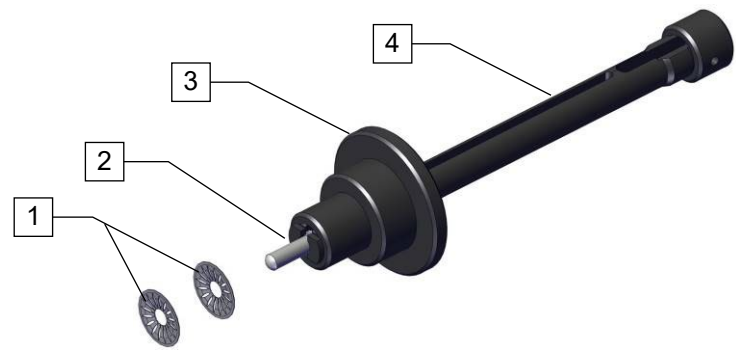
1. Insert poppet at tip of poppet insertion tool assembly (Figure 5-13).
2. Slide the insertion guide to end of poppet insertion tool assembly (Figure 5-13).



Item	Description
1	Poppet
2	Poppet Insertion Tool Assembly
3	Insertion Guide

Figure 5-13 Insert Poppet

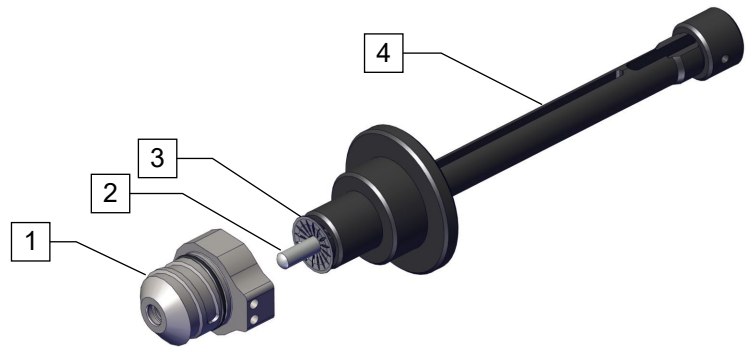
3. Place two (2) poppet springs onto the exposed end of the poppet (Figure 5-14).



Item	Description	Item	Description
1	Poppet Springs (2)	3	Insertion Guide
2	Poppet	4	Poppet Insertion Tool Assembly

Figure 5-14 Insert Poppet Springs

4. Insert the poppet insertion tool assembly with poppet and poppet springs into the flow insert (Figure 5-15).



Item	Description	Item	Description
1	Flow Insert	3	Poppet Springs (2)
2	Poppet	4	Poppet Insertion Tool Assembly

Figure 5-15 Insert Poppet Insertion Tool into Flow Insert

5. Push poppet partially through the flow insert (Figure 5-16).

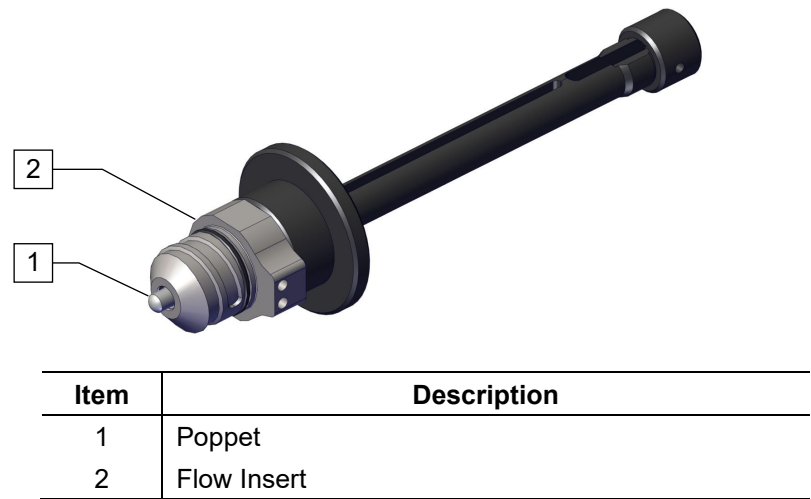
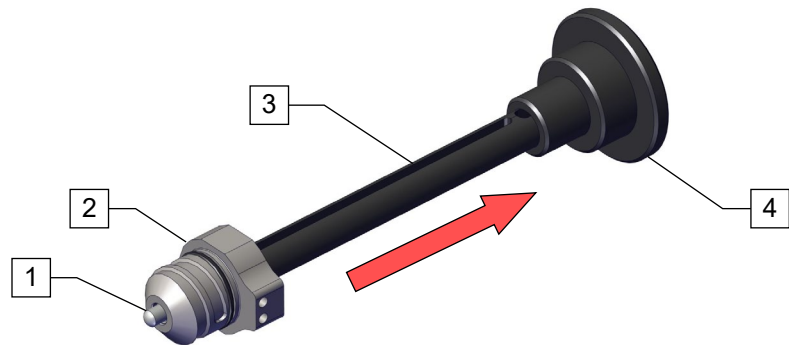


Figure 5-16 Poppet Insertion

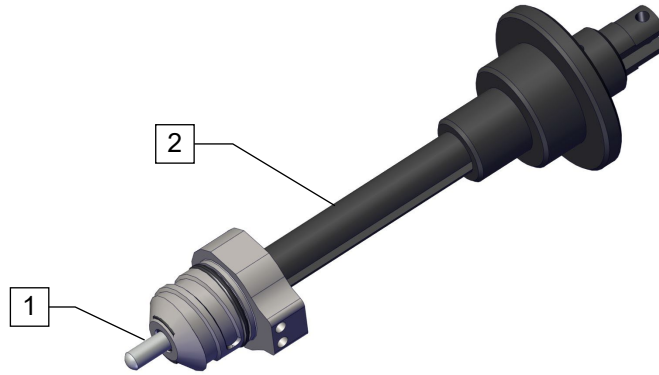
6. While maintaining light pressure with your thumb on the back of the poppet insertion tool assembly; slide insertion guide back until you hear a click (Figure 5-17).
- > The poppet insertion tool will open and release the poppet insertion tool assembly from the poppet.



Item	Description	Item	Description
1	Poppet	3	Poppet Insertion Tool Assembly
2	Flow Insert	4	Insertion Guide

Figure 5-17 Setting the Poppet

7. Rotate the poppet insertion tool assembly 180° and use the back end of the poppet insertion tool assembly to push the poppet into place (Figure 5-18).



Item	Description
1	Poppet
2	Poppet Insertion Tool Assembly

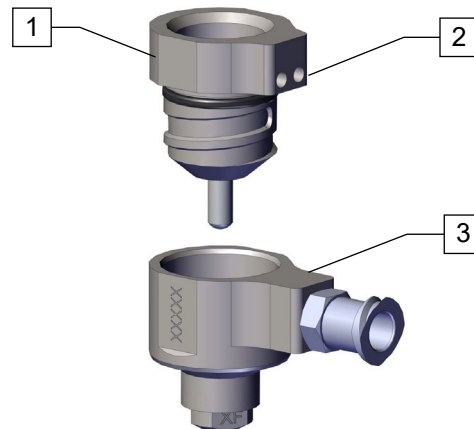
Figure 5-18 Poppet Installed

8. Insert the upper assembly into the lower assembly with the air ports rotated offset to 90° (Figure 5-19).
9. Rotate the upper assembly clockwise to seat the upper assembly onto the lower assembly.



WARNING!

Make sure that the cartridge size and poppet size are compatible. Using incompatible parts may cause damage to the IntelliJet or workpieces. See *ReadiSet Jet Cartridge Addendum*.



Item	Description
1	Upper Assembly
2	Air Ports
3	Lower Assembly

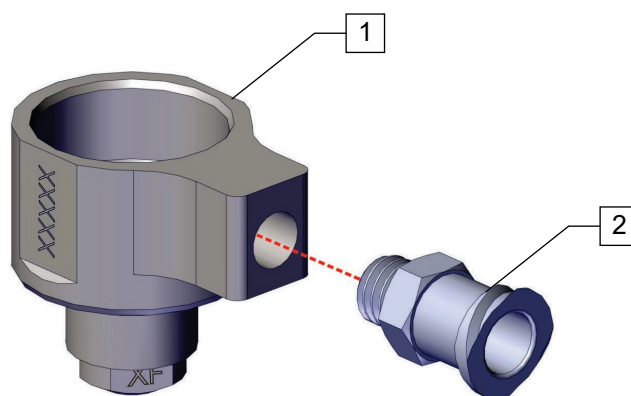
Figure 5-19 Installing Upper Assembly to Lower Assembly
(Non-Stinger Nozzle Shown)

To replace the inlet luer fitting:



NOTE This procedure is for RS cartridge only, RT lures are permanently bonded.

1. Remove the jet cartridge from the IntelliJet, see [5.5 Removing the Jet Cartridge](#).
2. Separate the jet cartridge upper assembly from the lower assembly by rotating the upper assembly counterclockwise (Figure 5-4).
3. Use a 1/4 inch wrench to remove the old fitting from the lower assembly (Figure 5-20).
4. Install a new fitting.
 - > Use thread locker on the threads.
5. Tighten until the fitting bottoms out.



Item	Description
1	Lower Assembly
2	Luer Fitting

Figure 5-20 Replacing the Luer Fitting

5.9 Replacing Stinger Nozzle

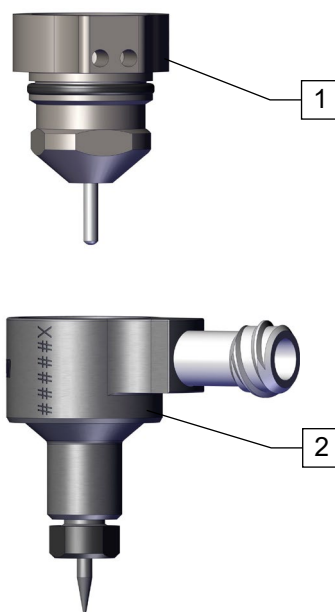
The RediSet Stinger Cartridge features the following replaceable and/or interchangeable parts. See [Section 7 - Parts Replacement](#) for ordering instructions and *RediSet Jet Cartridge Addendum* for part numbers.

Tools and Materials Needed:

- RS Stinger Torque Wrench
- Tube

To remove the stinger nozzle:

1. Remove the stinger cartridge from the IntelliJet, see [5.5 Removing the Jet Cartridge](#).
2. Separate the stinger cartridge upper assembly from the lower assembly by rotating the upper assembly counterclockwise (Figure 5-21).



Item	Description
1	Upper Assembly
2	Lower Assembly

Figure 5-21 Separate the Assemblies

3. Loosen the collar from the lower assembly with the torque wrench.
4. Carefully remove the collar from the lower assembly and over the stinger nozzle (Figure 5-22).

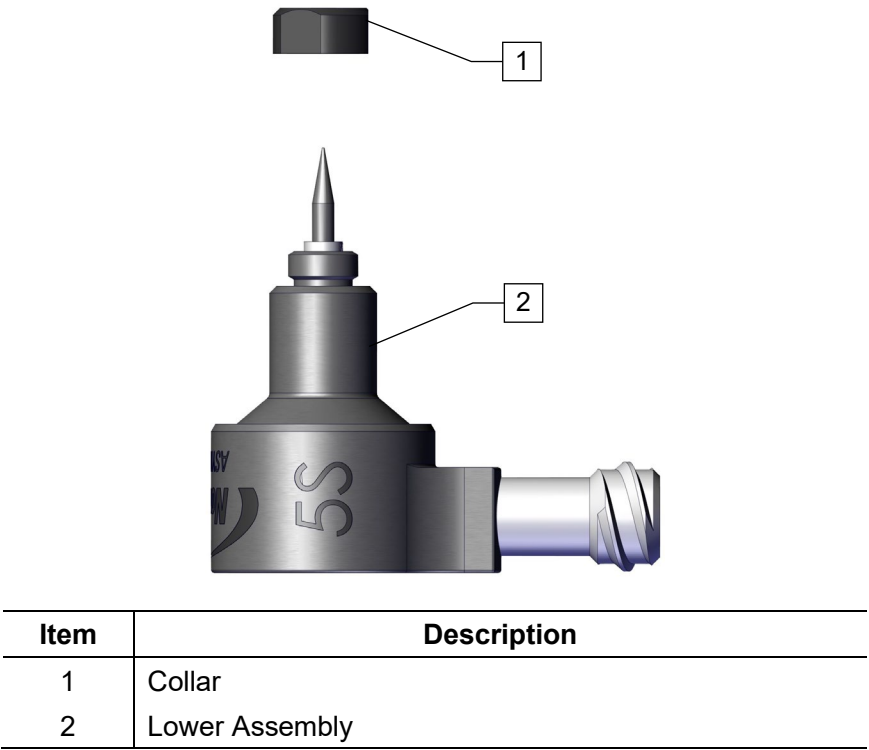


Figure 5-22 Removing the Collar

5. Carefully remove the stinger nozzle from the lower assembly (Figure 5-23).

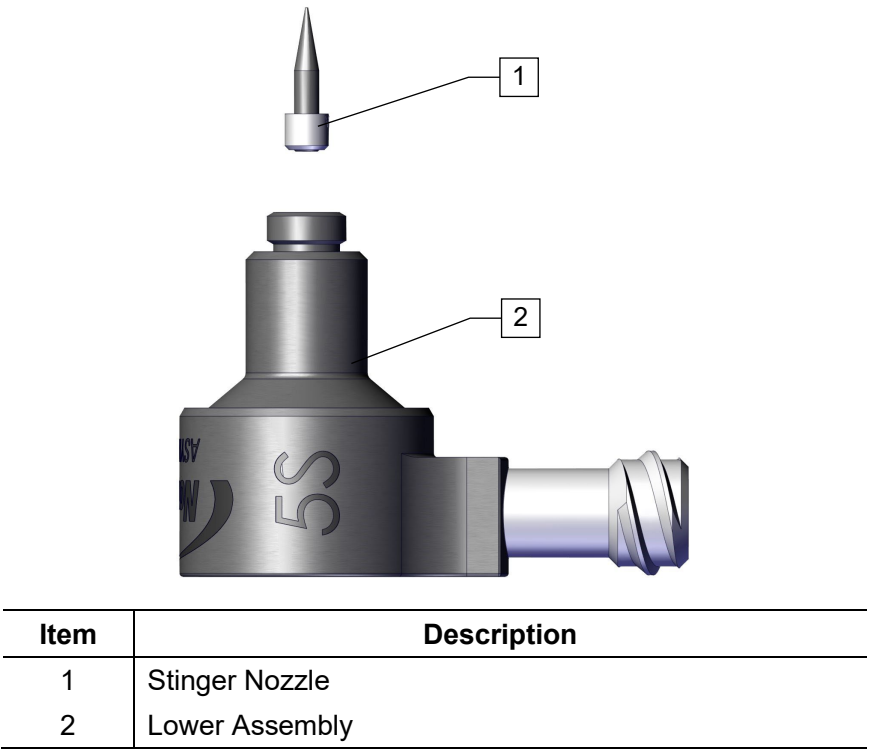
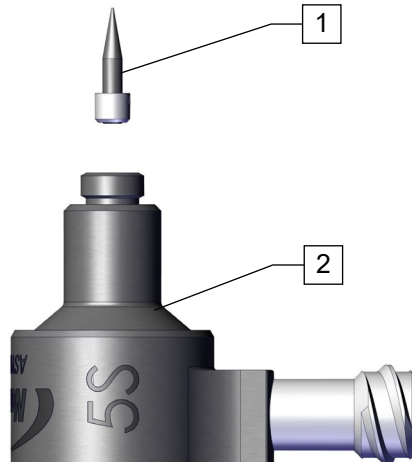


Figure 5-23 Removing the Stinger Nozzle

To install the stinger nozzle:

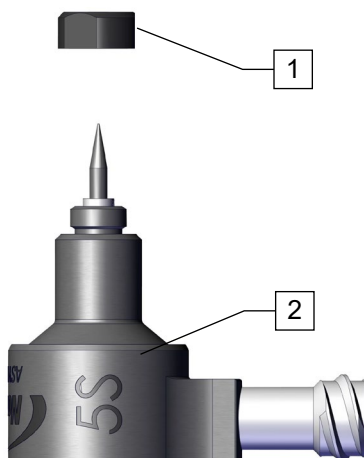
1. Carefully insert the stinger nozzle into the lower assembly (Figure 5-24).



Item	Description
1	Stinger Nozzle
2	Lower Assembly

Figure 5-24 Installing the Stinger Nozzle

2. Carefully install the collar over the stinger nozzle onto the lower assembly (Figure 5-25).



Item	Description
1	Collar
2	Lower Assembly

Figure 5-25 Installing the Collar

3. Finger tighten the collar until the stinger nozzle is fully seated.
4. Place the tube over the stinger nozzle.
5. Carefully place the torque wrench onto the collar.
6. Rotate the handle of the torque wrench clockwise until the rotary clutch mechanism slips free. The torque wrench is preset to 10.0 N-cm (0.885 in-lbs).

5.10 Inspecting the IntelliJet

To inspect the IntelliJet:

1. Inspect the heater assembly for the presence of fluid.
2. Wipe clear any fluid deposited in the heater assembly and flush with 150 kPa (22 psi) of pressurized air as needed.
3. Ensure that the jet cartridge is clean and in good working order.
 - > If not, repair or replace it with a new jet cartridge.
 - > If fluid is present on the jet cartridge weep holes and/or on the drive pin, replace with a new jet cartridge and clean the IntelliJet components as necessary.
 - > For IntelliJet model 1.1, if fluid is present on the jet cartridge weep holes and/or on the drive pin, clean the IntelliJet components as necessary and replace the drive pin seal, see [5.11 Replacing the Drive Pin Seal](#).



NOTE The mating faces of the jet cartridge and valve must be free of fluid for the jet cartridge to work properly.



CAUTION!

Fluid detected in the IntelliJet body or heater assembly (cooling path) must be cleared immediately or damage may result. The damage may include permanent blockage of the cooling path and/or poor dispense quality.

DO NOT place the IntelliJet on its side if fluid is suspected inside the cartridge body. This may cause fluid to run into undesirable locations inside the valve.

DO NOT immerse or expose the internal components of the valve to cleaning solvents.



NOTE If fluid is detected in the IntelliJet body, a leak has occurred, see [Section 6 - Troubleshooting](#).

5.11 Replacing the Drive Pin Seal



NOTE The drive pin seal on the IntelliJet 1.1 requires replacement every 7 days.

Tools and Materials Needed:

- Fine Point Stainless Steel Pick (Item 2)
- Drive Pin Seal Retainer (Item 2)
- Drive Pin Seal (Item 2)



WARNING!

DO NOT remove or disassemble the drive pin assembly as the warranty will be voided.



CAUTION!

DO NOT connect or disconnect the IntelliJet electrical cable while the software is running. Connecting or disconnecting the IntelliJet cable while the software is running may damage the platform electronics.

1. Remove the jet cartridge, see [5.5 Removing the Jet Cartridge](#).
2. Rotate the IntelliJet upside down.
3. Using thumbnail or similar type prying device, lift the drive pin seal retainer from the drive pin guide (Figure 5-26).



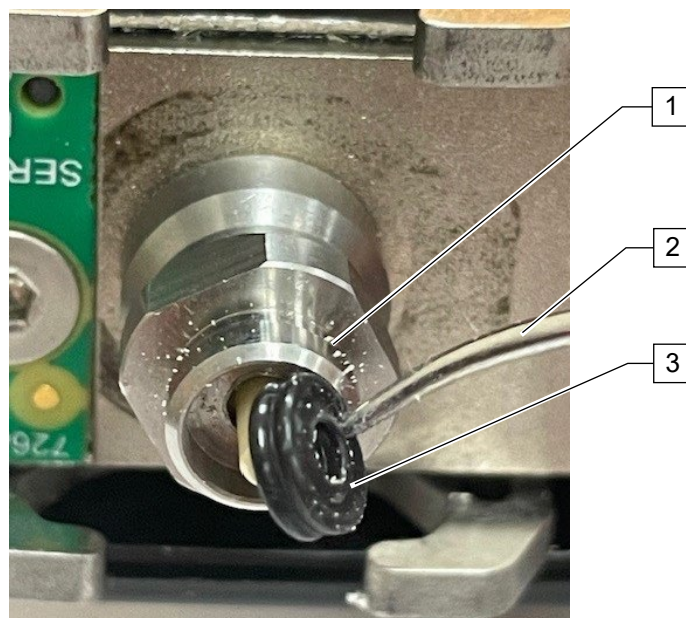
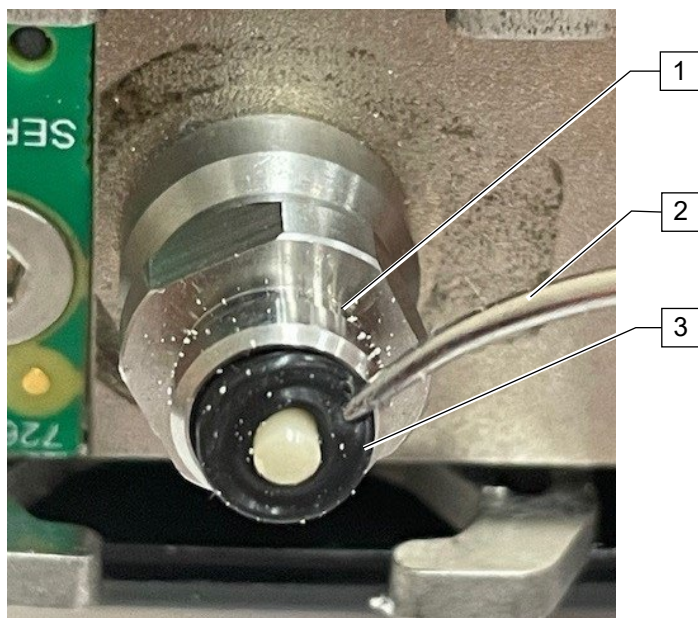
Item	Description
1	IJ 1.1 Drive Pin Seal Retainer (Item 2)
2	Drive Pin Guide

Figure 5-26 Removing the Seal Retainer

4. Utilizing the fine point stainless steel pick, pierce the drive pin seal and remove the drive pin seal from the drive pin guide (Figure 5-27).
5. Discard the drive pin seal.

**WARNING!**

The drive pin seal will become damaged during removal causing fluid to leak from the IntelliJet. Do not re-use the drive pin seal once it has been removed from the IntelliJet.



Item	Description
1	Drive Pin Guide
2	Fine Point Stainless Steel Pick (Item 2)
3	IJ 1.1 Drive Pin Seal (Item 2)

Figure 5-27 Removing the Drive Pin Seal

To install the drive pin seal:

1. Place the drive pin seal over the drive pin guide and press the drive pin seal into the drive pin guide cavity until fully seated (Figure 5-27).

**WARNING!**

Special care should be taken when handling the drive pin seal. If the drive pin seal is contaminated or damaged, the IntelliJet may leak or fail prematurely.

2. Press the drive pin seal retainer over the drive pin onto the drive pin guide (Figure 5-26).
3. If no additional maintenance is required, install the jet cartridge, see [5.7 Installing the Jet Cartridge](#).

5.12 Replacing the Syringe Holder

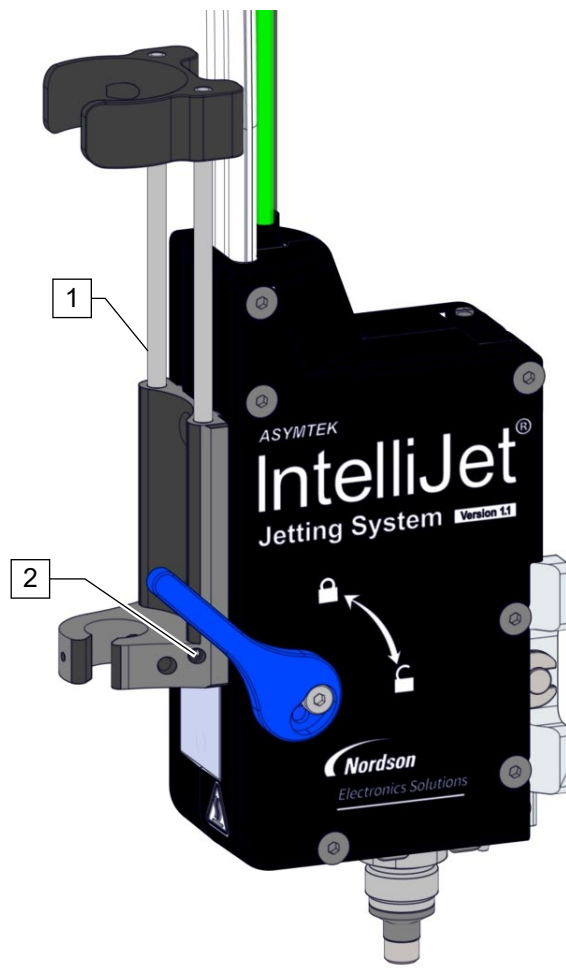
The syringe holder is available in different sizes to accommodate different size fluid syringes.

Tools and Materials Needed:

- 1.3 mm Hex Key

To replace the syringe holder (Figure 5-28):

1. Use a 1.3 mm hex key to remove the two set screws.
 - > There is one set screw on each side.



Item	Description
1	Syringe Holder
2	Set Screws (2)

Figure 5-28 Replacing the Syringe Holder

2. Remove the syringe holder.
3. Install a new syringe holder and reattach the set screws.

5.13 Replacing the Heater Interface Board

Tools and Materials Needed:

- 2 mm Hex Wrench
- Phillips Screwdriver
- Flat Screwdriver
- Loctite 242

To replace the heater interface board (Figure 5-29):

1. If applicable, close the applicable software.



CAUTION!

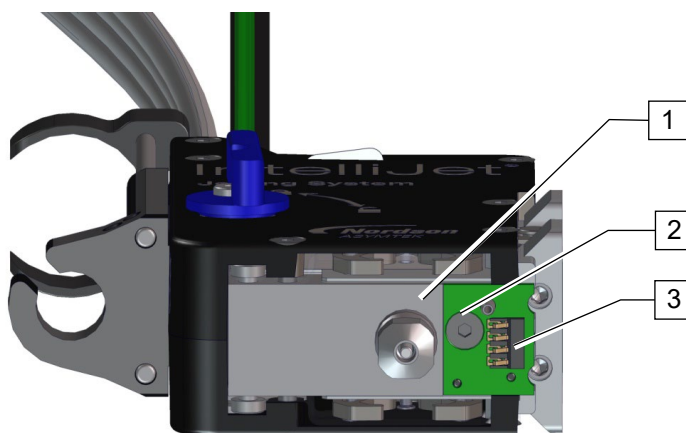
DO NOT connect or disconnect the IntelliJet electrical cable while the software is running. Connecting or disconnecting the IntelliJet cable while the software is running may damage the platform electronics.

2. Shutdown the dispensing system and remove the valve. Refer to the applicable dispensing system Installation, Operations, and Maintenance manual.
3. Remove the heater/jet cartridge assembly, see [5.5 Removing the Jet Cartridge](#).
4. Use the 2 mm hex wrench and remove the screw on the underside of the valve.
5. Place the flat screwdriver underneath the board and gently remove it from the valve.
6. Install a new heater interface board.
7. Clean any material off the screw prior to installation.
8. Apply Loctite 242 to the screw.
9. Install and torque the screw to 0.3 Nm (3 in-lbs) so the screw head is below the datum surface.



NOTE

If the screw is not installed correctly, this could cause the IntelliJet valve to fail calibration.



Item	Description
1	Datum Surface (Gray Shaded Area)
2	Screw
3	Heater Interface Board

Figure 5-29 Replacing the Heater Interconnect Board

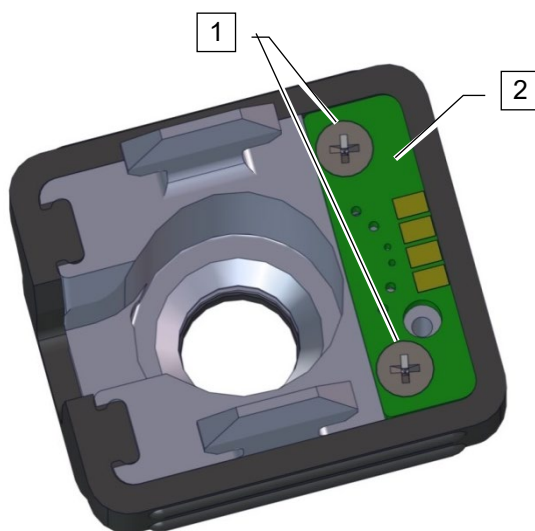
5.14 Replacing the Heater Circuit Board

Tools and Materials Needed:

- 2 mm Hex Wrench
- Phillips Screwdriver

To replace and test the heater board (Figure 5-30):

1. Remove the heater boot.
2. Use the Phillips screwdriver to remove the two (2) screws.
3. Remove the circuit board, heater, and RTD.
 - > If stuck, push the heater out from the far side.
4. Clean any fluid off the heater block.
5. Install a new circuit board.
6. Torque the screws to 0.3 Nm (3 in-lbs).
7. Measure the resistance across the heater and RTD pins.



Item	Description
1	Screws (Item 53)
2	Heater Circuit Board

Figure 5-30 Replacing the Heater Board

5.15 Removing and Reinstalling the Valve Lever

When shipped from the factory, the valve lever is mounted on the right side of the valve (when facing the front of the valve).

The valve lever can be mounted on either side of the valve. Mounting the lever on the left-hand side allows better access if the system is configured with dual valves.

To remove and reinstall the valve lever (Figure 5-31):

1. If applicable, remove the fluid syringe and heater/jet cartridge assembly.
2. Remove the screw mounting the valve lever to the IntelliJet.
3. Place the lever on the other side and tighten the screw.



Figure 5-31 Removing and Replacing the Valve Lever



NOTE The valve lever can be removed completely. You may use a 4 mm hex wrench instead of the valve lever to lock/unlock the heater/jet cartridge assembly.

6 Troubleshooting

6.1 Overview

To quickly identify problems, look for obvious signs such as burnt, missing, damaged, or loose parts, as well as fluid obstructions and leakages. If a problem recurs, there may be other root causes. This section facilitates troubleshooting based on symptom, setup, and component. See [7.9 Spare Parts Kit](#) for part identification.



NOTE Refer to the applicable software user guide for recovery procedures pertaining to Fluidmove or Canvas.

6.2 Safety First

Operation of the Select Coat Applicator involves air pressure, electrical power, mechanical devices, and the use of hazardous materials. It is essential that every person servicing or operating the applicator fully understands all hazards, risks, and safety precautions. See [Section 2 - Safety](#) for additional information.



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



WARNING! DO NOT hot swap connections when working with electrical and pneumatic power supplies. Turn the main circuit breaker off before disconnecting the external power plug from the facility.

6.3 No Fluid Jetted

Symptom	Possible Cause	Recovery
No Fluid Jetted	Heater not Working	- Verify heater is properly attached. If properly attached but does not work, test with another heater if available. - Verify electrical power at the valve connector. - Verify the resistance across the heater pins is $24 \pm 7 \Omega$ (Figure 6-1). - Verify RTD resistance is $108.6 \pm 2 \Omega$ at $22 \pm 5 ^\circ\text{C}$. - See 6.6 Component Based Issues for additional information.
	Valve Fault	Check the Status LED light (Figure 4-1). If not green, verify the Heater/Jet Cartridge Assembly is properly seated to the IntelliJet body. Check the attachments to the bulkhead (valve pressure, fluid pressure, and valve connector) are properly installed.
	Empty or Old (expired) Fluid	Replace fluid.
	Clogged Nozzle	Clean jet cartridge, see 5.6 Cleaning the Jet Cartridge .
	Air in Jet Cartridge	Purge air from fluid path, or perform a Vacuum Assisted Priming Routine (VAPR).
	Fluid Temperature Too Low/Off	Verify the heater is turned on and set to the correct temperature. Verify electrical power at the fluid connector. Verify proper heater element/RTD resistance.
	Fluid Pressure Too Low/Off	Verify the proper air pressure is delivered to the fluid syringe.
	Jet Cartridge not Working	Make sure the jet cartridge is properly attached. The mating faces between the jet cartridge and valve must be clean to maintain proper valve operation, see 5.6 Cleaning the Jet Cartridge .
	Valve Stroke is set too low	The travel or valve parameters are not set correctly.
	Valve is damaged	There are sensors and software protection to prevent the piezo from being damaged. If there is a failure, check the capacitance across the stack. It should be between 13.0 to 17.5 μf (Figure 6-2).

6.4 Poor Quality Jetting

Symptom	Possible Cause	Recovery
Poor Quality Jetting	Any previously discussed cause	Recover using any of the previously discussed methods.
	Software Settings	• Check valve settings (valve on time, frequency, valve stroke, and closing rate). • Check temperature and pressure settings (fluid, valve, and cooling). • Check dot parameters and fluid configuration values.
	Dirty, Worn, or Damaged Jet Cartridge	Thoroughly clean or replace jet cartridge as necessary.
	Dispense Gap	A fluid with the dispense gap set too low will “plow” through the dispensed fluid and accumulate fluid on the nozzle tip. Dispense gaps set too high will result in poor shot shape with a higher frequency of dispense “satellites.”
	Fluid Leak for IntelliJet model IJ 1.1	• Locate and fix leak. – Tighten fittings. – Replace jet cartridge. – Replace drive pin seal. • Clean valve and heater of all leaked fluids. • Verify calibration using gold stop, see 3.8 IntelliJet Calibration Procedure.
	Fluid Leak for IntelliJet model IJ	• Locate and fix leak. – Tighten fittings. – Replace jet cartridge. • Clean valve and heater of all leaked fluids. • Verify calibration using gold stop, see 3.8 IntelliJet Calibration Procedure.
	System Heater Calibration	Verify machine has proper calibration offsets (when the heater power is turned off, the temperature reading should be the same as the room temperature).
	System needs to be recalibrated	The calibration process determines the correct open and close voltages to be used with the each individual IntelliJet, see 3.8 IntelliJet Calibration Procedure .
	Empty Syringe	Replace fluid syringe.
	Expired Fluid	Replace fluid syringe. Make sure fluid has not expired.

6.5 Setup Variable Based Issues

Setup Variable	Effect	Notes
Fluid Properties	Dispense Volume and Quality	If this is a new process, contact Technical Support for assistance in process development. If this is a qualified process, fluid properties may have changed. The fluid may have exceeded its pot life or has been mishandled or set up incorrectly. In addition, air bubbles are a common problem in mixed, high viscosity fluids. Improper fluid warming can introduce air, which results in intermittent shots. De-gas the fluid, if possible, in a vacuum chamber.
Fluid Temperature	Dispense Volume and Quality	Typically, higher temperatures lead to decreased fluid viscosity and a higher fluid flow rate. Test the sensitivity of the fluid to a small temperature change. Verify the heater assembly is holding at the desired temperature through the Fluidmove or Canvas Temperature Control window. The heater elements and RTD, inside the heater assembly, are 2-wire devices. Failure modes include "open" and "short." The "open" mode occurs when either of the two wires is broken. The "short" mode occurs when there is zero resistance across the two wires, or between either wire and the heater body. Cooling occurs by circulating compressed air through the heater assembly. Check that adequate air pressure is present at the green pneumatic line, and that the cooling passage is unobstructed.
Fluid Pressure	Dispense Volume	Verify that the fluid supply has been set up correctly and that fluid is free to flow to the jet cartridge. Verify the pressure setting is correct. Insufficient fluid pressure results in small shot volumes or no shots. Too much fluid pressure leads to larger shot volumes.  NOTE When VAPR is enabled, there is no fluid pressure during non-dispense.
Valve Parameters	Fluid On/Off Time	"On Time" is the time the valve control signal is ON. "Off Time" is the time between ON signals. ON/OFF times that are too short may not allow fluid to flow properly into the fluid cartridge, which may result in small dot sizes. ON times that are too long may cause excess fluid to flow through the valve. ON times can be set as small as 0.4 ms (which is also the minimum opening time of the valve). The maximum valve frequency is 1000 Hz.
	Dot Closing Velocity Adjustment	By adjusting the closing velocity, the velocity of the dot can be adjusted. The typical value is 0.5; the maximum value is 2.5. If the fluid is accumulating, increase the valve speed or increase the heater temperature. If the fluid is spraying, decrease the valve speed or lower the heater temperature.
	Dot Opening Velocity Adjustment	The opening velocity adjustment is set to the maximum value; however, it can be reduced if needed for low viscosity materials.
	Valve Stroke	The valve travel should be 50-125. Thicker fluids need more travel and thinner fluids need less travel to be properly dispensed. The software will allow a stroke as low as 25 or as high as 150, but this may result in inconsistent performance. Contact Technical Support for additional support.

6.6 Component Based Issues

Component	Quality	Troubleshooting Questions
Jet Cartridge	Size and Cleanliness	- Is it the correct size? - Was it cleaned properly? - Does a new jet cartridge have the same behavior? - Run the auto valve calibration, see 3.8 IntelliJet Calibration Procedure.
Drive Pin Assembly for IntelliJet model IJ	Condition	- Is the drive pin assembly worn or damaged? - Check the tip, air seal location, and the piston seal. - Does the needle assembly move freely in the fluid body with the stroke adjustment assembly removed? - Run the auto valve calibration procedure to see if the cartridge is worn, see 3.8 IntelliJet Calibration Procedure.
Heater Assembly	Operation	- Is the heater set to the right temperature? - Does the resistance across the heater and RTD meet specification when the heater is installed? - Pins 4 & 5 - Check the heater's resistance in parallel $24 \pm 7 \Omega$. See Table 6-1. - Pins 6 & 7 = Check the RTD resistance $108.6 \pm 2 \Omega$ at $22 \pm 5 ^\circ\text{C}$. See Table 6-1. - See Figure 6-1 to check heater independently. - Are the heater and RTD pins shorted to the heater body? - Does cooling air pass through the heater body? - Is the cooling airflow set properly? - Are the heater PID settings in the heater file correct?
	Not Working	- Is the heater on? - Is the lever latch engaged in the top plate of the IntelliJet? - Are both latches on heater engaged? - Are contacts clean? - Is the LED light solid green?

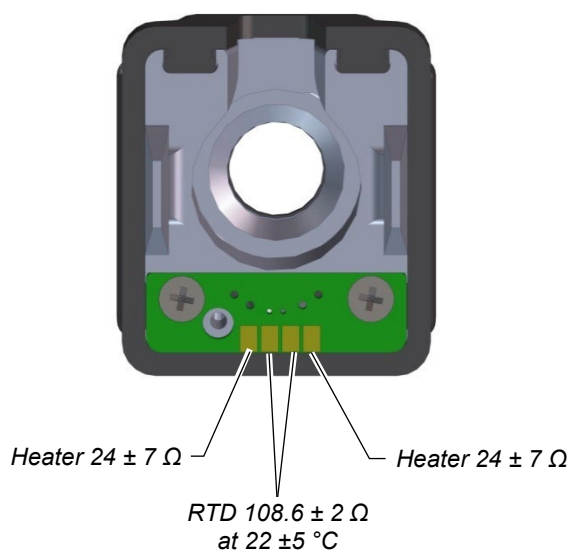


Figure 6-1 Heater Resistance

6.7 Fluidmove Error Messages

Message	Possible Cause	Recovery
Encoder reports jet did not fire as many shots as commanded	This error is an indication of a skip in encoder counts. Monitor to see if the error persists. Persistent errors are an indication of PDHC or encoder failure.	Run the calibration procedure. If the system passes calibration, the piezo stack is operational. If the calibration routine fails, contact Technical Support.
PZD Error, Cannot Calibrate	This message indicates that the piezo driver board is not functioning properly.	Exit Fluidmove. Power off the dispensing system and perform a cold restart. This is the only way to reset the PZD board. Note: The valve will be in the open position during power down. Remove low viscosity fluids before power down to avoid dripping at the nozzle.
Valve Error, Cannot Calibrate	The valve calibrates the drive pin position with every initialization. This error message indicates the cartridge seat and/or poppet are worn.	Run the calibration procedure. If Fluidmove still displays an error message, install a new cartridge. A new cartridge and/or poppet should resolve this issue.
Heater is Not Connected	There is an electrical connection issue with the heater module.	Clean the contacts on the circuit board mounted to the heater module and on the underside of the valve. If problem persists, measure resistance between contacts (Figure 6-1).
Duty Cycle Exceeded	The number of shots per second has exceeded the design limit of 5,000 dots in 10 seconds.	The dispensing program must be modified to keep the shot frequency below this limit.
Piezo Stack Over Temperature	- Cooling air line is not connected or is clogged. - Cooling air pressure is below 25 psi.	Restart Fluidmove. Check the cooling air tube and cooling air pressure.

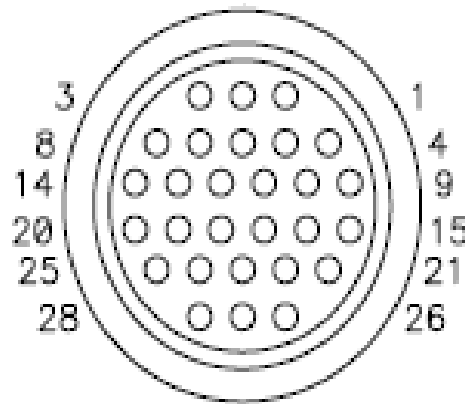


Figure 6-2 Pin Insertion View

Table 6-1 Connector Pin-Out

Pin #	Pin Output	Pin #	Pin Output
1	+24V	15	ENCODER A
2	UNUSED	16	ENCODER 1A
3	UNUSED	17	ENCODER B
4	+24V	18	ENCODER 1B
5	HEATER A-B IN PARALLEL	19	RS485-TX
6	RTD1-HI	20	UNUSED
7	RTD1-LO	21	GROUND
8	GROUND	22	PIEZO SHIELD
9	UNUSED	23	SIGNAL SHIELD
10	UNUSED	24	PIEZO HI
11	UNUSED	25	PIEZO LO
12	UNUSED	26	UNUSED
13	RS485-RX	27	VALVE PRESENT
14	UNUSED	28	UNUSED

6.8 Canvas Error Messages

Message	Possible Cause	Recovery
Heater is OFF	The heater is not powered on.	See 6.6 Component Based Issues .
A component is set to be simulated	A hardware device is being simulated by software.	Reconfigure to not be simulated.
Fluid level is critical	Low fluid level.	Stop program and add fluid.
Fluid level is low	Low fluid level.	Stop program and add fluid.
Heater not connected	There is an electrical connection issue with the heater module.	Clean the contacts on the circuit board mounted to the heater module and on the underside of the valve. If problem persists, measure resistance between contacts (Figure 6-1).
IntelliJet Valve is being Calibrated	One of the following procedures may be occurring: Machine restart, valve installation, heater installation, specified number of cycles has changed, or valve settings change has occurred.	Allow the procedure to complete.
IntelliJet Valve is not Calibrated	One of the following procedures may have occurred: Machine restart, valve installation, heater installation, specified number of cycles has changed, or valve settings change has occurred.	Perform the calibration procedure, see 3.8 IntelliJet Calibration Procedure .

6.9 Troubleshooting Trees

Figure 6-3 and Figure 6-4 will assist with the IntelliJet Valve and RS Cartridge troubleshooting procedures. Section 6.2 through Section 6.7 are detailed troubleshooting procedures and should be followed.

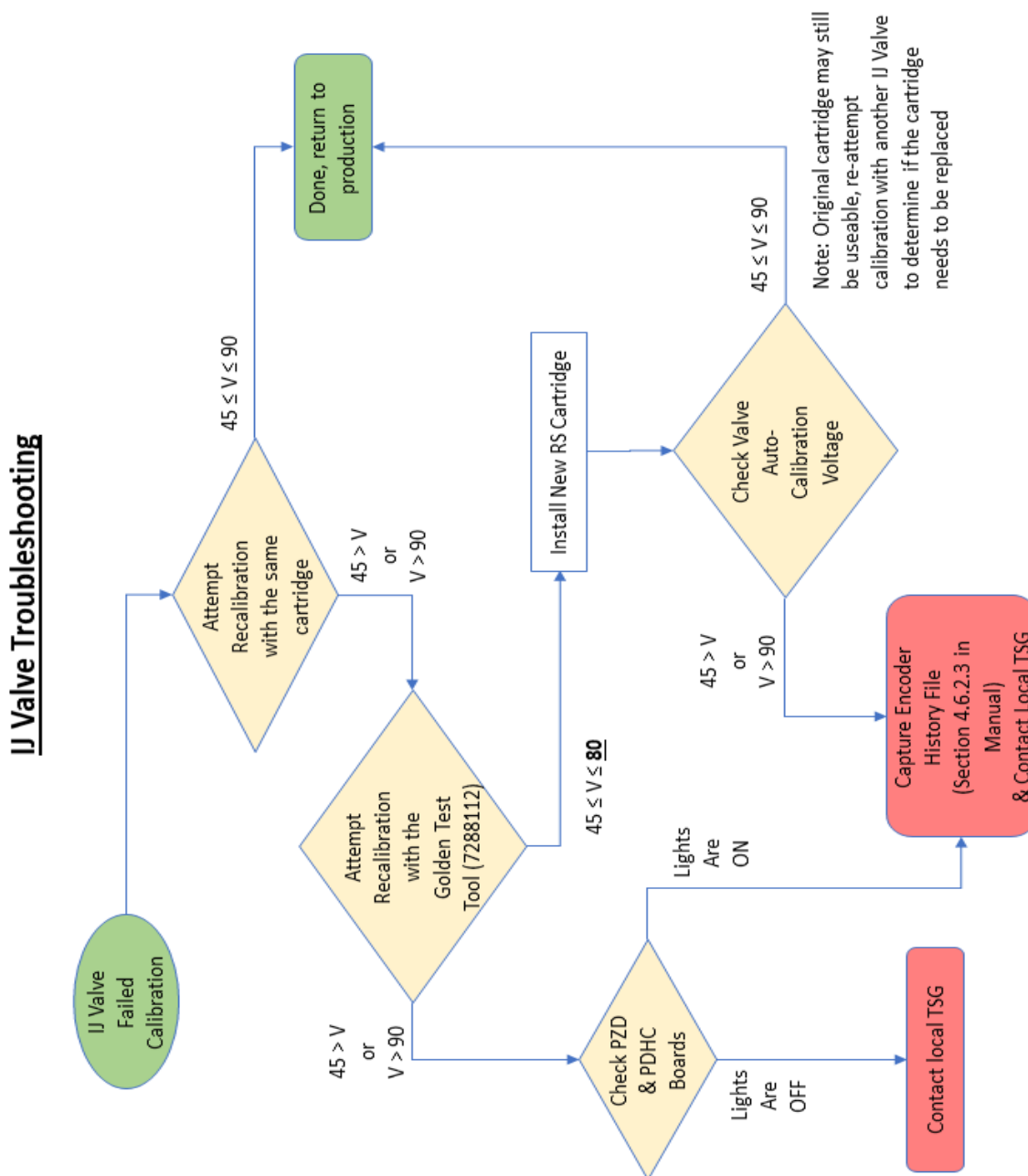


Figure 6-3 IntelliJet Valve Troubleshooting

RS Cartridge Troubleshooting

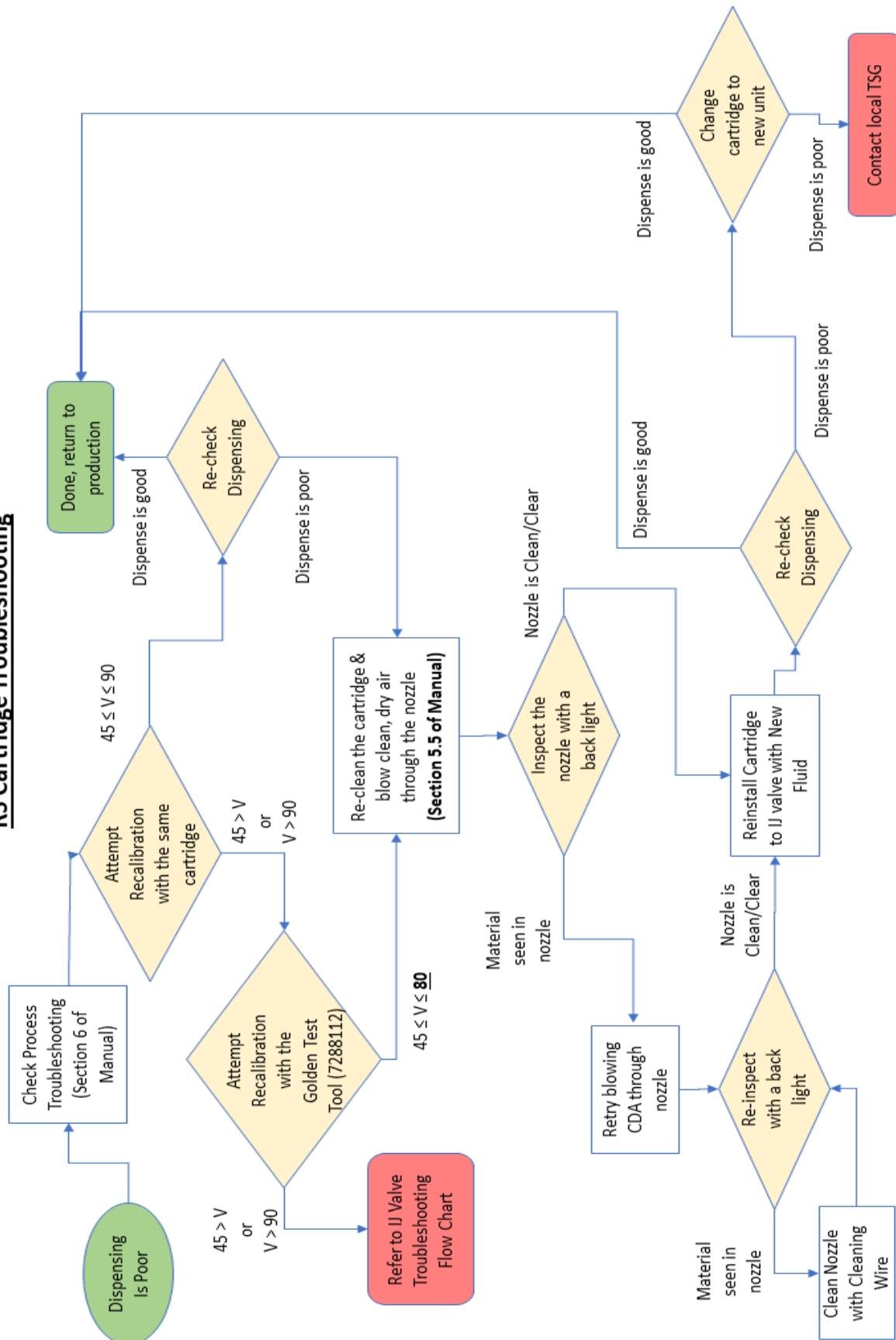


Figure 6-4 RS Cartridge Troubleshooting

7 Parts Replacement

7.1 Overview

This section includes general information for ordering recommended spares and replacement parts for your IntelliJet.



WARNING!

Parts replacement should only be performed by a trained service technician. Nordson assumes no liability for personal injury or property damage that may occur as a result of spare parts being replaced by a non-certified technician.

7.2 Safety First

Operation of the Select Coat Applicator involves air pressure, electrical power, mechanical devices, and the use of hazardous materials. It is essential that every person servicing or operating the applicator fully understands all hazards, risks, and safety precautions. See [Section 2 - Safety](#) for additional information.



WARNING!

DO NOT hot swap connections when working with electrical and pneumatic power supplies. Turn the main circuit breaker off before disconnecting the external power plug from the facility.

7.3 Parts Ordering Information

7.3.1 Placing Your Order

Customers can order spare parts by contacting Customer Service. Contact information is listed in the front of this manual. Spare parts can also be ordered online through our Internet Web Store. To set up a web store account, send an email to americas.at.cs@nordson.com.

When ordering parts, be prepared to provide the following information:

- | | |
|--|--|
| • Your Company Name | • Billing Address |
| • Shipping Address | • Part Number and Description of Part |
| • Purchase Order Number | • Quantity |
| • Dispensing System Serial Number
(found on back panel) | • Shipping Instructions with Collect
Account Number |

7.3.2 Shipping Instructions

When ordering parts, specify which carrier you prefer to use and provide your shipping account number. If no instructions are received, Technical Support will determine the best shipping method and items will be shipped prepaid with the shipping charge added to the invoice.

7.4 Warranty

Contact Technical Support for any warranty issues pertaining to spare parts. Wear items and consumables are covered under warranty against manufacturer defect only. Expected lifetimes for these parts will vary based upon application and use model.

Consumable parts are generally considered as parts that are replaced on a frequency of > 1 per calendar year under expected regular usage. In most cases, these parts are “wetted parts” that make contact with the dispensed fluid.

Wear items are those items that have been identified to have limited life expectancy (less than 5 years) but are not considered consumables. Wear items are often highly application dependent, high user-touch, or adjusted parts.

7.5 Credit and Exchanges

Contact Technical Support for credit or exchanges of recommended spare parts or refurbished components (components restored to original specifications but not sold as new). Obtain a Return Material Authorization (RMA) from Technical Support before returning parts.

7.5.1 Return Material Authorization

Contact Technical Support to obtain a Return Material Authorization (RMA) before returning any parts.



NOTE Find your local Technical Support contact on the Nordson web page, www.nordsonasymtek.com.

7.6 Record Keeping

The type of service performed should be recorded in the dispensing system maintenance records. Dates, part numbers/serial numbers of replaced parts, names of technicians, and other pertinent data should be recorded.

7.7 Unpacking and Inspecting Replacement Parts

Replacement parts are shipped to distributor or customer facilities in individual shipping cartons. Review the packing slip to ensure that the correct parts were received. Contact Technical Support if any discrepancies are discovered.

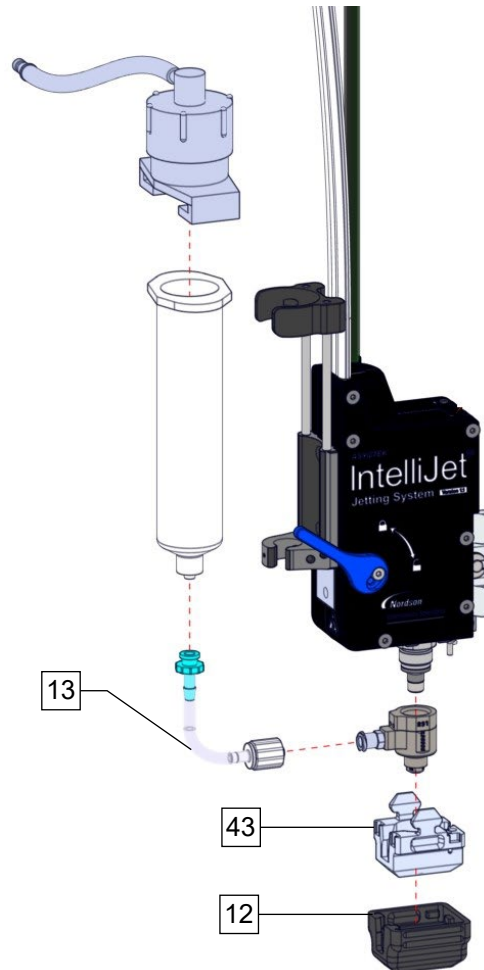
Before unpacking your spare parts, visually inspect the carton for damage. If applicable, check the “ShockWatch” and the “Tip N’ Tell” stickers for indications of improper shipping and handling. Inform the freight carrier of any damage.

7.8 Cleaning and Inspection

Always clean the applicable dispensing area after a failed part is removed from the dispensing system. Inspect the area for signs of what may have caused the part to fail. This may help prevent future part damage. While removing parts that will be reinstalled, visually inspect them for damage. If found undamaged, retain them for reinstallation. Replace damaged parts and hardware as appropriate.

7.9 Spare Parts Kit

Use the following tables to locate the item number corresponding to a procedure in this technical manual. Nearly all spare parts are sold as part of a spares kit, with a few exceptions. To order parts, access www.nordson.com/electronics, use the search feature to search for a kit part number or part description to locate the appropriate spares list, and follow the instructions in that file to complete the ordering process. Contact Technical Support for questions.



Item Number	Description
12	BOOT, 4 PIN HEATER, IJ
13	ASSY, FEED TUBE, 56MM, PU, PKG50
43	ASSY, HEATER, IJ BALL LATCH

Table 7-1 Spare Parts Kit

Kit Part Number	Kit Name	Item Number	Part Description	Quantity
7284671	CONSUMABLES KIT, INTELLIJET			
		1	BOOT, VAC .120 ID OLIVE	10
			LUBE, SUPER, SYNTIC PTFE .5oz	1
		13	ASSY, FEED TUBE, 56MM, PU, PKG50	use DU qty
			KIT, ACCESSORIES, RS CARTRIDGE	1
			LABEL, ZEBRA, 4"X2", THERM WHT	1
			BOX, 11X6.5X2 WITH CHERRY LOCKS	1
			LABEL, IF SEAL IS BROKEN,6800	1
6655700	ASSY, SPARE, VALVE, IJ 1.1	2		
			PICK, FINE POINT, 90 ANGLE, 75MM, SS	1
			SEAL, DRIVE PIN, IJ 1.1, PKG100	1
			RETAINER, SEAL, DRIVE PIN, IJ 1.1, PKG20	1
7284672	KIT, VALVE, IJ	19		
		21	HOLDER, SYRINGE, 5CC	1
		22	HOLDER, SYRINGE, 3 CC	1
			ASSY, RECEIVER HEAD, 3CC, CLEAR	1
			ASSY, RECEIVER HEAD, 5CC, CLEAR	1
			ASSY, RECEIVER HEAD, 10CC, CLEAR	1
		26	ASSY, RECEIVER HEAD, 30CC, CLEAR	1
			SET, SYRINGE, EFD OPTIMUM 3-30CC	1
		20	HOLDER, SYRINGE, 10CC, IJ COMP	1
			TOOL, POPPET SEAL INSERTION	1
		16	ASSY, TOOL, POPPET INSERTION	1
			LABEL, ZEBRA, 4"X2", THERM WHT	1
			BOX, 11X6.5X2 WITH CHERRY LOCKS	1
			LABEL, IF SEAL IS BROKEN, 6800	1
6655205	KIT, CARTRIDGE TOOLS			
		14	TOOL, SEAL REMOVAL, PLASTIC	2
		16	ASSY, TOOL, POPPET INSERTION	1
6655161	CLEANING VIALS, RT CARTRIDGES & DJ-9500			
		5	WISE, PIN	1
		6	PROBE, VIAL NZL CLEAN, .007" DIA	5
		7	PROBE, VIAL NZL CLEAN, .011" DIA	5
		8	PROBE, VIAL NZL CLEAN, .014" DIA	5
		9	PROBE, VIAL, NZL CLEAN, .003" DIA	5
		10	VIAL WIRE, 25PC., .0024 DIA	5

Kit Part Number	Kit Name	Item Number	Part Description	Quantity
7284706	EFD 6 OZ VALVE KIT (OPTIONAL)	28		
		29	FIT, Q-D MALE, 4MM BARB	1
			TUBING, PU, CLR, 6MM OD	0.65
		31	CLAMP, HOSE, TWO-EAR	1
		32	FITTING, LUERLOCK X 1/4 MNPT-PL	50
		33	RETAINER SYS, 6OZ, CL/BL	1
			ASSY, HOLDER, SYRINGE, EFD, 6OZ	1
			ASSY, FEED TUBE, 65MM, PU, PKG50	1
7270310	ASSY, HEATER, INTELLIJET, TESTED	43		
			BALL, CHROME STEEL, 3/32 DIA	1
			O-RING, FFKM, .070 ID X .04 W (001-1/2)	1
		53	SCREW, M2X.40X6 FLTHD. PH. REC.	2
		12	BOOT, 4 PIN HEATER, YJ	1
			HEATER BODY, IJ	1
7201410	KIT, MLFS, DJ9, DJ9.5, NJ, IJ			
			CLIP, 2.5/6 OZ, MLFS	1
			MAGNET, 10 CC, EFD FOLLOWER	5
			THREADLOCKER, REMOVBLE, 242, 10ML	1
			WASHER, FLAT M3	1
			SCREW, M3 X .05 PH. FLAT X 8	2
			SCREW, M3 X 0.5 SOCKET X 8	1
			SCREW, M3 X 20, SOCK. HD.CAP, SS	2
			SCREW, M3X6 BUTTON HEAD	2
			SCREW, BUTTON HEAD M3 X 10	4
			ASSY, SENSOR, LOW FLUID, MAGNETIC	1
			BRACKET, MLFS, DJ-9000	1
			PLATE, MOUNTING, MLFS	1
			HOLDER, FLFS, DJ-9000	1
			MAGNET, CERAMIC,.75"OD	5
			STRAIN RELIEF BRKT, MLFS, DJ9000	1
			STRAIN RELIEF CLMP, MLFS, DJ9000	1
6655690	Seal Kit (100 seals + pick)			
			PICK,FINE POINT,90ANGLE,75MM,SS	1
			BAG, SEALTOP 3X5, 2 MIL, W/WHT	1
			LABEL,ZEBRA, 4"X2", THERM WHT	1
6655700	IJ 1.1 Valve Assembly			
			TOOL,SEAL REMOVAL,PLASTIC	1
			TWEEZERS,ROUND TIP-4.5IN,SS	1

			SCREW,SET,M5X08X4	2
			LOCTITE 640,HIGH STR,2H ADJUST	1
			LABEL,ZEBRA, 4"X2', THERM WHT	2
			COVER,BLANK,INTELLIJET	1
			ASSY,HOLDER,SYRINGE,30CC	1
			AASY,DRIVE,BASE,COVERED,IJ 1.1	1
			SCREW, M5X0.8,FLAT TIP SET, X8	1
			ASSY,HEATER,INTELLIJET,TESTED	1
			SCREW, M3 X 10MM, SOCKET CAP	2
			PICK,FINE POINT, 90ANGLE, 75MM,SS	1
			SEAL,DRIVE PIN,IJ 1.1,PKG100	1
			RETAINER,SEAL,DRIVE PIN,IJ 1.1,PKG20	1
			BOX,SHIPPING,INTELLIJET	1
SOLD AS INDIVIDUAL PARTS				
		12	BOOT, 4 PIN HEATER, YJ	1
		13	ASSY, FEED TUBE, 56MM, PU, PKG50	2
		55	TOOL, IJ GOLDEN HARD STOP	1
6655680			SEAL, PKG 100	1
6655685			RETAINER, PKG 20	1



NOTE Contact Technical Support for versions that include cooling options.



Electronics Solutions

MAIN OFFICE
2762 Loker Avenue West
Carlsbad, CA 92010-6603 USA
Tel: +1-760-431-1919
www.nordson.com/electronics