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# *Micro-Dot Valve User Guide*

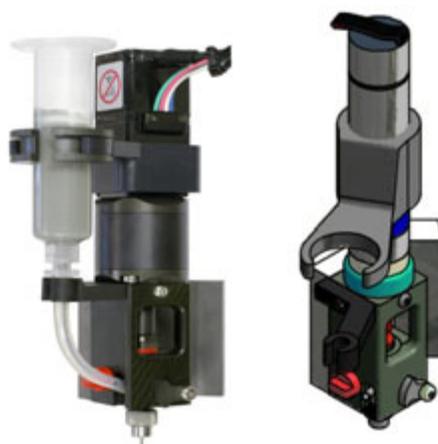
Version 4.3  
June 12, 2019  
Part No. 22200607

**for models:**

22110265  
22293189

**for use with:**

Dispensers using FLOWare<sup>®</sup> Software, ver 2.3+



prepared by GPD Global<sup>®</sup> Documentation Dept.

**GPD Global<sup>®</sup>**

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# Warranty

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**General Warranty.** Subject to the remedy limitation and procedures set forth in the Section “Warranty Procedures and Remedy Limitations,” GPD Global warrants that the system will conform to the written description and specifications furnished to Buyer in GPD Global’s proposal and specified in the Buyer’s purchase order, and that it will be free from defects in materials and workmanship for a period of one (1) year. GPD Global will repair, or, at its option, replace any part which proves defective in the sole judgment of GPD Global within one (1) year of date of shipment/invoice. Separate manufacturers’ warranties may apply to components or subassemblies purchased from others and incorporated into the system. THIS WARRANTY IS EXPRESSLY IN LIEU OF ANY AND ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

**Limitations.** GPD Global reserves the right to refuse warranty replacement, where, in the sole opinion of GPD Global the defect is due to the use of incompatible materials or other damages from the result of improper use or neglect.

This warranty does not apply if the GPD Global product has been damaged by accident, abuse, or has been modified without the written permission of GPD Global.

Items considered replaceable or rendered unusable under normal wear and tear are not covered under the terms of this warranty. Such items include fuses, lights, filters, belts, etc.

**Warranty Procedures and Remedy Limitations.** The sole and exclusive remedy of the buyer in the event that the system or any components of the system do not conform to the express warranties stated in the Section “Warranties” shall be the replacement of the component or part. If on-site labor of GPD Global personnel is required to replace the non-warranted defective component, GPD Global reserves the right to invoice the Buyer for component cost, personnel compensation, travel expenses and all subsistence costs. GPD Global’s liability for a software error will be limited to the cost of correcting the software error and the replacement of any system components damaged as a result of the software error. In no event and under no circumstances shall GPD Global be liable for any incidental or consequential damages; its liability is limited to the cost of the defective part or parts, regardless of the legal theory of any such claim. As to any part claimed to be defective within one (1) year of date of shipment/invoice, Buyer will order a replacement part which will be invoiced in ordinary fashion. If the replaced part is returned to GPD Global by Buyer and found by GPD Global in its sole judgment to be defective, GPD Global will issue to Buyer a credit in the amount of the price of the replacement part. GPD Global’s acceptance of any parts so shipped to it shall not be deemed an admission that such parts are defective.

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Specifications, descriptions, and all information contained in this manual are subject to change and/or correction without notice.

Although reasonable care has been exercised in the preparation of this manual to make it complete and accurate, this manual does not purport to cover all conceivable problems or applications pertaining to this machine.

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# Introduction

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The GPD Global Micro-Dot Valve is a precision machined dispensing system. It is designed for accurate and highly repeatable dispensing of solder paste, surface mount epoxy, conductive epoxy, underfills, and many other materials made for dispensing.

## Theory of Operation

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1. The material in the syringe is continuously pressurized to provide a steady supply of material to the lead screw.
2. The Z-axis lowers the dispense pump down to the dispense level.
3. The motor is signaled to rotate incrementally according to specific specifications set by the operator.
4. Upon completion of cycle, the Z-axis will raise the dispense pump, move to the next location, and repeat the process.

## Cartridges

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The Micro-Dot Valve has the capability to utilize three (3) different cartridges along with three (3) different styles of needle:

### Floating Cartridge

Designed to hold the footed needles. The footed needles have the capability to mechanically compensate for Z-axis error. This feature accurately controls the relationship between the tip of the dispense needle and the surface to be dispensed upon.

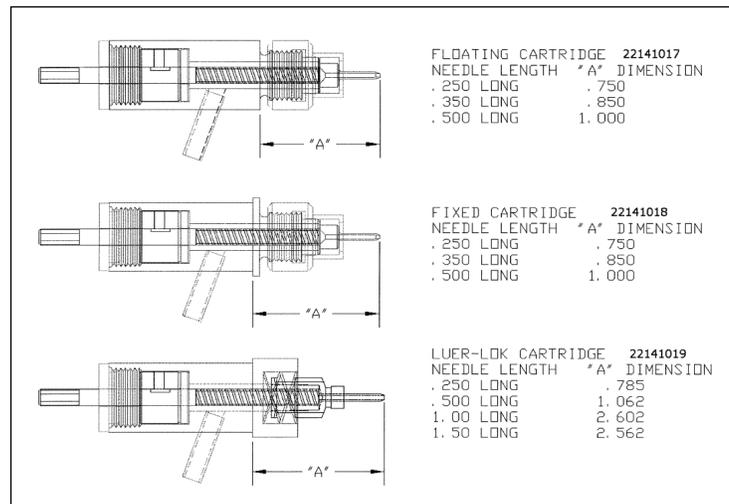
### Fixed Cartridge

Designed to hold non-footed needles where the Z-axis is used to control the relationship between the tip of the dispense needle and the surface to be dispensed upon.

### Luer-Lok Cartridge

Designed to use Luer-Lok style needles. The Luer-Lok Cartridge is also a fixed cartridge where the Z-axis is used to

control the relationship between the tip of the dispense needle and the surface to be dispensed upon.



## Needles

### Surface Mount Footed Needle

A precision-machined needle made from stainless steel. The footed needle has a hardened foot which is accurately ground to set a specific gap between the needle tip and the surface to be dispensed upon. This needle also features a conical ground tip.

### Surface Mount Non-Footed Needle

A precision-machined needle made from stainless steel. This needle also features a conical ground tip.

### Luer-Lok Needle

These needles are available in the following lengths and are made from either stainless steel or plastic with a stainless dispense tip. Not all gauges are available in the listed lengths. This needle also features a conical ground tip.

**Table 1: Luer-Lok Needle Lengths**

inches	millimeters
0.12 in	3.17 mm
0.15 in	3.81 mm
0.18 in	4.45 mm
0.25 in	6.5 mm
0.50 in	13 mm
1.00 in	25 mm
1.50 in	98 mm

# Operations

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## Air Pressure Tips

Most materials require 1 to 20 PSI to keep the dispensing pump full. The pump does rely on air pressure to dispense consistently. When the motor is activated, it rotates to move the material through the dispensing pump to mechanically dispense the material.

- The lower the air pressure required supplying the lead screw, the better the results.
- If too little air pressure is applied, voids will occur on the lead screw and at the needle tip.
- If too much air pressure is applied, materials tend to compact. If this occurs, material will clog the lead screw and/or the needle. Applying too much air pressure can also cause bleeding from the dispense tip when the machine is idle between points.
- Forcing materials through the lead screw may cause material to back up in the needle hub. If this occurs, the material will compact inside the needle and lead screw.

## Mounting Valve

To mount the Micro-Dot Valve on a GPD dispenser:

1. At the top of the dispenser mount, press down and hold the latching lever of the taper-lock mount.
2. Align and engage the valve with the top dowel pin of the mount.
3. Apply downward pressure to the valve while releasing the mount latching lever.
4. Connect the valve motor and encoder cables to the dispenser receptacle panel.

## Purging Cartridge

To purge the cartridge:

1. Remove the needle from the dispense pump for the initial cleaning.
2. With the material attached to the Luer-Lok adapter on the dispense tube assembly:
  - a. Turn the air pressure up to approximately 10 PSI.
  - b. Note the material migrating down the clear feed tube into the cartridge.
  - c. When the material reaches the cartridge, give it a few seconds to fill around the lead screw and then cycle the dispense pump, rotating the lead screw continuously until the material starts to dispense out of the end of the cartridge.
  - d. Allow the material to dispense for approximately 10 seconds.

- e. Stop the dispense cycle and wipe the end of the cartridge clean.
  - f. Cycle the pump again for 5 to 10 seconds.
  - g. Wipe the end of the cartridge clean.
3. Install the dispense needle to the cartridge, locking it in place with the cartridge nut.
  4. Cycle the dispense pump until the material dispenses from the needle tip.
    - a. Let the material dispense for approximately 15 to 30 seconds or until it looks to be dispensing consistently.
    - b. Continue this process until the lowest possible air pressure with consistent dispensing results is achieved.

**NOTE:** Some material requires as little as 2 PSI.

**NOTE:** Material bleeding out of the needle while in a non-dispense mode indicates entrapped air. Continue to purge material from the pump until bleeding stops.

**NOTE:** The material may also be bleeding out of the needle after the dispense cycle has stopped if the air pressure is set too high. Turn down the air pressure in small increments, letting the air pressure stabilize for about 30 seconds. Cycle the dispense pump.

5. The dispense pump is now ready for dispensing.

# Preventive Maintenance

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## Scheduled Operations

Maintenance recommendations are based on 40 to 60 hours of run time per week. The following suggested schedules should be altered to accommodate your particular process requirements. A record of the maintenance performed should be maintained.

### Daily

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Clean valve auger and needle per [Clean Micro-Dot Valve](#) (pg 6) and [Clean Dispense Needle](#) (pg 9).

### Periodically

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Quarterly, or as needed, [Lubricate Coupling](#) (pg 11).

## Replacement Cycles

### As needed

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[Replace Coupling](#) (pg 12)

## Clean Micro-Dot Valve

**REQUIRED** - The contents of the Micro-Dot Valve Support/Cleaning Kit P/N 22141031 will be needed to perform these procedures:

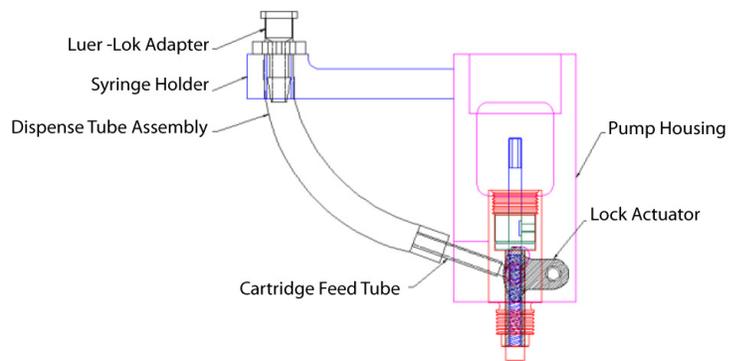
- [1 - Disassemble Valve](#)
- [2 - Clean Valve Components](#)
- [3 - Lubricate Lead Screw](#)
- [4 - Reassemble Valve](#)
- [5 - Purge Cartridge](#)

### 1 - Disassemble Valve

#### Remove Cartridge & Dispense Tube

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1. To remove Cartridge Assembly from Pump Housing:
  - a. Remove the Dispense Tube Assembly from Syringe Holder by pulling Luer-Lok Adapter through slot in the Syringe Holder.



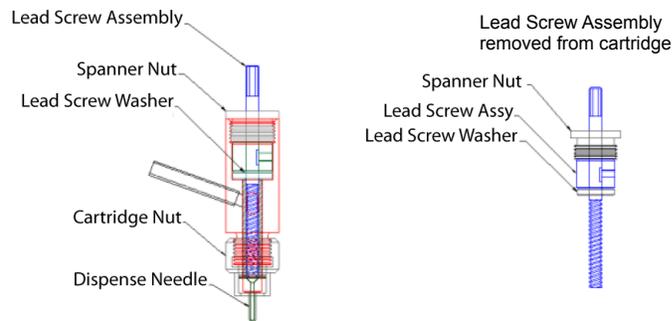
- b. Rotate the Lock Actuator in a clockwise direction to release Lock Pin. (Lock Actuator is shown in locked position.)
  - c. The Cartridge should now drop out of Pump Housing.
2. To remove Dispense Tube Assembly from Cartridge Feed Tube:
  - a. Grasp the Cartridge with thumb and forefinger, pinching the Cartridge Feed Tube.
  - b. Grasp the Dispense Tube Assembly and clear the tubing just above the Cartridge Feed Tube by pinching the tube with your thumb and forefinger.
  - c. Gently pull the clear tubing from the Dispense Tube Assembly.

**CAUTION:** Be careful to pull straight apart and not at an angle as the Cartridge Feed Tube might bend if care is not taken.

  - d. After cleaning the Cartridge Assembly, always replace the Dispense Tube Assembly with a new one.

## Remove Cartridge Nut, Dispense Needle, & Lead Screw

1. To remove Cartridge Nut:
  - a. Rotate the Cartridge Nut counterclockwise until it is free from the cartridge.

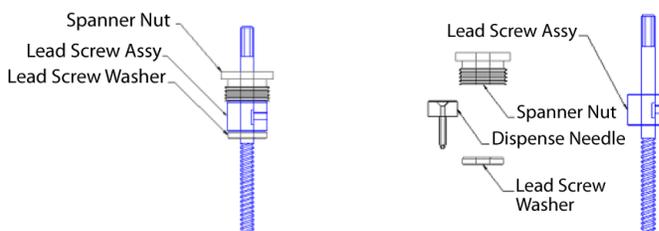


- b. The Dispense Needle should come off the Cartridge Assembly inside of Cartridge Nut. If it does not, remove the Nut from the end of the Cartridge.
2. To remove Dispense Needle:
  - a. Hold the Cartridge nut in one hand with Needle tip facing up while the backside is facing the palm of your other hand.
  - b. Remove the Dispense Needle from Cartridge Nut by gently pushing on the Needle Tip with your thumb. The Needle should move out of the Cartridge Nut freely, falling into the palm of your hand.
3. To remove Lead Screw Assembly:
  - a. Rotate the Spanner Nut counterclockwise using the Spanner Nut Wrench until assembly is free from Cartridge.
  - b. Lift the Lead Screw Assembly straight up and out of Cartridge.

## Remove Parts from Lead Screw Assembly

To remove components for cleaning from the Lead Screw Assembly:

1. Remove the Spanner Nut from the Lead Screw.
2. Remove the Lead Screw Washer from the Lead Screw Assembly.
3. Set components aside for cleaning.



## 2 - Clean Valve Components

**NOTE:** The cleaning solvent suggested for cleaning procedures is alcohol. See appropriate personnel at your facility for proper care, handling, and disposal.

1. Clean the Lead Screw Assembly using alcohol. Remove all materials from the screw and wipe dry.
2. Clean the Spanner Nut and Lead Screw Washer using alcohol. Remove all materials from both items and wipe dry.
3. Perform the following [Clean Cartridge](#) and [Clean Dispense Needle](#) procedures.

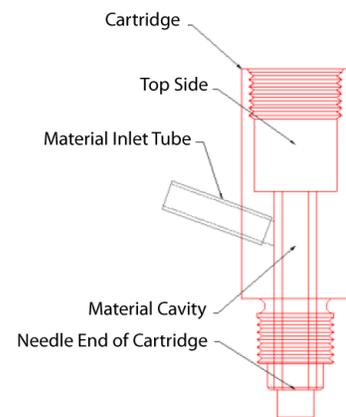
### Clean Cartridge

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**NOTE:** All material must be removed from both inside and outside of the cartridge. Clean the cartridge using one of these methods:

#### Method 1

1. Insert a pipe cleaner in the Top Side of the Cartridge, stopping just above the Material Inlet Tube.
2. Insert a second pipe cleaner into the Material Inlet Tube. Push the pipe cleaner to drive material into the Material Cavity.
3. Push the first pipe cleaner (inserted into the Cartridge) all the way through the Material Cavity.
4. Repeat the above process as many times as needed until the pipe cleaners remain clean.



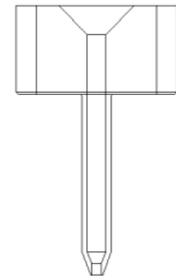
#### Method 2

1. Flush out the Cartridge using alcohol to ensure the Cartridge is totally clean.
2. Wet the brushes (from kit) with alcohol and brush in and out through the Material Inlet Tube and Material Cavity.
3. Flush and repeat the cleaning process several times until the Cartridge is completely clean.
4. Use the cleaning brushes to remove and clean all materials from the Needle End of the Cartridge.
5. Flush thoroughly and dry.

## Clean Dispense Needle

1. Using the pilot cleaning tool with the drill end first, insert the drill into the pin vise with at least 1/2 inch of the drill extended.

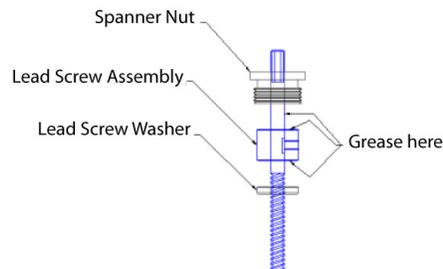
**NOTE:** Do not apply too much pressure with the drill as too much pressure can damage the needle.



2. Insert the tool into the backside of the needle.
3. Rotate the drill in a clockwise direction to remove dispensing material. Clean the tool after each attempt to remove material. Repeat this process several times.
4. Using the altered end of the pilot cleaning tool extended out of the pin vise at least 1/2 inch, insert the tool into the backside of the needle.
5. Rotate the tool clockwise while cleaning the tool after each attempt to remove material. Repeat several times.
6. Run the applicable gauge of cleaning wire through the needle to remove the material in the needle tip area.
7. Flush the needle in alcohol and repeat the above process until the needle is totally clean.

## 3 - Lubricate Lead Screw

1. Apply a small amount of Teflon grease on areas indicated.

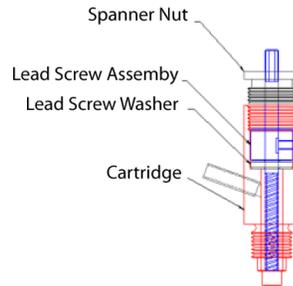


2. Slide the Lead Screw Washer onto the Lead Screw Assembly, placing it against the lead screw collar and rotating the washer to evenly displace grease between both surfaces.
3. Slid the Spanner nut onto the Lead Screw Assembly, placing it against the lead screw collar and rotating the spanner nut to evenly displace grease between both surfaces.

## 4 - Reassemble Valve

1. Insert assembled parts into the cartridge.

**NOTE:** Take care not to damage the end of the lead screw on the carbide sleeve installed in the cartridge.



2. After inserting the assembly into the cartridge, use the spanner nut wrench to tighten the spanner nut, rotating the nut clockwise until snug.

**NOTE:** Be careful not to over tighten the spanner nut as over tightening the spanner nut will prevent the lead screw from freely rotating.

3. The lead screw should rotate freely in the completed assembly. Inspect the lead screw to ensure it rotates freely before installing the cartridge into the pump assembly. If the lead screw does not rotate freely, the assembly must be disassembled, all parts checked to verify they are clean, and then reassembled.

### Insert Cartridge into Pump Housing

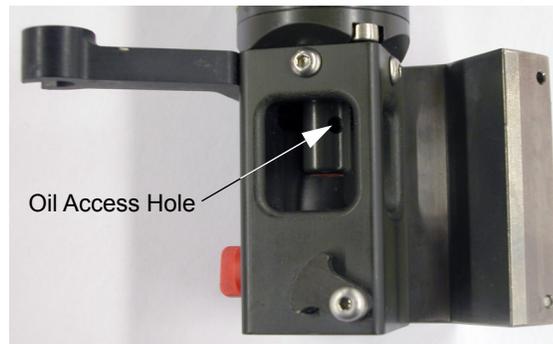
1. To insert the cartridge into the pump housing, line up the Internal Hex on the coupling [refer to [Lubricate Coupling](#) (pg 11) for visual reference] with the Hex on the lead screw.
2. Slide the cartridge assembly into the pump housing until the lead screw comes in contact with the coupling. The lead screw will enter the coupling if the hex is lined up. If the lead screw does not line up with the coupling, remove the cartridge assembly, manually rotate the lead screw, and reinsert cartridge.
3. When the cartridge is lined up with the coupling, push the assembly up into the pump housing until the outside diameter of the cartridge is flush with the bottom face of the pump housing.
4. Rotate the lock actuator to the locked position.

## 5 - Purge Cartridge

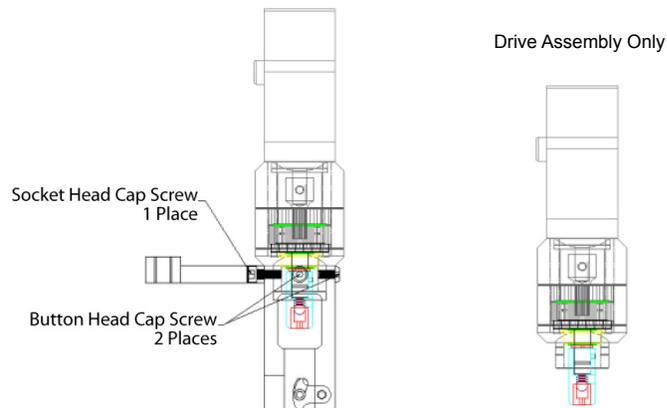
See details at [Purging Cartridge](#) (pg 3).

## Lubricate Coupling

1. Determine whether or not the coupling Oil Access Hole is accessible:
  - If the hole is accessible, skip to [Step 3](#).
  - If the hole is inaccessible, continue with the following step.



2. Remove the pump housing from the drive assembly:
  - a. Remove the cartridge assembly from the pump housing per [Step 1 \(pg 6\)](#).
  - b. Remove the Socket Head Cap Screw and the Button Head Cap Screws.

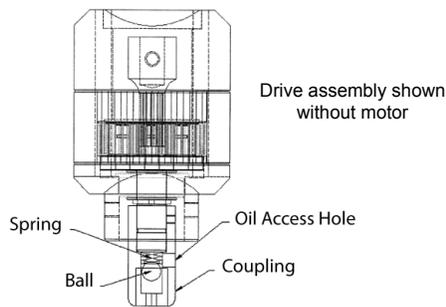


- c. Rotate the lead screw assembly counterclockwise and remove it from the pump housing.
  - d. Grasp the pump housing in one hand and the drive assembly in the other. Gently pull the two assemblies apart while slightly rotating them. Pull them straight apart from each other.

**CAUTION:** Do not remove coupling from reducer shaft. The ball and spring inside the coupling could be lost.

- e. If necessary, [Replace Coupling](#) (pg 12); otherwise, continue with the following step.

3. While holding the drive assembly on its side with the Oil Access Hole facing up, apply one drop of Teflon Oil (found in tool support kit).



You have completed coupling lubrication unless you performed [Step 2 \(pg 11\)](#) to remove the pump housing from the drive assembly.

4. To reassemble the pump housing and drive assembly:
  - a. Hold the drive assembly in one hand and the pump housing in the other. Line up the pump housing with the drive assembly, push together with a slight twisting motion until the pump housing sets flush against the transmission mount.
  - b. The transmission mount has a series of four (4) holes for mounting the pump housing. This allows you to have the power supply cords in any of four locations. The standard position is with the power supply cords located on the syringe mount side.
  - c. Attach the syringe mount with the slot to insert the dispense tube assembly facing the front of the pump. Align the two dowels on the syringe mount with the two location holes in the pump housing. Attach with Socket Head Cap Screw.
  - d. Finish the assembly procedure by installing 3 mm Button Had Cap Screws in the two remaining holes in the pump housing.

## Replace Coupling

To replace coupling assembly:

1. Remove the old coupling by aligning the set screw on the coupling with the larger diameter hole on the drive assembly and then unscrew with Allen wrench. The spring and brass ball should still be in the coupling.

2. Add the new brass ball followed by the spring in the new coupling.



3. Push the new coupling with spring and ball onto the drive assembly until you are unable to push it in anymore. You may have to loosen the set screw to push it in all the way.
4. Align the set screw with the flat on the drive assembly and the larger diameter hole and then tighten with Allen wrench.
5. Verify the spring is compressed in the coupling.

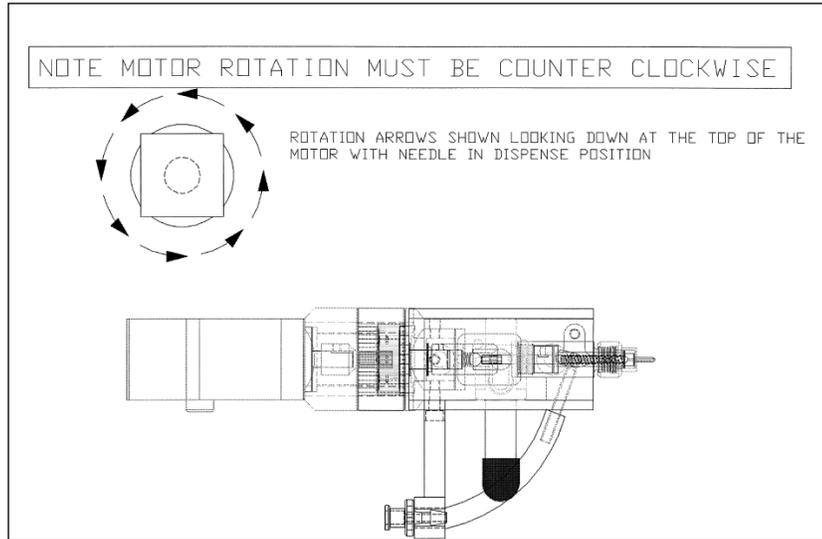
# Specifications

## Connections

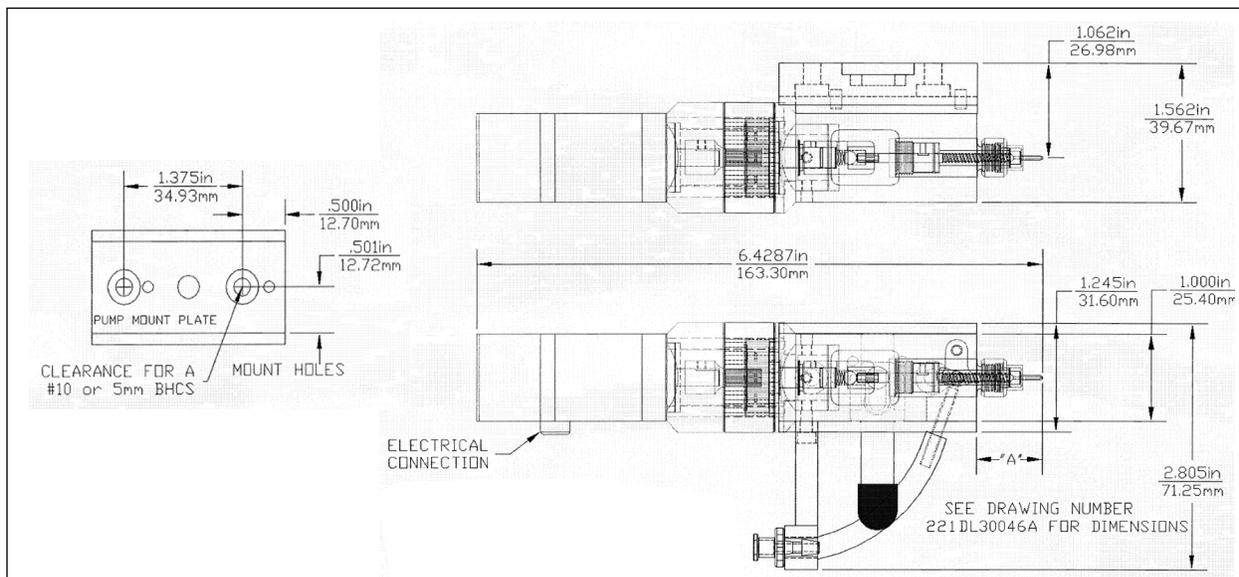
Power required . . . . . 24 VDC  
 Air Supply . . . . . constant pressure of 1-20 PSI

## Pump Rotation

Pump rotation must be counterclockwise.



## Dimensions



# Cartridge Parts

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## Precision Style

Description	Part Number
<b>Micro-Dot Cartridge Assemblies - PRECISION</b>	
Carbide Cartridge with 16P Shallow	22141014
Carbide Cartridge with 16P Standard	22141011
Carbide Cartridge with 16P Deep	22141009
Carbide Cartridge with 16P Ultra Deep	22141010
Carbide Cartridge with Double Helix	22141053
Carbide Cartridge with 16P Ultra Shallow	22141029
<b>Relieved Assemblies - PRECISION</b>	
Carbide Cartridge with 16P Standard	22141067
Carbide Cartridge with 16P Shallow	22141049

## Luer Style

Description	Part Number
<b>Micro-Dot Cartridge Assemblies - LUER</b>	
Carbide Cartridge with 16P Shallow	22141028
Carbide Cartridge with 16P Standard	22141013
Carbide Cartridge with 16P Deep	22141026
Carbide Cartridge with 16P Ultra Deep	22141027
<b>Relieved Assemblies - LUER</b>	
Carbide Cartridge with 16P Shallow	22141057

# Appendices

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## Cleaning Kit

- [Micro-Dot Support/Cleaning Kit - 22141031](#) (pg 17)

## Mechanical Drawings

- [Micro-Dot Pump, Model 22293189, Config 1 - 22293189-0001](#) (pg 18)
- [Micro-Dot Pump, Model 22293189, Config 2- 22293189-0002](#) (pg 19)
- [Cartridge Assembly, Floating, Standard - 22141011](#) (pg 20)
- [Cartridge Assembly, Floating, Shallow - 22141014](#) (pg 21)
- [Cartridge Assembly, Fixed - 22141012](#) (pg 22)
- [Cartridge Assembly, Luer-Lok - 22141013](#) (pg 23)
- [Cartridge Sub-Assembly, Floating - 22141017](#) (pg 24)
- [Cartridge Sub-Assembly, Fixed - 22141018](#) (pg 25)
- [Cartridge Sub-Assembly, Luer-Lok - 22141019](#) (pg 26)
- [3 cc Syringe Adapter Kit - 30156A](#) (pg 27)
- [Latch Assembly Pump Housing - 30155A](#) (pg 28)
- [Coupling Assembly Transmission - 30036A](#) (pg 29)

## Electrical Schematics

### Model 22110265

- [Electrical Components Dimensions - 103198A, 1 of 2](#) (pg 30)
- [Electrical Components Diagram - 103198A, 2 of 2](#) (pg 31)
- [Electrical Schematic for Micro-Dot Valve - 22181034](#) (pg 32)

### Model 22293189

- [Electrical Schematic for Micro-Dot Valve - 22291115](#) (pg 33)

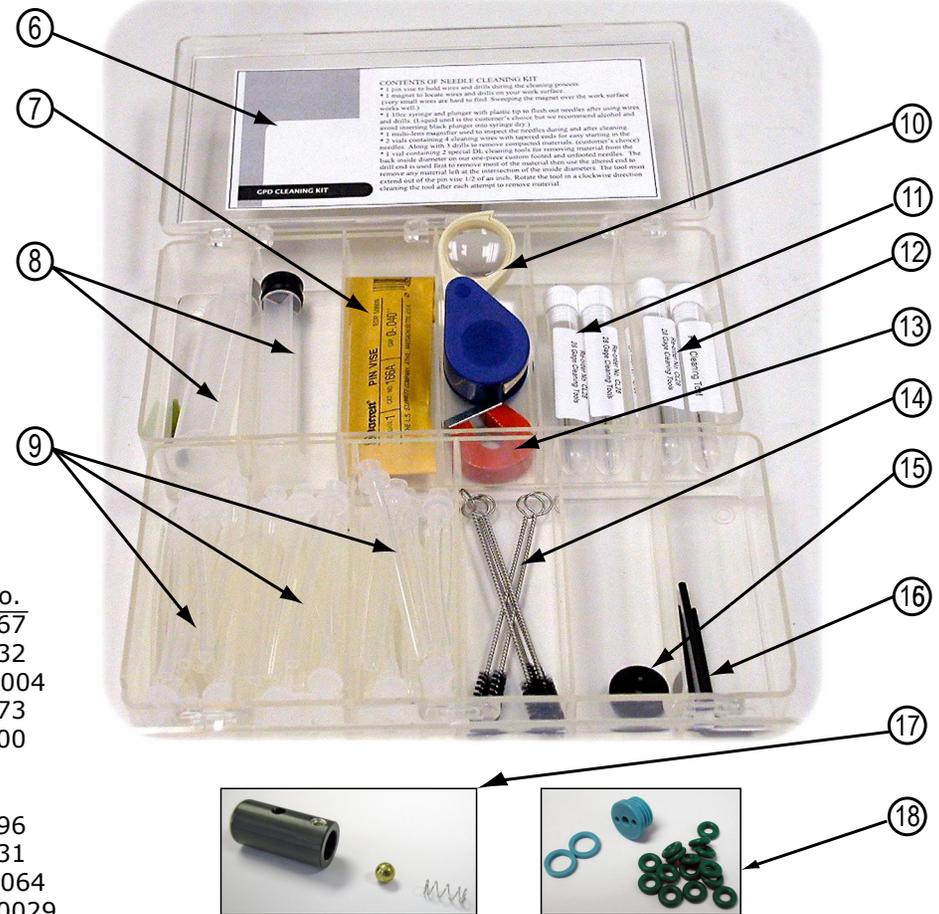


Needles (various gauges)

Item	Description	Part No.
1	Teflon/Dielectric Grease	10/4767
2	Teflon Oil	10/3432
3	Syringe Stabilizer	22140004
4	Cotton Swabs	10/3473
5	Pipe Cleaners	10/3900
6	Needle Cleaning Kit Contents	N/A
7	Pin Vise	10/4196
8	Syringe & Plunger, 10 cc	10/4231
9	Tubes with Luer Adapters	22110064
10	Multilens Magnifier	2725-0029
11	Pilot Cleaning Tool	22131209H
12	Cleaning Wires	varies with configuration
13	Magnet	10/4197
14	Cleaning Brushes	10/4155
15	Spanner Wrench	10/3451
16	Allen Wrench Kit	10/3452
17	Coupling Assembly	10/3660
18	No-Drip Micro-Dot Kit	22141047

Revision Notes

- F 04/21/10 Update Item 1, PN 10/4150 image & description.
- G 09/17/12 Add Item 17, PN 10/3660.
- H 10/29/12 Add PN 2725-0029 to Item 10.
- I 08/29/13 Add PN 22141047.
- J 04/14/14 Item 1 PN 10/4767 was 10/4150.

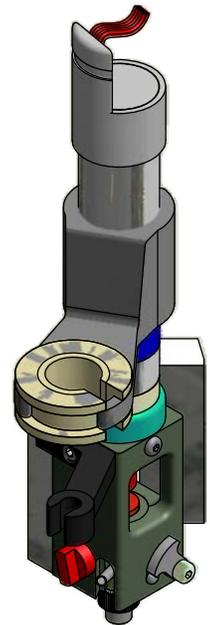
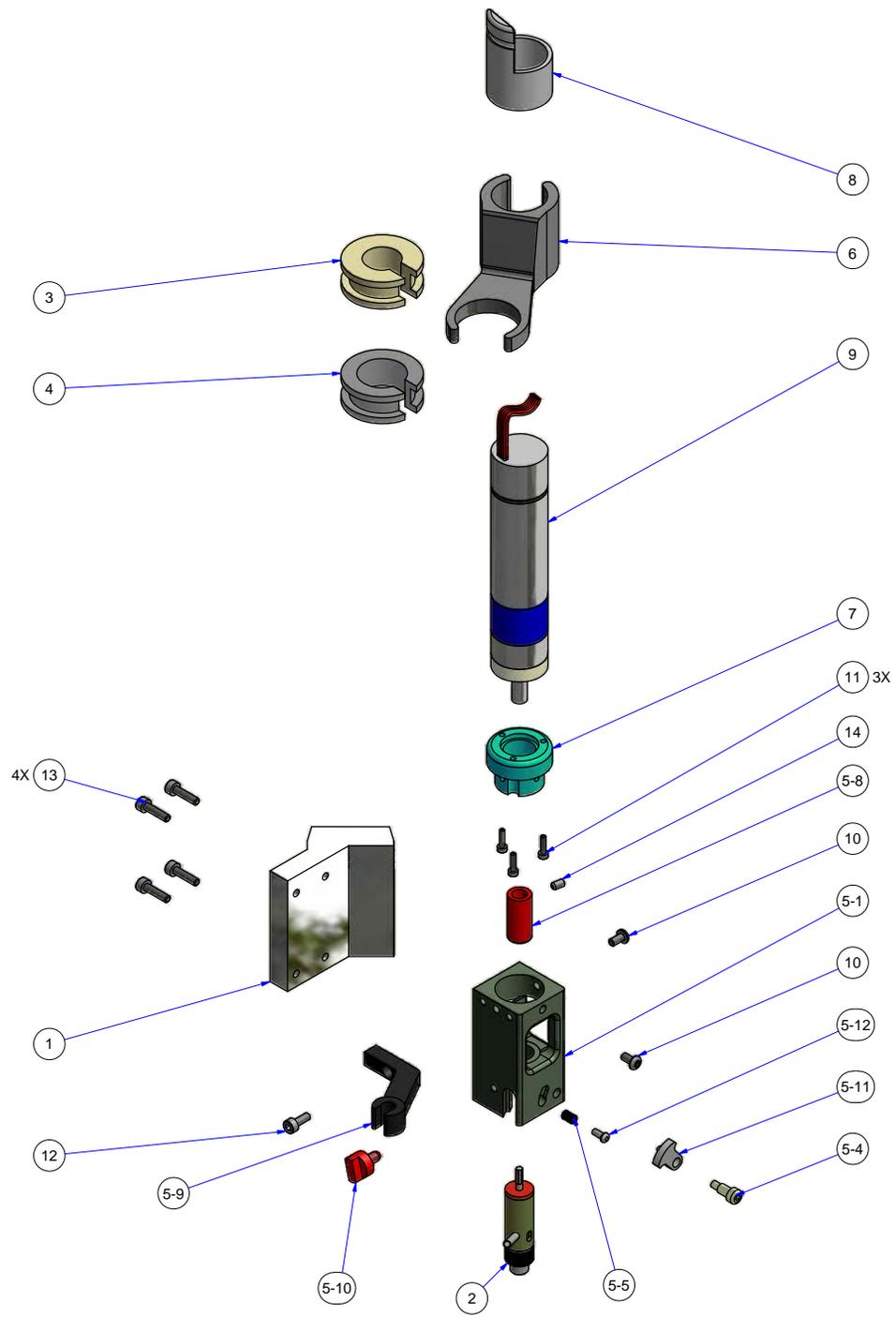


**GPD Global**

TOLERANCES UNLESS OTHERWISE SPECIFIED		NAME: Micro-Dot Support/Cleaning Kit	
FRACTIONS ±1/32	METRIC	USED IN:	
2 PLACE DECIMAL ±0.015	0.0 MM	MATERIAL:	
3 PLACE DECIMAL ±0.005	0.00MM	HEAT TREAT: -	
ANGULARITY ±0.5°		FINISH:	
RUNOUT ±0.003 T.I.R.		DWG SIZE	
DRAWN BY: MK		PART NUMBER	
CHECKED BY:		22141031	
DATE: 10/29/12		SCALE: N/A	
		REV J	

REVISION HISTORY			
REV	DATE	BY	DESCRIPTION
A	6/14/2017	MW	WAS 2 SHEET IS ONE SHEET; ADDED 22703040

Parts List			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	22121012	MALE ADAPTER, TAPER LOCK, DL VALVE
2	1	22141009	ASSY_CARTRIDGE, FLOATING, W/DEEP AUGER
3	1	22141042	BUSHING, 5CC
4	1	22141043	BUSHING, 10CC
5	1	22142038	ASSY_HOUSING_MD_CPL
5-1	1	22140001	HOUSING_PUMP_NSS_USE 22141059
5-4	1	10/3668	BOLT_SHOULDER_SST_4MM X 6MML X M3
5-5	1	S0074	SPRING_COMPRESSION_MICRODOT VALVE
5-8	1	10/3660	COUPLING ASSY, MICRO DOT VALVE
5-9	1	22140004	FEED TUBE SUPPORT
5-10	1	22140020	THUMB KNOB, RED TURCITE
5-11	1	22140002	ACTUATOR, LOCK
5-12	1	22140003	PIN, ACTUATOR
6	1	22203612	SYRINGE SUPPORT_MD_SNAPSTYLE
7	1	22503027	ADAPTER_MICRO MO MOTOR/HYFLO BODY
8	1	22703040	STRAIN RELIEF_MOTOR_GEAR
9	1	3500-0094	MOTOR_GEAR_24VDC_W/ENCODER_DIFFERENTIAL
10	2	SABSM030050006	SCREW, BUTTON HEAD, 3MM X .5 X 6MM, SST
11	3	SACANM0020040008	CAP SCREW 2MM X 0.4 - 8MM LG
12	1	SACSM030050008	CAP SCREW 3MM X .05 8MM LG, SST
13	4	SACSM030050012	CAP SCREW, SST 3MM X .05 12MM LG
14	1	TACSM030050005	SET.A.CU.SST.MET_3MMX0.5 X 5MM LG SST

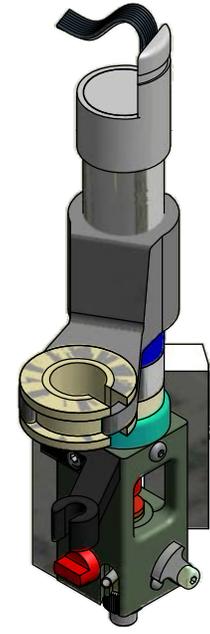
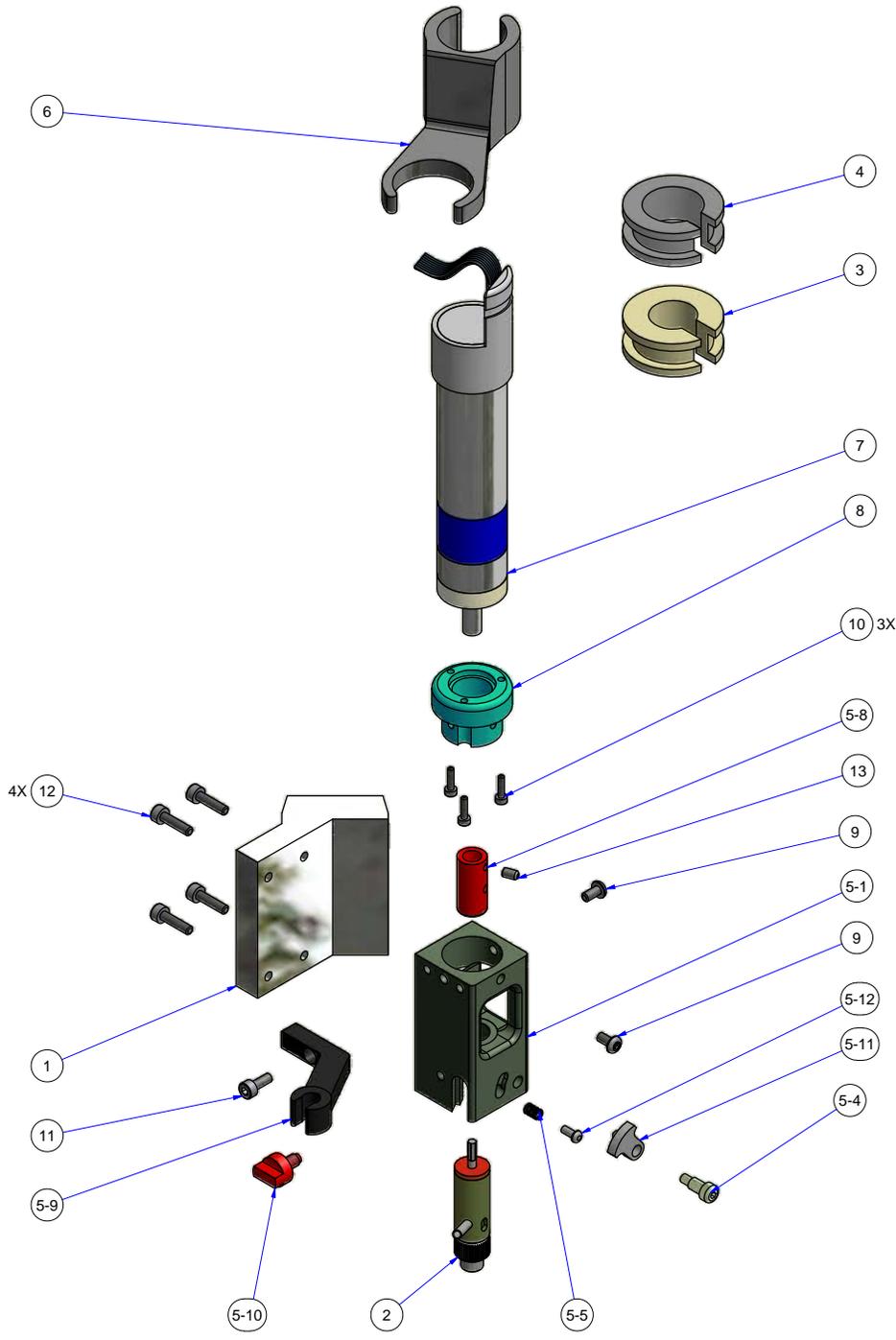


TOLERANCES UNLESS OTHERWISE SPECIFIED	
FRACTIONS	METRIC
XXX	± 0.015
XX.XX	± 0.005
X.XXX	± 0.002
ANGULAR	± 0.5°
RUNOUT	± 0.003 T.I.R.
FINISH	

<b>GPD Global</b>	
DESCRIPTION	
VALVE_MICRO DOT_STANDARD BODY	
ASSEMBLY	
MICRODOT VALVE	
MATERIAL	
ASSEMBLY	
DWG NO	
22293189-0001	
REV	
HEAT TREATMENT	DWG SIZE
NA	C
DRAWN BY MW	3/12/2015 SHEET 1 OF 1

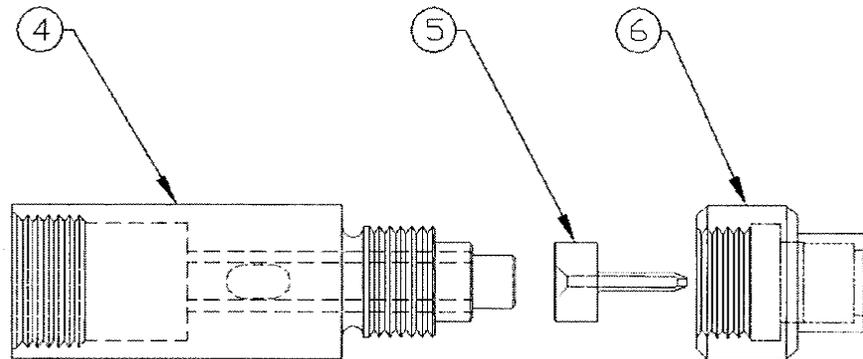
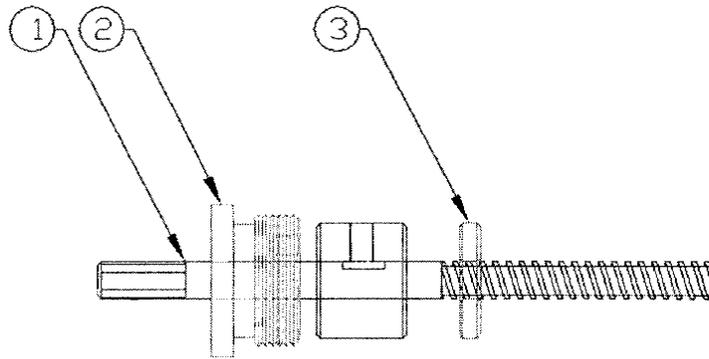
REVISION HISTORY			
REV	DATE	BY	DESCRIPTION
-	-	-	-

Parts List			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	22121012	MALE ADAPTER, TAPER LOCK, DL VALVE
2	1	22141009	ASSY_CARTRIDGE, FLOATING, W/DEEP AUGER
3	1	22141042	BUSHING, 5CC
4	1	22141043	BUSHING, 10CC
5	1	22142038	ASSY_HOUSING_MD_CPL
5-1	1	22140001	HOUSING, PUMP_NSS_USE 22141059
5-4	1	10/3668	BOLT, SHOULDER_SST_4MM X 6MML X M3
5-5	1	S0074	SPRING_COMPRESSION_MICRODOT VALVE
5-8	1	10/3660	COUPLING ASSY, MICRO DOT VALVE
5-9	1	22140004	FEED TUBE SUPPORT
5-10	1	22140020	THUMB KNOB, RED TURCITE
5-11	1	22140002	ACTUATOR, LOCK
5-12	1	22140003	PIN, ACTUATOR
6	1	22203612	SYRINGE SUPPORT_MD_SNAPSTYLE
7	1	22293288	SERVO MOTOR_CONNECTOR_UPGRADE
8	1	22503027	ADAPTER_MICRO MO MOTOR/HYFLO BODY
9	2	SABSM030050006	SCREW,BUTTON HEAD,3MMX.5 X 6MM,SST
10	3	SACANM0020040008	CAP SCREW 2MM X 0.4 - 8MM LG
11	1	SACSM030050008	CAP SCREW 3MM X .05 8MM LG, SST
12	4	SACSM030050012	CAP SCREW, SST 3MM X .05 12MM LG
13	1	TACSM030050005	SET.A.CU.SST.MET_ 3MMX0.5 X 5MM LG SST

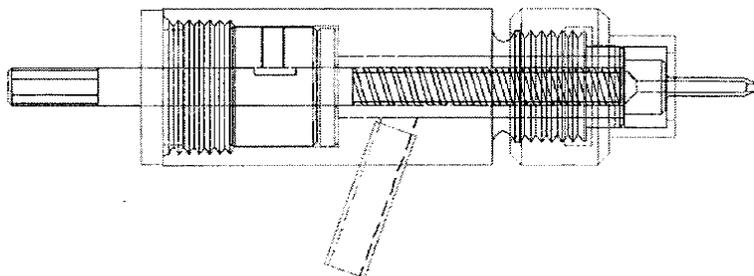


TOLERANCES UNLESS OTHERWISE SPECIFIED	
FRACTIONS	METRIC
b 1/32	b 0.015
b 0.015	b 0.005
b 0.005	b 0.003 T.I.R.
ANGULAR	b 0.5°
RUNOUT	b 0.003 T.I.R.
FINISH	

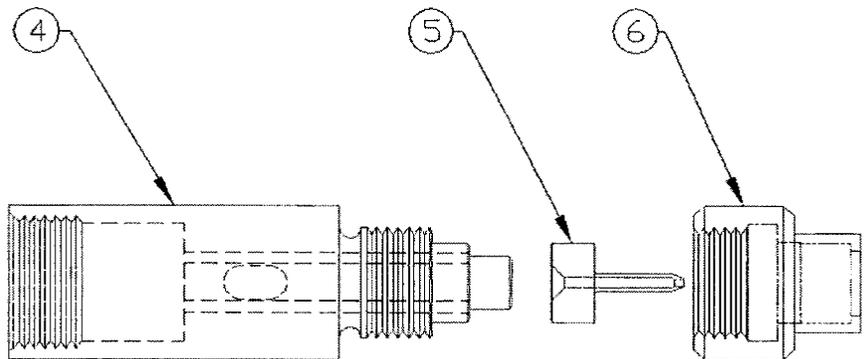
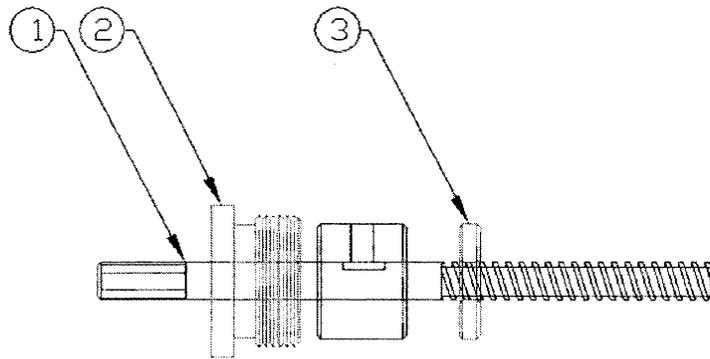
<b>GPD Global</b>	
DESCRIPTION VALVE_MICRO DOT_STANDARD BODY	
ASSEMBLY MICRODOT VALVE	
MATERIAL ASSEMBLY	
DWG NO 22293189-0002	
REV	
HEAT TREATMENT NA	DWG SIZE C
DRAWN BY MW	7/31/2017 SHEET 1 OF 1



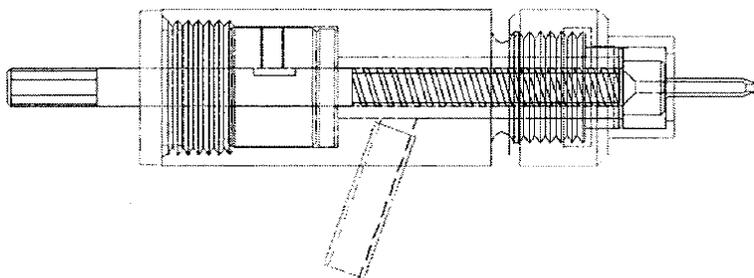
DETAIL	DESCRIPTION	PART NUMBER
1	LEAD SCREW, ASSEMBLY	22141001
2	SPANNER NUT	22140006
3	WASHER, CARTRIDGE	22140007
4	CARTRIDGE, SUB-ASSY	22141017
5	NEEDLE, DISPENSING	AS REQUIRED
6	NUT, CARTRIDGE	22140008



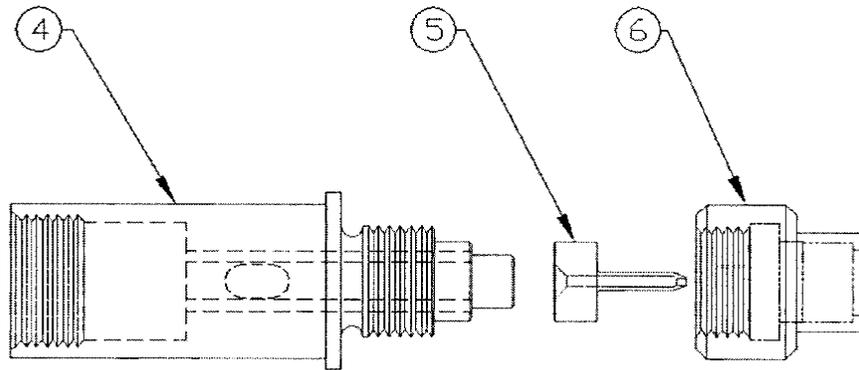
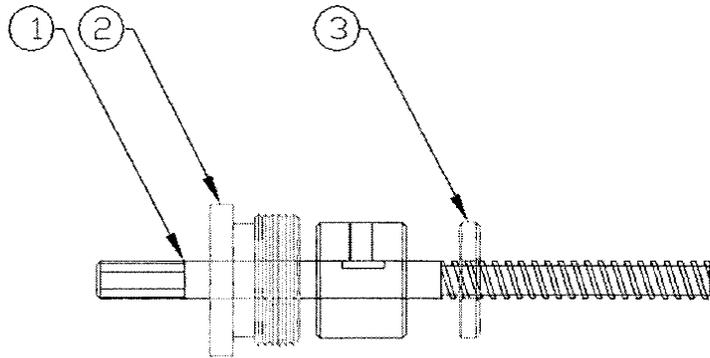
REVISIONS	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCE ON DECIMALS 2 PLACE DECIMALS ± .015 3 PLACE DECIMALS ± .005 4 PLACE DECIMALS ± .0005 ANGLES ± 1/2° MACHINE FINISH .63 R.M.S.	GPD 2322 I-70 Frontage Road Grand Junction, CO 81505 USA			
		Title CARTRIDGE ASSEMBLY, FLOATING STD			
		For MICRO-DOT VALVE			
	DO NOT SCALE DRAWING REMOVE BURRS AND SHARP EDGES UNLESS OTHERWISE SPECIFIED	Drawn By R. Massero, Jr.	Scale 2:1	Date 04/08/00	Part Number 22141011
				Rev. -	



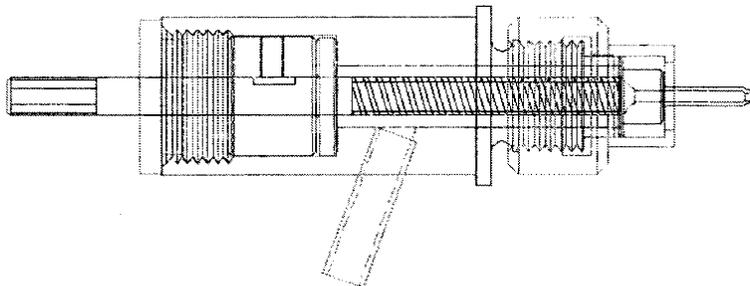
DETAIL	DESCRIPTION	PART NUMBER
1	LEAD SCREW, ASSEMBLY	22141002
2	SPANNER NUT	22140006
3	WASHER, CARTRIDGE	22140007
4	CARTRIDGE, SUB-ASSY	22141017
5	NEEDLE, DISPENSING	AS REQUIRED
6	NUT, CARTRIDGE	22140008



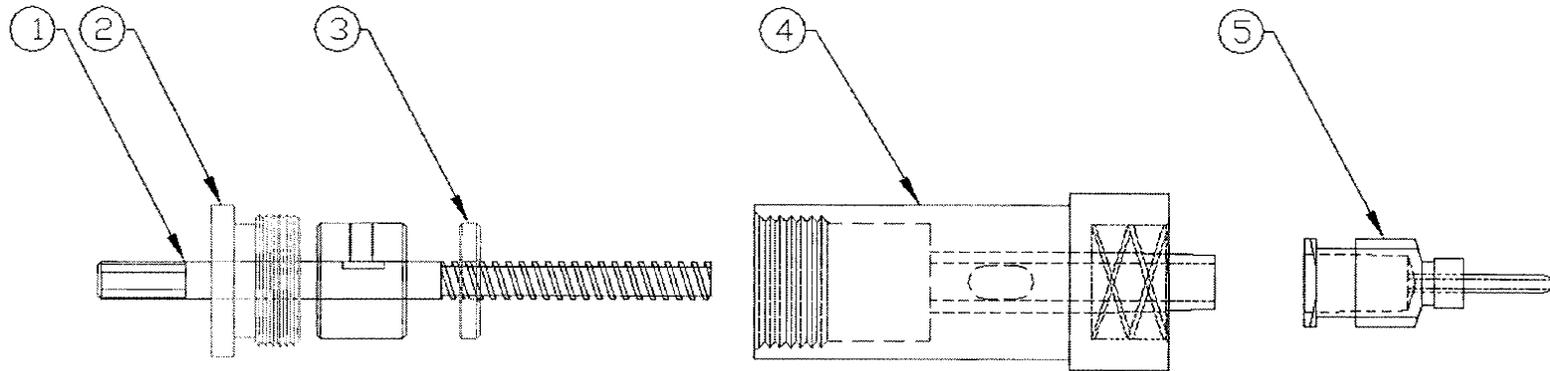
REVISIONS	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCE ON DECIMALS 2 PLACE DECIMALS ± .015 3 PLACE DECIMALS ± .005 4 PLACE DECIMALS ± .0005 ANGLES ± 1/2° MACHINE FINISH .63 R.M.S.					GPD 2322 I-70 Frontage Road Grand Junction, CO 81505 USA				
						Title CARTRIDGE ASSEMBLY, FLOATING SHL				
						For MICRO-DOT VALVE				
DO NOT SCALE DRAWING REMOVE BURRS AND SHARP EDGES UNLESS OTHERWISE SPECIFIED					Drawn By R. Massera, Jr.	Scale 2:1	Date 06/21/00	Part Number 22141014	Rev. -	



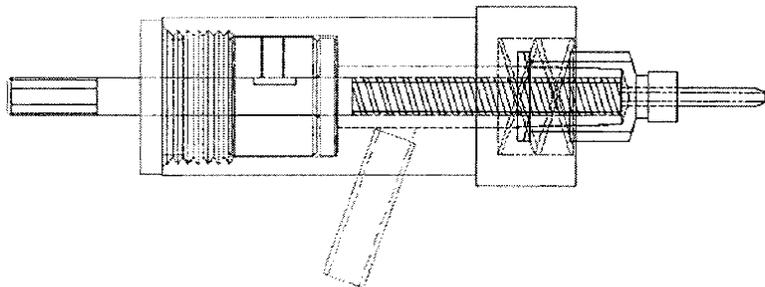
DETAIL	DESCRIPTION	PART NUMBER
1	LEAD SCREW, ASSEMBLY	22141001
2	SPANNER NUT	22140006
3	WASHER, CARTRIDGE	22140007
4	CARTRIDGE, SUB-ASSY	22141018
5	NEEDLE, DISPENSING	AS REQUIRED
6	NUT, CARTRIDGE	22140008



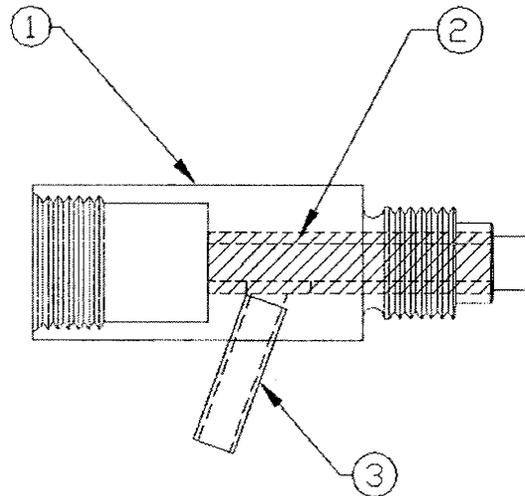
REVISIONS	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCE ON DECIMALS 2 PLACE DECIMALS ± .015 3 PLACE DECIMALS ± .005 4 PLACE DECIMALS ± .0005 ANGLES ± 1/2° MACHINE FINISH .63 R.M.S.		GPD 2322 I-70 Frontage Road Grand Junction, CO 81505 USA		
	DO NOT SCALE DRAWING REMOVE BURRS AND SHARP EDGES UNLESS OTHERWISE SPECIFIED		Title CARTRIDGE ASSEMBLY, FIXED For MICRO-DOT VALVE		
		Drawn By R. Massera, Jr.	Scale 2:1	Date 04/08/00	Part Number 22141012
				Rev. -	



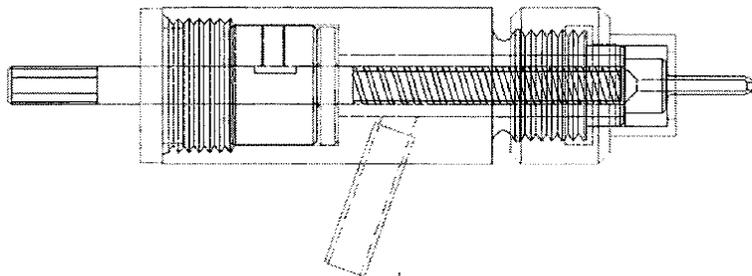
DETAIL	DESCRIPTION	PART NUMBER
1	LEAD SCREW, ASSEMBLY	22141001
2	SPANNER NUT	22140006
3	WASHER, CARTRIDGE	22140007
4	CARTRIDGE, SUB-ASSY	22141019
5	NEEDLE, DISPENSING	AS REQUIRED
6	NUT, CARTRIDGE	22140008



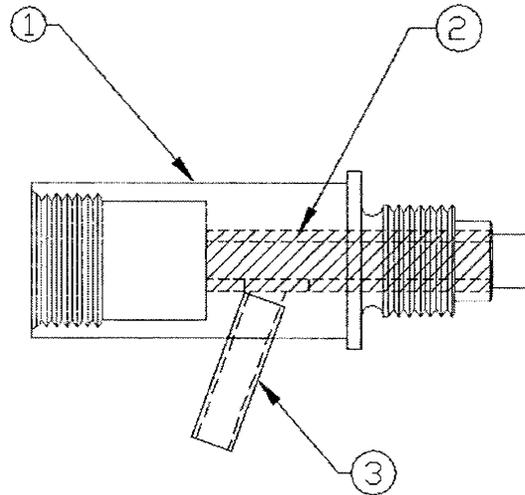
REVISIONS	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCE ON DECIMALS 2 PLACE DECIMALS ± .015 3 PLACE DECIMALS ± .005 4 PLACE DECIMALS ± .0005 ANGLES ± 1/2° MACHINE FINISH 63 R.M.S.	GPD 2322 I-70 Frontage Road Grand Junction, CO 81505 USA			
		Title CARTRIDGE ASSEMBLY, LUER-LOK			
		For MICRO-DOT VALVE			
	DO NOT SCALE DRAWING REMOVE BURRS AND SHARP EDGES UNLESS OTHERWISE SPECIFIED	Drawn By R. Massera, Jr.	Scale 2:1	Date 04/08/00	Part Number 22141013
				Rev. -	



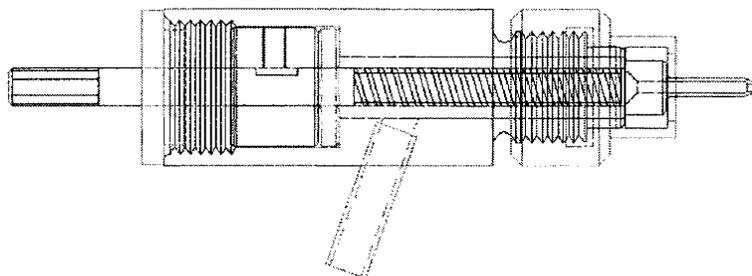
DETAIL	DESCRIPTION	PART NUMBER
1	CARTRIDGE, FLOATING	22140022
2	CARBIDE SLEEVE	22140027
3	FEED TUBE	22140011



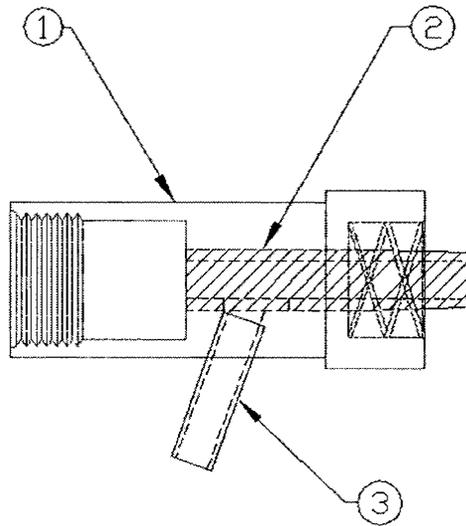
REVISIONS	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCE ON DECIMALS 2 PLACE DECIMALS ± .015 3 PLACE DECIMALS ± .005 4 PLACE DECIMALS ± .0005 ANGLES ± 1/2° MACHINE FINISH .63 R.M.S.		GPD 2322 I-70 Frontage Road Grand Junction, CO 81505 USA		
			Title CARTRIDGE SUB-ASSEMBLY, FLOATING		
		For MICRO-DOT VALVE			
DO NOT SCALE DRAWING REMOVE BURRS AND SHARP EDGES UNLESS OTHERWISE SPECIFIED		Drawn By R. Massero, Jr.	Scale 2:1	Date 04/08/00	Part Number 22141017
		Rev. -			



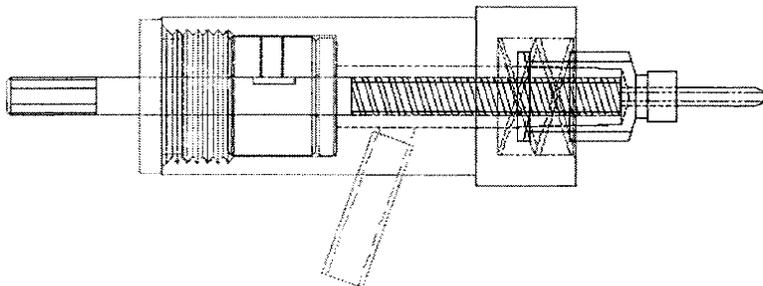
DETAIL	DESCRIPTION	PART NUMBER
1	CARTRIDGE, FIXED	22140023
2	CARBIDE SLEEVE	22140027
3	FEED TUBE	22140011



REVISIONS	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCE ON DECIMALS 2 PLACE DECIMALS ± .015 3 PLACE DECIMALS ± .005 4 PLACE DECIMALS ± .0005 ANGLES ± 1/2° MACHINE FINISH .63 R.M.S.		GPD 2322 I-70 Frontage Road Grand Junction, CO 81505 USA		
			Title CARTRIDGE SUB-ASSEMBLY, FIXED		
			For MICRO-DOT VALVE		
DO NOT SCALE DRAWING REMOVE BURRS AND SHARP EDGES UNLESS OTHERWISE SPECIFIED		Drawn By R. Massero, Jr.	Scale 2:1	Date 04/08/00	Part Number 22141018
				Rev. -	

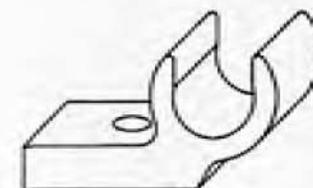
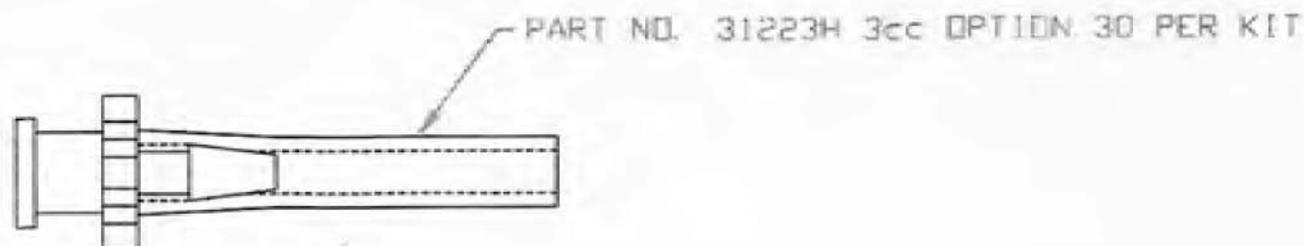


DETAIL	DESCRIPTION	PART NUMBER
1	CARTRIDGE, LUER-LOK	22140030
2	SLEEVE, CARBIDE	22140034
3	FEED TUBE	22140011

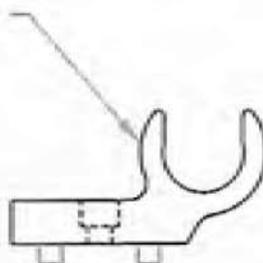


REVISIONS	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCE ON DECIMALS 2 PLACE DECIMALS ± .015 3 PLACE DECIMALS ± .005 4 PLACE DECIMALS ± .0005 ANGLES ± 1/2° MACHINE FINISH <u>63 R.M.S.</u>		GPD 2322 I-70 Frontage Road Grand Junction, CO 81505 USA		
	DO NOT SCALE DRAWING REMOVE BURRS AND SHARP EDGES UNLESS OTHERWISE SPECIFIED		Title CARTRIDGE SUB-ASSEMBLY, LUER-LOK For MICRO-DOT VALVE		
	Drawn By R. Massero, Jr.	Scale 2:1	Date 04/08/00	Part Number 22141019	Rev. -

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3cc SYRINGE HOLDER  
PART NUMBER 30072A

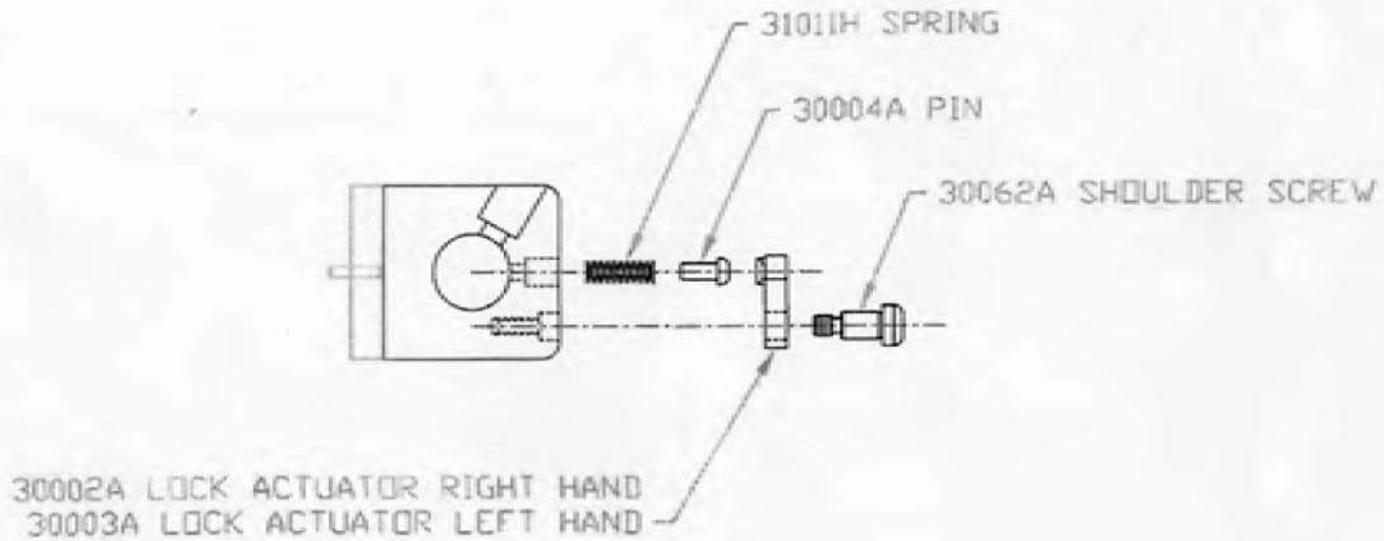


USE THIS KIT WHEN DISPENSING MATERIAL SUPPLIED IN 3cc SYRINGES.  
REPLACE THE STANDARD SYRINGE HOLDER WITH THE 3cc SYRINGE HOLDER SUPPLIED IN THIS KIT. MOUNT USING THE SAME HARDWARE AND MOUNTING LOCATION. USE THE SUPPLIED FEED TUBE ASSEMBLIES ONLY WHEN USING THIS SYRINGE HOLDER.

THIS KIT CAN BE USED ON A LEFT HAND OR RIGHT HAND MICRO VALVE.

REVISIONS	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCE ON DECIMALS 2 PLACE DECIMALS ± .015 3 PLACE DECIMALS ± .005 4 PLACE DECIMALS ± .0005 ANGLES ± .12° MACHINE FINISH .80 R.M.S.	<b>GPD Global</b> <sup>®</sup>			
	DO NOT SCALE DRAWING REMOVE BURRS AND SHARP EDGES UNLESS OTHERWISE SPECIFIED	Title 3cc SYRINGE ADAPTER KIT For DL MICRO VALVE			
	Drawn By R. Messero, Jr.	Scale 2:1	Date 01/08/03	Part Number 30156A	Rev. -

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REVISIONS

UNLESS OTHERWISE SPECIFIED  
 DIMENSIONS ARE IN INCHES  
 TOLERANCE ON DECIMALS  
 2 PLACE DECIMALS ± .015  
 3 PLACE DECIMALS ± .005  
 4 PLACE DECIMALS ± .0005  
 ANGLES ± 1°  
 MACHINE FINISH ± 32 R.M.S.

DO NOT SCALE DRAWING  
 REMOVE BURRS AND SHARP EDGES  
 UNLESS OTHERWISE SPECIFIED

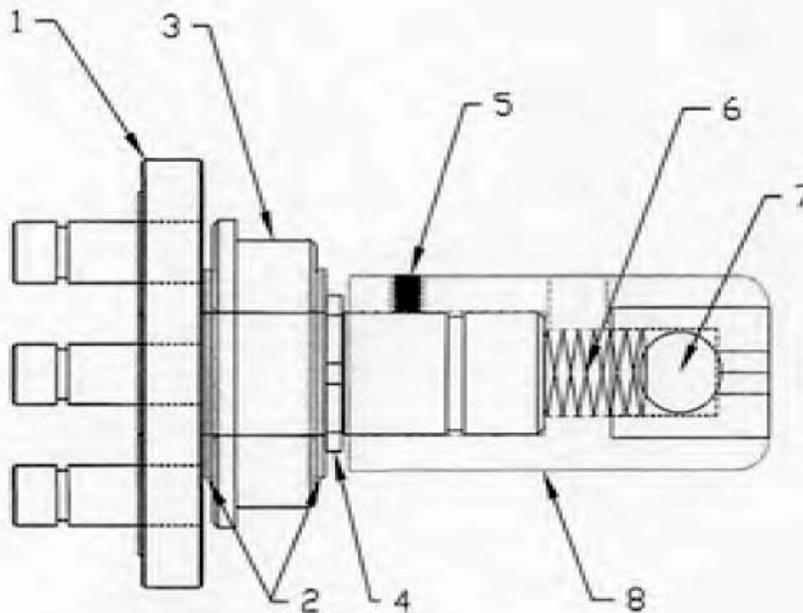
**GPD Global**®

Title LATCH ASSEMBLY PUMP HOUSING

For ULTRA MICRO DISPENSING PUMP

Drawn By	Scale	Date	Part Number	Rev.
R. Massero, Jr.	3:1	04/08/00	30155A	-

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DETAIL	DESCRIPTION	PART NUMBER
1	REDUCER HUB ASSEMBLY	30034A
2	BEARING WASHERS	31115H
3	BEARING	31117H
4	SNAP RING	31118H
5	SOCKET SET SCREW	31001H
6	SPRING	31010H
7	BRASS BALL	31009H
8	COUPLING	30040A

REVISIONS

UNLESS OTHERWISE SPECIFIED  
 DIMENSIONS ARE IN INCHES  
 TOLERANCE ON DECIMALS  
 2 PLACE DECIMALS ± .015  
 3 PLACE DECIMALS ± .005  
 4 PLACE DECIMALS ± .0005  
 ANGLES ± 1/2°  
 MACHINE FINISH .83 R.M.S.

DO NOT SCALE DRAWING  
 REMOVE BURRS AND SHARP EDGES  
 UNLESS OTHERWISE SPECIFIED

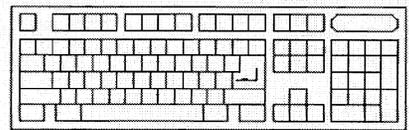
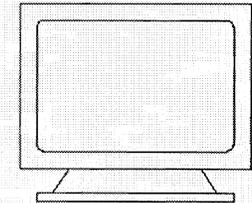
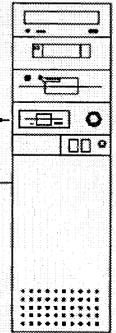
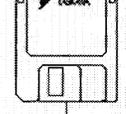
**GPD Global**®

Title  
 COUPLING ASSEMBLY-TRANSMISSION

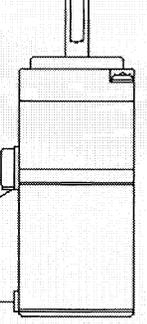
For  
 ULTRA MICRO DISPENSING PUMP

Drawn By R. Massaro, Jr.	Scale 3:1	Date 04/08/00	Part Number 30036A	Rev. -
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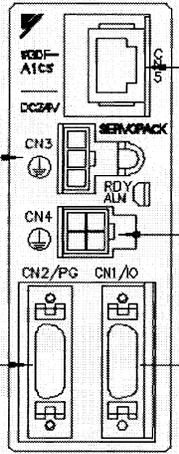
SIGMA SOFTWARE  
10/3661



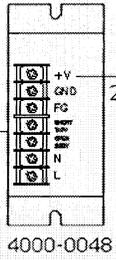
MOTOR  
4900-0033



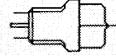
DRIVE  
SGDF-A2CS



POWER SUPPLY



115/240 VAC



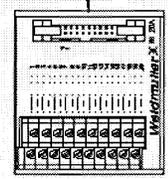
2218200

2218201

POWER CABLE  
2218202

ENCODER CABLE  
2218203

TRANSITION CABLE



TRANSITION BLOCK  
2218204

TERMINAL LAYOUT

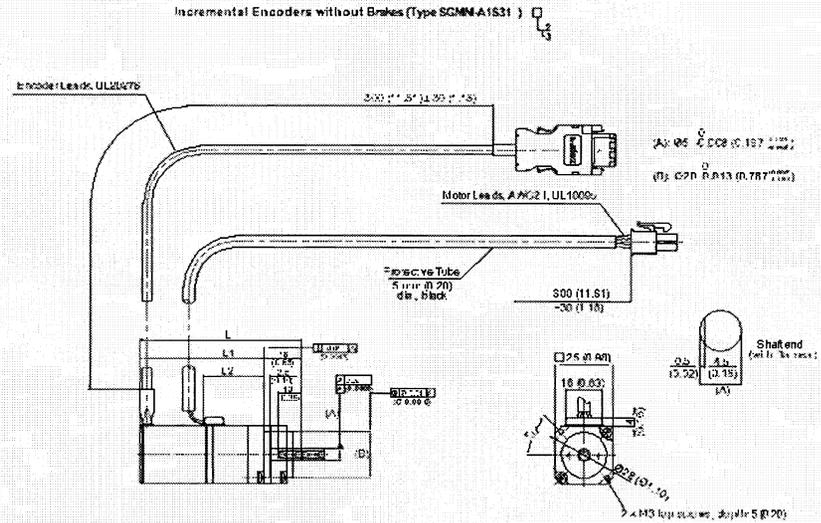
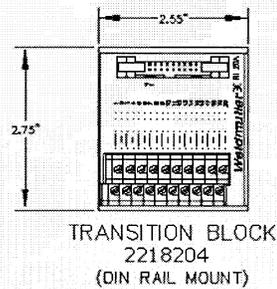
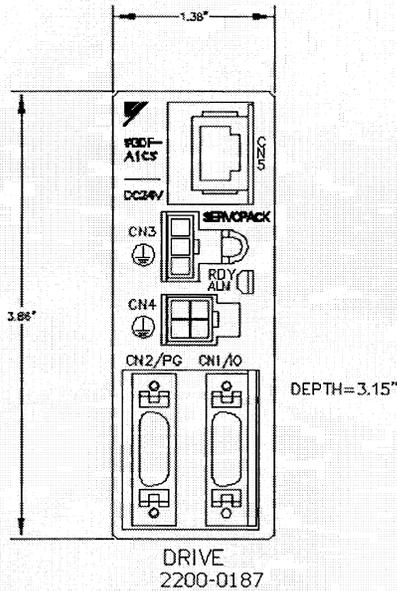
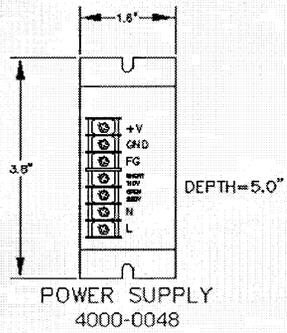
TERMINAL		
1	INH	SERV ON
2	IN2	ALARM RESET
3	SG-COM	OUTPUT SIGNAL OY
4	---	---
5	---	---
6	---	---
7	ALW	ALARM OUTPUT
8	OUT2	ALARM OUT
9	+24 VLN	EXT INPUT POWER SUPPLY
10	---	---
11	---	---
12	V-REF, T-REF	REFERENCE INPUT
13	SG	OY
14	PAO	PG OUTPUT PHASE A
15	PBO	PG OUTPUT PHASE B
16	PBO	PG OUTPUT PHASE B
17	PCO	PG OUTPUT PHASE C
18	PCO	PG OUTPUT PHASE C
19	PCO	PG OUTPUT PHASE C
20	FG	FRAME GROUND

103198A

REV.	DATE	BY	CHKD.	APP'D.	TITLE	DRAWN BY	DATE	SHEET	OF
					BRADFORD LABS	10319801		1	2
					ONE LINE DIAGRAM	RON	3-3-00		

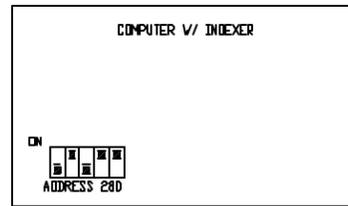
**BAKER**  
MOTION CONTROL SYSTEMS, INC.

SEEKONK, MA. 02771



Type	Size	Material	L1	L2	Output	Torque	Time	Number of	A	Motor
AWG21	0.020	UL1009	1.000	0.010	0.010	0.010	1.000	1.000	0.010	0.010
AWG21	0.020	UL1009	1.000	0.010	0.010	0.010	1.000	1.000	0.010	0.010

- Notes:
- 1) The detector uses a 2048 PR incremental encoder.
  - 2) The allowable load is applied to the shaft end.

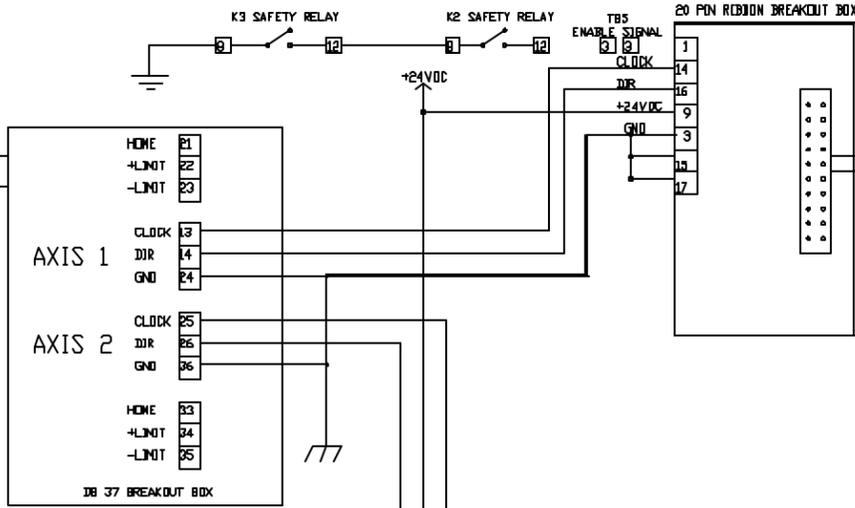


AXIS 1 & 2 ARE ON INDEXER CARD DB37  
 AXIS 3 & 4 ARE ON SEPARATE DB37

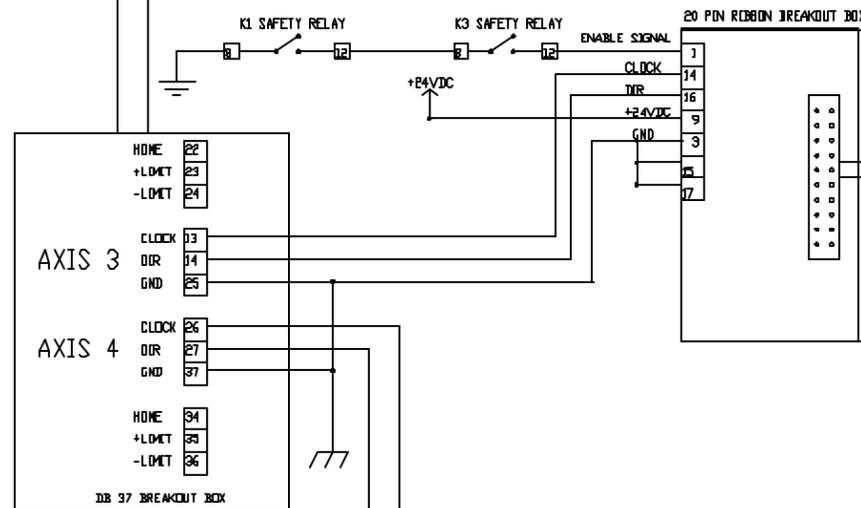
NOTE: MOTOR/AMPLIFIER REQUIRES TUNING BEFORE USE

AXIS 1 & 2

AXIS 3 & 4

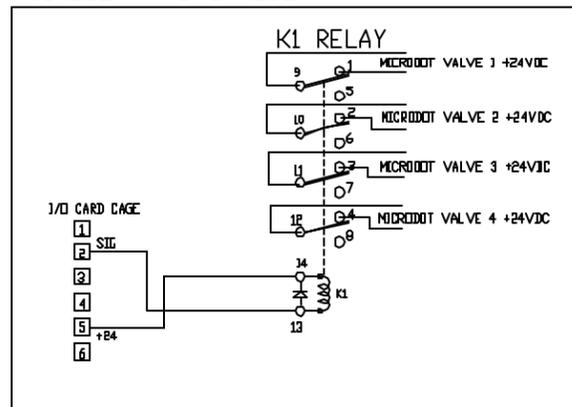


ALL CONNECTIONS TYPICAL FOR MULTIPLE MICRODOT VALVES



ALL CONNECTIONS TYPICAL FOR MULTIPLE MICRODOT VALVES

MICRODOT VALVE RESET



Revision History		
Revision	Date	Description
A	4-10-14	Initial Release

