

# Level Detect

## User Guide

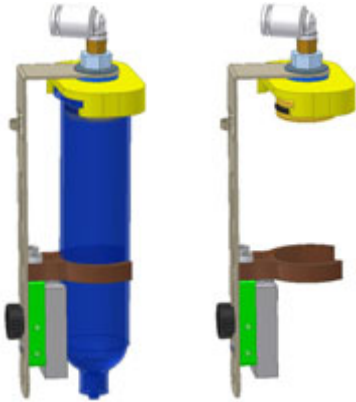
for use with Level Detect Models 22293209, 22293218, 22293219, 22293236

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### Overview

The optional Level Detect uses a capacitive proximity Sensor to identify the level of material in a material syringe. The Level Detect is syringe size specific (5 cc, 10 cc, 30 cc, 55 cc, etc.). A Syringe Support - ready to receive a specific size syringe - is included.

**Figure 1:** Level Detect with and without syringe

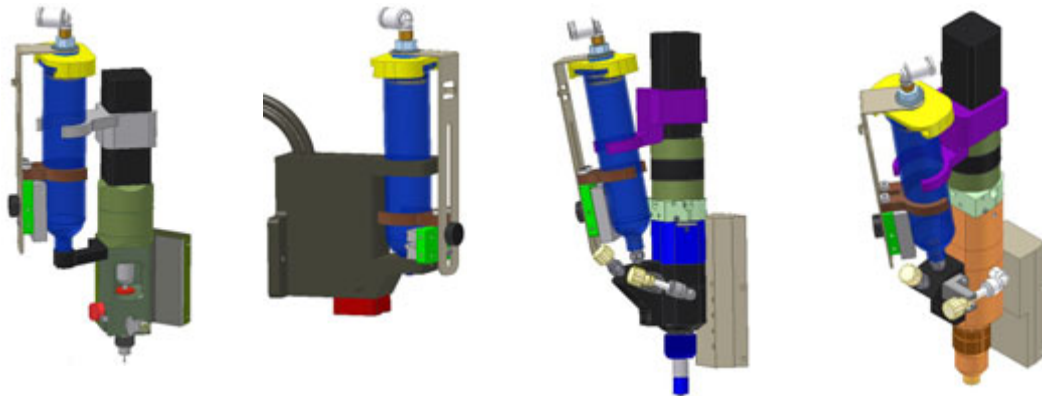


### Mount Syringe & Level Detect on Pump

To mount a syringe and Level Detect on a pump:

1. Screw a syringe onto the pump.
2. Press the syringe into the Level Detect Syringe Support.
3. Attach the Level Detect Syringe Cap assembly to the syringe, twisting the Syringe Cap 90 degrees to lock it in place on the syringe.

**Figure 2:** Examples of Level Detect mounted on Micro-Dot, NCM5000, PCD3H, & PCD4H pumps

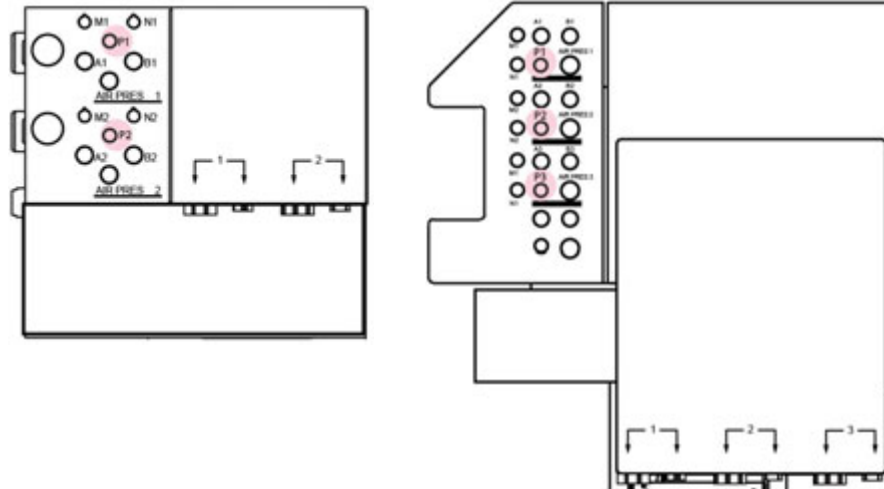


## Install Level Detect on System

To install a Level Detect on a GPD MAX Series or DS Series dispense system:

1. [Mount Syringe & Level Detect on Pump](#) (pg 1).
2. Mount the pump on a GPD dispense system.
3. Insert the Level Detect Sensor cable connector into the P receptacle (for the applicable mount station) on the dispense system interconnect panel.

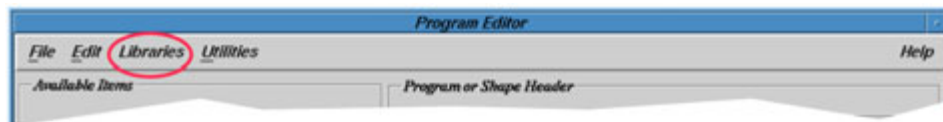
**Figure 3:** Interconnect panel for MAX Series (left) & DS Series (right)



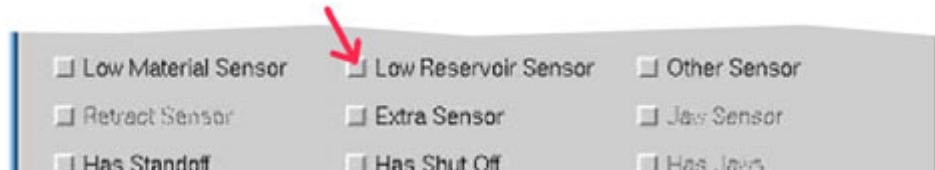
## Configure System for Level Detect

For initial setup, configure a GPD MAX Series or DS Series dispense system for a Syringe-Specific Level Detect:

1. In the FLOWare control software, open the Program Editor and from the menu bar select Libraries > Head.



2. When the Valve/Tool Editor window displays, select Low Reservoir Sensor.



**NOTE:** “Low Reservoir Sensor” is tied to IO/HeadX/LevelDetect in the IO System. Verify that IO/HeadX/LevelDetect is set to the proper input for the level detect option.

IO/Head1/ReleaseCtl:	Output	314	Normal	False	PseudoIODriver
IO/Head1/LevelDetect:	Input	14	Invert	False	PhysIODriver
IO/Head1/LowSense:	Input	315	Normal	False	PseudoIODriver
IO/Head1/AltSense:	Input	316	Normal	False	PseudoIODriver
IO/Head1/FlowCutoff:	Input	317	Normal	False	PseudoIODriver
IO/Head1/InA:	Input	318	Normal	False	PseudoIODriver

## Replace Syringe

To remove and replace a syringe:

1. Twist the syringe 90 degrees to disengage it from the Level Detect Syringe Cap tabs.
2. Release the syringe from the Level Detect Syringe Support.
3. Unscrew the syringe from the pump.

## Adjustments

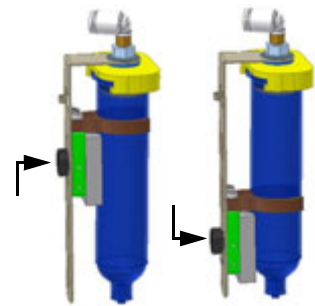
### Sensor Position

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Sliding the Level Detect Sensor up / down the L-Bracket moves the Sensor along the length of the syringe.

To change the position of the Sensor:

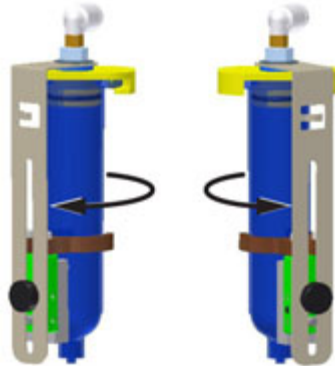
1. Loosen the Thumbscrew on the Level Detect.
2. Slide the Sensor along the syringe to desired sense point.
3. Tight the Thumbscrew.



### Sensor Rotation

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As needed for some pump configurations or syringe types, manually rotate the Level Detect assembly about the syringe to achieve an ideal Sensor position or to avoid obstructions.



## Sensor Orientation



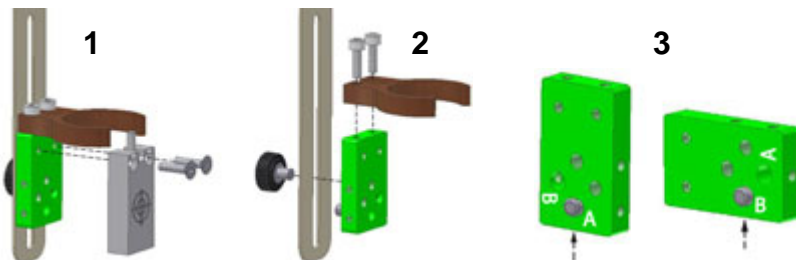
The orientation of the Sensor can be changed as needed to accommodate certain pump configurations or syringe types. The Level Detect Sensor can adopt either a vertical or horizontal orientation.

For illustrative purposes, sensor orientation in the following procedure is shown changing from vertical to horizontal.

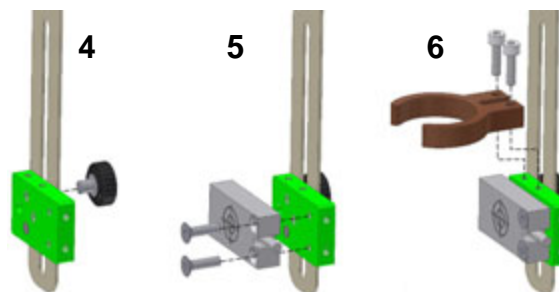
To change Sensor orientation:

1. Remove 2 screws and separate Sensor from Sensor Plate. (Figure 4, image 1)
2. Remove thumb screw and Sensor Plate from L-bracket. Remove 2 screws and separate Syringe Support from Sensor Plate. (Figure 4, image 2)
3. Loosen set screw in Sensor Plate. Move the dowel pin to the hole appropriate for desired orientation: A for vertical, B for horizontal. Tighten recessed set screw to secure dowel pin in Sensor Plate. (Figure 4, image 3)
4. Position Sensor Plate in new orientation and secure to L-bracket with thumb screw. When orienting sensor horizontally, it can be mounted in either direction. (Figure 5, image 4)
5. Secure Sensor to Sensor Plate with 2 screws. (Figure 5, image 5)
6. Secure Syringe Support to Sensor Plate with 2 screws. (Figure 5, image 6)
7. The potentiometer may or may not need to be adjusted. For details, refer to [Sensor Sensitivity](#) (pg 5).
8. Verify thumb screw is tightened.

**Figure 4:** Disassembly of vertical sensor orientation



**Figure 5:** Reassembly into horizontal sensor orientation



## Sensor Sensitivity

### Application notes for water based media

This sensor has been adjusted at the factory for standard applications. With this setting, the sensor is suitable for detecting water based liquids through glass or plastic walls without any further adjustment. The factory setting can automatically mask out glass or plastic walls (approx. 0.5 mm to 6 mm), and compensate within wide limits for foam, moisture and material build-up to the inside and outside of the tank concerned.

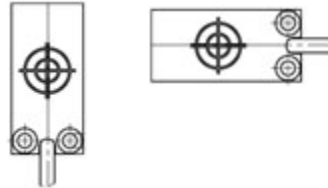
### Specialized applications

Because this sensor can also be used with water based liquids in hitherto insoluble and critical applications, e.g. with glass or plastic walls thicker than 6 mm, the factory setting can be altered by the user.

To adjust Sensor sensitivity to identify an empty or full syringe condition:

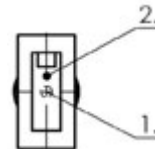
1. With the Level Detect Syringe Cap assembly installed, loosen the Thumbscrew.
2. Slide the Sensor to a position along the syringe representing an empty syringe.

**Figure 6:** Sensor face (orientation may vary).



3. Using the included screw driver, open the sensor cover to access the Sensor Potentiometer (Item 1).

**Figure 7:** Open the cover to reveal the potentiometer and lamp.



4. Adjust the potentiometer (Item 2) to the desired syringe condition:

Syringe Condition	Instructions
Empty	<ol style="list-style-type: none"> <li>1. Slide Sensor to a position along syringe where fluid is ABSENT.</li> <li>2. Adjust the potentiometer until the Sensor lamp does NOT light.</li> </ol>
Full	<ol style="list-style-type: none"> <li>1. Slide Sensor to a position along the syringe where fluid is PRESENT.</li> <li>2. Adjust the potentiometer until the Sensor lamp lights.</li> </ol>

5. Close the Sensor cover.
6. Move the sensor to the desired operating position along the syringe.
7. Tighten the Thumbscrew.

## Test Sensor

The Sensor lamp lights when a full syringe condition exists and turns off when an empty syringe condition exists.

To test the current Sensor sensitivity setting:

1. Loosen the Thumbscrew.
2. Slide the Sensor along the length of the syringe while watching the Sensor indicator lamp as it changes relative to the presence or absence of material in the syringe.

## Parts List

For part numbers and part descriptions, refer to [Mechanical Drawings](#) (pg 6).

## References

### Level Detect Sensor

Sensor type . . . . . Proximity NPN/Normally open (NO), Hirose 6 pin male connector

Pins:

Pin 6 . . . . . Ground

Pin 5 . . . . . +24V (range 12VDC minimum to 30 VDC maximum)

Pin 3 . . . . . sensor output (NPN) 50 mA maximum

### Mechanical Drawings

- [22293218 - Level Detect for 55 cc Syringe](#) (pg 8)
- [22293209 - Level Detect for 30 cc Syringe](#) (pg 7)
- [22293219 - Level Detect for 10cc Syringe](#) (pg 9)
- [22293236 - Level Detect for 5cc Syringe](#) (pg 10)

22293209 - Level Detect for 30 cc Syringe

Syringe-Specific Level Detect

10/4622 - POLYURETHANE HOSE, 6mm OD, BLUE TRANSLUCENT, 1981.2mm [78 in] LENGTH

Parts List			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	10_1547 V1	CONNECTOR,MALE,AIR QUICK_1/8 ID TUBE
2	1	10/3765	FITTING,ELBOW,MALE_5MM X.08,6MM TUBE
3	1	22503021	SENSOR PLATE_LEVEL DETECT
4	1	22503022	L-BRACKET_LEVEL DETECT_30CC
5	1	22503023	SEAL PLUG_LEVEL DETECT_30CC
6	1	22503024	SYRINGE CAP_LEVEL DETECT_30CC
7	1	22503025	SHOULDER BUSHING_LEVEL DETECT
8	1	22503131	SYRINGE SUPPORT_30CC_LEVEL DETECT
9	1	2525-0008	CAP_SCREW_THUMB_M4
10	1	2575-0031	O-RING_VITON_19.0ID X 23.0OD X 2.0W
11	1	REF	30cc SYRINGE
12	1	22293210	SENSOR W/CONNECTOR
13	1	M5517	WASHER SPACER_8MM ID 16MM OD 1.5MM THK
14	1	S7011	WASHER_WAVE_.317IDX.625ODX.042HT
15	1	DAM04008	DOWEL PIN 4.0mm X 8.0mm
16	2	SACSM030050010	CAP SCREW 3MM X 0.5 X 10MM LG
17	1	SACSM040070005	CAP SCREW 4MM X 0.7 - 5MM LG
18	2	SAFANM030050012	FLATHEAD SCREW 3MM X 0.5 -12MM LG
19	2	TACAM030050003	SET SCREW 3MMX0.5 X 3MM LG ALLOY

TOLERANCES UNLESS OTHERWISE SPECIFIED			
FRACTIONS		METRIC	
XXX	± 0.015	0 MM	± 1.0 MM
XXXX	± 0.005	0.0 MM	± 0.4 MM
ANGULAR	± 0.5	0.00 MM	± 0.1 MM
RUNOUT	± 0.003 T.I.R.		
FINISH	N/A		
HEAT TREATMENT	N/A		
DWG SIZE	B		

DESCRIPTION	
LEVEL DETECT SYRINGE MOUNT 30CC	
ASSEMBLY	
LEVEL DETECT	
MATERIAL	
N/A	
DWG NO	
22293209	
DRAWN BY	ALJ
DATE	11/27/2013
SHEET	1 OF 1

LAST REVISED 2/20/2018

**GPD Global**

22293218 - Level Detect for 55 cc Syringe

Syringe-Specific Level Detect

10/4622 - POLYURETHANE HOSE, 6mm OD, BLUE TRANSLUCENT, 1981.2mm [78 in] LENGTH

Parts List			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	10_1547 V1	CONNECTOR,MALE,AIR QUICK_1/8 ID TUBE
2	1	10/3765	FITTING,ELBOW,MALE_5MM X.08,6MM TUBE
3	1	22503021	SENSOR PLATE_LEVEL DETECT
4	1	22503064	L-BRACKET_LEVEL DETECT_55CC
5	1	22503023	SEAL PLUG_LEVEL DETECT_30CC
6	1	22503024	SYRINGE CAP_LEVEL DETECT_30CC
7	1	22503025	SHOULDER BUSHING_LEVEL DETECT
8	1	22503131	SYRINGE SUPPORT_30CC_LEVEL DETECT
9	1	2525-0008	CAP SCREW_THUMB_M4
10	1	2575-0031	O-RING_VITON_19.0ID X 23.0OD X 2.0W
11	1	22293210	SENSOR W/CONNECTOR
12	1	M5517	WASHER SPACER_8MM ID 16MM OD 1.5MM THK
13	1	S7011	WASHER_WAVE_.317IDX.625ODX.042HT
14	1	DAM04008	DOWEL PIN 4.0mm X 8.0mm
15	2	SACSM030050010	CAP SCREW 3MM X 0.5 X 10MM LG
16	1	SACSM040070005	CAP SCREW 4MM X 0.7 - 5MM LG
17	2	SAFANM030050012	FLATHEAD SCREW 3MM X 0.5 -12MM LG
18	2	TACAM030050003	SET SCREW 3MMX0.5 X 3MM LG ALLOY
19	1	REF	SYRINGE_W/SMOOTH FLOW PISTON_55CC

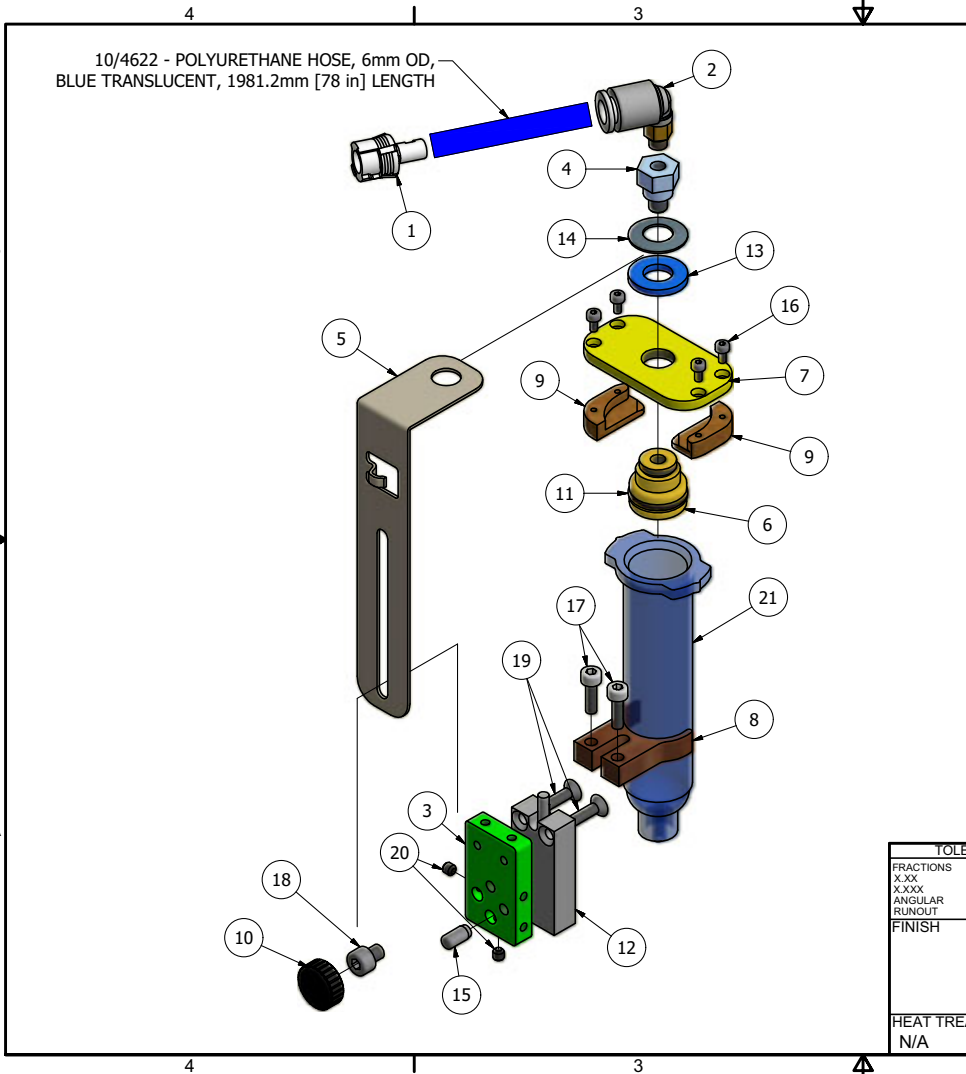
TOLERANCES UNLESS OTHERWISE SPECIFIED			
		METRIC	
FRACTIONS	± .102		
XXX	± 0.015	0 MM	± 1.0 MM
XXXX	± 0.005	0.0 MM	± 0.4 MM
ANGULAR	± 0.5	0.00 MM	± 0.1 MM
RUNOUT	± 0.003 T.I.R.		
FINISH	N/A		
HEAT TREATMENT	N/A		

DESCRIPTION			
LEVEL DETECT SYRINGE SPECIFIC 55CC			
ASSEMBLY			
LEVEL DETECT			
MATERIAL			
N/A			
DWG NO			
22293218			
DRAWN BY ALJ		7/9/2014	SHEET 1 OF 1



22293219 - Level Detect for 10cc Syringe

Syringe-Specific Level Detect



Parts List			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	10_1547 V1	CONNECTOR,MALE,AIR QUICK_1/8 ID TUBE
2	1	10/3765	FITTING,ELBOW,MALE_5MM X.08,6MM TUBE
3	1	22503021	SENSOR PLATE_LEVEL DETECT
4	1	22503025	SHOULDER BUSHING_LEVEL DETECT
5	1	22503065	L-BRACKET_LEVEL DETECT_10CC
6	1	22503066	SEAL PLUG_LEVEL DETECT_10CC
7	1	22503067	SYRINGE CAP BASE_LEVEL DETECT_10CC
8	1	22503132	SYRINGE SUPPORT_LEVEL DETECT_10CC
9	2	22503069	SYRINGE CAP WING_LEVEL DETECT_10CC
10	1	2525-0008	CAP_SCREW_THUMB_M4
11	1	2575-0042	O-RING_VITON_12.0ID X 16.0OD X 2.0W
12	1	22293210	SENSOR W/CONNECTOR
13	1	M5517	WASHER SPACER_8MM ID 16MM OD 1.5MM THK
14	1	S7011	WASHER_WAVE_.317IDX.625ODX.042HT
15	1	DAM04008	DOWEL PIN 4.0mm X 8.0mm
16	4	SACSM020040004	CAP SCREW 2MM X .04 4MM LG, SST
17	2	SACSM030050010	CAP SCREW 3MM X 0.5 X 10MM LG
18	1	SACSM040070005	CAP SCREW 4MM X 0.7 - 5MM LG
19	2	SAFANM030050012	FLATHEAD SCREW 3MM X 0.5 -12MM LG
20	2	TACAM030050003	SET SCREW 3MMX0.5 X 3MM LG ALLOY
21	1	10CC SYRINGE	SYRINGE TUBE, 10cc (FOR REFERENCE)

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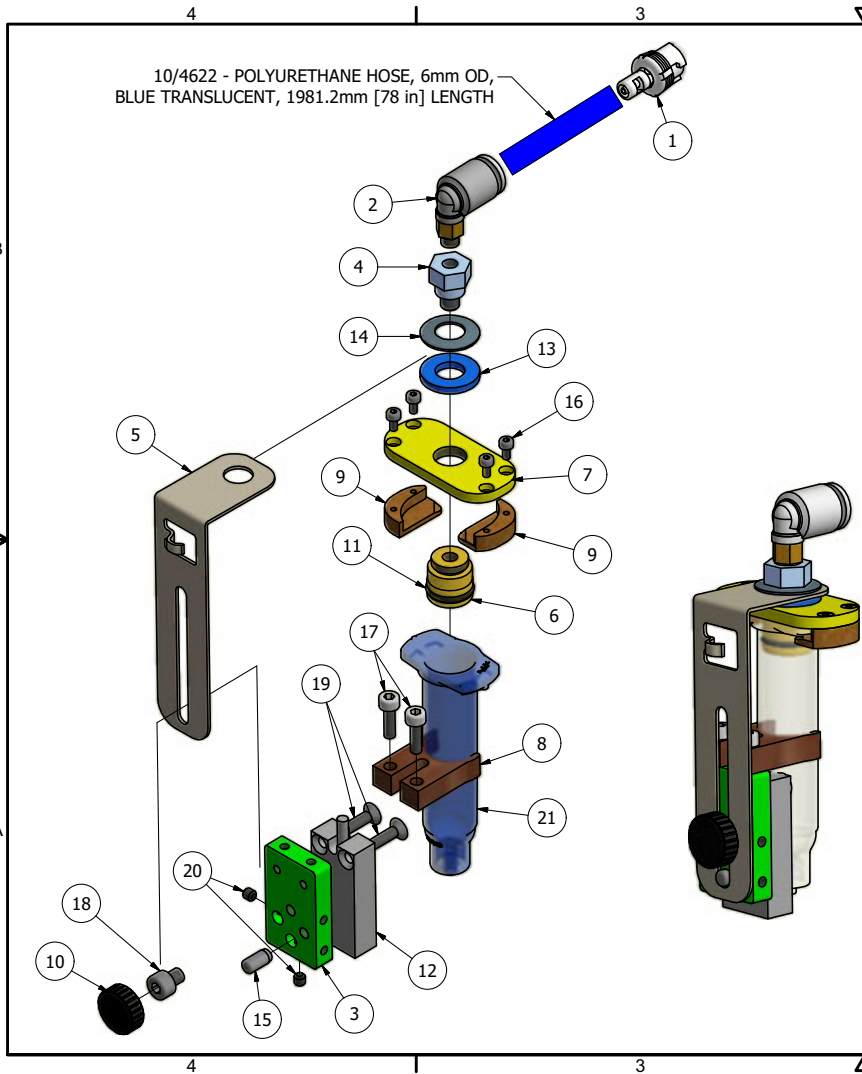


TOLERANCES UNLESS OTHERWISE SPECIFIED			
	METRIC		
FRACTIONS	± .102		
XXX	± 0.015	0 MM	± 1.0 MM
XXXX	± 0.005	0.0 MM	± 0.4 MM
ANGULAR	± 0.5	0.00 MM	± 0.1 MM
RUNOUT	± 0.003 T.I.R.		
FINISH	N/A		
HEAT TREATMENT	N/A		
DWG SIZE	B		

DESCRIPTION	LEVEL DETECT SYRINGE MOUNT 10CC		
ASSEMBLY	LEVEL DETECT		
MATERIAL	N/A		
DWG NO	22293219		
DRAWN BY	ALJ	9/29/2014	SHEET 1 OF 1

22293236 - Level Detect for 5cc Syringe

Syringe-Specific Level Detect



Parts List			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	10_1547 V1	CONNECTOR,MALE,AIR QUICK_1/8 ID TUBE
2	1	10/3765	FITTING,ELBOW,MALE_5MM X.08,6MM TUBE
3	1	22503021	SENSOR PLATE_LEVEL DETECT
4	1	22503025	SHOULDER BUSHING_LEVEL DETECT
5	1	22503072	L-BRACKET_LEVEL DETECT_5CC
6	1	22503073	SEAL PLUG_LEVEL DETECT_5CC
7	1	22503074	SYRINGE CAP BASE_LEVEL DETECT_5CC
8	1	22503133	SYRINGE SUPPORT_LEVEL DETECT_5CC
9	2	22503076	SYRINGE CAP WING_LEVEL DETECT_5CC
10	1	2525-0008	CAP_SCREW_THUMB_M4
11	1	2575-0045	O-RING_VITON_10.0ID X 13.0OD X 1.5W
12	1	22293210	SENSOR W/CONNECTOR
13	1	M5517	WASHER SPACER_8MM ID 16MM OD 1.5MM THK
14	1	S7011	WASHER_WAVE_.317IDX.625ODX.042HT
15	1	DAM04008	DOWEL PIN 4.0mm X 8.0mm
16	4	SACSM020040004	CAP SCREW 2MM X .04 4MM LG, SST
17	2	SACSM030050010	CAP SCREW 3MM X 0.5 X 10MM LG
18	1	SACSM040070005	CAP SCREW 4MM X 0.7 - 5MM LG
19	2	SAFANM030050012	FLATHEAD SCREW 3MM X 0.5 -12MM LG
20	2	TACAM030050003	SET SCREW 3MMX0.5 X 3MM LG ALLOY
21	1	5CC SYRINGE EFD	SYRINGE TUBE, 5cc (FOR REFERENCE)

LAST REVISED 2/20/2018



TOLERANCES UNLESS OTHERWISE SPECIFIED			DESCRIPTION
FRACTIONS		METRIC	
XXX	± 0.015	0 MM ± 1.0 MM	LEVEL DETECT SYRINGE MOUNT 5CC
XXXX	± 0.005	0.0 MM ± 0.4 MM	ASSEMBLY
ANGULAR	± 0.5	0.00 MM ± 0.1 MM	LEVEL DETECT
RUNOUT	± 0.003 T.I.R.		MATERIAL
FINISH			N/A
HEAT TREATMENT			DWG NO
N/A			22293236
HEAT TREATMENT		DWG SIZE	DRAWN BY ALJ 11/14/2014 SHEET 1 OF 1
N/A		B	

## Warranty

**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.