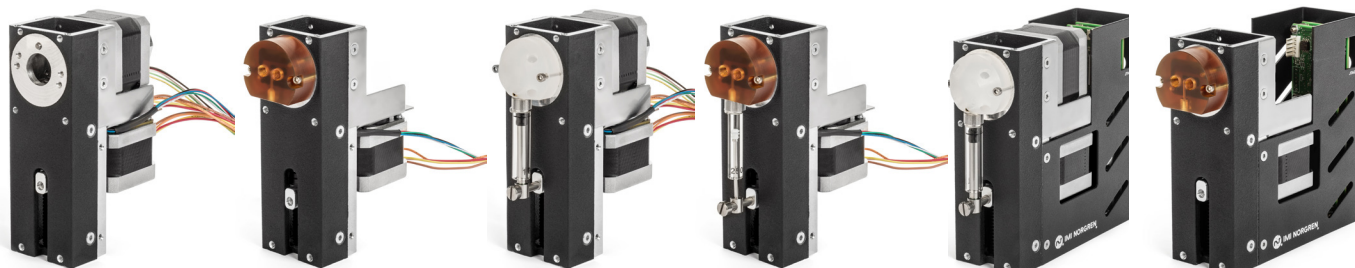


## Cadent™ 3 Syringe Pump

- > Programmable, maintenance free, precision liquid metering device
- > 30mm stroke driven via stepper motor and precision lead screw
- > Available in three mechanical resolutions: 6K, 12K, 24K
- > Highly flexible and versatile to meet a variety of system configurations
- > Exceptional precision, accuracy and lifetime performance
- > Available with or without an advanced controller
- > Can be used as a stand-alone controller or integrated into more complex systems



Level 1  
Robust Syringe and Valve Drive

Level 2\*  
Including Valve  
\*Syringes sold separately

Level 3\*  
Including Advanced Controller  
\*Syringes sold separately

### Specifications

#### Environmental

**Operating Temperature:**  
2°C to 50°C (36°F to 122°F)

**Operating Humidity:**  
<80% Relative Humidity at 5°C to 30°C and <50% at 31°C to 50°C

**Storage Temperature:**  
-33°C to 71°C (-27°F to 160°F)

**Noise <sup>(1)</sup>:**

< 55dBA

**Lifetime <sup>(2)</sup>:**

> 5 Million cycles (Cadent 3)  
[1 cycle = 1 full dispense and aspirate move]

#### Mechanical

##### Operation:

Any orientation

##### Mounting Holes:

Top and bottom

Front face

##### Resolutions:

6K, 12K and 24K steps

#### Performance Speed <sup>(3)</sup>:

0.0625 - 10,000 steps/sec

#### Precision:

0.50% CV at 1/10th dispense

0.05% CV at full stroke dispense

#### Accuracy:

±0.3% at 1/10th dispense

±0.2% at full stroke dispense

#### Flow Rate <sup>(3)</sup>:

Min: 0.008µL/min (with 50µL syringe)

Max: 500mL/min (with 5mL syringe)

#### Full Dispense Time <sup>(3)</sup>:

Min: 0.6 secs (with 6K resolution)

Max: 6400 mins (with 24K resolution)

#### Flow Accuracy <sup>(3)</sup>:

±1%

#### Linearity:

R > 0.9999

#### Electrical Connection <sup>(3)</sup>:

6 inputs - 2 Analog/Digital, 4 Digital

4 digital outputs

Tamper pin

#### Communication Options <sup>(3)</sup>:

RS-232, RS485, CANbus

#### Power Requirements:

24VDC (± 5% allowance)  
(with a maximum power ripple of 720mv peak to peak).

#### Power Consumption:

32 watts max; 3 watts idle.

#### Accessory Options

##### Solenoid Valve Options:

FAS 3/2 Microsol MS (Media Separated) Isolation Valve

##### Rotary Valve Options:

up to 12-way

##### Syringe Options:

50µl to 5mL

##### Compliance:

REACH & RoHS Compliant

UL & CE Compliant

CSA Certified

<sup>(1)</sup> Rated with Norgren advanced controller (Level 3)

<sup>(2)</sup> Tested using DI water and a 2.5mL syringe at 30psig

<sup>(3)</sup> Based on a 650Hz sample rate using a 2.5mL syringe at 250µL per minute

## Cadent 3 Pump

All pumps are offered with a pre-assembled valve. Replacement valves and KloeHN™ syringes (not included) may be purchased separately.

Cadent 3 Valve Description	6K Resolution			12K Resolution			24K Resolution			Replacement Valve Part Number
	Level 1	Level 2	Level 3	Level 1	Level 2	Level 3	Level 1	Level 2	Level 3	
None (rotary valve feature)	100276		100285	100277		100736	100278		100286	
FAS 3/2 Microsol Solenoid valve		100279	100287		100280	100288		100281	100289	20413
1-Way Valve (Through-Block)		100273	100282		100274	100283		100275	100284	23272
2-WAY Distribution - Plug		100926	100940		100954	100968		100982	100996	20052
3-WAY Distribution - Plug		100927	100941		100955	100969		100983	100997	25394
4-WAY Distribution - Plug		100928	100942		100956	100970		100984	100998	25397
5-WAY Distribution - Plug		100929	100943		100957	100971		100985	100999	25400
6-WAY Distribution - Plug		100930	100944		100958	100972		100986	101000	25402
3-WAY Distribution - Face		100931	100945		100959	100973		100987	101001	23324
4-WAY Distribution - Face		100932	100946		100960	100974		100988	101002	23325
6-WAY Distribution - Face		100933	100947		100961	100975		100989	101003	23327
3-WAY Distribution - Ceramic		100934	100948		100962	100976		100990	101004	30150
4-WAY Distribution - Ceramic		100935	100949		100963	100977		100991	101005	30151
5-WAY Distribution - Ceramic		100936	100950		100964	100978		100992	101006	30141
6-WAY Distribution - Ceramic		100937	100951		100965	100979		100993	101007	30142
8-WAY Distribution - Ceramic					100966	100980		100994	101104	101035
12-WAY Distribution - Ceramic					100967	100981		100995	101105	101038

Solenoid and Through-Block options are not available without a valve.

See Page 3 for additional valve options.

Other combinations not shown in the table above are available upon request.

Starter Kit	RS-232	RS-485	CANbus
Starter Kit (includes all items listed below)	100904	100905	100906
Power Supply	100907	100907	100907
Power Cable	50603	50603	50603
Communications Cable	100883	100884	100885
USB Communications Adapter	28646	100917	100918
Hardware User Manual	101101	101101	101101
Cadent Connect Software (GUI)	101102	101102	101102

The Cadent Connect software can be downloaded at [www.imi-precision.com/CadentConnect](http://www.imi-precision.com/CadentConnect)

PTFE KloeHN Syringes				UHMW KloeHN Syringes			
Size	Standard Assy	ZDV Assy	Orifice Size (in)	Size	Standard Assy	ZDV Assy	Orifice Size (in)
50µL	23164	27960	0.023	50µL	24411	27958	0.023
100µL	23165	27961	0.023	100µL	24412	27959	0.023
250µL	23166	28006	0.031	250µL	24413	28011	0.031
500µL	23167	28007	0.031	500µL	24414	28012	0.031
1.0mL	23168	28008	0.073	1.0mL	24415	28013	0.073
2.5mL	23169	28009	0.073	2.5mL	24416	28014	0.073
5.0mL	23170	28010	0.073	5.0mL	24417	28015	0.073

Wetted materials: Borosilicate glass, PCTFE, PTFE

Wetted materials: Borosilicate glass, PCTFE, UHMW-PE, PTFE

Zero Dead Volume (ZDV) KloeHN syringes have a pointed plunger tip to minimize carryover. All syringes are lubricated with Silicone oil. For more information on syringes please consult PSD-0006 or visit our website.

### Ancillary Items

Electrical Mounting Adapter Kit (V3 to Cadent 3)	100624
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**Rotary Face Valves**

P/N	Orifice Size (in/mm)	Valve Type
23324	0.059	3-Way Distribution
24643	0.020	4-Way Distribution
23325	0.059	4-Way Distribution
23326	1mm	5-Way Distribution
23327	1mm	6-Way Distribution

Wetted Materials: PPS, XP-113, PTFE. These valves are also lubricated with Krytox oil.

P/N	Orifice Size (in)	Valve Type
23562	0.059	3-Way Non-Distribution
23563	0.059	4-Way Non-Distribution

**Optional Accessories**

P/N	Description
24528	Weep Hole Fitting - PEEK
24529	Weep Hole Fitting - Stainless Steel
18659	Port Plug Screw, use with seal P/N 18781

**Rotary Ceramic Valves**

P/N	Orifice Size (in)	Valve Type
30138	0.031	2-Way Distribution
30149	0.059	2-Way Distribution
30139	0.031	3-Way Distribution
30150	0.059	3-Way Distribution
30140	0.031	4-Way Distribution
30151	0.059	4-Way Distribution
30141	0.031	5-Way Distribution
30152	0.040	5-Way Distribution
30142	0.031	6-Way Distribution
30153	0.040	6-Way Distribution
101034	0.031	8-Way Distribution
101035	0.040	8-Way Distribution
101036	0.031	12-Way Distribution
101038	0.040	12-Way Distribution

Wetted Materials: PEEK, Alumina Ceramic, FFKM PTFE. These valves are lubricated with Krytox oil.

P/N	Orifice Size (in)	Valve Type
30144	0.031	3-Way Non-Distribution
30155	0.059	3-Way Non-Distribution
30145	0.031	4-Way Non-Distribution
30156	0.059	4-Way Non-Distribution
30147	0.031	6-Way Non-Distribution
30158	0.040	6-Way Non-Distribution

**Optional Accessories**

P/N	Description
24528	Weep Hole Fitting - PEEK
24529	Weep Hole Fitting - Stainless Steel
18659	Port Plug Screw, use with seal P/N 18781

**Rotary Plug Valves**

P/N	Orifice Size (in/mm)	Valve Type
23272	0.059	1-Way Distribution
20051	0.031	2-Way Distribution
20052	0.059	2-Way Distribution
20053	0.076	2-Way Distribution
25393	0.031	3-Way Distribution
25394	0.059	3-Way Distribution
25395	0.076	3-Way Distribution
25396	0.031	4-Way Distribution
25397	0.059	4-Way Distribution
25398	0.076	4-Way Distribution
25399	0.031	5-Way Distribution
25400	1mm	5-Way Distribution
25401	0.031	6-Way Distribution
25402	1mm	6-Way Distribution

Wetted Materials: PCTFE, PTFE. These valves are lubricated with Silicone oil.

P/N	Orifice Size (in)	Valve Type
28391	0.031	3-Way Non-Distribution
28393	0.059	3-Way Non-Distribution
28395	0.076	3-Way Non-Distribution
28397	0.031	4-Way Non-Distribution
28399	0.059	4-Way Non-Distribution
28401	0.076	4-Way Non-Distribution

**Optional Accessories**

P/N	Description
24528	Weep Hole Fitting - PEEK
24529	Weep Hole Fitting - Stainless Steel
18659	Port Plug Screw, use with seal P/N 18781

**Solenoid Valves**

Configuration	P/N	Orifice Size (in)
FAS 3/2 Microsol Media Separated valve	20413	0.062

Wetted Materials: PEEK, EPDM

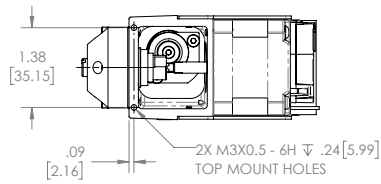
**Valve Notes:**

Port connection is 1/4-28 UNF. For more information on valves, consult PSD-0031 or visit our website.

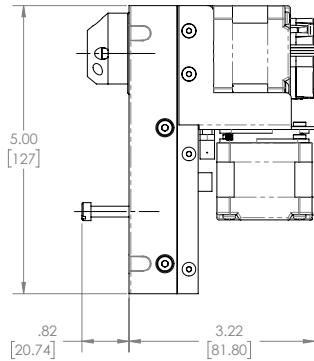
All valve ports are accessible when using syringes listed and Kloehn™ spring-loaded fittings (recommended).

Valve weep hole port connection is #6-40 UNF-2A. For use with 1/16" OD tubing.

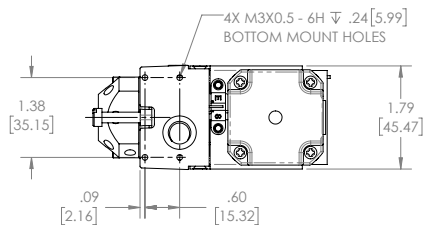
### Dimensions for Level 2



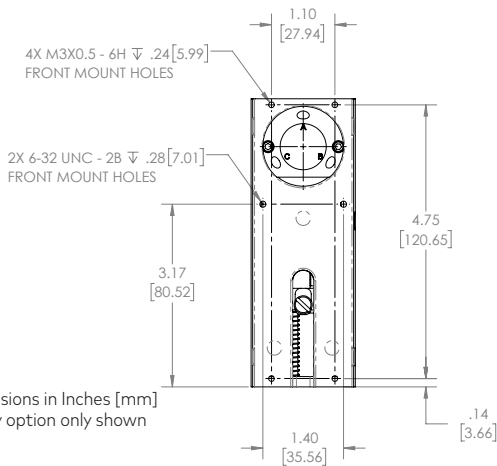
TOP VIEW



SIDE VIEW

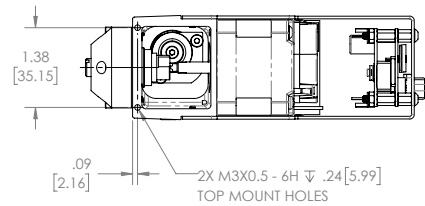


BOTTOM VIEW

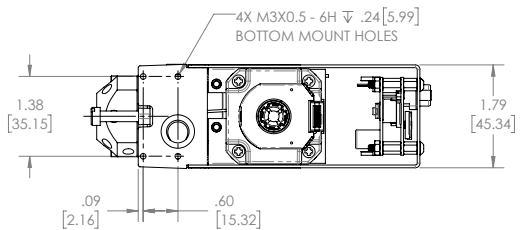
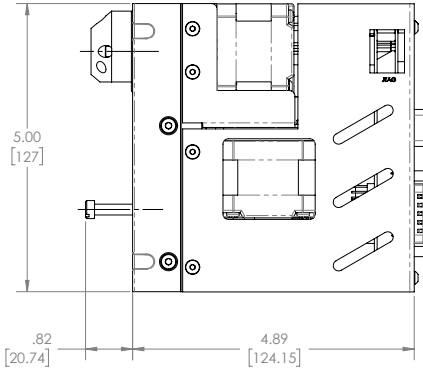
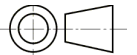


Dimensions in Inches [mm]  
Rotary option only shown

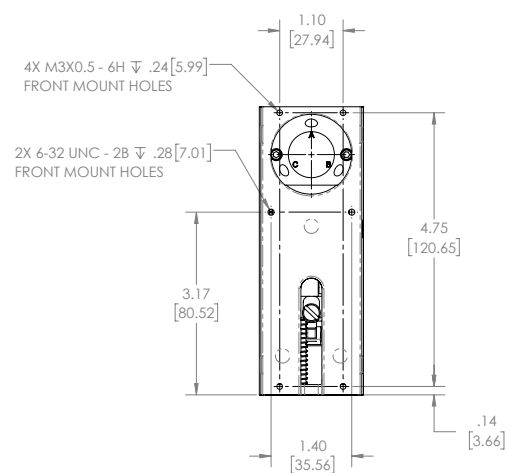
### Dimensions for Level 3



Third Angle Projection



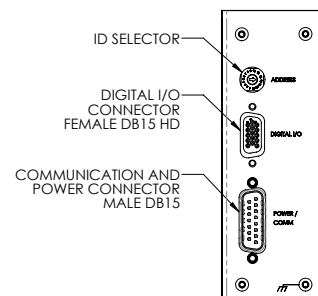
FRONT VIEW



### Warning

Improper selection, misuse, age or malfunction of components used in systems can cause failure in various modes. The system designer is warned to consider the failure modes of all component parts and to provide adequate safeguards to prevent personal injury or damage to equipment or property in the event of such failure modes. System designers and end-users are cautioned to consult instruction sheets and specifications available from the factory. The system designer/end-user is responsible for verifying that all requirements for the application are met. Due to unlimited application, system conditions and chemistries, it is the buyers responsibility to validate the product within their specific application.

**Proposition 65:** These products may contain chemicals known to the state of California to cause cancer, or birth defects, or other reproductive harm.



BACK VIEW