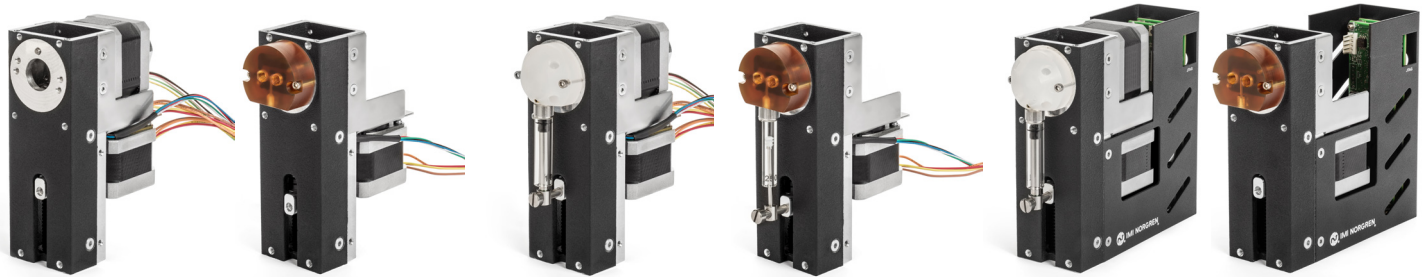


The IMI Norgren Cadent™ 3 is a highly flexible and programmable syringe pump with exceptional precision and accuracy performance in discrete dispense or stable flow modes. This maintenance free pump also offers long life.

The IMI Norgren Cadent™ 3 is available with or without its advanced controller in three mechanical resolutions, depending on the needs of your instrument. The pump can be further configured by mating with any of the options from the extensive range of IMI Norgren Syringes and Rotary Valves making the IMI Norgren Cadent™ 3 the most versatile fluid delivery solution for any analytical, diagnostic and biotechnology instrument.



**Level 1**  
**Robust Syringe Drive**

**Level 2\***  
**Including Valve**  
\*Syringes sold separately

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

Rotary and Solenoid Valve Options Shown

## Specifications

### Environmental

#### Operating Temperature

36°F to 122°F (2°C to 50°C)

#### Storage Temperature

-27°F to 160°F (-33°C to 71°C)

#### Operating Humidity

< 80% RH at 5°C - 30°C and

< 50% at 31°C - 50°C

#### Noise <sup>(1)</sup>

< 55 dBA

#### Lifetime <sup>(2)</sup>

> 2 Million cycles (Cadent™ 3)

> 5 Million cycles (Cadent™ 3E)

[1 cycle = 1 full dispense and aspirate moves]

### Mechanical

#### Operation

Any orientation

#### Mounting Holes

Top and bottom

Front face

#### Resolutions <sup>(4)</sup>

6K, 12K and 24K increments

### Performance

#### Speed <sup>(1)</sup>

0.0625 - 10,000 half-steps/sec

#### Precision

0.5% 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>(1)</sup>

Min: 0.008 µL/min (with 50µL syringe)

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

#### Full Dispense Time <sup>(1)</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>(1)</sup>

6 inputs - 2 Analog/Digital, 4 Digital

6 digital outputs

Tamper pin

### Communication Options <sup>(1)</sup>

RS-232, RS485, CANbus

### Power

#### Operation

24VDC (± 5% allowance)

(with a maximum power ripple

of 720mv peak to peak).

#### Power Consumption <sup>(1)</sup>

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

50ul to 5ml

### Compliance

REACH & RoHS Compliant

CSA and UL Certified

CE Compliant

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

<sup>(2)</sup> Tested using DI water and a 1mL syringe at 30 psi

<sup>(3)</sup> Based on a 10KHz sample rate using a 1mL syringe at 1mL/min

<sup>(4)</sup> 96K, 192K and 384K increments possible in microstep mode

**Cadent 3 Pump:**

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

Valve Description	CADENT™ 3									CADENT™ 3E	Replacement Valve Part #
	6K Resolution			12K Resolution			24K Resolution			24K Resolution	
	Level 1	Level 2	Level 3	Level 1	Level 2	Level 3	Level 1	Level 2	Level 3	Level 3	
None (rotary valve feature)	100276		100285	100277		100736	100278		100286	101008	N/A
FAS 3/2 Microsol Solenoid valve		100279	100287		100280	100288		100281	100289	101106	20413
1-Way Valve (Through-Block)		100273	100282		100274	100283		100275	100284	101107	23272
2-WAY Distribution - Plug		100926	100940		100954	100968		100982	100996	N/A	20052
3-WAY Distribution - Plug		100927	100941		100955	100969		100983	100997	101009	25394
4-WAY Distribution - Plug		100928	100942		100956	100970		100984	100998	101010	25397
5-WAY Distribution - Plug		100929	100943		100957	100971		100985	100999	101011	25400
6-WAY Distribution - Plug		100930	100944		100958	100972		100986	101000	101012	25402
3-WAY Distribution - Face		100931	100945		100959	100973		100987	101001	101013	23324
4-WAY Distribution - Face		100932	100946		100960	100974		100988	101002	101014	23325
6-WAY Distribution - Face		100933	100947		100961	100975		100989	101003	101015	23327
3-WAY Distribution - Ceramic		100934	100948		100962	100976		100990	101004	101016	30150
4-WAY Distribution - Ceramic		100935	100949		100963	100977		100991	101005	101017	30151
5-WAY Distribution - Ceramic		100936	100950		100964	100978		100992	101006	101018	30141
6-WAY Distribution - Ceramic		100937	100951		100965	100979		100993	101007	101019	30142
8-WAY Distribution - Ceramic					100966	100980		100994	101104	101020	101035
12-WAY Distribution - Ceramic					100967	100981		100995	101105	101021	101038

**Notes:**

Cadent 3E option offers extended performance on lifetime upto 5 million cycles (1 cycle = 1 full dispense and aspirate moves)

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
<b>Starter Kit (includes all items listed below)</b>	100904	100905	100906
Power Supply	100907	100907	100907
Power Cable	50603	50603	50603
Communications cable	100883	100884	100885
USB to Communications Adapter	28646	100917	100918
Hardware User Manual	101101	101101	101101
CadentConnect Software (GUI)	101102	101102	101102

**PTFE Syringes**

Size	Standard Assy	ZDV Assy	Orifice Size
50ul	23164	27960	0.023"
100ul	23165	27961	0.023"
250ul	23166	28006	0.031"
500ul	23167	28007	0.031"
1.0ml	23168	28008	0.073"
2.5ml	23169	28009	0.073"
5.0ml	23170	28010	0.073"

Wetted materials: Borosilicate glass, PCTFE, PTFE

Zero Dead Volume (ZDV) 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.

**UHMW Syringes**

Size	Standard Assy	ZDV Assy	Orifice Size
50ul	24411	27958	0.023"
100ul	24412	27959	0.023"
250ul	24413	28011	0.031"
500ul	24414	28012	0.031"
1.0ml	24415	28013	0.073"
2.5ml	24416	28014	0.073"
5.0ml	24417	28015	0.073"

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

**Ancillary items:**

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

P/N	Orifice Diameter	Valve Type	P/N	Orifice Diameter	Valve Type
23324	0.059"	3-Way Distribution	23562	0.059"	3-Way Non-Distribution
24643	0.020"	4-Way Distribution	23563	0.059"	4-Way Non-Distribution
23325	0.059"	4-Way Distribution	Optional Accessories		
23326	1mm	5-Way Distribution	24528	Weep Hole Fitting - PEEK	
23327	1mm	6-Way Distribution	24529	Weep Hole Fitting - Stainless Steel	
			18659	Port Plug Screw, use with seal p/n 18781	

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

**Rotary Ceramic Valves:**

P/N	Orifice Diameter	Valve Type	P/N	Orifice Diameter	Valve Type
30138	0.031	2-Way Distribution	30144	0.031	3-Way Non-Distribution
30149	0.059	2-Way Distribution	30155	0.059	3-Way Non-Distribution
30139	0.031	3-Way Distribution	30145	0.031	4-Way Non-Distribution
30150	0.059	3-Way Distribution	30156	0.059	4-Way Non-Distribution
30140	0.031	4-Way Distribution	30147	0.031	6-Way Non-Distribution
30151	0.059	4-Way Distribution	30158	0.040	6-Way Non-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	Optional Accessories		
101035	0.040	8-Way Distribution	24528	Weep Hole Fitting - PEEK	
101036	0.031	12-Way Distribution	24529	Weep Hole Fitting - Stainless Steel	
101038	0.040	12-Way Distribution	18659	Port Plug Screw, use with seal p/n 18781	

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

**Rotary Plug Valves:**

P/N	Orifice Diameter	Valve Type	P/N	Orifice Diameter	Valve Type
23272	0.059	1-Way Distribution	28391	0.031	3-Way Non-Distribution
20051	0.031	2-Way Distribution	28393	0.059	3-Way Non-Distribution
20052	0.059	2-Way Distribution	28395	0.076	3-Way Non-Distribution
20053	0.076	2-Way Distribution	28397	0.031	4-Way Non-Distribution
25393	0.031	3-Way Distribution	28399	0.059	4-Way Non-Distribution
25394	0.059	3-Way Distribution	28401	0.076	4-Way Non-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	Optional Accessories		
25400	1mm	5-Way Distribution	24528	Weep Hole Fitting - PEEK	
25401	0.031	6-Way Distribution	24529	Weep Hole Fitting - Stainless Steel	
25402	1mm	6-Way Distribution	18659	Port Plug Screw, use with seal p/n 18781	

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

**Solenoid Valves:**

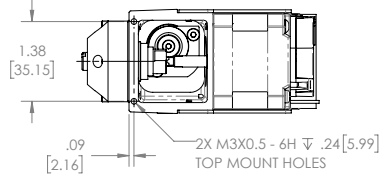
Configuration	P/N	Orifice Size
FAS 3/2 Microsol Media Separated valve	20413	0.062"

Wetted Materials: PEEK, EPDM

**Valve Notes:**

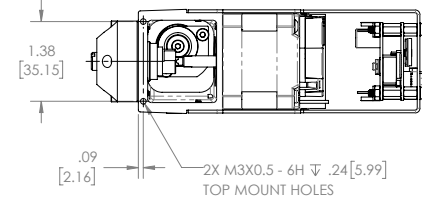
Port connection is 1/4-28 UNF. For more information on valves, consult PSD-0031 or visit our website. All valve ports are accessible when using syringes listed and Kloehn spring-loaded fittings (recommended). Valve weep hole port connection is #6-40 UNF-2A. For use with 1/16 OD tubing.

**Dimensions for Level 2**

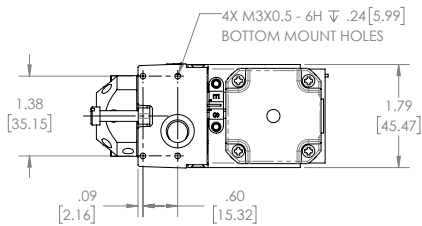
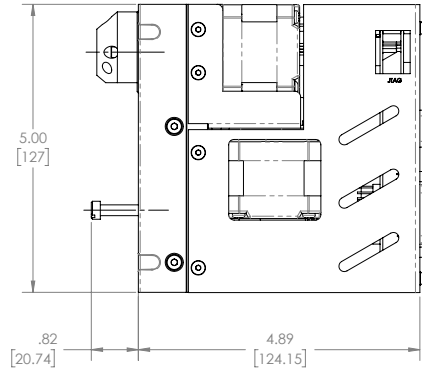
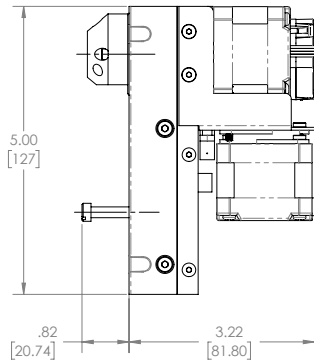


TOP VIEW

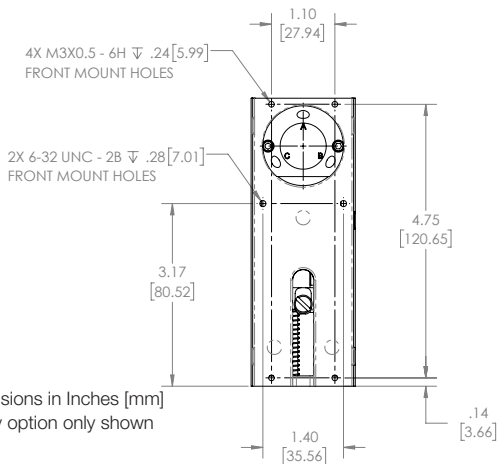
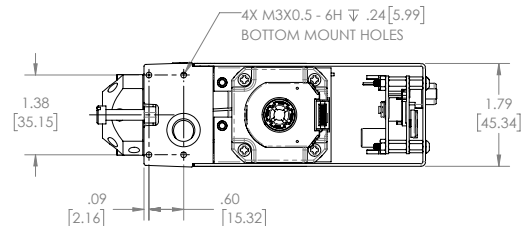
**Dimensions for Level 3**



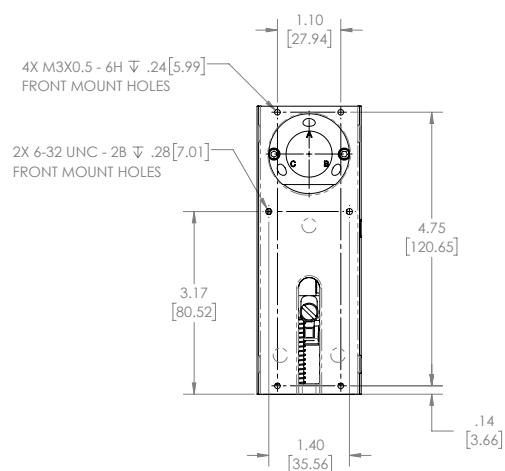
SIDE VIEW



BOTTOM VIEW



FRONT VIEW



Dimensions in Inches [mm]  
Rotary option only shown

**Warning**

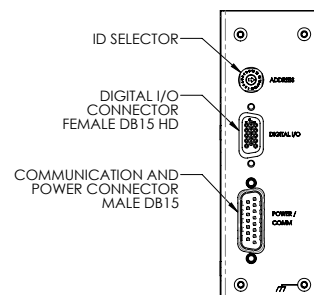
Improper selection, misuse, age or malfunction of components used in systems can cause failure in various modes. The system designer is warned to consider the failure modes of all component parts and to provide adequate safeguards to prevent personal injury or damage to equipment or property in the event 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.

**Proposition 65**

This product may contain chemicals known to the state of California to cause cancer, birth defects, or other reproductive harm.

**Warranty**

The products described herein are warranted subject to seller's Standard Terms and Condition of Sale, available at seller's website.



BACK VIEW