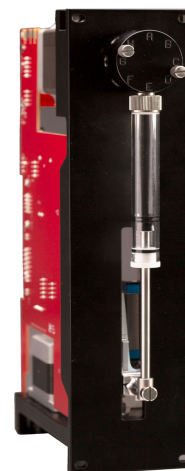


## Cadent™ 6 Syringe Pump

- > Programmable, maintenance free, precision liquid metering device
- > 60mm stroke driven via stepper motor and precision ball screw
- > Available in three mechanical resolutions: 12K, 24K, 48K
- > Powerful lift force and valve torque
- > Exceptional precision, accuracy and lifetime performance
- > Suitable for use in analytical, biotechnology, medical device, and diagnostic applications



**Level 1**  
Robust Syringe  
and Valve Drive



**Level 3\***

Including Advanced Controller to easily program the system using the industry standard CAVRO protocol  
\*syringe and valve 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>:**  
> 5.7 Million cycles  
[1 cycle = 1 full dispense and aspirate move]

#### Mechanical

**Operation:**  
Any orientation

**Mounting Holes:**  
Bottom and Front

**Resolutions:**  
12K, 24K and 48K 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>(1)</sup>:

Min: 46.9nL/hr (with 10µL syringe)

Max: 2.5mL/min (with 50mL syringe)

**Full Dispense Time <sup>(1)</sup>:**  
Min: 1.2 secs (with 12K resolution)  
Max: 12,800 min (with 48K resolution)

**Flow Accuracy <sup>(3)</sup>:**  
±1%

**Plunger Lift Force:**  
120lbs force, 12K res.  
140lbs force, 24 and 48K res.

**Electrical Connection <sup>(3)</sup>:**  
6 inputs - 2 Analog/Digital, 4 Digital  
4 digital outputs  
Tamper pin

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

RS-232, RS485, CANbus

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

**Power Consumption:**  
14 watts max; 3.5 watts idle.

**Rotary Valve Options:**  
up to 12-way

**Syringe Options:**  
10µl to 50mL

**Compliance:**  
REACH & RoHS Compliant  
UL & CE Compliant  
CSA Certified

<sup>(1)</sup> Rated with 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 6 Pump

Valves and syringes (not included) may be purchased separately.

Cadent					
12K Resolution		24K Resolution		48K Resolution	
Level 1	Level 3	Level 1	Level 3	Level 1	Level 3
102671	102674	102672	102675	102673	102676

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

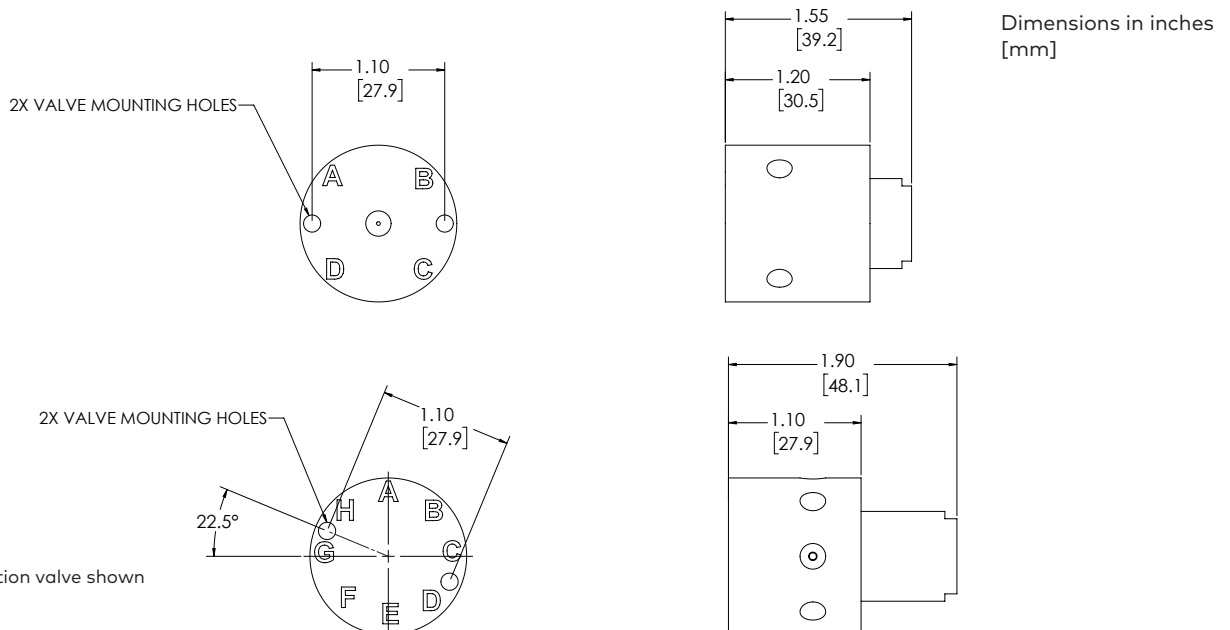
The Cadent™ Connect software can be downloaded at [www.imi-precision.com/CadentConnect](http://www.imi-precision.com/CadentConnect)

Plug Valves					
P/N	Orifice Size (in)	Valve Type	P/N	Orifice Size (in)	Valve Type
19218	0.059	1-Way Distribution	19194	0.031	3-Way Non-Distribution
18247	0.059	1-Way Distribution	17615	0.059	3-Way Non-Distribution
18248	0.076	1-Way Distribution	18192	0.076	3-Way Non-Distribution
99884	0.031	3-Way Distribution	18680	0.089	3-Way Non-Distribution
17616	0.059	3-Way Distribution	24699	0.090	3-Way Non-Distribution
18189	0.076	3-Way Distribution	17712	0.059	4-Way Non-Distribution
17617	0.059	4-Way Distribution	18191	0.076	4-Way Non-Distribution
18190	0.076	4-Way Distribution	24697	0.059	4-Way Loop
17618	0.059	5-Way Distribution	29621	0.059	6-Way Loop
18188	0.076	5-Way Distribution			
24701	0.031	6-Way Distribution			
17619	0.059	6-Way Distribution			
18193	0.076	6-Way Distribution			
19323	0.031	8-Way Distribution			
17620	0.059	8-Way Distribution			
17877	0.076	8-Way Distribution			

Optional Accessories	
P/N	Description
18659	Port Plug Screw, use with seal P/N 18781

Seal Washers	
P/N	Description
14271	Teflon, 0.070 ID Hole, for 0.059" orifice
18031	Teflon, 0.095 ID Hole, for 0.076" orifice
18033	Teflon, 0.125 ID Hole, for 0.089" orifice
18781	Teflon, No hole, for port plug

Wetted Materials: PCTFE, PTFE



**Face Seal Valves - Ceramic**

P/N	Orifice Size (in)	Valve Type
23550	0.059	3-Way Distribution
23551	0.078	3-Way Distribution
24898	0.059	4-Way Distribution
23604	0.059	5-Way Distribution
23370	0.059	8-Way Distribution
24090*	0.076	8-Way Distribution
24105**	0.040	12-Way Distribution
23548	0.059	3-Way Non-Distribution
23549	0.078	3-Way Non-Distribution

Wetted materials: alumina ceramic, FFKM (seals)

\* Overall length: 2.50"

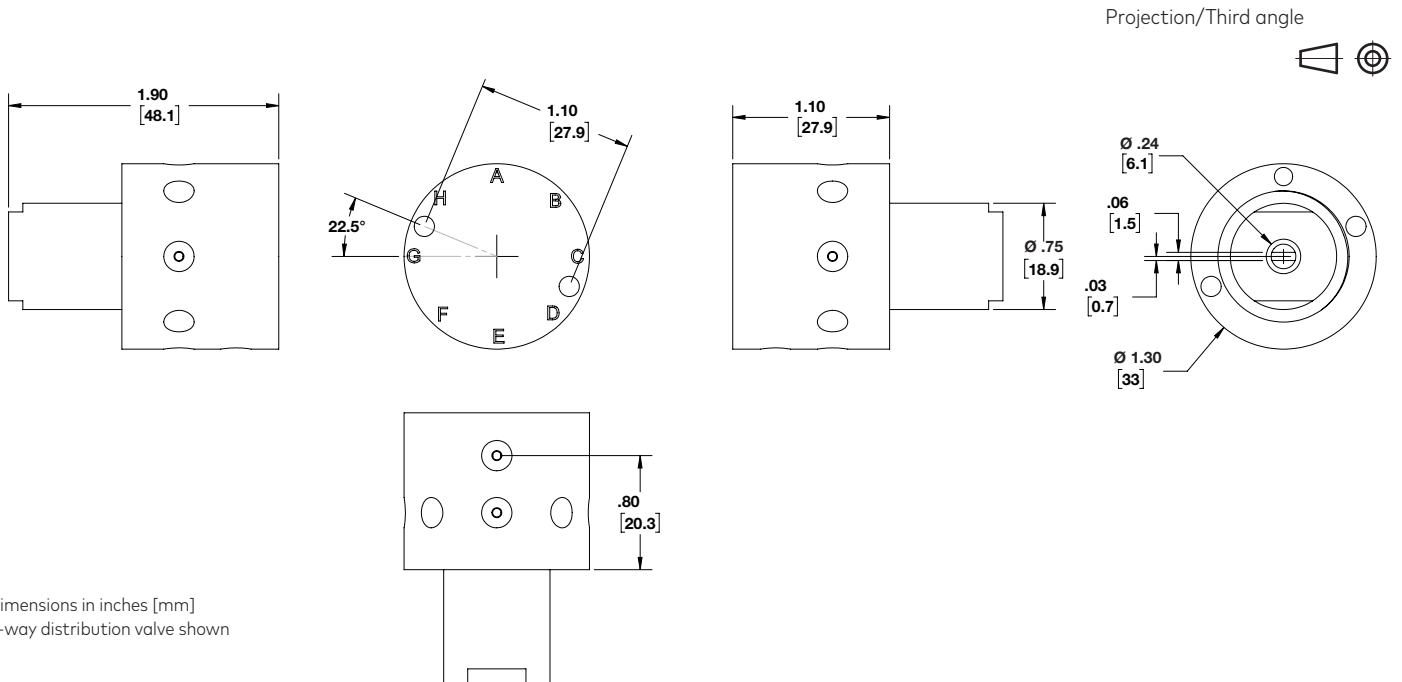
\*\* Overall length: 2.70"

 For other customization requests, contact us at [IMIKloehncustomersupport@imi-precision.com](mailto:IMIKloehncustomersupport@imi-precision.com)
**Optional Accessories**

P/N	Description
18659	Port Plug Screw, use with seal p/n 18781

**Seal Washers**

P/N	Description
14271	Teflon, 0.070 ID Hole, for 0.059" orifice
18031	Teflon, 0.095 ID Hole, for 0.076" orifice
18033	Teflon, 0.125 ID Hole, for 0.089" orifice
18781	Teflon, no hole, for port plug


**Valve Notes**

Port connection is 1/4-28 UNF. For more information on valves, consult PDS-0032 or visit our website.

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

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

**UHMW Kloehn™ Syringes (individually boxed):**

Size	Orifice Size (in)	Standard Lubricated Syringe	Zero Dead Volume (Lubricated)
25µL*	0.016	103177	-
50µL	0.024	103178	-
100µL	0.032	24518	-
250µL	0.039	19513	-
500µL	0.076	24694	25427
1.0mL	0.076	24690	25413
1.25mL	0.076	-	25438
2.5mL	0.076	24685	25388
5.0mL	0.076	18857	24691
10.0mL	0.076	19110	24139
25.0mL	0.076	24688	25380

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

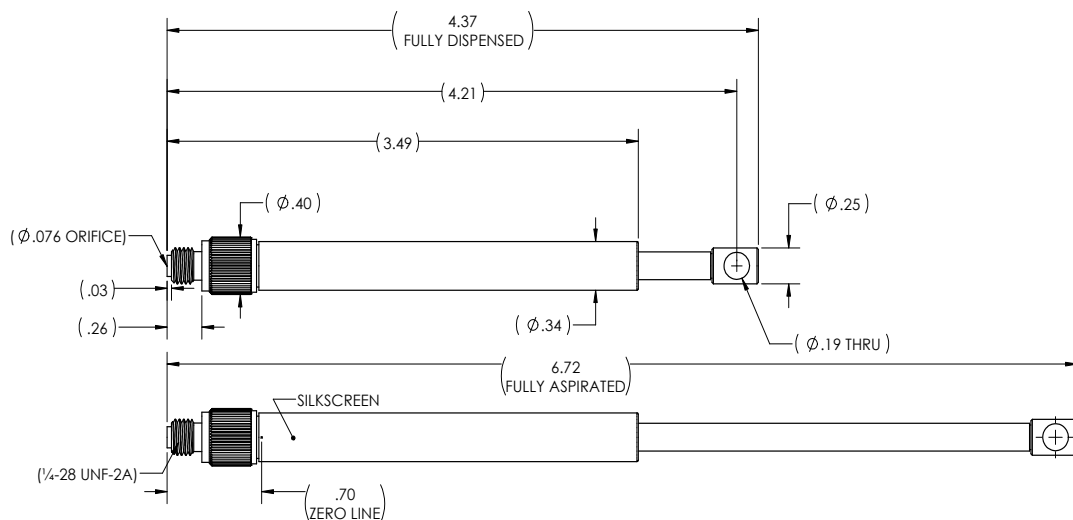
\* Contains stainless steel in wetted path

**PTFE Kloehn Syringe Assembly (individually boxed):**

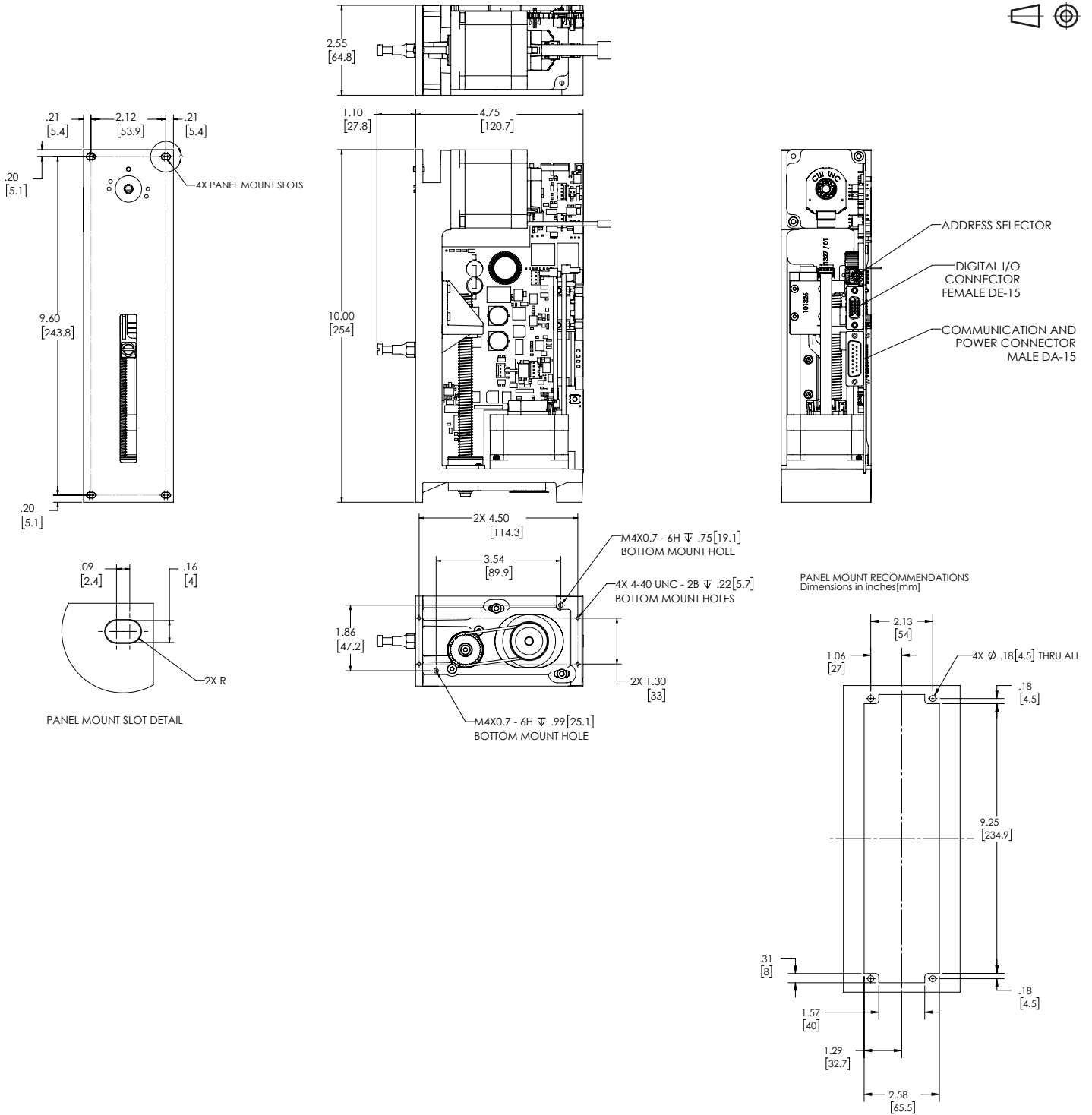
Size	Orifice Size (in)	Standard Lubricated Syringe	Zero Dead Volume (Lubricated)
10µL*	0.016	103179	-
25µL*	0.016	103180	-
50µL	0.024	103185	-
100µL	0.032	17593	-
250µL	0.039	17594	19509
500µL	0.076	17595	19537
1.0mL	0.076	17596	25429
1.25mL	0.076	17597	25431
2.5mL	0.076	17598	19539
5.0mL	0.076	17599	18463
10.0mL	0.076	17600	18469
25.0mL	0.076	17601	23734
50.0mL	0.076	17602	-

Wetted materials: Borosilicate glass, PCTFE, PTFE

\* contains stainless steel in wetted path

 Dimensions in inches [mm]  
 1mL syringe shown


**Level 3 Envelope**

 Dimensions in inches [mm]  
 Projection/Third angle

**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.