


# Series 9 Miniature High Speed and Pressure Liquid Dispense Valve

## 2-Way and 3-Way Solenoid Valve



Series 9 solenoid valves offer outstanding precision control in liquid analysis. Combining high speed, ultra low leak rate, high flow, high pressure and high temperature capability in a small size. This rugged valve operates with extreme repeatability and is constructed of non-corroding, passivated stainless steel. Series 9 coils are rated for continuous duty and are potted to exclude the environment.

### Features

- Smallest footprint and highest performance in its class
- High speed response times of less than 6 ms
- 100% tested to leak-tight  $1 \times 10^{-7}$  cc/sec/atm Helium
- Pressures up to 1250 psi (86.2 bar)
- 100% duty cycle in environmental temperatures of up to 221°F (105°C)
- Available with a variety of fittings, orifices, seals, and voltages to match your application
- RoHS compliant 

### Typical Applications

- Process Analysis of Liquids
- High Pressure Liquid Control
- Radioactive Liquids in Medical Imaging
- Cooling Circuits

## Product Specifications

### Physical Properties

<b>Valve Type:</b>	Inert Non-Isolation Valve
<b>Valve Configuration:</b>	2-Way Normally Closed or 3-Way
<b>Media:</b>	Liquids <i>(also capable of handling gasses, for details see the Series 9 Gas datasheet)</i>
<b>Operating Environment:</b>	40 to 221°F (4 to 105°C)
<b>Dimensions:</b>	See pages 4, 5, 6 & 7
<b>Porting (Orifice Dependent):</b>	A-LOK® 1/4 - 28 FNPT compression fittings, VacuSeal
<b>Weight:</b>	3.1 oz (87.9 g) [3-Way, 1/8" NPT Body Option]
<b>Internal Volume (µL):</b>	342.7 to 540.6 (Contact factory for details)

### Electrical

<b>Voltage (VDC):</b>	12	24
<b>Power (Watts):</b>	12	12
<b>Current (mA):</b>	1000	500
<b>Resistance (Ohm):</b>	12	48
<i>(Ω±5% @ 70°F, 21°C)</i>		
<b>Connections:</b>	12" Lead Wires Standard 24 AWG, PTFE Insulated (Custom connectors are available)	

### Wetted Materials\*

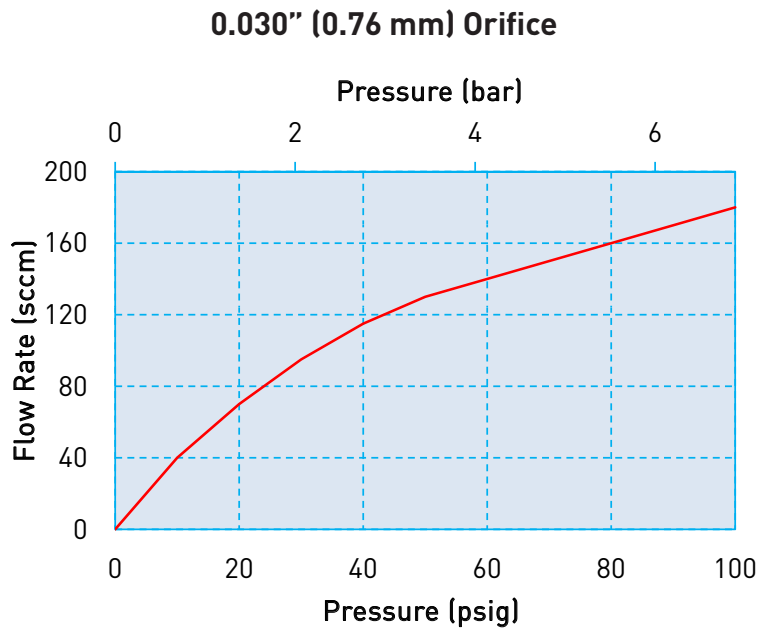
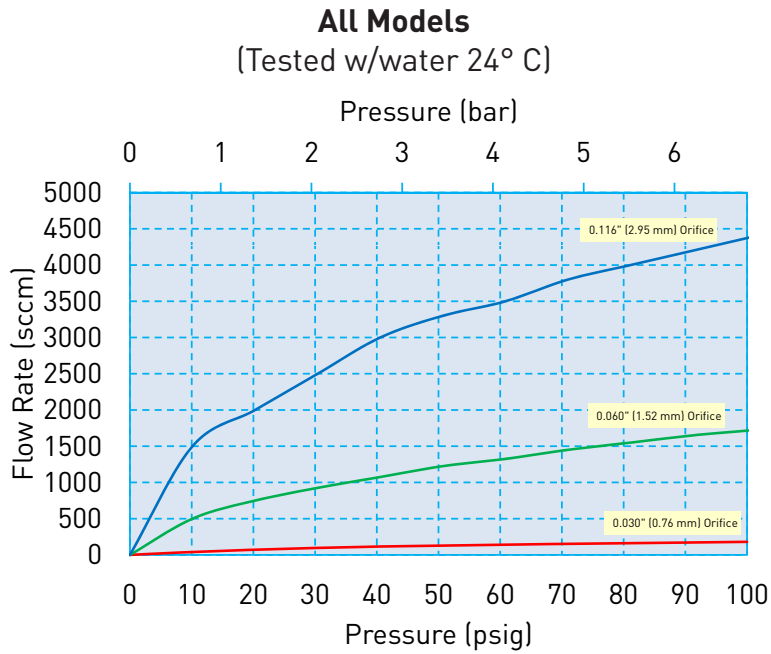
<b>Seals:</b>	FKM or FKM & Vespel
<b>Body:</b>	316 Stainless Steel
<b>All Others:</b>	PTFE, Stainless Steel, FKM
* See Chemical Compatibility Page Consult factory for other options	

### Performance Characteristics

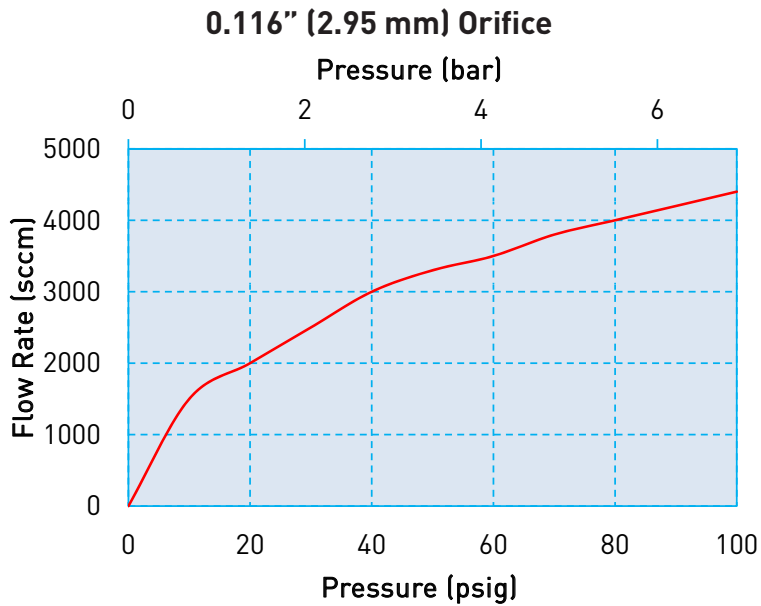
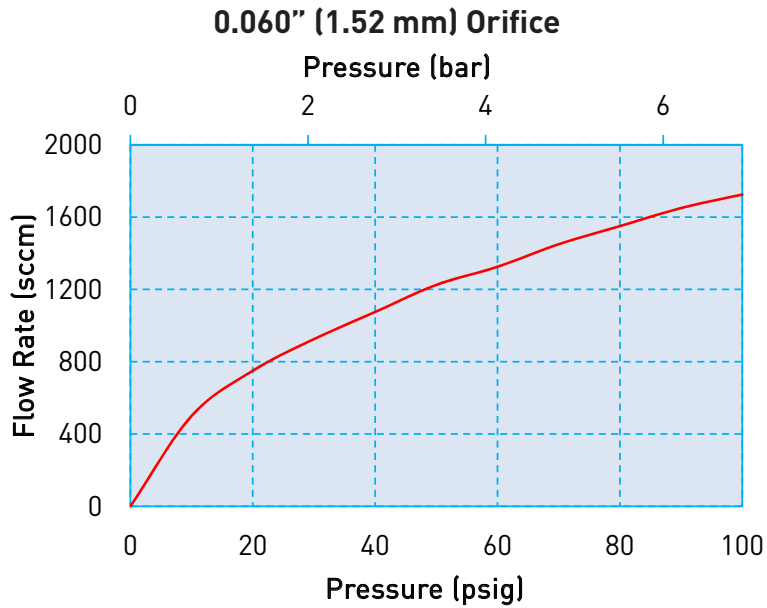
<b>Orifice Diameters/ Operating Pressure:</b>	0.030" (0.76 mm) / 1x10 <sup>-5</sup> Torr - 1250 psig (86.2 bar)
	0.060" (1.52 mm) / 1x10 <sup>-5</sup> Torr - 250 psig (17.2 bar)
	0.116" (2.95 mm) / 1x10 <sup>-5</sup> Torr - 100 psig (6.9 bar)
<b>Proof Pressure:</b>	1.5X rated pressure
<b>Response Time:</b>	<5 ms 0.030" (0.76 mm) <5 ms 0.060" (1.52 mm) <6 ms 0.116" (2.95 mm)
<b>Leak Rate:</b>	1 x 10 <sup>-7</sup> cc/sec/atm Helium
<b>Recommended Filtration:</b>	40 µm max

## Series 9 Miniature High Speed and Pressure Liquid Dispense Valve

### Typical Flow Curve

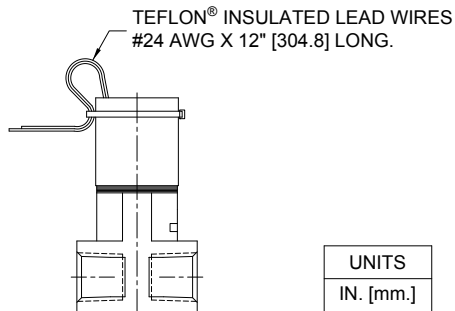


## Series 9 Miniature High Speed and Pressure Liquid Dispense Valve



### Electrical Interface

#### Coil Type: Wire leads



UNITS
IN. [mm.]

Custom connections available upon request

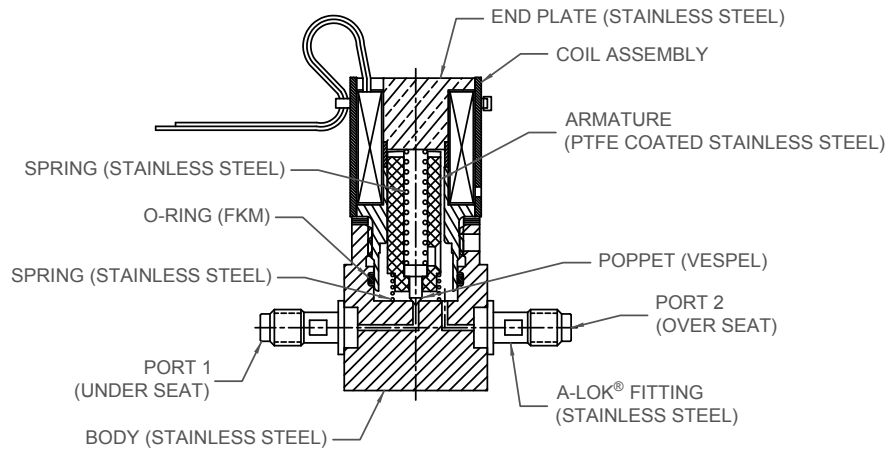


# Series 9 Miniature High Speed and Pressure Liquid Dispense Valve

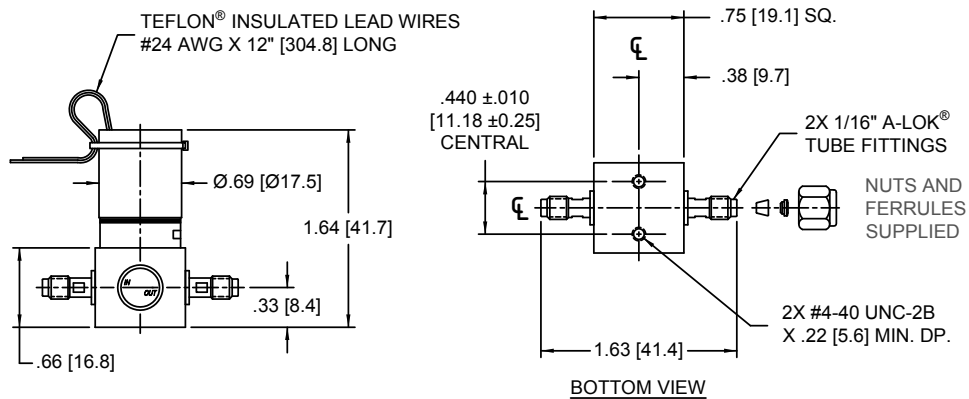
## Mechanical Integration

### Dimensions

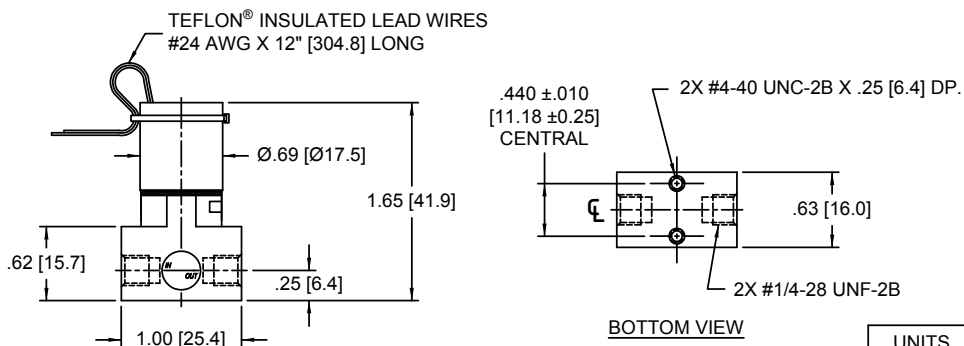
#### Series 9: 2-Way Cross-Section Wetted Material and Dimensions



#### 2-WAY, 0.030" [0.76 mm] ORIFICE, 1/16" [1.6 mm] A-LOK®



#### 2-WAY, 0.030" [0.76 mm] ORIFICE, 1/4-28 UNF-2B



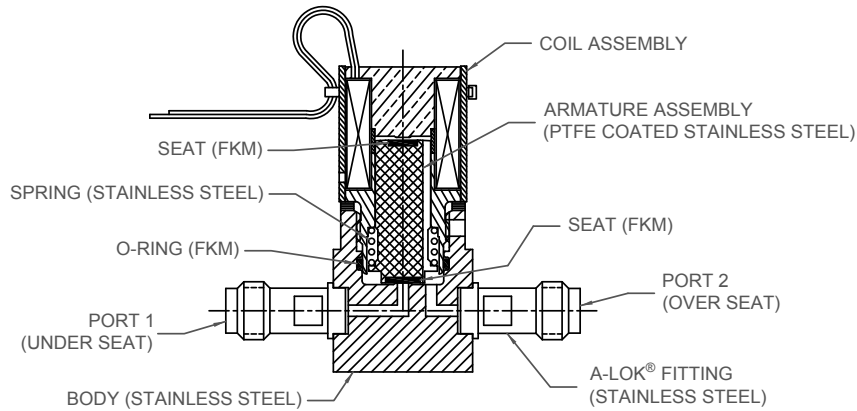
UNITS
IN. [mm.]

# Series 9 Miniature High Speed and Pressure Liquid Dispense Valve

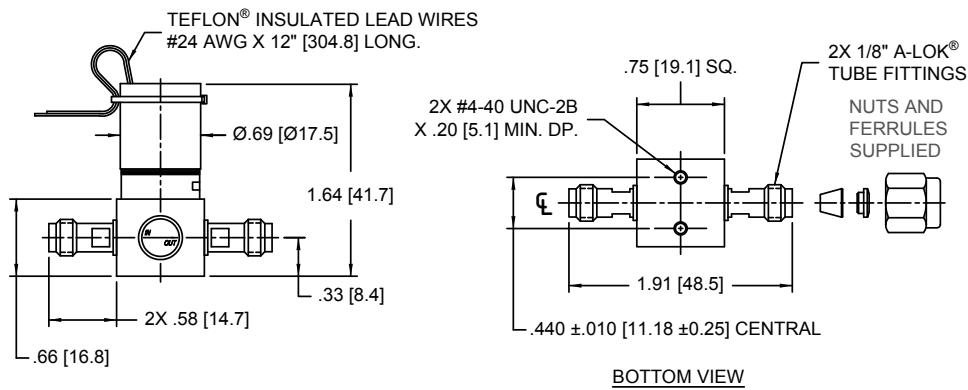
## Mechanical Integration

### Dimensions

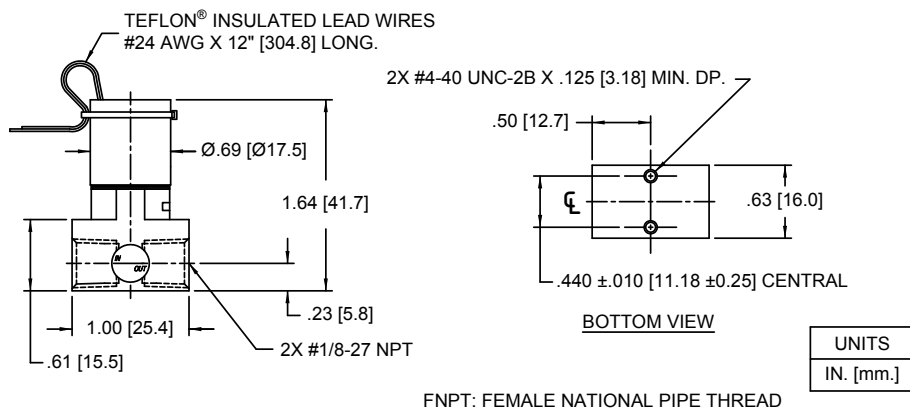
#### Series 9: 2-Way Cross-Section Wetted Material and Dimensions



#### 2-WAY, 0.060" [1.52 mm] ORIFICE, 1/8" [3.18 mm] A-LOK®



#### 2-WAY, 0.060" [1.52 mm] ORIFICE, 1/8" [3.18 mm] FNPT

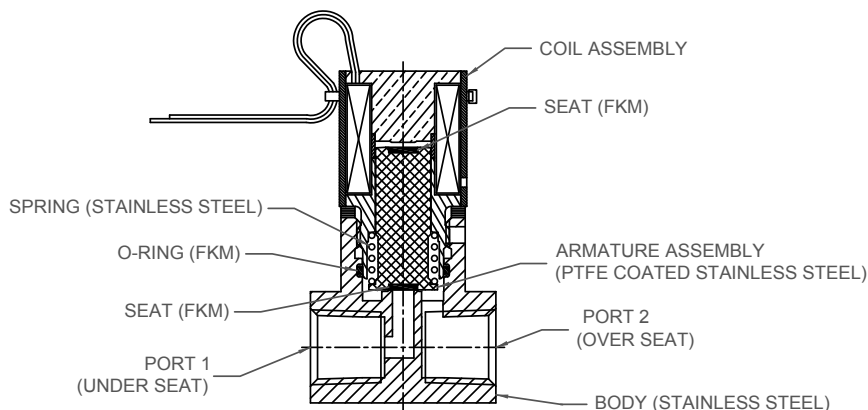


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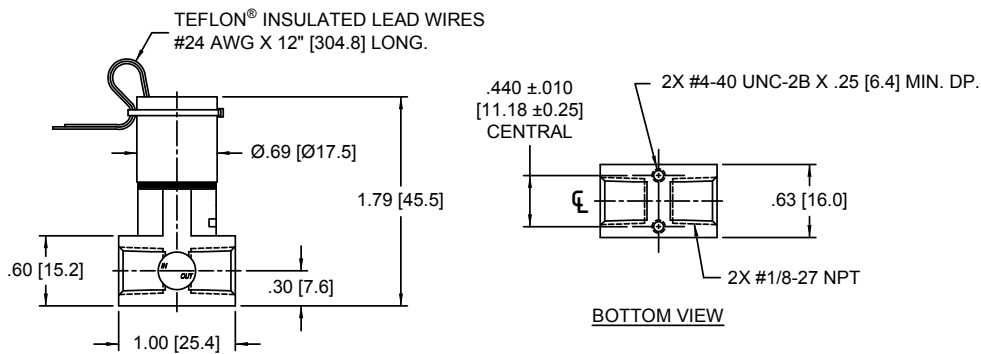
## Mechanical Integration

### Dimensions

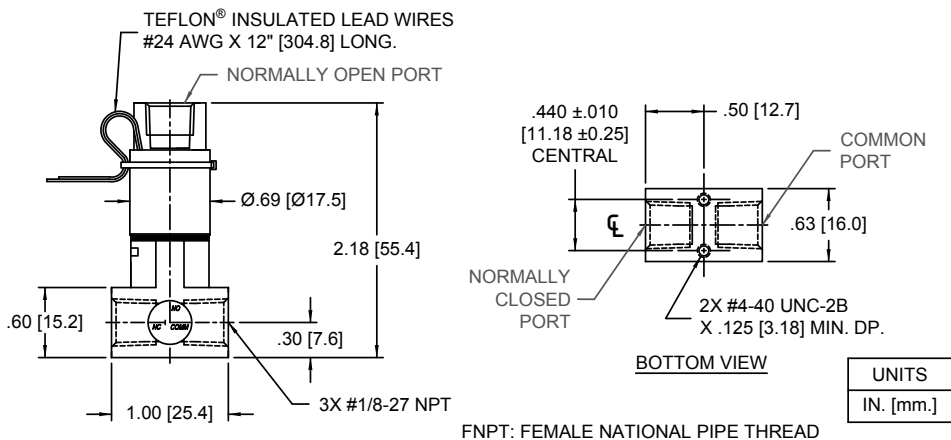
#### Series 9: 2-Way Cross-Section Wetted Material and Dimensions



**2-WAY, 0.116" [2.95 mm] ORIFICE, 1/8" [3.18 mm] FNPT**



**3-WAY, 0.116" [2.95 mm] ORIFICE, 1/8" [3.18 mm] FNPT**



UNITS
IN. [mm.]

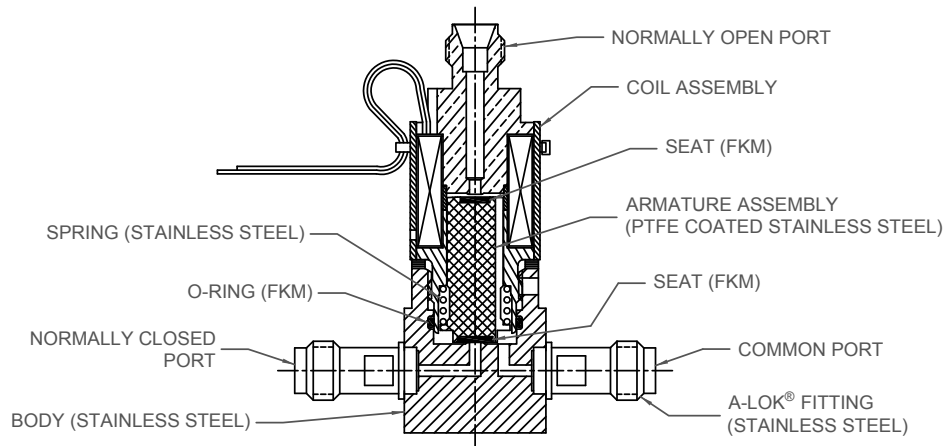
FNPT: FEMALE NATIONAL PIPE THREAD

# Series 9 Miniature High Speed and Pressure Liquid Dispense Valve

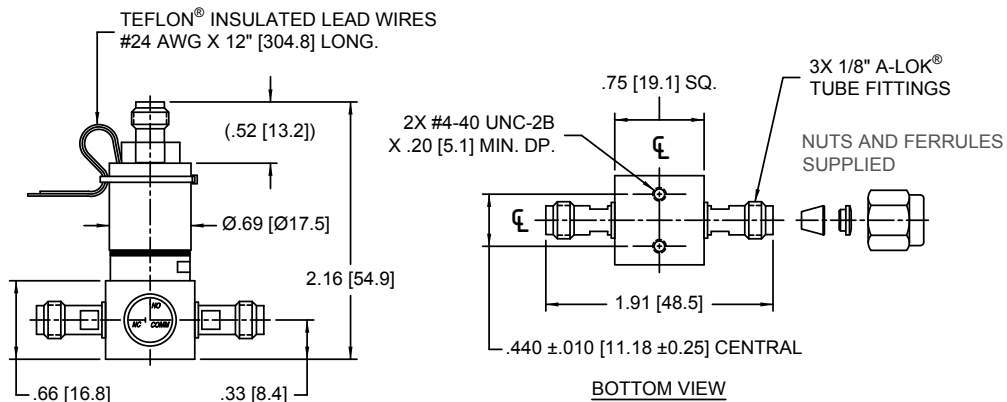
## Mechanical Integration

### Dimensions

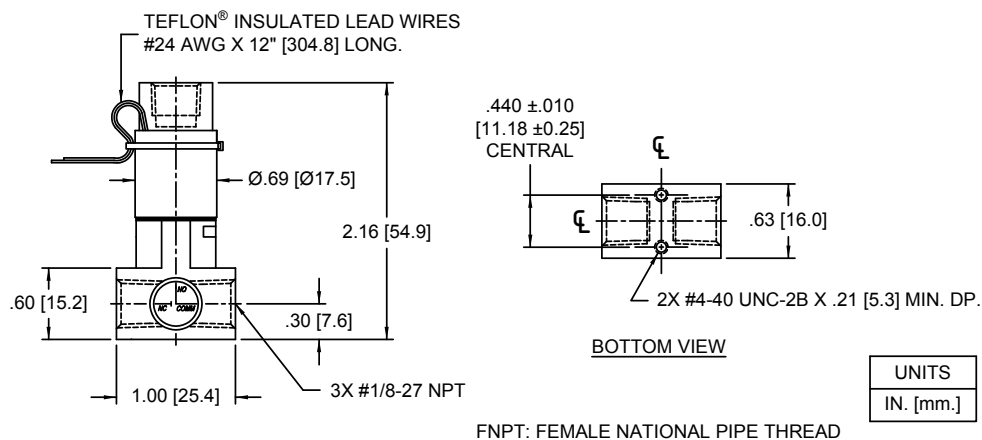
### Series 9: 3-Way Cross-Section Wetted Material and Dimensions



#### 3-WAY, 0.060" [1.52 mm] ORIFICE, 1/8" [3.18 mm] A-LOK®



#### 3-WAY, 0.060" [1.52 mm] ORIFICE, 1/8" [3.18 mm] FNPT

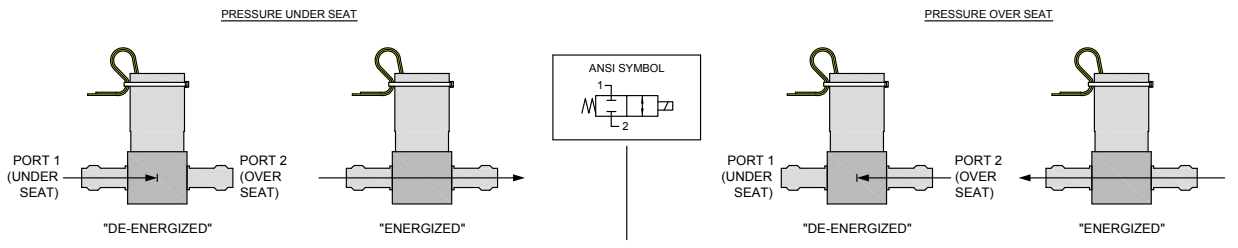


# Series 9 Miniature High Speed and Pressure Liquid Dispense Valve

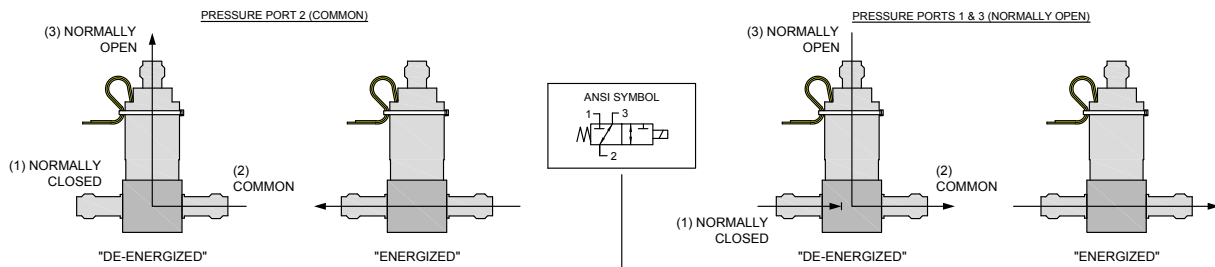
## ANSI Symbols

### Pressure

2-WAY (1/8" A-LOK® FITTINGS SHOWN)



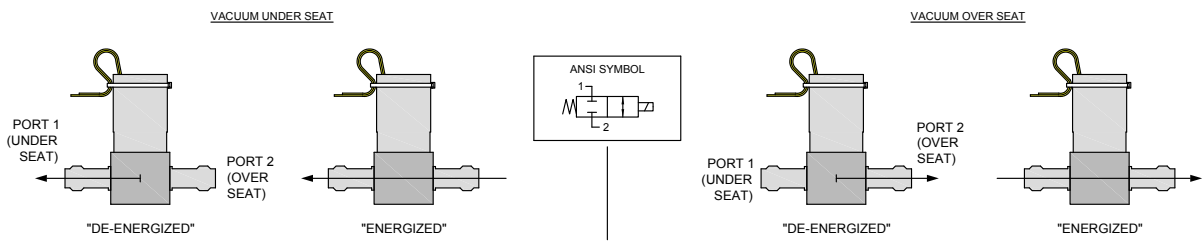
3-WAY (1/8" A-LOK® FITTINGS SHOWN)



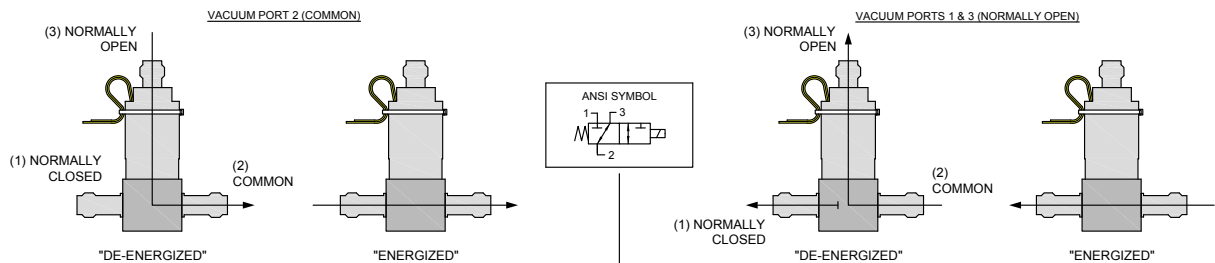
## ANSI Symbols

### Vacuum

2-WAY (1/8" A-LOK® FITTINGS SHOWN)



3-WAY (1/8" A-LOK® FITTINGS SHOWN)





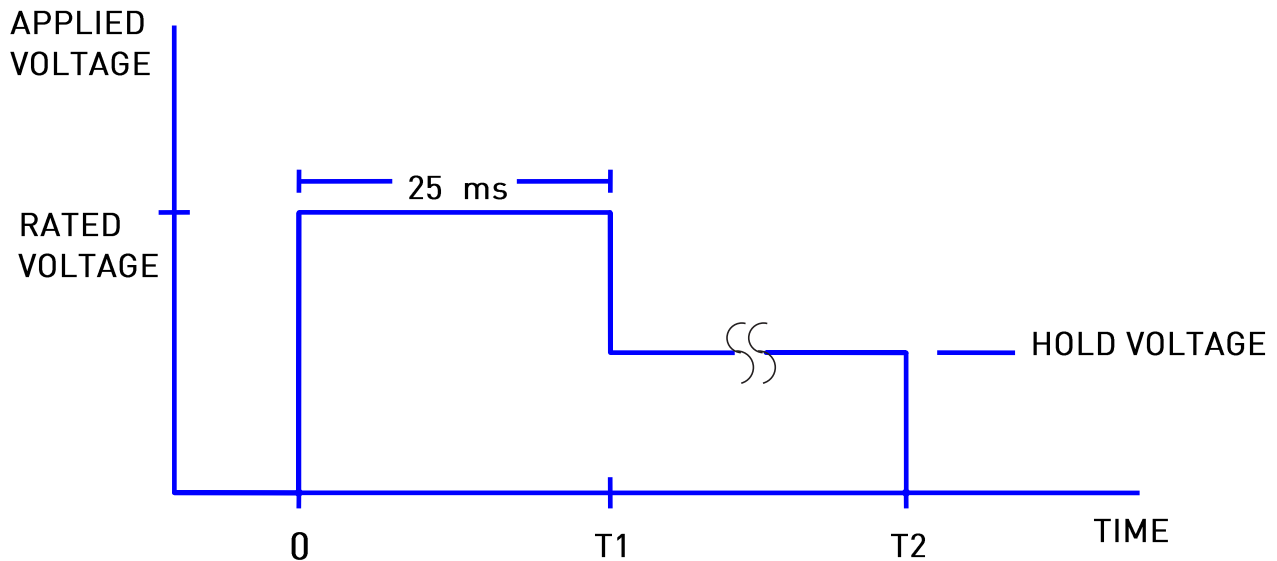
## Series 9 Miniature High Speed and Pressure Liquid Dispense Valve

### Hit and Hold Specifications (12-Watt coils):

Hit and Hold is a method for driving valves that can be used to reduce power consumption and heat generation while maintaining valve performance specifications. The valve is "hit" with the full rated voltage for some time period to open it (T1 in the graph) and then "held" open with substantially reduced voltage until the desired pulse length is reached (T2 in the graph). The following table shows the possible holding voltages and power consumption for our standard 12 and 24VDC solenoids.

Rated Voltage (volts)	3-way		2-way	
	Hold Voltage	Hold Power	Hold Voltage	Hold Power
24	12 volts	3 watts	5 volts	0.52 watts
12	6 volts	3 watts	5 volts	2.1 watts

Note: Other voltages available



*Hold Voltage Graph*

## Series 9 Miniature High Speed and Pressure Liquid Dispense Valve Chemical Compatibility Chart\*

Chemical	Seal Options			Other Wetted Materials	
	FKM and Vespel	or	FKM	PTFE	Stainless Steel
DI Water	1	2	1	1	1
Methanol	4	1	4	1	1
Isopropanol	1	2	1	1	1
Ethanol	3	1	3	1	1
Acetonitrile	4	1	4	1	1
Tetrahydrofuran	4	3	4	1	1
Toluene	2	1	2	1	1
Organic Acids - Dilute	1	1	1	1	1
Non Organic Acids - Dilute	1	1	1	1	1
Bases - Dilute	1	1	1	1	1
Saline	1	1	1	1	1
Bleach 12%	1	4	1	1	2
Sodium Hydroxide 20%	2	4	2	1	1

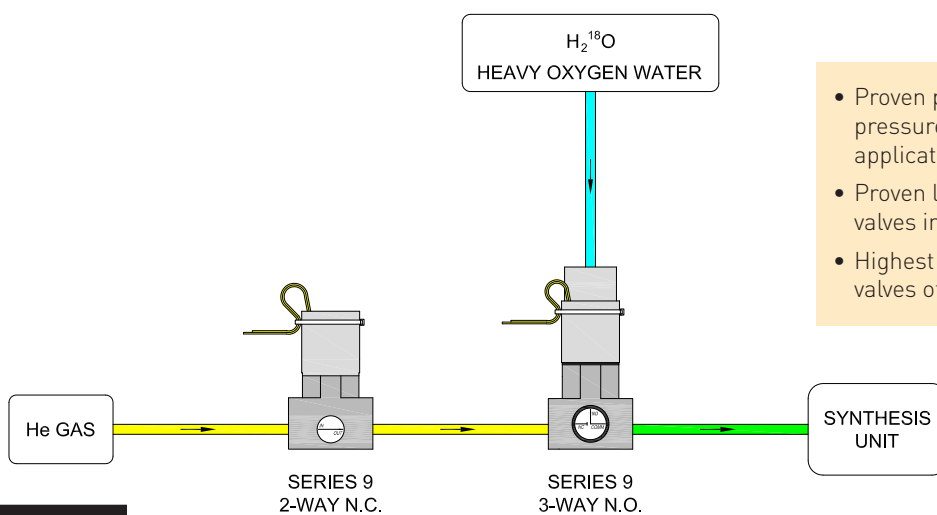
\*The above is an Abbreviated Chemical Compatibility Chart. Please consult factory for a complete list.

COMPATIBILITY LEGEND	
1 EXCELLENT	Minimal or no effect
2 GOOD	Possible swelling and/or loss of physical properties
3 DOUBTFUL	Moderate or severe swelling and loss of physical properties
4 NOT RECOMMENDED	Severe effect and should not be considered

### Typical Flow Diagram

#### Typical Sample Control for Mass Spec

PET RADIO NUCLEOTIDE PRODUCTION (CYCLOTRON)



- Proven performance in high pressure and low leak applications using liquids
- Proven lowest leak rate among valves in this form factor.
- Highest pressure capacity in valves of its size.

## Series 9 Miniature High Speed and Pressure Liquid Dispense Valve

### Ordering Information

Orifice Size	Seal Material	Pressure	Valve Type	Voltage	Porting	Part Number
				0.030" (0.76 mm)	Vespel, FKM	Vac-1250 psig (86.2 bar)
				24V	1/16" (1.6mm) A-Lok®	009-0172-900
				24V	1/4" (6.4mm)-28	009-0272-900

Orifice Size	Seal Material	Pressure	Valve Type	Voltage	Porting	Part Number
				0.060" (1.52 mm)	FKM	Vac-250 psig (17.2 bar)
				24V		1/8" (3.2mm) FNPT
		Vac-100psig (6.89 bar)	3-Way	12V	1/8" (3.2mm)FNPT	091-0094-900
				24V	1/8" (3.2mm)A-Lok®	009-0269-900
				24V	1/8" (3.2mm)FNPT	009-0933-900

Orifice Size	Seal Material	Pressure	Valve Type	Voltage	Porting	Part Number
				0.116" (2.95 mm)	FKM	Vac-100 psig (6.89 bar)
	3-Way	12V	1/8" (3.2mm) FNPT	009-0207-900		
				24V	1/8" (3.2mm) FNPT	009-0143-900

NOTE: In order to provide the best possible solution for your application, please provide the following requirements when contacting Applications Engineering:

- Media, Inlet & Outlet Pressures
- Minimum Required Flow Rate
- System Supply Voltage
- Media
- Ambient Temperature Range



Please click on the Order On-line button (or go to [www.parker.com/precisionfluidics/s9](http://www.parker.com/precisionfluidics/s9)) to configure your Series 9 Miniature High Speed and Pressure Liquid Dispense Valve. For more detailed information, visit us on the Web, or call 603-595-1500.

## NOTES

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