

# Pulse Valves

## Ultra Low Leak Extreme Performance Valve




### Typical Applications

- Gas pulse generation for Laser Spectroscopy

Pulse Valves solenoid valves offer outstanding potential for precision control of Laser Spectroscopy Gas Analysis. Combining high speed, ultra low leak rate, high flow, and high temperature capability in a small size; this rugged valve operates with extreme repeatability and is constructed of non-corroding, passivated stainless steel. Pulse Valves coils are rated for continuous duty and are potted to exclude the environment.

### Features

- Smallest footprint in its class
- High speed response times of less than 2 ms
- 100% tested to leak-tight  $1 \times 10^{-7}$  cc/sec/atm Helium
- 100% duty cycle in environmental temperatures of up to 221°F (105°C)
- Pressures up to 1250 PSI (86.2 bar)
- Available with a variety of orifices, seals, and voltages to match your application
- RoHS compliant 

## Product Specifications

### Physical Properties

<b>Valve Type:</b>	Inert Non Isolation
<b>Valve Configuration:</b>	2-Way Normally Closed
<b>Media:</b>	Gases
<b>Operating Environment:</b>	40 to 221°F (4 to 105°C)
<b>Dimensions:</b>	See Dimensions Page
<b>Weight:</b>	2.8 oz (79.4 g)
<b>Porting:</b>	A-LOK®, Flange
<b>Internal Volume:</b>	(Contact factory for details)

### Electrical

<b>Voltage (VDC):</b>	20	28
<b>Power (Watts):</b>	12.1	11.2
<b>Current (mA):</b>	606	400
<b>Resistance (Ohm):</b>	33	70
(Ω±5% @ 70°F, 21°C)		
<b>Connection</b>	12" Lead Wires Standard	

### Wetted Materials

<b>Poppet Materials*:</b>	Vespel®** PTFE
<b>O-Ring:</b>	FFKM (Kalrez®**)
**NOTE: Vespel and Kalrez are trademarks of Dupont.	
* See accessories table under ordering information for additional poppet materials.	

### Performance Characteristics

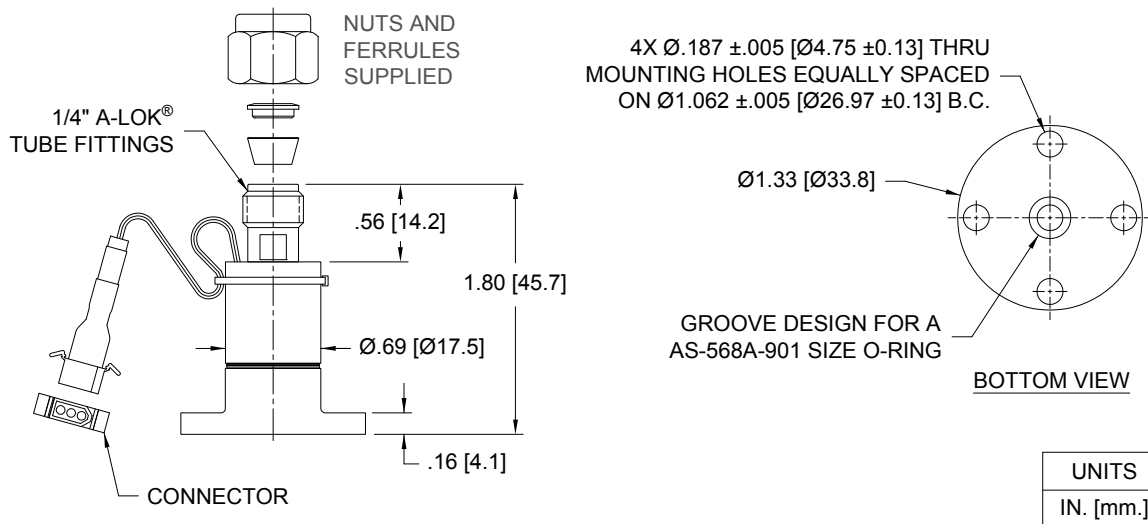
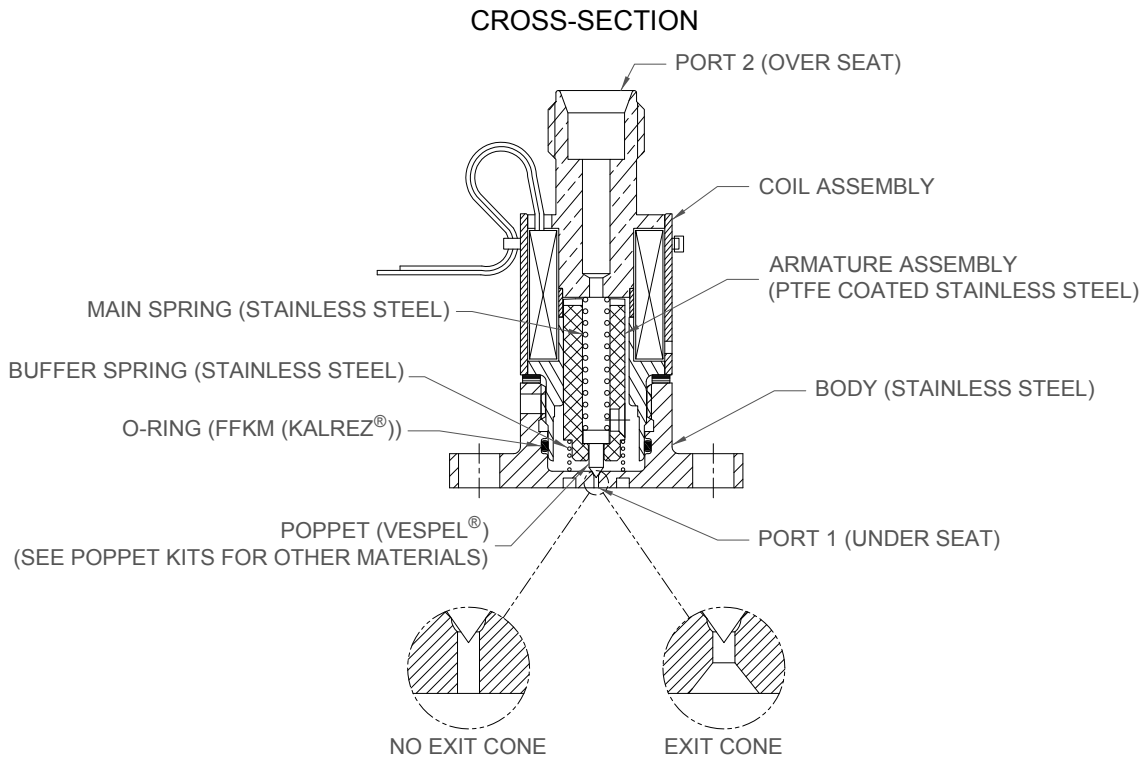
<b>Operating Pressures / Orifice Diameters:</b>	1x10 <sup>-5</sup> Torr -1250 psi (86.2 bar)/ 0.004" (.10 mm) 0.020" (.51 mm) 0.031" (.79 mm) 1x10 <sup>-5</sup> Torr -750 psi (51.7 bar)/ 0.039" (.99 mm)
<b>Proof Pressure:</b>	1.5X rated pressure
<b>Response Time:</b>	<2 ms cycling Down to 160µs with the Parker IOTA ONE Valve Driver. (See Accessories)
<b>Leak Rate:</b>	1 x 10 <sup>-7</sup> cc/sec/atm Helium
<b>Recommended Filtration:</b>	40 µm max
<b>Orifice Shape:</b>	Cone, No Cone (Cone improves exit stream uniformity)

# Pulse Valves Ultra Low Leak Extreme Performance Valve

## Mechanical Integration

### Dimensions

#### 1/4" [6.35 mm] A-LOK® CROSS-SECTION



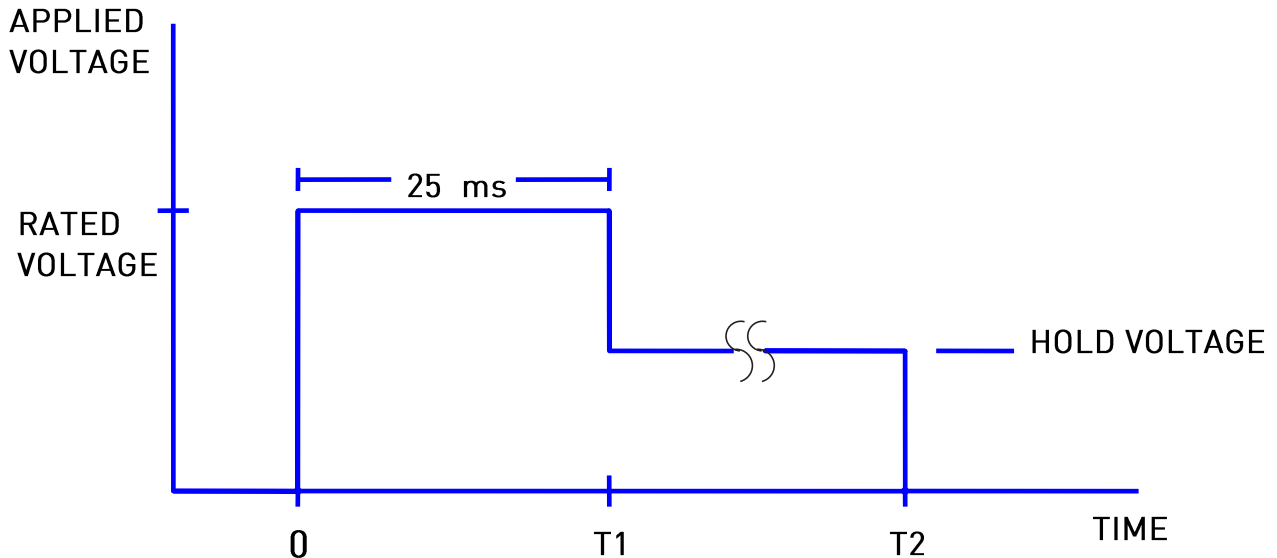
## Pulse Valves Ultra Low Leak Extreme Performance Valve

### 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 most of our standard 12-watt valve solenoids.

Rated Voltage (volts)	3-way		2-way	
	Hold Voltage	Hold Power	Hold Voltage	Hold Power
28	14 volts	2.8 watts	6 volts	0.51 watts
24	12 volts	3 watts	5 volts	0.52 watts
20	10 volts	3 watts	5 volts	0.76 watts
12	6 volts	3 watts	5 volts	2.1 watts

Note: values for 7-watt coils may be different



Hold Voltage Graph

## Pulse Valves Ultra Low Leak Extreme Performance Valve

### Chemical Compatibility Chart

Chemical	FFKM	PTFE	Stainless Steel	Vespel
DI Water	1	1	1	2
Methanol	1	1	1	1
Isopropanol	1	1	1	1
Ethanol	1	1	1	1
Acetonitrile	1	1	1	1
Tetrahydrofuran	1	1	1	2
Toluene	1	1	1	1
Organic Acids - Dilute	1	1	1	1
Non Organic Acids - Dilute	1	1	1	1
Bases - Dilute	1	1	1	1
Saline	1	1	1	1
Bleach 12%	1	1	2	4
Sodium Hydroxide 20%	1	1	1	4

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

# Pulse Valves Ultra Low Leak Extreme Performance Valve

## Accessories

**IOTA ONE**  
060-0001-900  
(Microfluidic Valve Driver)



## Ordering Information

Orifice Size	Pressure	Valve Type	Seal Material	Voltage	Inlet Porting	Outlet Porting	Part Number
0.004" (.10 mm)	Vac-1250 psi (86.2 bar)	2-Way NC	PTFE, FFKM	28V	1/4" A-Lok®	Flange, No Cone	009-1668-900
			Vespel, FFKM	20V			009-1670-900

Orifice Size	Pressure	Valve Type	Seal Material	Voltage	Inlet Porting	Outlet Porting	Part Number
0.020" (.51 mm)	Vac-1250 psi (86.2 bar)	2-Way NC	PTFE, FFKM	28V	1/4" A-Lok®	Flange, No Cone	009-0582-900
				20V		Flange, Exit Cone	009-0442-900
			Vespel, FFKM	20V	1/4" A-Lok®	Flange, No Cone	009-1421-900
						Flange, Exit Cone	009-0347-900

Orifice Size	Pressure	Valve Type	Seal Material	Voltage	Inlet Porting	Outlet Porting	Part Number
0.031" (.79 mm)	Vac-1250 psi (86.2 bar)	2-Way NC	PTFE, FFKM	28V	1/4" A-Lok®	Flange, No Cone	009-0381-900
				20V		Flange, Exit Cone	009-0181-900
			Vespel, FFKM	20V	1/4" A-Lok®	Flange, No Cone	009-1671-900
						Flange, Exit Cone	009-0279-900

Orifice Size	Pressure	Valve Type	Seal Material	Voltage	Inlet Porting	Outlet Porting	Part Number
0.039" (.99 mm)	Vac-750 psi (51.7 bar)	2-Way NC	PTFE, FFKM	28V	1/4" A-Lok®	Flange, No Cone	009-1669-900
			Vespel, FFKM	20V			009-1643-900

## Pulse Valve Rebuild Kits

Pulse Valve Rebuild Kits	Part Number
With Teflon Poppets	009-PTFE-KIT
With Vespel® Poppets	009-VSPL-KIT
With Kel-F® Poppets	009-KELF-KIT
With PEEK Poppets	009-PEEK-KIT

Kit Contents	Quantity Per Kit
Poppet	10
Buffer Spring	5
Load Spring	5
Internal Viton® O - Ring	5
External Viton® O - Ring	5
Teflon Coated Armature	1
Shims (Various Thicknesses)	40

Pulse Valve Poppet Kits	Part Number
PTFE Poppets Qty. 50pcs	003-0023-050-KIT
Kel-F® Poppets Qty. 50pcs	009-0185-020-KIT
Vespel® Poppets Qty. 10pcs	009-0595-020-KIT
PEEK Poppets Qty. 50pcs	009-0424-030-KIT

Pulse Valve Coils	Part Number
12 VDC	009-0280-050-2
20 VDC	009-0279-050-2
28 VDC	009-0181-050-2

Pulse Valve Bodies (Flange with conical discharge)	Part Number
0.020"(0.5 mm) Orifice	009-0309-010-003
0.031"(0.8 mm) Orifice	009-0181-010-003

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/pulse](http://www.parker.com/precisionfluidics/pulse)) to configure your Pulse Valve Ultra Low Leak Extreme Performance Valve. For more detailed information, visit us on the Web, or call 603-595-1500.



## Pulse Valves Ultra Low Leak Extreme Performance Valve Series 9 Accessory Kits

SERIES 9 Accessory Kits			
<b>Teflon Pulse Valve Kit - Contents</b>			<b>Qty</b>
	Teflon Poppet		10
	Buffer Spring		5
	Load Spring		5
	Internal Viton Oring		5
	External Viton Oring		5
	Teflon Coated Armature		1
	Shims (Various Thicknesses)		40
<b>Part Number</b>	<b>009-PTFE-KIT</b>		<b>1</b>
<b>VespeI Pulse Valve Kit - Contents</b>			<b>Qty</b>
	VespeI Poppet		5
	Buffer Spring		5
	Load Spring		5
	Internal Viton Oring		5
	External Viton Oring		5
	Teflon Coated Armature		1
	Shims (Various Thicknesses)		40
<b>Part Number</b>	<b>009-VSPL-KIT</b>		<b>1</b>
<b>Kel-f Pulse Valve Kit - Contents</b>			<b>Qty</b>
	Kel-f Poppet		10
	Buffer Spring		5
	Load Spring		5
	Internal Viton Oring		5
	External Viton Oring		5
	Teflon Coated Armature		1
	Shims (Various Thicknesses)		40
<b>Part Number</b>	<b>009-KELF-KIT</b>		<b>1</b>
<b>PEEK Pulse Valve Kit - Contents</b>			<b>Qty</b>
	PEEK Poppet		10
	Buffer Spring		5
	Load Spring		5
	Internal Viton Oring		5
	External Viton Oring		5
	Teflon Coated Armature		1
	Shims (Various Thicknesses)		40
<b>Part Number</b>	<b>009-PEEK-KIT</b>		<b>1</b>
<b>SERIES 9 POPPET KITS</b>			
<b>Part Number</b>	003-0023-050-KIT	PTFE Poppets	50
<b>Part Number</b>	009-0185-020-KIT	Kel-F Poppets	50
<b>Part Number</b>	009-0595-020-KIT	VespeI Poppets	10
<b>Part Number</b>	009-0424-030-KIT	PEEK Poppets	50
<b>SERIES 9 ORINGS (Kalrez)</b>			
<b>Part Number</b>	009-0070-100-001	Internal Kalrez Oring	1
<b>Part Number</b>	001-0045-020-001	External Kalrez Oring	1
<b>SERIES 9 COIL (1/4" A-LOK FITTING)***</b>			
<b>Part Number</b>	009-0280-050-2	12 VDC	1
<b>Part Number</b>	009-0181-050-2	28 VDC	1
<b>Part Number</b>	009-0279-050-2	20 VDC	1
<b>SERIES 9 BODIES (Flange with conical discharge)</b>			
<b>Part Number</b>	009-0309-010-003	.020" (0.5 mm)	1
<b>Part Number</b>	009-0181-010-003	.031" (0.8 mm)	1
<b>Part Number</b>	091-0351-010-003	.004" (0.1 mm)	1

Please contact customer service for order placement, leadtime and price

\*\*\*Series 9 coils shown do not ship with electrical connectors



# Pulse Valves Ultra Low Leak Extreme Performance Valve

## FAQs

### 1. Can the IOTA One trigger both 20 and 28V pulse valves?

*Yes, the IOTA One can trigger 12, 20, 24, and 28V pulse valves. However, you will need to change the jumper settings in the unit, reference manual that ships with the unit. Please note current standard coil are 20 and 28V.*

### 2. I used to purchase a pulse valve which is not listed in the chart above, is this pulse valve still available?

*Currently, only the pulse valve configurations listed in the chart above are available for purchase.*

### 3. I used to purchase spare parts for my pulse valve, are they still available?

*Yes, spare parts are still available for pulse valves. Please note that only the kits and part numbers above are available for purchase. Poppets, armatures, springs, etc... are no longer available for individual purchase and will need to be purchased as part of a kit.*

### 4. Can the IOTA One trigger multiple valves at once?

*Currently, the IOTA One is designed to trigger only one valve at a time.*

### 5. What is the fastest pulse duration, opening response time and closing response time?

*Typically, the fastest achievable pulse duration is 300 microseconds, opening response time is 180-200 microseconds, and closing response time is 50-250 microseconds.*

### 6. Which Poppet material should I choose and why?

*Poppet material should first be chosen based on compatibility with the gas you are flowing through the valve. If multiple materials are compatible then for general and low temperature and pressure applications PTFE and Kel-F should be used, for higher temperature and pressure applications Vespel or PEEK should be used.*

### 7. Is there a performance advantage between the different voltage valves?

*The performance difference between voltages is negligible. However, please note that the 20V coil is capable of handling 125C temperatures.*

### 8. What is the maximum cycle frequency for the valve?

*The maximum cycle frequency for the valve is 250Hz.*

## NOTES

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