CLEANING, STERILIZATION, STORAGE AND HANDLING

Cleaning Cautions

Several precautions must be observed when cleaning and sterilizing probes, as they are easily destroyed by improper handling.

NEVER BOIL OR AUTOCLAVE THE VINYL JACKETED LEAD WIRE. The vinyl may safely be exposed to temperatures up to 100°C, but above 90°C the vinyl softens and can be deformed permanently by mechanical stress. Handle gently while hot.

Avoid contact with strong, aromatic, chlorinated, ketone, ether or ester solvents. Prolonged immersion in alcohols or mild organic solvents, detergent solutions or highly alkaline solutions will cause the vinyl to lose flexibility. In medical applications, the user must determine that a probe is suitable and sufficiently flexible for esophageal or rectal use.

During cleaning or sterilization, probes should be handled gently. When wiping clean, hold the probe in one hand at the sensing tip and wipe the probe and lead wire toward the plug end. Excessive pressure could stretch the covering and break the internal wires, which would destroy the probe.

Continued flexing of lead wires in use and cleaning will also break the internal wires. Failure from this cause is not covered by the warranty.

NOTE: YSI disposable probes are designed for a single use only. The reusable cable used with disposable probes may be disinfected or sterilized the same way as the standard, reusable probes.

Disinfection

Probes may be disinfected and sanitized by washing with 3% hydrogen peroxide or 70% isopropanol. 70% ethanol is nearly as effective, but 100% alocohols are less germicidal. Dakin's solution (sodium hypochlorite in neutral buffer) is also suitable. Brief immersion of the probe in detergent solutions is not harmful. Activated dialdehyde solutions, such as Cidex, are also effective. Probe plugs and connectors should not be immersed.

If the connector on any extension or reusable instrument cable is inadvertently wetted during cleaning or disinfection, flush the connector with distilled or deionized water and dry it in a 40 to 80°C oven for at least an hour.

Sterilization

NEVER BOIL ANY YSI SERIES 400 TEMPERATURE PROBE. The detachable probe portion of the YSI 416 and 421 may be autoclaved. On probes other than the 416 and 421, autoclaving may cause the insulation to fail, and may also cause the probe to give inaccurate readings.

Ethylene oxide sterilization does not damage the probes, but the gas is absorbed by the plastic parts. Before handling or use, probes must be safely and thoroughly ventilated to eliminate the absorbed EtO. Because of variations in EtO sterilization equipment, equipment cycles, and variations in absorption from one probe style to another, adequate outgassing must be determined by appropriate testing.

Storage and Handling

When not in use, probes and leads should be formed into loose loops. If wires are stretched or wrapped tightly around instrument cases, stresses sufficient to cause mechanical failure may occur. Store probes at temperatures below 50°C, preferably at room temperatures. Store Super-Stable probes in cases supplied.

All probes should be handled with care, particularly those with delicate leads, and the Super-Stable probes which use glass-encapsulated thermistors. Mechanical shock can damage any probe.

CUSTOMER INFORMATION

Probe Modifications

The following probe modifications will be quoted on request. Contact the YSI Customer Service Department.

- YSI 402 — Length to 24"; Teflon® instead of vinyl.
- YSI 403, 408, 410, 416, 418 — Lengths to 36"; bends to 90° with 3/8" to 1/2" radius.
- YSI 404 — Lengths from 1" to 5".
- YSI 405 — Probe without cage; longer probe stem to 12".
- YSI 406 — Same as YSI 403, except 1/8" to 3/8" bend radius.
- YSI 408 — Bends to 90°; probe length to 12".
- YSI 415 — Lengths from 5" to 24".
- YSI 419 — Lengths from 6" to 70".
- YSI 409A, 421, 427 — Teflon® covered lead to 60" (consult factory for possible temperature error); epoxy encapsulated thermistor without stainless steel disc.
- YSI 423 — Length to 5".
- YSI 429 — Stainless steel sheath to 12".

Leads to 250' may be ordered for all but the Super-Stable and disposable probes. Consult factory for leads longer than 250'.

Special probes manufactured to customer specification, including waterproof probes utilizing marine cable for deep water applications.

Accessories

Standard extensions are available as follows: junctions are not water-resistant (not for use with Super-Stable probes):

YSI 4010 — 10' YSI 4025 — 25' YSI 4050 — 50'

- YSI 4009 Tempheart™ Heat Shields: Used with any skin temperature probe to deflect heat, to shield probe from ambient temperature fluctuations, and to hold probe securely in place. Boxes of 100.
- YSI 4900A and YSI 4910 Reusable Instrument Cables. Used with YSI Disposable probes. They are described at the end of the probe descriptions.
- YSI 4084 Manifold Outlet: Used with the YSI 441 Airway Probe to connect it to a standard 22 mm respiratory airway. One is supplied with each 441 probe.

Warranty

All reusable probes and instrument cables carry a one year warranty on workmanship and components. Damage through misuse or tampering is not covered. Probe life will vary from a few months to many years depending mainly on the amount of cable flexing. Normal life exceeds one year.

Super-stable probe specifications are warranted for three years.

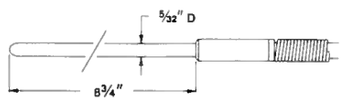
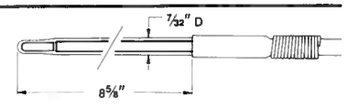
YSI Series 400 Disposable Probes are warranted to be functional for one year from date of purchase *for single-use applications only;* sterility is warranted unless package is opened, damaged or wet.

Warning

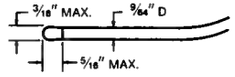
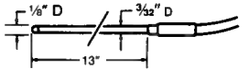
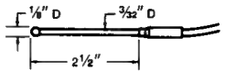
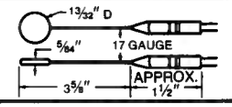
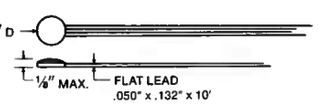
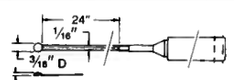
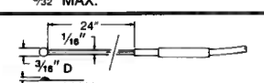
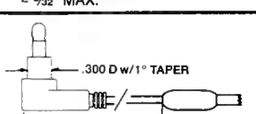
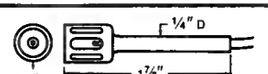
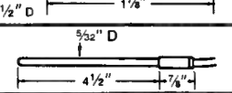
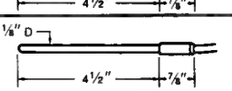
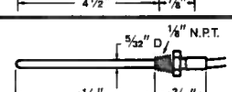
All wire-lead patient-connected transducer assemblies are subject to reading error, local heating and possible damage from high-intensity sources of RF energy. Inadequately grounded electrosurgical equipment represents one such source in that capacitively-coupled currents may seek alternate paths to ground through probe cables and associated instruments. Patient burns may result.

If at all possible, remove the probe from patient contact before activating the surgical unit or other RF source. If probes must be used simultaneously with electrosurgical apparatus, the instruments to which the probes are connected should be checked for adequate isolation from electrical grounds at radio frequencies. Hazards can be reduced by selecting a temperature monitoring point which is remote from the expected RF current path to the ground return pad, and by using pads having the largest practical contact area.

YSI Series 400 Super-Stable Probe Styles

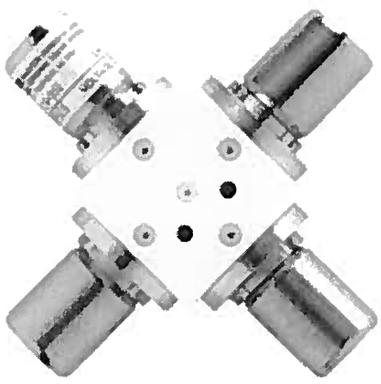
Probe No.	Description & Applications	Time Constant Temperature Range	Configuration
407	SUPER-STABLE REFERENCE, METAL: Stainless steel. For use as a secondary or transfer standard, and for those applications where long-term stability is essential. Useful for verifying accuracy of control probes in medical and scientific applications. Typically stable within ±0.015°C and warranted to an interchangeability within ±0.06°C for three years at measurement and storage temperatures between 0 and 70°C.	6.0 sec. 0 to 70°C	
411	SUPER-STABLE REFERENCE, GLASS: Tubular glass. Same specifications as 407.	6.0 sec. 0 to 70°C	

YSI Series 400 Standard Probe Styles

Probe No.	Description & Applications	Time Constant and Maximum Temperature	Configuration
401	GENERAL PURPOSE: Esophageal or rectal temperature. Used for water temperatures (short term), and often buried for sub-soil readings. Used for air where fast response is not required. Most rugged probe. Vinyl tip and lead.	7.0 sec. 100°C (212°F)	
402	SMALL FLEXIBLE VINYL: Esophageal or rectal temperatures of infants, small animals. Cuvette temperatures. Vinyl sheath and tip.	3.2 sec. 100°C (212°F)	
423	SMALL SEMI-FLEXIBLE NYLON: Frozen food package temperatures. Oral and rectal readings. Cuvette temperatures. Nylon with epoxy tip.	1.4 sec. 100°C (212°F)	
408	"BANJO" SURFACE TEMPERATURE. Skin, oral, axillary, water bath, and flat surface temperatures. Excellent for many air temperature applications. Handle aids in probe use. Stainless steel.	0.6 sec. 150°C (300°F)	
409A	ATTACHABLE SURFACE TEMPERATURE: Stainless steel cup, epoxy backed with Teflon covered flexible wire. Easy to tape on flat surfaces. Good for heat loss or compression efficiency study of piping. CAUTION: This probe is fragile.	1.1 sec. 150°C (300°F)	
409B	ATTACHABLE SURFACE TEMPERATURE: Tape on skin or flat surfaces. Good for heat loss and compression efficiency study of piping systems. Similar to 409A but less flexible and more rugged. Vinyl covered parallel lead. Stainless steel cup, epoxy backed.	1.1 sec. 100°C (212°F)	
421	SMALL SURFACE TEMPERATURE: 24" Teflon covered flexible wire. Stainless steel disc with epoxy back. Can be autoclaved. Probe head electrically isolated, connector not isolated. Detachable lead. Fastest probe.	0.3 sec. 150°C (300°F)	
427	SMALL SURFACE TEMPERATURE: Like YSI 421, but with YSI 402 type juncture. Non-detachable lead, non-autoclavable.	0.3 sec. 150°C (300°F)	
441	AIRWAY TEMPERATURE: For measurements in anesthesia and respiratory airways. Supplied with one YSI 4084 Airway Probe Adapter.	30.0 sec. in dry air 0 to 50°C (32 to 122°F)	
405	AIR TEMPERATURE: Test rooms, incubators, remote air readings, gas streams, etc. Stainless steel cage around epoxy encapsulated thermistor.	10.0 sec. in dry air 150°C (300°F)	
403	TUBULAR: For rugged duty in liquid immersion. Fast response oral or rectal. Stainless steel.	3.4 sec. 150°C (300°F)	
406	THIN TUBULAR: Same as YSI 403, except smaller diameter and is less rugged. Response is faster.	2.5 sec. 150°C (300°F)	
410	TUBULAR WITH FITTING: For readings in pipes or closed vessels. Stainless steel. Fitting withstands 500 psi.	3.4 sec. 150°C (300°F)	

Series 18
Teflon® Solenoid Valves

Features:
- Low Power
- Low Internal Volume
- High Cycle Life
- Only Teflon® Wetted Parts
- High Speed
- Requires No Pressure to Operate



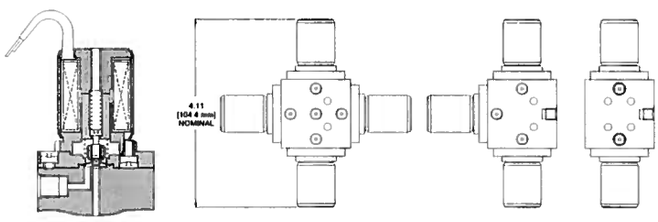
Valve Specifications:

Ports:	1/4-28 Threaded Ports
Operating Media:	Liquids and Gases
Operating Pressures:	Vacuum to 20 psi [1.38 BAR]
Operating Temperature:	40° to 150°F [4° to 66°C]
Leak Rate	$<1x10^{-6}$ cc/sec/atm Helium
Standard Orifices:	.031 and .062 [0.8mm and 1.6mm]
Materials Contacting Media:	Teflon®

Electrical Specifications
(continuous duty rated)

DC (V)	Power (W)	Current (ma)	Resistance (Ω±5% @ 70°F)
12	2.5	211	57
24	4.2	173	139

Mechanical Configuration



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All Series 18 valves are cycled 50,000 times prior to shipment after which they are tested 100% for all electrical and flow characteristics including actuation, response time, and leakage under both pressure and vacuum. After this rigorous testing, they are put through one additional leak check on a Mass-Spectrometer and tested for leak rates less than $1x10^{-6}$ ATM-cc/sec Helium.

Parker Hannifin Corporation
General Valve Division
19 Gloria Lane • Fairfield, NJ 07004
Phone: (973) 575-4844 • Fax: (973) 575-4011
Email: gvdhelp@parker.com

Parker Instrumentation

Series 1
Teflon® Solenoid Valves

Features:
- Low Power
- Low Internal Volume
- Requires No Pressure to Operate
- Only Teflon® and Glass Wetted Parts

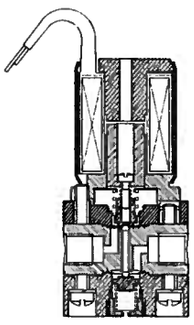
Valve Specifications:

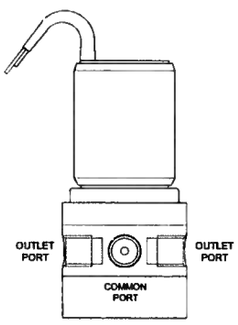
Ports:	1/4-28 Threaded Ports
Operating Media:	Liquids and Gases
Operating Pressures:	Vacuum to 20 psi [1.38 BAR]
Operating Temperature:	50° to 150°F [10° to 66°c]
Standard Orifices:	.031 and .062 [0.8mm and 1.6mm]
Materials Contacting Media:	Teflon® and Glass

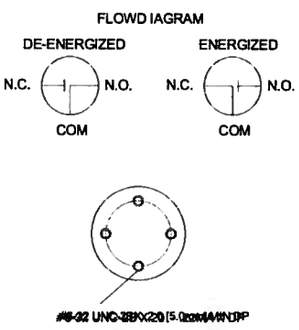
Electrical Specifications
(continuous duty rated)

DC (V)	Power (W)	Current (ma)	Resistance (Ω±5% @ 70°F)
12	2.5	211	57
24	4.2	173	139

Mechanical Configuration







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The Series 1's small internal volume combined with a fast response time—8ms—enables users to get fast readings and analysis. Washout is rapid. The Series 1's require no pressure to operate and the absence of sliding surfaces in the fluid stream ensures operation without particle generation.

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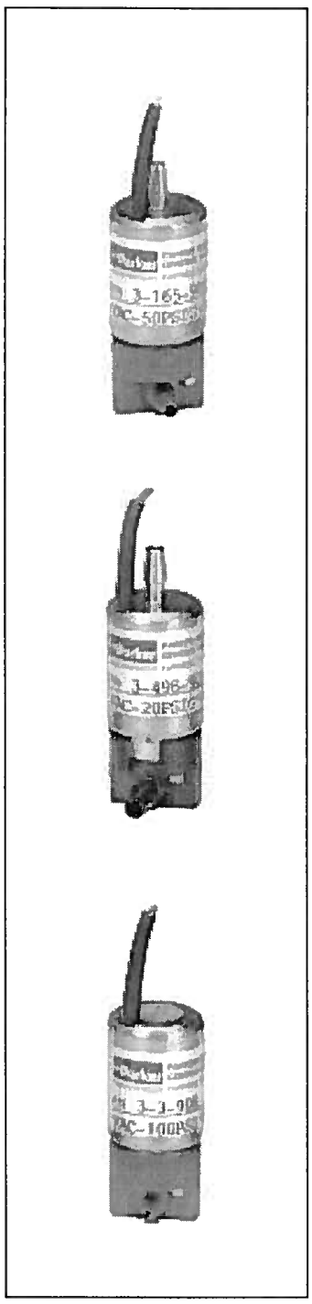
Email: gvdhelp@parker.com

Parker Instrumentation

Series 3
2 and 3 Way Solenoid Valves

Features:
- Low Internal Volume
- 2 Way NO, 2 Way NC and 3 Way Configurations
- Requires No Pressure to Operate
- High Cycle Life
- Small Package
- Integral Barbed Fittings



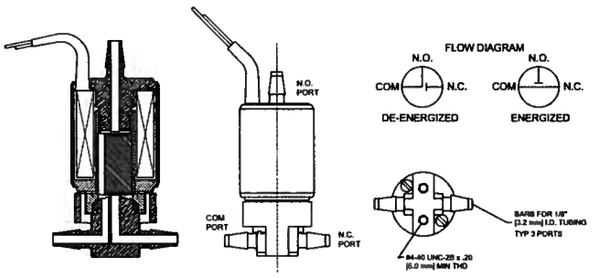
Valve Specifications:

Ports:	1/16", 1/8" and 3/16" Integral Barbed Fittings and #10-32 Threaded Ports
Operating Media:	Liquids and Gases
Operating Pressures:	Vacuum to 100 psi [6.89 BAR] (Orifice Dependent)
Operating Temperature:	40° to 150°F [4° to 66°C]
Standard Orifices:	.055 to .093 [1.4mm to 2.4mm]
Materials Contacting Media:	Passivated Stainless Steel, Teflon® and Elastomer, 10-32 Thread Bodies are Acetal, Barbed Bodies are Ryton® (Polyphenylene Sulfide)

Electrical Specifications
(continuous duty rated)

DC (V)	Power (W)	Current (ma)	Resistance (Ω±5% @ 70°F)
12	2.5	211	57
24	4.2	173	139

Mechanical Configuration



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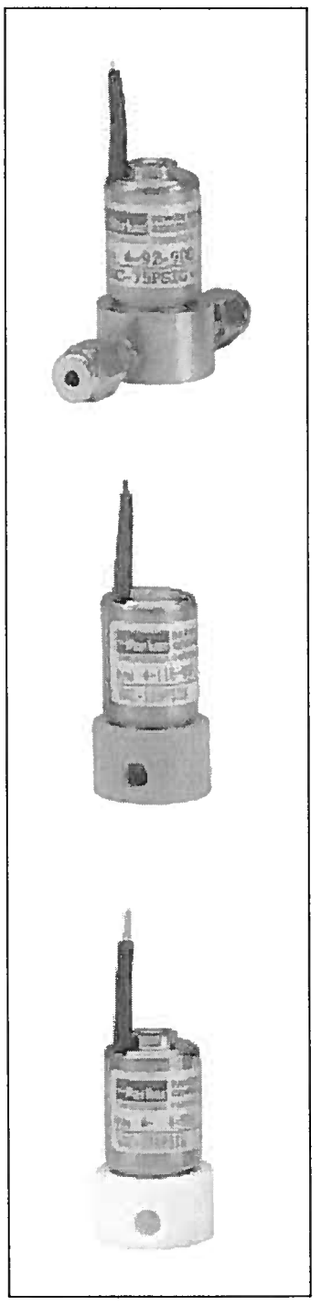
Parker Instrumentation

0004 - 0008 - 900 $6.50
3 way Teflon 1/4 28 Vitof

Series 4
2 and 3 Way Solenoid Valves

973 - 575 - 4844

Features:
- Low Internal Volume
- 2 Way NO, 2 Way NC and 3 Way Configurations
- Requires No Pressure to Operate
- High Cycle Life
- Small Package



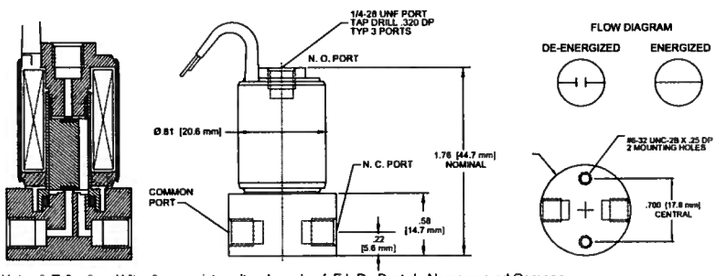
Valve Specifications:

Ports:	1/4-28 Threaded Ports, A-Lok Compression Fittings
Operating Media:	Liquids and Gases
Operating Pressures:	Vacuum to 100 psi [1.38 BAR] (Orifice Dependent)
Leak Rate:	<1x10E-5 cc/sec/atm Helium
Operating Temperature:	40° to 150°F [4° to 66°C]
Standard Orifices:	.055 and .093 [1.4mm and 2.4mm]
Materials Contacting Media:	Passivated Stainless Steel, Standard Body Materials: 316L Stainless Steel, PEEK, PTFE. Seal material Options: Viton®, Ethylene Propylene, Kalrez®.

Electrical Specifications
(continuous duty rated)

DC (V)	Power (W)	Current (ma)	Resistance (Ω±5% @ 70°F)
12	2.5	211	57
24	4.2	173	139

Mechanical Configuration



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Parker Instrumentation

Series 9
2 and 3 Way High Performance Valves

Features:
- Ultra High Speed
- High Flow
- Requires No Pressure to Operate
- High Cycle Life
- Stainless Steel Construction

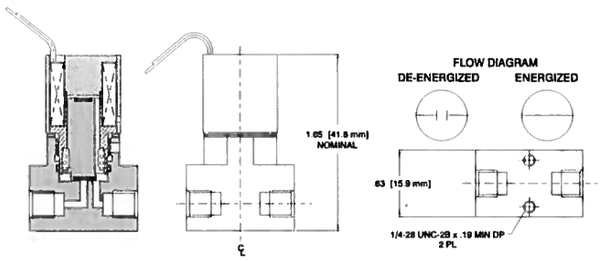
Valve Specifications:

Ports:	1/4-28 Threaded Ports, 1/8 NPT and A-Lok Compression Fittings
Operating Media:	Liquids and Gases
Operating Pressures:	Vacuum to 1500 psi [1.38 BAR]
Operating Temperature:	-40° to 200° C*
Standard Orifices:	.031 and .062 [0.8mm and 1.6mm]
Materials Contacting Media:	Passivated Stainless Steel, Teflon® Coating, and Elastomer
Leak Rate:	<1 x 10^{-7} cc/sec/atm Helium

Electrical Specifications
(continuous duty rated)

DC (V)	Power (W)	Current (ma)	Resistance (Ω±5% @ 70°F)
12	12	1000	12
20	12	594	33
24	12	500	48
28	11.2	400	70

Mechanical Configuration



*Notrated for continuous duty at max. temperature.
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The Series 9 is designed for high speed (5 ms or less opening response time) high flow (up to .116" orifice size) and high temperature applications (up to 200° C). This highly reliable compact valve is perfect for applications with the most critical needs. All valves are tested on helium leak detector mass spectrometers for leak rates less than 1 x 10-7 cc.

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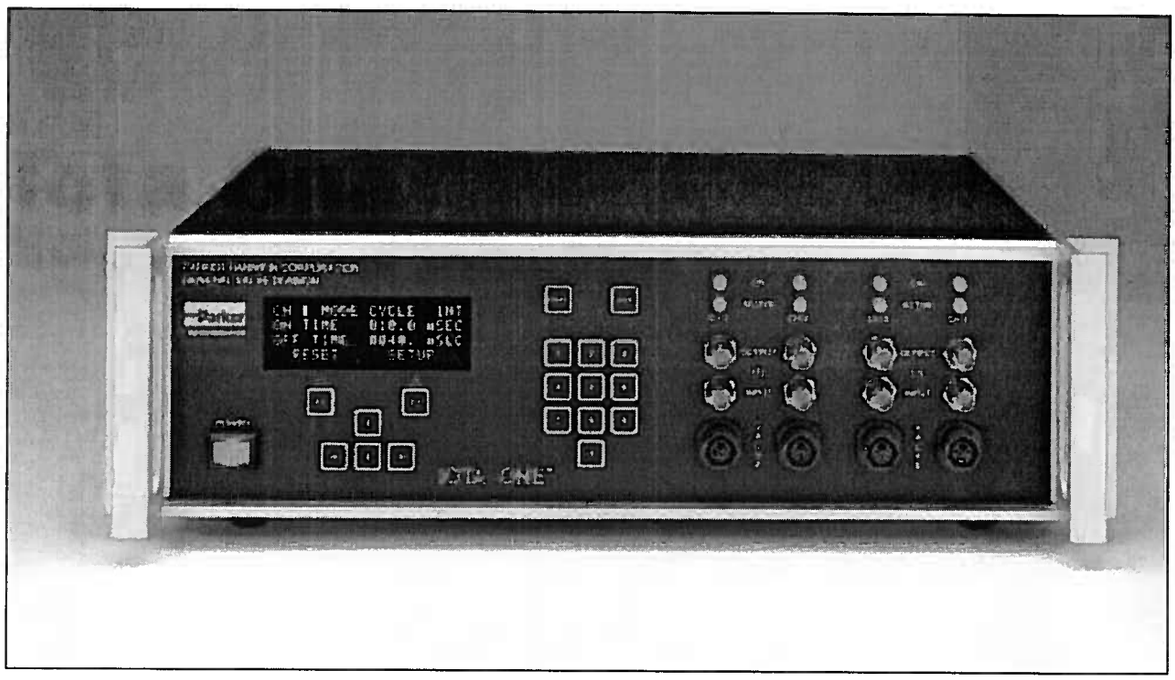
Email: gvdhelp@parker.com

Parker Instrumentation

Iota One
Solenoid Valve Controller



Features:

- Microsecond Operating Times
- Wide Range of Valves Supported
- Internally or Externally Triggered Modes
- 5 Volt TTL Coincident Output
- Low Voltage Holding Circuit
- Multi Channel Models Available

Valve Specifications:

- Operates Most Series 9, 91, or 99 Valves
- 12, 20, 24 and 28 Volt DC Coils Supported

Electrical Specifications

100 or 120 Volts AC
50-60 Hz 3.0 Amp

230 or 240 Volts AC
50-60 Hz 1.5 Amp

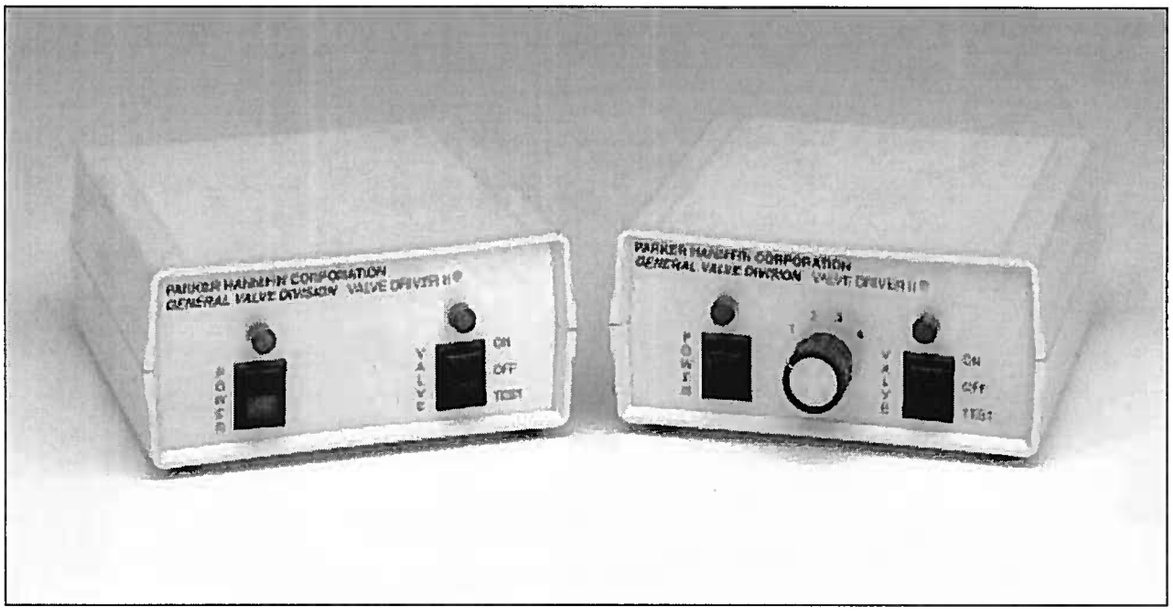
IOTA ONE is a bench top or rack mountable driver for high speed solenoid valves (series 9, 91 and 99). Pulse duration ranges in microseconds, milliseconds, or longer can be selected. Internally generated pulse trains can be achieved by setting on and off times or an operating frequency. Two externally triggered modes can be selected allowing partial or complete external control. Front panel BNC jacks are provided for both input and output TTL signals. The single channel unit can produce repetition rates up to 250 Hertz (maximum 50% duty cycle) while the multi-channel can produce repetition rates up to 999 Hertz. A shielded cable(s) is included for connection to the valve(s). Pulse valves are not included.

Used to drive molecular beam pulsed sources for laser spectroscopy experiments where pulsing the supersonic carrier gas instead of "CW" reduces the size of the vacuum pumping system required. Synchronizing the gas pulse with the laser pulse increases the signal-to-noise ratio and lowers the temperature. Molecules are cooled without changing to liquid, and therefore higher peak intensities can be achieved due to the simpler spectra of cold molecules. Less sample is required.

Parker Hannifin Corporation
General Valve Division
19 Gloria Lane • Fairfield, NJ 07004
Phone: (973) 575-4844 • Fax: (973) 575-4011
Email: gvdhelp@parker.com

Parker Instrumentation

Valve Drivers
Single and Multi-Channel



Features:

- Small and Lightweight
- Models for 12 and 24 VDC Valves
- Internally or Externally Triggered Modes
- Single, Two Channel and Multi Channel Models Available
- Drivers for Iso-Latch® valves

The Valve Driver II family of instruments is designed to assist in the automation of fluid (liquid or gas) control systems in the laboratory. They allow manual as well as external control of one or more electric solenoid valves. The drivers employ a "hit and hold" drive circuit that applies a pulse of full voltage to the valve after which a low holding voltage cuts on to keep the valve open as long as required. This technique reduces overall power consumption and substantially reduces the heat build up in the valve. Manual switches and LED indicators are on the front panel. The back panel has two detachable terminal blocks; one for the valve and one for all other I/O. In addition to standard positive and negative (contact closure) TTL inputs the drivers can be configured to trigger on the leading or trailing edge of a pulse. These instruments are small, lightweight and are powered by a modular remote power supply. Most 12 or 24 volt DC valves produced by the General Valve Division of Parker Hannifin Corporation can be operated by one or more of these drivers.

There are four models of the Valve Driver II each offered in both 12 and 24 volt versions. The Single Channel; the Two Channel (both channels independent); the Multi-Channel (manuel selection of 1 of 4 outputs); and the Iso-Latch®.

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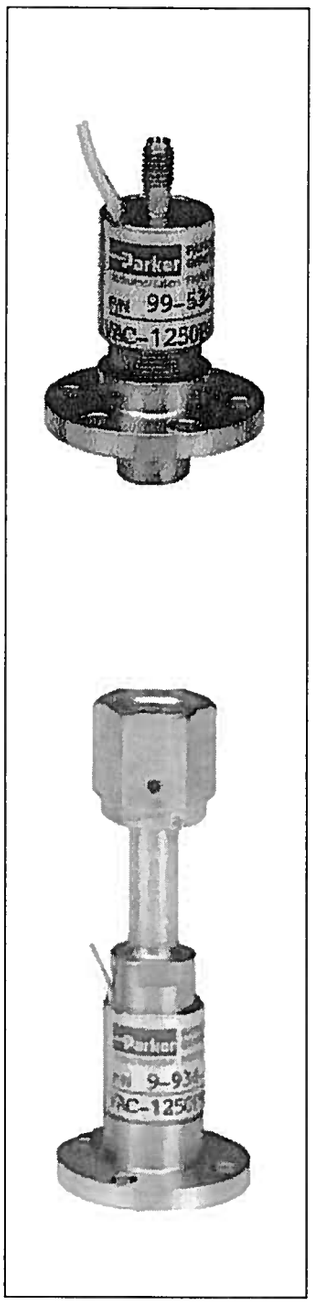
Parker Instrumentation

Pulse Valves
Series 9 and 99 Valves for Pulsed Spectroscopy

Features:
- Ultra High Speed
- Repeatable Pulses
- Requires No Pressure to Operate
- High Repetition Rates
- Stainless Steel Construction



Valve Specifications:

Ports:	A-Lok, VacuSeal and NPT Connections standard
Operating Media:	Liquids and Gases
Operating Pressures:	Vacuum to 1500 psi
Operating Temperature:	-40° C to 200° C*
Orifice Sizes:	.002" to .116" [0.5mm to 3.0mm]
Leak Rate:	$<1 \times 10^{-8}$ cc/sec/atm Helium

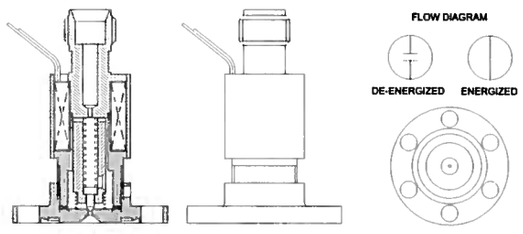
Materials Contacting Media:

Series 9 Pulse Valves	***Series 99 Pulse Valves***
O-Ring Materials: Kalrez®, Viton and EPDM	Gasket Materials: PEEK, Copper and Nickel
Poppet Materials: PTFE, PPS, PEEK, Kel -F and Vespel®	Poppet Materials: PTFE, PPS, PEEK, Kel-F and Vespel®

Electrical Specifications
(continuous duty rated)

DC (V)	Power (W)	Current (ma)	Resistance (Ω±5% @ 70°F)
6	12	2000	3
12	12	1000	12
20	12	594	33
24	12	500	48
28	11.2	400	70

Mechanical Configuration



*Notrated for continuous duty at max. temperature.
Kalrez®, Teflon® and Viton® areregisteredtr ademarksof E.I. Du Pont de Nemoursa nd Company.

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Parker Instrumentation

Series 99
Ultra High Vacuum Valves

Features:

- No Elastomers / Ultra High Vacuum / High Pressure
- Stainless Steel Construction
- Ultra High Speed
- Variety of Porting Options
- Orifice from 50 Microns to 2.9 mm
- High Cycle Life

The absolute latest in high and ultra-high vacuum valve technology. Utilizing the revolutionary Gen-Lock™ seal, the series 99 can achieve leak rates of 1 x 10^{-9} or better. The series 99 is also designed for high-speed (5ms or less opening response time) high flow (up to .116" orifice size) and high temperature applications (up to 200° C). This highly reliable compact valve is perfect for applications with the most critical needs.

Valve Specifications:

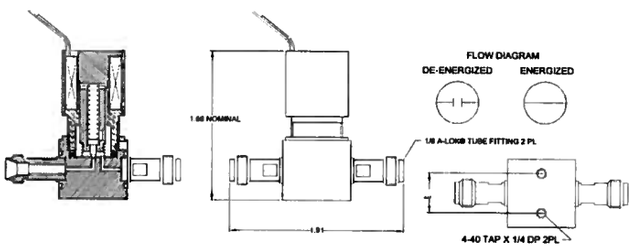
Ports:	Inlet:	Threaded Ports, Vacuum Fittings and Compression Fittings
	Outlet:	1 1/3" Standard or Conflat® Compatible Flange and Cylindrical
Operating Media:		Liquids and Gases
Operating Pressures:		Vacuum to 1250 psi [86.20 BAR] (Orifice Dependent)
Operating Temperature:		-40° C to 200° C*
Leak Rate:		<1x10^{-9} or Better cc/sec/atm Helium
Standard Orifices:		.031, .062 and .116 [0.8mm, 1.6mm and 2.9mm]
Materials Contacting Media:		Passivated Stainless Steel, Teflon® Coating and Gasket

Electrical Specifications
(continuous duty rated)

DC (V)	Power (W)	Current (ma)	Resistance (Ω±5% @ 70°F)
12	12	1000	12
20	12	594	33
24	12	500	48
28	11.2	400	70

AC coils available upon request.

Mechanical Configuration



*Notrated for coninuous dutya t max. temperature.
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Parker Instrumentation

Series 2
Teflon® Solenoid Valves

Features:
- Low Power
- Low Internal Volume
- High Cycle Life
- Only Teflon® Wetted Parts
- High Speed
- Requires No Pressure to Operate

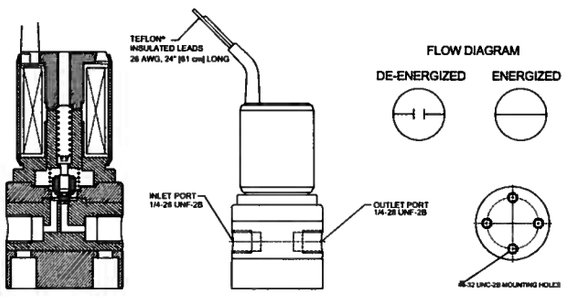
Valve Specifications:

Ports:	1/4-28 Threaded Ports
Operating Media:	Liquids and Gases
Operating Pressures:	Vacuum to 20 psi [1.38 BAR]
Operating Temperature:	40° to 150°F [4° to 66°C]
Leak Rate:	$<1x10^{-6}$ cc/sec/atm Helium
Standard Orifices:	.031 and .062 [0.8mm and 1.6mm]
Materials Contacting Media:	Teflon®

Electrical Specifications
(continuous duty rated)

DC (V)	Power (W)	Current (ma)	Resistance (Ω±5% @ 70°F)
12	2.5	211	57
24	4.2	173	139

Mechanical Configuration



All Series 2 valves are cycled 50,000 times prior to shipment after which they are tested 100% for all electrical and flow characteristics including actuation, response time, and leakage under both pressure and vacuum. After this rigorous testing, they are put through one additional leak check on a Mass-Spectrometer and tested for leak rates less than $1x10^{-6}$ ATM-cc/sec Helium.

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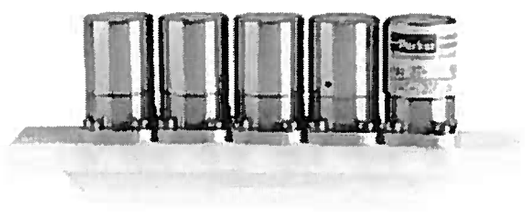
Parker Instrumentation

Series 27
Ultra High Speed Teflon® Solenoid Valves

Features:

- Compact Package
- Low Internal Volume
- High Cycle Life
- Only Teflon® Wetted Parts
- Ultra High Speed
- Requires No Pressure to Operate



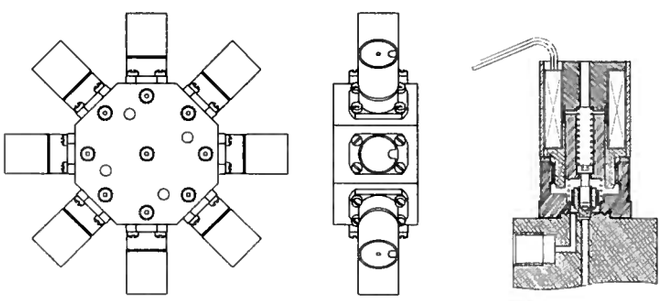
Valve Specifications:

Ports:	1/4-28 Threaded Ports
Operating Media:	Liquids and Gases
Operating Pressures:	Vacuum to 30 psi [2.07 BAR]
Operating Temperature:	40° to 150°F [4° to 66°C]
Leak Rate	$1x10^{-6}$ cc/sec/atm Helium
Standard Orifices:	.031 and .040 [0.8mm and 1.0mm]
Materials Contacting Media:	Teflon®

Electrical Specifications
(continuous duty rated)

DC (V)	Power (W)	Current (ma)	Resistance (Ω±5% @ 70°F)
12	5.0	414	29
24	7.0	292	82

Mechanical Configuration



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All Series 27 valves are cycled 50,000 times prior to shipment after which they are tested 100% for all electrical and flow characteristics including actuation, response time, and leakage under both pressure and vacuum. After this rigorous testing, they are put through one additional leak check on a Mass-Spectrometer and tested for leak rates less than $1x10^{-6}$ ATM-cc/sec Helium.

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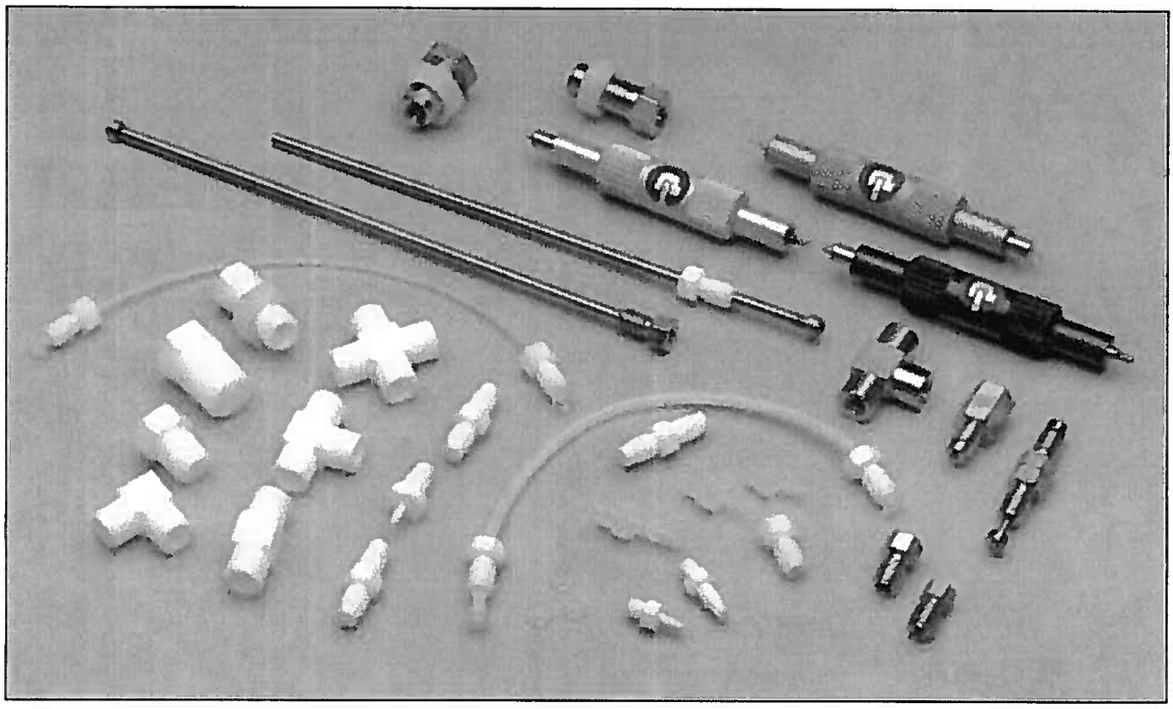
Parker Instrumentation

Tubing and Fittings

We offer a full line of compatible tubing fittings and tools.



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